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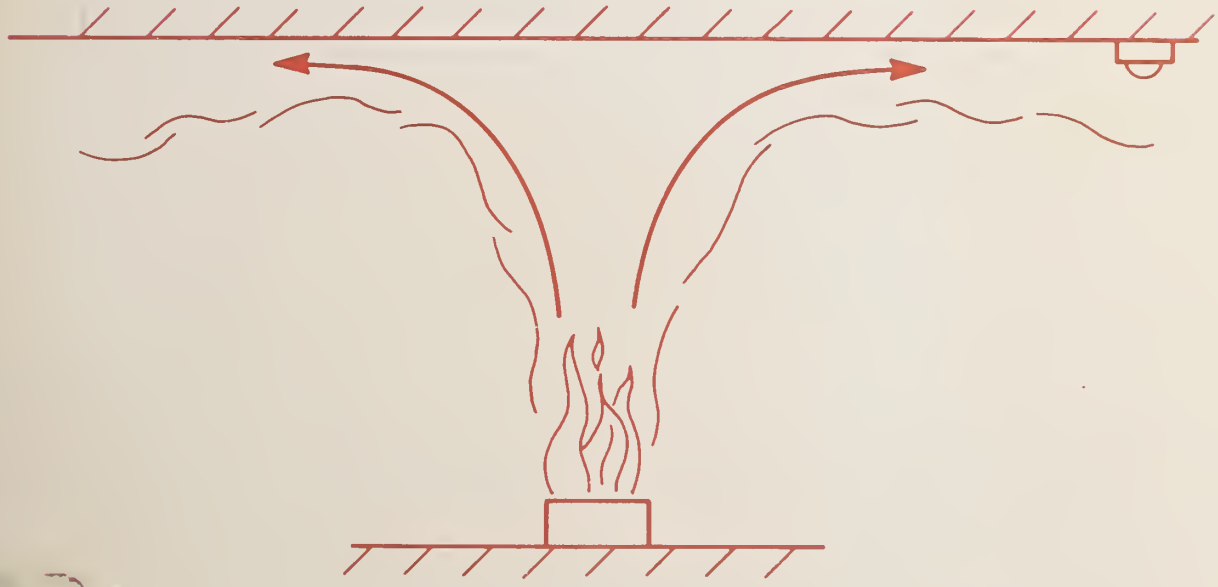
Evaluating Thermal Fire Detection Systems (English Units)



David Stroup • David Evans • Phyllis Martin

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Evaluating Thermal Fire Detection Systems [English Units]

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NOMENCLATURE

A	$g/(C_p\ T_\infty\ \rho_\infty)$
C_p	specific heat capacity of ambient air
C_T	constant used in equations 9 and 11
C_W	constant used in equations 10 and 11
g	acceleration of gravity
H	vertical distance from fuel to ceiling
$\dot{Q}$	fire energy release rate
$\dot{Q}^*$	dimensionless fire energy release rate
r	radial distance from fire axis to the detector
RTI	response time index, the product of the detector thermal time constant and the square root of the gas velocity used in the test to measure the time constant [8].
t	time
t_2^*	dimensionless time, $t/[A^{-1/5}\ \alpha^{-1/5}\ H^{4/5}]$
$(t_2^*)_f$	dimensionless time for time delay for gas front travel
T_∞	ambient temperature
T	gas temperature
T_s	temperature of detector sensing elements
ΔT	$T - T_\infty$

NOMENCLATURE (continued)

ΔT_2^*	dimensionless temperature difference, $\Delta T/[A^{2/5} (T_\infty/g) \alpha^{2/5} H^{-3/5}]$
U	gas velocity at the detector location
U_m	maximum gas velocity
U_2^*	dimensionless gas velocity, $U/[A \alpha H]^{1/5}$
α	proportionality constant for t^2 - fire growth = $\dot{Q}/t^2$
ρ_∞	ambient air density
τ	detector thermal time constant

Evaluating Thermal Fire Detection Systems [English Units]

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ABSTRACT

This report presents a methodology for evaluating heat detection systems installed in buildings. Previous work for use primarily in designing new thermal fire detection systems was used as a starting point. The previous work was enhanced and supplemented to make it more useful for evaluating existing systems. The resulting equations were programmed into a user interactive computer program. This program is available in both BASIC and FORTRAN and will run on mainframes as well as personal computers. In addition, a modified version of the FORTRAN program was used to develop an extensive set of tables listing detector activation times for given building geometries, detector characteristics, and fire growth rates. These tables are useful for quick evaluation of alternative heat detector installations. Finally, practical examples are included to illustrate the use of the tables and computer programs.

Keywords: fire alarm systems; fire detection; fire detection systems; fire hazard assessment; fire protection; fire suppression; heat detectors; sprinkler systems.

1. INTRODUCTION

Studies of the response of heat detectors to fire driven flows under confined ceilings have been conducted since the early 1970's [1,2,3,4,5][1]. Results of these largely experimental studies have been used to develop correlations of data that are useful under a broad range of fire conditions and building geometries. These correlations have been used to construct engineering methods to determine heat detector spacing, sprinkler response time, and smoke detector alarm times for industrial buildings where large undivided ceilings over storage and manufacturing facilities are common. The National Fire Protection Association (NFPA) has adopted an alternate design method for determining heat detector spacing which is based on some of these correlations.

This alternate design method is contained in Appendix C of the NFPA 72E standard [6], "Guide for Automatic Fire Detector Spacing," which consists of tables listing maximum allowable detector spacings for given room sizes and fire growth rates calculated from correlations of experimental measurements. The tabular form of presentation is useful for specifying design requirements in new installations. However, the tables are inconvenient to use in evaluating changes to existing detector systems where the spacing is fixed. There appears to be a need for a method which determines detector activation times for specified building geometries, detector characteristics, detector spacings, and fire growth rates. This method would be useful in evaluating the

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[1] Numbers in brackets refer to literature references at the end of this repor

expected fire detection time for existing and proposed systems for use in determining available safe egress time, and the relative effectiveness of different detectors used at the same spacing.

This paper presents the results of work to develop an alternative method appropriate to existing installations. As part of this study, the basis for the calculation method published in Appendix C of the NFPA 72E standard was determined. Alternate correlations of the experimental data, used to develop the results presented in Appendix C of NFPA 72E, have been used to construct a FORTRAN program (DETACT-T2). This computer program evaluates the response time of heat detector systems [7]. In this work, a modified version of the DETACT-T2 program was used to generate tables of detector response times for a wide range of building geometries, detector characteristics, and fire growth rates. These calculated values for response time agree to within 5 percent of those published in the tables contained in Appendix C of the NFPA 72E standard.

2. DESCRIPTION OF THE MODEL

The problem of heat detector response is solved by predicting the time dependent temperature of the detector sensing element up to the point when it is heated to the specified alarm conditions. In order to predict the temperature of a heat detector element, it is necessary to describe the fire and the fire generated environment to which the detector is exposed. The primary fire related parameters which influence the response of heat detectors are the gas temperature and velocity. Once the fire-generated environmental

characteristics are known, a model of the response of the thermal sensing element in the detector is employed to calculate the detector element temperature as a function of time.

2.1 Characteristic Fire

Extensive full-scale tests have been conducted to determine the response of heat detectors [1-4]. These tests have studied two classes of fires. The first of these are steady fires. These fires have energy release rate histories which do not change with time. Results from work using this type of fire may be used to calculate heat detector response if the quasi-steady state assumption is invoked. In this case, a varying energy release rate history is approximated as a series of steady fires. In this type of analysis, the transport time of the gases to the detector is ignored. This usually results in a predicted actuation time which is earlier than that encountered in actual practice. This may or may not be acceptable depending on the case.

Another class of fires for which research results are available are called "t-squared" (t^2) fires. These fires have energy release rate histories which increase proportionally with the second power of time from ignition. This class of fires was used to develop the tables in the NFPA 72E document and will be used in this paper.

Appendix C of the NFPA 72E standard lists three fires which have t^2 type fire growth behavior. A slow developing fire is defined as one which would

take 600 seconds (10 minutes) from the time of flaming ignition until it reaches a heat release rate of 1000 BTU/s (1055 kW). A medium growth rate fire reaches a heat release rate of 1000 BTU/s (1055 kW) approximately 300 seconds (5 minutes) after flaming ignition occurs. The fast developing fire requires 150 seconds (2.5 minutes) to reach a heat release rate of 1000 BTU/s (1055 kW). In addition, a fourth t^2 fire has been developed in this report. This fire has been defined as one which takes 75 seconds (1.25 minutes) to reach a heat release rate of 1000 BTU/s (1055 kW). These four fire growth curves are plotted in Figure 1.

Table 1 is a reproduction of a table in NFPA 72E. It lists various warehouse commodities and their maximum fire heat release rates per unit floor area covered by the commodity. The time required for a fire, occurring in a particular commodity, to reach a heat release rate of 1000 BTU/s is also listed. If possible, each commodity is identified with a specific fire growth behavior - slow, medium, fast, or ultrafast fire. Table 2 is a reproduction of another table found in Appendix C of NFPA 72E. It lists the maximum heat release rates for various furnishing type fuel items. Both of these tables are useful for estimating fire growth rates that may be expected from various fuel packages.

2.2 Temperature and Velocity Correlations

Values of the time dependent gas velocity and temperature for t^2 fires may be obtained from work by Heskestad and Delichatsios [4]. From experiments and

use of dimensional arguments, they developed correlations of maximum temperature rise and velocity for unconfined ceiling layer flows as a function of radial distance from the axis of fire plume impingement. These correlations of dimensionless maximum temperature rise and dimensionless maximum velocity are:

$$\Delta T_2^* = \begin{cases} 0, & t_2^* \leq (t_2^*)_f \\ \left[\dfrac{t_2^* - 0.954\ (1 + r/H)}{0.188 + 0.313\ r/H}\right]^{4/3}, & t_2^* > (t_2^*)_f \end{cases} \tag{1}$$

$$U_2^* / \sqrt{\Delta T_2^*} = 0.59\ (r/H)^{-0.63} \tag{2}$$

where

$$t_2^* = t\ /\ [A^{-1/5}\ \alpha^{-1/5}\ H^{4/5}]$$

$$U_2^* = U\ /\ [A^{1/5}\ \alpha^{1/5}\ H^{1/5}]$$

$$\Delta T_2^* = \Delta T\ /\ [A^{2/5}\ (T_\infty/g)\ \alpha^{2/5}\ H^{-3/5}]$$

$$A = g\ /\ [C_p\ T_\infty\ \rho_\infty]$$

$$\alpha = \dot{Q}\ /\ t^2$$

$$(t_2^*)_f = 0.954\ (1 + r/H)$$

These equations may be used to predict the fire-generated environment (gas temperature and velocity) near a detector.

2.3 Detector Response Model

Characterization of the thermal response of heat detector and sprinkler thermal sensing elements is discussed by Heskestad and Smith [8], and Evans [9]. The model for the detector sensing element temperature is based on a convective heat transfer process. The first order differential equation that describes the rate of temperature increase of the sensing element is:

$$\frac{dT_s}{dt} = \frac{U^{1/2}}{RTI} [T - T_s] \tag{3}$$

This equation predicts the temperature change of a detector with known thermal characteristics to a given time dependent gas flow temperature and velocity. In particular, the rate of change of the detector element temperature at any time is equal to the gas velocity to the one-half power multiplied by the difference between the temperature of the hot fire generated gas flow near the detector and the temperature of the detector element. All divided by the detector RTI or response time index.

The RTI is a measure of the detector's thermal lag and can be determined for sprinkler or heat detector sensing elements using the plunge test [8]. NFPA 72E reports detector sensitivity in terms of time constants, τ. At any given time, the time constant for a given type of detector may be calculated from the RTI using:

$$\tau = RTI / U^{1/2} \tag{4}$$

Tables 3 and 4 relate heat detector listed spacings to RTI values for fixed temperature detectors and rate of rise detectors respectively. These Tables were derived from results published in references 3 and 5.

Beyler [10] used the correlations of Heskestad and Delichatsios [4] to derive a new form of equation (3). He was able to solve this new form of the heat detector response equation analytically. Using the condition that the initial detector element temperature is equal to ambient temperature ($T_s = T_\infty$), the equations for calculating the response of fixed temperature and rate of temperature rise detectors are, from Beyler:

$$\frac{dT_s}{dt} = \frac{(4/3)\ (\Delta T/\Delta T_2^*)\ (\Delta T_2^*)^{1/4}}{(t/t_2^*)\ (0.188 + 0.313\ r/H)}\ (1 - e^{-Y}) \qquad (5)$$

$$T_s - T_s(0) = (\Delta T/\Delta T_2^*)\ \Delta T_2^* \left[1 - \frac{(1 - e^{-Y})}{Y}\right] \qquad (6)$$

where

$$Y = \frac{3}{4}\left(\frac{U}{U_2^*}\right)^{1/2} \left(\frac{U_2^*}{\sqrt{\Delta T_2^*}}\right)^{1/2} \frac{\Delta T_2^*}{RTI} \left(\frac{t}{t_2^*}\right) (0.188 + 0.313r/H)$$

Using equations (1) and (2), equations (5) and (6) may be solved to predict the response of sprinkler and heat detector sensing elements to fire-driven ceiling jet flows.

2.4 Velocity Correlation for r/H < 0.3

While this exact solution to equation (3) is applicable to any r/H value, the dimensionless velocity correlation, previously discussed, is only valid for r/H values greater than 0.3. In an effort to extend the usefulness of the detector response calculations, an analysis was made of the available data for ceiling jets at r/H values less than 0.3. Results of this analysis indicated a lack of much quantitative information for this region. Therefore, an analysis to develop a rational estimation of velocities in the ceiling-jet close to the plume axis was undertaken by studying a simple extension of the velocities in the plume.

The dimensionless velocity and temperature change relations proposed by Heskestad and Delichatsios [4] together with equations proposed by Zukoski et. al. [11] to describe fire plume maximum temperature and velocity distributions were taken as a starting point.

$$U_2^* = U / [A^{1/5} \alpha^{1/5} H^{1/5}] \tag{7}$$

$$\Delta T_2^* = \Delta T / [A^{2/5} (T_\infty/g) \alpha^{2/5} H^{-3/5}] \tag{8}$$

$$\Delta T_m / T_\infty = C_T (\dot{Q}^*)^{2/3} \tag{9}$$

$$U_m = C_W g^{1/2} H^{1/2} (\dot{Q}^*)^{1/3} \tag{10}$$

These equations were used to obtain an expression of dimensionless maximum gas velocity in the same form as equation (2).

$$U_2^* / \sqrt{\Delta T_2^*} = C_W / \sqrt{C_T} \tag{11}$$

Using values suggested by Zukoski et. al. [11], the dimensionless gas velocity is found to be a constant at r/H values less than 0.3. The complete dimensionless gas velocity equation for all values of r/H is:

$$U_2^* / \sqrt{\Delta T_2^*} = \begin{cases} 3.87 / \sqrt{9.115}, & r/H \leq 0.3 \\ 0.59\ (r/H)^{-0.63}, & r/H > 0.3 \end{cases} \tag{12}$$

This equation is plotted in Figure 2. The two curves merge nicely. This equation together with the previously discussed correlations and analytic solution may be used to calculate any aspect of the response of thermal detectors to t^2 fires.

3. IMPLEMENTATION OF THE MODEL: COMPUTER PROGRAMS

3.1 General Program Structure

The equations discussed in Section 2 were programmed into a user interactive computer code called DETACT-T2. To evaluate the response of a detector, the user enters values for ambient air temperature, detector activation temperature and rate of temperature rise, detector RTI, fuel to ceiling distance, detector spacing, and a fire growth rate constant, α (for t^2 fires). The program solves the appropriate equation to obtain the response time for a fixed temperature detector and a rate of rise detector with the

given characteristics. The fire energy release rate at each time step is also calculated.

The computer program is available in two versions. One version, contained in Appendix A, is written in FORTRAN 77. The program contains approximately 400 lines of source code and requires about 64k of computer memory in compiled form for execution. The source code may be compiled on any computer supporting an ANSI standard FORTRAN 77 compiler. The program has been compiled and run successfully on IBM[2] and compatible personal computers operating under MS-DOS[3]. A specially modified version of this program was used to generate the tables discussed in section 4.

The other version of the program, listed in Appendix B, is written in BASIC. It consists of approximately 350 lines of source code. This program has also been successfully tested on IBM and compatible micro-computers. Both programs have essentially the same structure and use the same variable names. To insure convergence, all variables are in double precision.

The program consists of three major sections. The main program reads and lists the required input data, performs the calculations necessary to set up the equations, calls the solution subroutines, and writes out the results. The second section is a subroutine which uses a Newton-Raphson technique to solve the equation describing the activation time of a fixed temperature detector.

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[2] IBM is a trademark of International Business Machines Corporation and does not represent an endorsement by the National Bureau of Standards.

[3] MS and Microsoft are trademarks of Microsoft Corporation and do not represent an endorsement by the National Bureau of Standards.

The last section is a subroutine which uses a bisection method to solve the rate of temperature rise detector activation time equation. Each of these sections is described in more detail below.

3.2 Main Program

3.2.1 Data Input Section

This section of the main program requests information from the user concerning the building geometry, the detector characteristics, and the fire growth rate. The user may also elect to enter data in either English or S.I. units.

3.2.2 Calculation Initialization

Several preliminary calculations must be made before the activation time equations may be solved. These calculations are done in the second section of the main program. In this section, the dimensionless time, velocity, and temperature are calculated. Based on the user-specified detector spacing, the maximum radial distance of the detector from the fire is calculated. After these calculations have been completed, the two activation time calculation subroutines are called. The results from these subroutines are converted into activation times, and the heat release rates are calculated.

3.2.3 Conversion and Output Section

The last section of the main program writes out the solutions to the equations. The results are printed in both English and S.I. units.

3.3 Activation Time Equation Solution: Fixed Temperature

The equation describing the activation time of a fixed temperature detector cannot be solved explicitly for activation time. Therefore, a numerical technique must be used. A Newton-Raphson technique was selected for use in solving the fixed temperature detector equation. This technique is discussed in most numerical methods textbooks [12].

The Newton-Raphson (or simply Newton's) method is one of the most powerful and well-known numerical methods for finding a root (solution) of $f(x) = 0$. To use this routine, the activation time equation is first adjusted to fit the appropriate form. This method converges very rapidly for the cases considered here.

3.4 Activation Time Equation Solution: Rate of Temperature Rise

A bisection technique was selected for use in solving the rate of rise activation time equation. This technique is also discussed in most numerical methods textbooks [12]. It was chosen for use in this instance because the Newton method would have introduced stability problems into the calculation. This method also converges very rapidly for the cases considered here.

4. IMPLEMENTATION OF THE MODEL: TABLES OF RESULTS

The computer programs calculate detector activation times one case at a time. In many instances, it is necessary to evaluate a number of alternatives. It would be tedious and inconvenient to run a computer program to examine each case of interest. In light of this fact, the FORTRAN version of the computer program was used to generate an extensive set of tables. These tables list detector activation time as a function of building geometry, detector characteristics, and fire growth rate constants.

Each entry in the tables was checked by first calculating the response time of the given detector numerically. Then the calculated time is substituted into the exact form of the equation, and it is solved for the temperature of the detector sensing element at that time. In each case, the calculated temperature agreed with the originally assumed one to within an accuracy of 0.005 percent.

The tables cover a wide range of parameter variations. Tables have been developed for each of the four fire growth rates that were described earlier. Tables are available in both English and S.I. units. The English units tables are contained in Appendixes C and D of this report. The S. I. units tables are available in the metric version [13].

For use with English units, tables cover detector spacings of 0 to 60 feet and fuel to ceiling heights of 4 to 80 feet. RTI values range from 0 to 800 $(ft\text{-}s)^{1/2}$ for fixed temperature detectors and from 100 to 2000 $(ft\text{-}s)^{1/2}$ for rate of temperature rise detectors. Temperature differences for fixed temperature detectors range from 10 to 140 degrees F, and available rate of temperature rise values are 15, 20, and 25 degrees F/minute.

The tables of detector activation times are organized according to: type of detector (fixed temperature or rate of temperature rise), detector spacing, and type of fire (ultrafast, fast, medium, or slow). Appendix C contains the tables listing activation times for fixed temperature heat detectors, and Appendix D contains the tables listing activation times for rate of temperature rise detectors. In each appendix, the tables are arranged in order of increasing detector spacing (i.e. 0 ft, 2 ft, 4 ft, etc.). For each spacing, the tables are arranged according to fire type. Ultrafast is first, followed by fast, medium, and slow.

The asterisks next to some of the table entries indicate that the detector location places it within the $r/H < 0.3$ region. This region is where the theoretical dimensionless velocity correlation, discussed in section 2.4, is

applicable. These values are flagged because the calculation of gas velocity in this region is based primarily on a theoretical analysis and not on a combination of theory and experiment. In addition, this region is not considered in the NFPA 72E Appendix C.

Finally, just as in Appendix C of NFPA 72E, for the tables in this report, the fire plume is assumed to impinge on the ceiling at the center of the square array of detectors spaced as indicated. So for detectors spaced at 10 ft (3.048 m), the distance of each detector from the gas impingement point would be 7.07 ft ($10\sqrt{2}/2$). Each table indicates this distance in parenthesis after the table spacing value.

5. EXAMPLES

5.1 Using the Tables

5.1.1 Example 1: Comparison with NFPA 72E Table Results

The first example will show that these new tables agree quite well with the results from the tables in Appendix C of NFPA 72E even though each set of tables were generated using different correlations of experimental data. Assume a system of detectors is installed using a 14 foot spacing in a room with a 12 foot ceiling height. A medium fire growth rate is expected. The detectors have an RTI rating of 50 $(\text{ft-s})^{1/2}$ which corresponds to a 22.4 second time constant. The ambient temperature is 70 degrees F and the rated

activation temperature of the detector is 190 degrees F. This gives a temperature difference of 120 degrees.

$$\Delta T = T_{act} - T_{amb} = 190 - 70 = 120 \text{ degrees F}$$

Looking in Appendix C, a detection system installed using a 14 foot spacing would detect a medium growth rate fire 4.91 minutes after ignition. If we next look for similar conditions in the 72E tables [NFPA, p. 72E-36], we find that a detector installed under these conditions with a time constant of 25s will activate when a medium growth rate fire reaches a heat release rate of 1000 BTU/s. A medium growth rate fire will reach this heat release rate 300 seconds or five minutes after ignition.

The detector listed in the NFPA table has a time constant of 25s. This is slightly higher than the 22.4s for the detector listed in the NBS table. Therefore, it is expected that the detector listed in the NBS table would have an activation time slightly lower than the one in the NFPA table. After extensive cross checks between the new NBS tables and the 72E tables, the results were found to agree to within 5 percent.

5.1.2 Example 2: Fixed Temperature vs. Rate of Rise

This example will show how alternative heat detector installations may be compared using the tabular results. In particular, the differences between fixed temperature and rate of rise detectors will be compared. Suppose a detection system is installed in a room with a ceiling height of 40 feet and

detection of a medium fire is desired. The detectors are spaced 20 feet apart. Currently, fixed temperature detectors with an RTI of 200 $(ft\text{-}s)^{1/2}$ and an activation temperature rating of 170 degrees F are installed in the room. Ambient temperature is 70 degrees F. (Temperature differential of 100 degrees.) Will the use of rate of rise detectors with the same RTI as the fixed temperature detectors and an activation rate of rise rating of 15 degrees F/min yield a lesser time to activate a detector in response to a <u>medium</u> growth rate fire?

From Appendix C, the activation time of the fixed temperature detectors, installed using a 20.0 foot spacing and exposed to a medium growth rate fire, is 12.27 minutes. The time required to activate the rate of rise detectors is obtained from Appendix D. The activation time for these detectors is 15.29 minutes. From Figure 1, the heat release rate at activation of the rate of rise detectors would be 9342 BTU/s compared to 6016 BTU/s for the fixed temperature detectors.

It would take about three minutes longer to activate the rate of rise detectors, and the fire heat release rate would have increased by about 3326 BTU/s. This is interesting in light of the generally held belief that rate of rise detectors activate before fixed temperature detectors. This is not true when the detectors are located in areas with high ceilings and the fire does not grow rapidly. This example illustrates how quick and sometimes surprising comparisons may be made using the tabular form of the detector activation time results.

5.2 Example 3: Using the Computer Program

The last example will be used to show how the computer programs work. Both the BASIC version and the FORTRAN version ask similar questions and operate in a similar manner so this discussion is applicable to both programs. The problem will be to calculate the activation time for fixed temperature and rate of rise detectors installed, using a 10 foot spacing, in an area with a ceiling height of 12 feet. The detectors have an RTI of 670.8 $(ft\text{-}s)^{1/2}$. The detector activation temperature is 130 degrees F, and the activation rate of rise is 15 degrees F/min. Ambient temperature is 70 degrees F. (User input is preceded by a > and, where possible, typed in lower case.)

```
ENTER 1 FOR ENGLISH UNIT INPUT
      2 FOR METRIC  UNIT INPUT
>1

ENTER THE AMBIENT TEMPERATURE IN DEGREES F.
>70

ENTER THE DETECTOR RESPONSE TIME INDEX (RTI) IN (FT-SEC)**1/2.
>670.8

ENTER THE DETECTOR ACTIVATION TEMPERATURE IN DEGREES F.
>130

ENTER THE DETECTOR RATE OF RISE IN DEGREES F/MIN.
>15

ENTER THE CEILING HEIGHT IN FEET.
>12

ENTER THE DETECTOR SPACING IN FEET.
>10

ENTER: S FOR SLOW FIRE GROWTH RATE,
       M FOR MEDIUM FIRE GROWTH RATE,
       F FOR FAST FIRE GROWTH RATE,
       U FOR ULTRAFAST FIRE GROWTH RATE, OR
       O FOR OTHER.
>m
```

```
RESULTS:

CEILING HEIGHT = 12.0 FEET ( 3.66 METERS)
DETECTOR SPACING = 10.0 FEET ( 3.05 METERS)

DETECTOR RTI = 670.8 (FT-SEC)**1/2 ( 370.3 (M-SEC)**1/2)

FIRE GROWTH RATE CONSTANT = .1111E-001 BTU/(SEC**3)
                            (.1171E+002 JOULES/SEC**3)


FOR TEMPERATURE ACTUATED DETECTOR:

  ACTIVATION TEMPERATURE = 130.0 DEGREES F (54.4 DEGREES C)

  TIME OF ACTIVATION = 4.96 MINUTES

  HEAT RELEASE RATE = .9859E+003 BTU/SEC
                     (.1040E+004 KILOJOULES/SEC)


FOR RATE OF RISE ACTUATED DETECTOR:

  ACTIVATION RATE OF RISE = 15.00 DEGREES F/MIN
                            ( 8.33 DEGREES C/MIN)

  TIME OF ACTIVATION = 3.04 MINUTES

  HEAT RELEASE RATE = .3707E+003 BTU/SEC
                     (.3911E+003 KILOJOULES/SEC)
```

The results show that the fixed temperature heat detector would activate approximately 5 minutes after the fire reaches a flaming state. The heat release rate at this time would be 986 BTU/s. A rate of rise detector would activate at about 3 minutes with a corresponding heat release rate of 371 BTU/s. (If metric units had been selected, the input requests would have called for data in metric units instead of English units.)

6. SUMMARY

This report presented a methodology for evaluating heat detection systems installed in existing buildings. Previous work for use primarily in designing new systems was enhanced and supplemented to broaden its application. The resulting equations were programmed into a user interactive computer program. This program is available in both BASIC and FORTRAN and will run on mainframes as well as personal computers. In addition, a modified version of the FORTRAN program was used to develop an extensive set of tables listing detector activation times for given building geometries, detector characteristics, and fire growth rates. These tables are useful for quick evaluation of alternative heat detector installations among other uses. Practical examples were utilized to illustrate the use of the tables and computer programs.

7. REFERENCES

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TABLE 1. WAREHOUSE MATERIALS*

	Time to Reach 1000 BTU/s (sec)	Maximum Heat Release per Unit Floor Area (BTU/s/ft^2)	Classification (s - slow) (m - medium) (f - fast) (u - ultrafast)
1. Wood pallets, stack 1.5 ft high (6-12% moisture)	150-310	110	m-f
2. Wood pallets, stack 5 ft high (6-12% moisture)	90-190	330	f
3. Wood pallets, stack 10 ft high (6-12% moisture)	80-110	600	f
4. Wood pallets, stack 16 ft high (6-12% moisture)	75-105	900	f
5. Mail bags, filled, stored 5 ft high	190	35	f
6. Cartons, compartmented, stacked 15 ft high	60	200	u
7. Paper, vertical rolls, stacked 20 ft high	15-28	-	-
8. Cotton (also PE, PE/Cot, Acrylic/Nylon/PE), garments in 12 ft high rack	20-42	-	-
9. Cartons on pallets rack storage, 15-30 ft high	40-280	-	m-f

* Adapted from Table C-2-2.2.1(a) of Ref. 5

TABLE 1. WAREHOUSE MATERIALS (continued)

	Time to Reach 1000 BTU/s (sec)	Maximum Heat Release per Unit Floor Area (BTU/s/ft^2)	Classification (s - slow) (m - medium) (f - fast) (u - ultrafast)
10. Paper products, densely packed in cartons, rack storage, 20 ft high	470	-	m-s
11. PE letter trays, filled, stacked 5 ft high on cart	190	750	f
12. PE trash barrels in cartons stacked 15 ft high	55	250	u
13. FRP shower stalls in cartons, stacked 15 ft high	85	110	u
14. PE bottles packed in Item 6	85	550	u
15. PE bottles in cartons, stacked 15 ft high	75	170	u
16. PE pallets, stack 3 ft high	130	-	f
17. PE pallets, stack 6-8 ft high	30-55	-	-
18. PU mattress, single, horizontal	110	-	f
19. PF insulation board, rigid foam, stacked 15 ft high	8	170	-
20. PS jars packed in Item 6	55	1200	-

TABLE 1. WAREHOUSE MATERIALS (continued)

	Time to Reach 1000 BTU/s (sec)	Maximum Heat Release per Unit Floor Area (BTU/s/ft^2)	Classification (s - slow) (m - medium) (f - fast) (u - ultrafast)
21. PS tubs nested in cartons, stacked 14 ft high	105	450	f
22. PS toy parts in cartons, stacked 15 ft high	110	180	f
23. PS insulation board, rigid, stacked 14 ft high	7	290	-
24. PVC bottles packed in Item 6	9	300	-
25. PP tubs packed in Item 6	10	390	-
26. PP and PE film in rolls, stacked 14 ft high	40	350	-
27. Distilled spirits in barrels, stacked 20 ft high	23-40	-	-
28. Methyl alcohol	-	65	-
29. Gasoline	-	200	-
30. Kerosine	-	200	-
31. Diesel Oil	-	180	-

Abbreviations:

FRP - Fire Retardant Plastic
PE - Polyethylene
PF - Phenolic Resins
PP - Polypropylene

PS - Polysytrene
PU - Polyurethane
PVC - Polyvinyl Chloride

TABLE 2. MAXIMUM HEAT RELEASE RATES FROM FIRE DETECTION INSTITUTE ANALYSIS*

	Approximate Values BTU/s
1. Medium wastebasket with milk cartons	100
2. Large barrel with milk cartons	140
3. Upholstered chair with polyurethane foam	350
4. Latex foam mattress (heat at room door)	1200
5. Furnished living room (heat at open door)	4000 - 8000

* Adapted from Table C-2-2.2.1(b) of Ref. 3

TABLE 3. RTI VALUES FOR ANY LISTED DETECTOR*
(FIXED TEMPERATURE TYPE) [(ft-s)$^{1/2}$]

Listed Spacing (ft)	UL Listed Activation Temperature						All FM Listed Temp.
	128°F	135°F	145°F	160°F	170°F	196°F	
10	894	738	586	436	358	217	436
15	559	425	349	246	199	101	246
20	369	302	235	157	116	38	157
25	277	224	174	107	72		107
30	212	179	136	81	49		81
40	159	128	92	40			
50	132	98	67				
70	81	54	20				

NOTE: These RTIs are based on an analysis of the Underwriters Laboratories and Factory Mutual listing test procedures. Plunge test (see Ref. 7) results performed on the detector to be used will give a more accurate response time index.

Abbreviations:

FM - Factory Mutual
UL - Underwriters Laboratories Inc.

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* Adapted from Table C-3-2.1.1 of Ref. 5

TABLE 4. RTI VALUES FOR ANY LISTED DETECTOR*
(RATE OF RISE TYPE) [(ft-s)$^{1/2}$]

Listed Spacing (ft)	UL Listed Activation Rate of Temp. Rise		
	15 °F/min	20 °F/min	25 °F/min
10	1834	1308	984
12.5	1453	1073	805
15	1185	872	637
20	872	581	425
30	559	380	280
40	447	291	206
50	425	246	161

Abbreviation:

UL - Underwriters Laboratories Inc.

---

* Adapted from Ref. 3

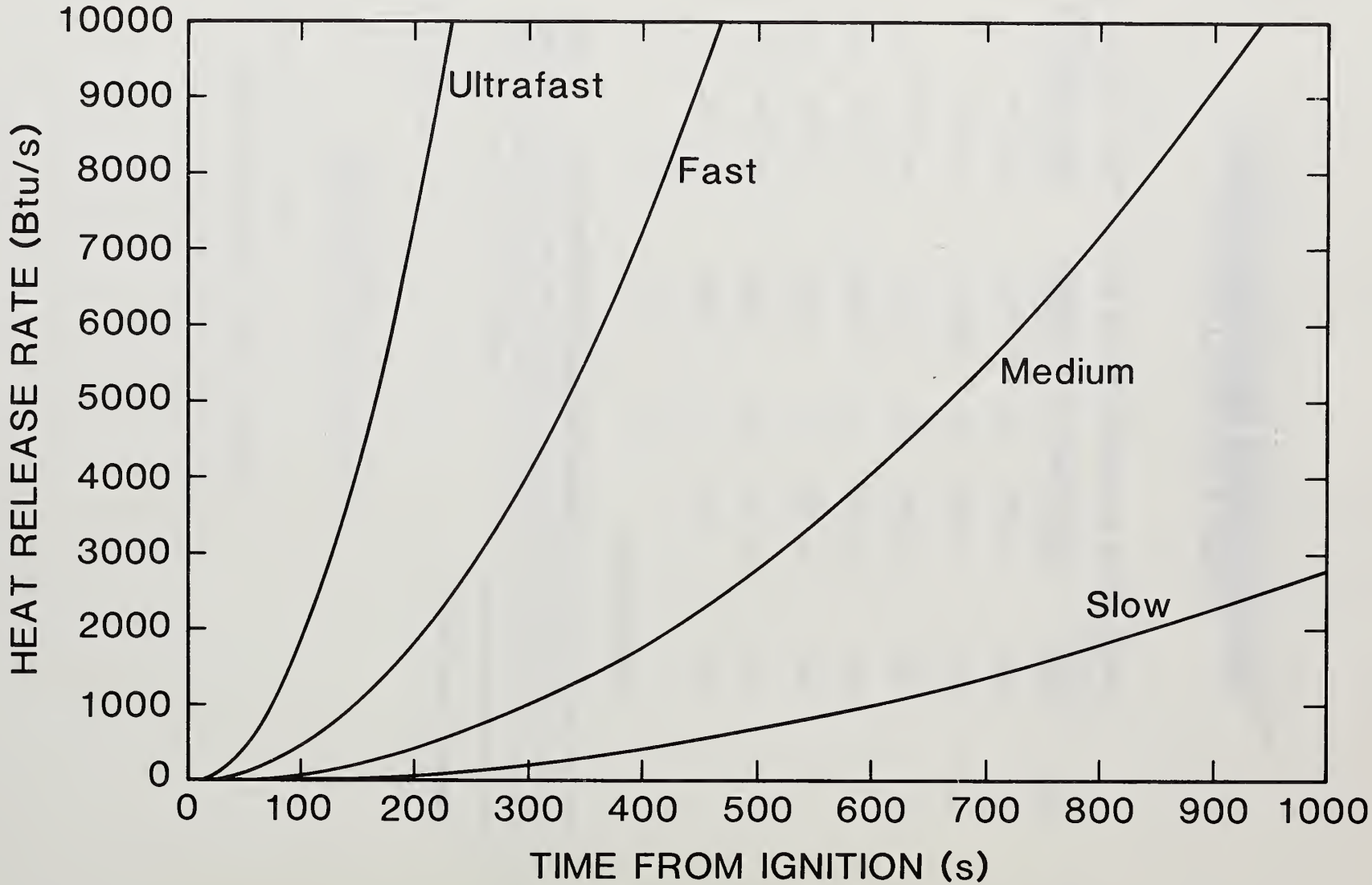

Figure 1. Plot of t^2 Fire Growth Curves

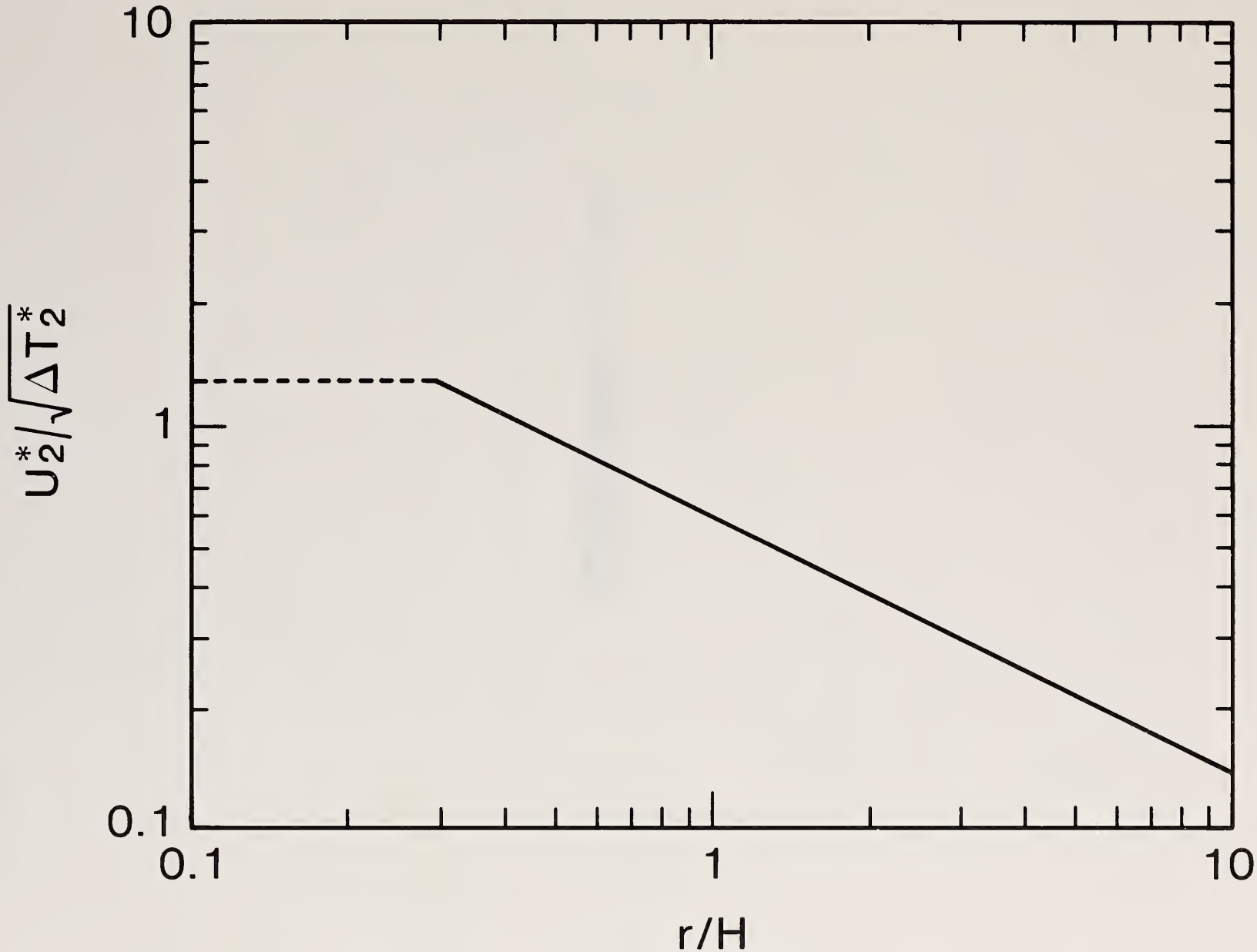

Figure 2. Plot of Dimensionless Velocity Correlation

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APPENDIX A. DETACT-T2
FORTRAN VERSION

```
C
      PROGRAM DETACT
C
C THIS IS PROGRAM DETACT-T2.
C IT CALCULATES THE RESPONSE OF THERMAL DETECTORS, BOTH FIXED TEMPERATURE
C AND RATE OF TEMPERATURE RISE, TO FIRES WHOSE HEAT RELEASE RATE GROWS
C PROPORTIONALLY WITH THE SQUARE OF TIME FROM IGNITION.
C
C WRITTEN BY DAVID W. STROUP, CENTER FOR FIRE RESEARCH, NBS
C
C THIS PROGRAM IS A CONTRIBUTION OF THE NATIONAL BUREAU OF STANDARDS AND
C IS NOT SUBJECT TO COPYRIGHT.
C
C VERSION 1.1
C
C ****************************** NOTATION ********************************
C
C INPUT:
C  J     - UNITS CODE  (1 OR 2)
C          1 - INPUT DATA IN ENGLISH UNITS
C          2 - INPUT DATA IN METRIC  UNITS
C  TAMB  - AMBIENT TEMPERATURE
C  RTI   - DETECTOR RESPONSE TIME INDEX
C  TACT  - DETECTOR ACTIVATION TEMPERATURE
C  ROR   - DETECTOR ACTIVATION RATE OF RISE
C  HF    - CEILING HEIGHT
C  ZF    - DETECTOR SPACING
C  M     - GROWTH FACTOR CODE, CHARACTER VARIABLE   (S, M, F, U, OR O)
C  ALPHA - FIRE GROWTH RATE CONSTANT
C
C OUTPUT:
C  T     - TIME OF ACTIVATION FOR FIXED TEMPERATURE DETECTOR
C  QD    - HEAT RELEASE RATE AT TIME OF ACTIVATION, T
C  TR    - TIME OF ACTIVATION FOR RATE OF RISE DETECTOR
C  QDR   - HEAT RELEASE RATE AT TIME OF ACTIVATION, TR
C  IERR  - ERROR CODE   (0 OR 1)
C          0 - SUCCESSFUL
C          1 - UNSUCCESSFUL
C
C ************************************************************************
C
      IMPLICIT DOUBLE PRECISION (A-H,O-Z)
      CHARACTER M
      DATA IRTTY,IWTTY/5,6/
      DATA GE,CPE,RHOE/32.2D0,0.24D0,0.0735D0/
      DATA GM,CPM,RHOM/9.8D0,1.0035D0,1.1768D0/
      IERR = 0
      WRITE (IWTTY,1)
1     FORMAT ('  DETACT-T2    VERSION 1.0'/
     &        ' WRITTEN BY D.W. STROUP  (1985)'//
     &        ' CONTRIBUTION OF THE '/
```

```
     &         ' NATIONAL BUREAU OF STANDARDS (U.S.).'/
     &         ' NOT SUBJECT TO COPYRIGHT.'//
     &         ' CALCULATES DETECTOR ACTUATION TIME'/
     &         ' BELOW UNCONFINED CEILINGS WITH '/
     &         ' TIME SQUARED FIRE GROWTH RATES.'//)
C
C ENTER INPUT DATA
C
5     CONTINUE
      WRITE (IWTTY,10)
10    FORMAT (' ENTER: 1 FOR ENGLISH UNIT INPUT'/8X,'2 FOR METRIC UNIT I
     &NPUT'/)
      READ (IRTTY,*) J
      IF (J.EQ.1) THEN
      WRITE (IWTTY,20)
20    FORMAT (' ENTER THE AMBIENT TEMPERATURE IN DEGREES F.'/)
      READ (IRTTY,*) TAMB
      WRITE (IWTTY,30)
30    FORMAT (' ENTER THE DETECTOR RESPONSE TIME INDEX (RTI) IN (FT-SEC)
     &**1/2.'/)
      READ (IRTTY,*) RTI
      IF (RTI.LE.0.000001D0) RTI = 0.000001D0
      RTIR = RTI
      WRITE (IWTTY,40)
40    FORMAT (' ENTER THE DETECTOR ACTIVATION TEMPERATURE IN DEGREES F.'
     &/)
      READ (IRTTY,*) TACT
      WRITE (IWTTY,50)
50    FORMAT (' ENTER A DETECTOR RATE OF RISE IN DEGREES F/MINUTE.'/)
      READ (IRTTY,*) ROR
      WRITE (IWTTY,60)
60    FORMAT (' ENTER THE CEILING HEIGHT IN FEET.'/)
      READ (IRTTY,*) HF
      WRITE (IWTTY,70)
70    FORMAT (' ENTER THE DETECTOR SPACING IN FEET.'/)
      READ (IRTTY,*) ZF
      WRITE (IWTTY,80)
80    FORMAT (' ENTER: S FOR SLOW FIRE GROWTH RATE '/
     &         '        M FOR MEDIUM FIRE GROWTH RATE'/
     &         '        F FOR FAST FIRE GROWTH RATE'/
     &         '        U FOR ULTRAFAST FIRE GROWTH RATE OR'/
     &         '        O FOR OTHER'/)
      READ (IRTTY,410) M
      IF ((M.EQ.'s').OR.(M.EQ.'S')) ALPHA = 0.00277778D0
      IF ((M.EQ.'m').OR.(M.EQ.'M')) ALPHA = 0.01111111D0
      IF ((M.EQ.'f').OR.(M.EQ.'F')) ALPHA = 0.0444445D0
      IF ((M.EQ.'u').OR.(M.EQ.'U')) ALPHA = 0.1777778D0
      IF ((M.EQ.'o').OR.(M.EQ.'O')) WRITE (IWTTY,90)
      IF ((M.EQ.'o').OR.(M.EQ.'O')) READ (IRTTY,*) ALPHA
90    FORMAT (' ENTER THE FIRE GROWTH RATE CONSTANT (ALPHA) IN BTU/SEC/S
     &EC/SEC.'/)
100   CONTINUE
```

```
      ELSE
C
C METRIC UNIT INPUT
C
      WRITE (IWTTY,110)
110   FORMAT (' ENTER THE AMBIENT TEMPERATURE IN DEGREES C.'/)
      READ (IRTTY,*) TAMB
      WRITE (IWTTY,120)
120   FORMAT (' ENTER THE DETECTOR RESPONSE TIME INDEX (RTI) IN (M-SEC)*
     &*1/2.'/)
      READ (IRTTY,*) RTI
      IF (RTI.LE.0.000001D0) RTI = 0.000001D0
      RTIR = RTI
      WRITE (IWTTY,130)
130   FORMAT (' ENTER THE DETECTOR ACTIVATION TEMPERATURE IN DEGREES C.'
     &/)
      READ (IRTTY,*) TACT
      WRITE (IWTTY,140)
140   FORMAT (' ENTER A DETECTOR RATE OF RISE IN DEGREES C/MINUTE.'/)
      READ (IRTTY,*) ROR
      WRITE (IWTTY,150)
150   FORMAT (' ENTER THE CEILING HEIGHT IN METERS.'/)
      READ (IRTTY,*) HF
      WRITE (IWTTY,160)
160   FORMAT (' ENTER THE DETECTOR SPACING IN METERS.'/)
      READ (IRTTY,*) ZF
      WRITE (IWTTY,80)
      READ (IRTTY,410) M
      IF ((M.EQ.'s').OR.(M.EQ.'S')) ALPHA = 2.930555556D0
      IF ((M.EQ.'m').OR.(M.EQ.'M')) ALPHA = 11.72222222D0
      IF ((M.EQ.'f').OR.(M.EQ.'F')) ALPHA = 46.88888889D0
      IF ((M.EQ.'u').OR.(M.EQ.'U')) ALPHA = 187.5555556D0
      IF ((M.EQ.'o').OR.(M.EQ.'O')) WRITE (IWTTY,170)
      IF ((M.EQ.'o').OR.(M.EQ.'O')) READ (IRTTY,*) ALPHA
170   FORMAT (' ENTER THE FIRE GROWTH RATE CONSTANT (ALPHA) IN WATTS/SEC/
     &SEC.'/)
180   CONTINUE
      ENDIF
C
C ******************* CALCULATIONS ************************************
C
      R = 0.5D0*DSQRT(2.0D0)*ZF
      ROH = R/HF
      ROR = ROR/60.D0
      IF (J.EQ.1) THEN
      TAMB = TAMB + 460.D0
      TACT = TACT + 460.D0
      A = GE/(CPE*TAMB*RHOE)
      G = GE
      ELSE
      TAMB = TAMB + 273.D0
      TACT = TACT + 273.D0
```

```
      A = GM/(CPM*TAMB*RHOM*1000.D0)
      G = GM
      ENDIF
      TOTS2 = A**(-1.D0/5.D0)*ALPHA**(-1.D0/5.D0)*HF**(4.D0/5.D0)
      DLTODL = A**(2.D0/5.D0)*(TAMB/G)*ALPHA**(2.D0/5.D0)
     &            *HF**(-3.D0/5.D0)
      UOUS2 = A**(1.D0/5.D0)*ALPHA**(1.D0/5.D0)*HF**(1.D0/5.D0)
      DELTD = TACT - TAMB
      IF (ROH.GT.0.3D0) THEN
      UODLTH = 0.59D0*ROH**(-0.63D0)
      ELSE
      UODLTH = 3.87D0/(9.115D0**0.5D0)
      ENDIF
      TS2F = 0.954D0*(1.D0+ROH)
      A2 = (4.D0/3.D0)*DLTODL*UOUS2**(-0.5D0)*UODLTH**(-0.5D0)*RTI/
     &              (TOTS2*(0.188D0+0.313D0*ROH))
      C = 1.D0+DELTD/A2
      CALL NWTN (C,Y,IERR,IWTTY)
      IF (IERR.EQ.1) GO TO 380
      DELTS2 = (4.D0/3.D0)*UOUS2**(-0.5D0)*UODLTH**(-0.5D0)*RTI*Y/
     &                 (TOTS2*(0.188D0+0.313D0*ROH))
      TS2 = 0.954D0*(1.D0+ROH)+(0.188D0+0.313D0*ROH)*DELTS2**(3.D0/4.D0)
      TS2 = TS2 + TS2F
      T = TS2*A**(-1.D0/5.D0)*ALPHA**(-1.D0/5.D0)*HF**(4.D0/5.D0)
      QD = ALPHA*T**2
      IF (RTIR.LE.2.0D0) RTIR = 2.0D0
      D1 = (4.D0/3.D0)*DLTODL/(TOTS2*(0.188D0+0.313D0*ROH))
      D2 = (3.D0/4.D0)*UOUS2**0.5D0*UODLTH**0.5D0*(1.D0/RTIR)*TOTS2
     &                *(0.188D0+0.313D0*ROH)
      CALL BISECT (D1,D2,ROR,DELTS2,IERR,IWTTY)
      IF (IERR.EQ.1) GO TO 380
      TS2R = 0.954D0*(1.D0+ROH)+(0.188D0+0.313D0*ROH)*DELTS2
     &            **(3.D0/4.D0)
      TS2R = TS2R + TS2F
      TR = TS2R*A**(-1.D0/5.D0)*ALPHA**(-1.D0/5.D0)*HF**(4.D0/5.D0)
      QDR = ALPHA*TR**2
C
C ********** PRINT OUT RESULTS ****************************************
C
      ROR = ROR*60.D0
      WRITE (IWTTY,190)
190   FORMAT ('1  RESULTS:')
      IF (J.EQ.1) THEN
C
C ENGLISH (METRIC) OUTPUT
C
      HF2 = HF * 0.3048D0
      ZF2 = ZF * 0.3048D0
      WRITE (IWTTY,200) HF,HF2,ZF,ZF2
200   FORMAT ('0    CEILING HEIGHT   = ',F6.2,' FEET (',F6.2,' METERS)'/
     &          5X,'DETECTOR SPACING = ',F6.2,' FEET (',F6.2,' METERS)')
      RTI2 = RTI * (0.3048D0**0.5D0)
```

```
      WRITE (IWTTY,210) RTI,RTI2
210   FORMAT ('0    DETECTOR RTI = ',F6.1,' (FT-SEC)**1/2 (',F6.1,' (M-S
     &EC)**1/2)')
      ALPHA2 = ALPHA * 1055.D0
      WRITE (IWTTY,220) ALPHA,ALPHA2
220   FORMAT ('0    FIRE GROWTH CONSTANT = ',E12.4,' BTU/(SEC**3)'/
     &        '                            (',E12.4,' JOULES/SEC**3)')
      WRITE (IWTTY,400)
      READ (IRTTY,410) M
      WRITE (IWTTY,230)
230   FORMAT (/'0  FOR TEMPERATURE ACTUATED DETECTOR:')
      TACT = TACT - 460.D0
      TACT2 = (5.D0/9.D0)*(TACT-32.D0)
      WRITE (IWTTY,240) TACT,TACT2
240   FORMAT ('0    ACTIVATION TEMPERATURE = ',F6.1,' DEGREES F (' ,F6.1,
     & ' DEGREES C)')
      T = T / 60.D0
      WRITE (IWTTY,250) T
250   FORMAT ('0    TIME TO ACTIVATION = ',F8.2,' MINUTES')
      QD2 = QD * 1.055D0
      WRITE (IWTTY,260) QD,QD2
260   FORMAT ('0    HEAT RELEASE RATE = ',E12.4,' BTU/SEC'/
     &        '                        (',E12.4,' KILOJOULES/SEC)')
      WRITE (IWTTY,400)
      READ (IRTTY,410) M
      WRITE (IWTTY,270)
270   FORMAT (//'0  FOR RATE OF RISE ACTUATED DETECTOR:')
      ROR2 = ROR * (5.D0/9.D0)
      WRITE (IWTTY,290) ROR,ROR2
290   FORMAT ('0    ACTIVATION RATE OF RISE = ',F6.2,' DEGREES F/MIN (',
     &                 F6.2,' DEGREES C/MIN)')
      TR = TR / 60.D0
      WRITE (IWTTY,250) TR
      QDR2 = QDR * 1.055D0
      WRITE (IWTTY,260) QDR,QDR2
      WRITE (IWTTY,400)
      READ (IRTTY,410) M
      ELSE
C
C METRIC (ENGLISH) OUTPUT
C
      HF2 = HF * (1.D0/0.3048D0)
      ZF2 = ZF * (1.D0/0.3048D0)
      WRITE (IWTTY,300) HF,HF2,ZF,ZF2
300   FORMAT ('0    CEILING HEIGHT   = ',F6.2,' METERS (',F6.2,' FEET)'/
     &          5X,'DETECTOR SPACING = ',F6.2,' METERS (',F6.2,' FEET)')
      RTI2 = RTI * ((1.D0/0.3048D0)**0.5D0)
      WRITE (IWTTY,320) RTI,RTI2
320   FORMAT ('0    DETECTOR RTI = ',F6.1,' (M-SEC)**1/2 (',F6.1,' (FT-S
     &EC)**1/2)')
      ALPHA2 = ALPHA * (1.D0/1055.D0)
      WRITE (IWTTY,330) ALPHA,ALPHA2
```

```
330   FORMAT ('0    FIRE GROWTH CONSTANT = ',E12.4,' JOULES/(SEC**3)'/
     &        '                            (',E12.4,' BTU/SEC**3)')
      WRITE (IWTTY,400)
      READ (IRTTY,410) M
      WRITE (IWTTY,230)
      TACT = TACT - 273.D0
      TACT2 = (9.D0/5.D0) * TACT + 32.D0
      WRITE (IWTTY,340) TACT,TACT2
340   FORMAT ('0    ACTIVATION TEMPERATURE = ',F6.1,' DEGREES C (',F6.1,
     & ' DEGREES F)')
      T = T / 60.D0
      WRITE (IWTTY,350) T
350   FORMAT ('0    TIME TO ACTIVATION = ',F8.2,' MINUTES')
      QD = QD / 1000.D0
      QD2 = QD * (1.D0/1.055D0)
      WRITE (IWTTY,360) QD,QD2
360   FORMAT ('0    HEAT RELEASE RATE = ',E12.4,' KILOJOULES/SEC'/
     &        '                         (',E12.4,' BTU/SEC)')
      WRITE (IWTTY,400)
      READ (IRTTY,410) M
      WRITE (IWTTY,270)
      ROR2 = ROR * (9.D0/5.D0)
      WRITE (IWTTY,370) ROR,ROR2
370   FORMAT ('0    ACTIVATION RATE OF RISE = ',F6.2,' DEGREES C/MIN (',
     &               F6.2,' DEGREES F/MIN)')
      TR = TR / 60.D0
      WRITE (IWTTY,350) TR
      QDR = QDR / 1000.D0
      QDR2 = QDR * (1.D0/1.055D0)
      WRITE (IWTTY,360) QDR,QDR2
      WRITE (IWTTY,400)
      READ (IRTTY,410) M
      ENDIF
      WRITE (IWTTY,420)
      READ (IRTTY,410) M
      IF ((M.EQ.'Y').OR.(M.EQ.'y')) GO TO 5
      STOP 'PROGRAM COMPLETED'
380   CONTINUE
      WRITE (IWTTY,390)
390   FORMAT (' *******> ERROR IN DETACT ROUTINE <*******')
400   FORMAT (//' <RETURN> TO CONTINUE')
410   FORMAT (A1)
      WRITE (IWTTY,420)
420   FORMAT (' TRY ANOTHER CASE (Y/N) ?'/)
      READ (IRTTY,410) M
      IF ((M.EQ.'Y').OR.(M.EQ.'y')) GO TO 5
      STOP 'PROGRAM ABORTED'
      END
C
      SUBROUTINE NWTN (C,P,IERR,IWTTY)
C
C THIS IS ROUTINE NWTN. IT SOLVES THE FIXED TEMPERATURE DETECTOR
```

```
C ACTIVATION TIME EQUATION USING A NEWTON-RAPHSON METHOD.
C
      IMPLICIT DOUBLE PRECISION (A-H,O-Z)
      P0 = 0.1D0
      TOL = 0.00001D0
      N0 = 1000
      I = 1
      IERR = 0
10    CONTINUE
      IF (I.LE.N0) THEN
      IF (P0.GT.50.D0) THEN
      X = 0.0D0
      ELSE
      X = DEXP(-P0)
      ENDIF
      FX = P0 + X - C
      FPMX = 1.0D0 - X
      IF (FPMX.LT.0.00000001D0) GO TO 30
      P = P0 - (FX/FPMX)
      IF (ABS(P-P0).LT.TOL) THEN
      IERR = 0
      RETURN
      ELSE
      I = I + 1
      P0 = P
      ENDIF
      GO TO 10
      ENDIF
      IERR = 1
      WRITE (IWTTY,20) I
20    FORMAT (' NEWTON-RAPHSON FAILED AFTER N0 ITERATIONS, N0 = ',I4)
      RETURN
30    WRITE (IWTTY,40)
40    FORMAT (' SLOPE OF EQUATION TOO CLOSE TO ZERO FOR '/
     &   '    NEWTON-RAPHSON METHOD.'/
     &   '    ERROR RETURN')
      IERR = 1
      RETURN
      END
C
      SUBROUTINE BISECT (D1,D2,ROR,P,IERR,IWTTY)
C
C THIS IS ROUTINE BISECT. IT SOLVES THE RATE OF RISE DETECTOR ACTIVATION
C TIME EQUATION USING A BISECTION METHOD.
C
      IMPLICIT DOUBLE PRECISION (A-H,O-Z)
      IERR = 0
      TOL = 0.00001D0
      N0 = 1000
      A = 0.0D0
      B = 1000.0D0
      RLMT = TOL / 20.0
```

```
10    CONTINUE
      IF ((D2*B).GT.50.D0) THEN
      X = 0.0D0
      ELSE
      X = DEXP (-D2*B)
      ENDIF
      FXB = D1*B**0.25D0-D1*B**0.25*X-ROR
      IF (FXB.LT.0.0D0) THEN
      A = B
      B = B + 500.D0
      GO TO 10
      ENDIF
      I = 1
20    CONTINUE
      IF (I.LE.N0) THEN
      P = A+(B-A)/2.0D0
      IF ((D2*P).GT.50.D0) THEN
      X = 0.0D0
      ELSE
      X = DEXP (-D2*P)
      ENDIF
      FX = D1*P**0.25D0-D1*P**0.25D0*X-ROR
      IF (((FX.GT.-RLMT).AND.(FX.LT.RLMT)).OR.
     &   (((B-A)/2.D0).LT.TOL)) THEN
      IERR = 0
      RETURN
      ELSE
      I = I + 1
      IF ((D2*A).GT.50.D0) THEN
      X = 0.0D0
      ELSE
      X = DEXP (-D2*A)
      ENDIF
      FXA = D1*A**0.25D0-D1*A**0.25D0*X-ROR
      IF ((FXA*FX).GT.0.0D0) THEN
      A = P
      ELSE
      B = P
      ENDIF
      ENDIF
      GO TO 20
      ENDIF
      IERR = 1
      WRITE (IWTTY,30) I
30    FORMAT (' BISECTION ROUTINE FAILED AFTER N0 ITERATIONS, N0 = ',I4)
      RETURN
      END
```

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APPENDIX B. DETACT-T2
BASIC VERSION

```
10 PRINT "DETACT-T2   VERSION 2.0"
20 PRINT "WRITTEN BY D.W. STROUP  (1985)"
30 PRINT " "
40 PRINT "CONTRIBUTION OF THE"
50 PRINT "NATIONAL BUREAU OF STANDARDS (U.S.)."
60 PRINT "NOT SUBJECT TO COPYRIGHT. "
70 PRINT " "
80 PRINT "CALCULATES DETECTOR ACTUATION TIME"
90 PRINT "BELOW UNCONFINED CEILINGS WITH "
100 PRINT "TIME SQUARED FIRE GROWTH RATES "
110 PRINT " "
120 REM
130 REM INPUT:
140 REM  J     - UNITS CODE (1 OR 2)
150 REM          1 - INPUT DATA IN ENGLISH UNITS
160 REM          2 - INPUT DATA IN METRIC  UNITS
170 REM  TAMB  - AMBIENT TEMPERATURE
180 REM  RTI   - DETECTOR RESPONSE TIME INDEX
190 REM  TACT  - DETECTOR ACTIVATION TEMPERATURE
200 REM  ROR   - DETECTOR ACTIVATION RATE OF RISE
210 REM  HF    - CEILING HEIGHT
220 REM  ZF    - DETECTOR SPACING
230 REM  M     - GROWTH RATE FACTOR CODE, CHARACTER (S, M, F, U, OR O)
240 REM  ALPHA - FIRE GROWTH RATE CONSTANT (FOR M = O)
250 REM
260 REM OUTPUT:
270 REM  T     - TIME OF ACTIVATION FOR FIXED TEMPERATURE DETECTOR
280 REM  QD    - HEAT RELEASE RATE AT TIME OF ACTIVATION, T
290 REM  TR    - TIME OF ACTIVATION FOR RATE OF RISE DETECTOR
300 REM  QDR   - HEAT RELEASE RATE AT TIME OF ACTIVATION, TR
310 REM  IERR  - ERROR CODE  (0 OR 1)
320 REM          0 - SUCCESSFUL
330 REM          1 - UNSUCCESSFUL
340 REM
350 CLEAR
360 REM
370 REM ENTER INPUT DATA
380 REM
390 READ GE#,CPE#,RHOE#
400 DATA 32.2#,0.24#,0.0735#
410 READ GM#,CPM#,RHOM#
420 DATA 9.8#,1.0035#,1.1768#
430 IERR% = 0
440 PRINT " ENTER: 1 FOR ENGLISH UNIT INPUT"
450 PRINT "        2 FOR METRIC  UNIT INPUT"
460 INPUT "SELECTION = ",J%
470 IF J%<>1 GOTO 740
480 REM
490 REM ENTER DATA IN ENGLISH UNITS
500 REM
```

```
510 INPUT "AMBIENT TEMPERATURE <DEGREES F> = ",TAMB#
520 INPUT "DETECTOR RESPONSE TIME INDEX, RTI <(FT-SEC)^(1/2)> = ",RTI#
530 IF RTI#<.0000001# THEN LET RTI# = .0000001#
540 RTIR# = RTI#
550 INPUT "DETECTOR ACTIVATION TEMPERATURE <DEGREES F> = ",TACT#
560 INPUT "DETECTOR RATE OF TEMPERATURE RISE <DEGREES F/MIN> = ",ROR#
570 INPUT "ROOM CEILING HEIGHT <FEET> = ",HF#
580 INPUT "DETECTOR SPACING <FEET> = ",ZF#
590 PRINT "ENTER: S FOR SLOW      FIRE GROWTH RATE,"
600 PRINT "       M FOR MEDIUM    FIRE GROWTH RATE,"
610 PRINT "       F FOR FAST      FIRE GROWTH RATE,"
620 PRINT "       U FOR ULTRAFAST FIRE GROWTH RATE, OR"
630 PRINT "       O FOR OTHER     FIRE GROWTH RATE"
640 INPUT "SELECTION = ",M$
650 IF (M$="s" OR M$="S") THEN LET ALPHA# = .00277778#
660 IF (M$="m" OR M$="M") THEN LET ALPHA# = .01111111#
670 IF (M$="f" OR M$="F") THEN LET ALPHA# = .04444445#
680 IF (M$="u" OR M$="U") THEN LET ALPHA# = .17777778#
690 IF (M$="o" OR M$="O") THEN INPUT "FIRE GROWTH RATE <BTU/SEC^3> = ",ALPHA#
700 GOTO 940
710 REM
720 REM ENTER DATA IN METRIC UNITS
730 REM
740 INPUT "AMBIENT TEMPERATURE <DEGREES C> = ",TAMB#
750 INPUT "DETECTOR RESPONSE TIME INDEX, RTI <(M-SEC)^(1/2)> = ",RTI#
760 IF RTI#<.0000001# THEN LET RTI# = .0000001#
770 RTIR# = RTI#
780 INPUT "DETECTOR ACTIVATION TEMPERATURE <DEGREES C> = ",TACT#
790 INPUT "DETECTOR RATE OF TEMPERATURE RISE <DEGREES C/MIN> = ",ROR#
800 INPUT "ROOM CEILING HEIGHT <METERS> = ",HF#
810 INPUT "DETECTOR SPACING <METERS> = ",ZF#
820 PRINT "ENTER: S FOR SLOW      FIRE GROWTH RATE,"
830 PRINT "       M FOR MEDIUM    FIRE GROWTH RATE,"
840 PRINT "       F FOR FAST      FIRE GROWTH RATE,"
850 PRINT "       U FOR ULTRAFAST FIRE GROWTH RATE, OR"
860 PRINT "       O FOR OTHER     FIRE GROWTH RATE"
870 INPUT "SELECTION = ",M$
880 IF (M$="s" OR M$="S") THEN LET ALPHA# = 2.9305556#
890 IF (M$="m" OR M$="M") THEN LET ALPHA# = 11.722222#
900 IF (M$="f" OR M$="F") THEN LET ALPHA# = 46.888889#
910 IF (M$="u" OR M$="U") THEN LET ALPHA# = 187.55556#
920 IF (M$="o" OR M$="O") THEN INPUT "FIRE GROWTH RATE <J/SEC^3> = ",ALPHA#
930 REM
940 REM ****************  CALCULATIONS  ************************************
950 REM
960 R# = .5# * SQR(2#) * ZF#
970 ROH# = R# /HF#
980 ROR# = ROR# / 60#
990 IF J%<>1 GOTO 1050
1000 TAMB# = TAMB# + 460#
1010 TACT# = TACT# + 460#
1020 A# = GE#/(CPE#*TAMB#*RHOE#)
```

```
1030 G# = GE#
1040 GOTO 1090
1050 TAMB# = TAMB# + 273#
1060 TACT# = TACT# + 273#
1070 A# = GM#/(CPM#*TAMB#*RHOM#*1000#)
1080 G# = GM#
1090 TOTS2#=A#^(-1#/5#)*ALPHA#^(-1#/5#)*HF#^(4#/5#)
1100 DLTODL#=A#^(2#/5#)*(TAMB#/G#)*ALPHA#^(2#/5#)*HF#^(-3#/5#)
1110 UOUS2#=A#^(1#/5#)*ALPHA#^(1#/5#)*HF#^(1#/5#)
1120 DELTD# = TACT# - TAMB#
1130 IF (ROH#>.3) THEN UODLTH#=.59*ROH#^(-.63#) ELSE UODLTH#=3.87#/(SQR(9.115#))
1140 TS2F# = .954# * (1# + ROH#)
1150 P# = TOTS2#*(.188#+.313#*ROH#)
1160 A2#=(4#/3#)*DLTODL#*UOUS2#^(-.5#)*UODLTH#^(-.5#)*RTI#/P#
1170 C# = 1# + DELTD# / A2#
1180 GOSUB 2650
1190 IF IERR%=1 GOTO 2550
1200 DELTS2#=(4#/3#)*UOUS2#^(-.5#)*UODLTH#^(-.5#)*RTI#*Y#/P#
1210 TS2#=.954#*(1#+ROH#)+(.188#+.313#*ROH#)*DELTS2#^(3#/4#)
1220 TS2# = TS2# + TS2F#
1230 T#=TS2#*A#^(-1#/5#)*ALPHA#^(-1#/5#)*HF#^(4#/5#)
1240 QD# = ALPHA# * T#^2!
1250 IF RTIR#<=2# THEN LET RTIR# = 2#
1260 D1#=(4#/3#)*DLTODL#/P#
1270 D2#=(3#/4#)*UOUS2#^.5#*UODLTH#^.5#*(1#/RTIR#)*P#
1280 GOSUB 2950
1290 IF IERR%=1 GOTO 2550
1300 TS2R#=.954#*(1#+ROH#)+(.188#+.313#*ROH#)*DELTS2#^(3#/4#)
1310 TS2R# = TS2R# + TS2F#
1320 TR#=TS2R#*A#^(-1#/5#)*ALPHA#^(-1#/5#)*HF#^(4#/5#)
1330 QDR# = ALPHA# * TR#^2!
1340 ROR# = ROR# * 60#
1350 REM
1360 REM PRINT OUT RESULTS
1370 REM
1380 PRINT "RESULTS:"
1390 IF J%<>1 GOTO 1960
1400 REM
1410 REM ENGLISH (METRIC) OUTPUT
1420 REM
1430 HF2# = HF# * .3048
1440 ZF2# = ZF# * .3048
1450 PRINT " "
1460 PRINT " CEILING HEIGHT = ";CSNG(HF#);" FEET"
1470 PRINT "                  (";CSNG(HF2#);" METERS)"
1480 PRINT " "
1490 PRINT " DETECTOR SPACING = ";CSNG(ZF#);" FEET"
1500 PRINT "                    (";CSNG(ZF2#);" METERS)"
1510 PRINT "  "
1520 RTI2# = RTI# * (.3048#^.5#)
1530 PRINT " RTI = ";CSNG(RTI#);" (FT-SEC)^0.5";" (";CSNG(RTI2#);" (M-SEC)^0.5)
1540 PRINT "  "
```

```
1550 ALPHA2# = ALPHA# * 1055#
1560 PRINT " FIRE GROWTH RATE = ";CSNG(ALPHA#);" BTU/(SEC^3)"
1570 PRINT "                    (";CSNG(ALPHA2#);" J/(SEC^3))"
1580 PRINT " "
1590 INPUT "<RETURN> TO CONTINUE ";O$
1600 PRINT " "
1610 PRINT " "
1620 PRINT " FOR TEMPERATURE ACTUATED DETECTOR:"
1630 TACT# = TACT# - 460#
1640 TACT2# = (5#/9#) * (TACT# - 32#)
1650 PRINT " "
1660 PRINT "  ACTIVATION TEMPERATURE = ";CSNG(TACT#);" DEGREES F"
1670 PRINT "                           (";CSNG(TACT2#);" DEGREES C)"
1680 PRINT " "
1690 T# = T# / 60#
1700 PRINT "  TIME TO ACTIVATION = ";CSNG(T#);" MINUTES"
1710 PRINT " "
1720 QD2# = QD# * 1.055#
1730 PRINT "  HEAT RELEASE RATE = ";CSNG(QD#);" BTU/SEC"
1740 PRINT "                      (";CSNG(QD2#);" kJ/SEC )"
1750 PRINT " "
1760 INPUT "<RETURN> TO CONTINUE ";O$
1770 PRINT " "
1780 PRINT " "
1790 PRINT " FOR RATE OF RISE ACTUATED DETECTOR:"
1800 ROR2# = ROR# * (5#/9#)
1810 PRINT " "
1820 PRINT "  ACTIVATION RATE OF RISE = ";CSNG(ROR#);" DEGREES F/MIN"
1830 PRINT "                            (";CSNG(ROR2#);" DEGREES C/MIN)"
1840 PRINT " "
1850 TR# = TR# /60#
1860 PRINT "  TIME TO ACTIVATION = ";CSNG(TR#);" MINUTES"
1870 QDR2# = QDR# * 1.055#
1880 PRINT " "
1890 PRINT "  HEAT RELEASE RATE = ";CSNG(QDR#);" BTU/SEC"
1900 PRINT "                      (";CSNG(QDR2#);" kJ/SEC )"
1910 PRINT " "
1920 PRINT " "
1930 INPUT " TRY ANOTHER RUN (YES/NO) ";O$
1940 IF (O$="Y" OR O$="y") GOTO 120
1950 GOTO 2530
1960 HF2# = HF# * (1!/.3048)
1970 ZF2# = ZF# * (1!/.3048)
1980 REM
1990 REM METRIC (ENGLISH) OUTPUT
2000 REM
2010 PRINT " "
2020 PRINT " CEILING HEIGHT = ";CSNG(HF#);" METERS"
2030 PRINT "                 (";CSNG(HF2#);" FEET)"
2040 PRINT " "
2050 PRINT " DETECTOR SPACING = ";CSNG(ZF#);" METERS"
2060 PRINT "                    (";CSNG(ZF2#);" FEET)"
```

```
2070 PRINT " "
2080 RTI2# = RTI# * ((1!/.3048)^.5#)
2090 PRINT " RTI = ";CSNG(RTI#);" (M-SEC)^0.5";" (";CSNG(RTI2#);" (FT-SEC)^0.5)
2100 PRINT " "
2110 ALPHA2# = ALPHA# * (1!/1055!)
2120 PRINT " FIRE GROWTH RATE = ";CSNG(ALPHA#);" J/(SEC^3)"
2130 PRINT "                    (";CSNG(ALPHA2#);" BTU/(SEC^3))"
2140 PRINT " "
2150 INPUT "<RETURN> TO CONTINUE ";O$
2160 PRINT " "
2170 PRINT " "
2180 PRINT " FOR TEMPERATURE ACTUATED DETECTOR:"
2190 PRINT " "
2200 TACT# = TACT# - 273#
2210 TACT2# = (9#/5#) * TACT# + 32#
2220 PRINT "  ACTIVATION TEMPERATURE = ";CSNG(TACT#);" DEGREES C"
2230 PRINT "                          (";CSNG(TACT2#);" DEGREES F)"
2240 PRINT " "
2250 T# = T# / 60#
2260 PRINT "  TIME TO ACTIVATION = ";CSNG(T#);" MINUTES"
2270 PRINT " "
2280 QD# = QD# / 1000#
2290 QD2# = QD# * (1!/1.055)
2300 PRINT "  HEAT RELEASE RATE = ";CSNG(QD#);" kJ/SEC"
2310 PRINT "                      (";CSNG(QD2#);" BTU/SEC )"
2320 PRINT " "
2330 INPUT "<RETURN> TO CONTINUE";O$
2340 PRINT " "
2350 PRINT " "
2360 PRINT " FOR RATE OF RISE ACTUATED DETECTOR:"
2370 ROR2# = ROR# * (9#/5#)
2380 PRINT " "
2390 PRINT "  ACTIVATION RATE OF RISE = ";CSNG(ROR#);" DEGREES C/MIN"
2400 PRINT "                           (";CSNG(ROR2#);" DEGREES F/MIN)"
2410 PRINT " "
2420 TR# = TR# /60#
2430 PRINT "  TIME TO ACTIVATION = ";CSNG(TR#);" MINUTES"
2440 PRINT " "
2450 QDR# = QDR# / 1000#
2460 QDR2# = QDR# * (1!/1.055)
2470 PRINT "  HEAT RELEASE RATE = ";CSNG(QDR#);" kJ/SEC"
2480 PRINT "                      (";CSNG(QDR2#);" BTU/SEC )"
2490 PRINT " "
2500 PRINT " "
2510 INPUT " TRY ANOTHER RUN (YES/NO) ";O$
2520 IF (O$="Y" OR O$="y") GOTO 120
2530 END
2540 REM
2550 REM *********** ERROR HANDLING ROUTINE ***********
2560 REM
2570 PRINT " "
2580 PRINT " !!!!! ERROR IN DETACT-T2 ROUTINE !!!!!"
```

```
2590 PRINT " !!!!! PROGRAM RUN ABORTED        !!!!!"
2600 PRINT " "
2610 INPUT " WOULD YOU LIKE TO TRY AGAIN (YES/NO) ?";O$
2620 IF (O$="Y" OR O$="y") GOTO 120
2630 END
2640 REM
2650 REM ** NEWTON RAPHSON ROUTINE TO FIND ACTIVATION **
2660 REM ** TIME OF FIXED TEMPERATURE DETECTOR.       **
2670 REM
2680 P0# = .1#
2690 TOL# = .00001#
2700 N0% = 1000
2710 I% = 1
2720 IERR% = 0
2730 REM
2740 IF I%>N0% GOTO 2870
2750 IF (P0#>50#) THEN LET X#=0# ELSE X#=EXP(-P0#)
2760 FX#=P0# + X# - C#
2770 FPMX# = 1# - X#
2780 IF (FPMX#<.00000001#) GOTO 2900
2790 P2# = P0# - (FX#/FPMX#)
2800 IF (ABS(P0#-P2#)>TOL#) GOTO 2840
2810 IERR% = 0
2820 Y# = P2#
2830 RETURN
2840 I% = I% + 1
2850 P0# = P2#
2860 GOTO 2730
2870 IERR% = 1
2880 PRINT "NEWTON RAPHSON FAILED AFTER N0 ITERATIONS, N0 = ",I%
2890 RETURN
2900 PRINT "SLOPE OF EQUATION TOO CLOSE TO ZERO!!!"
2910 PRINT "ERROR IN NEWTON RAPHSON ROUTINE"
2920 IERR% = 1
2930 RETURN
2940 REM
2950 REM ** BISECTION ROUTINE TO FIND ACTIVATION **
2960 REM ** TIME OF RATE OF RISE DETECTOR.       **
2970 REM
2980 IERR% = 0
2990 TOL# = .00001#
3000 N0% = 1000
3010 AA# = 0#
3020 B# = 1000#
3030 RLMT# = TOL# / 20#
3040 REM
3050 IF (D2#*B#)>50# THEN X# = 0# ELSE X# = EXP(-D2#*B#)
3060 FXB# = D1# * B# ^ .25# - D1# * B# ^ .25# * X# - ROR#
3070 IF FXB#>=0# GOTO 3110
3080 AA# = B#
3090 B# = B# + 500#
3100 GOTO 3040
```

```
3110 I% = 1
3120 REM
3130 IF I>N0 GOTO 3260
3140 P3# = AA# + (B# - AA#) / 2#
3150 IF (D2#*P3#)>50# THEN X# = 0# ELSE X# = EXP (-D2#*P3#)
3160 FX# = D1# * P3# ^ .25# - D1# * P3# ^ .25# * X# - ROR#
3170 DELTS2# = P3#
3180 IF ((FX#>(-RLMT#)) AND (FX#<RLMT#)) THEN RETURN
3190 IF ((B#-AA#)/2#)<TOL# THEN RETURN
3200 REM
3210 I% = I% + 1
3220 IF (D2#*AA#)>50# THEN X# = 0# ELSE X# = EXP(-D2#*AA#)
3230 FXA# = D1# * AA# ^ .25# - D1# * AA# ^ .25# * X# - ROR#
3240 IF (FXA#*FX#)>0# THEN AA# = P3# ELSE B# = P3#
3250 GOTO 3120
3260 IERR% = 1
3270 PRINT "BISECTION ALGORITHM FAILED TO CONVERGE AFTER ",I%," ITERATIONS."
3280 RETURN
```

APPENDIX C.

DETECTOR ACTIVATION TIME TABLES: FIXED TEMPERATURE

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.12*	0.22*	0.32*	0.41*	0.50*	0.59*	0.73*	0.84*	0.95*	1.39*	1.83*
	20	0.13*	0.25*	0.36*	0.47*	0.58*	0.69*	0.86*	1.00*	1.14*	1.70*	2.28*
	40	0.15*	0.29*	0.43*	0.57*	0.71*	0.86*	1.08*	1.27*	1.45*	2.23*	3.03*
	60	0.17*	0.33*	0.49*	0.66*	0.83*	1.01*	1.27*	1.50*	1.73*	2.69*	3.70*
	80	0.18*	0.36*	0.55*	0.74*	0.94*	1.14*	1.45*	1.72*	1.99*	3.12*	4.30*
	100	0.19*	0.39*	0.60*	0.82*	1.04*	1.27*	1.62*	1.92*	2.23*	3.52*	4.88*
	120	0.21*	0.42*	0.65*	0.89*	1.14*	1.39*	1.78*	2.12*	2.46*	3.89*	5.42*
	140	0.22*	0.45*	0.70*	0.96*	1.23*	1.51*	1.93*	2.30*	2.68*	4.26*	5.94*
25	10	0.18*	0.30*	0.41*	0.52*	0.62*	0.72*	0.86*	0.97*	1.08*	1.53*	1.96*
	20	0.20*	0.34*	0.47*	0.59*	0.71*	0.82*	0.99*	1.13*	1.27*	1.82*	2.39*
	40	0.23*	0.39*	0.55*	0.69*	0.84*	0.98*	1.20*	1.38*	1.57*	2.33*	3.13*
	60	0.25*	0.44*	0.61*	0.78*	0.95*	1.12*	1.39*	1.61*	1.84*	2.79*	3.78*
	80	0.27*	0.47*	0.66*	0.86*	1.05*	1.25*	1.56*	1.82*	2.09*	3.21*	4.39*
	100	0.29*	0.50*	0.72*	0.93*	1.15*	1.37*	1.72*	2.02*	2.32*	3.60*	4.95*
	120	0.30*	0.54*	0.76*	1.00*	1.24*	1.49*	1.87*	2.21*	2.55*	3.97*	5.49*
	140	0.32*	0.56*	0.81*	1.07*	1.33*	1.60*	2.02*	2.39*	2.76*	4.34*	6.01*
50	10	0.20*	0.33*	0.45*	0.57*	0.68*	0.78*	0.93*	1.05*	1.17*	1.63*	2.07*
	20	0.22*	0.38*	0.52*	0.65*	0.78*	0.90*	1.08*	1.22*	1.37*	1.93*	2.50*
	40	0.26*	0.45*	0.61*	0.77*	0.92*	1.07*	1.30*	1.49*	1.67*	2.44*	3.23*
	60	0.29*	0.49*	0.68*	0.86*	1.04*	1.22*	1.49*	1.71*	1.94*	2.88*	3.87*
	80	0.31*	0.54*	0.74*	0.95*	1.15*	1.35*	1.66*	1.92*	2.18*	3.29*	4.47*
	100	0.33*	0.57*	0.80*	1.02*	1.24*	1.47*	1.81*	2.11*	2.41*	3.68*	5.03*
	120	0.35*	0.61*	0.85*	1.09*	1.33*	1.58*	1.97*	2.30*	2.63*	4.05*	5.57*
	140	0.37*	0.64*	0.90*	1.16*	1.42*	1.69*	2.11*	2.48*	2.85*	4.41*	6.08*
100	10	0.22*	0.37*	0.51*	0.63*	0.75*	0.87*	1.03*	1.16*	1.29*	1.78*	2.24*
	20	0.26*	0.43*	0.59*	0.74*	0.87*	1.01*	1.20*	1.36*	1.51*	2.11*	2.69*
	40	0.31*	0.51*	0.70*	0.88*	1.04*	1.21*	1.45*	1.64*	1.84*	2.62*	3.41*
	60	0.34*	0.57*	0.78*	0.98*	1.18*	1.37*	1.65*	1.88*	2.11*	3.06*	4.04*
	80	0.37*	0.62*	0.85*	1.08*	1.29*	1.50*	1.82*	2.09*	2.36*	3.46*	4.63*
	100	0.39*	0.67*	0.92*	1.16*	1.39*	1.63*	1.98*	2.28*	2.58*	3.85*	5.18*
	120	0.41*	0.71*	0.97*	1.23*	1.49*	1.75*	2.13*	2.46*	2.80*	4.21*	5.72*
	140	0.43*	0.74*	1.03*	1.30*	1.58*	1.86*	2.28*	2.64*	3.01*	4.56*	6.23*
150	10	0.24*	0.40*	0.55*	0.68*	0.81*	0.93*	1.10*	1.24*	1.38*	1.89*	2.38*
	20	0.28*	0.47*	0.64*	0.80*	0.94*	1.09*	1.29*	1.46*	1.62*	2.24*	2.85*
	40	0.34*	0.56*	0.76*	0.95*	1.13*	1.31*	1.56*	1.77*	1.97*	2.78*	3.58*
	60	0.38*	0.63*	0.86*	1.07*	1.28*	1.48*	1.77*	2.01*	2.26*	3.22*	4.21*
	80	0.41*	0.69*	0.94*	1.17*	1.40*	1.63*	1.96*	2.23*	2.51*	3.62*	4.79*
	100	0.44*	0.73*	1.00*	1.26*	1.51*	1.76*	2.12*	2.43*	2.74*	4.00*	5.34*
	120	0.46*	0.78*	1.07*	1.34*	1.61*	1.88*	2.28*	2.61*	2.95*	4.36*	5.86*
	140	0.48*	0.82*	1.12*	1.42*	1.71*	1.99*	2.43*	2.79*	3.16*	4.71*	6.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.26*	0.43*	0.58*	0.72*	0.85*	0.98*	1.16*	1.30*	1.45*	1.98*	2.49*
	20	0.30*	0.50*	0.68*	0.85*	1.00*	1.15*	1.37*	1.54*	1.71*	2.36*	2.98*
	40	0.36*	0.60*	0.82*	1.02*	1.21*	1.39*	1.66*	1.87*	2.08*	2.91*	3.73*
	60	0.41*	0.68*	0.92*	1.15*	1.36*	1.57*	1.88*	2.13*	2.38*	3.36*	4.36*
	80	0.44*	0.74*	1.00*	1.25*	1.49*	1.73*	2.07*	2.35*	2.64*	3.77*	4.94*
	100	0.47*	0.79*	1.08*	1.35*	1.61*	1.87*	2.24*	2.56*	2.87*	4.15*	5.48*
	120	0.50*	0.84*	1.14*	1.43*	1.72*	1.99*	2.40*	2.75*	3.09*	4.51*	6.00*
	140	0.52*	0.88*	1.20*	1.51*	1.81*	2.11*	2.56*	2.93*	3.30*	4.86*	6.50*
300	10	0.28*	0.47*	0.63*	0.78*	0.92*	1.06*	1.25*	1.41*	1.56*	2.13*	2.66*
	20	0.33*	0.55*	0.75*	0.93*	1.09*	1.26*	1.49*	1.67*	1.86*	2.54*	3.20*
	40	0.40*	0.67*	0.90*	1.12*	1.33*	1.52*	1.81*	2.04*	2.27*	3.14*	3.99*
	60	0.45*	0.75*	1.02*	1.26*	1.50*	1.72*	2.05*	2.32*	2.58*	3.62*	4.64*
	80	0.49*	0.82*	1.11*	1.38*	1.64*	1.89*	2.26*	2.56*	2.86*	4.03*	5.22*
	100	0.53*	0.88*	1.19*	1.49*	1.77*	2.05*	2.45*	2.78*	3.11*	4.42*	5.76*
	120	0.56*	0.93*	1.27*	1.58*	1.89*	2.18*	2.62*	2.98*	3.34*	4.78*	6.28*
	140	0.59*	0.98*	1.34*	1.67*	1.99*	2.31*	2.78*	3.16*	3.55*	5.13*	6.78*
400	10	0.30*	0.50*	0.67*	0.83*	0.98*	1.13*	1.33*	1.50*	1.65*	2.25*	2.81*
	20	0.36*	0.59*	0.80*	0.99*	1.17*	1.34*	1.59*	1.78*	1.97*	2.70*	3.38*
	40	0.43*	0.72*	0.97*	1.20*	1.42*	1.63*	1.93*	2.18*	2.42*	3.33*	4.21*
	60	0.49*	0.81*	1.10*	1.36*	1.61*	1.85*	2.20*	2.48*	2.76*	3.83*	4.88*
	80	0.54*	0.89*	1.20*	1.49*	1.77*	2.03*	2.42*	2.74*	3.05*	4.26*	5.47*
	100	0.57*	0.95*	1.29*	1.60*	1.90*	2.19*	2.62*	2.96*	3.30*	4.66*	6.02*
	120	0.61*	1.01*	1.37*	1.71*	2.03*	2.34*	2.80*	3.17*	3.54*	5.03*	6.54*
	140	0.64*	1.07*	1.44*	1.80*	2.14*	2.47*	2.96*	3.37*	3.77*	5.38*	7.03*
600	10	0.33*	0.55*	0.74*	0.91*	1.08*	1.23*	1.46*	1.63*	1.80*	2.45*	3.05*
	20	0.40*	0.66*	0.89*	1.10*	1.29*	1.48*	1.75*	1.96*	2.17*	2.95*	3.68*
	40	0.49*	0.80*	1.08*	1.34*	1.58*	1.81*	2.14*	2.40*	2.66*	3.65*	4.58*
	60	0.55*	0.91*	1.23*	1.52*	1.79*	2.05*	2.43*	2.74*	3.04*	4.19*	5.29*
	80	0.60*	1.00*	1.34*	1.66*	1.97*	2.26*	2.68*	3.02*	3.35*	4.65*	5.91*
	100	0.65*	1.07*	1.45*	1.79*	2.12*	2.44*	2.90*	3.27*	3.63*	5.06*	6.48*
	120	0.69*	1.14*	1.54*	1.91*	2.26*	2.60*	3.09*	3.49*	3.89*	5.45*	7.00*
	140	0.72*	1.20*	1.62*	2.01*	2.38*	2.74*	3.27*	3.70*	4.13*	5.81*	7.50*
800	10	0.36*	0.59*	0.79*	0.98*	1.15*	1.32*	1.56*	1.74*	1.93*	2.61*	3.24*
	20	0.43*	0.71*	0.96*	1.18*	1.39*	1.59*	1.88*	2.10*	2.32*	3.15*	3.93*
	40	0.53*	0.87*	1.17*	1.45*	1.71*	1.95*	2.31*	2.59*	2.86*	3.91*	4.89*
	60	0.60*	0.99*	1.33*	1.64*	1.94*	2.22*	2.62*	2.95*	3.27*	4.48*	5.64*
	80	0.66*	1.09*	1.46*	1.80*	2.13*	2.44*	2.89*	3.25*	3.61*	4.97*	6.29*
	100	0.71*	1.17*	1.57*	1.94*	2.30*	2.63*	3.12*	3.52*	3.91*	5.41*	6.87*
	120	0.75*	1.24*	1.67*	2.07*	2.44*	2.81*	3.33*	3.76*	4.18*	5.81*	7.41*
	140	0.79*	1.31*	1.76*	2.18*	2.58*	2.97*	3.53*	3.98*	4.43*	6.18*	7.92*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
0	10	0.17*	0.32*	0.46*	0.60*	0.74*	0.88*	1.09*	1.26*	1.44*	2.14*	2.86*
	20	0.19*	0.37*	0.54*	0.72*	0.90*	1.08*	1.35*	1.58*	1.82*	2.77*	3.76*
	40	0.23*	0.45*	0.69*	0.92*	1.17*	1.42*	1.80*	2.12*	2.45*	3.83*	5.27*
	60	0.26*	0.53*	0.81*	1.10*	1.40*	1.71*	2.19*	2.59*	3.01*	4.75*	6.60*
	80	0.29*	0.60*	0.92*	1.26*	1.62*	1.98*	2.54*	3.03*	3.52*	5.60*	7.81*
	100	0.32*	0.66*	1.03*	1.42*	1.82*	2.23*	2.88*	3.43*	4.00*	6.40*	8.96*
	120	0.34*	0.72*	1.13*	1.56*	2.01*	2.48*	3.20*	3.82*	4.46*	7.16*	10.04*
	140	0.37*	0.78*	1.23*	1.70*	2.20*	2.71*	3.50*	4.19*	4.90*	7.89*	11.08*
25	10	0.25*	0.43*	0.59*	0.74*	0.89*	1.03*	1.24*	1.42*	1.59*	2.29*	3.00*
	20	0.29*	0.49*	0.68*	0.87*	1.05*	1.23*	1.50*	1.72*	1.95*	2.90*	3.88*
	40	0.34*	0.59*	0.82*	1.06*	1.30*	1.55*	1.92*	2.24*	2.57*	3.93*	5.37*
	60	0.37*	0.66*	0.94*	1.23*	1.53*	1.83*	2.30*	2.70*	3.12*	4.85*	6.69*
	80	0.41*	0.73*	1.05*	1.39*	1.73*	2.09*	2.65*	3.13*	3.62*	5.69*	7.90*
	100	0.44*	0.79*	1.15*	1.53*	1.93*	2.34*	2.98*	3.53*	4.10*	6.48*	9.03*
	120	0.46*	0.85*	1.25*	1.67*	2.12*	2.58*	3.29*	3.91*	4.55*	7.24*	10.12*
	140	0.49*	0.90*	1.34*	1.81*	2.30*	2.80*	3.60*	4.28*	4.98*	7.96*	11.16*
50	10	0.28*	0.48*	0.65*	0.82*	0.97*	1.13*	1.35*	1.53*	1.71*	2.42*	3.13*
	20	0.33*	0.55*	0.76*	0.96*	1.15*	1.34*	1.61*	1.85*	2.08*	3.02*	3.99*
	40	0.39*	0.66*	0.92*	1.17*	1.41*	1.66*	2.04*	2.36*	2.68*	4.04*	5.47*
	60	0.43*	0.75*	1.04*	1.34*	1.64*	1.94*	2.41*	2.81*	3.22*	4.94*	6.77*
	80	0.47*	0.82*	1.16*	1.49*	1.84*	2.20*	2.75*	3.23*	3.72*	5.78*	7.98*
	100	0.50*	0.88*	1.26*	1.64*	2.03*	2.44*	3.08*	3.62*	4.19*	6.57*	9.11*
	120	0.53*	0.94*	1.35*	1.78*	2.22*	2.67*	3.39*	4.00*	4.64*	7.32*	10.19*
	140	0.56*	1.00*	1.45*	1.91*	2.40*	2.90*	3.69*	4.37*	5.07*	8.04*	11.23*
100	10	0.32*	0.54*	0.73*	0.92*	1.09*	1.26*	1.50*	1.69*	1.88*	2.63*	3.35*
	20	0.38*	0.63*	0.87*	1.08*	1.29*	1.49*	1.79*	2.03*	2.28*	3.24*	4.21*
	40	0.45*	0.76*	1.05*	1.32*	1.58*	1.85*	2.24*	2.56*	2.89*	4.24*	5.66*
	60	0.51*	0.86*	1.19*	1.51*	1.82*	2.13*	2.61*	3.01*	3.42*	5.13*	6.95*
	80	0.55*	0.95*	1.31*	1.67*	2.03*	2.39*	2.95*	3.42*	3.91*	5.95*	8.14*
	100	0.59*	1.02*	1.42*	1.82*	2.22*	2.63*	3.27*	3.81*	4.37*	6.73*	9.27*
	120	0.63*	1.09*	1.53*	1.96*	2.41*	2.86*	3.57*	4.18*	4.81*	7.48*	10.34*
	140	0.66*	1.15*	1.62*	2.10*	2.58*	3.08*	3.86*	4.54*	5.24*	8.19*	11.37*
150	10	0.35*	0.59*	0.79*	0.99*	1.17*	1.35*	1.61*	1.81*	2.01*	2.79*	3.54*
	20	0.41*	0.69*	0.94*	1.18*	1.40*	1.61*	1.93*	2.18*	2.43*	3.42*	4.41*
	40	0.50*	0.84*	1.15*	1.44*	1.72*	1.99*	2.40*	2.73*	3.07*	4.43*	5.85*
	60	0.56*	0.95*	1.30*	1.64*	1.97*	2.29*	2.78*	3.19*	3.60*	5.31*	7.12*
	80	0.61*	1.04*	1.43*	1.81*	2.19*	2.56*	3.12*	3.60*	4.09*	6.13*	8.30*
	100	0.66*	1.12*	1.55*	1.97*	2.39*	2.80*	3.44*	3.99*	4.54*	6.90*	9.42*
	120	0.70*	1.20*	1.66*	2.12*	2.57*	3.03*	3.74*	4.35*	4.98*	7.63*	10.49*
	140	0.74*	1.26*	1.76*	2.25*	2.75*	3.25*	4.04*	4.71*	5.40*	8.34*	11.51*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.37*	0.62*	0.84*	1.05*	1.24*	1.43*	1.69*	1.91*	2.12*	2.92*	3.69*
	20	0.44*	0.74*	1.01*	1.25*	1.49*	1.71*	2.04*	2.30*	2.56*	3.58*	4.59*
	40	0.54*	0.90*	1.23*	1.53*	1.83*	2.11*	2.53*	2.88*	3.22*	4.61*	6.03*
	60	0.61*	1.02*	1.39*	1.75*	2.09*	2.43*	2.93*	3.35*	3.77*	5.48*	7.29*
	80	0.66*	1.12*	1.53*	1.93*	2.32*	2.70*	3.28*	3.76*	4.25*	6.29*	8.47*
	100	0.71*	1.21*	1.66*	2.10*	2.53*	2.95*	3.60*	4.15*	4.71*	7.06*	9.57*
	120	0.76*	1.29*	1.77*	2.25*	2.72*	3.19*	3.91*	4.52*	5.14*	7.79*	10.64*
	140	0.80*	1.36*	1.88*	2.39*	2.90*	3.41*	4.20*	4.87*	5.56*	8.50*	11.66*
300	10	0.41*	0.68*	0.92*	1.14*	1.35*	1.55*	1.84*	2.07*	2.29*	3.15*	3.96*
	20	0.49*	0.82*	1.11*	1.37*	1.63*	1.87*	2.22*	2.50*	2.78*	3.85*	4.90*
	40	0.60*	1.00*	1.36*	1.69*	2.00*	2.31*	2.76*	3.13*	3.49*	4.92*	6.36*
	60	0.68*	1.13*	1.54*	1.93*	2.29*	2.65*	3.18*	3.62*	4.05*	5.81*	7.62*
	80	0.74*	1.25*	1.70*	2.13*	2.54*	2.95*	3.55*	4.05*	4.55*	6.62*	8.78*
	100	0.80*	1.34*	1.84*	2.30*	2.76*	3.21*	3.88*	4.45*	5.02*	7.37*	9.88*
	120	0.85*	1.43*	1.96*	2.47*	2.96*	3.45*	4.20*	4.82*	5.45*	8.10*	10.93*
	140	0.90*	1.51*	2.07*	2.62*	3.15*	3.68*	4.49*	5.17*	5.87*	8.79*	11.94*
400	10	0.44*	0.73*	0.99*	1.22*	1.44*	1.65*	1.96*	2.20*	2.44*	3.33*	4.18*
	20	0.53*	0.88*	1.19*	1.47*	1.74*	2.00*	2.37*	2.67*	2.96*	4.08*	5.16*
	40	0.65*	1.08*	1.46*	1.81*	2.15*	2.48*	2.95*	3.33*	3.71*	5.19*	6.66*
	60	0.74*	1.23*	1.66*	2.07*	2.46*	2.84*	3.40*	3.85*	4.30*	6.10*	7.93*
	80	0.81*	1.35*	1.83*	2.29*	2.72*	3.15*	3.78*	4.30*	4.82*	6.91*	9.08*
	100	0.87*	1.45*	1.98*	2.48*	2.96*	3.43*	4.13*	4.71*	5.29*	7.67*	10.17*
	120	0.93*	1.55*	2.11*	2.65*	3.17*	3.68*	4.45*	5.09*	5.73*	8.39*	11.21*
	140	0.98*	1.64*	2.24*	2.81*	3.37*	3.92*	4.75*	5.44*	6.15*	9.08*	12.22*
600	10	0.49*	0.81*	1.09*	1.35*	1.59*	1.82*	2.15*	2.41*	2.66*	3.63*	4.53*
	20	0.59*	0.98*	1.32*	1.63*	1.93*	2.21*	2.61*	2.94*	3.25*	4.46*	5.60*
	40	0.73*	1.21*	1.63*	2.02*	2.39*	2.74*	3.26*	3.67*	4.08*	5.65*	7.18*
	60	0.83*	1.38*	1.86*	2.31*	2.73*	3.15*	3.75*	4.23*	4.71*	6.60*	8.48*
	80	0.91*	1.52*	2.05*	2.55*	3.02*	3.49*	4.16*	4.71*	5.26*	7.44*	9.65*
	100	0.98*	1.64*	2.21*	2.76*	3.28*	3.79*	4.53*	5.15*	5.76*	8.21*	10.73*
	120	1.05*	1.74*	2.36*	2.95*	3.51*	4.06*	4.87*	5.54*	6.21*	8.93*	11.77*
	140	1.10*	1.84*	2.50*	3.12*	3.72*	4.32*	5.19*	5.92*	6.65*	9.62*	12.76*
800	10	0.53*	0.87*	1.17*	1.45*	1.70*	1.95*	2.30*	2.58*	2.85*	3.87*	4.83*
	20	0.64*	1.06*	1.43*	1.76*	2.08*	2.38*	2.81*	3.16*	3.49*	4.77*	5.97*
	40	0.80*	1.32*	1.77*	2.19*	2.58*	2.96*	3.51*	3.95*	4.38*	6.03*	7.63*
	60	0.91*	1.50*	2.02*	2.50*	2.96*	3.40*	4.03*	4.55*	5.06*	7.03*	8.97*
	80	1.00*	1.65*	2.23*	2.76*	3.27*	3.76*	4.48*	5.06*	5.63*	7.89*	10.15*
	100	1.08*	1.78*	2.41*	2.99*	3.55*	4.08*	4.87*	5.52*	6.15*	8.68*	11.25*
	120	1.15*	1.90*	2.57*	3.19*	3.79*	4.38*	5.23*	5.93*	6.63*	9.42*	12.28*
	140	1.21*	2.00*	2.71*	3.38*	4.02*	4.65*	5.56*	6.32*	7.07*	10.12*	13.27*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.25*	0.47*	0.69*	0.91*	1.14*	1.36*	1.70*	1.99*	2.28*	3.46*	4.67*
	20	0.29*	0.57*	0.86*	1.15*	1.45*	1.76*	2.23*	2.63*	3.03*	4.71*	6.47*
	40	0.36*	0.74*	1.14*	1.56*	1.99*	2.43*	3.12*	3.70*	4.30*	6.82*	9.49*
	60	0.42*	0.89*	1.39*	1.91*	2.46*	3.02*	3.89*	4.65*	5.42*	8.67*	12.14*
	80	0.48*	1.03*	1.62*	2.24*	2.89*	3.56*	4.61*	5.51*	6.44*	10.37*	14.58*
	100	0.54*	1.16*	1.83*	2.54*	3.29*	4.07*	5.28*	6.33*	7.40*	11.97*	16.86*
	120	0.59*	1.28*	2.03*	2.84*	3.68*	4.55*	5.92*	7.10*	8.32*	13.48*	19.04*
	140	0.64*	1.40*	2.23*	3.11*	4.05*	5.01*	6.53*	7.84*	9.19*	14.94*	21.12*
25	10	0.36*	0.62*	0.86*	1.09*	1.31*	1.54*	1.87*	2.15*	2.44*	3.60*	4.81*
	20	0.42*	0.73*	1.02*	1.32*	1.61*	1.91*	2.38*	2.77*	3.17*	4.84*	6.59*
	40	0.50*	0.90*	1.29*	1.70*	2.13*	2.56*	3.24*	3.82*	4.42*	6.93*	9.59*
	60	0.57*	1.04*	1.53*	2.04*	2.58*	3.14*	4.01*	4.76*	5.52*	8.77*	12.23*
	80	0.63*	1.17*	1.75*	2.36*	3.00*	3.67*	4.71*	5.61*	6.54*	10.46*	14.66*
	100	0.68*	1.29*	1.95*	2.66*	3.40*	4.17*	5.38*	6.42*	7.50*	12.05*	16.94*
	120	0.73*	1.41*	2.15*	2.95*	3.78*	4.65*	6.01*	7.19*	8.41*	13.56*	19.11*
	140	0.78*	1.52*	2.34*	3.22*	4.15*	5.11*	6.62*	7.93*	9.28*	15.01*	21.19*
50	10	0.41*	0.69*	0.95*	1.19*	1.43*	1.67*	2.01*	2.30*	2.58*	3.75*	4.95*
	20	0.48*	0.82*	1.14*	1.44*	1.75*	2.05*	2.51*	2.91*	3.30*	4.96*	6.70*
	40	0.58*	1.00*	1.42*	1.83*	2.26*	2.69*	3.36*	3.94*	4.54*	7.03*	9.69*
	60	0.65*	1.16*	1.65*	2.17*	2.70*	3.26*	4.12*	4.86*	5.63*	8.86*	12.32*
	80	0.72*	1.29*	1.87*	2.48*	3.12*	3.78*	4.82*	5.72*	6.64*	10.55*	14.74*
	100	0.78*	1.41*	2.07*	2.77*	3.51*	4.28*	5.48*	6.52*	7.59*	12.13*	17.02*
	120	0.83*	1.53*	2.27*	3.06*	3.89*	4.75*	6.11*	7.28*	8.49*	13.64*	19.19*
	140	0.88*	1.64*	2.45*	3.33*	4.25*	5.21*	6.71*	8.02*	9.36*	15.09*	21.26*
100	10	0.47*	0.79*	1.07*	1.34*	1.60*	1.85*	2.22*	2.52*	2.82*	4.01*	5.21*
	20	0.56*	0.94*	1.29*	1.63*	1.95*	2.27*	2.75*	3.15*	3.55*	5.20*	6.93*
	40	0.68*	1.16*	1.61*	2.04*	2.48*	2.92*	3.60*	4.17*	4.76*	7.24*	9.88*
	60	0.77*	1.33*	1.86*	2.39*	2.93*	3.48*	4.34*	5.08*	5.84*	9.05*	12.50*
	80	0.84*	1.47*	2.08*	2.70*	3.34*	4.00*	5.02*	5.91*	6.83*	10.73*	14.91*
	100	0.91*	1.60*	2.29*	2.99*	3.72*	4.48*	5.67*	6.71*	7.77*	12.30*	17.18*
	120	0.97*	1.72*	2.48*	3.27*	4.09*	4.95*	6.30*	7.46*	8.67*	13.80*	19.34*
	140	1.03*	1.84*	2.66*	3.53*	4.44*	5.40*	6.89*	8.19*	9.53*	15.25*	21.41*
150	10	0.51*	0.86*	1.17*	1.45*	1.73*	1.99*	2.38*	2.70*	3.01*	4.23*	5.44*
	20	0.61*	1.03*	1.41*	1.76*	2.11*	2.44*	2.94*	3.35*	3.76*	5.43*	7.15*
	40	0.75*	1.27*	1.75*	2.21*	2.67*	3.12*	3.81*	4.39*	4.98*	7.44*	10.08*
	60	0.85*	1.45*	2.02*	2.57*	3.12*	3.69*	4.55*	5.28*	6.04*	9.24*	12.67*
	80	0.94*	1.61*	2.25*	2.89*	3.54*	4.20*	5.23*	6.11*	7.02*	10.90*	15.07*
	100	1.01*	1.75*	2.46*	3.18*	3.92*	4.68*	5.87*	6.89*	7.95*	12.47*	17.33*
	120	1.08*	1.88*	2.66*	3.46*	4.29*	5.14*	6.48*	7.64*	8.84*	13.96*	19.48*
	140	1.14*	2.00*	2.85*	3.72*	4.64*	5.58*	7.07*	8.37*	9.70*	15.40*	21.55*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.55*	0.91*	1.24*	1.54*	1.83*	2.11*	2.52*	2.84*	3.16*	4.42*	5.65*
	20	0.66*	1.10*	1.50*	1.88*	2.24*	2.59*	3.10*	3.53*	3.95*	5.64*	7.37*
	40	0.81*	1.36*	1.87*	2.35*	2.82*	3.29*	3.99*	4.58*	5.17*	7.64*	10.27*
	60	0.92*	1.56*	2.15*	2.73*	3.30*	3.87*	4.74*	5.48*	6.23*	9.42*	12.85*
	80	1.01*	1.73*	2.40*	3.06*	3.72*	4.39*	5.42*	6.30*	7.21*	11.07*	15.24*
	100	1.09*	1.87*	2.62*	3.35*	4.10*	4.87*	6.05*	7.08*	8.13*	12.63*	17.49*
	120	1.16*	2.01*	2.82*	3.64*	4.47*	5.33*	6.66*	7.82*	9.02*	14.12*	19.63*
	140	1.23*	2.13*	3.01*	3.90*	4.82*	5.77*	7.25*	8.54*	9.87*	15.55*	21.69*
300	10	0.60*	1.01*	1.36*	1.69*	2.00*	2.30*	2.73*	3.08*	3.42*	4.74*	6.02*
	20	0.73*	1.22*	1.66*	2.06*	2.45*	2.83*	3.37*	3.82*	4.26*	6.01*	7.77*
	40	0.90*	1.51*	2.06*	2.58*	3.09*	3.58*	4.31*	4.92*	5.53*	8.03*	10.64*
	60	1.03*	1.73*	2.37*	2.99*	3.59*	4.19*	5.08*	5.83*	6.60*	9.79*	13.19*
	80	1.13*	1.92*	2.64*	3.34*	4.03*	4.72*	5.77*	6.66*	7.57*	11.42*	15.56*
	100	1.22*	2.08*	2.87*	3.65*	4.43*	5.21*	6.41*	7.43*	8.49*	12.96*	17.79*
	120	1.30*	2.23*	3.09*	3.94*	4.80*	5.67*	7.01*	8.17*	9.36*	14.44*	19.93*
	140	1.38*	2.36*	3.29*	4.22*	5.15*	6.11*	7.59*	8.88*	10.20*	15.86*	21.98*
400	10	0.65*	1.08*	1.46*	1.81*	2.14*	2.45*	2.91*	3.28*	3.64*	5.01*	6.34*
	20	0.79*	1.32*	1.78*	2.21*	2.62*	3.02*	3.60*	4.07*	4.53*	6.33*	8.12*
	40	0.98*	1.64*	2.22*	2.77*	3.31*	3.82*	4.59*	5.22*	5.84*	8.38*	11.00*
	60	1.12*	1.87*	2.56*	3.20*	3.83*	4.46*	5.38*	6.15*	6.93*	10.14*	13.54*
	80	1.23*	2.07*	2.84*	3.57*	4.29*	5.01*	6.08*	6.99*	7.91*	11.76*	15.88*
	100	1.33*	2.25*	3.09*	3.90*	4.70*	5.51*	6.73*	7.76*	8.82*	13.29*	18.10*
	120	1.42*	2.40*	3.32*	4.20*	5.09*	5.98*	7.33*	8.50*	9.69*	14.75*	20.22*
	140	1.50*	2.55*	3.53*	4.49*	5.45*	6.42*	7.92*	9.20*	10.52*	16.16*	22.26*
600	10	0.72*	1.20*	1.61*	2.00*	2.36*	2.70*	3.20*	3.60*	3.98*	5.46*	6.87*
	20	0.89*	1.47*	1.98*	2.46*	2.91*	3.34*	3.96*	4.47*	4.96*	6.88*	8.75*
	40	1.10*	1.83*	2.48*	3.09*	3.66*	4.22*	5.04*	5.71*	6.37*	9.00*	11.67*
	60	1.26*	2.10*	2.85*	3.56*	4.24*	4.91*	5.89*	6.70*	7.51*	10.78*	14.19*
	80	1.39*	2.33*	3.17*	3.96*	4.73*	5.49*	6.62*	7.56*	8.51*	12.40*	16.51*
	100	1.50*	2.52*	3.44*	4.32*	5.17*	6.02*	7.29*	8.35*	9.43*	13.91*	18.71*
	120	1.60*	2.70*	3.69*	4.64*	5.58*	6.51*	7.91*	9.10*	10.30*	15.36*	20.80*
	140	1.70*	2.86*	3.92*	4.94*	5.96*	6.97*	8.50*	9.80*	11.13*	16.75*	22.82*
800	10	0.78*	1.30*	1.74*	2.15*	2.54*	2.91*	3.43*	3.86*	4.27*	5.83*	7.30*
	20	0.97*	1.60*	2.15*	2.66*	3.14*	3.60*	4.26*	4.80*	5.32*	7.33*	9.28*
	40	1.21*	2.00*	2.69*	3.34*	3.96*	4.55*	5.42*	6.12*	6.82*	9.55*	12.28*
	60	1.38*	2.29*	3.10*	3.85*	4.58*	5.28*	6.31*	7.16*	8.00*	11.36*	14.81*
	80	1.52*	2.53*	3.43*	4.28*	5.10*	5.90*	7.08*	8.06*	9.03*	12.99*	17.12*
	100	1.65*	2.74*	3.73*	4.66*	5.57*	6.46*	7.77*	8.87*	9.97*	14.51*	19.30*
	120	1.76*	2.93*	4.00*	5.01*	5.99*	6.96*	8.42*	9.63*	10.86*	15.95*	21.38*
	140	1.85*	3.11*	4.24*	5.33*	6.39*	7.44*	9.02*	10.35*	11.70*	17.33*	23.38*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.37*	0.72*	1.08*	1.45*	1.82*	2.20*	2.77*	3.26*	3.76*	5.81*	7.96*
	20	0.45*	0.92*	1.42*	1.93*	2.45*	2.99*	3.83*	4.54*	5.27*	8.32*	11.55*
	40	0.60*	1.26*	1.98*	2.74*	3.52*	4.34*	5.60*	6.69*	7.81*	12.54*	17.60*
	60	0.72*	1.56*	2.48*	3.44*	4.46*	5.51*	7.16*	8.58*	10.04*	16.24*	22.90*
	80	0.84*	1.84*	2.93*	4.10*	5.32*	6.59*	8.59*	10.31*	12.09*	19.64*	27.77*
	100	0.95*	2.09*	3.36*	4.71*	6.13*	7.61*	9.93*	11.94*	14.01*	22.83*	32.34*
	120	1.05*	2.34*	3.76*	5.29*	6.90*	8.57*	11.20*	13.48*	15.84*	25.87*	36.69*
	140	1.15*	2.57*	4.15*	5.85*	7.63*	9.50*	12.43*	14.97*	17.59*	28.78*	40.86*
25	10	0.52*	0.91*	1.28*	1.64*	2.01*	2.38*	2.95*	3.43*	3.92*	5.96*	8.10*
	20	0.62*	1.11*	1.60*	2.10*	2.62*	3.15*	3.98*	4.68*	5.41*	8.45*	11.67*
	40	0.77*	1.43*	2.14*	2.88*	3.66*	4.47*	5.73*	6.81*	7.93*	12.65*	17.70*
	60	0.89*	1.72*	2.62*	3.58*	4.58*	5.63*	7.27*	8.69*	10.15*	16.34*	22.99*
	80	1.00*	1.98*	3.06*	4.22*	5.44*	6.71*	8.69*	10.41*	12.19*	19.73*	27.86*
	100	1.10*	2.23*	3.48*	4.82*	6.24*	7.72*	10.03*	12.03*	14.10*	22.92*	32.42*
	120	1.20*	2.47*	3.88*	5.40*	7.00*	8.68*	11.30*	13.58*	15.93*	25.95*	36.76*
	140	1.29*	2.70*	4.27*	5.95*	7.74*	9.60*	12.52*	15.06*	17.68*	28.85*	40.93*
50	10	0.59*	1.02*	1.41*	1.79*	2.17*	2.54*	3.11*	3.59*	4.08*	6.11*	8.23*
	20	0.71*	1.24*	1.74*	2.25*	2.77*	3.30*	4.12*	4.83*	5.55*	8.57*	11.79*
	40	0.88*	1.57*	2.28*	3.02*	3.80*	4.60*	5.85*	6.93*	8.05*	12.76*	17.80*
	60	1.01*	1.86*	2.75*	3.71*	4.71*	5.75*	7.38*	8.80*	10.25*	16.44*	23.08*
	80	1.13*	2.12*	3.19*	4.34*	5.55*	6.82*	8.80*	10.52*	12.29*	19.82*	27.94*
	100	1.23*	2.36*	3.61*	4.94*	6.35*	7.82*	10.13*	12.13*	14.20*	23.00*	32.50*
	120	1.33*	2.60*	4.00*	5.51*	7.11*	8.78*	11.39*	13.67*	16.02*	26.03*	36.84*
	140	1.43*	2.82*	4.38*	6.06*	7.84*	9.69*	12.61*	15.14*	17.76*	28.93*	41.00*
100	10	0.68*	1.16*	1.59*	2.01*	2.41*	2.80*	3.39*	3.88*	4.37*	6.40*	8.51*
	20	0.83*	1.42*	1.97*	2.50*	3.04*	3.58*	4.40*	5.10*	5.81*	8.82*	12.02*
	40	1.03*	1.79*	2.53*	3.28*	4.06*	4.85*	6.10*	7.17*	8.28*	12.96*	17.99*
	60	1.18*	2.09*	3.01*	3.96*	4.95*	5.99*	7.61*	9.01*	10.46*	16.63*	23.26*
	80	1.31*	2.36*	3.44*	4.58*	5.78*	7.04*	9.01*	10.72*	12.48*	20.00*	28.10*
	100	1.43*	2.60*	3.84*	5.17*	6.57*	8.03*	10.33*	12.32*	14.38*	23.17*	32.66*
	120	1.53*	2.84*	4.23*	5.73*	7.32*	8.98*	11.58*	13.85*	16.19*	26.19*	36.99*
	140	1.63*	3.06*	4.61*	6.27*	8.04*	9.89*	12.79*	15.32*	17.93*	29.08*	41.14*
150	10	0.75*	1.27*	1.73*	2.17*	2.59*	3.01*	3.62*	4.12*	4.63*	6.67*	8.77*
	20	0.91*	1.55*	2.14*	2.70*	3.26*	3.81*	4.65*	5.35*	6.07*	9.06*	12.25*
	40	1.14*	1.96*	2.74*	3.51*	4.29*	5.09*	6.33*	7.40*	8.50*	13.17*	18.19*
	60	1.30*	2.28*	3.22*	4.19*	5.18*	6.22*	7.83*	9.23*	10.67*	16.81*	23.44*
	80	1.45*	2.55*	3.66*	4.81*	6.00*	7.25*	9.21*	10.92*	12.68*	20.17*	28.27*
	100	1.57*	2.81*	4.07*	5.39*	6.78*	8.24*	10.52*	12.51*	14.57*	23.34*	32.81*
	120	1.69*	3.04*	4.45*	5.94*	7.52*	9.17*	11.77*	14.03*	16.37*	26.35*	37.14*
	140	1.79*	3.27*	4.82*	6.48*	8.24*	10.08*	12.97*	15.50*	18.10*	29.24*	41.29*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.81*	1.35*	1.84*	2.31*	2.75*	3.18*	3.81*	4.33*	4.85*	6.91*	9.03*
	20	0.98*	1.66*	2.28*	2.87*	3.45*	4.02*	4.87*	5.58*	6.31*	9.30*	12.48*
	40	1.23*	2.10*	2.91*	3.71*	4.51*	5.32*	6.56*	7.63*	8.73*	13.38*	18.38*
	60	1.41*	2.43*	3.41*	4.40*	5.40*	6.44*	8.04*	9.44*	10.88*	17.00*	23.61*
	80	1.56*	2.72*	3.86*	5.02*	6.22*	7.47*	9.42*	11.12*	12.87*	20.35*	28.43*
	100	1.69*	2.98*	4.27*	5.60*	6.99*	8.44*	10.72*	12.70*	14.75*	23.50*	32.97*
	120	1.82*	3.23*	4.66*	6.15*	7.72*	9.37*	11.96*	14.21*	16.55*	26.51*	37.29*
	140	1.93*	3.46*	5.02*	6.68*	8.43*	10.27*	13.16*	15.67*	18.27*	29.39*	41.43*
300	10	0.89*	1.49*	2.03*	2.53*	3.00*	3.46*	4.13*	4.68*	5.22*	7.36*	9.50*
	20	1.10*	1.84*	2.51*	3.15*	3.76*	4.36*	5.25*	5.99*	6.73*	9.76*	12.92*
	40	1.37*	2.32*	3.20*	4.04*	4.88*	5.71*	6.98*	8.06*	9.16*	13.79*	18.77*
	60	1.58*	2.69*	3.73*	4.76*	5.79*	6.84*	8.46*	9.85*	11.28*	17.38*	23.96*
	80	1.75*	3.00*	4.20*	5.40*	6.62*	7.87*	9.82*	11.51*	13.25*	20.70*	28.76*
	100	1.89*	3.28*	4.62*	5.98*	7.38*	8.83*	11.10*	13.07*	15.11*	23.84*	33.28*
	120	2.03*	3.54*	5.02*	6.54*	8.11*	9.75*	12.33*	14.57*	16.89*	26.83*	37.58*
	140	2.15*	3.78*	5.39*	7.07*	8.82*	10.64*	13.51*	16.02*	18.61*	29.70*	41.72*
400	10	0.97*	1.61*	2.18*	2.70*	3.21*	3.69*	4.40*	4.97*	5.53*	7.74*	9.93*
	20	1.19*	1.99*	2.70*	3.37*	4.02*	4.65*	5.58*	6.34*	7.10*	10.17*	13.35*
	40	1.49*	2.51*	3.43*	4.32*	5.19*	6.05*	7.35*	8.45*	9.55*	14.19*	19.15*
	60	1.71*	2.90*	4.00*	5.07*	6.14*	7.21*	8.84*	10.24*	11.67*	17.75*	24.31*
	80	1.90*	3.23*	4.49*	5.73*	6.98*	8.24*	10.20*	11.89*	13.63*	21.05*	29.09*
	100	2.06*	3.53*	4.93*	6.33*	7.75*	9.21*	11.48*	13.44*	15.47*	24.17*	33.59*
	120	2.20*	3.80*	5.34*	6.89*	8.48*	10.12*	12.69*	14.93*	17.24*	27.14*	37.88*
	140	2.33*	4.05*	5.72*	7.42*	9.18*	11.00*	13.87*	16.36*	18.94*	30.00*	42.00*
600	10	1.08*	1.79*	2.42*	3.00*	3.54*	4.07*	4.83*	5.45*	6.05*	8.39*	10.66*
	20	1.34*	2.22*	3.01*	3.74*	4.44*	5.12*	6.12*	6.93*	7.73*	10.92*	14.15*
	40	1.68*	2.81*	3.82*	4.78*	5.72*	6.63*	8.00*	9.13*	10.27*	14.95*	19.90*
	60	1.93*	3.25*	4.45*	5.59*	6.72*	7.84*	9.53*	10.96*	12.40*	18.48*	25.00*
	80	2.14*	3.61*	4.97*	6.29*	7.60*	8.91*	10.90*	12.61*	14.35*	21.74*	29.74*
	100	2.32*	3.94*	5.44*	6.92*	8.39*	9.89*	12.18*	14.15*	16.18*	24.82*	34.21*
	120	2.48*	4.23*	5.88*	7.50*	9.14*	10.81*	13.39*	15.62*	17.92*	27.77*	38.47*
	140	2.63*	4.50*	6.28*	8.05*	9.85*	11.69*	14.55*	17.04*	19.60*	30.61*	42.57*
800	10	1.17*	1.94*	2.61*	3.23*	3.82*	4.38*	5.19*	5.84*	6.48*	8.93*	11.30*
	20	1.46*	2.41*	3.26*	4.04*	4.79*	5.51*	6.56*	7.42*	8.26*	11.56*	14.86*
	40	1.83*	3.05*	4.14*	5.17*	6.15*	7.12*	8.54*	9.72*	10.89*	15.66*	20.62*
	60	2.11*	3.53*	4.81*	6.03*	7.21*	8.38*	10.13*	11.59*	13.06*	19.17*	25.69*
	80	2.34*	3.93*	5.37*	6.76*	8.13*	9.48*	11.53*	13.26*	15.02*	22.41*	30.38*
	100	2.54*	4.27*	5.87*	7.42*	8.95*	10.49*	12.82*	14.81*	16.84*	25.47*	34.82*
	120	2.71*	4.59*	6.33*	8.03*	9.72*	11.42*	14.04*	16.28*	18.58*	28.40*	39.06*
	140	2.87*	4.88*	6.75*	8.59*	10.44*	12.31*	15.20*	17.69*	20.25*	31.22*	43.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.17	0.27*	0.36*	0.45*	0.54*	0.63*	0.77*	0.88*	0.99*	1.43*	1.87*
	20	0.19	0.30*	0.41*	0.52*	0.63*	0.74*	0.91*	1.05*	1.19*	1.75*	2.33*
	40	0.21	0.35*	0.49*	0.64*	0.78*	0.93*	1.15*	1.34*	1.52*	2.30*	3.11*
	60	0.24	0.40*	0.57*	0.74*	0.91*	1.09*	1.36*	1.59*	1.82*	2.78*	3.79*
	80	0.26	0.45*	0.64*	0.83*	1.03*	1.24*	1.55*	1.82*	2.09*	3.22*	4.42*
	100	0.28	0.49*	0.70*	0.92*	1.15*	1.38*	1.73*	2.04*	2.35*	3.64*	5.01*
	120	0.30	0.53*	0.76*	1.00*	1.25*	1.51*	1.90*	2.24*	2.59*	4.03*	5.56*
	140	0.32	0.57*	0.82*	1.08*	1.36*	1.64*	2.07*	2.44*	2.82*	4.41*	6.10*
25	10	0.24	0.36*	0.46*	0.57*	0.66*	0.76*	0.90*	1.01*	1.13*	1.57*	2.00*
	20	0.27	0.40*	0.53*	0.64*	0.76*	0.87*	1.04*	1.18*	1.32*	1.88*	2.45*
	40	0.31	0.47*	0.62*	0.76*	0.91*	1.05*	1.27*	1.45*	1.64*	2.41*	3.21*
	60	0.35	0.52*	0.69*	0.86*	1.03*	1.20*	1.47*	1.69*	1.92*	2.88*	3.88*
	80	0.37	0.56*	0.76*	0.95*	1.15*	1.35*	1.65*	1.92*	2.19*	3.31*	4.50*
	100	0.40	0.61*	0.82*	1.03*	1.25*	1.48*	1.83*	2.13*	2.44*	3.72*	5.08*
	120	0.42	0.64*	0.87*	1.11*	1.36*	1.61*	2.00*	2.33*	2.68*	4.11*	5.64*
	140	0.44	0.68*	0.93*	1.19*	1.46*	1.73*	2.16*	2.53*	2.90*	4.49*	6.17*
50	10	0.27	0.39*	0.51*	0.62*	0.73*	0.83*	0.98*	1.10*	1.21*	1.67*	2.11*
	20	0.31	0.45*	0.58*	0.71*	0.84*	0.96*	1.13*	1.28*	1.42*	1.99*	2.56*
	40	0.36	0.53*	0.69*	0.84*	1.00*	1.15*	1.37*	1.56*	1.74*	2.51*	3.30*
	60	0.40	0.59*	0.77*	0.95*	1.13*	1.30*	1.57*	1.80*	2.02*	2.97*	3.97*
	80	0.43	0.64*	0.84*	1.04*	1.24*	1.45*	1.75*	2.02*	2.28*	3.40*	4.58*
	100	0.46	0.68*	0.91*	1.13*	1.35*	1.58*	1.93*	2.22*	2.53*	3.81*	5.16*
	120	0.49	0.73*	0.97*	1.21*	1.45*	1.70*	2.09*	2.42*	2.76*	4.19*	5.71*
	140	0.51	0.76*	1.02*	1.28*	1.55*	1.82*	2.25*	2.61*	2.99*	4.56*	6.24*
100	10	0.30	0.44*	0.57*	0.69*	0.81*	0.92*	1.08*	1.21*	1.34*	1.82*	2.29*
	20	0.35	0.51*	0.66*	0.80*	0.94*	1.07*	1.26*	1.42*	1.57*	2.16*	2.75*
	40	0.42	0.61*	0.79*	0.96*	1.12*	1.29*	1.52*	1.72*	1.91*	2.69*	3.49*
	60	0.47	0.68*	0.88*	1.08*	1.27*	1.46*	1.74*	1.97*	2.20*	3.15*	4.14*
	80	0.51	0.74*	0.96*	1.18*	1.39*	1.61*	1.92*	2.19*	2.46*	3.57*	4.74*
	100	0.54	0.79*	1.04*	1.27*	1.51*	1.74*	2.10*	2.40*	2.70*	3.97*	5.31*
	120	0.57	0.84*	1.10*	1.36*	1.61*	1.87*	2.26*	2.59*	2.93*	4.35*	5.86*
	140	0.60	0.88*	1.16*	1.44*	1.71*	1.99*	2.42*	2.78*	3.15*	4.72*	6.39*
150	10	0.33	0.48*	0.61*	0.74*	0.87*	0.98*	1.16*	1.29*	1.43*	1.94*	2.42*
	20	0.39	0.56*	0.72*	0.87*	1.01*	1.15*	1.36*	1.52*	1.68*	2.30*	2.90*
	40	0.46	0.67*	0.86*	1.04*	1.22*	1.39*	1.64*	1.85*	2.05*	2.85*	3.66*
	60	0.52	0.75*	0.97*	1.17*	1.38*	1.58*	1.87*	2.11*	2.35*	3.31*	4.30*
	80	0.56	0.81*	1.05*	1.29*	1.51*	1.73*	2.06*	2.34*	2.61*	3.73*	4.90*
	100	0.60	0.87*	1.13*	1.39*	1.63*	1.88*	2.24*	2.55*	2.86*	4.13*	5.47*
	120	0.63	0.92*	1.20*	1.48*	1.74*	2.01*	2.41*	2.75*	3.09*	4.50*	6.01*
	140	0.67	0.97*	1.27*	1.56*	1.85*	2.13*	2.57*	2.93*	3.31*	4.87*	6.53*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.35	0.50*	0.65*	0.79*	0.91*	1.04*	1.22*	1.36*	1.50*	2.03*	2.53*
	20	0.41	0.59*	0.76*	0.92*	1.08*	1.22*	1.44*	1.61*	1.77*	2.42*	3.04*
	40	0.49	0.71*	0.92*	1.11*	1.30*	1.48*	1.74*	1.95*	2.17*	2.99*	3.81*
	60	0.55	0.80*	1.03*	1.25*	1.47*	1.67*	1.98*	2.23*	2.48*	3.46*	4.46*
	80	0.60	0.87*	1.13*	1.37*	1.61*	1.84*	2.18*	2.47*	2.75*	3.88*	5.05*
	100	0.65	0.94*	1.21*	1.48*	1.74*	1.99*	2.37*	2.68*	3.00*	4.28*	5.61*
	120	0.69	0.99*	1.29*	1.57*	1.85*	2.13*	2.54*	2.88*	3.23*	4.65*	6.15*
	140	0.72	1.05*	1.36*	1.66*	1.96*	2.26*	2.70*	3.07*	3.45*	5.01*	6.67*
300	10	0.38	0.55*	0.71*	0.85*	0.99*	1.12*	1.32*	1.47*	1.62*	2.18*	2.71*
	20	0.45	0.65*	0.84*	1.01*	1.18*	1.33*	1.56*	1.75*	1.93*	2.61*	3.26*
	40	0.55	0.79*	1.01*	1.22*	1.42*	1.62*	1.90*	2.13*	2.35*	3.22*	4.07*
	60	0.62	0.89*	1.14*	1.38*	1.61*	1.84*	2.16*	2.43*	2.69*	3.72*	4.74*
	80	0.68	0.97*	1.25*	1.51*	1.77*	2.02*	2.38*	2.68*	2.98*	4.15*	5.34*
	100	0.72	1.04*	1.34*	1.63*	1.91*	2.18*	2.58*	2.91*	3.24*	4.55*	5.90*
	120	0.77	1.11*	1.43*	1.74*	2.03*	2.33*	2.76*	3.12*	3.48*	4.92*	6.43*
	140	0.81	1.16*	1.51*	1.83*	2.15*	2.46*	2.93*	3.32*	3.70*	5.28*	6.94*
400	10	0.41	0.59*	0.75*	0.91*	1.05*	1.19*	1.40*	1.56*	1.71*	2.31*	2.86*
	20	0.49	0.70*	0.90*	1.08*	1.26*	1.42*	1.67*	1.86*	2.05*	2.77*	3.45*
	40	0.59	0.85*	1.09*	1.31*	1.53*	1.73*	2.03*	2.27*	2.51*	3.42*	4.30*
	60	0.67	0.96*	1.23*	1.49*	1.73*	1.97*	2.31*	2.59*	2.86*	3.93*	4.98*
	80	0.73	1.05*	1.35*	1.63*	1.90*	2.16*	2.55*	2.86*	3.17*	4.38*	5.59*
	100	0.79	1.13*	1.45*	1.76*	2.05*	2.34*	2.76*	3.10*	3.44*	4.79*	6.16*
	120	0.84	1.20*	1.54*	1.87*	2.18*	2.49*	2.95*	3.32*	3.69*	5.17*	6.69*
	140	0.88	1.26*	1.63*	1.97*	2.31*	2.64*	3.12*	3.52*	3.92*	5.53*	7.20*
600	10	0.45	0.65*	0.83*	1.00*	1.16*	1.31*	1.53*	1.70*	1.87*	2.51*	3.11*
	20	0.54	0.78*	0.99*	1.20*	1.39*	1.57*	1.83*	2.04*	2.25*	3.02*	3.75*
	40	0.67	0.95*	1.21*	1.46*	1.70*	1.92*	2.25*	2.51*	2.76*	3.74*	4.68*
	60	0.75	1.07*	1.38*	1.66*	1.92*	2.18*	2.56*	2.86*	3.16*	4.30*	5.40*
	80	0.83	1.18*	1.51*	1.82*	2.11*	2.40*	2.82*	3.15*	3.49*	4.77*	6.04*
	100	0.89	1.27*	1.62*	1.96*	2.28*	2.59*	3.05*	3.42*	3.78*	5.20*	6.62*
	120	0.94	1.34*	1.73*	2.09*	2.43*	2.76*	3.25*	3.65*	4.05*	5.60*	7.16*
	140	0.99	1.42*	1.82*	2.20*	2.57*	2.92*	3.45*	3.87*	4.30*	5.97*	7.67*
800	10	0.49	0.69*	0.89*	1.07*	1.24*	1.40*	1.63*	1.82*	2.00*	2.67*	3.30*
	20	0.59	0.84*	1.07*	1.29*	1.49*	1.69*	1.97*	2.19*	2.41*	3.23*	4.01*
	40	0.72	1.03*	1.31*	1.58*	1.83*	2.07*	2.42*	2.70*	2.97*	4.01*	4.99*
	60	0.82	1.17*	1.49*	1.79*	2.08*	2.36*	2.76*	3.08*	3.39*	4.60*	5.76*
	80	0.90	1.28*	1.64*	1.97*	2.29*	2.60*	3.04*	3.40*	3.75*	5.10*	6.42*
	100	0.97	1.38*	1.76*	2.12*	2.47*	2.80*	3.28*	3.68*	4.06*	5.55*	7.02*
	120	1.03	1.46*	1.88*	2.26*	2.63*	2.99*	3.51*	3.93*	4.34*	5.97*	7.57*
	140	1.08	1.54*	1.98*	2.39*	2.78*	3.16*	3.71*	4.16*	4.61*	6.35*	8.10*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.24	0.38*	0.52*	0.67*	0.80*	0.94*	1.15*	1.33*	1.50*	2.21*	2.93*
	20	0.27	0.45*	0.63*	0.80*	0.98*	1.16*	1.44*	1.67*	1.90*	2.86*	3.85*
	40	0.33	0.56*	0.79*	1.04*	1.28*	1.53*	1.92*	2.24*	2.58*	3.96*	5.41*
	60	0.38	0.66*	0.94*	1.24*	1.54*	1.86*	2.34*	2.75*	3.17*	4.92*	6.77*
	80	0.43	0.74*	1.08*	1.43*	1.78*	2.15*	2.72*	3.21*	3.71*	5.80*	8.03*
	100	0.47	0.83*	1.21*	1.60*	2.01*	2.43*	3.08*	3.64*	4.22*	6.63*	9.20*
	120	0.51	0.91*	1.33*	1.77*	2.22*	2.70*	3.43*	4.06*	4.70*	7.42*	10.32*
	140	0.55	0.98*	1.44*	1.93*	2.43*	2.95*	3.76*	4.45*	5.17*	8.18*	11.39*
25	10	0.34	0.51*	0.66*	0.81*	0.96*	1.10*	1.31*	1.48*	1.66*	2.36*	3.06*
	20	0.39	0.58*	0.77*	0.95*	1.13*	1.31*	1.58*	1.81*	2.04*	2.99*	3.97*
	40	0.46	0.70*	0.94*	1.17*	1.42*	1.66*	2.04*	2.36*	2.69*	4.06*	5.51*
	60	0.52	0.79*	1.08*	1.37*	1.67*	1.97*	2.45*	2.86*	3.27*	5.02*	6.86*
	80	0.57	0.88*	1.21*	1.55*	1.90*	2.26*	2.83*	3.31*	3.81*	5.89*	8.11*
	100	0.61	0.96*	1.33*	1.72*	2.12*	2.54*	3.18*	3.74*	4.31*	6.72*	9.28*
	120	0.65	1.03*	1.44*	1.88*	2.33*	2.80*	3.52*	4.15*	4.79*	7.50*	10.40*
	140	0.69	1.11*	1.56*	2.03*	2.53*	3.05*	3.85*	4.54*	5.25*	8.25*	11.46*
50	10	0.38	0.56*	0.73*	0.89*	1.05*	1.20*	1.42*	1.60*	1.78*	2.49*	3.19*
	20	0.45	0.66*	0.86*	1.05*	1.24*	1.42*	1.70*	1.93*	2.16*	3.11*	4.08*
	40	0.53	0.79*	1.04*	1.29*	1.53*	1.78*	2.16*	2.48*	2.81*	4.17*	5.60*
	60	0.60	0.89*	1.19*	1.48*	1.78*	2.09*	2.56*	2.96*	3.38*	5.11*	6.95*
	80	0.65	0.98*	1.32*	1.66*	2.01*	2.37*	2.93*	3.41*	3.90*	5.98*	8.19*
	100	0.70	1.06*	1.44*	1.83*	2.23*	2.64*	3.28*	3.83*	4.40*	6.80*	9.36*
	120	0.74	1.14*	1.55*	1.98*	2.43*	2.89*	3.62*	4.24*	4.88*	7.58*	10.47*
	140	0.79	1.21*	1.66*	2.14*	2.63*	3.14*	3.94*	4.63*	5.34*	8.33*	11.54*
100	10	0.44	0.64*	0.82*	1.00*	1.17*	1.33*	1.57*	1.77*	1.96*	2.70*	3.42*
	20	0.52	0.75*	0.97*	1.19*	1.39*	1.59*	1.89*	2.13*	2.37*	3.33*	4.30*
	40	0.62	0.91*	1.18*	1.45*	1.71*	1.97*	2.36*	2.69*	3.02*	4.37*	5.80*
	60	0.70	1.03*	1.35*	1.66*	1.97*	2.29*	2.76*	3.16*	3.58*	5.30*	7.12*
	80	0.76	1.13*	1.49*	1.85*	2.21*	2.57*	3.13*	3.60*	4.09*	6.15*	8.35*
	100	0.82	1.22*	1.62*	2.02*	2.42*	2.83*	3.47*	4.02*	4.58*	6.97*	9.51*
	120	0.87	1.30*	1.74*	2.18*	2.62*	3.09*	3.80*	4.42*	5.05*	7.74*	10.62*
	140	0.92	1.38*	1.85*	2.33*	2.82*	3.33*	4.12*	4.80*	5.50*	8.48*	11.68*
150	10	0.48	0.69*	0.89*	1.08*	1.26*	1.43*	1.69*	1.89*	2.09*	2.86*	3.61*
	20	0.57	0.82*	1.06*	1.29*	1.50*	1.72*	2.03*	2.28*	2.53*	3.52*	4.50*
	40	0.69	0.99*	1.29*	1.58*	1.85*	2.12*	2.53*	2.86*	3.20*	4.56*	5.98*
	60	0.77	1.13*	1.47*	1.80*	2.13*	2.45*	2.94*	3.35*	3.76*	5.48*	7.30*
	80	0.85	1.24*	1.62*	2.00*	2.37*	2.74*	3.31*	3.79*	4.28*	6.33*	8.52*
	100	0.91	1.34*	1.76*	2.17*	2.59*	3.01*	3.65*	4.20*	4.76*	7.13*	9.67*
	120	0.97	1.43*	1.88*	2.34*	2.80*	3.26*	3.98*	4.59*	5.22*	7.90*	10.77*
	140	1.02	1.51*	2.00*	2.49*	2.99*	3.50*	4.29*	4.97*	5.67*	8.64*	11.82*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.51	0.73*	0.95*	1.14*	1.33*	1.52*	1.78*	1.99*	2.20*	3.00*	3.77*
	20	0.61	0.88*	1.13*	1.37*	1.60*	1.82*	2.14*	2.41*	2.67*	3.68*	4.68*
	40	0.74	1.07*	1.38*	1.68*	1.97*	2.25*	2.67*	3.01*	3.36*	4.74*	6.16*
	60	0.83	1.21*	1.57*	1.92*	2.26*	2.59*	3.09*	3.51*	3.93*	5.65*	7.47*
	80	0.91	1.33*	1.73*	2.12*	2.51*	2.89*	3.47*	3.95*	4.45*	6.50*	8.68*
	100	0.98	1.43*	1.88*	2.31*	2.74*	3.16*	3.81*	4.37*	4.93*	7.29*	9.82*
	120	1.05	1.53*	2.01*	2.48*	2.95*	3.42*	4.14*	4.76*	5.39*	8.05*	10.91*
	140	1.10	1.62*	2.13*	2.64*	3.15*	3.66*	4.46*	5.13*	5.83*	8.79*	11.96*
300	10	0.56	0.80*	1.03*	1.25*	1.45*	1.65*	1.93*	2.16*	2.38*	3.23*	4.03*
	20	0.67	0.97*	1.24*	1.50*	1.75*	1.99*	2.33*	2.61*	2.89*	3.96*	5.00*
	40	0.82	1.18*	1.52*	1.85*	2.16*	2.46*	2.91*	3.27*	3.63*	5.06*	6.50*
	60	0.93	1.34*	1.74*	2.11*	2.47*	2.83*	3.36*	3.79*	4.22*	5.98*	7.80*
	80	1.02	1.48*	1.91*	2.33*	2.74*	3.15*	3.75*	4.25*	4.75*	6.82*	8.99*
	100	1.10	1.59*	2.07*	2.53*	2.98*	3.43*	4.10*	4.67*	5.24*	7.61*	10.12*
	120	1.17	1.70*	2.21*	2.71*	3.21*	3.70*	4.44*	5.06*	5.70*	8.36*	11.20*
	140	1.24	1.80*	2.35*	2.88*	3.41*	3.95*	4.76*	5.44*	6.14*	9.08*	12.25*
400	10	0.60	0.86*	1.10*	1.33*	1.55*	1.75*	2.05*	2.29*	2.53*	3.41*	4.26*
	20	0.73	1.04*	1.33*	1.61*	1.87*	2.12*	2.49*	2.79*	3.08*	4.19*	5.27*
	40	0.89	1.28*	1.64*	1.98*	2.31*	2.63*	3.10*	3.48*	3.86*	5.33*	6.81*
	60	1.01	1.45*	1.87*	2.27*	2.65*	3.03*	3.58*	4.03*	4.48*	6.27*	8.11*
	80	1.11	1.60*	2.06*	2.51*	2.94*	3.36*	3.99*	4.50*	5.02*	7.12*	9.30*
	100	1.20	1.72*	2.23*	2.72*	3.19*	3.66*	4.36*	4.94*	5.52*	7.91*	10.42*
	120	1.27	1.84*	2.38*	2.91*	3.43*	3.94*	4.70*	5.34*	5.98*	8.65*	11.49*
	140	1.34	1.94*	2.52*	3.09*	3.64*	4.19*	5.02*	5.72*	6.43*	9.37*	12.52*
600	10	0.67	0.95*	1.22*	1.47*	1.70*	1.93*	2.25*	2.51*	2.76*	3.72*	4.62*
	20	0.81	1.16*	1.48*	1.78*	2.07*	2.35*	2.74*	3.06*	3.38*	4.57*	5.72*
	40	1.00	1.43*	1.83*	2.21*	2.57*	2.92*	3.42*	3.83*	4.24*	5.80*	7.34*
	60	1.14	1.63*	2.09*	2.53*	2.94*	3.35*	3.94*	4.43*	4.90*	6.78*	8.67*
	80	1.25	1.79*	2.31*	2.79*	3.26*	3.71*	4.38*	4.93*	5.48*	7.65*	9.87*
	100	1.35	1.93*	2.49*	3.02*	3.54*	4.04*	4.78*	5.39*	6.00*	8.45*	10.98*
	120	1.44	2.06*	2.66*	3.23*	3.79*	4.33*	5.14*	5.81*	6.48*	9.20*	12.05*
	140	1.52	2.18*	2.82*	3.43*	4.02*	4.61*	5.48*	6.21*	6.93*	9.92*	13.07*
800	10	0.72	1.03*	1.31*	1.58*	1.83*	2.07*	2.41*	2.69*	2.96*	3.97*	4.92*
	20	0.88	1.25*	1.60*	1.92*	2.23*	2.53*	2.95*	3.29*	3.62*	4.89*	6.09*
	40	1.09	1.55*	1.98*	2.39*	2.78*	3.15*	3.69*	4.12*	4.55*	6.19*	7.79*
	60	1.24	1.77*	2.27*	2.74*	3.18*	3.61*	4.24*	4.75*	5.26*	7.22*	9.16*
	80	1.37	1.95*	2.50*	3.02*	3.52*	4.01*	4.71*	5.29*	5.86*	8.12*	10.38*
	100	1.48	2.11*	2.71*	3.27*	3.82*	4.35*	5.13*	5.77*	6.41*	8.93*	11.50*
	120	1.57	2.25*	2.89*	3.50*	4.09*	4.66*	5.51*	6.21*	6.91*	9.70*	12.57*
	140	1.66	2.37*	3.06*	3.71*	4.34*	4.95*	5.87*	6.62*	7.37*	10.42*	13.59*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.35	0.57*	0.79*	1.02*	1.24*	1.46*	1.81*	2.09*	2.38*	3.57*	4.78*
	20	0.42	0.70*	0.99*	1.29*	1.59*	1.90*	2.38*	2.78*	3.18*	4.87*	6.64*
	40	0.53	0.92*	1.33*	1.76*	2.19*	2.64*	3.33*	3.92*	4.53*	7.06*	9.75*
	60	0.63	1.12*	1.63*	2.16*	2.72*	3.29*	4.17*	4.93*	5.71*	8.99*	12.48*
	80	0.72	1.29*	1.90*	2.54*	3.20*	3.88*	4.94*	5.86*	6.79*	10.75*	14.98*
	100	0.81	1.46*	2.15*	2.89*	3.65*	4.44*	5.67*	6.72*	7.81*	12.41*	17.34*
	120	0.89	1.62*	2.40*	3.22*	4.08*	4.97*	6.35*	7.55*	8.78*	13.99*	19.57*
	140	0.97	1.77*	2.63*	3.54*	4.49*	5.48*	7.01*	8.34*	9.71*	15.50*	21.72*
25	10	0.49	0.73*	0.97*	1.19*	1.42*	1.64*	1.98*	2.26*	2.55*	3.71*	4.92*
	20	0.58	0.87*	1.16*	1.46*	1.75*	2.06*	2.52*	2.92*	3.32*	5.00*	6.75*
	40	0.70	1.08*	1.48*	1.90*	2.33*	2.77*	3.46*	4.05*	4.65*	7.17*	9.85*
	60	0.80	1.27*	1.77*	2.29*	2.84*	3.41*	4.28*	5.04*	5.82*	9.08*	12.57*
	80	0.89	1.44*	2.03*	2.66*	3.31*	3.99*	5.05*	5.96*	6.89*	10.84*	15.07*
	100	0.97	1.60*	2.28*	3.00*	3.76*	4.54*	5.76*	6.82*	7.90*	12.49*	17.41*
	120	1.05	1.75*	2.52*	3.33*	4.18*	5.07*	6.45*	7.64*	8.87*	14.07*	19.65*
	140	1.12	1.89*	2.74*	3.65*	4.59*	5.57*	7.10*	8.43*	9.79*	15.58*	21.79*
50	10	0.56	0.82*	1.07*	1.31*	1.54*	1.78*	2.12*	2.41*	2.69*	3.86*	5.06*
	20	0.66	0.97*	1.28*	1.59*	1.89*	2.20*	2.66*	3.06*	3.46*	5.12*	6.87*
	40	0.80	1.20*	1.62*	2.03*	2.46*	2.90*	3.58*	4.16*	4.76*	7.27*	9.94*
	60	0.91	1.39*	1.90*	2.42*	2.96*	3.52*	4.40*	5.15*	5.92*	9.18*	12.65*
	80	1.01	1.56*	2.16*	2.78*	3.43*	4.10*	5.15*	6.06*	6.99*	10.93*	15.15*
	100	1.09	1.72*	2.40*	3.12*	3.87*	4.65*	5.86*	6.92*	8.00*	12.58*	17.49*
	120	1.17	1.87*	2.63*	3.44*	4.29*	5.17*	6.54*	7.73*	8.96*	14.15*	19.72*
	140	1.25	2.02*	2.86*	3.75*	4.69*	5.67*	7.20*	8.52*	9.88*	15.65*	21.86*
100	10	0.64	0.93*	1.21*	1.47*	1.72*	1.97*	2.34*	2.64*	2.94*	4.12*	5.32*
	20	0.76	1.12*	1.46*	1.78*	2.11*	2.43*	2.90*	3.30*	3.71*	5.36*	7.10*
	40	0.93	1.38*	1.82*	2.26*	2.69*	3.14*	3.81*	4.39*	4.99*	7.48*	10.14*
	60	1.06	1.59*	2.11*	2.65*	3.19*	3.75*	4.62*	5.36*	6.13*	9.37*	12.83*
	80	1.17	1.77*	2.38*	3.00*	3.65*	4.32*	5.36*	6.26*	7.18*	11.11*	15.31*
	100	1.27	1.93*	2.62*	3.34*	4.08*	4.85*	6.06*	7.11*	8.18*	12.75*	17.65*
	120	1.36	2.09*	2.85*	3.65*	4.49*	5.37*	6.73*	7.91*	9.13*	14.31*	19.87*
	140	1.44	2.23*	3.07*	3.96*	4.89*	5.86*	7.38*	8.69*	10.05*	15.81*	22.01*
150	10	0.70	1.01*	1.31*	1.59*	1.86*	2.12*	2.51*	2.82*	3.13*	4.34*	5.56*
	20	0.84	1.22*	1.58*	1.93*	2.27*	2.61*	3.10*	3.51*	3.92*	5.59*	7.32*
	40	1.03	1.51*	1.98*	2.43*	2.89*	3.34*	4.03*	4.61*	5.20*	7.69*	10.33*
	60	1.18	1.73*	2.29*	2.84*	3.40*	3.96*	4.83*	5.57*	6.33*	9.55*	13.01*
	80	1.30	1.93*	2.56*	3.20*	3.85*	4.52*	5.56*	6.45*	7.38*	11.28*	15.48*
	100	1.40	2.10*	2.81*	3.54*	4.28*	5.05*	6.25*	7.29*	8.36*	12.91*	17.80*
	120	1.50	2.26*	3.05*	3.85*	4.69*	5.56*	6.92*	8.09*	9.31*	14.47*	20.02*
	140	1.59	2.41*	3.27*	4.16*	5.08*	6.05*	7.56*	8.87*	10.22*	15.96*	22.15*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.75	1.08*	1.39*	1.69*	1.97*	2.24*	2.64*	2.97*	3.29*	4.54*	5.77*
	20	0.90	1.31*	1.69*	2.06*	2.41*	2.76*	3.27*	3.69*	4.11*	5.80*	7.54*
	40	1.11	1.62*	2.11*	2.59*	3.05*	3.52*	4.22*	4.81*	5.41*	7.89*	10.52*
	60	1.27	1.86*	2.44*	3.01*	3.58*	4.15*	5.02*	5.77*	6.53*	9.74*	13.18*
	80	1.40	2.06*	2.72*	3.38*	4.04*	4.71*	5.75*	6.65*	7.56*	11.46*	15.64*
	100	1.51	2.24*	2.98*	3.72*	4.47*	5.24*	6.44*	7.48*	8.54*	13.08*	17.96*
	120	1.62	2.41*	3.22*	4.04*	4.88*	5.75*	7.10*	8.27*	9.48*	14.63*	20.17*
	140	1.71	2.57*	3.44*	4.34*	5.27*	6.23*	7.73*	9.04*	10.38*	16.11*	22.29*
300	10	0.82	1.19*	1.53*	1.84*	2.15*	2.44*	2.87*	3.22*	3.56*	4.87*	6.15*
	20	1.00	1.44*	1.86*	2.26*	2.64*	3.01*	3.55*	4.00*	4.43*	6.18*	7.94*
	40	1.24	1.79*	2.33*	2.84*	3.33*	3.82*	4.55*	5.16*	5.77*	8.27*	10.90*
	60	1.42	2.06*	2.68*	3.29*	3.88*	4.48*	5.37*	6.13*	6.90*	10.10*	13.53*
	80	1.56	2.28*	2.99*	3.68*	4.37*	5.06*	6.11*	7.01*	7.93*	11.80*	15.97*
	100	1.69	2.48*	3.26*	4.03*	4.81*	5.59*	6.80*	7.83*	8.90*	13.41*	18.27*
	120	1.81	2.66*	3.51*	4.36*	5.22*	6.10*	7.45*	8.62*	9.82*	14.94*	20.46*
	140	1.91	2.83*	3.75*	4.67*	5.61*	6.58*	8.08*	9.38*	10.71*	16.42*	22.58*
400	10	0.89	1.27*	1.63*	1.97*	2.30*	2.61*	3.06*	3.42*	3.78*	5.15*	6.47*
	20	1.08	1.56*	2.00*	2.42*	2.82*	3.21*	3.78*	4.25*	4.71*	6.51*	8.30*
	40	1.35	1.94*	2.50*	3.04*	3.56*	4.08*	4.84*	5.46*	6.09*	8.63*	11.26*
	60	1.54	2.22*	2.88*	3.52*	4.14*	4.76*	5.68*	6.46*	7.23*	10.46*	13.87*
	80	1.70	2.46*	3.21*	3.93*	4.65*	5.36*	6.43*	7.34*	8.27*	12.14*	16.29*
	100	1.84	2.67*	3.50*	4.30*	5.10*	5.90*	7.13*	8.17*	9.23*	13.73*	18.57*
	120	1.96	2.87*	3.76*	4.64*	5.52*	6.42*	7.78*	8.95*	10.15*	15.25*	20.76*
	140	2.08	3.04*	4.00*	4.96*	5.92*	6.90*	8.41*	9.71*	11.04*	16.72*	22.86*
600	10	0.99	1.41*	1.81*	2.18*	2.53*	2.87*	3.36*	3.75*	4.14*	5.60*	7.00*
	20	1.22	1.74*	2.23*	2.69*	3.13*	3.55*	4.17*	4.67*	5.16*	7.06*	8.93*
	40	1.52	2.17*	2.79*	3.38*	3.95*	4.50*	5.31*	5.97*	6.63*	9.26*	11.94*
	60	1.74	2.49*	3.21*	3.91*	4.58*	5.23*	6.21*	7.02*	7.82*	11.11*	14.53*
	80	1.92	2.76*	3.57*	4.35*	5.11*	5.87*	6.99*	7.93*	8.88*	12.79*	16.92*
	100	2.07	2.99*	3.89*	4.75*	5.60*	6.44*	7.71*	8.78*	9.86*	14.36*	19.18*
	120	2.21	3.20*	4.17*	5.11*	6.04*	6.97*	8.38*	9.57*	10.78*	15.87*	21.34*
	140	2.34	3.40*	4.44*	5.45*	6.46*	7.47*	9.01*	10.32*	11.66*	17.32*	23.42*
800	10	1.07	1.53*	1.95*	2.35*	2.72*	3.09*	3.61*	4.02*	4.43*	5.98*	7.45*
	20	1.32	1.88*	2.41*	2.90*	3.37*	3.82*	4.48*	5.01*	5.53*	7.53*	9.47*
	40	1.65	2.36*	3.02*	3.65*	4.26*	4.85*	5.70*	6.40*	7.09*	9.81*	12.55*
	60	1.89	2.71*	3.48*	4.22*	4.93*	5.63*	6.65*	7.49*	8.33*	11.70*	15.15*
	80	2.09	3.00*	3.87*	4.70*	5.51*	6.30*	7.47*	8.44*	9.42*	13.38*	17.53*
	100	2.26	3.25*	4.21*	5.12*	6.01*	6.90*	8.21*	9.31*	10.41*	14.96*	19.77*
	120	2.42	3.48*	4.51*	5.50*	6.48*	7.45*	8.90*	10.11*	11.34*	16.46*	21.92*
	140	2.56	3.69*	4.79*	5.86*	6.91*	7.96*	9.54*	10.88*	12.23*	17.90*	23.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.53	0.88*	1.25*	1.62*	1.99*	2.37*	2.95*	3.44*	3.94*	6.01*	8.16*
	20	0.66	1.15*	1.65*	2.17*	2.70*	3.25*	4.09*	4.81*	5.54*	8.62*	11.86*
	40	0.89	1.59*	2.32*	3.09*	3.90*	4.72*	6.00*	7.11*	8.24*	13.00*	18.09*
	60	1.09	1.97*	2.92*	3.91*	4.94*	6.01*	7.68*	9.12*	10.60*	16.85*	23.55*
	80	1.27	2.33*	3.46*	4.66*	5.91*	7.20*	9.22*	10.97*	12.77*	20.38*	28.56*
	100	1.44	2.66*	3.97*	5.36*	6.81*	8.32*	10.67*	12.70*	14.80*	23.70*	33.26*
	120	1.61	2.98*	4.45*	6.02*	7.67*	9.38*	12.04*	14.35*	16.74*	26.85*	37.74*
	140	1.76	3.28*	4.92*	6.66*	8.49*	10.39*	13.36*	15.94*	18.59*	29.87*	42.03*
25	10	0.72	1.08*	1.45*	1.81*	2.18*	2.55*	3.13*	3.61*	4.11*	6.16*	8.30*
	20	0.86	1.34*	1.83*	2.34*	2.86*	3.40*	4.24*	4.95*	5.68*	8.74*	11.98*
	40	1.09	1.76*	2.48*	3.24*	4.03*	4.85*	6.13*	7.23*	8.35*	13.11*	18.19*
	60	1.28	2.13*	3.06*	4.04*	5.07*	6.13*	7.79*	9.23*	10.70*	16.94*	23.64*
	80	1.45	2.47*	3.59*	4.78*	6.02*	7.31*	9.33*	11.07*	12.86*	20.47*	28.64*
	100	1.62	2.80*	4.09*	5.47*	6.92*	8.42*	10.77*	12.80*	14.89*	23.78*	33.34*
	120	1.77	3.11*	4.57*	6.14*	7.77*	9.48*	12.14*	14.45*	16.82*	26.93*	37.81*
	140	1.92	3.41*	5.04*	6.77*	8.59*	10.49*	13.46*	16.03*	18.68*	29.95*	42.10*
50	10	0.81	1.21*	1.59*	1.97*	2.34*	2.72*	3.29*	3.78*	4.27*	6.30*	8.44*
	20	0.98	1.48*	1.99*	2.50*	3.02*	3.56*	4.38*	5.09*	5.82*	8.87*	12.10*
	40	1.23	1.91*	2.63*	3.38*	4.17*	4.98*	6.25*	7.35*	8.47*	13.21*	18.28*
	60	1.43	2.28*	3.20*	4.17*	5.19*	6.25*	7.91*	9.34*	10.81*	17.04*	23.72*
	80	1.61	2.61*	3.72*	4.90*	6.14*	7.42*	9.43*	11.17*	12.96*	20.56*	28.72*
	100	1.77	2.93*	4.22*	5.59*	7.03*	8.53*	10.87*	12.90*	14.99*	23.86*	33.42*
	120	1.92	3.24*	4.69*	6.25*	7.88*	9.58*	12.24*	14.54*	16.91*	27.01*	37.89*
	140	2.07	3.53*	5.15*	6.88*	8.69*	10.59*	13.55*	16.11*	18.76*	30.03*	42.17*
100	10	0.94	1.38*	1.80*	2.20*	2.60*	2.99*	3.58*	4.07*	4.56*	6.59*	8.71*
	20	1.14	1.69*	2.23*	2.76*	3.30*	3.84*	4.66*	5.37*	6.09*	9.11*	12.33*
	40	1.43	2.15*	2.89*	3.65*	4.43*	5.24*	6.50*	7.58*	8.70*	13.42*	18.48*
	60	1.65	2.53*	3.46*	4.42*	5.44*	6.49*	8.13*	9.55*	11.02*	17.23*	23.90*
	80	1.84	2.87*	3.97*	5.14*	6.37*	7.64*	9.64*	11.37*	13.16*	20.74*	28.89*
	100	2.02	3.19*	4.46*	5.82*	7.25*	8.74*	11.07*	13.09*	15.17*	24.03*	33.58*
	120	2.18	3.49*	4.93*	6.47*	8.09*	9.78*	12.43*	14.72*	17.09*	27.17*	38.04*
	140	2.33	3.77*	5.38*	7.09*	8.89*	10.78*	13.73*	16.29*	18.93*	30.18*	42.32*
150	10	1.03	1.50*	1.95*	2.38*	2.80*	3.21*	3.81*	4.32*	4.82*	6.86*	8.97*
	20	1.26	1.85*	2.42*	2.97*	3.53*	4.08*	4.92*	5.63*	6.35*	9.36*	12.56*
	40	1.57	2.34*	3.11*	3.89*	4.68*	5.49*	6.74*	7.82*	8.93*	13.63*	18.68*
	60	1.82	2.74*	3.69*	4.66*	5.67*	6.72*	8.35*	9.77*	11.23*	17.42*	24.08*
	80	2.02	3.09*	4.21*	5.37*	6.59*	7.86*	9.85*	11.57*	13.35*	20.91*	29.05*
	100	2.21	3.41*	4.69*	6.04*	7.46*	8.94*	11.26*	13.28*	15.36*	24.20*	33.73*
	120	2.38	3.71*	5.15*	6.68*	8.29*	9.98*	12.61*	14.90*	17.27*	27.33*	38.19*
	140	2.54	4.00*	5.60*	7.30*	9.09*	10.97*	13.91*	16.47*	19.10*	30.33*	42.46*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.11	1.60*	2.07*	2.52*	2.96*	3.39*	4.01*	4.53*	5.05*	7.11*	9.23*
	20	1.35	1.97*	2.57*	3.15*	3.72*	4.29*	5.15*	5.86*	6.59*	9.60*	12.78*
	40	1.70	2.50*	3.30*	4.10*	4.90*	5.71*	6.97*	8.05*	9.15*	13.84*	18.87*
	60	1.96	2.92*	3.89*	4.88*	5.90*	6.94*	8.57*	9.98*	11.43*	17.61*	24.25*
	80	2.17	3.28*	4.42*	5.59*	6.81*	8.08*	10.06*	11.77*	13.54*	21.09*	29.22*
	100	2.37	3.61*	4.90*	6.26*	7.67*	9.15*	11.46*	13.47*	15.54*	24.37*	33.89*
	120	2.55	3.91*	5.36*	6.89*	8.50*	10.17*	12.80*	15.08*	17.44*	27.49*	38.34*
	140	2.71	4.20*	5.81*	7.50*	9.29*	11.16*	14.09*	16.64*	19.27*	30.49*	42.60*
300	10	1.23	1.77*	2.28*	2.76*	3.23*	3.68*	4.35*	4.89*	5.43*	7.56*	9.71*
	20	1.51	2.18*	2.83*	3.45*	4.06*	4.65*	5.54*	6.28*	7.02*	10.05*	13.23*
	40	1.89	2.76*	3.62*	4.45*	5.29*	6.12*	7.40*	8.48*	9.58*	14.25*	19.26*
	60	2.18	3.21*	4.24*	5.27*	6.30*	7.36*	8.99*	10.39*	11.84*	17.98*	24.61*
	80	2.42	3.60*	4.79*	5.99*	7.22*	8.49*	10.46*	12.17*	13.93*	21.44*	29.55*
	100	2.64	3.94*	5.28*	6.66*	8.08*	9.55*	11.85*	13.84*	15.90*	24.70*	34.20*
	120	2.83	4.26*	5.75*	7.29*	8.89*	10.56*	13.17*	15.44*	17.79*	27.81*	38.63*
	140	3.01	4.56*	6.20*	7.90*	9.68*	11.54*	14.45*	16.99*	19.61*	30.80*	42.89*
400	10	1.32	1.90*	2.44*	2.96*	3.45*	3.93*	4.63*	5.19*	5.75*	7.95*	10.14*
	20	1.63	2.35*	3.04*	3.70*	4.33*	4.96*	5.88*	6.64*	7.40*	10.48*	13.66*
	40	2.05	2.98*	3.88*	4.75*	5.62*	6.48*	7.78*	8.88*	9.99*	14.65*	19.64*
	60	2.37	3.46*	4.54*	5.60*	6.66*	7.74*	9.38*	10.79*	12.23*	18.35*	24.96*
	80	2.63	3.86*	5.10*	6.34*	7.59*	8.87*	10.85*	12.55*	14.31*	21.79*	29.87*
	100	2.86	4.23*	5.62*	7.02*	8.45*	9.93*	12.22*	14.21*	16.26*	25.03*	34.51*
	120	3.06	4.56*	6.09*	7.66*	9.27*	10.93*	13.54*	15.80*	18.14*	28.12*	38.93*
	140	3.25	4.87*	6.55*	8.27*	10.05*	11.90*	14.81*	17.33*	19.94*	31.10*	43.18*
600	10	1.48	2.11*	2.71*	3.27*	3.81*	4.33*	5.08*	5.69*	6.29*	8.61*	10.89*
	20	1.83	2.63*	3.38*	4.10*	4.79*	5.46*	6.44*	7.25*	8.05*	11.23*	14.47*
	40	2.31	3.33*	4.31*	5.25*	6.18*	7.09*	8.44*	9.58*	10.72*	15.42*	20.39*
	60	2.66	3.86*	5.03*	6.16*	7.28*	8.40*	10.09*	11.52*	12.97*	19.08*	25.65*
	80	2.96	4.30*	5.63*	6.94*	8.24*	9.56*	11.56*	13.28*	15.03*	22.48*	30.52*
	100	3.21	4.70*	6.18*	7.65*	9.13*	10.63*	12.94*	14.93*	16.97*	25.69*	35.13*
	120	3.44	5.06*	6.68*	8.31*	9.95*	11.64*	14.24*	16.50*	18.82*	28.76*	39.52*
	140	3.65	5.39*	7.15*	8.93*	10.74*	12.60*	15.50*	18.01*	20.61*	31.71*	43.75*
800	10	1.60	2.29*	2.93*	3.53*	4.10*	4.66*	5.45*	6.10*	6.73*	9.17*	11.53*
	20	2.00	2.85*	3.66*	4.43*	5.16*	5.87*	6.91*	7.75*	8.59*	11.89*	15.19*
	40	2.52	3.62*	4.67*	5.67*	6.64*	7.60*	9.01*	10.18*	11.36*	16.13*	21.12*
	60	2.91	4.19*	5.43*	6.63*	7.80*	8.96*	10.71*	12.17*	13.65*	19.79*	26.33*
	80	3.23	4.67*	6.08*	7.45*	8.80*	10.16*	12.21*	13.94*	15.71*	23.15*	31.17*
	100	3.50	5.09*	6.65*	8.18*	9.71*	11.25*	13.59*	15.60*	17.65*	26.34*	35.74*
	120	3.75	5.47*	7.18*	8.86*	10.56*	12.27*	14.90*	17.16*	19.49*	29.38*	40.11*
	140	3.98	5.83*	7.67*	9.50*	11.36*	13.24*	16.16*	18.67*	21.26*	32.31*	44.31*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.22	0.31	0.40*	0.49*	0.58*	0.67*	0.81*	0.92*	1.03*	1.47*	1.91*
	20	0.24	0.35	0.46*	0.57*	0.68*	0.79*	0.96*	1.10*	1.24*	1.81*	2.38*
	40	0.28	0.42	0.56*	0.70*	0.85*	0.99*	1.22*	1.40*	1.59*	2.38*	3.18*
	60	0.31	0.48	0.64*	0.82*	0.99*	1.17*	1.44*	1.67*	1.91*	2.87*	3.89*
	80	0.34	0.53	0.72*	0.92*	1.12*	1.33*	1.65*	1.92*	2.19*	3.33*	4.53*
	100	0.37	0.58	0.80*	1.02*	1.25*	1.48*	1.84*	2.15*	2.46*	3.76*	5.14*
	120	0.40	0.63	0.87*	1.12*	1.37*	1.63*	2.03*	2.37*	2.72*	4.17*	5.71*
	140	0.43	0.68	0.94*	1.21*	1.48*	1.77*	2.20*	2.58*	2.96*	4.56*	6.26*
25	10	0.31	0.41	0.51*	0.61*	0.71*	0.80*	0.94*	1.06*	1.17*	1.61*	2.04*
	20	0.35	0.47	0.58*	0.70*	0.81*	0.93*	1.09*	1.23*	1.37*	1.93*	2.50*
	40	0.41	0.54	0.69*	0.83*	0.97*	1.12*	1.34*	1.52*	1.71*	2.48*	3.28*
	60	0.45	0.61	0.77*	0.94*	1.11*	1.29*	1.55*	1.78*	2.01*	2.97*	3.97*
	80	0.49	0.66	0.85*	1.04*	1.24*	1.44*	1.75*	2.02*	2.29*	3.42*	4.61*
	100	0.52	0.71	0.92*	1.13*	1.36*	1.59*	1.94*	2.24*	2.55*	3.85*	5.21*
	120	0.55	0.76	0.98*	1.22*	1.47*	1.73*	2.12*	2.46*	2.80*	4.25*	5.79*
	140	0.58	0.80	1.05*	1.31*	1.58*	1.86*	2.29*	2.67*	3.05*	4.64*	6.33*
50	10	0.35	0.45	0.56*	0.67*	0.77*	0.88*	1.02*	1.14*	1.26*	1.71*	2.16*
	20	0.40	0.52	0.65*	0.77*	0.89*	1.01*	1.19*	1.33*	1.47*	2.04*	2.61*
	40	0.47	0.61	0.76*	0.92*	1.07*	1.22*	1.44*	1.63*	1.82*	2.58*	3.38*
	60	0.52	0.68	0.86*	1.03*	1.21*	1.39*	1.66*	1.88*	2.11*	3.06*	4.06*
	80	0.56	0.75	0.94*	1.14*	1.34*	1.54*	1.85*	2.12*	2.38*	3.51*	4.69*
	100	0.60	0.80	1.01*	1.23*	1.46*	1.69*	2.04*	2.34*	2.64*	3.93*	5.29*
	120	0.64	0.85	1.08*	1.32*	1.57*	1.82*	2.21*	2.55*	2.89*	4.33*	5.86*
	140	0.67	0.90	1.15*	1.41*	1.68*	1.96*	2.38*	2.75*	3.13*	4.72*	6.41*
100	10	0.39	0.51	0.63*	0.75*	0.86*	0.97*	1.13*	1.26*	1.38*	1.87*	2.33*
	20	0.46	0.59	0.73*	0.87*	1.00*	1.13*	1.32*	1.48*	1.63*	2.22*	2.80*
	40	0.54	0.71	0.87*	1.04*	1.20*	1.36*	1.60*	1.80*	1.99*	2.77*	3.56*
	60	0.61	0.79	0.98*	1.17*	1.36*	1.55*	1.83*	2.06*	2.29*	3.24*	4.23*
	80	0.66	0.86	1.07*	1.28*	1.50*	1.71*	2.03*	2.29*	2.56*	3.68*	4.86*
	100	0.71	0.92	1.15*	1.39*	1.62*	1.86*	2.21*	2.51*	2.82*	4.09*	5.44*
	120	0.75	0.98	1.23*	1.48*	1.74*	1.99*	2.39*	2.72*	3.06*	4.49*	6.01*
	140	0.79	1.03	1.30*	1.57*	1.85*	2.13*	2.55*	2.92*	3.29*	4.87*	6.55*
150	10	0.43	0.55	0.68*	0.80*	0.92*	1.04*	1.21*	1.34*	1.48*	1.98*	2.47*
	20	0.50	0.65	0.79*	0.94*	1.08*	1.22*	1.42*	1.58*	1.74*	2.36*	2.96*
	40	0.60	0.77	0.95*	1.13*	1.30*	1.47*	1.72*	1.93*	2.13*	2.93*	3.73*
	60	0.67	0.87	1.07*	1.27*	1.47*	1.67*	1.96*	2.20*	2.44*	3.41*	4.40*
	80	0.73	0.95	1.17*	1.40*	1.62*	1.84*	2.17*	2.44*	2.72*	3.84*	5.01*
	100	0.79	1.02	1.26*	1.51*	1.75*	2.00*	2.36*	2.67*	2.98*	4.25*	5.60*
	120	0.83	1.08	1.34*	1.61*	1.87*	2.14*	2.54*	2.88*	3.22*	4.64*	6.15*
	140	0.87	1.14	1.41*	1.70*	1.99*	2.27*	2.71*	3.08*	3.45*	5.02*	6.69*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.45	0.58	0.72*	0.85*	0.98*	1.10*	1.27*	1.41*	1.55*	2.08*	2.58*
	20	0.54	0.69	0.84*	1.00*	1.15*	1.29*	1.50*	1.67*	1.84*	2.48*	3.10*
	40	0.65	0.83	1.01*	1.20*	1.39*	1.56*	1.82*	2.04*	2.25*	3.07*	3.89*
	60	0.73	0.93	1.14*	1.36*	1.57*	1.77*	2.08*	2.32*	2.57*	3.56*	4.56*
	80	0.79	1.02	1.25*	1.49*	1.72*	1.95*	2.29*	2.57*	2.86*	3.99*	5.17*
	100	0.85	1.09	1.34*	1.61*	1.86*	2.11*	2.49*	2.80*	3.12*	4.40*	5.74*
	120	0.90	1.16	1.43*	1.71*	1.99*	2.26*	2.67*	3.02*	3.36*	4.79*	6.30*
	140	0.95	1.22	1.51*	1.81*	2.11*	2.40*	2.84*	3.22*	3.60*	5.16*	6.83*
300	10	0.50	0.64	0.78*	0.92*	1.06*	1.19*	1.38*	1.53*	1.68*	2.24*	2.76*
	20	0.59	0.76	0.92*	1.09*	1.25*	1.41*	1.64*	1.82*	1.99*	2.67*	3.32*
	40	0.72	0.92	1.12*	1.32*	1.52*	1.71*	1.99*	2.22*	2.44*	3.31*	4.15*
	60	0.81	1.03	1.26*	1.50*	1.72*	1.94*	2.27*	2.53*	2.79*	3.81*	4.84*
	80	0.89	1.13	1.38*	1.64*	1.89*	2.14*	2.50*	2.80*	3.09*	4.26*	5.45*
	100	0.95	1.21	1.49*	1.77*	2.04*	2.31*	2.71*	3.04*	3.36*	4.68*	6.03*
	120	1.01	1.29	1.58*	1.88*	2.18*	2.47*	2.90*	3.26*	3.62*	5.07*	6.57*
	140	1.06	1.36	1.67*	1.99*	2.31*	2.62*	3.08*	3.47*	3.85*	5.44*	7.10*
400	10	0.53	0.68	0.83*	0.98*	1.12*	1.26*	1.46*	1.62*	1.78*	2.36*	2.92*
	20	0.64	0.81	0.99*	1.17*	1.34*	1.50*	1.74*	1.93*	2.12*	2.84*	3.51*
	40	0.78	0.99	1.20*	1.42*	1.63*	1.83*	2.13*	2.37*	2.60*	3.51*	4.38*
	60	0.88	1.12	1.36*	1.61*	1.85*	2.08*	2.42*	2.70*	2.97*	4.04*	5.09*
	80	0.96	1.22	1.49*	1.77*	2.03*	2.29*	2.67*	2.98*	3.29*	4.50*	5.71*
	100	1.03	1.31	1.60*	1.90*	2.19*	2.48*	2.89*	3.23*	3.57*	4.92*	6.29*
	120	1.10	1.39	1.71*	2.03*	2.34*	2.64*	3.09*	3.47*	3.83*	5.32*	6.84*
	140	1.15	1.47	1.80*	2.14*	2.47*	2.80*	3.28*	3.68*	4.08*	5.69*	7.36*
600	10	0.59	0.75	0.91*	1.08*	1.23*	1.38*	1.60*	1.77*	1.94*	2.57*	3.16*
	20	0.71	0.90	1.10*	1.29*	1.48*	1.66*	1.92*	2.13*	2.33*	3.10*	3.83*
	40	0.87	1.10	1.34*	1.58*	1.81*	2.03*	2.35*	2.61*	2.86*	3.84*	4.77*
	60	0.99	1.25	1.52*	1.79*	2.06*	2.31*	2.68*	2.98*	3.27*	4.41*	5.51*
	80	1.08	1.37	1.67*	1.97*	2.26*	2.54*	2.95*	3.29*	3.62*	4.90*	6.16*
	100	1.17	1.47	1.79*	2.12*	2.44*	2.75*	3.19*	3.56*	3.92*	5.34*	6.76*
	120	1.24	1.57	1.91*	2.26*	2.60*	2.93*	3.41*	3.81*	4.20*	5.75*	7.31*
	140	1.31	1.65	2.01*	2.39*	2.75*	3.10*	3.62*	4.04*	4.46*	6.14*	7.84*
800	10	0.63	0.80	0.98*	1.15*	1.32*	1.48*	1.71*	1.89*	2.07*	2.74*	3.36*
	20	0.77	0.97	1.18*	1.39*	1.59*	1.78*	2.06*	2.28*	2.50*	3.31*	4.08*
	40	0.95	1.20	1.45*	1.71*	1.95*	2.19*	2.53*	2.81*	3.08*	4.11*	5.09*
	60	1.08	1.36	1.65*	1.94*	2.22*	2.49*	2.89*	3.21*	3.52*	4.72*	5.87*
	80	1.18	1.49	1.81*	2.13*	2.44*	2.75*	3.18*	3.54*	3.89*	5.23*	6.55*
	100	1.27	1.60	1.95*	2.30*	2.64*	2.97*	3.44*	3.83*	4.21*	5.70*	7.16*
	120	1.35	1.70	2.07*	2.45*	2.81*	3.16*	3.68*	4.10*	4.51*	6.13*	7.73*
	140	1.43	1.80	2.19*	2.59*	2.97*	3.35*	3.89*	4.34*	4.78*	6.53*	8.27*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.31	0.45	0.59*	0.73*	0.87*	1.01*	1.22*	1.39*	1.57*	2.27*	2.99*
	20	0.35	0.53	0.71*	0.88*	1.06*	1.25*	1.52*	1.76*	1.99*	2.95*	3.94*
	40	0.43	0.66	0.90*	1.15*	1.39*	1.65*	2.04*	2.37*	2.70*	4.09*	5.54*
	60	0.50	0.78	1.07*	1.38*	1.68*	2.00*	2.49*	2.90*	3.32*	5.09*	6.95*
	80	0.56	0.89	1.23*	1.59*	1.95*	2.32*	2.90*	3.39*	3.90*	6.00*	8.24*
	100	0.62	0.99	1.38*	1.78*	2.20*	2.63*	3.29*	3.85*	4.43*	6.86*	9.45*
	120	0.68	1.09	1.52*	1.97*	2.44*	2.92*	3.66*	4.29*	4.94*	7.68*	10.60*
	140	0.73	1.18	1.66*	2.15*	2.66*	3.19*	4.01*	4.71*	5.43*	8.47*	11.70*
25	10	0.44	0.59	0.73*	0.88*	1.02*	1.17*	1.38*	1.55*	1.72*	2.42*	3.13*
	20	0.51	0.68	0.86*	1.04*	1.22*	1.40*	1.67*	1.90*	2.13*	3.08*	4.06*
	40	0.60	0.82	1.05*	1.29*	1.53*	1.78*	2.16*	2.49*	2.82*	4.19*	5.64*
	60	0.68	0.93	1.21*	1.51*	1.81*	2.12*	2.60*	3.01*	3.43*	5.18*	7.04*
	80	0.74	1.04	1.36*	1.71*	2.07*	2.43*	3.00*	3.49*	3.99*	6.09*	8.32*
	100	0.80	1.13	1.50*	1.90*	2.31*	2.73*	3.39*	3.95*	4.53*	6.95*	9.53*
	120	0.86	1.23	1.64*	2.08*	2.54*	3.02*	3.75*	4.38*	5.03*	7.76*	10.67*
	140	0.91	1.32	1.77*	2.26*	2.77*	3.29*	4.10*	4.80*	5.52*	8.54*	11.77*
50	10	0.50	0.65	0.81*	0.97*	1.12*	1.27*	1.49*	1.67*	1.85*	2.55*	3.26*
	20	0.58	0.76	0.95*	1.14*	1.33*	1.51*	1.79*	2.02*	2.25*	3.20*	4.17*
	40	0.69	0.92	1.16*	1.40*	1.65*	1.90*	2.28*	2.60*	2.93*	4.30*	5.74*
	60	0.78	1.04	1.33*	1.62*	1.92*	2.23*	2.71*	3.12*	3.53*	5.28*	7.13*
	80	0.85	1.15	1.48*	1.82*	2.18*	2.54*	3.11*	3.59*	4.09*	6.18*	8.40*
	100	0.92	1.25	1.62*	2.01*	2.42*	2.84*	3.48*	4.04*	4.62*	7.03*	9.60*
	120	0.98	1.35	1.75*	2.19*	2.64*	3.12*	3.85*	4.47*	5.12*	7.84*	10.75*
	140	1.03	1.43	1.88*	2.36*	2.87*	3.38*	4.19*	4.89*	5.60*	8.62*	11.84*
100	10	0.57	0.74	0.91*	1.08*	1.25*	1.41*	1.65*	1.84*	2.03*	2.77*	3.49*
	20	0.67	0.87	1.08*	1.29*	1.49*	1.69*	1.98*	2.22*	2.46*	3.42*	4.39*
	40	0.81	1.06	1.31*	1.58*	1.84*	2.10*	2.49*	2.81*	3.14*	4.50*	5.93*
	60	0.91	1.20	1.50*	1.81*	2.12*	2.44*	2.91*	3.32*	3.73*	5.46*	7.30*
	80	1.00	1.32	1.66*	2.02*	2.38*	2.74*	3.31*	3.79*	4.28*	6.36*	8.57*
	100	1.08	1.43	1.81*	2.21*	2.62*	3.03*	3.68*	4.23*	4.80*	7.20*	9.76*
	120	1.15	1.53	1.95*	2.39*	2.84*	3.31*	4.03*	4.65*	5.29*	8.00*	10.90*
	140	1.21	1.62	2.08*	2.56*	3.06*	3.57*	4.37*	5.06*	5.77*	8.77*	11.99*
150	10	0.62	0.80	0.98*	1.17*	1.35*	1.52*	1.77*	1.97*	2.17*	2.93*	3.68*
	20	0.74	0.95	1.17*	1.39*	1.61*	1.82*	2.12*	2.38*	2.63*	3.61*	4.60*
	40	0.90	1.16	1.43*	1.71*	1.98*	2.25*	2.66*	2.99*	3.33*	4.70*	6.12*
	60	1.01	1.31	1.63*	1.96*	2.28*	2.61*	3.09*	3.51*	3.92*	5.65*	7.47*
	80	1.11	1.45	1.80*	2.18*	2.55*	2.92*	3.49*	3.97*	4.46*	6.53*	8.73*
	100	1.20	1.56	1.96*	2.37*	2.79*	3.21*	3.86*	4.41*	4.98*	7.36*	9.91*
	120	1.27	1.67	2.10*	2.56*	3.02*	3.49*	4.21*	4.83*	5.47*	8.16*	11.04*
	140	1.34	1.77	2.24*	2.73*	3.23*	3.75*	4.55*	5.23*	5.94*	8.93*	12.13*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.66	0.85	1.04*	1.24*	1.42*	1.60*	1.86*	2.07*	2.28*	3.07*	3.84*
	20	0.79	1.02	1.25*	1.48*	1.71*	1.93*	2.25*	2.51*	2.77*	3.78*	4.78*
	40	0.97	1.24	1.53*	1.82*	2.11*	2.39*	2.80*	3.15*	3.49*	4.88*	6.30*
	60	1.09	1.41	1.74*	2.08*	2.42*	2.75*	3.25*	3.67*	4.09*	5.82*	7.65*
	80	1.20	1.55	1.92*	2.31*	2.69*	3.08*	3.65*	4.14*	4.64*	6.70*	8.89*
	100	1.29	1.68	2.09*	2.52*	2.94*	3.37*	4.03*	4.58*	5.15*	7.52*	10.07*
	120	1.37	1.79	2.24*	2.70*	3.17*	3.65*	4.38*	5.00*	5.63*	8.31*	11.19*
	140	1.45	1.90	2.38*	2.88*	3.39*	3.91*	4.71*	5.40*	6.10*	9.08*	12.27*
300	10	0.73	0.93	1.14*	1.35*	1.55*	1.74*	2.02*	2.25*	2.47*	3.31*	4.11*
	20	0.88	1.12	1.37*	1.62*	1.87*	2.10*	2.45*	2.72*	3.00*	4.06*	5.10*
	40	1.08	1.38	1.69*	2.00*	2.31*	2.61*	3.05*	3.41*	3.77*	5.20*	6.64*
	60	1.22	1.56	1.92*	2.29*	2.65*	3.00*	3.53*	3.96*	4.39*	6.15*	7.98*
	80	1.34	1.72	2.12*	2.54*	2.94*	3.34*	3.94*	4.44*	4.95*	7.02*	9.21*
	100	1.45	1.86	2.30*	2.75*	3.20*	3.65*	4.32*	4.89*	5.46*	7.84*	10.37*
	120	1.54	1.99	2.46*	2.95*	3.45*	3.94*	4.68*	5.31*	5.95*	8.62*	11.48*
	140	1.63	2.10	2.61*	3.14*	3.67*	4.21*	5.02*	5.71*	6.41*	9.38*	12.55*
400	10	0.78	1.00	1.22*	1.44*	1.65*	1.85*	2.15*	2.39*	2.62*	3.50*	4.34*
	20	0.95	1.21	1.47*	1.74*	2.00*	2.25*	2.61*	2.90*	3.19*	4.30*	5.37*
	40	1.17	1.48	1.81*	2.15*	2.47*	2.79*	3.25*	3.63*	4.00*	5.48*	6.95*
	60	1.33	1.69	2.07*	2.46*	2.84*	3.21*	3.76*	4.21*	4.65*	6.45*	8.29*
	80	1.46	1.86	2.29*	2.72*	3.15*	3.57*	4.19*	4.71*	5.22*	7.33*	9.51*
	100	1.57	2.01	2.47*	2.95*	3.42*	3.89*	4.58*	5.16*	5.75*	8.14*	10.67*
	120	1.68	2.15	2.65*	3.16*	3.68*	4.18*	4.95*	5.59*	6.24*	8.92*	11.77*
	140	1.77	2.27	2.80*	3.36*	3.91*	4.46*	5.29*	5.99*	6.70*	9.67*	12.83*
600	10	0.87	1.10	1.34*	1.59*	1.82*	2.04*	2.36*	2.61*	2.86*	3.81*	4.71*
	20	1.06	1.34	1.63*	1.93*	2.21*	2.48*	2.87*	3.19*	3.50*	4.69*	5.83*
	40	1.31	1.66	2.02*	2.39*	2.74*	3.09*	3.59*	3.99*	4.39*	5.95*	7.49*
	60	1.50	1.89	2.31*	2.74*	3.15*	3.55*	4.14*	4.62*	5.09*	6.97*	8.85*
	80	1.65	2.09	2.55*	3.03*	3.49*	3.94*	4.60*	5.15*	5.69*	7.87*	10.08*
	100	1.78	2.26	2.76*	3.28*	3.79*	4.28*	5.02*	5.63*	6.24*	8.69*	11.23*
	120	1.89	2.41	2.95*	3.51*	4.06*	4.60*	5.41*	6.07*	6.74*	9.47*	12.33*
	140	2.00	2.54	3.12*	3.72*	4.31*	4.90*	5.77*	6.49*	7.22*	10.22*	13.38*
800	10	0.94	1.19	1.45*	1.70*	1.95*	2.18*	2.52*	2.80*	3.06*	4.07*	5.01*
	20	1.15	1.45	1.76*	2.08*	2.38*	2.67*	3.09*	3.43*	3.75*	5.01*	6.21*
	40	1.43	1.80	2.19*	2.59*	2.96*	3.33*	3.86*	4.29*	4.72*	6.35*	7.94*
	60	1.63	2.06	2.51*	2.96*	3.40*	3.83*	4.45*	4.96*	5.46*	7.41*	9.35*
	80	1.80	2.27	2.77*	3.27*	3.77*	4.24*	4.95*	5.52*	6.09*	8.34*	10.60*
	100	1.94	2.45	2.99*	3.55*	4.09*	4.61*	5.39*	6.02*	6.66*	9.18*	11.76*
	120	2.07	2.62	3.20*	3.80*	4.38*	4.95*	5.79*	6.49*	7.18*	9.97*	12.85*
	140	2.19	2.77	3.38*	4.02*	4.65*	5.26*	6.17*	6.92*	7.67*	10.72*	13.90*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS 2.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.45	0.67	0.89*	1.12*	1.34*	1.57*	1.91*	2.20*	2.49*	3.68*	4.90*
	20	0.54	0.83	1.13*	1.43*	1.73*	2.05*	2.52*	2.93*	3.34*	5.03*	6.80*
	40	0.70	1.10	1.52*	1.95*	2.39*	2.85*	3.55*	4.15*	4.76*	7.31*	10.00*
	60	0.84	1.34	1.87*	2.41*	2.97*	3.55*	4.45*	5.22*	6.00*	9.30*	12.81*
	80	0.96	1.56	2.18*	2.83*	3.51*	4.20*	5.27*	6.20*	7.15*	11.13*	15.39*
	100	1.08	1.76	2.48*	3.23*	4.00*	4.81*	6.05*	7.12*	8.22*	12.85*	17.81*
	120	1.19	1.96	2.76*	3.60*	4.48*	5.38*	6.79*	8.00*	9.24*	14.49*	20.11*
	140	1.30	2.14	3.03*	3.96*	4.93*	5.94*	7.50*	8.84*	10.22*	16.06*	22.32*
25	10	0.64	0.85	1.07*	1.30*	1.52*	1.75*	2.08*	2.37*	2.65*	3.82*	5.04*
	20	0.75	1.02	1.30*	1.60*	1.90*	2.20*	2.67*	3.07*	3.47*	5.16*	6.92*
	40	0.92	1.28	1.67*	2.10*	2.53*	2.98*	3.67*	4.27*	4.87*	7.41*	10.10*
	60	1.05	1.50	2.01*	2.54*	3.10*	3.67*	4.56*	5.32*	6.11*	9.40*	12.90*
	80	1.17	1.71	2.31*	2.95*	3.62*	4.31*	5.38*	6.30*	7.24*	11.22*	15.47*
	100	1.28	1.91	2.60*	3.34*	4.11*	4.91*	6.15*	7.22*	8.31*	12.94*	17.89*
	120	1.39	2.09	2.88*	3.72*	4.58*	5.48*	6.88*	8.09*	9.33*	14.57*	20.18*
	140	1.49	2.28	3.15*	4.07*	5.04*	6.03*	7.59*	8.93*	10.31*	16.14*	22.39*
50	10	0.72	0.95	1.18*	1.42*	1.65*	1.88*	2.23*	2.51*	2.80*	3.97*	5.17*
	20	0.86	1.14	1.43*	1.73*	2.04*	2.34*	2.81*	3.21*	3.61*	5.28*	7.03*
	40	1.05	1.41	1.81*	2.23*	2.67*	3.11*	3.80*	4.38*	4.99*	7.52*	10.20*
	60	1.20	1.64	2.14*	2.67*	3.22*	3.79*	4.67*	5.43*	6.21*	9.49*	12.99*
	80	1.32	1.85	2.44*	3.08*	3.74*	4.42*	5.48*	6.40*	7.34*	11.31*	15.55*
	100	1.44	2.04	2.73*	3.46*	4.22*	5.02*	6.25*	7.31*	8.41*	13.02*	17.97*
	120	1.55	2.23	3.00*	3.83*	4.69*	5.58*	6.98*	8.18*	9.42*	14.65*	20.26*
	140	1.66	2.41	3.26*	4.18*	5.14*	6.13*	7.68*	9.02*	10.39*	16.21*	22.46*
100	10	0.83	1.08	1.34*	1.59*	1.85*	2.09*	2.45*	2.75*	3.05*	4.23*	5.43*
	20	0.99	1.30	1.62*	1.94*	2.26*	2.58*	3.06*	3.46*	3.86*	5.52*	7.26*
	40	1.22	1.61	2.03*	2.46*	2.90*	3.35*	4.03*	4.62*	5.21*	7.73*	10.39*
	60	1.40	1.86	2.37*	2.90*	3.45*	4.02*	4.89*	5.65*	6.42*	9.68*	13.17*
	80	1.54	2.08	2.67*	3.30*	3.96*	4.64*	5.69*	6.60*	7.54*	11.49*	15.72*
	100	1.67	2.28	2.95*	3.68*	4.44*	5.22*	6.45*	7.50*	8.59*	13.19*	18.12*
	120	1.79	2.47	3.22*	4.04*	4.90*	5.78*	7.17*	8.36*	9.59*	14.81*	20.41*
	140	1.91	2.64	3.48*	4.39*	5.34*	6.32*	7.86*	9.19*	10.56*	16.37*	22.60*
150	10	0.91	1.18	1.45*	1.72*	1.99*	2.25*	2.63*	2.94*	3.25*	4.46*	5.67*
	20	1.10	1.42	1.76*	2.10*	2.44*	2.77*	3.26*	3.67*	4.08*	5.75*	7.49*
	40	1.35	1.76	2.20*	2.65*	3.11*	3.56*	4.25*	4.84*	5.43*	7.93*	10.59*
	60	1.54	2.03	2.55*	3.11*	3.66*	4.23*	5.10*	5.85*	6.62*	9.87*	13.34*
	80	1.71	2.26	2.87*	3.51*	4.17*	4.85*	5.89*	6.80*	7.73*	11.66*	15.88*
	100	1.85	2.47	3.15*	3.89*	4.64*	5.42*	6.64*	7.69*	8.77*	13.36*	18.28*
	120	1.98	2.66	3.42*	4.24*	5.10*	5.98*	7.35*	8.54*	9.77*	14.97*	20.56*
	140	2.10	2.85	3.68*	4.59*	5.53*	6.51*	8.04*	9.37*	10.73*	16.52*	22.75*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.97	1.25	1.54*	1.83*	2.11*	2.38*	2.77*	3.09*	3.41*	4.66*	5.89*
	20	1.18	1.52	1.87*	2.23*	2.58*	2.93*	3.43*	3.85*	4.27*	5.96*	7.70*
	40	1.46	1.89	2.34*	2.81*	3.28*	3.74*	4.45*	5.04*	5.64*	8.13*	10.78*
	60	1.67	2.17	2.71*	3.28*	3.85*	4.43*	5.30*	6.05*	6.82*	10.06*	13.52*
	80	1.84	2.42	3.04*	3.69*	4.36*	5.04*	6.09*	6.99*	7.92*	11.84*	16.05*
	100	1.99	2.63	3.33*	4.08*	4.84*	5.62*	6.83*	7.88*	8.95*	13.52*	18.43*
	120	2.13	2.83	3.61*	4.43*	5.29*	6.17*	7.54*	8.72*	9.94*	15.13*	20.71*
	140	2.26	3.02	3.87*	4.78*	5.72*	6.70*	8.22*	9.54*	10.90*	16.67*	22.89*
300	10	1.08	1.38	1.69*	2.00*	2.30*	2.59*	3.01*	3.35*	3.69*	4.99*	6.27*
	20	1.31	1.68	2.06*	2.45*	2.82*	3.19*	3.73*	4.17*	4.61*	6.35*	8.11*
	40	1.63	2.09	2.58*	3.08*	3.57*	4.06*	4.79*	5.40*	6.01*	8.52*	11.16*
	60	1.86	2.40	2.98*	3.58*	4.17*	4.77*	5.67*	6.42*	7.20*	10.42*	13.86*
	80	2.06	2.67	3.32*	4.01*	4.70*	5.39*	6.45*	7.36*	8.28*	12.18*	16.37*
	100	2.23	2.90	3.63*	4.41*	5.18*	5.98*	7.19*	8.24*	9.31*	13.85*	18.74*
	120	2.38	3.12	3.92*	4.77*	5.64*	6.52*	7.89*	9.07*	10.29*	15.44*	21.00*
	140	2.52	3.32	4.19*	5.12*	6.07*	7.05*	8.57*	9.88*	11.23*	16.98*	23.17*
400	10	1.16	1.48	1.80*	2.13*	2.45*	2.76*	3.20*	3.56*	3.91*	5.28*	6.59*
	20	1.42	1.81	2.21*	2.62*	3.02*	3.40*	3.97*	4.43*	4.89*	6.68*	8.47*
	40	1.77	2.26	2.77*	3.30*	3.82*	4.33*	5.08*	5.71*	6.34*	8.88*	11.52*
	60	2.02	2.60	3.20*	3.83*	4.45*	5.06*	5.98*	6.76*	7.54*	10.77*	14.20*
	80	2.24	2.88	3.56*	4.28*	4.99*	5.71*	6.79*	7.70*	8.63*	12.52*	16.69*
	100	2.42	3.13	3.89*	4.69*	5.49*	6.30*	7.53*	8.58*	9.65*	14.18*	19.05*
	120	2.59	3.36	4.19*	5.07*	5.95*	6.85*	8.23*	9.41*	10.62*	15.76*	21.29*
	140	2.74	3.57	4.47*	5.42*	6.39*	7.38*	8.90*	10.21*	11.56*	17.28*	23.46*
600	10	1.29	1.64	2.00*	2.36*	2.70*	3.04*	3.52*	3.91*	4.29*	5.74*	7.14*
	20	1.59	2.02	2.46*	2.91*	3.34*	3.76*	4.37*	4.86*	5.35*	7.25*	9.11*
	40	1.99	2.53	3.09*	3.66*	4.22*	4.77*	5.57*	6.24*	6.89*	9.52*	12.20*
	60	2.28	2.90	3.56*	4.24*	4.90*	5.56*	6.53*	7.33*	8.14*	11.43*	14.87*
	80	2.52	3.22	3.96*	4.73*	5.49*	6.24*	7.36*	8.30*	9.25*	13.17*	17.33*
	100	2.73	3.50	4.31*	5.17*	6.01*	6.85*	8.12*	9.19*	10.28*	14.81*	19.65*
	120	2.92	3.75	4.64*	5.57*	6.50*	7.43*	8.84*	10.03*	11.25*	16.37*	21.88*
	140	3.09	3.98	4.93*	5.94*	6.95*	7.97*	9.51*	10.83*	12.18*	17.88*	24.02*
800	10	1.40	1.77	2.15*	2.54*	2.91*	3.26*	3.77*	4.19*	4.59*	6.13*	7.59*
	20	1.73	2.19	2.66*	3.14*	3.60*	4.05*	4.69*	5.22*	5.73*	7.72*	9.66*
	40	2.17	2.74	3.34*	3.96*	4.55*	5.13*	5.98*	6.68*	7.36*	10.08*	12.81*
	60	2.49	3.16	3.86*	4.58*	5.28*	5.97*	6.99*	7.83*	8.66*	12.03*	15.49*
	80	2.76	3.50	4.29*	5.10*	5.90*	6.69*	7.86*	8.83*	9.80*	13.78*	17.94*
	100	2.98	3.80	4.66*	5.57*	6.45*	7.33*	8.64*	9.74*	10.85*	15.41*	20.25*
	120	3.19	4.07	5.01*	5.99*	6.96*	7.92*	9.37*	10.59*	11.83*	16.97*	22.45*
	140	3.37	4.31	5.32*	6.38*	7.43*	8.48*	10.06*	11.40*	12.76*	18.46*	24.58*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.69	1.05	1.41*	1.78*	2.16*	2.55*	3.13*	3.63*	4.13*	6.20*	8.36*
	20	0.87	1.37	1.88*	2.41*	2.95*	3.50*	4.35*	5.08*	5.82*	8.91*	12.17*
	40	1.18	1.91	2.67*	3.45*	4.27*	5.11*	6.40*	7.52*	8.66*	13.46*	18.57*
	60	1.46	2.38	3.36*	4.37*	5.43*	6.52*	8.20*	9.66*	11.15*	17.45*	24.19*
	80	1.71	2.82	3.99*	5.21*	6.49*	7.81*	9.86*	11.63*	13.44*	21.12*	29.34*
	100	1.94	3.23	4.58*	6.01*	7.49*	9.02*	11.41*	13.47*	15.59*	24.56*	34.18*
	120	2.17	3.61	5.15*	6.76*	8.44*	10.18*	12.89*	15.22*	17.63*	27.83*	38.79*
	140	2.38	3.99	5.69*	7.48*	9.35*	11.28*	14.30*	16.91*	19.59*	30.97*	43.20*
25	10	0.93	1.27	1.62*	1.98*	2.35*	2.73*	3.31*	3.80*	4.29*	6.35*	8.50*
	20	1.13	1.58	2.06*	2.58*	3.11*	3.66*	4.50*	5.22*	5.96*	9.04*	12.29*
	40	1.43	2.09	2.82*	3.60*	4.41*	5.24*	6.53*	7.64*	8.78*	13.57*	18.67*
	60	1.69	2.55	3.50*	4.50*	5.55*	6.64*	8.32*	9.77*	11.26*	17.55*	24.28*
	80	1.93	2.97	4.12*	5.34*	6.61*	7.92*	9.96*	11.73*	13.54*	21.21*	29.43*
	100	2.16	3.37	4.71*	6.12*	7.60*	9.13*	11.51*	13.57*	15.68*	24.64*	34.26*
	120	2.37	3.75	5.27*	6.87*	8.54*	10.28*	12.98*	15.32*	17.72*	27.91*	38.86*
	140	2.58	4.12	5.80*	7.59*	9.45*	11.38*	14.39*	17.00*	19.68*	31.04*	43.27*
50	10	1.06	1.41	1.77*	2.15*	2.52*	2.90*	3.47*	3.96*	4.45*	6.50*	8.64*
	20	1.28	1.74	2.23*	2.74*	3.27*	3.81*	4.65*	5.36*	6.09*	9.16*	12.40*
	40	1.62	2.26	2.97*	3.74*	4.54*	5.37*	6.65*	7.76*	8.89*	13.67*	18.77*
	60	1.89	2.71	3.64*	4.63*	5.68*	6.75*	8.43*	9.88*	11.36*	17.64*	24.37*
	80	2.13	3.12	4.25*	5.46*	6.72*	8.03*	10.07*	11.83*	13.64*	21.30*	29.51*
	100	2.35	3.52	4.83*	6.24*	7.71*	9.23*	11.61*	13.66*	15.77*	24.73*	34.34*
	120	2.57	3.89	5.39*	6.98*	8.65*	10.38*	13.08*	15.41*	17.81*	27.99*	38.94*
	140	2.77	4.25	5.92*	7.69*	9.55*	11.48*	14.48*	17.08*	19.76*	31.12*	43.34*
100	10	1.22	1.60	1.99*	2.39*	2.79*	3.18*	3.77*	4.26*	4.75*	6.79*	8.91*
	20	1.50	1.98	2.49*	3.02*	3.55*	4.10*	4.93*	5.64*	6.36*	9.41*	12.64*
	40	1.88	2.53	3.25*	4.02*	4.81*	5.63*	6.90*	8.00*	9.12*	13.88*	18.97*
	60	2.18	2.99	3.90*	4.89*	5.92*	6.99*	8.66*	10.09*	11.57*	17.83*	24.54*
	80	2.43	3.40	4.51*	5.70*	6.95*	8.25*	10.28*	12.03*	13.83*	21.47*	29.68*
	100	2.67	3.79	5.08*	6.47*	7.93*	9.44*	11.81*	13.85*	15.96*	24.89*	34.50*
	120	2.89	4.16	5.62*	7.20*	8.86*	10.58*	13.27*	15.59*	17.99*	28.15*	39.09*
	140	3.10	4.52	6.15*	7.91*	9.75*	11.67*	14.67*	17.26*	19.93*	31.28*	43.49*
150	10	1.35	1.75	2.16*	2.58*	3.00*	3.40*	4.01*	4.51*	5.01*	7.06*	9.18*
	20	1.65	2.15	2.69*	3.24*	3.79*	4.35*	5.19*	5.90*	6.62*	9.65*	12.87*
	40	2.07	2.75	3.48*	4.26*	5.06*	5.88*	7.14*	8.23*	9.35*	14.09*	19.16*
	60	2.40	3.22	4.14*	5.13*	6.16*	7.22*	8.88*	10.31*	11.78*	18.02*	24.72*
	80	2.67	3.65	4.75*	5.94*	7.18*	8.47*	10.49*	12.23*	14.03*	21.65*	29.84*
	100	2.92	4.04	5.31*	6.69*	8.14*	9.65*	12.01*	14.04*	16.14*	25.06*	34.65*
	120	3.15	4.41	5.85*	7.42*	9.06*	10.78*	13.45*	15.77*	18.16*	28.31*	39.23*
	140	3.37	4.76	6.37*	8.12*	9.95*	11.86*	14.85*	17.44*	20.10*	31.43*	43.63*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.44	1.86	2.30*	2.74*	3.17*	3.59*	4.22*	4.73*	5.25*	7.31*	9.44*
	20	1.77	2.30	2.86*	3.43*	4.00*	4.57*	5.42*	6.14*	6.87*	9.89*	13.09*
	40	2.23	2.93	3.68*	4.48*	5.29*	6.11*	7.37*	8.46*	9.58*	14.30*	19.36*
	60	2.58	3.43	4.36*	5.36*	6.39*	7.45*	9.10*	10.52*	11.99*	18.21*	24.90*
	80	2.87	3.86	4.97*	6.16*	7.40*	8.68*	10.69*	12.43*	14.22*	21.83*	30.00*
	100	3.13	4.26	5.53*	6.91*	8.35*	9.85*	12.20*	14.23*	16.33*	25.23*	34.81*
	120	3.37	4.63	6.07*	7.63*	9.27*	10.97*	13.64*	15.96*	18.34*	28.47*	39.38*
	140	3.60	4.99	6.58*	8.32*	10.15*	12.05*	15.03*	17.61*	20.27*	31.58*	43.77*
300	10	1.60	2.05	2.52*	2.99*	3.45*	3.90*	4.56*	5.10*	5.64*	7.77*	9.92*
	20	1.98	2.54	3.14*	3.75*	4.35*	4.94*	5.83*	6.57*	7.31*	10.35*	13.54*
	40	2.49	3.23	4.03*	4.86*	5.69*	6.53*	7.81*	8.90*	10.01*	14.71*	19.74*
	60	2.87	3.77	4.73*	5.76*	6.81*	7.87*	9.52*	10.94*	12.40*	18.59*	25.25*
	80	3.20	4.23	5.36*	6.57*	7.82*	9.10*	11.10*	12.82*	14.60*	22.18*	30.33*
	100	3.48	4.64	5.93*	7.32*	8.77*	10.26*	12.59*	14.61*	16.69*	25.56*	35.12*
	120	3.74	5.03	6.47*	8.04*	9.67*	11.36*	14.02*	16.32*	18.69*	28.79*	39.68*
	140	3.98	5.39	6.99*	8.72*	10.54*	12.43*	15.39*	17.96*	20.61*	31.89*	44.06*
400	10	1.73	2.21	2.70*	3.20*	3.69*	4.16*	4.85*	5.42*	5.97*	8.17*	10.35*
	20	2.14	2.74	3.37*	4.01*	4.64*	5.26*	6.18*	6.94*	7.70*	10.78*	13.97*
	40	2.70	3.48	4.31*	5.18*	6.04*	6.90*	8.20*	9.30*	10.42*	15.11*	20.13*
	60	3.12	4.05	5.05*	6.11*	7.18*	8.26*	9.92*	11.34*	12.79*	18.96*	25.60*
	80	3.47	4.53	5.70*	6.94*	8.20*	9.49*	11.49*	13.21*	14.98*	22.53*	30.66*
	100	3.77	4.97	6.29*	7.70*	9.15*	10.64*	12.97*	14.98*	17.05*	25.89*	35.43*
	120	4.05	5.37	6.84*	8.42*	10.05*	11.74*	14.38*	16.67*	19.04*	29.11*	39.98*
	140	4.31	5.75	7.36*	9.10*	10.92*	12.80*	15.75*	18.30*	20.94*	32.20*	44.35*
600	10	1.94	2.46	3.00*	3.54*	4.07*	4.58*	5.32*	5.93*	6.52*	8.84*	11.11*
	20	2.41	3.06	3.74*	4.44*	5.12*	5.78*	6.76*	7.56*	8.36*	11.54*	14.78*
	40	3.04	3.89	4.78*	5.71*	6.63*	7.53*	8.89*	10.02*	11.17*	15.89*	20.88*
	60	3.51	4.51	5.58*	6.71*	7.83*	8.94*	10.64*	12.08*	13.54*	19.69*	26.29*
	80	3.90	5.04	6.27*	7.57*	8.88*	10.20*	12.22*	13.95*	15.72*	23.22*	31.31*
	100	4.24	5.51	6.89*	8.36*	9.85*	11.36*	13.69*	15.70*	17.76*	26.55*	36.05*
	120	4.55	5.94	7.47*	9.10*	10.76*	12.46*	15.09*	17.37*	19.72*	29.74*	40.57*
	140	4.83	6.34	8.00*	9.79*	11.62*	13.51*	16.44*	18.98*	21.61*	32.81*	44.92*
800	10	2.10	2.66	3.23*	3.82*	4.38*	4.92*	5.71*	6.35*	6.98*	9.40*	11.76*
	20	2.62	3.32	4.05*	4.79*	5.52*	6.22*	7.25*	8.09*	8.92*	12.21*	15.51*
	40	3.32	4.22	5.17*	6.15*	7.12*	8.06*	9.47*	10.65*	11.82*	16.61*	21.61*
	60	3.83	4.89	6.03*	7.21*	8.37*	9.53*	11.28*	12.74*	14.23*	20.40*	26.98*
	80	4.26	5.46	6.75*	8.11*	9.47*	10.82*	12.88*	14.63*	16.40*	23.89*	31.95*
	100	4.63	5.96	7.41*	8.93*	10.46*	12.00*	14.36*	16.38*	18.44*	27.20*	36.66*
	120	4.96	6.42	8.00*	9.69*	11.39*	13.11*	15.77*	18.05*	20.39*	30.36*	41.16*
	140	5.26	6.84	8.56*	10.40*	12.26*	14.17*	17.11*	19.65*	22.26*	33.41*	45.48*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.26	0.35	0.44	0.53*	0.62*	0.71*	0.85*	0.96*	1.07*	1.51*	1.95*
	20	0.29	0.40	0.51	0.62*	0.73*	0.84*	1.01*	1.15*	1.29*	1.86*	2.44*
	40	0.34	0.48	0.62	0.77*	0.91*	1.06*	1.28*	1.47*	1.66*	2.45*	3.26*
	60	0.38	0.55	0.72	0.90*	1.07*	1.25*	1.52*	1.76*	1.99*	2.97*	3.98*
	80	0.42	0.62	0.81	1.01*	1.22*	1.43*	1.75*	2.02*	2.29*	3.44*	4.64*
	100	0.46	0.68	0.90	1.12*	1.35*	1.59*	1.95*	2.26*	2.58*	3.89*	5.26*
	120	0.50	0.73	0.98	1.23*	1.48*	1.75*	2.15*	2.49*	2.84*	4.31*	5.86*
	140	0.53	0.79	1.05	1.33*	1.61*	1.90*	2.34*	2.72*	3.10*	4.72*	6.42*
25	10	0.38	0.47	0.57	0.66*	0.75*	0.85*	0.99*	1.10*	1.21*	1.65*	2.08*
	20	0.43	0.54	0.64	0.75*	0.87*	0.98*	1.15*	1.28*	1.42*	1.98*	2.55*
	40	0.50	0.63	0.76	0.90*	1.04*	1.19*	1.41*	1.59*	1.78*	2.55*	3.36*
	60	0.55	0.70	0.86	1.02*	1.19*	1.37*	1.64*	1.86*	2.10*	3.06*	4.07*
	80	0.60	0.77	0.94	1.13*	1.33*	1.54*	1.85*	2.12*	2.39*	3.53*	4.73*
	100	0.64	0.82	1.02	1.24*	1.46*	1.69*	2.05*	2.36*	2.67*	3.97*	5.34*
	120	0.67	0.88	1.10	1.34*	1.59*	1.85*	2.24*	2.59*	2.93*	4.39*	5.93*
	140	0.71	0.93	1.17	1.43*	1.71*	1.99*	2.43*	2.80*	3.19*	4.79*	6.49*
50	10	0.42	0.52	0.62	0.72*	0.82*	0.92*	1.07*	1.19*	1.30*	1.76*	2.20*
	20	0.48	0.60	0.71	0.83*	0.95*	1.07*	1.24*	1.39*	1.53*	2.09*	2.66*
	40	0.57	0.71	0.85	0.99*	1.14*	1.29*	1.51*	1.70*	1.89*	2.65*	3.45*
	60	0.63	0.79	0.95	1.12*	1.29*	1.47*	1.74*	1.97*	2.20*	3.15*	4.16*
	80	0.69	0.86	1.04	1.23*	1.43*	1.64*	1.95*	2.22*	2.49*	3.62*	4.81*
	100	0.73	0.93	1.13	1.34*	1.56*	1.79*	2.15*	2.45*	2.76*	4.05*	5.42*
	120	0.78	0.99	1.20	1.44*	1.69*	1.94*	2.34*	2.67*	3.02*	4.47*	6.01*
	140	0.82	1.04	1.28	1.53*	1.81*	2.09*	2.52*	2.89*	3.27*	4.87*	6.57*
100	10	0.48	0.59	0.70	0.80*	0.91*	1.02*	1.18*	1.31*	1.43*	1.91*	2.38*
	20	0.56	0.68	0.81	0.93*	1.07*	1.19*	1.38*	1.53*	1.68*	2.27*	2.86*
	40	0.66	0.82	0.97	1.12*	1.28*	1.44*	1.68*	1.87*	2.06*	2.84*	3.64*
	60	0.74	0.91	1.09	1.26*	1.45*	1.64*	1.91*	2.15*	2.38*	3.33*	4.33*
	80	0.81	1.00	1.19	1.39*	1.60*	1.81*	2.13*	2.39*	2.67*	3.79*	4.97*
	100	0.86	1.07	1.28	1.50*	1.73*	1.97*	2.32*	2.63*	2.93*	4.22*	5.57*
	120	0.91	1.14	1.36	1.60*	1.86*	2.12*	2.51*	2.85*	3.19*	4.63*	6.15*
	140	0.96	1.20	1.44	1.70*	1.98*	2.26*	2.69*	3.06*	3.44*	5.02*	6.71*
150	10	0.52	0.63	0.75	0.86*	0.98*	1.10*	1.26*	1.40*	1.53*	2.03*	2.51*
	20	0.61	0.75	0.88	1.01*	1.15*	1.29*	1.48*	1.65*	1.80*	2.42*	3.02*
	40	0.73	0.89	1.05	1.22*	1.39*	1.56*	1.80*	2.01*	2.21*	3.01*	3.81*
	60	0.82	1.00	1.19	1.37*	1.57*	1.77*	2.05*	2.29*	2.53*	3.50*	4.50*
	80	0.89	1.10	1.30	1.51*	1.73*	1.95*	2.28*	2.55*	2.82*	3.95*	5.13*
	100	0.96	1.18	1.40	1.62*	1.87*	2.11*	2.48*	2.78*	3.09*	4.38*	5.73*
	120	1.01	1.25	1.49	1.73*	2.00*	2.27*	2.67*	3.01*	3.35*	4.78*	6.30*
	140	1.07	1.32	1.57	1.84*	2.12*	2.41*	2.85*	3.22*	3.59*	5.17*	6.85*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.55	0.67	0.79	0.91*	1.04*	1.15*	1.33*	1.47*	1.61*	2.13*	2.63*
	20	0.65	0.79	0.93	1.07*	1.22*	1.36*	1.57*	1.74*	1.90*	2.54*	3.16*
	40	0.79	0.96	1.12	1.29*	1.47*	1.65*	1.91*	2.12*	2.33*	3.15*	3.97*
	60	0.88	1.08	1.27	1.46*	1.67*	1.87*	2.17*	2.42*	2.67*	3.65*	4.65*
	80	0.96	1.18	1.39	1.60*	1.84*	2.06*	2.40*	2.68*	2.96*	4.10*	5.28*
	100	1.03	1.27	1.49	1.73*	1.98*	2.24*	2.61*	2.92*	3.24*	4.53*	5.88*
	120	1.10	1.34	1.59	1.85*	2.12*	2.39*	2.80*	3.15*	3.50*	4.93*	6.44*
	140	1.15	1.42	1.68	1.95*	2.25*	2.54*	2.99*	3.36*	3.74*	5.32*	6.99*
300	10	0.60	0.73	0.86	0.99*	1.12*	1.25*	1.44*	1.59*	1.73*	2.29*	2.81*
	20	0.72	0.87	1.02	1.17*	1.33*	1.48*	1.71*	1.89*	2.06*	2.74*	3.39*
	40	0.87	1.06	1.24	1.42*	1.62*	1.81*	2.08*	2.31*	2.53*	3.39*	4.24*
	60	0.99	1.20	1.40	1.61*	1.83*	2.05*	2.37*	2.63*	2.89*	3.91*	4.94*
	80	1.08	1.31	1.53	1.77*	2.01*	2.26*	2.62*	2.91*	3.21*	4.38*	5.57*
	100	1.16	1.41	1.65	1.90*	2.18*	2.44*	2.84*	3.16*	3.49*	4.81*	6.16*
	120	1.23	1.50	1.76	2.03*	2.32*	2.61*	3.04*	3.40*	3.75*	5.21*	6.72*
	140	1.29	1.58	1.86	2.15*	2.46*	2.77*	3.23*	3.62*	4.01*	5.60*	7.26*
400	10	0.65	0.78	0.92	1.05*	1.19*	1.33*	1.52*	1.68*	1.84*	2.42*	2.97*
	20	0.78	0.94	1.10	1.25*	1.42*	1.58*	1.82*	2.01*	2.19*	2.90*	3.58*
	40	0.95	1.14	1.33	1.53*	1.73*	1.93*	2.22*	2.46*	2.69*	3.59*	4.47*
	60	1.07	1.29	1.51	1.73*	1.97*	2.20*	2.53*	2.81*	3.08*	4.14*	5.19*
	80	1.17	1.42	1.65	1.90*	2.16*	2.42*	2.79*	3.10*	3.41*	4.62*	5.83*
	100	1.26	1.52	1.78	2.05*	2.33*	2.61*	3.03*	3.37*	3.70*	5.05*	6.42*
	120	1.34	1.62	1.90	2.18*	2.49*	2.79*	3.24*	3.61*	3.98*	5.46*	6.99*
	140	1.41	1.71	2.00	2.30*	2.63*	2.96*	3.44*	3.84*	4.24*	5.85*	7.52*
600	10	0.72	0.87	1.01	1.15*	1.31*	1.45*	1.67*	1.84*	2.00*	2.63*	3.22*
	20	0.87	1.04	1.21	1.39*	1.57*	1.75*	2.00*	2.21*	2.41*	3.17*	3.90*
	40	1.06	1.28	1.48	1.70*	1.92*	2.14*	2.46*	2.71*	2.96*	3.93*	4.86*
	60	1.20	1.45	1.68	1.92*	2.18*	2.43*	2.80*	3.10*	3.39*	4.52*	5.62*
	80	1.32	1.59	1.85	2.11*	2.40*	2.68*	3.09*	3.42*	3.75*	5.02*	6.29*
	100	1.42	1.71	1.99	2.28*	2.59*	2.90*	3.34*	3.70*	4.06*	5.48*	6.89*
	120	1.51	1.82	2.12	2.43*	2.76*	3.09*	3.57*	3.97*	4.36*	5.90*	7.46*
	140	1.59	1.92	2.24	2.57*	2.92*	3.27*	3.78*	4.21*	4.63*	6.30*	8.01*
800	10	0.77	0.93	1.08	1.24*	1.40*	1.55*	1.78*	1.96*	2.14*	2.80*	3.42*
	20	0.94	1.13	1.31	1.49*	1.69*	1.88*	2.15*	2.37*	2.58*	3.39*	4.15*
	40	1.16	1.39	1.61	1.83*	2.07*	2.31*	2.64*	2.92*	3.18*	4.21*	5.18*
	60	1.31	1.57	1.83	2.08*	2.36*	2.63*	3.02*	3.33*	3.64*	4.83*	5.98*
	80	1.44	1.73	2.01	2.29*	2.60*	2.89*	3.33*	3.68*	4.02*	5.37*	6.68*
	100	1.55	1.86	2.16	2.47*	2.80*	3.13*	3.60*	3.98*	4.36*	5.84*	7.30*
	120	1.65	1.98	2.30	2.63*	2.99*	3.34*	3.84*	4.26*	4.67*	6.28*	7.89*
	140	1.74	2.09	2.43	2.78*	3.16*	3.53*	4.07*	4.52*	4.96*	6.70*	8.44*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.38	0.51	0.65	0.79*	0.93*	1.07*	1.28*	1.46*	1.63*	2.34*	3.06*
	20	0.43	0.61	0.79	0.97*	1.15*	1.33*	1.61*	1.84*	2.08*	3.04*	4.04*
	40	0.53	0.77	1.01	1.26*	1.51*	1.76*	2.15*	2.49*	2.82*	4.22*	5.68*
	60	0.62	0.91	1.21	1.51*	1.83*	2.14*	2.64*	3.05*	3.48*	5.25*	7.12*
	80	0.70	1.04	1.39	1.75*	2.12*	2.49*	3.08*	3.57*	4.08*	6.20*	8.45*
	100	0.77	1.16	1.56	1.97*	2.39*	2.82*	3.49*	4.06*	4.65*	7.10*	9.69*
	120	0.85	1.27	1.72	2.18*	2.65*	3.14*	3.88*	4.53*	5.18*	7.94*	10.88*
	140	0.91	1.38	1.87	2.38*	2.90*	3.43*	4.26*	4.97*	5.70*	8.76*	12.01*
25	10	0.54	0.67	0.81	0.95*	1.09*	1.23*	1.44*	1.61*	1.79*	2.49*	3.20*
	20	0.62	0.78	0.95	1.12*	1.30*	1.48*	1.75*	1.98*	2.21*	3.17*	4.15*
	40	0.74	0.95	1.17	1.40*	1.64*	1.89*	2.28*	2.61*	2.94*	4.33*	5.78*
	60	0.83	1.08	1.35	1.64*	1.95*	2.26*	2.75*	3.16*	3.59*	5.35*	7.21*
	80	0.91	1.21	1.53	1.87*	2.23*	2.61*	3.18*	3.68*	4.18*	6.29*	8.53*
	100	0.99	1.32	1.69	2.08*	2.50*	2.93*	3.59*	4.16*	4.74*	7.18*	9.77*
	120	1.05	1.43	1.84	2.29*	2.75*	3.24*	3.98*	4.62*	5.27*	8.02*	10.95*
	140	1.12	1.53	1.99	2.48*	3.00*	3.53*	4.35*	5.06*	5.79*	8.83*	12.08*
50	10	0.60	0.75	0.90	1.04*	1.19*	1.34*	1.56*	1.74*	1.91*	2.62*	3.33*
	20	0.70	0.88	1.05	1.23*	1.42*	1.60*	1.88*	2.11*	2.34*	3.29*	4.27*
	40	0.84	1.06	1.29	1.52*	1.77*	2.02*	2.40*	2.72*	3.05*	4.43*	5.88*
	60	0.95	1.21	1.48	1.76*	2.07*	2.38*	2.86*	3.27*	3.69*	5.44*	7.30*
	80	1.04	1.34	1.65	1.99*	2.34*	2.71*	3.29*	3.78*	4.28*	6.38*	8.61*
	100	1.12	1.46	1.81	2.20*	2.61*	3.03*	3.69*	4.25*	4.83*	7.26*	9.85*
	120	1.20	1.57	1.96	2.40*	2.86*	3.34*	4.07*	4.71*	5.36*	8.10*	11.02*
	140	1.27	1.67	2.11	2.59*	3.10*	3.63*	4.45*	5.15*	5.87*	8.91*	12.15*
100	10	0.69	0.85	1.01	1.17*	1.33*	1.49*	1.72*	1.91*	2.10*	2.83*	3.56*
	20	0.82	1.01	1.19	1.38*	1.58*	1.78*	2.07*	2.31*	2.55*	3.51*	4.49*
	40	0.99	1.22	1.46	1.70*	1.96*	2.22*	2.61*	2.94*	3.27*	4.63*	6.07*
	60	1.12	1.39	1.67	1.96*	2.27*	2.59*	3.07*	3.47*	3.89*	5.63*	7.48*
	80	1.22	1.53	1.85	2.19*	2.55*	2.92*	3.49*	3.97*	4.47*	6.56*	8.78*
	100	1.32	1.66	2.02	2.40*	2.81*	3.23*	3.88*	4.44*	5.01*	7.43*	10.00*
	120	1.40	1.78	2.17	2.60*	3.06*	3.53*	4.26*	4.89*	5.54*	8.26*	11.17*
	140	1.48	1.89	2.32	2.79*	3.29*	3.81*	4.62*	5.32*	6.04*	9.06*	12.30*
150	10	0.75	0.92	1.09	1.26*	1.43*	1.60*	1.84*	2.04*	2.24*	3.01*	3.75*
	20	0.90	1.10	1.30	1.50*	1.71*	1.92*	2.22*	2.47*	2.72*	3.70*	4.69*
	40	1.09	1.34	1.59	1.84*	2.12*	2.38*	2.79*	3.12*	3.46*	4.83*	6.26*
	60	1.24	1.52	1.81	2.12*	2.44*	2.76*	3.25*	3.66*	4.08*	5.81*	7.65*
	80	1.36	1.68	2.01	2.35*	2.73*	3.10*	3.67*	4.16*	4.65*	6.73*	8.94*
	100	1.46	1.82	2.18	2.57*	2.99*	3.41*	4.06*	4.62*	5.19*	7.59*	10.16*
	120	1.56	1.94	2.35	2.77*	3.24*	3.71*	4.44*	5.07*	5.71*	8.42*	11.32*
	140	1.64	2.06	2.50	2.97*	3.47*	3.99*	4.80*	5.49*	6.21*	9.22*	12.44*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.80	0.98	1.15	1.33*	1.51*	1.69*	1.95*	2.15*	2.36*	3.15*	3.91*
	20	0.96	1.18	1.38	1.59*	1.81*	2.03*	2.35*	2.61*	2.86*	3.87*	4.88*
	40	1.18	1.44	1.70	1.96*	2.24*	2.52*	2.94*	3.28*	3.62*	5.01*	6.44*
	60	1.33	1.64	1.94	2.25*	2.58*	2.92*	3.41*	3.83*	4.25*	5.99*	7.82*
	80	1.46	1.80	2.14	2.50*	2.88*	3.26*	3.84*	4.33*	4.83*	6.90*	9.10*
	100	1.58	1.95	2.32	2.72*	3.15*	3.58*	4.24*	4.79*	5.36*	7.76*	10.31*
	120	1.68	2.08	2.49	2.93*	3.40*	3.88*	4.61*	5.24*	5.88*	8.58*	11.47*
	140	1.77	2.21	2.65	3.12*	3.64*	4.16*	4.97*	5.66*	6.37*	9.37*	12.58*
300	10	0.88	1.08	1.26	1.45*	1.64*	1.83*	2.11*	2.33*	2.55*	3.39*	4.19*
	20	1.07	1.30	1.52	1.74*	1.98*	2.22*	2.55*	2.83*	3.10*	4.16*	5.20*
	40	1.31	1.59	1.87	2.15*	2.46*	2.75*	3.19*	3.55*	3.91*	5.34*	6.78*
	60	1.49	1.82	2.14	2.47*	2.82*	3.17*	3.69*	4.13*	4.56*	6.32*	8.15*
	80	1.64	2.00	2.36	2.73*	3.14*	3.54*	4.14*	4.64*	5.14*	7.23*	9.42*
	100	1.77	2.16	2.56	2.97*	3.42*	3.87*	4.54*	5.11*	5.68*	8.07*	10.62*
	120	1.88	2.31	2.74	3.19*	3.68*	4.17*	4.92*	5.55*	6.19*	8.89*	11.76*
	140	1.99	2.44	2.91	3.40*	3.93*	4.46*	5.28*	5.97*	6.68*	9.67*	12.86*
400	10	0.95	1.15	1.35	1.55*	1.75*	1.95*	2.24*	2.48*	2.71*	3.58*	4.42*
	20	1.15	1.40	1.63	1.87*	2.12*	2.37*	2.72*	3.01*	3.30*	4.40*	5.47*
	40	1.42	1.72	2.01	2.31*	2.63*	2.94*	3.40*	3.78*	4.15*	5.62*	7.09*
	60	1.62	1.96	2.30	2.65*	3.02*	3.39*	3.93*	4.38*	4.83*	6.63*	8.47*
	80	1.78	2.16	2.54	2.93*	3.35*	3.77*	4.39*	4.91*	5.42*	7.53*	9.73*
	100	1.92	2.34	2.75	3.18*	3.65*	4.11*	4.81*	5.39*	5.97*	8.38*	10.91*
	120	2.04	2.50	2.94	3.41*	3.92*	4.43*	5.19*	5.84*	6.49*	9.18*	12.05*
	140	2.16	2.64	3.12	3.63*	4.18*	4.73*	5.56*	6.26*	6.98*	9.96*	13.14*
600	10	1.06	1.28	1.49	1.70*	1.93*	2.14*	2.46*	2.71*	2.96*	3.90*	4.79*
	20	1.29	1.56	1.81	2.07*	2.35*	2.61*	3.00*	3.31*	3.62*	4.80*	5.94*
	40	1.60	1.93	2.24	2.57*	2.92*	3.25*	3.75*	4.15*	4.55*	6.10*	7.64*
	60	1.82	2.20	2.57	2.94*	3.35*	3.74*	4.33*	4.80*	5.28*	7.15*	9.04*
	80	2.01	2.43	2.83	3.25*	3.71*	4.16*	4.82*	5.36*	5.91*	8.08*	10.30*
	100	2.17	2.62	3.07	3.53*	4.03*	4.53*	5.26*	5.87*	6.47*	8.93*	11.48*
	120	2.31	2.80	3.28	3.78*	4.33*	4.86*	5.67*	6.33*	7.00*	9.74*	12.61*
	140	2.44	2.96	3.48	4.01*	4.60*	5.18*	6.05*	6.77*	7.51*	10.51*	13.69*
800	10	1.14	1.38	1.60	1.83*	2.07*	2.30*	2.63*	2.90*	3.17*	4.16*	5.10*
	20	1.40	1.69	1.96	2.23*	2.53*	2.81*	3.22*	3.56*	3.88*	5.13*	6.32*
	40	1.74	2.09	2.43	2.78*	3.15*	3.51*	4.03*	4.46*	4.88*	6.51*	8.10*
	60	1.99	2.39	2.78	3.18*	3.61*	4.04*	4.65*	5.15*	5.65*	7.60*	9.54*
	80	2.19	2.64	3.07	3.52*	4.00*	4.48*	5.17*	5.75*	6.31*	8.56*	10.82*
	100	2.37	2.85	3.33	3.82*	4.35*	4.87*	5.64*	6.27*	6.90*	9.43*	12.01*
	120	2.52	3.05	3.56	4.09*	4.66*	5.23*	6.07*	6.76*	7.45*	10.25*	13.13*
	140	2.67	3.22	3.77	4.33*	4.95*	5.56*	6.46*	7.21*	7.97*	11.03*	14.21*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.55	0.77	0.99	1.22*	1.44*	1.67*	2.02*	2.30*	2.60*	3.79*	5.01*
	20	0.67	0.96	1.26	1.57*	1.87*	2.19*	2.67*	3.07*	3.49*	5.19*	6.97*
	40	0.87	1.28	1.71	2.15*	2.60*	3.06*	3.76*	4.37*	4.98*	7.55*	10.26*
	60	1.04	1.56	2.10	2.66*	3.23*	3.82*	4.72*	5.50*	6.29*	9.62*	13.14*
	80	1.20	1.82	2.46	3.13*	3.81*	4.52*	5.61*	6.54*	7.50*	11.52*	15.79*
	100	1.35	2.06	2.80	3.57*	4.36*	5.18*	6.44*	7.52*	8.63*	13.30*	18.28*
	120	1.49	2.29	3.12	3.99*	4.88*	5.80*	7.22*	8.45*	9.70*	14.99*	20.65*
	140	1.63	2.51	3.43	4.39*	5.38*	6.40*	7.98*	9.34*	10.73*	16.62*	22.91*
25	10	0.77	0.98	1.19	1.40*	1.63*	1.85*	2.19*	2.47*	2.76*	3.94*	5.15*
	20	0.91	1.17	1.45	1.73*	2.04*	2.34*	2.81*	3.22*	3.62*	5.32*	7.09*
	40	1.12	1.48	1.87	2.29*	2.74*	3.19*	3.89*	4.49*	5.10*	7.65*	10.36*
	60	1.29	1.75	2.25	2.79*	3.36*	3.94*	4.84*	5.61*	6.40*	9.71*	13.23*
	80	1.44	2.00	2.60	3.25*	3.93*	4.63*	5.71*	6.64*	7.60*	11.61*	15.88*
	100	1.59	2.23	2.94	3.69*	4.47*	5.28*	6.54*	7.61*	8.72*	13.38*	18.36*
	120	1.72	2.45	3.25	4.10*	4.99*	5.90*	7.32*	8.54*	9.79*	15.07*	20.72*
	140	1.85	2.67	3.56	4.50*	5.48*	6.50*	8.07*	9.43*	10.82*	16.70*	22.99*
50	10	0.88	1.09	1.31	1.53*	1.76*	1.99*	2.34*	2.62*	2.91*	4.08*	5.29*
	20	1.04	1.31	1.59	1.88*	2.18*	2.49*	2.96*	3.35*	3.76*	5.44*	7.20*
	40	1.28	1.64	2.02	2.43*	2.87*	3.32*	4.01*	4.61*	5.21*	7.76*	10.46*
	60	1.46	1.91	2.39	2.92*	3.48*	4.06*	4.95*	5.72*	6.50*	9.81*	13.32*
	80	1.63	2.16	2.74	3.37*	4.05*	4.74*	5.82*	6.74*	7.69*	11.69*	15.96*
	100	1.77	2.39	3.07	3.80*	4.58*	5.39*	6.63*	7.71*	8.81*	13.47*	18.44*
	120	1.91	2.60	3.38	4.21*	5.09*	6.00*	7.41*	8.63*	9.88*	15.15*	20.80*
	140	2.04	2.82	3.68	4.60*	5.58*	6.59*	8.16*	9.52*	10.91*	16.77*	23.06*
100	10	1.01	1.25	1.48	1.72*	1.96*	2.21*	2.57*	2.87*	3.16*	4.35*	5.55*
	20	1.21	1.50	1.79	2.09*	2.41*	2.73*	3.21*	3.61*	4.01*	5.68*	7.43*
	40	1.49	1.87	2.26	2.67*	3.11*	3.56*	4.25*	4.84*	5.44*	7.97*	10.65*
	60	1.71	2.16	2.64	3.16*	3.71*	4.29*	5.17*	5.93*	6.71*	10.00*	13.50*
	80	1.89	2.42	2.99	3.60*	4.27*	4.96*	6.02*	6.94*	7.89*	11.87*	16.12*
	100	2.05	2.66	3.31	4.02*	4.80*	5.59*	6.83*	7.90*	9.00*	13.63*	18.59*
	120	2.20	2.88	3.62	4.43*	5.30*	6.20*	7.60*	8.81*	10.06*	15.31*	20.94*
	140	2.34	3.09	3.91	4.81*	5.78*	6.78*	8.34*	9.69*	11.07*	16.93*	23.20*
150	10	1.10	1.36	1.60	1.85*	2.11*	2.37*	2.75*	3.06*	3.36*	4.58*	5.79*
	20	1.34	1.64	1.95	2.26*	2.60*	2.93*	3.42*	3.83*	4.24*	5.91*	7.65*
	40	1.65	2.05	2.45	2.87*	3.32*	3.78*	4.47*	5.06*	5.66*	8.17*	10.84*
	60	1.89	2.36	2.85	3.37*	3.93*	4.50*	5.38*	6.14*	6.92*	10.18*	13.67*
	80	2.09	2.63	3.20	3.82*	4.48*	5.17*	6.23*	7.14*	8.08*	12.05*	16.29*
	100	2.26	2.88	3.53	4.24*	5.00*	5.79*	7.03*	8.09*	9.18*	13.80*	18.75*
	120	2.43	3.11	3.84	4.63*	5.50*	6.39*	7.79*	8.99*	10.23*	15.47*	21.09*
	140	2.58	3.32	4.13	5.02*	5.98*	6.97*	8.52*	9.87*	11.24*	17.08*	23.34*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.18	1.45	1.70	1.96*	2.24*	2.51*	2.90*	3.22*	3.53*	4.78*	6.01*
	20	1.44	1.76	2.08	2.40*	2.75*	3.09*	3.60*	4.02*	4.44*	6.13*	7.87*
	40	1.78	2.19	2.61	3.04*	3.50*	3.97*	4.67*	5.27*	5.87*	8.38*	11.04*
	60	2.03	2.53	3.02	3.55*	4.12*	4.70*	5.59*	6.34*	7.12*	10.37*	13.85*
	80	2.25	2.81	3.39	4.01*	4.68*	5.37*	6.43*	7.34*	8.27*	12.22*	16.45*
	100	2.44	3.07	3.72	4.43*	5.20*	5.99*	7.22*	8.27*	9.36*	13.97*	18.90*
	120	2.61	3.30	4.03	4.83*	5.69*	6.59*	7.97*	9.17*	10.41*	15.63*	21.24*
	140	2.77	3.52	4.33	5.21*	6.17*	7.16*	8.70*	10.04*	11.41*	17.24*	23.49*
300	10	1.31	1.59	1.87	2.14*	2.44*	2.73*	3.14*	3.48*	3.82*	5.12*	6.39*
	20	1.60	1.94	2.28	2.63*	3.00*	3.36*	3.90*	4.34*	4.78*	6.52*	8.28*
	40	1.99	2.43	2.87	3.32*	3.81*	4.30*	5.02*	5.63*	6.24*	8.76*	11.41*
	60	2.27	2.80	3.32	3.87*	4.46*	5.05*	5.96*	6.72*	7.49*	10.74*	14.20*
	80	2.51	3.11	3.71	4.34*	5.03*	5.73*	6.80*	7.71*	8.64*	12.57*	16.78*
	100	2.72	3.38	4.06	4.77*	5.56*	6.36*	7.58*	8.64*	9.72*	14.30*	19.21*
	120	2.91	3.63	4.38	5.18*	6.05*	6.95*	8.33*	9.52*	10.75*	15.95*	21.54*
	140	3.09	3.87	4.68	5.57*	6.53*	7.52*	9.05*	10.38*	11.74*	17.54*	23.77*
400	10	1.41	1.71	2.00	2.29*	2.60*	2.91*	3.34*	3.70*	4.05*	5.41*	6.72*
	20	1.73	2.10	2.45	2.82*	3.21*	3.59*	4.15*	4.61*	5.06*	6.85*	8.65*
	40	2.15	2.62	3.08	3.56*	4.07*	4.57*	5.33*	5.95*	6.58*	9.13*	11.78*
	60	2.47	3.02	3.56	4.13*	4.75*	5.36*	6.28*	7.06*	7.84*	11.09*	14.54*
	80	2.73	3.35	3.97	4.63*	5.34*	6.05*	7.13*	8.05*	8.99*	12.91*	17.10*
	100	2.96	3.64	4.34	5.07*	5.88*	6.69*	7.92*	8.98*	10.06*	14.62*	19.52*
	120	3.16	3.91	4.67	5.49*	6.38*	7.28*	8.67*	9.86*	11.09*	16.26*	21.83*
	140	3.35	4.16	4.99	5.88*	6.86*	7.85*	9.39*	10.71*	12.07*	17.84*	24.06*
600	10	1.57	1.90	2.21	2.53*	2.87*	3.20*	3.67*	4.06*	4.43*	5.88*	7.27*
	20	1.94	2.34	2.73	3.12*	3.55*	3.96*	4.56*	5.06*	5.54*	7.43*	9.29*
	40	2.43	2.93	3.43	3.94*	4.49*	5.03*	5.83*	6.49*	7.15*	9.78*	12.46*
	60	2.78	3.38	3.96	4.57*	5.23*	5.88*	6.84*	7.65*	8.46*	11.76*	15.20*
	80	3.08	3.75	4.41	5.10*	5.85*	6.60*	7.73*	8.67*	9.62*	13.56*	17.73*
	100	3.34	4.07	4.81	5.58*	6.42*	7.26*	8.54*	9.61*	10.70*	15.26*	20.13*
	120	3.56	4.36	5.17	6.02*	6.94*	7.88*	9.29*	10.50*	11.72*	16.88*	22.42*
	140	3.77	4.63	5.50	6.43*	7.44*	8.46*	10.01*	11.34*	12.70*	18.44*	24.62*
800	10	1.71	2.05	2.39	2.72*	3.08*	3.43*	3.94*	4.35*	4.75*	6.27*	7.73*
	20	2.11	2.54	2.95	3.37*	3.82*	4.26*	4.90*	5.42*	5.93*	7.91*	9.84*
	40	2.65	3.19	3.71	4.26*	4.84*	5.42*	6.26*	6.95*	7.63*	10.35*	13.08*
	60	3.04	3.67	4.29	4.93*	5.62*	6.31*	7.32*	8.15*	8.99*	12.36*	15.83*
	80	3.36	4.07	4.77	5.50*	6.29*	7.07*	8.24*	9.21*	10.18*	14.17*	18.35*
	100	3.64	4.42	5.19	6.00*	6.88*	7.76*	9.07*	10.17*	11.28*	15.86*	20.72*
	120	3.89	4.74	5.58	6.46*	7.43*	8.39*	9.84*	11.07*	12.31*	17.47*	22.99*
	140	4.12	5.03	5.93	6.89*	7.94*	8.99*	10.58*	11.92*	13.29*	19.03*	25.18*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.85	1.21	1.58	1.95*	2.33*	2.72*	3.31*	3.81*	4.31*	6.40*	8.57*
	20	1.08	1.59	2.11	2.65*	3.19*	3.75*	4.61*	5.35*	6.09*	9.20*	12.48*
	40	1.48	2.23	3.01	3.81*	4.64*	5.49*	6.81*	7.93*	9.08*	13.92*	19.06*
	60	1.83	2.79	3.79	4.84*	5.91*	7.02*	8.73*	10.20*	11.71*	18.06*	24.83*
	80	2.14	3.31	4.52	5.77*	7.07*	8.42*	10.49*	12.28*	14.12*	21.86*	30.13*
	100	2.44	3.79	5.19	6.66*	8.17*	9.73*	12.15*	14.24*	16.38*	25.42*	35.10*
	120	2.73	4.25	5.84	7.49*	9.21*	10.98*	13.73*	16.09*	18.53*	28.81*	39.83*
	140	3.00	4.69	6.46	8.30*	10.20*	12.18*	15.24*	17.88*	20.59*	32.06*	44.37*
25	10	1.14	1.46	1.80	2.15*	2.53*	2.91*	3.49*	3.98*	4.48*	6.55*	8.70*
	20	1.38	1.83	2.31	2.82*	3.36*	3.91*	4.76*	5.49*	6.23*	9.33*	12.60*
	40	1.77	2.44	3.17	3.96*	4.78*	5.62*	6.93*	8.05*	9.20*	14.03*	19.16*
	60	2.10	2.98	3.95	4.97*	6.04*	7.14*	8.84*	10.31*	11.81*	18.15*	24.92*
	80	2.40	3.48	4.66	5.90*	7.19*	8.53*	10.60*	12.38*	14.21*	21.94*	30.21*
	100	2.69	3.96	5.33	6.77*	8.28*	9.83*	12.25*	14.33*	16.47*	25.50*	35.18*
	120	2.96	4.41	5.97	7.60*	9.31*	11.08*	13.82*	16.19*	18.62*	28.89*	39.91*
	140	3.23	4.85	6.58	8.40*	10.31*	12.27*	15.33*	17.97*	20.67*	32.14*	44.44*
50	10	1.29	1.63	1.97	2.32*	2.70*	3.08*	3.65*	4.14*	4.64*	6.69*	8.84*
	20	1.57	2.01	2.48	2.98*	3.52*	4.06*	4.91*	5.63*	6.37*	9.45*	12.71*
	40	1.98	2.63	3.34	4.10*	4.92*	5.76*	7.06*	8.17*	9.32*	14.13*	19.26*
	60	2.32	3.16	4.09	5.10*	6.16*	7.26*	8.95*	10.42*	11.92*	18.25*	25.01*
	80	2.63	3.66	4.80	6.02*	7.31*	8.64*	10.70*	12.48*	14.31*	22.03*	30.30*
	100	2.91	4.12	5.46	6.89*	8.39*	9.94*	12.35*	14.43*	16.56*	25.59*	35.26*
	120	3.18	4.57	6.09	7.72*	9.42*	11.18*	13.92*	16.28*	18.71*	28.97*	39.98*
	140	3.44	5.00	6.70	8.51*	10.41*	12.37*	15.42*	18.05*	20.76*	32.22*	44.51*
100	10	1.49	1.85	2.21	2.58*	2.98*	3.37*	3.95*	4.44*	4.94*	6.98*	9.11*
	20	1.82	2.29	2.77	3.27*	3.81*	4.35*	5.19*	5.91*	6.64*	9.70*	12.94*
	40	2.30	2.94	3.63	4.38*	5.18*	6.01*	7.30*	8.41*	9.55*	14.34*	19.45*
	60	2.67	3.49	4.38	5.36*	6.41*	7.49*	9.18*	10.63*	12.13*	18.44*	25.19*
	80	2.99	3.98	5.07	6.26*	7.54*	8.86*	10.91*	12.69*	14.51*	22.21*	30.46*
	100	3.29	4.44	5.72	7.12*	8.61*	10.15*	12.55*	14.62*	16.75*	25.76*	35.42*
	120	3.56	4.87	6.34	7.94*	9.63*	11.38*	14.11*	16.46*	18.88*	29.13*	40.13*
	140	3.83	5.30	6.94	8.72*	10.61*	12.56*	15.60*	18.23*	20.93*	32.37*	44.66*
150	10	1.64	2.02	2.40	2.78*	3.19*	3.60*	4.20*	4.70*	5.21*	7.26*	9.38*
	20	2.01	2.50	2.99	3.50*	4.06*	4.61*	5.45*	6.17*	6.90*	9.95*	13.17*
	40	2.53	3.19	3.89	4.63*	5.44*	6.26*	7.54*	8.65*	9.78*	14.55*	19.65*
	60	2.93	3.76	4.64	5.60*	6.65*	7.72*	9.40*	10.85*	12.34*	18.63*	25.36*
	80	3.28	4.26	5.33	6.50*	7.76*	9.08*	11.12*	12.89*	14.70*	22.39*	30.63*
	100	3.59	4.72	5.97	7.34*	8.82*	10.36*	12.75*	14.81*	16.93*	25.92*	35.57*
	120	3.88	5.16	6.59	8.15*	9.84*	11.58*	14.30*	16.64*	19.06*	29.29*	40.28*
	140	4.15	5.58	7.18	8.93*	10.81*	12.75*	15.79*	18.41*	21.10*	32.53*	44.80*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.76	2.16	2.55	2.95*	3.37*	3.79*	4.42*	4.93*	5.44*	7.51*	9.64*
	20	2.16	2.67	3.18	3.71*	4.27*	4.84*	5.69*	6.41*	7.15*	10.19*	13.40*
	40	2.73	3.41	4.11	4.86*	5.67*	6.50*	7.78*	8.88*	10.00*	14.76*	19.84*
	60	3.15	3.99	4.88	5.83*	6.88*	7.95*	9.62*	11.06*	12.54*	18.82*	25.54*
	80	3.52	4.51	5.57	6.73*	7.99*	9.29*	11.33*	13.09*	14.90*	22.56*	30.79*
	100	3.85	4.98	6.21	7.57*	9.04*	10.56*	12.94*	15.00*	17.12*	26.09*	35.73*
	120	4.15	5.42	6.82	8.37*	10.04*	11.78*	14.48*	16.83*	19.23*	29.45*	40.43*
	140	4.43	5.84	7.41	9.14*	11.01*	12.95*	15.97*	18.58*	21.27*	32.68*	44.95*
300	10	1.95	2.38	2.79	3.22*	3.68*	4.12*	4.77*	5.31*	5.85*	7.97*	10.12*
	20	2.41	2.95	3.49	4.04*	4.64*	5.23*	6.11*	6.85*	7.59*	10.65*	13.85*
	40	3.04	3.76	4.49	5.26*	6.09*	6.93*	8.22*	9.32*	10.44*	15.17*	20.23*
	60	3.51	4.39	5.29	6.25*	7.31*	8.38*	10.05*	11.48*	12.95*	19.19*	25.89*
	80	3.91	4.93	5.99	7.15*	8.41*	9.71*	11.73*	13.48*	15.28*	22.91*	31.12*
	100	4.27	5.42	6.65	7.99*	9.45*	10.97*	13.33*	15.38*	17.48*	26.42*	36.04*
	120	4.59	5.88	7.26	8.78*	10.44*	12.17*	14.86*	17.19*	19.59*	29.77*	40.73*
	140	4.89	6.31	7.85	9.55*	11.40*	13.32*	16.33*	18.93*	21.61*	32.99*	45.23*
400	10	2.11	2.56	3.00	3.44*	3.92*	4.39*	5.07*	5.63*	6.19*	8.38*	10.56*
	20	2.61	3.18	3.74	4.32*	4.94*	5.56*	6.47*	7.23*	7.99*	11.08*	14.29*
	40	3.30	4.05	4.80	5.59*	6.45*	7.31*	8.62*	9.73*	10.86*	15.57*	20.61*
	60	3.81	4.71	5.64	6.62*	7.69*	8.78*	10.45*	11.88*	13.35*	19.56*	26.24*
	80	4.24	5.29	6.37	7.53*	8.81*	10.11*	12.13*	13.87*	15.66*	23.26*	31.45*
	100	4.62	5.80	7.03	8.38*	9.85*	11.36*	13.71*	15.75*	17.84*	26.76*	36.35*
	120	4.96	6.27	7.66	9.17*	10.83*	12.55*	15.23*	17.54*	19.93*	30.09*	41.03*
	140	5.28	6.71	8.25	9.94*	11.78*	13.70*	16.69*	19.27*	21.94*	33.29*	45.52*
600	10	2.36	2.85	3.32	3.81*	4.32*	4.83*	5.57*	6.16*	6.76*	9.06*	11.33*
	20	2.94	3.55	4.16	4.78*	5.45*	6.11*	7.08*	7.88*	8.67*	11.85*	15.10*
	40	3.71	4.52	5.32	6.16*	7.07*	7.97*	9.33*	10.46*	11.61*	16.35*	21.37*
	60	4.29	5.25	6.22	7.25*	8.36*	9.49*	11.19*	12.64*	14.11*	20.30*	26.94*
	80	4.77	5.88	7.00	8.20*	9.51*	10.84*	12.87*	14.61*	16.40*	23.95*	32.10*
	100	5.19	6.43	7.70	9.07*	10.56*	12.09*	14.45*	16.47*	18.56*	27.41*	36.97*
	120	5.57	6.93	8.35	9.88*	11.56*	13.28*	15.94*	18.25*	20.62*	30.72*	41.62*
	140	5.92	7.40	8.96	10.65*	12.50*	14.41*	17.39*	19.96*	22.61*	33.90*	46.09*
800	10	2.56	3.08	3.59	4.10*	4.65*	5.19*	5.97*	6.60*	7.22*	9.64*	11.99*
	20	3.20	3.86	4.50	5.15*	5.86*	6.56*	7.58*	8.42*	9.25*	12.53*	15.84*
	40	4.05	4.91	5.75	6.63*	7.58*	8.53*	9.93*	11.10*	12.28*	17.08*	22.10*
	60	4.68	5.70	6.71	7.78*	8.94*	10.10*	11.84*	13.31*	14.80*	21.01*	27.62*
	80	5.20	6.36	7.53	8.77*	10.12*	11.48*	13.55*	15.30*	17.09*	24.64*	32.74*
	100	5.66	6.95	8.26	9.66*	11.20*	12.75*	15.13*	17.16*	19.24*	28.07*	37.58*
	120	6.06	7.49	8.94	10.50*	12.21*	13.95*	16.62*	18.93*	21.29*	31.35*	42.21*
	140	6.44	7.98	9.57	11.28*	13.16*	15.09*	18.06*	20.62*	23.26*	34.51*	46.65*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.31	0.40	0.49	0.58	0.67*	0.75*	0.89*	1.00*	1.11*	1.55*	1.99*
	20	0.34	0.45	0.56	0.67	0.78*	0.89*	1.06*	1.20*	1.34*	1.91*	2.49*
	40	0.40	0.54	0.69	0.83	0.98*	1.13*	1.35*	1.54*	1.73*	2.52*	3.34*
	60	0.46	0.63	0.80	0.97	1.15*	1.33*	1.61*	1.84*	2.08*	3.06*	4.08*
	80	0.51	0.70	0.90	1.10	1.31*	1.52*	1.84*	2.12*	2.39*	3.55*	4.76*
	100	0.55	0.77	0.99	1.22	1.46*	1.70*	2.06*	2.37*	2.69*	4.01*	5.39*
	120	0.59	0.84	1.09	1.34	1.60*	1.87*	2.27*	2.62*	2.97*	4.45*	6.00*
	140	0.64	0.90	1.17	1.45	1.74*	2.03*	2.47*	2.86*	3.24*	4.87*	6.58*
25	10	0.44	0.53	0.62	0.71	0.80*	0.89*	1.03*	1.14*	1.25*	1.69*	2.12*
	20	0.50	0.60	0.71	0.81	0.92*	1.03*	1.20*	1.34*	1.47*	2.03*	2.61*
	40	0.58	0.71	0.84	0.97	1.11*	1.25*	1.47*	1.66*	1.85*	2.63*	3.43*
	60	0.65	0.79	0.95	1.11	1.27*	1.45*	1.72*	1.95*	2.18*	3.15*	4.16*
	80	0.70	0.87	1.04	1.23	1.42*	1.63*	1.95*	2.22*	2.49*	3.64*	4.84*
	100	0.75	0.93	1.13	1.35	1.57*	1.80*	2.16*	2.47*	2.78*	4.09*	5.47*
	120	0.79	1.00	1.22	1.46	1.70*	1.97*	2.37*	2.71*	3.06*	4.53*	6.08*
	140	0.84	1.06	1.30	1.56	1.84*	2.12*	2.56*	2.94*	3.33*	4.95*	6.66*
50	10	0.49	0.59	0.68	0.78	0.87*	0.97*	1.11*	1.23*	1.35*	1.80*	2.24*
	20	0.57	0.68	0.79	0.90	1.01*	1.12*	1.30*	1.44*	1.58*	2.15*	2.72*
	40	0.67	0.80	0.93	1.07	1.21*	1.36*	1.58*	1.77*	1.96*	2.73*	3.53*
	60	0.74	0.89	1.05	1.21	1.38*	1.56*	1.82*	2.05*	2.28*	3.25*	4.25*
	80	0.80	0.98	1.15	1.34	1.53*	1.73*	2.05*	2.32*	2.59*	3.72*	4.92*
	100	0.86	1.05	1.25	1.45	1.67*	1.90*	2.26*	2.56*	2.88*	4.18*	5.55*
	120	0.91	1.12	1.33	1.56	1.80*	2.06*	2.46*	2.80*	3.15*	4.61*	6.15*
	140	0.96	1.18	1.42	1.67	1.93*	2.22*	2.65*	3.03*	3.41*	5.02*	6.73*
100	10	0.56	0.66	0.77	0.87	0.97*	1.07*	1.23*	1.36*	1.48*	1.96*	2.42*
	20	0.65	0.77	0.89	1.01	1.13*	1.25*	1.44*	1.59*	1.74*	2.33*	2.91*
	40	0.78	0.92	1.07	1.21	1.36*	1.52*	1.75*	1.94*	2.14*	2.92*	3.72*
	60	0.87	1.03	1.20	1.37	1.54*	1.72*	2.00*	2.23*	2.47*	3.43*	4.42*
	80	0.94	1.13	1.32	1.50	1.70*	1.91*	2.23*	2.50*	2.77*	3.90*	5.08*
	100	1.01	1.21	1.42	1.63	1.84*	2.08*	2.44*	2.74*	3.05*	4.34*	5.70*
	120	1.07	1.29	1.51	1.74	1.98*	2.24*	2.64*	2.97*	3.32*	4.77*	6.30*
	140	1.13	1.36	1.60	1.85	2.11*	2.39*	2.83*	3.20*	3.58*	5.17*	6.87*
150	10	0.60	0.71	0.82	0.93	1.04*	1.15*	1.31*	1.45*	1.58*	2.08*	2.56*
	20	0.71	0.84	0.97	1.09	1.22*	1.35*	1.55*	1.71*	1.86*	2.48*	3.07*
	40	0.85	1.01	1.16	1.32	1.47*	1.64*	1.88*	2.08*	2.28*	3.08*	3.89*
	60	0.96	1.13	1.31	1.49	1.66*	1.86*	2.15*	2.39*	2.63*	3.59*	4.59*
	80	1.05	1.24	1.44	1.63	1.83*	2.05*	2.38*	2.65*	2.93*	4.06*	5.24*
	100	1.12	1.33	1.55	1.76	1.99*	2.23*	2.59*	2.90*	3.21*	4.50*	5.86*
	120	1.19	1.42	1.65	1.88	2.13*	2.39*	2.79*	3.14*	3.48*	4.92*	6.44*
	140	1.25	1.49	1.74	2.00	2.26*	2.55*	2.99*	3.36*	3.74*	5.32*	7.01*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.64	0.76	0.87	0.98	1.09*	1.21*	1.38*	1.52*	1.66*	2.18*	2.67*
	20	0.76	0.90	1.03	1.16	1.29*	1.43*	1.64*	1.80*	1.97*	2.60*	3.21*
	40	0.92	1.08	1.24	1.40	1.56*	1.73*	1.99*	2.20*	2.41*	3.23*	4.04*
	60	1.03	1.22	1.40	1.59	1.77*	1.97*	2.27*	2.52*	2.76*	3.75*	4.75*
	80	1.13	1.33	1.54	1.74	1.95*	2.17*	2.51*	2.79*	3.07*	4.21*	5.40*
	100	1.21	1.43	1.66	1.88	2.11*	2.36*	2.73*	3.04*	3.36*	4.65*	6.01*
	120	1.28	1.52	1.76	2.00	2.25*	2.52*	2.94*	3.28*	3.63*	5.07*	6.59*
	140	1.35	1.60	1.86	2.12	2.39*	2.68*	3.13*	3.51*	3.89*	5.47*	7.15*
300	10	0.71	0.83	0.95	1.07	1.19*	1.31*	1.50*	1.64*	1.79*	2.34*	2.86*
	20	0.84	0.99	1.13	1.27	1.41*	1.56*	1.78*	1.96*	2.13*	2.80*	3.45*
	40	1.02	1.20	1.37	1.54	1.71*	1.90*	2.17*	2.39*	2.61*	3.47*	4.32*
	60	1.15	1.35	1.55	1.74	1.94*	2.16*	2.47*	2.73*	2.99*	4.01*	5.04*
	80	1.26	1.48	1.70	1.92	2.13*	2.37*	2.73*	3.03*	3.32*	4.49*	5.69*
	100	1.36	1.59	1.83	2.07	2.31*	2.57*	2.96*	3.29*	3.62*	4.93*	6.29*
	120	1.44	1.69	1.95	2.20	2.46*	2.75*	3.18*	3.54*	3.89*	5.35*	6.87*
	140	1.51	1.78	2.06	2.33	2.61*	2.92*	3.38*	3.77*	4.15*	5.75*	7.42*
400	10	0.76	0.88	1.01	1.14	1.26*	1.39*	1.59*	1.74*	1.89*	2.47*	3.02*
	20	0.91	1.06	1.21	1.36	1.50*	1.66*	1.89*	2.08*	2.27*	2.97*	3.64*
	40	1.11	1.29	1.48	1.65	1.83*	2.03*	2.32*	2.55*	2.78*	3.68*	4.55*
	60	1.25	1.46	1.67	1.88	2.08*	2.31*	2.64*	2.91*	3.18*	4.24*	5.29*
	80	1.37	1.60	1.83	2.06	2.29*	2.54*	2.92*	3.22*	3.53*	4.73*	5.95*
	100	1.47	1.72	1.98	2.22	2.47*	2.75*	3.16*	3.50*	3.84*	5.18*	6.56*
	120	1.56	1.83	2.10	2.37	2.64*	2.94*	3.38*	3.75*	4.12*	5.61*	7.13*
	140	1.65	1.93	2.22	2.50	2.79*	3.11*	3.59*	3.99*	4.39*	6.01*	7.69*
600	10	0.84	0.98	1.11	1.25	1.38*	1.52*	1.73*	1.90*	2.07*	2.69*	3.27*
	20	1.01	1.18	1.34	1.50	1.66*	1.83*	2.08*	2.29*	2.49*	3.24*	3.96*
	40	1.24	1.44	1.64	1.84	2.03*	2.25*	2.56*	2.81*	3.06*	4.02*	4.95*
	60	1.41	1.64	1.87	2.09	2.31*	2.56*	2.92*	3.21*	3.50*	4.63*	5.73*
	80	1.54	1.80	2.05	2.29	2.54*	2.81*	3.22*	3.55*	3.87*	5.15*	6.41*
	100	1.66	1.94	2.21	2.47	2.74*	3.04*	3.48*	3.85*	4.20*	5.62*	7.03*
	120	1.77	2.06	2.35	2.64	2.92*	3.25*	3.73*	4.12*	4.51*	6.06*	7.62*
	140	1.86	2.17	2.48	2.79	3.09*	3.44*	3.95*	4.37*	4.79*	6.47*	8.17*
800	10	0.90	1.05	1.20	1.34	1.48*	1.63*	1.85*	2.03*	2.20*	2.86*	3.48*
	20	1.10	1.27	1.45	1.62	1.78*	1.97*	2.24*	2.45*	2.66*	3.47*	4.23*
	40	1.35	1.57	1.78	1.99	2.19*	2.42*	2.75*	3.02*	3.29*	4.30*	5.28*
	60	1.53	1.78	2.02	2.26	2.49*	2.76*	3.14*	3.45*	3.76*	4.95*	6.10*
	80	1.69	1.96	2.22	2.48	2.74*	3.04*	3.47*	3.82*	4.16*	5.50*	6.80*
	100	1.81	2.11	2.40	2.68	2.96*	3.28*	3.75*	4.13*	4.51*	5.99*	7.45*
	120	1.93	2.24	2.55	2.86	3.16*	3.50*	4.01*	4.42*	4.83*	6.44*	8.05*
	140	2.03	2.37	2.70	3.02	3.34*	3.71*	4.25*	4.69*	5.13*	6.87*	8.61*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.44	0.58	0.72	0.86	1.00*	1.13*	1.34*	1.52*	1.70*	2.40*	3.12*
	20	0.51	0.69	0.87	1.05	1.23*	1.41*	1.69*	1.93*	2.16*	3.13*	4.13*
	40	0.63	0.87	1.12	1.37	1.62*	1.88*	2.27*	2.61*	2.95*	4.35*	5.82*
	60	0.74	1.04	1.34	1.65	1.97*	2.29*	2.79*	3.21*	3.64*	5.42*	7.30*
	80	0.84	1.18	1.54	1.91	2.28*	2.67*	3.25*	3.76*	4.27*	6.40*	8.66*
	100	0.93	1.32	1.73	2.15	2.58*	3.02*	3.69*	4.27*	4.86*	7.33*	9.94*
	120	1.01	1.46	1.91	2.38	2.86*	3.36*	4.11*	4.76*	5.43*	8.20*	11.15*
	140	1.10	1.59	2.09	2.60	3.13*	3.68*	4.52*	5.23*	5.97*	9.05*	12.32*
25	10	0.63	0.76	0.89	1.02	1.16*	1.30*	1.51*	1.68*	1.85*	2.55*	3.26*
	20	0.73	0.88	1.05	1.21	1.38*	1.56*	1.84*	2.07*	2.30*	3.26*	4.25*
	40	0.87	1.07	1.29	1.52	1.76*	2.01*	2.40*	2.73*	3.06*	4.46*	5.92*
	60	0.98	1.23	1.50	1.79	2.09*	2.41*	2.90*	3.32*	3.74*	5.52*	7.39*
	80	1.07	1.37	1.69	2.04	2.40*	2.78*	3.36*	3.86*	4.37*	6.49*	8.74*
	100	1.16	1.50	1.88	2.27	2.69*	3.12*	3.79*	4.37*	4.95*	7.41*	10.02*
	120	1.25	1.63	2.05	2.50	2.97*	3.46*	4.21*	4.85*	5.52*	8.29*	11.23*
	140	1.33	1.75	2.22	2.72	3.23*	3.77*	4.61*	5.32*	6.05*	9.12*	12.39*
50	10	0.71	0.84	0.99	1.12	1.26*	1.41*	1.63*	1.80*	1.98*	2.68*	3.39*
	20	0.83	0.99	1.16	1.33	1.50*	1.69*	1.96*	2.19*	2.43*	3.38*	4.36*
	40	0.99	1.20	1.42	1.65	1.88*	2.13*	2.52*	2.84*	3.18*	4.56*	6.01*
	60	1.12	1.37	1.64	1.92	2.21*	2.52*	3.01*	3.42*	3.85*	5.61*	7.48*
	80	1.23	1.52	1.83	2.16	2.51*	2.89*	3.46*	3.96*	4.46*	6.58*	8.83*
	100	1.32	1.65	2.01	2.39	2.80*	3.23*	3.89*	4.46*	5.05*	7.50*	10.09*
	120	1.41	1.78	2.18	2.61	3.07*	3.56*	4.30*	4.95*	5.60*	8.37*	11.30*
	140	1.50	1.90	2.35	2.83	3.33*	3.87*	4.70*	5.41*	6.14*	9.20*	12.46*
100	10	0.81	0.96	1.11	1.26	1.41*	1.56*	1.80*	1.98*	2.17*	2.90*	3.63*
	20	0.96	1.14	1.32	1.50	1.68*	1.87*	2.16*	2.40*	2.64*	3.60*	4.58*
	40	1.16	1.38	1.61	1.85	2.08*	2.34*	2.73*	3.06*	3.39*	4.77*	6.21*
	60	1.31	1.57	1.85	2.13	2.42*	2.74*	3.22*	3.63*	4.05*	5.80*	7.65*
	80	1.44	1.74	2.05	2.38	2.72*	3.09*	3.66*	4.15*	4.66*	6.76*	8.99*
	100	1.55	1.88	2.24	2.61	3.00*	3.43*	4.09*	4.65*	5.23*	7.66*	10.25*
	120	1.65	2.02	2.41	2.83	3.27*	3.75*	4.49*	5.13*	5.78*	8.52*	11.45*
	140	1.74	2.15	2.58	3.04	3.53*	4.06*	4.88*	5.58*	6.31*	9.35*	12.60*
150	10	0.88	1.04	1.20	1.36	1.51*	1.68*	1.92*	2.12*	2.32*	3.08*	3.82*
	20	1.05	1.24	1.43	1.62	1.81*	2.02*	2.32*	2.57*	2.82*	3.80*	4.79*
	40	1.28	1.52	1.76	2.00	2.24*	2.51*	2.91*	3.25*	3.58*	4.96*	6.40*
	60	1.45	1.73	2.01	2.30	2.59*	2.92*	3.41*	3.82*	4.24*	5.98*	7.83*
	80	1.59	1.90	2.23	2.56	2.90*	3.28*	3.85*	4.34*	4.84*	6.93*	9.15*
	100	1.71	2.06	2.42	2.80	3.19*	3.61*	4.27*	4.83*	5.41*	7.83*	10.40*
	120	1.82	2.20	2.60	3.02	3.46*	3.93*	4.67*	5.30*	5.95*	8.68*	11.60*
	140	1.93	2.34	2.78	3.23	3.71*	4.24*	5.05*	5.75*	6.47*	9.51*	12.75*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.94	1.11	1.27	1.44	1.60*	1.77*	2.03*	2.23*	2.44*	3.22*	3.99*
	20	1.13	1.33	1.53	1.72	1.92*	2.13*	2.45*	2.71*	2.96*	3.97*	4.97*
	40	1.38	1.63	1.88	2.13	2.38*	2.66*	3.07*	3.41*	3.75*	5.14*	6.58*
	60	1.56	1.85	2.15	2.44	2.74*	3.07*	3.57*	3.99*	4.42*	6.16*	8.00*
	80	1.71	2.04	2.37	2.71	3.06*	3.44*	4.02*	4.52*	5.02*	7.10*	9.31*
	100	1.85	2.21	2.58	2.96	3.35*	3.78*	4.44*	5.01*	5.58*	7.99*	10.56*
	120	1.97	2.36	2.77	3.19	3.62*	4.10*	4.84*	5.47*	6.12*	8.84*	11.75*
	140	2.08	2.50	2.94	3.40	3.88*	4.41*	5.22*	5.92*	6.64*	9.66*	12.89*
300	10	1.03	1.21	1.39	1.57	1.74*	1.92*	2.20*	2.42*	2.63*	3.47*	4.26*
	20	1.25	1.46	1.68	1.89	2.10*	2.33*	2.66*	2.94*	3.21*	4.26*	5.30*
	40	1.53	1.80	2.07	2.34	2.60*	2.90*	3.33*	3.69*	4.05*	5.47*	6.92*
	60	1.74	2.05	2.37	2.68	2.99*	3.34*	3.86*	4.30*	4.73*	6.50*	8.33*
	80	1.92	2.27	2.62	2.97	3.33*	3.73*	4.33*	4.83*	5.34*	7.43*	9.63*
	100	2.07	2.45	2.84	3.23	3.63*	4.08*	4.76*	5.33*	5.90*	8.31*	10.86*
	120	2.20	2.62	3.04	3.47	3.92*	4.41*	5.16*	5.79*	6.44*	9.15*	12.04*
	140	2.33	2.77	3.23	3.70	4.18*	4.72*	5.54*	6.24*	6.95*	9.96*	13.17*
400	10	1.11	1.30	1.49	1.67	1.85*	2.05*	2.34*	2.57*	2.79*	3.67*	4.50*
	20	1.35	1.58	1.80	2.02	2.24*	2.49*	2.84*	3.13*	3.41*	4.51*	5.58*
	40	1.66	1.95	2.23	2.51	2.78*	3.09*	3.55*	3.92*	4.29*	5.76*	7.24*
	60	1.89	2.22	2.55	2.87	3.20*	3.57*	4.11*	4.55*	5.00*	6.80*	8.65*
	80	2.08	2.45	2.82	3.18	3.56*	3.97*	4.59*	5.11*	5.62*	7.74*	9.94*
	100	2.25	2.65	3.05	3.46	3.87*	4.34*	5.03*	5.61*	6.20*	8.61*	11.16*
	120	2.39	2.83	3.27	3.71	4.17*	4.67*	5.44*	6.08*	6.74*	9.45*	12.33*
	140	2.53	2.99	3.47	3.95	4.44*	4.99*	5.83*	6.53*	7.25*	10.25*	13.45*
600	10	1.24	1.44	1.64	1.84	2.03*	2.25*	2.56*	2.81*	3.06*	3.99*	4.88*
	20	1.51	1.76	2.00	2.24	2.48*	2.74*	3.13*	3.44*	3.74*	4.92*	6.05*
	40	1.87	2.18	2.49	2.78	3.08*	3.42*	3.91*	4.31*	4.71*	6.25*	7.78*
	60	2.13	2.49	2.85	3.19	3.54*	3.94*	4.51*	4.99*	5.46*	7.33*	9.22*
	80	2.35	2.75	3.14	3.53	3.93*	4.37*	5.03*	5.58*	6.12*	8.29*	10.52*
	100	2.54	2.97	3.41	3.84	4.27*	4.77*	5.50*	6.10*	6.71*	9.18*	11.73*
	120	2.70	3.17	3.64	4.11	4.59*	5.12*	5.93*	6.59*	7.26*	10.01*	12.89*
	140	2.85	3.35	3.86	4.36	4.88*	5.46*	6.33*	7.06*	7.79*	10.81*	14.00*
800	10	1.34	1.55	1.77	1.98	2.18*	2.41*	2.74*	3.01*	3.27*	4.26*	5.19*
	20	1.64	1.90	2.17	2.42	2.67*	2.95*	3.36*	3.69*	4.01*	5.25*	6.44*
	40	2.04	2.37	2.69	3.01	3.33*	3.68*	4.21*	4.63*	5.05*	6.67*	8.26*
	60	2.33	2.71	3.09	3.45	3.82*	4.24*	4.85*	5.35*	5.85*	7.79*	9.73*
	80	2.57	2.99	3.41	3.82	4.24*	4.71*	5.40*	5.97*	6.53*	8.78*	11.05*
	100	2.77	3.23	3.69	4.15	4.61*	5.12*	5.89*	6.52*	7.15*	9.68*	12.26*
	120	2.95	3.45	3.95	4.44	4.94*	5.50*	6.34*	7.03*	7.72*	10.52*	13.42*
	140	3.12	3.65	4.18	4.71	5.25*	5.85*	6.76*	7.51*	8.26*	11.33*	14.52*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.66	0.87	1.10	1.32	1.55*	1.77*	2.12*	2.41*	2.70*	3.90*	5.13*
	20	0.80	1.09	1.40	1.70	2.01*	2.33*	2.81*	3.22*	3.64*	5.35*	7.14*
	40	1.04	1.46	1.90	2.34	2.80*	3.27*	3.98*	4.59*	5.21*	7.79*	10.51*
	60	1.25	1.79	2.34	2.91	3.49*	4.08*	5.00*	5.78*	6.58*	9.93*	13.48*
	80	1.44	2.09	2.75	3.43	4.12*	4.84*	5.94*	6.88*	7.85*	11.90*	16.20*
	100	1.62	2.37	3.13	3.91	4.72*	5.54*	6.82*	7.92*	9.04*	13.74*	18.75*
	120	1.80	2.63	3.49	4.37	5.28*	6.22*	7.66*	8.90*	10.17*	15.50*	21.18*
	140	1.96	2.89	3.84	4.82	5.82*	6.86*	8.46*	9.84*	11.25*	17.18*	23.51*
25	10	0.91	1.10	1.31	1.52	1.73*	1.95*	2.29*	2.58*	2.87*	4.05*	5.26*
	20	1.07	1.33	1.60	1.88	2.18*	2.49*	2.96*	3.36*	3.78*	5.47*	7.25*
	40	1.32	1.68	2.08	2.50	2.94*	3.40*	4.10*	4.71*	5.32*	7.90*	10.61*
	60	1.53	1.99	2.50	3.05	3.61*	4.20*	5.11*	5.89*	6.69*	10.03*	13.57*
	80	1.71	2.28	2.90	3.56	4.24*	4.95*	6.05*	6.99*	7.95*	11.99*	16.28*
	100	1.88	2.55	3.27	4.03	4.83*	5.65*	6.92*	8.01*	9.13*	13.83*	18.83*
	120	2.05	2.81	3.63	4.49	5.39*	6.32*	7.75*	8.99*	10.25*	15.58*	21.26*
	140	2.20	3.05	3.97	4.93	5.93*	6.96*	8.55*	9.93*	11.33*	17.26*	23.58*
50	10	1.03	1.23	1.45	1.66	1.87*	2.10*	2.44*	2.73*	3.02*	4.19*	5.40*
	20	1.22	1.48	1.76	2.03	2.32*	2.63*	3.10*	3.50*	3.91*	5.60*	7.37*
	40	1.50	1.86	2.24	2.65	3.07*	3.53*	4.23*	4.83*	5.44*	8.00*	10.71*
	60	1.72	2.17	2.66	3.18	3.74*	4.32*	5.23*	6.00*	6.80*	10.12*	13.66*
	80	1.92	2.45	3.05	3.68	4.35*	5.06*	6.15*	7.09*	8.05*	12.08*	16.36*
	100	2.10	2.72	3.41	4.16	4.94*	5.75*	7.02*	8.11*	9.22*	13.91*	18.91*
	120	2.26	2.97	3.76	4.61	5.49*	6.42*	7.85*	9.08*	10.34*	15.66*	21.33*
	140	2.42	3.22	4.10	5.04	6.03*	7.05*	8.65*	10.01*	11.42*	17.34*	23.66*
100	10	1.18	1.40	1.63	1.86	2.08*	2.32*	2.68*	2.98*	3.27*	4.46*	5.66*
	20	1.42	1.70	1.98	2.27	2.56*	2.88*	3.36*	3.76*	4.17*	5.84*	7.60*
	40	1.75	2.12	2.50	2.90	3.32*	3.77*	4.47*	5.06*	5.67*	8.21*	10.91*
	60	2.01	2.45	2.93	3.44	3.98*	4.55*	5.45*	6.22*	7.00*	10.31*	13.83*
	80	2.22	2.75	3.32	3.93	4.58*	5.28*	6.36*	7.29*	8.24*	12.25*	16.53*
	100	2.42	3.02	3.68	4.40	5.15*	5.96*	7.22*	8.30*	9.41*	14.08*	19.07*
	120	2.60	3.28	4.03	4.84	5.70*	6.62*	8.04*	9.26*	10.52*	15.82*	21.48*
	140	2.76	3.52	4.36	5.26	6.23*	7.25*	8.83*	10.19*	11.59*	17.49*	23.80*
150	10	1.29	1.53	1.77	2.00	2.24*	2.49*	2.87*	3.17*	3.48*	4.69*	5.91*
	20	1.56	1.86	2.16	2.45	2.75*	3.03*	3.57*	3.98*	4.39*	6.07*	7.82*
	40	1.93	2.32	2.71	3.12	3.54*	3.99*	4.69*	5.28*	5.89*	8.42*	11.10*
	60	2.21	2.68	3.16	3.67	4.19*	4.77*	5.66*	6.43*	7.21*	10.50*	14.01*
	80	2.45	2.99	3.56	4.16	4.80*	5.49*	6.56*	7.48*	8.43*	12.43*	16.69*
	100	2.66	3.27	3.92	4.62	5.36*	6.16*	7.41*	8.49*	9.59*	14.25*	19.22*
	120	2.85	3.53	4.27	5.06	5.90*	6.81*	8.23*	9.44*	10.69*	15.98*	21.63*
	140	3.03	3.78	4.60	5.48	6.42*	7.43*	9.01*	10.36*	11.76*	17.64*	23.94*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.38	1.63	1.88	2.12	2.37*	2.63*	3.02*	3.34*	3.66*	4.90*	6.13*
	20	1.68	1.99	2.30	2.60	2.91*	3.25*	3.76*	4.18*	4.60*	6.29*	8.04*
	40	2.08	2.48	2.89	3.30	3.72*	4.19*	4.90*	5.49*	6.10*	8.62*	11.29*
	60	2.39	2.86	3.36	3.86	4.39*	4.98*	5.87*	6.63*	7.41*	10.69*	14.18*
	80	2.64	3.19	3.77	4.37	5.00*	5.69*	6.76*	7.68*	8.62*	12.60*	16.86*
	100	2.86	3.48	4.14	4.83	5.56*	6.36*	7.60*	8.67*	9.77*	14.41*	19.38*
	120	3.07	3.75	4.49	5.27	6.10*	7.00*	8.41*	9.62*	10.87*	16.14*	21.78*
	140	3.26	4.01	4.82	5.69	6.62*	7.62*	9.19*	10.54*	11.93*	17.80*	24.09*
300	10	1.53	1.80	2.06	2.32	2.58*	2.86*	3.28*	3.61*	3.95*	5.24*	6.52*
	20	1.87	2.20	2.53	2.85	3.18*	3.54*	4.07*	4.51*	4.94*	6.68*	8.45*
	40	2.33	2.75	3.18	3.61	4.04*	4.53*	5.26*	5.87*	6.48*	9.01*	11.67*
	60	2.66	3.17	3.68	4.20	4.74*	5.34*	6.24*	7.01*	7.79*	11.05*	14.53*
	80	2.95	3.52	4.12	4.72	5.36*	6.06*	7.14*	8.05*	8.99*	12.95*	17.18*
	100	3.20	3.84	4.51	5.20	5.93*	6.73*	7.97*	9.04*	10.13*	14.74*	19.69*
	120	3.42	4.13	4.87	5.65	6.47*	7.37*	8.77*	9.98*	11.21*	16.45*	22.07*
	140	3.63	4.40	5.21	6.07	6.98*	7.98*	9.54*	10.88*	12.26*	18.10*	24.37*
400	10	1.65	1.93	2.21	2.48	2.75*	3.05*	3.49*	3.84*	4.19*	5.54*	6.85*
	20	2.02	2.37	2.72	3.06	3.40*	3.77*	4.33*	4.79*	5.24*	7.03*	8.82*
	40	2.52	2.97	3.42	3.86	4.31*	4.82*	5.57*	6.19*	6.82*	9.38*	12.04*
	60	2.89	3.42	3.95	4.49	5.04*	5.65*	6.58*	7.36*	8.14*	11.41*	14.87*
	80	3.20	3.80	4.41	5.03	5.68*	6.39*	7.48*	8.40*	9.35*	13.29*	17.50*
	100	3.47	4.13	4.82	5.52	6.26*	7.07*	8.32*	9.38*	10.47*	15.07*	19.99*
	120	3.71	4.44	5.20	5.98	6.80*	7.71*	9.12*	10.32*	11.55*	16.77*	22.37*
	140	3.93	4.72	5.55	6.41	7.32*	8.33*	9.88*	11.21*	12.59*	18.40*	24.65*
600	10	1.84	2.14	2.45	2.74	3.03*	3.36*	3.83*	4.21*	4.58*	6.02*	7.41*
	20	2.27	2.65	3.02	3.39	3.75*	4.16*	4.76*	5.25*	5.73*	7.61*	9.47*
	40	2.84	3.32	3.80	4.28	4.76*	5.30*	6.09*	6.75*	7.41*	10.03*	12.72*
	60	3.26	3.83	4.40	4.96	5.54*	6.19*	7.16*	7.96*	8.77*	12.08*	15.54*
	80	3.61	4.25	4.90	5.55	6.22*	6.96*	8.09*	9.03*	9.99*	13.95*	18.14*
	100	3.91	4.62	5.34	6.07	6.82*	7.67*	8.94*	10.02*	11.12*	15.70*	20.60*
	120	4.18	4.95	5.75	6.55	7.39*	8.32*	9.75*	10.96*	12.19*	17.38*	22.95*
	140	4.42	5.26	6.12	7.00	7.92*	8.95*	10.51*	11.85*	13.22*	19.00*	25.22*
800	10	1.99	2.32	2.64	2.95	3.26*	3.60*	4.10*	4.51*	4.90*	6.42*	7.87*
	20	2.47	2.87	3.27	3.66	4.04*	4.48*	5.11*	5.63*	6.13*	8.10*	10.03*
	40	3.10	3.61	4.12	4.62	5.13*	5.69*	6.53*	7.22*	7.90*	10.61*	13.35*
	60	3.56	4.16	4.76	5.35	5.96*	6.64*	7.65*	8.48*	9.32*	12.69*	16.17*
	80	3.94	4.61	5.30	5.98	6.67*	7.45*	8.61*	9.58*	10.56*	14.56*	18.76*
	100	4.26	5.01	5.77	6.53	7.30*	8.18*	9.49*	10.59*	11.71*	16.31*	21.20*
	120	4.56	5.37	6.20	7.03	7.89*	8.85*	10.31*	11.54*	12.79*	17.98*	23.53*
	140	4.83	5.70	6.60	7.50	8.44*	9.49*	11.09*	12.44*	13.82*	19.59*	25.78*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.01	1.37	1.74	2.12	2.51*	2.90*	3.49*	3.99*	4.50*	6.59*	8.77*
	20	1.29	1.81	2.34	2.89	3.44*	4.01*	4.88*	5.61*	6.37*	9.50*	12.79*
	40	1.77	2.55	3.35	4.17	5.01*	5.88*	7.21*	8.35*	9.51*	14.38*	19.55*
	60	2.19	3.20	4.23	5.30	6.39*	7.52*	9.25*	10.74*	12.26*	18.66*	25.47*
	80	2.58	3.80	5.05	6.33	7.66*	9.02*	11.13*	12.94*	14.79*	22.59*	30.92*
	100	2.94	4.36	5.81	7.30	8.85*	10.44*	12.89*	15.00*	17.17*	26.28*	36.02*
	120	3.29	4.89	6.53	8.23	9.98*	11.78*	14.57*	16.96*	19.42*	29.79*	40.88*
	140	3.62	5.40	7.23	9.11	11.06*	13.07*	16.17*	18.85*	21.59*	33.16*	45.54*
25	10	1.34	1.65	1.99	2.34	2.70*	3.08*	3.66*	4.16*	4.66*	6.74*	8.91*
	20	1.63	2.07	2.56	3.07	3.61*	4.16*	5.02*	5.76*	6.51*	9.62*	12.91*
	40	2.09	2.78	3.53	4.33	5.15*	6.01*	7.33*	8.47*	9.63*	14.49*	19.65*
	60	2.49	3.41	4.40	5.44	6.52*	7.64*	9.37*	10.85*	12.37*	18.76*	25.56*
	80	2.86	3.99	5.20	6.46	7.78*	9.13*	11.23*	13.04*	14.89*	22.68*	31.00*
	100	3.21	4.54	5.95	7.43	8.96*	10.54*	12.99*	15.10*	17.26*	26.37*	36.10*
	120	3.54	5.06	6.67	8.35	10.08*	11.88*	14.66*	17.06*	19.51*	29.87*	40.96*
	140	3.86	5.57	7.36	9.23	11.16*	13.16*	16.27*	18.94*	21.67*	33.24*	45.61*
50	10	1.51	1.84	2.17	2.52	2.87*	3.25*	3.83*	4.33*	4.82*	6.89*	9.05*
	20	1.85	2.28	2.75	3.25	3.77*	4.32*	5.17*	5.90*	6.64*	9.75*	13.02*
	40	2.34	2.99	3.71	4.48	5.29*	6.14*	7.46*	8.59*	9.74*	14.59*	19.74*
	60	2.75	3.61	4.56	5.58	6.64*	7.76*	9.48*	10.96*	12.47*	18.85*	25.65*
	80	3.12	4.18	5.35	6.59	7.89*	9.24*	11.34*	13.14*	14.99*	22.77*	31.08*
	100	3.46	4.72	6.10	7.55	9.07*	10.65*	13.09*	15.19*	17.35*	26.45*	36.18*
	120	3.79	5.24	6.81	8.46	10.19*	11.98*	14.76*	17.15*	19.60*	29.95*	41.03*
	140	4.10	5.73	7.49	9.34	11.26*	13.26*	16.36*	19.02*	21.76*	33.31*	45.68*
100	10	1.75	2.09	2.44	2.80	3.16*	3.55*	4.14*	4.63*	5.13*	7.18*	9.32*
	20	2.14	2.59	3.06	3.55	4.06*	4.61*	5.46*	6.18*	6.91*	9.99*	13.25*
	40	2.70	3.34	4.04	4.77	5.56*	6.40*	7.70*	8.82*	9.97*	14.80*	19.94*
	60	3.14	3.97	4.88	5.85	6.89*	7.99*	9.70*	11.17*	12.68*	19.04*	25.83*
	80	3.53	4.53	5.65	6.85	8.12*	9.47*	11.55*	13.34*	15.18*	22.95*	31.25*
	100	3.89	5.07	6.38	7.80	9.29*	10.86*	13.29*	15.39*	17.54*	26.62*	36.34*
	120	4.22	5.57	7.08	8.70	10.40*	12.18*	14.95*	17.33*	19.78*	30.11*	41.18*
	140	4.54	6.06	7.76	9.57	11.47*	13.45*	16.54*	19.20*	21.93*	33.47*	45.83*
150	10	1.92	2.28	2.65	3.02	3.39*	3.79*	4.39*	4.89*	5.40*	7.45*	9.59*
	20	2.36	2.83	3.31	3.81	4.32*	4.87*	5.72*	6.44*	7.18*	10.24*	13.48*
	40	2.97	3.62	4.32	5.05	5.82*	6.65*	7.95*	9.06*	10.20*	15.01*	20.14*
	60	3.45	4.27	5.16	6.12	7.13*	8.23*	9.93*	11.39*	12.89*	19.23*	26.01*
	80	3.86	4.85	5.93	7.10	8.35*	9.68*	11.76*	13.54*	15.38*	23.12*	31.41*
	100	4.23	5.38	6.66	8.04	9.50*	11.06*	13.49*	15.58*	17.72*	26.79*	36.49*
	120	4.58	5.89	7.35	8.93	10.61*	12.38*	15.14*	17.51*	19.96*	30.27*	41.33*
	140	4.90	6.37	8.02	9.79	11.67*	13.65*	16.72*	19.38*	22.10*	33.62*	45.97*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.06	2.43	2.82	3.20	3.58*	3.99*	4.61*	5.13*	5.64*	7.71*	9.84*
	20	2.54	3.02	3.52	4.02	4.54*	5.11*	5.97*	6.69*	7.42*	10.48*	13.71*
	40	3.20	3.86	4.56	5.29	6.05*	6.89*	8.18*	9.29*	10.43*	15.22*	20.33*
	60	3.71	4.53	5.42	6.36	7.36*	8.45*	10.15*	11.60*	13.10*	19.42*	26.18*
	80	4.14	5.13	6.20	7.35	8.57*	9.90*	11.96*	13.74*	15.57*	23.30*	31.58*
	100	4.53	5.67	6.92	8.27	9.72*	11.27*	13.68*	15.77*	17.91*	26.95*	36.65*
	120	4.89	6.18	7.61	9.16	10.81*	12.58*	15.33*	17.70*	20.13*	30.43*	41.48*
	140	5.22	6.66	8.27	10.01	11.87*	13.84*	16.90*	19.55*	22.27*	33.78*	46.12*
300	10	2.28	2.69	3.09	3.49	3.89*	4.33*	4.98*	5.52*	6.05*	8.18*	10.33*
	20	2.82	3.34	3.86	4.39	4.92*	5.51*	6.39*	7.13*	7.88*	10.94*	14.16*
	40	3.56	4.26	4.98	5.72	6.49*	7.33*	8.63*	9.74*	10.87*	15.63*	20.72*
	60	4.12	4.98	5.88	6.81	7.80*	8.89*	10.57*	12.02*	13.51*	19.80*	26.53*
	80	4.60	5.60	6.67	7.80	9.01*	10.32*	12.37*	14.14*	15.96*	23.65*	31.90*
	100	5.02	6.16	7.40	8.72	10.14*	11.68*	14.07*	16.14*	18.27*	27.29*	36.96*
	120	5.40	6.69	8.09	9.60	11.22*	12.97*	15.70*	18.06*	20.48*	30.75*	41.78*
	140	5.76	7.18	8.75	10.45	12.26*	14.22*	17.27*	19.90*	22.61*	34.08*	46.40*
400	10	2.46	2.89	3.32	3.73	4.15*	4.61*	5.29*	5.85*	6.40*	8.59*	10.77*
	20	3.06	3.60	4.15	4.69	5.24*	5.85*	6.77*	7.52*	8.28*	11.38*	14.60*
	40	3.86	4.59	5.33	6.08	6.86*	7.73*	9.04*	10.15*	11.29*	16.03*	21.10*
	60	4.47	5.35	6.27	7.21	8.20*	9.30*	10.98*	12.43*	13.91*	20.17*	26.88*
	80	4.98	6.00	7.08	8.21	9.41*	10.73*	12.77*	14.53*	16.34*	24.00*	32.23*
	100	5.42	6.59	7.83	9.14	10.54*	12.07*	14.46*	16.52*	18.63*	27.62*	37.27*
	120	5.83	7.13	8.53	10.02	11.61*	13.35*	16.07*	18.42*	20.83*	31.07*	42.07*
	140	6.21	7.64	9.19	10.86	12.65*	14.59*	17.62*	20.25*	22.94*	34.39*	46.69*
600	10	2.76	3.22	3.68	4.13	4.57*	5.07*	5.80*	6.40*	6.99*	9.28*	11.55*
	20	3.43	4.02	4.61	5.19	5.77*	6.42*	7.39*	8.19*	8.98*	12.16*	15.42*
	40	4.35	5.12	5.91	6.70	7.50*	8.41*	9.76*	10.90*	12.05*	16.82*	21.86*
	60	5.03	5.96	6.92	7.89	8.90*	10.02*	11.74*	13.19*	14.67*	20.90*	27.58*
	80	5.59	6.67	7.79	8.93	10.13*	11.47*	13.52*	15.28*	17.08*	24.69*	32.88*
	100	6.09	7.30	8.57	9.88	11.27*	12.82*	15.20*	17.24*	19.35*	28.28*	37.89*
	120	6.53	7.88	9.29	10.78	12.35*	14.09*	16.79*	19.12*	21.52*	31.70*	42.67*
	140	6.95	8.42	9.98	11.62	13.38*	15.32*	18.33*	20.93*	23.61*	35.00*	47.26*
800	10	2.99	3.48	3.97	4.45	4.92*	5.45*	6.22*	6.85*	7.47*	9.87*	12.21*
	20	3.74	4.36	4.99	5.59	6.21*	6.90*	7.91*	8.74*	9.57*	12.85*	16.16*
	40	4.74	5.56	6.39	7.21	8.04*	8.98*	10.39*	11.56*	12.73*	17.55*	22.59*
	60	5.48	6.46	7.46	8.46	9.50*	10.66*	12.41*	13.88*	15.38*	21.62*	28.26*
	80	6.09	7.22	8.37	9.55	10.77*	12.13*	14.21*	15.98*	17.78*	25.38*	33.53*
	100	6.63	7.89	9.19	10.53	11.93*	13.49*	15.89*	17.94*	20.04*	28.93*	38.50*
	120	7.11	8.50	9.95	11.44	13.02*	14.77*	17.48*	19.81*	22.19*	32.33*	43.25*
	140	7.55	9.07	10.65	12.31	14.05*	16.00*	19.01*	21.60*	24.27*	35.60*	47.83*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.36	0.44	0.53	0.62	0.71	0.80*	0.93*	1.04*	1.15*	1.59*	2.03*
	20	0.40	0.50	0.61	0.72	0.83	0.94*	1.11*	1.25*	1.39*	1.96*	2.54*
	40	0.47	0.61	0.75	0.90	1.05	1.19*	1.42*	1.61*	1.80*	2.59*	3.41*
	60	0.53	0.70	0.87	1.05	1.23	1.41*	1.69*	1.93*	2.16*	3.15*	4.17*
	80	0.59	0.78	0.99	1.19	1.40	1.62*	1.94*	2.22*	2.50*	3.66*	4.87*
	100	0.64	0.86	1.09	1.33	1.56	1.80*	2.17*	2.49*	2.81*	4.13*	5.52*
	120	0.69	0.94	1.19	1.45	1.72	1.98*	2.40*	2.75*	3.10*	4.59*	6.15*
	140	0.74	1.01	1.29	1.57	1.86	2.16*	2.61*	2.99*	3.39*	5.02*	6.75*
25	10	0.50	0.59	0.67	0.76	0.85	0.94*	1.07*	1.18*	1.29*	1.73*	2.16*
	20	0.57	0.67	0.77	0.88	0.98	1.08*	1.25*	1.39*	1.53*	2.09*	2.66*
	40	0.67	0.79	0.92	1.05	1.18	1.32*	1.54*	1.73*	1.92*	2.70*	3.51*
	60	0.74	0.88	1.03	1.19	1.36	1.53*	1.80*	2.03*	2.27*	3.24*	4.26*
	80	0.80	0.96	1.14	1.33	1.52	1.73*	2.04*	2.32*	2.59*	3.74*	4.95*
	100	0.86	1.04	1.24	1.46	1.68	1.91*	2.27*	2.58*	2.90*	4.22*	5.60*
	120	0.91	1.11	1.34	1.58	1.83	2.08*	2.49*	2.84*	3.19*	4.67*	6.22*
	140	0.96	1.18	1.43	1.69	1.97	2.25*	2.70*	3.08*	3.47*	5.10*	6.82*
50	10	0.56	0.65	0.74	0.84	0.93	1.02*	1.16*	1.27*	1.39*	1.84*	2.28*
	20	0.65	0.75	0.86	0.97	1.07	1.18*	1.35*	1.49*	1.63*	2.20*	2.77*
	40	0.76	0.89	1.02	1.16	1.29	1.43*	1.65*	1.84*	2.03*	2.80*	3.60*
	60	0.85	0.99	1.15	1.31	1.47	1.64*	1.91*	2.14*	2.37*	3.34*	4.35*
	80	0.92	1.09	1.26	1.45	1.64	1.83*	2.15*	2.42*	2.69*	3.83*	5.03*
	100	0.98	1.17	1.37	1.57	1.79	2.01*	2.37*	2.68*	2.99*	4.30*	5.68*
	120	1.04	1.24	1.46	1.69	1.93	2.18*	2.58*	2.93*	3.28*	4.75*	6.30*
	140	1.10	1.32	1.55	1.81	2.07	2.35*	2.79*	3.17*	3.56*	5.18*	6.89*
100	10	0.64	0.73	0.83	0.93	1.03	1.12*	1.28*	1.40*	1.53*	2.00*	2.46*
	20	0.74	0.85	0.97	1.09	1.20	1.31*	1.50*	1.65*	1.80*	2.39*	2.97*
	40	0.88	1.02	1.16	1.31	1.45	1.59*	1.82*	2.02*	2.21*	2.99*	3.79*
	60	0.99	1.15	1.31	1.48	1.65	1.81*	2.09*	2.32*	2.56*	3.52*	4.52*
	80	1.08	1.25	1.44	1.63	1.82	2.01*	2.33*	2.60*	2.87*	4.00*	5.20*
	100	1.16	1.35	1.55	1.76	1.97	2.19*	2.55*	2.86*	3.17*	4.46*	5.83*
	120	1.22	1.43	1.66	1.88	2.12	2.36*	2.76*	3.10*	3.45*	4.90*	6.44*
	140	1.29	1.51	1.75	2.00	2.26	2.53*	2.96*	3.34*	3.72*	5.33*	7.03*
150	10	0.69	0.79	0.90	1.00	1.10	1.20*	1.37*	1.50*	1.63*	2.13*	2.60*
	20	0.81	0.93	1.06	1.18	1.30	1.42*	1.61*	1.77*	1.92*	2.53*	3.13*
	40	0.97	1.12	1.27	1.42	1.57	1.71*	1.96*	2.16*	2.36*	3.16*	3.96*
	60	1.09	1.26	1.43	1.61	1.78	1.95*	2.24*	2.48*	2.72*	3.69*	4.69*
	80	1.19	1.38	1.57	1.77	1.96	2.16*	2.48*	2.76*	3.03*	4.17*	5.35*
	100	1.28	1.48	1.69	1.91	2.12	2.34*	2.71*	3.02*	3.33*	4.62*	5.99*
	120	1.36	1.58	1.81	2.04	2.28	2.52*	2.92*	3.26*	3.61*	5.06*	6.59*
	140	1.43	1.66	1.91	2.16	2.42	2.68*	3.12*	3.50*	3.88*	5.48*	7.17*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	0.73	0.84	0.95	1.06	1.17	1.27*	1.44*	1.58*	1.71*	2.23*	2.72*
	20	0.87	0.99	1.12	1.25	1.38	1.50*	1.70*	1.87*	2.03*	2.66*	3.27*
	40	1.05	1.20	1.36	1.51	1.67	1.82*	2.07*	2.28*	2.49*	3.31*	4.12*
	60	1.18	1.35	1.53	1.71	1.89	2.07*	2.36*	2.61*	2.86*	3.84*	4.85*
	80	1.29	1.48	1.68	1.88	2.08	2.28*	2.62*	2.90*	3.18*	4.32*	5.51*
	100	1.38	1.59	1.81	2.03	2.25	2.47*	2.85*	3.16*	3.48*	4.78*	6.14*
	120	1.47	1.69	1.93	2.17	2.41	2.65*	3.07*	3.41*	3.76*	5.21*	6.73*
	140	1.54	1.79	2.04	2.30	2.56	2.82*	3.27*	3.65*	4.03*	5.62*	7.31*
300	10	0.80	0.92	1.04	1.15	1.26	1.37*	1.55*	1.70*	1.84*	2.39*	2.91*
	20	0.96	1.09	1.23	1.37	1.50	1.63*	1.85*	2.02*	2.20*	2.87*	3.51*
	40	1.17	1.33	1.50	1.66	1.83	1.99*	2.26*	2.48*	2.70*	3.56*	4.40*
	60	1.32	1.50	1.70	1.89	2.07	2.26*	2.57*	2.83*	3.09*	4.11*	5.14*
	80	1.44	1.65	1.86	2.07	2.28	2.49*	2.85*	3.14*	3.43*	4.60*	5.80*
	100	1.55	1.77	2.00	2.24	2.47	2.70*	3.09*	3.42*	3.74*	5.06*	6.42*
	120	1.64	1.88	2.13	2.39	2.64	2.89*	3.32*	3.67*	4.03*	5.49*	7.02*
	140	1.73	1.99	2.25	2.52	2.79	3.06*	3.53*	3.91*	4.30*	5.91*	7.59*
400	10	0.86	0.98	1.10	1.23	1.34	1.46*	1.65*	1.80*	1.95*	2.53*	3.07*
	20	1.03	1.18	1.32	1.46	1.60	1.74*	1.97*	2.16*	2.34*	3.04*	3.71*
	40	1.26	1.43	1.61	1.79	1.96	2.12*	2.41*	2.64*	2.87*	3.77*	4.64*
	60	1.43	1.62	1.83	2.03	2.22	2.42*	2.75*	3.02*	3.29*	4.34*	5.39*
	80	1.56	1.78	2.01	2.23	2.45	2.66*	3.04*	3.34*	3.65*	4.85*	6.07*
	100	1.68	1.92	2.16	2.40	2.65	2.88*	3.29*	3.63*	3.97*	5.32*	6.69*
	120	1.78	2.04	2.30	2.56	2.82	3.08*	3.53*	3.90*	4.26*	5.75*	7.28*
	140	1.88	2.15	2.43	2.71	2.99	3.27*	3.75*	4.15*	4.54*	6.17*	7.85*
600	10	0.95	1.08	1.22	1.35	1.47	1.59*	1.80*	1.97*	2.13*	2.75*	3.33*
	20	1.15	1.31	1.46	1.62	1.77	1.92*	2.16*	2.37*	2.56*	3.32*	4.03*
	40	1.41	1.60	1.80	1.99	2.17	2.35*	2.66*	2.91*	3.16*	4.11*	5.04*
	60	1.60	1.82	2.04	2.26	2.47	2.68*	3.03*	3.33*	3.61*	4.74*	5.83*
	80	1.76	2.00	2.24	2.48	2.72	2.95*	3.35*	3.68*	4.00*	5.27*	6.53*
	100	1.89	2.15	2.42	2.68	2.94	3.19*	3.63*	3.99*	4.34*	5.76*	7.17*
	120	2.01	2.29	2.57	2.85	3.13	3.41*	3.88*	4.27*	4.66*	6.21*	7.77*
	140	2.12	2.41	2.72	3.02	3.31	3.61*	4.12*	4.54*	4.95*	6.63*	8.34*
800	10	1.03	1.16	1.30	1.44	1.58	1.70*	1.92*	2.10*	2.27*	2.93*	3.54*
	20	1.25	1.41	1.58	1.74	1.90	2.06*	2.32*	2.54*	2.75*	3.54*	4.30*
	40	1.54	1.74	1.95	2.15	2.34	2.53*	2.86*	3.13*	3.39*	4.40*	5.37*
	60	1.75	1.98	2.21	2.44	2.67	2.89*	3.27*	3.58*	3.88*	5.06*	6.21*
	80	1.92	2.17	2.43	2.69	2.94	3.18*	3.61*	3.95*	4.29*	5.63*	6.93*
	100	2.07	2.34	2.62	2.90	3.17	3.44*	3.90*	4.28*	4.66*	6.13*	7.59*
	120	2.20	2.49	2.80	3.09	3.39	3.67*	4.17*	4.58*	4.99*	6.60*	8.20*
	140	2.32	2.63	2.95	3.27	3.58	3.89*	4.42*	4.86*	5.30*	7.04*	8.78*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.51	0.64	0.78	0.92	1.06	1.20*	1.41*	1.58*	1.76*	2.47*	3.19*
	20	0.60	0.77	0.95	1.13	1.31	1.50*	1.78*	2.01*	2.25*	3.22*	4.22*
	40	0.74	0.98	1.23	1.48	1.74	2.00*	2.39*	2.73*	3.07*	4.48*	5.96*
	60	0.86	1.16	1.47	1.79	2.11	2.43*	2.93*	3.36*	3.79*	5.59*	7.48*
	80	0.97	1.33	1.70	2.07	2.45	2.84*	3.43*	3.94*	4.46*	6.61*	8.87*
	100	1.08	1.49	1.91	2.33	2.77	3.22*	3.90*	4.48*	5.08*	7.56*	10.18*
	120	1.18	1.64	2.11	2.59	3.08	3.58*	4.34*	5.00*	5.67*	8.47*	11.43*
	140	1.28	1.79	2.30	2.83	3.37	3.92*	4.77*	5.49*	6.24*	9.34*	12.63*
25	10	0.72	0.84	0.97	1.10	1.23	1.36*	1.57*	1.74*	1.92*	2.62*	3.33*
	20	0.83	0.98	1.14	1.31	1.48	1.65*	1.92*	2.15*	2.39*	3.34*	4.34*
	40	0.99	1.19	1.41	1.64	1.88	2.13*	2.52*	2.85*	3.19*	4.59*	6.05*
	60	1.12	1.37	1.64	1.94	2.24	2.55*	3.05*	3.47*	3.90*	5.68*	7.57*
	80	1.23	1.53	1.86	2.21	2.57	2.95*	3.54*	4.04*	4.55*	6.69*	8.96*
	100	1.34	1.68	2.06	2.47	2.89	3.32*	4.00*	4.58*	5.17*	7.64*	10.26*
	120	1.43	1.83	2.26	2.71	3.19	3.68*	4.44*	5.09*	5.76*	8.55*	11.50*
	140	1.53	1.96	2.44	2.95	3.48	4.02*	4.86*	5.58*	6.32*	9.41*	12.70*
50	10	0.81	0.94	1.07	1.21	1.34	1.48*	1.69*	1.87*	2.05*	2.75*	3.46*
	20	0.94	1.10	1.27	1.43	1.60	1.77*	2.05*	2.28*	2.51*	3.47*	4.45*
	40	1.13	1.34	1.55	1.78	2.01	2.25*	2.64*	2.97*	3.30*	4.69*	6.15*
	60	1.28	1.53	1.79	2.07	2.37	2.67*	3.16*	3.58*	4.00*	5.78*	7.65*
	80	1.40	1.69	2.01	2.34	2.69	3.06*	3.64*	4.14*	4.65*	6.78*	9.04*
	100	1.52	1.85	2.21	2.59	3.00	3.42*	4.10*	4.67*	5.26*	7.73*	10.34*
	120	1.62	1.99	2.40	2.84	3.30	3.78*	4.53*	5.18*	5.85*	8.63*	11.58*
	140	1.72	2.13	2.58	3.07	3.58	4.11*	4.95*	5.67*	6.41*	9.49*	12.77*
100	10	0.92	1.06	1.21	1.35	1.50	1.64*	1.87*	2.06*	2.24*	2.97*	3.69*
	20	1.09	1.26	1.44	1.62	1.79	1.97*	2.25*	2.49*	2.73*	3.69*	4.67*
	40	1.32	1.54	1.76	1.99	2.23	2.46*	2.85*	3.18*	3.52*	4.90*	6.34*
	60	1.49	1.75	2.02	2.30	2.59	2.88*	3.37*	3.78*	4.21*	5.97*	7.83*
	80	1.64	1.93	2.25	2.58	2.92	3.27*	3.84*	4.34*	4.84*	6.96*	9.20*
	100	1.77	2.10	2.45	2.83	3.22	3.63*	4.29*	4.86*	5.44*	7.89*	10.50*
	120	1.89	2.25	2.65	3.07	3.51	3.97*	4.72*	5.36*	6.02*	8.79*	11.73*
	140	2.00	2.40	2.83	3.30	3.79	4.30*	5.13*	5.84*	6.57*	9.64*	12.91*
150	10	1.00	1.15	1.31	1.46	1.61	1.76*	2.00*	2.20*	2.39*	3.15*	3.89*
	20	1.20	1.38	1.56	1.75	1.93	2.11*	2.42*	2.66*	2.91*	3.89*	4.88*
	40	1.46	1.68	1.92	2.16	2.40	2.64*	3.04*	3.37*	3.71*	5.09*	6.53*
	60	1.65	1.92	2.20	2.49	2.78	3.07*	3.56*	3.98*	4.40*	6.15*	8.00*
	80	1.81	2.12	2.44	2.77	3.11	3.46*	4.03*	4.53*	5.03*	7.13*	9.36*
	100	1.96	2.30	2.66	3.03	3.42	3.81*	4.48*	5.04*	5.62*	8.06*	10.65*
	120	2.09	2.46	2.86	3.27	3.71	4.16*	4.90*	5.54*	6.19*	8.94*	11.88*
	140	2.20	2.61	3.05	3.50	3.98	4.48*	5.31*	6.02*	6.74*	9.80*	13.05*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.07	1.23	1.39	1.55	1.70	1.86*	2.11*	2.31*	2.52*	3.30*	4.06*
	20	1.28	1.47	1.67	1.86	2.05	2.24*	2.55*	2.81*	3.06*	4.07*	5.07*
	40	1.57	1.81	2.05	2.30	2.54	2.79*	3.20*	3.54*	3.89*	5.28*	6.72*
	60	1.78	2.06	2.35	2.64	2.94	3.23*	3.73*	4.15*	4.58*	6.33*	8.17*
	80	1.96	2.27	2.60	2.94	3.28	3.62*	4.21*	4.70*	5.21*	7.30*	9.53*
	100	2.11	2.46	2.83	3.20	3.59	3.99*	4.65*	5.22*	5.80*	8.22*	10.80*
	120	2.25	2.63	3.03	3.45	3.89	4.33*	5.07*	5.71*	6.36*	9.10*	12.02*
	140	2.38	2.79	3.23	3.69	4.16	4.66*	5.48*	6.18*	6.91*	9.95*	13.20*
300	10	1.18	1.35	1.52	1.69	1.85	2.01*	2.28*	2.50*	2.72*	3.54*	4.34*
	20	1.42	1.63	1.83	2.04	2.24	2.44*	2.77*	3.04*	3.31*	4.36*	5.40*
	40	1.75	2.00	2.26	2.52	2.78	3.04*	3.47*	3.83*	4.18*	5.61*	7.06*
	60	1.99	2.28	2.59	2.90	3.20	3.51*	4.03*	4.46*	4.90*	6.67*	8.51*
	80	2.19	2.52	2.87	3.22	3.57	3.92*	4.52*	5.02*	5.53*	7.63*	9.84*
	100	2.36	2.73	3.11	3.50	3.89	4.29*	4.97*	5.54*	6.12*	8.54*	11.11*
	120	2.51	2.91	3.33	3.76	4.20	4.64*	5.40*	6.03*	6.69*	9.41*	12.32*
	140	2.66	3.09	3.54	4.01	4.49	4.97*	5.80*	6.51*	7.22*	10.25*	13.48*
400	10	1.27	1.44	1.62	1.80	1.98	2.14*	2.43*	2.66*	2.88*	3.75*	4.58*
	20	1.54	1.75	1.97	2.19	2.40	2.60*	2.95*	3.24*	3.52*	4.61*	5.68*
	40	1.90	2.16	2.44	2.71	2.98	3.24*	3.70*	4.07*	4.44*	5.90*	7.38*
	60	2.16	2.47	2.79	3.11	3.43	3.74*	4.28*	4.73*	5.17*	6.97*	8.83*
	80	2.37	2.72	3.09	3.45	3.81	4.17*	4.79*	5.31*	5.82*	7.94*	10.15*
	100	2.56	2.95	3.35	3.75	4.15	4.56*	5.25*	5.83*	6.42*	8.85*	11.41*
	120	2.73	3.15	3.58	4.02	4.47	4.92*	5.68*	6.33*	6.99*	9.71*	12.60*
	140	2.88	3.33	3.80	4.28	4.76	5.25*	6.09*	6.80*	7.53*	10.54*	13.76*
600	10	1.41	1.60	1.79	1.99	2.17	2.35*	2.66*	2.91*	3.15*	4.08*	4.96*
	20	1.72	1.95	2.19	2.42	2.65	2.87*	3.25*	3.56*	3.86*	5.03*	6.16*
	40	2.13	2.42	2.72	3.01	3.30	3.58*	4.07*	4.47*	4.86*	6.40*	7.93*
	60	2.43	2.77	3.11	3.46	3.79	4.12*	4.70*	5.17*	5.64*	7.52*	9.41*
	80	2.68	3.05	3.44	3.83	4.21	4.59*	5.24*	5.79*	6.33*	8.50*	10.74*
	100	2.89	3.30	3.73	4.16	4.58	5.00*	5.73*	6.34*	6.95*	9.42*	11.98*
	120	3.08	3.53	3.99	4.45	4.92	5.38*	6.18*	6.85*	7.52*	10.28*	13.17*
	140	3.25	3.73	4.23	4.73	5.23	5.74*	6.61*	7.33*	8.07*	11.10*	14.31*
800	10	1.52	1.72	1.93	2.14	2.33	2.52*	2.85*	3.11*	3.37*	4.35*	5.28*
	20	1.87	2.11	2.37	2.61	2.85	3.09*	3.49*	3.82*	4.14*	5.37*	6.55*
	40	2.32	2.63	2.95	3.26	3.56	3.86*	4.37*	4.79*	5.21*	6.83*	8.41*
	60	2.65	3.01	3.38	3.74	4.09	4.44*	5.05*	5.55*	6.04*	7.98*	9.92*
	80	2.92	3.32	3.73	4.14	4.54	4.93*	5.62*	6.19*	6.75*	9.00*	11.27*
	100	3.16	3.60	4.05	4.49	4.94	5.37*	6.14*	6.77*	7.40*	9.93*	12.52*
	120	3.37	3.84	4.33	4.81	5.29	5.77*	6.61*	7.30*	7.99*	10.80*	13.70*
	140	3.55	4.06	4.58	5.10	5.63	6.14*	7.05*	7.80*	8.55*	11.63*	14.84*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.76	0.97	1.20	1.42	1.65	1.88*	2.22*	2.52*	2.81*	4.01*	5.24*
	20	0.93	1.22	1.53	1.84	2.15	2.47*	2.96*	3.37*	3.79*	5.51*	7.30*
	40	1.21	1.64	2.09	2.54	3.00	3.47*	4.19*	4.81*	5.43*	8.03*	10.77*
	60	1.45	2.01	2.58	3.16	3.75	4.35*	5.28*	6.07*	6.88*	10.25*	13.81*
	80	1.68	2.35	3.03	3.72	4.43	5.16*	6.27*	7.23*	8.20*	12.28*	16.60*
	100	1.90	2.67	3.45	4.25	5.07	5.91*	7.21*	8.31*	9.44*	14.19*	19.23*
	120	2.10	2.97	3.85	4.76	5.68	6.63*	8.09*	9.35*	10.63*	16.00*	21.72*
	140	2.29	3.26	4.24	5.24	6.27	7.32*	8.95*	10.34*	11.76*	17.74*	24.11*
25	10	1.04	1.23	1.43	1.63	1.84	2.06*	2.40*	2.68*	2.97*	4.16*	5.38*
	20	1.23	1.48	1.75	2.03	2.33	2.63*	3.11*	3.51*	3.93*	5.63*	7.42*
	40	1.52	1.88	2.28	2.71	3.15	3.61*	4.32*	4.93*	5.55*	8.14*	10.87*
	60	1.76	2.23	2.75	3.31	3.88	4.47*	5.39*	6.18*	6.98*	10.34*	13.90*
	80	1.97	2.56	3.19	3.86	4.55	5.27*	6.38*	7.33*	8.30*	12.37*	16.69*
	100	2.18	2.86	3.61	4.38	5.19	6.02*	7.31*	8.41*	9.54*	14.27*	19.30*
	120	2.37	3.16	4.00	4.88	5.80	6.73*	8.19*	9.44*	10.72*	16.08*	21.79*
	140	2.55	3.44	4.38	5.36	6.38	7.42*	9.04*	10.43*	11.85*	17.82*	24.18*
50	10	1.17	1.37	1.58	1.79	2.00	2.21*	2.55*	2.84*	3.13*	4.30*	5.51*
	20	1.40	1.65	1.92	2.20	2.48	2.78*	3.25*	3.65*	4.06*	5.76*	7.53*
	40	1.72	2.07	2.46	2.86	3.29	3.74*	4.44*	5.05*	5.67*	8.24*	10.97*
	60	1.98	2.43	2.92	3.45	4.01	4.59*	5.50*	6.29*	7.09*	10.44*	13.99*
	80	2.20	2.75	3.35	4.00	4.68	5.38*	6.48*	7.43*	8.40*	12.46*	16.77*
	100	2.41	3.05	3.76	4.52	5.31	6.12*	7.41*	8.51*	9.63*	14.36*	19.38*
	120	2.61	3.34	4.15	5.01	5.91	6.83*	8.28*	9.53*	10.81*	16.16*	21.87*
	140	2.79	3.62	4.52	5.48	6.48	7.52*	9.13*	10.51*	11.93*	17.90*	24.25*
100	10	1.35	1.56	1.78	2.00	2.22	2.44*	2.79*	3.09*	3.39*	4.57*	5.78*
	20	1.62	1.89	2.17	2.45	2.74	3.03*	3.51*	3.91*	4.32*	6.00*	7.76*
	40	2.00	2.36	2.74	3.14	3.56	3.98*	4.68*	5.28*	5.89*	8.45*	11.16*
	60	2.29	2.74	3.22	3.73	4.26	4.82*	5.72*	6.50*	7.29*	10.63*	14.17*
	80	2.54	3.07	3.65	4.27	4.92	5.60*	6.69*	7.63*	8.59*	12.63*	16.93*
	100	2.77	3.38	4.05	4.77	5.54	6.33*	7.60*	8.70*	9.81*	14.52*	19.54*
	120	2.98	3.67	4.43	5.26	6.13	7.03*	8.47*	9.71*	10.98*	16.32*	22.02*
	140	3.17	3.94	4.80	5.72	6.70	7.71*	9.31*	10.69*	12.10*	18.05*	24.40*
150	10	1.47	1.70	1.93	2.16	2.39	2.61*	2.99*	3.29*	3.60*	4.81*	6.02*
	20	1.78	2.06	2.36	2.65	2.94	3.24*	3.73*	4.14*	4.55*	6.23*	7.99*
	40	2.21	2.58	2.97	3.37	3.79	4.21*	4.91*	5.51*	6.12*	8.66*	11.36*
	60	2.53	2.98	3.47	3.97	4.50	5.04*	5.94*	6.71*	7.50*	10.81*	14.34*
	80	2.80	3.33	3.91	4.51	5.15	5.81*	6.90*	7.83*	8.78*	12.81*	17.10*
	100	3.05	3.65	4.31	5.01	5.76	6.53*	7.80*	8.88*	10.00*	14.69*	19.69*
	120	3.27	3.95	4.69	5.49	6.34	7.23*	8.66*	9.89*	11.16*	16.48*	22.17*
	140	3.47	4.23	5.06	5.96	6.91	7.90*	9.49*	10.86*	12.27*	18.20*	24.54*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.58	1.81	2.05	2.29	2.53	2.76*	3.15*	3.46*	3.78*	5.01*	6.25*
	20	1.92	2.21	2.51	2.81	3.12	3.41*	3.92*	4.34*	4.76*	6.45*	8.21*
	40	2.38	2.76	3.16	3.57	3.99	4.41*	5.12*	5.72*	6.33*	8.86*	11.55*
	60	2.73	3.19	3.68	4.19	4.71	5.25*	6.15*	6.92*	7.70*	11.00*	14.52*
	80	3.02	3.55	4.13	4.73	5.36	6.01*	7.10*	8.02*	8.98*	12.98*	17.26*
	100	3.27	3.88	4.54	5.24	5.97	6.73*	7.99*	9.07*	10.18*	14.86*	19.85*
	120	3.51	4.19	4.93	5.72	6.55	7.42*	8.85*	10.07*	11.33*	16.64*	22.31*
	140	3.73	4.48	5.30	6.18	7.11	8.08*	9.67*	11.04*	12.44*	18.36*	24.68*
300	10	1.74	1.99	2.25	2.51	2.75	3.00*	3.41*	3.74*	4.07*	5.37*	6.64*
	20	2.13	2.44	2.76	3.08	3.40	3.71*	4.24*	4.68*	5.11*	6.85*	8.62*
	40	2.65	3.06	3.48	3.90	4.33	4.76*	5.49*	6.10*	6.71*	9.25*	11.93*
	60	3.04	3.53	4.03	4.55	5.08	5.62*	6.53*	7.30*	8.09*	11.37*	14.86*
	80	3.37	3.92	4.51	5.12	5.75	6.39*	7.48*	8.40*	9.35*	13.33*	17.59*
	100	3.65	4.28	4.95	5.64	6.36	7.11*	8.36*	9.44*	10.54*	15.19*	20.16*
	120	3.91	4.60	5.35	6.13	6.94	7.79*	9.21*	10.43*	11.68*	16.96*	22.61*
	140	4.14	4.90	5.72	6.59	7.50	8.45*	10.02*	11.38*	12.77*	18.66*	24.97*
400	10	1.88	2.14	2.41	2.68	2.94	3.19*	3.62*	3.98*	4.32*	5.66*	6.97*
	20	2.30	2.63	2.97	3.30	3.63	3.96*	4.51*	4.96*	5.41*	7.20*	8.99*
	40	2.87	3.30	3.74	4.18	4.62	5.06*	5.81*	6.43*	7.06*	9.62*	12.29*
	60	3.30	3.80	4.33	4.86	5.40	5.95*	6.87*	7.65*	8.44*	11.73*	15.21*
	80	3.65	4.23	4.83	5.45	6.09	6.73*	7.83*	8.76*	9.70*	13.67*	17.91*
	100	3.96	4.60	5.29	5.99	6.71	7.46*	8.71*	9.79*	10.89*	15.51*	20.47*
	120	4.23	4.95	5.70	6.49	7.30	8.14*	9.56*	10.77*	12.01*	17.27*	22.90*
	140	4.49	5.27	6.09	6.96	7.86	8.80*	10.37*	11.72*	13.10*	18.97*	25.25*
600	10	2.10	2.38	2.67	2.96	3.24	3.51*	3.98*	4.35*	4.73*	6.16*	7.54*
	20	2.58	2.94	3.30	3.66	4.01	4.36*	4.95*	5.44*	5.91*	7.79*	9.65*
	40	3.23	3.69	4.16	4.63	5.10	5.56*	6.35*	7.00*	7.66*	10.29*	12.99*
	60	3.71	4.26	4.82	5.38	5.94	6.50*	7.46*	8.27*	9.08*	12.40*	15.88*
	80	4.11	4.73	5.37	6.01	6.66	7.32*	8.45*	9.40*	10.36*	14.33*	18.55*
	100	4.46	5.14	5.86	6.58	7.32	8.07*	9.35*	10.44*	11.54*	16.15*	21.07*
	120	4.76	5.52	6.30	7.11	7.93	8.77*	10.20*	11.42*	12.66*	17.89*	23.49*
	140	5.05	5.86	6.72	7.60	8.50	9.43*	11.01*	12.36*	13.74*	19.56*	25.82*
800	10	2.27	2.57	2.88	3.19	3.48	3.77*	4.26*	4.66*	5.06*	6.56*	8.01*
	20	2.81	3.19	3.57	3.95	4.33	4.69*	5.31*	5.83*	6.33*	8.30*	10.22*
	40	3.53	4.01	4.51	5.00	5.49	5.97*	6.80*	7.49*	8.17*	10.88*	13.62*
	60	4.05	4.62	5.21	5.80	6.39	6.96*	7.97*	8.80*	9.64*	13.02*	16.51*
	80	4.49	5.13	5.80	6.48	7.15	7.82*	8.99*	9.96*	10.94*	14.95*	19.17*
	100	4.86	5.58	6.33	7.08	7.84	8.60*	9.91*	11.02*	12.14*	16.77*	21.67*
	120	5.20	5.98	6.80	7.63	8.47	9.31*	10.78*	12.01*	13.26*	18.49*	24.07*
	140	5.50	6.35	7.24	8.14	9.06	9.99*	11.60*	12.96*	14.34*	20.15*	26.38*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.17	1.53	1.91	2.29	2.68	3.07*	3.67*	4.17*	4.68*	6.79*	8.97*
	20	1.50	2.03	2.58	3.13	3.69	4.26*	5.14*	5.88*	6.64*	9.79*	13.10*
	40	2.07	2.87	3.69	4.53	5.39	6.26*	7.61*	8.76*	9.93*	14.84*	20.03*
	60	2.56	3.61	4.67	5.76	6.88	8.02*	9.78*	11.28*	12.82*	19.26*	26.12*
	80	3.02	4.29	5.57	6.89	8.24	9.63*	11.76*	13.59*	15.47*	23.33*	31.70*
	100	3.44	4.92	6.42	7.95	9.53	11.14*	13.63*	15.77*	17.95*	27.15*	36.95*
	120	3.85	5.53	7.22	8.96	10.75	12.58*	15.41*	17.83*	20.32*	30.77*	41.93*
	140	4.24	6.11	7.99	9.93	11.92	13.96*	17.11*	19.82*	22.59*	34.25*	46.71*
25	10	1.53	1.84	2.17	2.52	2.88	3.26*	3.84*	4.34*	4.85*	6.94*	9.11*
	20	1.87	2.31	2.80	3.32	3.86	4.42*	5.29*	6.03*	6.78*	9.91*	13.21*
	40	2.41	3.12	3.89	4.70	5.53	6.40*	7.73*	8.88*	10.05*	14.94*	20.13*
	60	2.88	3.83	4.85	5.91	7.01	8.14*	9.89*	11.39*	12.92*	19.36*	26.21*
	80	3.32	4.50	5.74	7.03	8.37	9.74*	11.87*	13.70*	15.57*	23.42*	31.78*
	100	3.73	5.12	6.58	8.09	9.65	11.25*	13.73*	15.86*	18.05*	27.23*	37.02*
	120	4.12	5.72	7.37	9.09	10.86	12.68*	15.50*	17.93*	20.41*	30.85*	42.01*
	140	4.50	6.29	8.14	10.05	12.03	14.06*	17.20*	19.90*	22.67*	34.33*	46.78*
50	10	1.73	2.04	2.37	2.72	3.07	3.43*	4.01*	4.51*	5.01*	7.08*	9.25*
	20	2.11	2.54	3.01	3.51	4.03	4.57*	5.43*	6.17*	6.92*	10.04*	13.33*
	40	2.69	3.35	4.08	4.86	5.68	6.53*	7.86*	9.00*	10.17*	15.05*	20.23*
	60	3.16	4.05	5.03	6.06	7.14	8.26*	10.00*	11.50*	13.03*	19.46*	26.29*
	80	3.60	4.70	5.90	7.17	8.49	9.85*	11.98*	13.80*	15.66*	23.51*	31.87*
	100	4.00	5.31	6.73	8.22	9.76	11.35*	13.83*	15.96*	18.14*	27.31*	37.10*
	120	4.39	5.90	7.52	9.22	10.97	12.78*	15.60*	18.02*	20.50*	30.94*	42.08*
	140	4.76	6.47	8.28	10.17	12.13	14.15*	17.29*	19.99*	22.76*	34.41*	46.86*
100	10	2.00	2.32	2.67	3.02	3.38	3.73*	4.32*	4.82*	5.32*	7.37*	9.52*
	20	2.45	2.89	3.35	3.84	4.35	4.87*	5.72*	6.45*	7.19*	10.29*	13.56*
	40	3.09	3.73	4.43	5.18	5.97	6.79*	8.11*	9.24*	10.40*	15.26*	20.43*
	60	3.61	4.44	5.36	6.36	7.40	8.49*	10.23*	11.71*	13.24*	19.65*	26.47*
	80	4.06	5.08	6.22	7.45	8.74	10.07*	12.19*	14.00*	15.86*	23.69*	32.03*
	100	4.47	5.69	7.04	8.48	9.99	11.56*	14.03*	16.15*	18.33*	27.48*	37.26*
	120	4.86	6.26	7.82	9.47	11.19	12.98*	15.79*	18.20*	20.67*	31.10*	42.23*
	140	5.23	6.82	8.56	10.42	12.35	14.35*	17.48*	20.17*	22.93*	34.56*	47.00*
150	10	2.19	2.53	2.89	3.26	3.62	3.98*	4.58*	5.09*	5.59*	7.65*	9.79*
	20	2.69	3.15	3.63	4.12	4.62	5.14*	5.99*	6.71*	7.45*	10.53*	13.79*
	40	3.40	4.04	4.74	5.47	6.24	7.04*	8.35*	9.47*	10.63*	15.47*	20.62*
	60	3.95	4.77	5.67	6.64	7.66	8.73*	10.45*	11.93*	13.45*	19.84*	26.65*
	80	4.43	5.42	6.53	7.72	8.98	10.29*	12.39*	14.20*	16.05*	23.86*	32.20*
	100	4.86	6.03	7.33	8.74	10.22	11.77*	14.23*	16.34*	18.51*	27.65*	37.41*
	120	5.26	6.60	8.10	9.72	11.42	13.18*	15.98*	18.38*	20.85*	31.26*	42.38*
	140	5.64	7.15	8.84	10.66	12.56	14.54*	17.66*	20.35*	23.10*	34.72*	47.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.35	2.70	3.08	3.45	3.82	4.19*	4.81*	5.32*	5.84*	7.91*	10.05*
	20	2.89	3.36	3.85	4.35	4.86	5.38*	6.24*	6.96*	7.70*	10.77*	14.02*
	40	3.65	4.31	5.00	5.73	6.49	7.28*	8.59*	9.71*	10.85*	15.68*	20.82*
	60	4.24	5.06	5.96	6.91	7.91	8.96*	10.67*	12.14*	13.65*	20.02*	26.83*
	80	4.74	5.73	6.82	7.98	9.22	10.51*	12.60*	14.40*	16.25*	24.04*	32.36*
	100	5.19	6.34	7.62	8.99	10.45	11.98*	14.43*	16.53*	18.69*	27.82*	37.57*
	120	5.61	6.92	8.38	9.96	11.63	13.38*	16.17*	18.57*	21.03*	31.42*	42.53*
	140	6.00	7.47	9.12	10.89	12.77	14.73*	17.84*	20.52*	23.27*	34.87*	47.29*
300	10	2.60	2.98	3.38	3.77	4.16	4.54*	5.19*	5.73*	6.26*	8.38*	10.54*
	20	3.22	3.71	4.23	4.75	5.27	5.79*	6.68*	7.42*	8.16*	11.24*	14.47*
	40	4.07	4.74	5.46	6.20	6.95	7.73*	9.04*	10.15*	11.29*	16.09*	21.20*
	60	4.71	5.55	6.45	7.39	8.38	9.40*	11.10*	12.56*	14.06*	20.40*	27.18*
	80	5.26	6.25	7.33	8.47	9.68	10.93*	13.01*	14.80*	16.63*	24.39*	32.69*
	100	5.74	6.89	8.14	9.48	10.90	12.39*	14.82*	16.91*	19.06*	28.15*	37.88*
	120	6.19	7.48	8.90	10.44	12.07	13.77*	16.54*	18.93*	21.38*	31.73*	42.83*
	140	6.60	8.04	9.64	11.36	13.19	15.11*	18.20*	20.87*	23.61*	35.18*	47.57*
400	10	2.81	3.21	3.62	4.03	4.44	4.84*	5.51*	6.07*	6.62*	8.80*	10.98*
	20	3.49	4.00	4.54	5.08	5.61	6.15*	7.06*	7.82*	8.58*	11.68*	14.91*
	40	4.41	5.11	5.84	6.59	7.36	8.14*	9.46*	10.58*	11.72*	16.49*	21.59*
	60	5.10	5.96	6.88	7.82	8.80	9.81*	11.52*	12.97*	14.47*	20.77*	27.53*
	80	5.68	6.70	7.78	8.92	10.11	11.34*	13.41*	15.19*	17.01*	24.74*	33.02*
	100	6.20	7.36	8.61	9.93	11.32	12.78*	15.20*	17.28*	19.42*	28.48*	38.19*
	120	6.67	7.97	9.38	10.89	12.49	14.16*	16.91*	19.29*	21.73*	32.05*	43.12*
	140	7.10	8.54	10.12	11.81	13.60	15.49*	18.56*	21.22*	23.94*	35.49*	47.86*
600	10	3.14	3.57	4.02	4.46	4.89	5.31*	6.04*	6.63*	7.21*	9.50*	11.77*
	20	3.91	4.47	5.04	5.61	6.18	6.74*	7.70*	8.49*	9.29*	12.47*	15.73*
	40	4.96	5.70	6.47	7.26	8.04	8.84*	10.20*	11.34*	12.49*	17.28*	22.35*
	60	5.73	6.64	7.59	8.56	9.55	10.56*	12.28*	13.74*	15.24*	21.51*	28.22*
	80	6.38	7.43	8.54	9.69	10.88	12.10*	14.17*	15.94*	17.76*	25.43*	33.67*
	100	6.95	8.14	9.41	10.73	12.11	13.54*	15.95*	18.01*	20.14*	29.14*	38.81*
	120	7.47	8.79	10.21	11.70	13.27	14.90*	17.64*	19.99*	22.42*	32.68*	43.71*
	140	7.94	9.40	10.97	12.63	14.38	16.22*	19.27*	21.90*	24.61*	36.09*	48.43*
800	10	3.41	3.87	4.34	4.81	5.26	5.70*	6.47*	7.09*	7.71*	10.10*	12.44*
	20	4.26	4.85	5.46	6.06	6.65	7.23*	8.24*	9.07*	9.89*	13.17*	16.48*
	40	5.40	6.19	7.00	7.81	8.62	9.43*	10.84*	12.01*	13.19*	18.02*	23.08*
	60	6.25	7.19	8.18	9.18	10.19	11.21*	12.96*	14.45*	15.95*	22.23*	28.91*
	80	6.95	8.04	9.19	10.36	11.56	12.78*	14.87*	16.65*	18.47*	26.12*	34.31*
	100	7.57	8.80	10.09	11.43	12.81	14.23*	16.65*	18.72*	20.84*	29.79*	39.42*
	120	8.12	9.48	10.93	12.43	13.99	15.60*	18.33*	20.68*	23.09*	33.31*	44.30*
	140	8.63	10.12	11.71	13.37	15.10	16.91*	19.95*	22.58*	25.27*	36.70*	49.00*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.40	0.48	0.57	0.66	0.75	0.84	0.97*	1.08*	1.19*	1.63*	2.07*
	20	0.45	0.55	0.66	0.77	0.88	0.99	1.16*	1.30*	1.44*	2.02*	2.60*
	40	0.53	0.67	0.82	0.96	1.11	1.26	1.49*	1.68*	1.87*	2.67*	3.49*
	60	0.60	0.77	0.95	1.13	1.31	1.49	1.77*	2.01*	2.25*	3.24*	4.27*
	80	0.67	0.87	1.07	1.28	1.49	1.71	2.04*	2.32*	2.60*	3.76*	4.98*
	100	0.73	0.96	1.19	1.43	1.67	1.91	2.28*	2.60*	2.92*	4.26*	5.65*
	120	0.79	1.04	1.30	1.56	1.83	2.10	2.52*	2.87*	3.23*	4.72*	6.29*
	140	0.84	1.12	1.41	1.70	1.99	2.29	2.74*	3.13*	3.53*	5.17*	6.91*
25	10	0.57	0.64	0.73	0.81	0.90	0.98	1.11*	1.22*	1.33*	1.77*	2.20*
	20	0.64	0.73	0.83	0.94	1.04	1.14	1.30*	1.44*	1.58*	2.14*	2.71*
	40	0.75	0.86	0.99	1.12	1.26	1.40	1.61*	1.80*	1.99*	2.77*	3.58*
	60	0.83	0.97	1.12	1.28	1.45	1.62	1.89*	2.12*	2.36*	3.33*	4.35*
	80	0.90	1.06	1.24	1.43	1.62	1.83	2.14*	2.42*	2.70*	3.85*	5.06*
	100	0.97	1.15	1.35	1.56	1.79	2.02	2.38*	2.70*	3.02*	4.34*	5.73*
	120	1.03	1.23	1.45	1.70	1.95	2.21	2.61*	2.96*	3.32*	4.80*	6.37*
	140	1.08	1.31	1.56	1.82	2.10	2.39	2.83*	3.22*	3.61*	5.25*	6.98*
50	10	0.63	0.71	0.80	0.89	0.98	1.07	1.20*	1.32*	1.43*	1.88*	2.32*
	20	0.72	0.82	0.93	1.03	1.14	1.25	1.41*	1.55*	1.69*	2.25*	2.82*
	40	0.85	0.97	1.10	1.24	1.37	1.51	1.72*	1.91*	2.10*	2.87*	3.68*
	60	0.95	1.09	1.25	1.40	1.57	1.73	1.99*	2.22*	2.46*	3.43*	4.44*
	80	1.03	1.19	1.37	1.55	1.74	1.94	2.24*	2.51*	2.79*	3.94*	5.15*
	100	1.11	1.29	1.48	1.69	1.91	2.13	2.48*	2.79*	3.11*	4.42*	5.81*
	120	1.17	1.37	1.59	1.82	2.06	2.31	2.71*	3.05*	3.41*	4.88*	6.44*
	140	1.23	1.45	1.69	1.94	2.21	2.49	2.92*	3.31*	3.70*	5.33*	7.05*
100	10	0.71	0.80	0.90	1.00	1.09	1.19	1.33*	1.45*	1.57*	2.05*	2.50*
	20	0.83	0.94	1.05	1.16	1.28	1.39	1.56*	1.71*	1.86*	2.44*	3.02*
	40	0.99	1.12	1.26	1.40	1.54	1.68	1.90*	2.09*	2.28*	3.07*	3.87*
	60	1.11	1.26	1.42	1.59	1.75	1.92	2.18*	2.41*	2.65*	3.61*	4.62*
	80	1.21	1.38	1.56	1.75	1.93	2.13	2.43*	2.70*	2.97*	4.11*	5.31*
	100	1.30	1.48	1.68	1.89	2.10	2.32	2.66*	2.97*	3.28*	4.59*	5.96*
	120	1.37	1.58	1.80	2.02	2.26	2.50	2.89*	3.23*	3.58*	5.04*	6.59*
	140	1.44	1.66	1.90	2.15	2.41	2.68	3.10*	3.48*	3.86*	5.48*	7.19*
150	10	0.77	0.87	0.97	1.07	1.17	1.27	1.42*	1.55*	1.68*	2.17*	2.65*
	20	0.91	1.02	1.14	1.26	1.38	1.50	1.67*	1.83*	1.98*	2.59*	3.19*
	40	1.09	1.23	1.37	1.52	1.67	1.81	2.04*	2.24*	2.44*	3.23*	4.04*
	60	1.23	1.38	1.55	1.72	1.89	2.07	2.33*	2.57*	2.81*	3.78*	4.78*
	80	1.34	1.51	1.70	1.89	2.09	2.28	2.59*	2.86*	3.14*	4.28*	5.47*
	100	1.43	1.63	1.84	2.05	2.26	2.48	2.82*	3.13*	3.45*	4.75*	6.12*
	120	1.52	1.73	1.96	2.19	2.43	2.67	3.05*	3.39*	3.74*	5.20*	6.74*
	140	1.60	1.83	2.07	2.32	2.58	2.85	3.26*	3.64*	4.02*	5.63*	7.33*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.82	0.92	1.03	1.13	1.24	1.34	1.49*	1.63*	1.76*	2.28*	2.77*
	20	0.97	1.09	1.21	1.34	1.46	1.58	1.77*	1.93*	2.09*	2.72*	3.33*
	40	1.17	1.32	1.47	1.62	1.77	1.92	2.15*	2.36*	2.57*	3.38*	4.20*
	60	1.32	1.48	1.66	1.84	2.01	2.19	2.46*	2.70*	2.95*	3.93*	4.94*
	80	1.44	1.63	1.82	2.02	2.22	2.42	2.73*	3.01*	3.29*	4.43*	5.62*
	100	1.55	1.75	1.96	2.18	2.40	2.62	2.97*	3.28*	3.60*	4.90*	6.27*
	120	1.64	1.86	2.09	2.33	2.57	2.82	3.20*	3.54*	3.89*	5.35*	6.88*
	140	1.73	1.96	2.21	2.47	2.73	3.00	3.41*	3.79*	4.18*	5.78*	7.47*
300	10	0.90	1.01	1.12	1.23	1.34	1.45	1.61*	1.76*	1.90*	2.44*	2.96*
	20	1.07	1.20	1.33	1.47	1.60	1.73	1.92*	2.09*	2.27*	2.93*	3.57*
	40	1.30	1.46	1.62	1.78	1.95	2.10	2.34*	2.56*	2.78*	3.64*	4.48*
	60	1.47	1.65	1.84	2.02	2.21	2.39	2.67*	2.93*	3.19*	4.21*	5.23*
	80	1.61	1.81	2.01	2.22	2.43	2.64	2.96*	3.25*	3.54*	4.72*	5.92*
	100	1.73	1.94	2.17	2.40	2.63	2.86	3.21*	3.54*	3.87*	5.19*	6.55*
	120	1.84	2.07	2.31	2.56	2.81	3.06	3.45*	3.81*	4.17*	5.63*	7.16*
	140	1.93	2.18	2.44	2.71	2.98	3.25	3.67*	4.06*	4.45*	6.06*	7.75*
400	10	0.96	1.07	1.19	1.31	1.43	1.54	1.71*	1.86*	2.01*	2.58*	3.12*
	20	1.16	1.29	1.43	1.57	1.71	1.84	2.04*	2.23*	2.41*	3.10*	3.77*
	40	1.41	1.57	1.74	1.92	2.08	2.25	2.50*	2.73*	2.96*	3.85*	4.72*
	60	1.60	1.78	1.98	2.18	2.37	2.56	2.85*	3.12*	3.39*	4.45*	5.49*
	80	1.75	1.95	2.17	2.39	2.61	2.83	3.15*	3.46*	3.76*	4.97*	6.18*
	100	1.88	2.10	2.34	2.58	2.82	3.06	3.42*	3.76*	4.10*	5.45*	6.82*
	120	1.99	2.24	2.49	2.75	3.01	3.27	3.67*	4.04*	4.41*	5.90*	7.43*
	140	2.10	2.36	2.63	2.91	3.19	3.47	3.90*	4.30*	4.70*	6.32*	8.01*
600	10	1.07	1.19	1.31	1.44	1.56	1.69	1.87*	2.03*	2.19*	2.81*	3.39*
	20	1.29	1.43	1.58	1.74	1.88	2.03	2.24*	2.44*	2.64*	3.39*	4.10*
	40	1.58	1.76	1.94	2.13	2.31	2.49	2.76*	3.01*	3.25*	4.21*	5.13*
	60	1.79	2.00	2.21	2.42	2.63	2.84	3.15*	3.44*	3.73*	4.84*	5.94*
	80	1.97	2.19	2.43	2.66	2.90	3.13	3.48*	3.80*	4.13*	5.39*	6.65*
	100	2.12	2.36	2.62	2.88	3.13	3.38	3.77*	4.13*	4.48*	5.89*	7.31*
	120	2.25	2.51	2.79	3.07	3.34	3.61	4.03*	4.42*	4.81*	6.36*	7.92*
	140	2.37	2.65	2.94	3.24	3.54	3.83	4.28*	4.70*	5.12*	6.79*	8.51*
800	10	1.15	1.28	1.41	1.54	1.68	1.80	1.99*	2.17*	2.34*	2.99*	3.60*
	20	1.39	1.55	1.71	1.87	2.03	2.18	2.41*	2.62*	2.83*	3.62*	4.37*
	40	1.72	1.91	2.11	2.30	2.50	2.68	2.97*	3.23*	3.49*	4.50*	5.46*
	60	1.95	2.17	2.40	2.62	2.84	3.06	3.39*	3.70*	4.00*	5.18*	6.32*
	80	2.15	2.38	2.64	2.89	3.13	3.37	3.74*	4.09*	4.43*	5.75*	7.06*
	100	2.31	2.57	2.84	3.12	3.38	3.65	4.05*	4.43*	4.80*	6.27*	7.73*
	120	2.46	2.74	3.03	3.32	3.61	3.90	4.33*	4.74*	5.15*	6.75*	8.36*
	140	2.59	2.89	3.20	3.51	3.82	4.13	4.59*	5.03*	5.47*	7.20*	8.95*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.58	0.71	0.84	0.98	1.12	1.26	1.47*	1.65*	1.82*	2.53*	3.26*
	20	0.68	0.85	1.03	1.21	1.39	1.58	1.86*	2.10*	2.33*	3.31*	4.31*
	40	0.84	1.08	1.33	1.59	1.85	2.11	2.51*	2.85*	3.19*	4.61*	6.09*
	60	0.98	1.29	1.60	1.92	2.25	2.58	3.08*	3.51*	3.95*	5.76*	7.65*
	80	1.11	1.48	1.85	2.23	2.62	3.01	3.61*	4.12*	4.64*	6.81*	9.08*
	100	1.23	1.66	2.08	2.52	2.96	3.41	4.10*	4.69*	5.29*	7.79*	10.43*
	120	1.35	1.83	2.30	2.79	3.29	3.79	4.57*	5.23*	5.91*	8.73*	11.71*
	140	1.46	1.99	2.52	3.05	3.60	4.16	5.02*	5.75*	6.50*	9.63*	12.93*
25	10	0.81	0.92	1.05	1.18	1.31	1.44	1.64*	1.81*	1.98*	2.68*	3.39*
	20	0.93	1.08	1.24	1.40	1.57	1.74	2.01*	2.24*	2.47*	3.43*	4.43*
	40	1.12	1.31	1.53	1.76	2.00	2.25	2.64*	2.97*	3.31*	4.72*	6.19*
	60	1.26	1.51	1.79	2.08	2.39	2.71	3.20*	3.62*	4.05*	5.85*	7.74*
	80	1.39	1.69	2.02	2.38	2.75	3.13	3.71*	4.22*	4.74*	6.89*	9.17*
	100	1.51	1.86	2.25	2.66	3.08	3.52	4.20*	4.79*	5.38*	7.88*	10.51*
	120	1.62	2.02	2.46	2.93	3.41	3.90	4.67*	5.33*	6.00*	8.81*	11.78*
	140	1.73	2.18	2.67	3.18	3.72	4.27	5.11*	5.84*	6.59*	9.70*	13.01*
50	10	0.90	1.03	1.16	1.29	1.43	1.56	1.76*	1.94*	2.11*	2.82*	3.53*
	20	1.06	1.21	1.37	1.54	1.70	1.87	2.14*	2.37*	2.60*	3.56*	4.55*
	40	1.27	1.47	1.68	1.91	2.14	2.38	2.76*	3.09*	3.43*	4.82*	6.29*
	60	1.44	1.68	1.95	2.23	2.52	2.83	3.31*	3.73*	4.16*	5.95*	7.83*
	80	1.58	1.86	2.18	2.52	2.87	3.24	3.82*	4.32*	4.84*	6.98*	9.25*
	100	1.71	2.04	2.40	2.79	3.21	3.63	4.30*	4.88*	5.48*	7.96*	10.59*
	120	1.82	2.20	2.61	3.06	3.52	4.01	4.76*	5.42*	6.09*	8.89*	11.86*
	140	1.94	2.35	2.81	3.31	3.83	4.37	5.20*	5.93*	6.67*	9.78*	13.08*
100	10	1.03	1.16	1.31	1.45	1.59	1.73	1.94*	2.13*	2.31*	3.04*	3.76*
	20	1.22	1.38	1.56	1.73	1.90	2.08	2.35*	2.58*	2.82*	3.78*	4.77*
	40	1.48	1.69	1.91	2.14	2.37	2.61	2.98*	3.31*	3.64*	5.03*	6.48*
	60	1.68	1.92	2.19	2.47	2.76	3.06	3.52*	3.94*	4.36*	6.13*	8.01*
	80	1.84	2.13	2.44	2.77	3.11	3.46	4.02*	4.52*	5.03*	7.16*	9.41*
	100	1.99	2.31	2.67	3.04	3.44	3.85	4.50*	5.07*	5.66*	8.13*	10.74*
	120	2.12	2.48	2.88	3.30	3.75	4.21	4.95*	5.60*	6.26*	9.05*	12.01*
	140	2.24	2.64	3.08	3.55	4.05	4.57	5.38*	6.10*	6.84*	9.93*	13.22*
150	10	1.13	1.26	1.41	1.56	1.71	1.86	2.08*	2.27*	2.47*	3.22*	3.96*
	20	1.34	1.51	1.69	1.87	2.06	2.24	2.51*	2.76*	3.00*	3.98*	4.97*
	40	1.63	1.85	2.08	2.32	2.56	2.80	3.17*	3.50*	3.84*	5.23*	6.67*
	60	1.85	2.11	2.38	2.67	2.96	3.25	3.71*	4.13*	4.56*	6.32*	8.18*
	80	2.03	2.33	2.65	2.98	3.32	3.67	4.21*	4.71*	5.22*	7.33*	9.58*
	100	2.19	2.52	2.88	3.26	3.65	4.05	4.68*	5.25*	5.84*	8.29*	10.90*
	120	2.34	2.70	3.10	3.52	3.96	4.41	5.13*	5.78*	6.43*	9.21*	12.15*
	140	2.47	2.87	3.31	3.77	4.26	4.76	5.56*	6.28*	7.01*	10.09*	13.36*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.20	1.35	1.50	1.66	1.81	1.96	2.19*	2.39*	2.59*	3.37*	4.13*
	20	1.44	1.61	1.80	1.99	2.18	2.37	2.65*	2.90*	3.16*	4.16*	5.16*
	40	1.76	1.98	2.22	2.47	2.71	2.95	3.33*	3.67*	4.02*	5.41*	6.86*
	60	2.00	2.26	2.54	2.83	3.13	3.43	3.89*	4.31*	4.74*	6.50*	8.35*
	80	2.19	2.50	2.82	3.15	3.50	3.85	4.39*	4.89*	5.39*	7.50*	9.74*
	100	2.37	2.70	3.07	3.44	3.83	4.23	4.86*	5.43*	6.01*	8.45*	11.05*
	120	2.52	2.89	3.29	3.71	4.15	4.60	5.31*	5.95*	6.60*	9.36*	12.30*
	140	2.66	3.07	3.51	3.97	4.45	4.95	5.73*	6.45*	7.17*	10.24*	13.51*
300	10	1.32	1.48	1.64	1.81	1.97	2.13	2.37*	2.59*	2.80*	3.62*	4.42*
	20	1.59	1.78	1.98	2.19	2.38	2.58	2.88*	3.15*	3.42*	4.46*	5.50*
	40	1.96	2.20	2.45	2.71	2.96	3.22	3.61*	3.96*	4.32*	5.75*	7.20*
	60	2.23	2.51	2.81	3.11	3.42	3.72	4.19*	4.63*	5.06*	6.84*	8.69*
	80	2.45	2.77	3.11	3.45	3.80	4.16	4.71*	5.21*	5.73*	7.83*	10.06*
	100	2.64	3.00	3.37	3.76	4.16	4.56	5.18*	5.76*	6.34*	8.77*	11.35*
	120	2.82	3.20	3.62	4.04	4.48	4.93	5.63*	6.28*	6.93*	9.67*	12.59*
	140	2.97	3.39	3.84	4.31	4.79	5.28	6.06*	6.77*	7.49*	10.54*	13.79*
400	10	1.42	1.58	1.76	1.93	2.10	2.27	2.52*	2.75*	2.97*	3.83*	4.66*
	20	1.72	1.92	2.13	2.34	2.55	2.76	3.06*	3.35*	3.63*	4.72*	5.78*
	40	2.12	2.37	2.64	2.91	3.17	3.44	3.84*	4.21*	4.58*	6.05*	7.52*
	60	2.41	2.71	3.02	3.34	3.65	3.97	4.45*	4.90*	5.34*	7.15*	9.01*
	80	2.66	2.99	3.34	3.70	4.06	4.43	4.99*	5.50*	6.02*	8.15*	10.37*
	100	2.87	3.24	3.63	4.03	4.43	4.84	5.47*	6.06*	6.65*	9.08*	11.65*
	120	3.06	3.46	3.89	4.32	4.77	5.22	5.93*	6.58*	7.24*	9.98*	12.88*
	140	3.23	3.66	4.13	4.60	5.09	5.58	6.36*	7.07*	7.80*	10.83*	14.07*
600	10	1.58	1.75	1.94	2.13	2.31	2.49	2.76*	3.00*	3.24*	4.17*	5.05*
	20	1.92	2.14	2.37	2.60	2.82	3.04	3.37*	3.68*	3.98*	5.14*	6.26*
	40	2.38	2.66	2.94	3.23	3.52	3.80	4.22*	4.62*	5.01*	6.55*	8.08*
	60	2.72	3.04	3.37	3.71	4.04	4.38	4.88*	5.36*	5.83*	7.70*	9.59*
	80	2.99	3.35	3.73	4.11	4.49	4.87	5.45*	5.99*	6.53*	8.71*	10.95*
	100	3.23	3.63	4.04	4.47	4.89	5.31	5.96*	6.57*	7.18*	9.66*	12.23*
	120	3.45	3.87	4.33	4.79	5.25	5.72	6.44*	7.11*	7.78*	10.55*	13.45*
	140	3.64	4.10	4.59	5.09	5.59	6.09	6.88*	7.61*	8.35*	11.40*	14.62*
800	10	1.70	1.89	2.09	2.29	2.48	2.67	2.95*	3.21*	3.47*	4.44*	5.37*
	20	2.09	2.32	2.56	2.80	3.04	3.27	3.62*	3.94*	4.26*	5.49*	6.67*
	40	2.59	2.88	3.19	3.50	3.80	4.09	4.54*	4.96*	5.37*	6.98*	8.56*
	60	2.96	3.30	3.66	4.01	4.37	4.71	5.24*	5.74*	6.23*	8.17*	10.11*
	80	3.27	3.65	4.05	4.45	4.84	5.24	5.84*	6.41*	6.97*	9.21*	11.49*
	100	3.53	3.95	4.39	4.83	5.27	5.71	6.38*	7.01*	7.64*	10.17*	12.77*
	120	3.76	4.21	4.69	5.17	5.65	6.13	6.87*	7.56*	8.26*	11.07*	13.98*
	140	3.97	4.46	4.97	5.49	6.01	6.53	7.33*	8.08*	8.84*	11.93*	15.15*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.86	1.07	1.30	1.52	1.75	1.98	2.33*	2.62*	2.92*	4.12*	5.35*
	20	1.05	1.35	1.66	1.98	2.29	2.62	3.10*	3.52*	3.94*	5.67*	7.47*
	40	1.38	1.82	2.28	2.74	3.21	3.68	4.41*	5.03*	5.66*	8.28*	11.03*
	60	1.66	2.24	2.82	3.40	4.01	4.62	5.55*	6.35*	7.17*	10.56*	14.14*
	80	1.92	2.62	3.31	4.02	4.74	5.48	6.61*	7.57*	8.55*	12.66*	17.01*
	100	2.17	2.97	3.78	4.59	5.43	6.28	7.59*	8.71*	9.85*	14.63*	19.70*
	120	2.40	3.31	4.22	5.14	6.08	7.05	8.53*	9.80*	11.09*	16.51*	22.25*
	140	2.62	3.63	4.64	5.67	6.71	7.78	9.43*	10.84*	12.28*	18.30*	24.71*
25	10	1.17	1.35	1.54	1.75	1.96	2.17	2.50*	2.79*	3.08*	4.27*	5.49*
	20	1.38	1.63	1.90	2.18	2.48	2.78	3.25*	3.66*	4.08*	5.79*	7.58*
	40	1.71	2.08	2.48	2.91	3.36	3.82	4.54*	5.15*	5.78*	8.38*	11.12*
	60	1.98	2.47	3.00	3.56	4.15	4.74	5.67*	6.46*	7.27*	10.66*	14.23*
	80	2.23	2.83	3.48	4.17	4.87	5.59	6.71*	7.67*	8.65*	12.75*	17.09*
	100	2.47	3.18	3.94	4.73	5.55	6.39	7.69*	8.81*	9.95*	14.72*	19.78*
	120	2.69	3.51	4.37	5.28	6.20	7.16	8.63*	9.89*	11.18*	16.59*	22.33*
	140	2.90	3.82	4.79	5.80	6.83	7.89	9.52*	10.93*	12.36*	18.38*	24.78*
50	10	1.32	1.50	1.70	1.91	2.12	2.33	2.66*	2.94*	3.23*	4.41*	5.63*
	20	1.57	1.81	2.08	2.36	2.64	2.94	3.40*	3.80*	4.21*	5.92*	7.70*
	40	1.94	2.28	2.67	3.08	3.51	3.96	4.66*	5.27*	5.89*	8.49*	11.22*
	60	2.23	2.68	3.18	3.72	4.28	4.87	5.78*	6.57*	7.38*	10.75*	14.32*
	80	2.48	3.04	3.65	4.31	5.00	5.71	6.82*	7.77*	8.75*	12.84*	17.17*
	100	2.72	3.38	4.10	4.87	5.68	6.50	7.79*	8.90*	10.04*	14.80*	19.85*
	120	2.94	3.70	4.53	5.41	6.32	7.26	8.72*	9.98*	11.27*	16.67*	22.40*
	140	3.16	4.01	4.94	5.92	6.94	7.99	9.61*	11.01*	12.45*	18.46*	24.85*
100	10	1.51	1.71	1.92	2.14	2.36	2.58	2.91*	3.20*	3.50*	4.68*	5.89*
	20	1.82	2.07	2.35	2.63	2.92	3.21	3.66*	4.06*	4.47*	6.16*	7.93*
	40	2.25	2.60	2.98	3.38	3.79	4.22	4.90*	5.50*	6.12*	8.70*	11.42*
	60	2.58	3.02	3.50	4.01	4.55	5.12	6.00*	6.79*	7.59*	10.94*	14.50*
	80	2.86	3.39	3.97	4.60	5.25	5.94	7.02*	7.97*	8.94*	13.02*	17.34*
	100	3.12	3.73	4.41	5.14	5.92	6.73	7.99*	9.09*	10.22*	14.97*	20.01*
	120	3.35	4.05	4.83	5.67	6.55	7.47	8.91*	10.16*	11.44*	16.83*	22.55*
	140	3.57	4.36	5.24	6.18	7.17	8.19	9.79*	11.19*	12.62*	18.61*	24.99*
150	10	1.65	1.86	2.09	2.31	2.54	2.76	3.10*	3.41*	3.71*	4.92*	6.14*
	20	2.00	2.27	2.55	2.84	3.13	3.43	3.88*	4.29*	4.71*	6.40*	8.16*
	40	2.48	2.83	3.22	3.62	4.04	4.46	5.13*	5.73*	6.34*	8.90*	11.61*
	60	2.84	3.28	3.76	4.27	4.80	5.35	6.22*	7.00*	7.79*	11.13*	14.68*
	80	3.15	3.67	4.25	4.86	5.50	6.17	7.23*	8.17*	9.14*	13.19*	17.50*
	100	3.42	4.02	4.69	5.40	6.16	6.94	8.18*	9.28*	10.41*	15.13*	20.17*
	120	3.67	4.35	5.11	5.92	6.78	7.68	9.10*	10.34*	11.62*	16.99*	22.70*
	140	3.91	4.67	5.51	6.42	7.39	8.39	9.98*	11.36*	12.79*	18.76*	25.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.77	1.99	2.22	2.45	2.69	2.92	3.27*	3.58*	3.90*	5.13*	6.36*
	20	2.15	2.42	2.72	3.02	3.32	3.62	4.08*	4.50*	4.92*	6.62*	8.37*
	40	2.66	3.03	3.43	3.84	4.25	4.68	5.34*	5.94*	6.56*	9.10*	11.80*
	60	3.05	3.51	3.99	4.50	5.03	5.57	6.43*	7.20*	7.99*	11.32*	14.85*
	80	3.38	3.91	4.49	5.09	5.73	6.39	7.43*	8.37*	9.33*	13.37*	17.67*
	100	3.67	4.28	4.94	5.64	6.38	7.15	8.38*	9.47*	10.59*	15.30*	20.32*
	120	3.94	4.62	5.37	6.16	7.00	7.89	9.28*	10.52*	11.79*	17.14*	22.85*
	140	4.19	4.94	5.77	6.66	7.60	8.59	10.16*	11.54*	12.95*	18.92*	25.28*
300	10	1.95	2.19	2.44	2.68	2.93	3.17	3.54*	3.87*	4.20*	5.49*	6.76*
	20	2.39	2.68	2.99	3.31	3.62	3.93	4.41*	4.84*	5.28*	7.02*	8.79*
	40	2.97	3.36	3.77	4.19	4.62	5.05	5.72*	6.33*	6.95*	9.50*	12.18*
	60	3.41	3.87	4.38	4.89	5.42	5.97	6.82*	7.59*	8.38*	11.69*	15.20*
	80	3.77	4.31	4.90	5.51	6.14	6.79	7.81*	8.75*	9.70*	13.71*	17.99*
	100	4.09	4.71	5.37	6.07	6.80	7.55	8.75*	9.84*	10.95*	15.63*	20.63*
	120	4.38	5.07	5.81	6.60	7.42	8.28	9.65*	10.88*	12.14*	17.46*	23.15*
	140	4.65	5.40	6.23	7.10	8.02	8.98	10.51*	11.88*	13.29*	19.22*	25.57*
400	10	2.10	2.35	2.61	2.87	3.13	3.38	3.76*	4.11*	4.45*	5.79*	7.10*
	20	2.58	2.89	3.21	3.54	3.87	4.19	4.68*	5.14*	5.59*	7.37*	9.17*
	40	3.22	3.62	4.05	4.49	4.93	5.37	6.05*	6.67*	7.30*	9.87*	12.55*
	60	3.69	4.18	4.70	5.23	5.77	6.31	7.16*	7.95*	8.74*	12.04*	15.54*
	80	4.09	4.65	5.25	5.87	6.50	7.15	8.17*	9.11*	10.06*	14.06*	18.32*
	100	4.43	5.06	5.74	6.45	7.17	7.92	9.11*	10.19*	11.30*	15.96*	20.94*
	120	4.74	5.44	6.20	6.98	7.80	8.65	10.00*	11.22*	12.48*	17.78*	23.44*
	140	5.03	5.80	6.62	7.49	8.40	9.35	10.85*	12.22*	13.62*	19.53*	25.85*
600	10	2.34	2.61	2.89	3.17	3.45	3.72	4.13*	4.50*	4.87*	6.29*	7.67*
	20	2.89	3.22	3.58	3.93	4.28	4.62	5.14*	5.62*	6.10*	7.98*	9.83*
	40	3.62	4.05	4.51	4.97	5.44	5.90	6.60*	7.26*	7.91*	10.54*	13.25*
	60	4.16	4.67	5.22	5.78	6.34	6.90	7.77*	8.58*	9.39*	12.72*	16.21*
	80	4.60	5.19	5.82	6.46	7.12	7.78	8.80*	9.76*	10.72*	14.72*	18.95*
	100	4.99	5.65	6.36	7.08	7.82	8.57	9.76*	10.85*	11.96*	16.60*	21.55*
	120	5.33	6.06	6.84	7.65	8.47	9.32	10.65*	11.88*	13.13*	18.40*	24.03*
	140	5.65	6.45	7.30	8.18	9.09	10.02	11.51*	12.87*	14.26*	20.13*	26.41*
800	10	2.54	2.82	3.12	3.42	3.71	3.99	4.42*	4.82*	5.21*	6.71*	8.15*
	20	3.14	3.50	3.87	4.24	4.61	4.97	5.52*	6.02*	6.53*	8.48*	10.41*
	40	3.94	4.40	4.89	5.37	5.86	6.33	7.07*	7.75*	8.43*	11.14*	13.88*
	60	4.53	5.08	5.65	6.23	6.81	7.40	8.29*	9.12*	9.96*	13.35*	16.85*
	80	5.02	5.64	6.30	6.96	7.63	8.31	9.36*	10.33*	11.31*	15.34*	19.57*
	100	5.44	6.13	6.86	7.61	8.37	9.13	10.33*	11.44*	12.56*	17.22*	22.15*
	120	5.82	6.57	7.38	8.20	9.04	9.90	11.24*	12.48*	13.74*	19.00*	24.60*
	140	6.16	6.98	7.86	8.76	9.68	10.62	12.10*	13.47*	14.87*	20.72*	26.97*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.33	1.70	2.08	2.46	2.85	3.25	3.85*	4.36*	4.87*	6.98*	9.17*
	20	1.71	2.26	2.81	3.37	3.94	4.52	5.40*	6.15*	6.92*	10.08*	13.41*
	40	2.36	3.20	4.04	4.89	5.76	6.65	8.01*	9.17*	10.36*	15.30*	20.52*
	60	2.93	4.02	5.11	6.23	7.36	8.52	10.30*	11.82*	13.37*	19.87*	26.76*
	80	3.45	4.78	6.10	7.45	8.83	10.24	12.40*	14.25*	16.14*	24.07*	32.49*
	100	3.94	5.49	7.03	8.60	10.21	11.85	14.37*	16.53*	18.74*	28.01*	37.87*
	120	4.41	6.17	7.92	9.70	11.52	13.38	16.25*	18.70*	21.22*	31.76*	42.98*
	140	4.85	6.81	8.76	10.75	12.78	14.85	18.05*	20.79*	23.59*	35.35*	47.88*
25	10	1.72	2.02	2.35	2.70	3.07	3.44	4.02*	4.52*	5.03*	7.13*	9.31*
	20	2.11	2.55	3.05	3.58	4.12	4.68	5.55*	6.29*	7.05*	10.21*	13.52*
	40	2.73	3.46	4.24	5.07	5.92	6.79	8.14*	9.29*	10.47*	15.40*	20.62*
	60	3.27	4.26	5.30	6.39	7.50	8.65	10.41*	11.93*	13.48*	19.96*	26.85*
	80	3.77	5.00	6.28	7.60	8.96	10.35	12.51*	14.35*	16.24*	24.16*	32.57*
	100	4.25	5.70	7.20	8.74	10.33	11.96	14.47*	16.63*	18.84*	28.09*	37.94*
	120	4.70	6.36	8.07	9.83	11.64	13.49	16.34*	18.80*	21.30*	31.84*	43.05*
	140	5.13	7.01	8.92	10.88	12.89	14.95	18.14*	20.87*	23.67*	35.43*	47.95*
50	10	1.94	2.24	2.57	2.91	3.27	3.63	4.19*	4.69*	5.19*	7.28*	9.45*
	20	2.38	2.80	3.27	3.78	4.30	4.85	5.70*	6.44*	7.19*	10.33*	13.64*
	40	3.03	3.70	4.45	5.24	6.07	6.93	8.26*	9.41*	10.59*	15.51*	20.72*
	60	3.58	4.48	5.49	6.54	7.64	8.77	10.53*	12.04*	13.58*	20.06*	26.94*
	80	4.07	5.21	6.45	7.75	9.09	10.47	12.61*	14.45*	16.34*	24.25*	32.65*
	100	4.54	5.90	7.36	8.88	10.46	12.07	14.57*	16.73*	18.93*	28.18*	38.02*
	120	4.98	6.56	8.23	9.97	11.76	13.60	16.44*	18.89*	21.39*	31.92*	43.13*
	140	5.41	7.19	9.07	11.01	13.00	15.06	18.23*	20.96*	23.76*	35.50*	48.03*
100	10	2.24	2.55	2.89	3.24	3.59	3.95	4.51*	5.00*	5.50*	7.57*	9.72*
	20	2.75	3.17	3.64	4.13	4.63	5.16	5.98*	6.72*	7.46*	10.58*	13.87*
	40	3.48	4.11	4.82	5.58	6.37	7.20	8.51*	9.65*	10.82*	15.72*	20.91*
	60	4.06	4.90	5.84	6.86	7.92	9.02	10.75*	12.25*	13.79*	20.25*	27.11*
	80	4.58	5.62	6.79	8.04	9.35	10.71	12.82*	14.66*	16.53*	24.42*	32.82*
	100	5.05	6.30	7.69	9.16	10.70	12.29	14.77*	16.92*	19.11*	28.34*	38.18*
	120	5.49	6.94	8.54	10.23	11.99	13.81	16.63*	19.07*	21.57*	32.08*	43.28*
	140	5.92	7.57	9.37	11.26	13.23	15.26	18.42*	21.14*	23.93*	35.66*	48.17*
150	10	2.45	2.78	3.13	3.49	3.85	4.21	4.77*	5.27*	5.78*	7.85*	9.99*
	20	3.02	3.46	3.93	4.42	4.93	5.44	6.25*	6.98*	7.73*	10.83*	14.10*
	40	3.82	4.45	5.15	5.89	6.66	7.47	8.75*	9.89*	11.05*	15.93*	21.11*
	60	4.44	5.26	6.18	7.16	8.19	9.27	10.97*	12.47*	14.00*	20.44*	27.29*
	80	4.98	5.99	7.12	8.33	9.61	10.94	13.03*	14.86*	16.73*	24.60*	32.98*
	100	5.47	6.67	8.00	9.44	10.95	12.52	14.97*	17.11*	19.30*	28.51*	38.33*
	120	5.93	7.31	8.85	10.50	12.23	14.02	16.82*	19.25*	21.75*	32.24*	43.43*
	140	6.36	7.93	9.66	11.52	13.46	15.47	18.60*	21.32*	24.10*	35.81*	48.31*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.63	2.97	3.33	3.70	4.07	4.44	5.00*	5.52*	6.03*	8.11*	10.25*
	20	3.24	3.69	4.18	4.67	5.18	5.70	6.51*	7.24*	7.98*	11.07*	14.33*
	40	4.10	4.74	5.44	6.17	6.93	7.73	8.99*	10.12*	11.28*	16.14*	21.30*
	60	4.76	5.58	6.48	7.44	8.45	9.52	11.19*	12.68*	14.21*	20.63*	27.47*
	80	5.33	6.32	7.42	8.61	9.86	11.17	13.24*	15.06*	16.92*	24.78*	33.15*
	100	5.84	7.00	8.30	9.71	11.19	12.74	15.17*	17.30*	19.48*	28.68*	38.49*
	120	6.31	7.65	9.14	10.76	12.46	14.23	17.01*	19.44*	21.92*	32.40*	43.58*
	140	6.75	8.26	9.95	11.77	13.68	15.67	18.78*	21.49*	24.27*	35.97*	48.46*
300	10	2.91	3.27	3.66	4.04	4.43	4.81	5.40*	5.93*	6.46*	8.59*	10.74*
	20	3.61	4.08	4.58	5.10	5.62	6.14	6.95*	7.70*	8.45*	11.54*	14.78*
	40	4.56	5.22	5.93	6.66	7.42	8.21	9.45*	10.57*	11.72*	16.55*	21.69*
	60	5.28	6.11	7.01	7.96	8.95	9.99	11.63*	13.11*	14.62*	21.01*	27.82*
	80	5.90	6.89	7.97	9.13	10.35	11.62	13.65*	15.46*	17.31*	25.13*	33.48*
	100	6.45	7.60	8.86	10.22	11.66	13.17	15.56*	17.68*	19.85*	29.01*	38.80*
	120	6.95	8.26	9.70	11.26	12.92	14.65	17.38*	19.80*	22.27*	32.72*	43.87*
	140	7.42	8.88	10.51	12.26	14.12	16.07	19.14*	21.84*	24.61*	36.27*	48.74*
400	10	3.14	3.52	3.92	4.33	4.73	5.12	5.73*	6.28*	6.83*	9.01*	11.19*
	20	3.90	4.39	4.92	5.45	5.98	6.52	7.35*	8.10*	8.87*	11.98*	15.22*
	40	4.94	5.61	6.34	7.09	7.85	8.64	9.87*	11.00*	12.15*	16.95*	22.07*
	60	5.72	6.56	7.47	8.42	9.40	10.43	12.05*	13.52*	15.02*	21.38*	28.17*
	80	6.37	7.37	8.46	9.60	10.80	12.06	14.05*	15.85*	17.69*	25.48*	33.80*
	100	6.96	8.11	9.36	10.70	12.11	13.59	15.94*	18.05*	20.21*	29.34*	39.11*
	120	7.49	8.78	10.21	11.74	13.36	15.06	17.75*	20.16*	22.62*	33.03*	44.17*
	140	7.98	9.42	11.02	12.74	14.56	16.47	19.50*	22.19*	24.94*	36.58*	49.03*
600	10	3.51	3.92	4.35	4.78	5.21	5.63	6.27*	6.86*	7.44*	9.72*	11.99*
	20	4.38	4.91	5.47	6.03	6.59	7.15	8.01*	8.80*	9.59*	12.78*	16.05*
	40	5.55	6.26	7.02	7.80	8.59	9.38	10.63*	11.77*	12.93*	17.74*	22.83*
	60	6.42	7.30	8.24	9.20	10.20	11.22	12.82*	14.30*	15.80*	22.12*	28.87*
	80	7.15	8.18	9.28	10.43	11.63	12.86	14.82*	16.61*	18.44*	26.17*	34.46*
	100	7.79	8.96	10.23	11.56	12.95	14.39	16.69*	18.78*	20.93*	30.00*	39.73*
	120	8.37	9.68	11.11	12.61	14.19	15.85	18.48*	20.87*	23.31*	33.67*	44.76*
	140	8.90	10.35	11.94	13.62	15.39	17.25	20.21*	22.87*	25.61*	37.19*	49.60*
800	10	3.81	4.24	4.70	5.16	5.61	6.05	6.71*	7.33*	7.95*	10.33*	12.67*
	20	4.76	5.32	5.91	6.50	7.09	7.67	8.56*	9.39*	10.21*	13.49*	16.80*
	40	6.04	6.79	7.59	8.39	9.20	10.02	11.28*	12.46*	13.64*	18.49*	23.57*
	60	6.99	7.91	8.88	9.87	10.88	11.91	13.52*	15.01*	16.52*	22.83*	29.55*
	80	7.78	8.84	9.98	11.15	12.35	13.58	15.53*	17.32*	19.16*	26.86*	35.10*
	100	8.47	9.68	10.97	12.31	13.69	15.13	17.40*	19.49*	21.63*	30.66*	40.34*
	120	9.09	10.43	11.88	13.38	14.96	16.59	19.19*	21.56*	23.99*	34.30*	45.35*
	140	9.67	11.14	12.73	14.40	16.16	17.99	20.90*	23.55*	26.27*	37.80*	50.17*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.45	0.53	0.61	0.70	0.79	0.88	1.01	1.12*	1.23*	1.67*	2.11*
	20	0.50	0.61	0.71	0.82	0.93	1.05	1.21	1.35*	1.50*	2.07*	2.65*
	40	0.60	0.74	0.88	1.03	1.18	1.33	1.56	1.75*	1.94*	2.74*	3.56*
	60	0.68	0.85	1.03	1.21	1.39	1.58	1.86	2.10*	2.34*	3.33*	4.36*
	80	0.75	0.95	1.16	1.37	1.59	1.80	2.13	2.41*	2.70*	3.87*	5.09*
	100	0.82	1.05	1.29	1.53	1.77	2.02	2.39	2.71*	3.04*	4.38*	5.78*
	120	0.88	1.15	1.41	1.68	1.95	2.22	2.64	3.00*	3.36*	4.86*	6.44*
	140	0.95	1.24	1.52	1.82	2.11	2.42	2.88	3.27*	3.67*	5.33*	7.07*
25	10	0.63	0.70	0.78	0.86	0.95	1.03	1.16	1.27*	1.37*	1.81*	2.24*
	20	0.71	0.80	0.90	1.00	1.10	1.20	1.36	1.49*	1.63*	2.19*	2.77*
	40	0.83	0.94	1.07	1.20	1.33	1.47	1.68	1.87*	2.06*	2.84*	3.66*
	60	0.92	1.06	1.21	1.37	1.53	1.71	1.97	2.20*	2.44*	3.42*	4.45*
	80	1.00	1.16	1.34	1.53	1.72	1.93	2.24	2.52*	2.80*	3.96*	5.18*
	100	1.07	1.25	1.46	1.67	1.90	2.13	2.50	2.81*	3.13*	4.46*	5.86*
	120	1.14	1.34	1.57	1.82	2.07	2.33	2.74	3.09*	3.45*	4.94*	6.51*
	140	1.20	1.43	1.68	1.95	2.23	2.52	2.97	3.36*	3.76*	5.40*	7.14*
50	10	0.70	0.77	0.86	0.95	1.04	1.12	1.25	1.36*	1.48*	1.92*	2.36*
	20	0.80	0.89	0.99	1.10	1.20	1.31	1.47	1.60*	1.74*	2.31*	2.88*
	40	0.94	1.06	1.19	1.32	1.45	1.59	1.80	1.98*	2.17*	2.95*	3.76*
	60	1.05	1.19	1.34	1.50	1.66	1.83	2.09	2.31*	2.54*	3.52*	4.54*
	80	1.14	1.30	1.47	1.66	1.85	2.04	2.35	2.61*	2.89*	4.05*	5.26*
	100	1.22	1.40	1.60	1.80	2.02	2.25	2.60	2.90*	3.22*	4.55*	5.94*
	120	1.30	1.49	1.71	1.94	2.19	2.44	2.84	3.18*	3.54*	5.02*	6.59*
	140	1.37	1.58	1.82	2.08	2.35	2.63	3.07	3.45*	3.84*	5.48*	7.21*
100	10	0.79	0.87	0.96	1.06	1.15	1.25	1.38	1.50*	1.62*	2.09*	2.55*
	20	0.92	1.02	1.13	1.24	1.35	1.46	1.63	1.76*	1.91*	2.50*	3.08*
	40	1.10	1.22	1.35	1.49	1.63	1.77	1.98	2.16*	2.36*	3.14*	3.94*
	60	1.23	1.37	1.53	1.69	1.86	2.02	2.28	2.50*	2.73*	3.70*	4.71*
	80	1.34	1.50	1.68	1.86	2.05	2.24	2.54	2.80*	3.08*	4.22*	5.42*
	100	1.43	1.61	1.81	2.02	2.23	2.45	2.79	3.08*	3.40*	4.71*	6.09*
	120	1.52	1.72	1.93	2.16	2.40	2.64	3.02	3.36*	3.71*	5.18*	6.74*
	140	1.60	1.81	2.05	2.30	2.56	2.83	3.25	3.62*	4.01*	5.63*	7.35*
150	10	0.86	0.94	1.04	1.14	1.24	1.34	1.48	1.60*	1.73*	2.22*	2.69*
	20	1.01	1.11	1.22	1.34	1.46	1.57	1.74	1.89*	2.04*	2.65*	3.24*
	40	1.21	1.33	1.48	1.62	1.77	1.91	2.13	2.31*	2.51*	3.31*	4.12*
	60	1.35	1.50	1.67	1.84	2.01	2.18	2.44	2.66*	2.90*	3.87*	4.88*
	80	1.48	1.65	1.83	2.02	2.21	2.41	2.71	2.97*	3.24*	4.39*	5.58*
	100	1.58	1.77	1.98	2.19	2.40	2.62	2.96	3.25*	3.57*	4.87*	6.25*
	120	1.68	1.88	2.11	2.34	2.58	2.82	3.19	3.52*	3.87*	5.34*	6.88*
	140	1.77	1.99	2.23	2.48	2.74	3.01	3.42	3.78*	4.17*	5.78*	7.49*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.91	1.00	1.10	1.20	1.31	1.41	1.56	1.68*	1.81*	2.32*	2.81*
	20	1.07	1.18	1.30	1.43	1.55	1.67	1.84	1.99*	2.15*	2.78*	3.39*
	40	1.30	1.43	1.58	1.73	1.88	2.03	2.25	2.44*	2.65*	3.46*	4.28*
	60	1.46	1.61	1.78	1.96	2.13	2.31	2.57	2.80*	3.04*	4.03*	5.04*
	80	1.59	1.77	1.96	2.15	2.35	2.55	2.85	3.11*	3.39*	4.54*	5.74*
	100	1.71	1.90	2.11	2.33	2.55	2.77	3.11	3.40*	3.72*	5.03*	6.40*
	120	1.81	2.02	2.25	2.49	2.73	2.97	3.35	3.67*	4.03*	5.49*	7.03*
	140	1.91	2.13	2.38	2.64	2.90	3.16	3.57	3.93*	4.32*	5.93*	7.63*
300	10	0.99	1.09	1.20	1.31	1.42	1.53	1.68	1.81*	1.95*	2.50*	3.01*
	20	1.19	1.30	1.43	1.56	1.69	1.82	2.00	2.16*	2.33*	2.99*	3.63*
	40	1.44	1.58	1.74	1.90	2.06	2.22	2.45	2.65*	2.87*	3.72*	4.56*
	60	1.62	1.79	1.97	2.16	2.34	2.52	2.80	3.03*	3.29*	4.31*	5.33*
	80	1.78	1.96	2.17	2.37	2.58	2.79	3.10	3.36*	3.66*	4.83*	6.03*
	100	1.91	2.11	2.33	2.56	2.79	3.02	3.37	3.66*	3.99*	5.32*	6.69*
	120	2.03	2.25	2.49	2.73	2.98	3.23	3.61	3.94*	4.30*	5.77*	7.31*
	140	2.13	2.37	2.63	2.89	3.16	3.43	3.85	4.21*	4.60*	6.21*	7.91*
400	10	1.06	1.17	1.28	1.40	1.51	1.62	1.78	1.92*	2.07*	2.64*	3.18*
	20	1.28	1.40	1.53	1.67	1.81	1.94	2.13	2.30*	2.48*	3.17*	3.84*
	40	1.56	1.71	1.87	2.04	2.21	2.37	2.62	2.82*	3.05*	3.94*	4.81*
	60	1.76	1.93	2.13	2.32	2.51	2.70	2.99	3.23*	3.49*	4.55*	5.59*
	80	1.93	2.12	2.33	2.55	2.77	2.98	3.30	3.58*	3.88*	5.08*	6.30*
	100	2.07	2.29	2.52	2.75	2.99	3.23	3.58	3.89*	4.22*	5.58*	6.96*
	120	2.20	2.43	2.68	2.94	3.19	3.45	3.84	4.18*	4.55*	6.04*	7.58*
	140	2.32	2.56	2.83	3.11	3.38	3.66	4.08	4.45*	4.85*	6.48*	8.18*
600	10	1.18	1.29	1.41	1.53	1.65	1.77	1.95	2.09*	2.25*	2.86*	3.44*
	20	1.42	1.55	1.70	1.85	1.99	2.14	2.35	2.52*	2.72*	3.46*	4.17*
	40	1.74	1.91	2.09	2.27	2.45	2.63	2.89	3.11*	3.35*	4.30*	5.22*
	60	1.98	2.17	2.37	2.58	2.79	2.99	3.29	3.55*	3.84*	4.95*	6.05*
	80	2.17	2.38	2.61	2.84	3.07	3.30	3.64	3.93*	4.25*	5.52*	6.78*
	100	2.33	2.56	2.81	3.07	3.32	3.57	3.94	4.26*	4.62*	6.03*	7.45*
	120	2.48	2.73	3.00	3.27	3.54	3.82	4.22	4.57*	4.96*	6.51*	8.07*
	140	2.61	2.88	3.17	3.46	3.75	4.04	4.48	4.86*	5.28*	6.96*	8.67*
800	10	1.27	1.38	1.51	1.64	1.77	1.90	2.08	2.24*	2.41*	3.05*	3.66*
	20	1.54	1.68	1.84	1.99	2.15	2.30	2.52	2.70*	2.91*	3.70*	4.45*
	40	1.89	2.07	2.26	2.45	2.64	2.83	3.11	3.34*	3.60*	4.60*	5.56*
	60	2.15	2.36	2.58	2.80	3.01	3.23	3.55	3.82*	4.12*	5.29*	6.43*
	80	2.36	2.59	2.83	3.08	3.32	3.56	3.92	4.22*	4.56*	5.88*	7.19*
	100	2.55	2.79	3.06	3.32	3.59	3.85	4.24	4.58*	4.95*	6.42*	7.87*
	120	2.71	2.97	3.26	3.54	3.83	4.12	4.54	4.90*	5.31*	6.91*	8.51*
	140	2.85	3.14	3.44	3.75	4.05	4.36	4.81	5.20*	5.64*	7.37*	9.12*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.65	0.77	0.91	1.05	1.19	1.32	1.53	1.71*	1.89*	2.60*	3.32*
	20	0.76	0.93	1.11	1.29	1.48	1.66	1.94	2.18*	2.42*	3.40*	4.41*
	40	0.94	1.19	1.44	1.70	1.96	2.23	2.63	2.97*	3.32*	4.74*	6.23*
	60	1.10	1.42	1.74	2.06	2.39	2.72	3.23	3.67*	4.11*	5.92*	7.83*
	80	1.25	1.63	2.01	2.39	2.78	3.18	3.79	4.30*	4.83*	7.01*	9.30*
	100	1.39	1.82	2.26	2.70	3.15	3.61	4.31	4.90*	5.51*	8.02*	10.67*
	120	1.52	2.01	2.50	3.00	3.50	4.01	4.80	5.47*	6.15*	8.99*	11.99*
	140	1.64	2.19	2.73	3.28	3.84	4.40	5.27	6.02*	6.77*	9.92*	13.24*
25	10	0.89	1.00	1.13	1.25	1.38	1.51	1.71	1.87*	2.05*	2.75*	3.46*
	20	1.04	1.17	1.33	1.49	1.66	1.83	2.10	2.32*	2.56*	3.52*	4.52*
	40	1.24	1.43	1.65	1.88	2.12	2.37	2.76	3.09*	3.43*	4.85*	6.33*
	60	1.40	1.65	1.93	2.23	2.54	2.86	3.35	3.78*	4.21*	6.02*	7.92*
	80	1.55	1.85	2.19	2.55	2.92	3.30	3.90	4.40*	4.93*	7.10*	9.38*
	100	1.68	2.04	2.43	2.85	3.28	3.73	4.41	5.00*	5.60*	8.11*	10.75*
	120	1.80	2.21	2.66	3.14	3.63	4.13	4.90	5.56*	6.24*	9.07*	12.06*
	140	1.92	2.39	2.89	3.42	3.96	4.51	5.37	6.10*	6.86*	9.99*	13.31*
50	10	1.00	1.12	1.24	1.37	1.51	1.64	1.84	2.00*	2.18*	2.88*	3.59*
	20	1.17	1.31	1.47	1.64	1.80	1.97	2.23	2.45*	2.69*	3.65*	4.64*
	40	1.41	1.60	1.81	2.04	2.27	2.51	2.89	3.21*	3.55*	4.95*	6.43*
	60	1.59	1.83	2.10	2.38	2.68	2.99	3.47	3.88*	4.31*	6.11*	8.01*
	80	1.75	2.03	2.35	2.69	3.05	3.43	4.00	4.51*	5.02*	7.18*	9.46*
	100	1.89	2.22	2.59	2.99	3.41	3.84	4.51	5.09*	5.69*	8.19*	10.83*
	120	2.03	2.40	2.82	3.27	3.75	4.24	5.00	5.65*	6.33*	9.15*	12.13*
	140	2.15	2.57	3.04	3.55	4.08	4.62	5.46	6.19*	6.94*	10.07*	13.39*
100	10	1.14	1.26	1.40	1.54	1.68	1.82	2.03	2.20*	2.38*	3.11*	3.83*
	20	1.35	1.50	1.67	1.84	2.02	2.19	2.45	2.67*	2.91*	3.88*	4.86*
	40	1.64	1.84	2.06	2.28	2.51	2.75	3.12	3.43*	3.77*	5.16*	6.62*
	60	1.85	2.09	2.36	2.64	2.93	3.23	3.69	4.09*	4.52*	6.30*	8.18*
	80	2.04	2.32	2.63	2.96	3.30	3.66	4.22	4.70*	5.22*	7.36*	9.63*
	100	2.20	2.52	2.88	3.25	3.65	4.07	4.71	5.28*	5.87*	8.36*	10.99*
	120	2.35	2.71	3.11	3.53	3.99	4.46	5.19	5.83*	6.50*	9.31*	12.28*
	140	2.48	2.88	3.33	3.80	4.31	4.83	5.65	6.37*	7.11*	10.22*	13.53*
150	10	1.24	1.37	1.52	1.66	1.81	1.95	2.17	2.35*	2.54*	3.29*	4.03*
	20	1.48	1.64	1.82	2.00	2.18	2.36	2.62	2.85*	3.10*	4.08*	5.07*
	40	1.81	2.01	2.24	2.47	2.71	2.95	3.31	3.63*	3.97*	5.36*	6.81*
	60	2.05	2.29	2.57	2.85	3.14	3.43	3.89	4.29*	4.71*	6.49*	8.36*
	80	2.25	2.53	2.85	3.18	3.52	3.87	4.42	4.89*	5.40*	7.53*	9.79*
	100	2.43	2.75	3.11	3.48	3.87	4.28	4.91	5.46*	6.05*	8.52*	11.14*
	120	2.59	2.95	3.34	3.77	4.21	4.66	5.38	6.01*	6.68*	9.47*	12.43*
	140	2.74	3.13	3.57	4.04	4.52	5.03	5.84	6.54*	7.28*	10.38*	13.67*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.33	1.46	1.61	1.76	1.91	2.06	2.28	2.47*	2.67*	3.45*	4.20*
	20	1.59	1.75	1.94	2.12	2.31	2.49	2.77	3.00*	3.25*	4.26*	5.26*
	40	1.94	2.15	2.39	2.63	2.87	3.12	3.48	3.80*	4.15*	5.54*	6.99*
	60	2.20	2.46	2.74	3.03	3.32	3.62	4.07	4.47*	4.90*	6.67*	8.53*
	80	2.42	2.71	3.04	3.37	3.71	4.06	4.60	5.07*	5.58*	7.70*	9.95*
	100	2.61	2.94	3.30	3.68	4.07	4.47	5.10	5.64*	6.23*	8.69*	11.29*
	120	2.79	3.15	3.55	3.97	4.41	4.86	5.56	6.19*	6.85*	9.63*	12.58*
	140	2.94	3.34	3.78	4.24	4.73	5.23	6.02	6.71*	7.44*	10.53*	13.81*
300	10	1.46	1.60	1.76	1.92	2.08	2.24	2.47	2.67*	2.88*	3.70*	4.49*
	20	1.76	1.94	2.13	2.33	2.52	2.72	3.01	3.25*	3.52*	4.56*	5.60*
	40	2.16	2.39	2.64	2.89	3.14	3.39	3.77	4.10*	4.46*	5.88*	7.34*
	60	2.46	2.73	3.02	3.32	3.62	3.93	4.39	4.79*	5.23*	7.01*	8.86*
	80	2.70	3.01	3.34	3.69	4.04	4.39	4.93	5.41*	5.92*	8.04*	10.27*
	100	2.92	3.26	3.63	4.02	4.41	4.81	5.43	5.98*	6.56*	9.01*	11.60*
	120	3.11	3.49	3.90	4.32	4.76	5.21	5.90	6.52*	7.18*	9.94*	12.87*
	140	3.29	3.69	4.14	4.61	5.09	5.58	6.36	7.03*	7.76*	10.83*	14.10*
400	10	1.57	1.72	1.89	2.05	2.22	2.39	2.63	2.83*	3.06*	3.91*	4.73*
	20	1.90	2.08	2.29	2.50	2.70	2.90	3.20	3.46*	3.74*	4.82*	5.89*
	40	2.34	2.58	2.84	3.10	3.36	3.63	4.02	4.35*	4.72*	6.19*	7.66*
	60	2.66	2.95	3.25	3.56	3.87	4.19	4.66	5.07*	5.52*	7.32*	9.18*
	80	2.93	3.25	3.60	3.95	4.31	4.67	5.22	5.70*	6.22*	8.35*	10.58*
	100	3.17	3.52	3.90	4.30	4.70	5.11	5.73	6.28*	6.87*	9.32*	11.90*
	120	3.37	3.76	4.18	4.62	5.06	5.52	6.21	6.82*	7.48*	10.24*	13.16*
	140	3.56	3.99	4.44	4.92	5.40	5.90	6.67	7.34*	8.07*	11.13*	14.38*
600	10	1.74	1.90	2.08	2.27	2.45	2.62	2.88	3.10*	3.34*	4.26*	5.13*
	20	2.12	2.32	2.54	2.77	2.99	3.20	3.52	3.79*	4.09*	5.25*	6.37*
	40	2.63	2.88	3.16	3.45	3.73	4.01	4.42	4.77*	5.16*	6.70*	8.23*
	60	3.00	3.30	3.63	3.96	4.29	4.62	5.11	5.54*	6.01*	7.88*	9.77*
	80	3.30	3.64	4.01	4.39	4.76	5.14	5.71	6.20*	6.74*	8.92*	11.17*
	100	3.57	3.94	4.35	4.77	5.19	5.61	6.25	6.80*	7.41*	9.89*	12.48*
	120	3.80	4.21	4.66	5.11	5.57	6.04	6.75	7.36*	8.04*	10.81*	13.73*
	140	4.02	4.46	4.94	5.43	5.93	6.44	7.21	7.89*	8.63*	11.69*	14.93*
800	10	1.88	2.05	2.24	2.44	2.63	2.81	3.09	3.32*	3.57*	4.54*	5.46*
	20	2.30	2.52	2.75	2.99	3.22	3.45	3.79	4.07*	4.39*	5.61*	6.78*
	40	2.86	3.13	3.43	3.73	4.02	4.32	4.75	5.12*	5.53*	7.14*	8.72*
	60	3.27	3.59	3.93	4.28	4.63	4.98	5.49	5.93*	6.42*	8.36*	10.30*
	80	3.60	3.96	4.35	4.75	5.14	5.53	6.12	6.63*	7.19*	9.43*	11.71*
	100	3.89	4.29	4.72	5.15	5.59	6.03	6.68	7.25*	7.88*	10.42*	13.02*
	120	4.15	4.58	5.05	5.52	6.00	6.48	7.20	7.83*	8.52*	11.34*	14.26*
	140	4.38	4.85	5.35	5.86	6.38	6.90	7.69	8.37*	9.13*	12.22*	15.46*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.96	1.18	1.40	1.62	1.85	2.08	2.43	2.73*	3.02*	4.23*	5.47*
	20	1.18	1.48	1.80	2.11	2.43	2.76	3.25	3.67*	4.09*	5.83*	7.63*
	40	1.55	2.00	2.47	2.93	3.41	3.89	4.63	5.25*	5.89*	8.52*	11.28*
	60	1.87	2.46	3.05	3.65	4.26	4.88	5.83	6.64*	7.46*	10.88*	14.48*
	80	2.16	2.88	3.59	4.31	5.05	5.79	6.94	7.91*	8.90*	13.04*	17.41*
	100	2.44	3.27	4.10	4.94	5.78	6.65	7.98	9.11*	10.26*	15.08*	20.17*
	120	2.70	3.65	4.58	5.53	6.49	7.46	8.96	10.25*	11.55*	17.01*	22.79*
	140	2.95	4.01	5.04	6.09	7.16	8.24	9.91	11.34*	12.79*	18.86*	25.30*
25	10	1.29	1.47	1.66	1.86	2.07	2.29	2.61	2.89*	3.19*	4.38*	5.60*
	20	1.54	1.77	2.04	2.33	2.62	2.93	3.40	3.81*	4.23*	5.95*	7.75*
	40	1.90	2.27	2.68	3.12	3.57	4.04	4.76	5.37*	6.00*	8.62*	11.38*
	60	2.21	2.70	3.25	3.82	4.41	5.02	5.95	6.75*	7.57*	10.97*	14.57*
	80	2.49	3.11	3.78	4.47	5.19	5.92	7.05	8.01*	9.00*	13.13*	17.50*
	100	2.75	3.49	4.27	5.08	5.92	6.77	8.08	9.20*	10.35*	15.16*	20.25*
	120	3.00	3.85	4.75	5.67	6.61	7.58	9.06	10.34*	11.64*	17.09*	22.87*
	140	3.25	4.21	5.20	6.23	7.28	8.35	10.01	11.42*	12.87*	18.94*	25.38*
50	10	1.46	1.63	1.83	2.04	2.24	2.45	2.78	3.05*	3.34*	4.52*	5.74*
	20	1.74	1.97	2.24	2.51	2.80	3.10	3.55	3.95*	4.36*	6.08*	7.87*
	40	2.15	2.49	2.88	3.29	3.73	4.18	4.88	5.49*	6.12*	8.73*	11.48*
	60	2.47	2.93	3.44	3.98	4.56	5.15	6.07	6.86*	7.67*	11.07*	14.66*
	80	2.76	3.32	3.95	4.62	5.32	6.04	7.16	8.11*	9.10*	13.22*	17.58*
	100	3.03	3.70	4.44	5.23	6.04	6.88	8.18	9.30*	10.45*	15.24*	20.33*
	120	3.28	4.06	4.91	5.81	6.73	7.69	9.16	10.43*	11.73*	17.17*	22.94*
	140	3.52	4.40	5.36	6.36	7.40	8.46	10.10	11.51*	12.96*	19.02*	25.45*
100	10	1.67	1.86	2.07	2.28	2.50	2.71	3.04	3.31*	3.61*	4.79*	6.01*
	20	2.01	2.25	2.52	2.80	3.09	3.38	3.83	4.21*	4.62*	6.32*	8.10*
	40	2.49	2.83	3.21	3.61	4.03	4.46	5.14	5.73*	6.35*	8.94*	11.67*
	60	2.85	3.29	3.77	4.29	4.84	5.41	6.30	7.07*	7.88*	11.26*	14.83*
	80	3.17	3.70	4.29	4.92	5.59	6.29	7.37	8.32*	9.30*	13.40*	17.74*
	100	3.46	4.07	4.77	5.51	6.30	7.12	8.39	9.49*	10.63*	15.41*	20.48*
	120	3.72	4.43	5.23	6.08	6.98	7.91	9.36	10.61*	11.91*	17.33*	23.09*
	140	3.97	4.77	5.67	6.63	7.63	8.67	10.29	11.69*	13.13*	19.17*	25.59*
150	10	1.83	2.02	2.24	2.46	2.69	2.91	3.24	3.52*	3.83*	5.03*	6.25*
	20	2.21	2.46	2.74	3.03	3.32	3.61	4.06	4.45*	4.86*	6.56*	8.32*
	40	2.74	3.09	3.47	3.87	4.28	4.71	5.37	5.95*	6.57*	9.14*	11.87*
	60	3.14	3.58	4.06	4.57	5.10	5.65	6.52	7.28*	8.08*	11.45*	15.01*
	80	3.48	4.00	4.58	5.20	5.85	6.52	7.59	8.51*	9.49*	13.57*	17.91*
	100	3.79	4.39	5.07	5.79	6.55	7.34	8.59	9.68*	10.82*	15.58*	20.64*
	120	4.07	4.75	5.52	6.35	7.22	8.13	9.55	10.79*	12.08*	17.49*	23.24*
	140	4.33	5.10	5.96	6.89	7.87	8.89	10.48	11.86*	13.30*	19.33*	25.74*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.95	2.16	2.38	2.61	2.84	3.07	3.41	3.70*	4.01*	5.25*	6.48*
	20	2.37	2.63	2.92	3.22	3.51	3.81	4.27	4.65*	5.07*	6.78*	8.54*
	40	2.94	3.30	3.69	4.10	4.51	4.94	5.59	6.17*	6.78*	9.35*	12.06*
	60	3.38	3.82	4.30	4.81	5.34	5.89	6.74	7.49*	8.29*	11.63*	15.18*
	80	3.74	4.26	4.84	5.45	6.09	6.75	7.80	8.71*	9.68*	13.75*	18.07*
	100	4.07	4.67	5.33	6.04	6.79	7.57	8.79	9.87*	11.00*	15.74*	20.79*
	120	4.36	5.04	5.79	6.60	7.45	8.35	9.75	10.97*	12.26*	17.65*	23.39*
	140	4.63	5.39	6.23	7.14	8.09	9.10	10.67	12.04*	13.47*	19.48*	25.88*
300	10	2.16	2.37	2.62	2.86	3.10	3.34	3.70	4.00*	4.33*	5.61*	6.88*
	20	2.63	2.91	3.22	3.52	3.83	4.15	4.61	5.01*	5.44*	7.18*	8.96*
	40	3.28	3.65	4.06	4.47	4.90	5.33	5.99	6.56*	7.18*	9.74*	12.44*
	60	3.76	4.22	4.71	5.23	5.76	6.30	7.14	7.88*	8.68*	12.00*	15.53*
	80	4.17	4.70	5.28	5.89	6.52	7.17	8.20	9.09*	10.05*	14.10*	18.40*
	100	4.52	5.13	5.79	6.49	7.23	7.99	9.18	10.24*	11.36*	16.07*	21.10*
	120	4.84	5.52	6.27	7.06	7.89	8.76	10.13	11.33*	12.60*	17.97*	23.68*
	140	5.14	5.89	6.72	7.60	8.53	9.50	11.04	12.38*	13.80*	19.78*	26.16*
400	10	2.32	2.55	2.80	3.06	3.31	3.56	3.93	4.25*	4.59*	5.92*	7.22*
	20	2.85	3.14	3.45	3.78	4.10	4.42	4.90	5.31*	5.76*	7.54*	9.34*
	40	3.55	3.94	4.36	4.79	5.23	5.66	6.33	6.91*	7.54*	10.12*	12.81*
	60	4.08	4.55	5.06	5.58	6.12	6.67	7.51	8.24*	9.04*	12.36*	15.88*
	80	4.51	5.06	5.65	6.27	6.90	7.56	8.57	9.46*	10.42*	14.44*	18.72*
	100	4.90	5.51	6.19	6.89	7.62	8.38	9.55	10.59*	11.71*	16.40*	21.41*
	120	5.24	5.93	6.68	7.47	8.29	9.15	10.49	11.68*	12.94*	18.28*	23.98*
	140	5.56	6.31	7.14	8.02	8.94	9.89	11.40	12.72*	14.13*	20.09*	26.45*
600	10	2.59	2.83	3.11	3.38	3.65	3.92	4.31	4.65*	5.01*	6.43*	7.80*
	20	3.19	3.50	3.84	4.19	4.53	4.87	5.38	5.81*	6.28*	8.16*	10.01*
	40	3.99	4.40	4.85	5.31	5.77	6.22	6.91	7.51*	8.16*	10.80*	13.51*
	60	4.58	5.08	5.62	6.17	6.73	7.29	8.14	8.89*	9.70*	13.05*	16.55*
	80	5.08	5.65	6.27	6.91	7.56	8.22	9.23	10.12*	11.08*	15.10*	19.36*
	100	5.50	6.15	6.84	7.57	8.30	9.06	10.23	11.26*	12.37*	17.04*	22.02*
	120	5.89	6.60	7.37	8.17	9.00	9.85	11.17	12.34*	13.60*	18.90*	24.56*
	140	6.24	7.02	7.86	8.74	9.66	10.60	12.07	13.37*	14.78*	20.69*	27.01*
800	10	2.80	3.06	3.35	3.64	3.93	4.21	4.62	4.97*	5.36*	6.85*	8.29*
	20	3.46	3.80	4.16	4.52	4.88	5.24	5.77	6.22*	6.72*	8.67*	10.59*
	40	4.35	4.78	5.26	5.73	6.21	6.69	7.40	8.01*	8.69*	11.40*	14.15*
	60	5.00	5.52	6.08	6.66	7.23	7.81	8.69	9.44*	10.28*	13.67*	17.19*
	80	5.53	6.13	6.78	7.44	8.10	8.78	9.81	10.70*	11.69*	15.73*	19.98*
	100	6.00	6.67	7.39	8.13	8.89	9.65	10.83	11.86*	12.99*	17.66*	22.62*
	120	6.42	7.15	7.95	8.77	9.61	10.47	11.79	12.95*	14.22*	19.51*	25.14*
	140	6.80	7.60	8.47	9.36	10.28	11.23	12.70	13.98*	15.39*	21.28*	27.57*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.49	1.86	2.24	2.63	3.02	3.42	4.03	4.54*	5.05*	7.18*	9.38*
	20	1.92	2.48	3.04	3.61	4.18	4.77	5.66	6.42*	7.19*	10.38*	13.71*
	40	2.65	3.52	4.38	5.25	6.13	7.03	8.41	9.58*	10.78*	15.76*	21.01*
	60	3.30	4.43	5.55	6.69	7.84	9.02	10.82	12.36*	13.93*	20.47*	27.40*
	80	3.89	5.27	6.63	8.01	9.41	10.84	13.04	14.91*	16.82*	24.80*	33.27*
	100	4.44	6.06	7.65	9.25	10.89	12.55	15.11	17.30*	19.53*	28.87*	38.79*
	120	4.97	6.80	8.61	10.43	12.29	14.18	17.09	19.57*	22.11*	32.74*	44.03*
	140	5.47	7.52	9.53	11.56	13.63	15.74	18.98	21.76*	24.59*	36.45*	49.05*
25	10	1.91	2.20	2.53	2.89	3.25	3.63	4.21	4.71*	5.22*	7.33*	9.52*
	20	2.35	2.79	3.29	3.83	4.38	4.94	5.82	6.56*	7.33*	10.50*	13.83*
	40	3.04	3.79	4.60	5.43	6.30	7.18	8.54	9.71*	10.90*	15.86*	21.11*
	60	3.66	4.68	5.75	6.86	7.99	9.15	10.94	12.47*	14.03*	20.57*	27.49*
	80	4.22	5.50	6.82	8.17	9.55	10.97	13.15	15.01*	16.92*	24.89*	33.36*
	100	4.76	6.27	7.82	9.40	11.02	12.67	15.22	17.40*	19.62*	28.96*	38.86*
	120	5.27	7.01	8.77	10.57	12.41	14.29	17.19	19.67*	22.20*	32.82*	44.10*
	140	5.77	7.72	9.69	11.70	13.75	15.85	19.08	21.84*	24.67*	36.52*	49.13*
50	10	2.15	2.44	2.77	3.11	3.46	3.82	4.39	4.87*	5.38*	7.47*	9.65*
	20	2.64	3.06	3.53	4.04	4.57	5.12	5.97	6.70*	7.47*	10.63*	13.95*
	40	3.37	4.05	4.81	5.62	6.46	7.33	8.67	9.83*	11.01*	15.97*	21.20*
	60	3.98	4.92	5.95	7.02	8.14	9.29	11.06	12.58*	14.14*	20.66*	27.58*
	80	4.54	5.73	7.00	8.32	9.69	11.09	13.26	15.11*	17.01*	24.98*	33.44*
	100	5.07	6.49	7.99	9.55	11.15	12.79	15.32	17.49*	19.72*	29.04*	38.94*
	120	5.57	7.22	8.94	10.71	12.54	14.41	17.29	19.76*	22.29*	32.90*	44.18*
	140	6.06	7.92	9.85	11.84	13.87	15.96	19.18	21.93*	24.76*	36.60*	49.20*
100	10	2.48	2.77	3.11	3.45	3.80	4.16	4.71	5.19*	5.69*	7.76*	9.93*
	20	3.04	3.46	3.92	4.41	4.92	5.45	6.27	6.98*	7.74*	10.87*	14.18*
	40	3.85	4.49	5.21	5.97	6.78	7.62	8.93	10.06*	11.24*	16.18*	21.40*
	60	4.51	5.36	6.32	7.35	8.43	9.55	11.29	12.79*	14.35*	20.85*	27.76*
	80	5.08	6.16	7.36	8.63	9.96	11.34	13.47	15.31*	17.21*	25.16*	33.60*
	100	5.62	6.91	8.33	9.84	11.41	13.02	15.53	17.68*	19.90*	29.21*	39.10*
	120	6.12	7.62	9.27	10.99	12.79	14.63	17.49	19.94*	22.47*	33.06*	44.33*
	140	6.60	8.31	10.17	12.11	14.11	16.17	19.37	22.11*	24.93*	36.75*	49.34*
150	10	2.71	3.02	3.37	3.72	4.08	4.44	4.99	5.46*	5.97*	8.04*	10.19*
	20	3.34	3.76	4.23	4.72	5.23	5.74	6.55	7.25*	8.00*	11.12*	14.41*
	40	4.23	4.85	5.55	6.30	7.08	7.90	9.18	10.30*	11.47*	16.39*	21.60*
	60	4.92	5.75	6.67	7.67	8.72	9.81	11.52	13.01*	14.56*	21.04*	27.93*
	80	5.53	6.55	7.70	8.93	10.23	11.58	13.69	15.51*	17.41*	25.34*	33.77*
	100	6.08	7.30	8.66	10.13	11.66	13.26	15.73	17.87*	20.09*	29.37*	39.26*
	120	6.59	8.01	9.59	11.27	13.03	14.85	17.68	20.12*	22.64*	33.22*	44.48*
	140	7.08	8.69	10.48	12.37	14.35	16.39	19.56	22.29*	25.10*	36.91*	49.49*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.90	3.23	3.58	3.94	4.31	4.68	5.23	5.71*	6.22*	8.31*	10.46*
	20	3.58	4.02	4.50	4.99	5.50	6.01	6.81	7.51*	8.26*	11.36*	14.64*
	40	4.53	5.16	5.86	6.60	7.37	8.17	9.43	10.53*	11.70*	16.59*	21.79*
	60	5.27	6.09	7.00	7.97	8.99	10.07	11.75	13.22*	14.76*	21.23*	28.11*
	80	5.90	6.90	8.02	9.22	10.50	11.82	13.91	15.71*	17.60*	25.51*	33.93*
	100	6.47	7.66	8.98	10.41	11.92	13.49	15.94	18.06*	20.27*	29.54*	39.41*
	120	7.00	8.37	9.90	11.54	13.27	15.07	17.88	20.31*	22.82*	33.38*	44.62*
	140	7.50	9.05	10.78	12.64	14.58	16.60	19.75	22.46*	25.27*	37.06*	49.63*
300	10	3.22	3.56	3.93	4.31	4.69	5.07	5.64	6.13*	6.66*	8.79*	10.95*
	20	3.98	4.44	4.93	5.44	5.96	6.48	7.28	7.98*	8.73*	11.83*	15.09*
	40	5.04	5.68	6.39	7.12	7.89	8.68	9.91	10.99*	12.15*	17.01*	22.18*
	60	5.84	6.66	7.56	8.52	9.52	10.56	12.20	13.65*	15.18*	21.61*	28.46*
	80	6.53	7.51	8.61	9.78	11.01	12.30	14.33	16.11*	17.99*	25.87*	34.26*
	100	7.14	8.29	9.58	10.95	12.41	13.94	16.34	18.44*	20.64*	29.88*	39.72*
	120	7.70	9.02	10.49	12.08	13.76	15.51	18.27	20.67*	23.17*	33.70*	44.92*
	140	8.22	9.71	11.37	13.16	15.05	17.03	20.12	22.81*	25.61*	37.37*	49.92*
400	10	3.47	3.82	4.21	4.61	5.01	5.40	5.99	6.49*	7.04*	9.21*	11.40*
	20	4.31	4.78	5.29	5.81	6.34	6.88	7.69	8.39*	9.16*	12.28*	15.53*
	40	5.45	6.11	6.83	7.57	8.34	9.13	10.35	11.42*	12.58*	17.42*	22.56*
	60	6.32	7.14	8.05	9.00	9.99	11.02	12.64	14.06*	15.58*	21.98*	28.81*
	80	7.05	8.04	9.12	10.28	11.49	12.76	14.75	16.51*	18.37*	26.22*	34.59*
	100	7.69	8.84	10.11	11.46	12.89	14.39	16.75	18.82*	21.00*	30.21*	40.03*
	120	8.28	9.59	11.03	12.58	14.22	15.94	18.66	21.03*	23.52*	34.02*	45.22*
	140	8.83	10.29	11.91	13.66	15.51	17.45	20.49	23.16*	25.94*	37.68*	50.20*
600	10	3.87	4.26	4.68	5.10	5.52	5.94	6.56	7.08*	7.66*	9.94*	12.20*
	20	4.83	5.33	5.88	6.43	6.99	7.54	8.38	9.10*	9.89*	13.09*	16.36*
	40	6.12	6.81	7.56	8.33	9.12	9.91	11.14	12.21*	13.37*	18.21*	23.32*
	60	7.09	7.94	8.87	9.84	10.83	11.86	13.45	14.85*	16.36*	22.72*	29.51*
	80	7.89	8.90	10.01	11.16	12.36	13.60	15.55	17.27*	19.12*	26.91*	35.24*
	100	8.60	9.76	11.03	12.37	13.77	15.23	17.53	19.55*	21.72*	30.87*	40.65*
	120	9.25	10.55	11.99	13.51	15.10	16.78	19.41	21.74*	24.21*	34.65*	45.81*
	140	9.84	11.29	12.89	14.59	16.38	18.26	21.23	23.85*	26.61*	38.29*	50.77*
800	10	4.20	4.61	5.05	5.50	5.94	6.38	7.02	7.57*	8.18*	10.56*	12.89*
	20	5.25	5.78	6.36	6.94	7.52	8.10	8.96	9.70*	10.52*	13.80*	17.12*
	40	6.66	7.38	8.16	8.96	9.77	10.58	11.82	12.90*	14.09*	18.96*	24.06*
	60	7.71	8.60	9.56	10.55	11.56	12.59	14.18	15.57*	17.09*	23.44*	30.20*
	80	8.59	9.62	10.75	11.92	13.12	14.36	16.29	17.99*	19.84*	27.60*	35.89*
	100	9.35	10.53	11.82	13.17	14.56	16.01	18.27	20.27*	22.42*	31.52*	41.27*
	120	10.04	11.37	12.81	14.32	15.91	17.55	20.15	22.44*	24.89*	35.28*	46.40*
	140	10.68	12.14	13.73	15.42	17.19	19.04	21.95	24.52*	27.27*	38.89*	51.34*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.50	0.57	0.66	0.74	0.83	0.92	1.05	1.16	1.27*	1.71*	2.15*
	20	0.56	0.66	0.76	0.87	0.98	1.10	1.26	1.40	1.55*	2.12*	2.70*
	40	0.66	0.80	0.94	1.09	1.24	1.40	1.62	1.82	2.01*	2.81*	3.64*
	60	0.75	0.92	1.10	1.29	1.47	1.66	1.94	2.18	2.42*	3.42*	4.46*
	80	0.83	1.04	1.25	1.46	1.68	1.90	2.23	2.51	2.80*	3.98*	5.21*
	100	0.91	1.15	1.39	1.63	1.88	2.13	2.51	2.83	3.15*	4.50*	5.91*
	120	0.98	1.25	1.52	1.79	2.06	2.34	2.76	3.12	3.49*	5.00*	6.58*
	140	1.05	1.35	1.64	1.94	2.24	2.55	3.01	3.41	3.81*	5.48*	7.23*
25	10	0.69	0.75	0.83	0.92	1.00	1.08	1.21	1.31	1.42*	1.85*	2.28*
	20	0.78	0.86	0.96	1.05	1.16	1.26	1.41	1.55	1.68*	2.24*	2.82*
	40	0.91	1.02	1.14	1.27	1.40	1.54	1.76	1.94	2.13*	2.92*	3.74*
	60	1.01	1.14	1.29	1.45	1.62	1.79	2.06	2.29	2.53*	3.52*	4.54*
	80	1.10	1.25	1.43	1.62	1.82	2.03	2.35	2.62	2.90*	4.07*	5.29*
	100	1.18	1.36	1.56	1.78	2.01	2.25	2.61	2.93	3.25*	4.59*	5.99*
	120	1.25	1.45	1.69	1.93	2.19	2.46	2.87	3.22	3.58*	5.08*	6.66*
	140	1.32	1.55	1.81	2.08	2.37	2.66	3.11	3.50	3.90*	5.56*	7.30*
50	10	0.76	0.83	0.92	1.00	1.09	1.18	1.31	1.41	1.52*	1.96*	2.40*
	20	0.88	0.96	1.06	1.16	1.27	1.37	1.53	1.66	1.79*	2.36*	2.93*
	40	1.03	1.14	1.27	1.40	1.53	1.67	1.88	2.06	2.24*	3.02*	3.83*
	60	1.15	1.28	1.43	1.59	1.75	1.92	2.18	2.40	2.63*	3.61*	4.63*
	80	1.25	1.40	1.58	1.76	1.95	2.15	2.46	2.72	2.99*	4.16*	5.37*
	100	1.34	1.51	1.71	1.92	2.14	2.36	2.72	3.02	3.34*	4.67*	6.07*
	120	1.42	1.62	1.84	2.07	2.31	2.57	2.97	3.31	3.67*	5.16*	6.73*
	140	1.50	1.71	1.95	2.21	2.49	2.77	3.21	3.59	3.98*	5.63*	7.37*
100	10	0.86	0.94	1.03	1.12	1.21	1.31	1.44	1.55	1.67*	2.13*	2.59*
	20	1.01	1.10	1.20	1.31	1.42	1.53	1.69	1.83	1.97*	2.55*	3.13*
	40	1.20	1.31	1.45	1.58	1.72	1.86	2.07	2.25	2.43*	3.21*	4.02*
	60	1.34	1.48	1.63	1.79	1.96	2.12	2.38	2.60	2.82*	3.79*	4.81*
	80	1.46	1.62	1.79	1.98	2.17	2.36	2.66	2.91	3.18*	4.33*	5.53*
	100	1.57	1.74	1.94	2.14	2.36	2.58	2.92	3.21	3.52*	4.83*	6.22*
	120	1.66	1.85	2.07	2.30	2.54	2.78	3.16	3.49	3.84*	5.32*	6.88*
	140	1.75	1.96	2.19	2.45	2.71	2.98	3.40	3.77	4.15*	5.79*	7.51*
150	10	0.94	1.02	1.11	1.21	1.30	1.40	1.54	1.66	1.77*	2.26*	2.74*
	20	1.10	1.20	1.31	1.42	1.54	1.65	1.82	1.96	2.10*	2.71*	3.30*
	40	1.32	1.44	1.58	1.72	1.86	2.01	2.22	2.40	2.59*	3.39*	4.20*
	60	1.48	1.62	1.78	1.95	2.12	2.29	2.55	2.76	2.99*	3.96*	4.97*
	80	1.61	1.78	1.96	2.15	2.34	2.53	2.83	3.08	3.35*	4.50*	5.69*
	100	1.73	1.91	2.11	2.32	2.54	2.76	3.09	3.38	3.68*	5.00*	6.38*
	120	1.84	2.03	2.25	2.48	2.72	2.96	3.34	3.66	4.00*	5.47*	7.03*
	140	1.93	2.15	2.39	2.64	2.90	3.16	3.58	3.94	4.31*	5.94*	7.66*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	0.99	1.08	1.18	1.28	1.38	1.48	1.62	1.74	1.86*	2.37*	2.86*
	20	1.17	1.28	1.39	1.51	1.63	1.75	1.92	2.07	2.21*	2.84*	3.45*
	40	1.42	1.54	1.68	1.83	1.98	2.13	2.35	2.53	2.72*	3.54*	4.36*
	60	1.59	1.74	1.91	2.08	2.25	2.42	2.69	2.91	3.14*	4.12*	5.13*
	80	1.74	1.91	2.09	2.29	2.48	2.68	2.98	3.24	3.50*	4.65*	5.85*
	100	1.87	2.05	2.26	2.47	2.69	2.91	3.25	3.54	3.84*	5.15*	6.53*
	120	1.98	2.18	2.41	2.64	2.88	3.13	3.50	3.82	4.16*	5.63*	7.17*
	140	2.08	2.30	2.55	2.80	3.06	3.33	3.74	4.09	4.46*	6.08*	7.80*
300	10	1.09	1.18	1.28	1.39	1.49	1.60	1.75	1.88	2.01*	2.55*	3.06*
	20	1.30	1.40	1.53	1.65	1.78	1.91	2.09	2.24	2.40*	3.06*	3.69*
	40	1.57	1.71	1.86	2.02	2.17	2.33	2.56	2.75	2.95*	3.80*	4.64*
	60	1.77	1.93	2.11	2.29	2.47	2.65	2.92	3.15	3.39*	4.40*	5.43*
	80	1.94	2.12	2.31	2.52	2.72	2.93	3.24	3.50	3.77*	4.94*	6.15*
	100	2.08	2.28	2.50	2.72	2.95	3.17	3.52	3.81	4.11*	5.44*	6.82*
	120	2.21	2.42	2.66	2.90	3.15	3.40	3.78	4.10	4.44*	5.92*	7.46*
	140	2.33	2.56	2.81	3.07	3.34	3.61	4.03	4.38	4.75*	6.37*	8.07*
400	10	1.16	1.26	1.37	1.48	1.59	1.70	1.86	1.99	2.13*	2.69*	3.23*
	20	1.39	1.51	1.64	1.77	1.90	2.03	2.23	2.39	2.55*	3.24*	3.90*
	40	1.70	1.84	2.00	2.16	2.33	2.49	2.73	2.93	3.14*	4.02*	4.89*
	60	1.92	2.09	2.27	2.46	2.65	2.84	3.12	3.36	3.60*	4.65*	5.70*
	80	2.10	2.29	2.49	2.71	2.92	3.13	3.45	3.72	3.99*	5.20*	6.42*
	100	2.26	2.46	2.69	2.92	3.16	3.39	3.75	4.04	4.35*	5.71*	7.09*
	120	2.40	2.62	2.87	3.12	3.37	3.63	4.02	4.35	4.69*	6.18*	7.73*
	140	2.53	2.77	3.03	3.30	3.57	3.85	4.27	4.63	5.00*	6.64*	8.34*
600	10	1.29	1.39	1.50	1.62	1.74	1.86	2.03	2.17	2.32*	2.92*	3.50*
	20	1.55	1.67	1.82	1.96	2.10	2.24	2.45	2.62	2.79*	3.53*	4.24*
	40	1.90	2.06	2.23	2.41	2.58	2.76	3.02	3.23	3.44*	4.39*	5.30*
	60	2.16	2.33	2.53	2.74	2.94	3.14	3.44	3.69	3.95*	5.06*	6.15*
	80	2.37	2.56	2.79	3.01	3.24	3.47	3.81	4.08	4.37*	5.64*	6.90*
	100	2.55	2.76	3.01	3.26	3.50	3.75	4.13	4.44	4.76*	6.16*	7.58*
	120	2.71	2.94	3.20	3.47	3.74	4.01	4.42	4.76	5.11*	6.65*	8.22*
	140	2.85	3.10	3.38	3.67	3.96	4.25	4.69	5.06	5.44*	7.12*	8.84*
800	10	1.38	1.49	1.62	1.74	1.87	1.99	2.17	2.32	2.47*	3.11*	3.72*
	20	1.68	1.81	1.96	2.11	2.26	2.41	2.63	2.81	2.99*	3.77*	4.52*
	40	2.07	2.23	2.41	2.60	2.79	2.97	3.25	3.47	3.70*	4.69*	5.65*
	60	2.35	2.54	2.75	2.97	3.18	3.39	3.71	3.97	4.23*	5.40*	6.54*
	80	2.58	2.79	3.03	3.27	3.51	3.74	4.10	4.39	4.69*	6.01*	7.31*
	100	2.78	3.01	3.27	3.53	3.79	4.05	4.44	4.76	5.09*	6.56*	8.01*
	120	2.95	3.20	3.48	3.76	4.04	4.33	4.75	5.10	5.46*	7.06*	8.67*
	140	3.11	3.38	3.67	3.98	4.28	4.58	5.04	5.41	5.81*	7.54*	9.29*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.72	0.84	0.97	1.11	1.25	1.39	1.60	1.77	1.95*	2.66*	3.39*
	20	0.84	1.01	1.19	1.37	1.56	1.74	2.03	2.27	2.51*	3.49*	4.50*
	40	1.04	1.29	1.55	1.81	2.08	2.34	2.75	3.09	3.44*	4.88*	6.37*
	60	1.22	1.54	1.87	2.20	2.53	2.87	3.38	3.82	4.26*	6.09*	8.00*
	80	1.38	1.77	2.16	2.55	2.95	3.35	3.96	4.49	5.01*	7.21*	9.51*
	100	1.54	1.99	2.44	2.89	3.34	3.80	4.51	5.11	5.72*	8.26*	10.92*
	120	1.68	2.19	2.70	3.20	3.71	4.23	5.03	5.71	6.39*	9.25*	12.26*
	140	1.83	2.39	2.95	3.51	4.07	4.65	5.53	6.28	7.04*	10.21*	13.55*
25	10	0.98	1.08	1.20	1.33	1.45	1.58	1.78	1.94	2.11*	2.81*	3.53*
	20	1.14	1.27	1.42	1.58	1.75	1.92	2.19	2.41	2.64*	3.61*	4.62*
	40	1.36	1.55	1.77	2.00	2.24	2.50	2.88	3.22	3.56*	4.98*	6.47*
	60	1.54	1.79	2.07	2.37	2.68	3.01	3.51	3.93	4.37*	6.19*	8.09*
	80	1.70	2.01	2.35	2.71	3.09	3.48	4.08	4.59	5.11*	7.30*	9.59*
	100	1.85	2.21	2.61	3.04	3.48	3.93	4.62	5.21	5.81*	8.34*	11.00*
	120	1.99	2.41	2.87	3.35	3.84	4.35	5.13	5.80	6.48*	9.33*	12.34*
	140	2.12	2.60	3.11	3.65	4.20	4.76	5.63	6.37	7.12*	10.28*	13.62*
50	10	1.10	1.20	1.33	1.46	1.59	1.72	1.91	2.08	2.25*	2.95*	3.66*
	20	1.28	1.42	1.57	1.73	1.90	2.07	2.33	2.55	2.77*	3.74*	4.73*
	40	1.54	1.73	1.94	2.17	2.40	2.64	3.02	3.34	3.67*	5.09*	6.56*
	60	1.75	1.98	2.25	2.53	2.83	3.14	3.63	4.04	4.47*	6.28*	8.18*
	80	1.92	2.20	2.52	2.87	3.23	3.61	4.19	4.69	5.21*	7.38*	9.67*
	100	2.08	2.41	2.79	3.19	3.61	4.05	4.73	5.31	5.91*	8.42*	11.08*
	120	2.22	2.60	3.03	3.49	3.97	4.47	5.24	5.89	6.57*	9.41*	12.41*
	140	2.36	2.79	3.27	3.79	4.32	4.87	5.73	6.46	7.21*	10.36*	13.69*
100	10	1.25	1.36	1.50	1.63	1.77	1.91	2.11	2.28	2.45*	3.18*	3.90*
	20	1.48	1.62	1.78	1.95	2.12	2.30	2.56	2.78	3.00*	3.97*	4.95*
	40	1.79	1.98	2.20	2.42	2.65	2.89	3.26	3.57	3.89*	5.29*	6.76*
	60	2.03	2.26	2.53	2.81	3.09	3.39	3.86	4.26	4.68*	6.47*	8.36*
	80	2.23	2.50	2.82	3.15	3.49	3.85	4.41	4.90	5.40*	7.56*	9.84*
	100	2.41	2.72	3.08	3.46	3.86	4.28	4.94	5.50	6.09*	8.59*	11.23*
	120	2.57	2.93	3.33	3.76	4.22	4.69	5.44	6.08	6.75*	9.57*	12.56*
	140	2.72	3.12	3.57	4.05	4.56	5.09	5.92	6.64	7.38*	10.52*	13.84*
150	10	1.36	1.48	1.62	1.76	1.91	2.05	2.26	2.43	2.61*	3.36*	4.10*
	20	1.62	1.77	1.94	2.12	2.29	2.47	2.74	2.96	3.19*	4.17*	5.16*
	40	1.97	2.17	2.39	2.62	2.86	3.10	3.46	3.77	4.09*	5.49*	6.95*
	60	2.24	2.48	2.75	3.03	3.31	3.61	4.07	4.46	4.87*	6.65*	8.53*
	80	2.46	2.74	3.05	3.38	3.72	4.07	4.62	5.10	5.59*	7.73*	10.00*
	100	2.65	2.97	3.33	3.70	4.10	4.50	5.14	5.69	6.27*	8.75*	11.39*
	120	2.83	3.19	3.58	4.01	4.45	4.91	5.64	6.26	6.92*	9.73*	12.71*
	140	2.99	3.39	3.83	4.30	4.79	5.30	6.11	6.82	7.54*	10.67*	13.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.45	1.57	1.72	1.87	2.02	2.16	2.38	2.56	2.75*	3.52*	4.27*
	20	1.74	1.89	2.07	2.25	2.43	2.62	2.89	3.12	3.35*	4.35*	5.35*
	40	2.12	2.32	2.55	2.79	3.03	3.27	3.64	3.95	4.28*	5.68*	7.13*
	60	2.41	2.65	2.93	3.21	3.50	3.80	4.26	4.65	5.06*	6.83*	8.70*
	80	2.65	2.93	3.25	3.58	3.92	4.27	4.82	5.28	5.77*	7.91*	10.16*
	100	2.86	3.18	3.54	3.91	4.30	4.71	5.33	5.88	6.45*	8.92*	11.54*
	120	3.05	3.40	3.80	4.22	4.66	5.12	5.83	6.44	7.09*	9.89*	12.86*
	140	3.22	3.61	4.05	4.52	5.00	5.51	6.30	6.99	7.71*	10.82*	14.12*
300	10	1.59	1.73	1.88	2.04	2.20	2.35	2.58	2.77	2.96*	3.78*	4.57*
	20	1.92	2.09	2.28	2.47	2.66	2.85	3.14	3.38	3.62*	4.66*	5.69*
	40	2.36	2.57	2.82	3.06	3.32	3.57	3.95	4.26	4.59*	6.02*	7.48*
	60	2.68	2.94	3.23	3.52	3.82	4.13	4.59	4.98	5.39*	7.18*	9.04*
	80	2.95	3.25	3.58	3.92	4.26	4.62	5.16	5.63	6.11*	8.24*	10.48*
	100	3.19	3.52	3.89	4.27	4.66	5.07	5.69	6.22	6.78*	9.24*	11.85*
	120	3.40	3.76	4.17	4.59	5.03	5.48	6.18	6.79	7.42*	10.20*	13.15*
	140	3.59	3.99	4.43	4.90	5.38	5.88	6.66	7.33	8.03*	11.12*	14.40*
400	10	1.71	1.85	2.01	2.18	2.34	2.50	2.74	2.94	3.14*	3.99*	4.81*
	20	2.07	2.25	2.44	2.65	2.85	3.05	3.35	3.59	3.84*	4.93*	5.99*
	40	2.55	2.78	3.03	3.29	3.55	3.81	4.20	4.53	4.86*	6.33*	7.81*
	60	2.91	3.18	3.47	3.78	4.09	4.40	4.88	5.27	5.68*	7.50*	9.36*
	80	3.20	3.51	3.85	4.20	4.55	4.91	5.46	5.93	6.42*	8.56*	10.79*
	100	3.46	3.80	4.18	4.57	4.97	5.38	6.00	6.53	7.09*	9.55*	12.15*
	120	3.68	4.06	4.48	4.91	5.35	5.80	6.50	7.10	7.73*	10.50*	13.44*
	140	3.89	4.30	4.75	5.23	5.71	6.21	6.98	7.65	8.34*	11.42*	14.68*
600	10	1.90	2.05	2.22	2.40	2.58	2.75	3.01	3.22	3.43*	4.34*	5.22*
	20	2.31	2.50	2.72	2.93	3.15	3.36	3.68	3.94	4.21*	5.36*	6.48*
	40	2.87	3.11	3.38	3.66	3.93	4.21	4.62	4.96	5.31*	6.85*	8.38*
	60	3.27	3.56	3.88	4.20	4.53	4.86	5.35	5.76	6.19*	8.06*	9.95*
	80	3.60	3.93	4.29	4.66	5.03	5.41	5.98	6.45	6.95*	9.13*	11.39*
	100	3.89	4.25	4.65	5.06	5.48	5.90	6.54	7.08	7.64*	10.13*	12.73*
	120	4.15	4.54	4.98	5.43	5.89	6.35	7.06	7.66	8.29*	11.08*	14.00*
	140	4.38	4.81	5.28	5.77	6.27	6.78	7.55	8.22	8.91*	11.99*	15.24*
800	10	2.05	2.21	2.39	2.58	2.77	2.95	3.22	3.44	3.67*	4.63*	5.55*
	20	2.51	2.71	2.94	3.17	3.40	3.62	3.96	4.23	4.51*	5.72*	6.89*
	40	3.12	3.38	3.66	3.96	4.25	4.54	4.97	5.32	5.69*	7.29*	8.87*
	60	3.56	3.87	4.20	4.55	4.89	5.23	5.74	6.17	6.61*	8.54*	10.48*
	80	3.93	4.27	4.65	5.04	5.43	5.82	6.40	6.89	7.40*	9.65*	11.93*
	100	4.24	4.62	5.04	5.47	5.90	6.34	7.00	7.55	8.12*	10.66*	13.27*
	120	4.53	4.94	5.40	5.86	6.34	6.82	7.54	8.15	8.79*	11.61*	14.55*
	140	4.78	5.23	5.72	6.23	6.74	7.26	8.05	8.72	9.42*	12.52*	15.77*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.06	1.28	1.50	1.73	1.96	2.19	2.54	2.83	3.13*	4.34*	5.58*
	20	1.31	1.61	1.93	2.25	2.57	2.90	3.40	3.82	4.24*	5.99*	7.80*
	40	1.72	2.19	2.66	3.13	3.61	4.10	4.84	5.47	6.11*	8.76*	11.54*
	60	2.07	2.69	3.29	3.90	4.52	5.15	6.11	6.92	7.75*	11.19*	14.81*
	80	2.40	3.14	3.88	4.61	5.36	6.11	7.27	8.25	9.26*	13.42*	17.82*
	100	2.71	3.58	4.42	5.28	6.14	7.02	8.36	9.51	10.67*	15.52*	20.64*
	120	3.00	3.99	4.94	5.91	6.89	7.88	9.40	10.69	12.01*	17.51*	23.33*
	140	3.29	4.38	5.44	6.52	7.60	8.71	10.40	11.84	13.30*	19.42*	25.90*
25	10	1.42	1.58	1.77	1.98	2.18	2.40	2.73	3.01	3.29*	4.49*	5.72*
	20	1.69	1.92	2.19	2.47	2.77	3.08	3.56	3.96	4.38*	6.11*	7.92*
	40	2.09	2.46	2.88	3.32	3.78	4.25	4.98	5.60	6.23*	8.87*	11.64*
	60	2.43	2.94	3.50	4.08	4.67	5.29	6.23	7.04	7.86*	11.29*	14.90*
	80	2.75	3.38	4.07	4.77	5.50	6.24	7.38	8.36	9.35*	13.51*	17.90*
	100	3.04	3.80	4.60	5.43	6.28	7.14	8.47	9.60	10.76*	15.60*	20.72*
	120	3.32	4.20	5.12	6.06	7.02	8.00	9.50	10.79	12.10*	17.59*	23.40*
	140	3.59	4.59	5.61	6.66	7.73	8.82	10.50	11.93	13.39*	19.50*	25.97*
50	10	1.60	1.76	1.96	2.16	2.36	2.57	2.90	3.17	3.45*	4.63*	5.85*
	20	1.91	2.13	2.39	2.67	2.96	3.25	3.71	4.11	4.52*	6.24*	8.03*
	40	2.35	2.70	3.09	3.51	3.95	4.40	5.11	5.72	6.34*	8.97*	11.73*
	60	2.71	3.17	3.69	4.25	4.83	5.43	6.35	7.15	7.96*	11.38*	14.99*
	80	3.03	3.61	4.25	4.93	5.64	6.37	7.50	8.46	9.45*	13.60*	17.99*
	100	3.33	4.02	4.78	5.58	6.41	7.26	8.58	9.70	10.86*	15.69*	20.80*
	120	3.61	4.41	5.29	6.20	7.15	8.11	9.61	10.88	12.19*	17.67*	23.48*
	140	3.88	4.79	5.78	6.80	7.85	8.93	10.59	12.02	13.47*	19.58*	26.05*
100	10	1.83	2.00	2.21	2.42	2.63	2.84	3.17	3.44	3.72*	4.91*	6.12*
	20	2.20	2.43	2.70	2.98	3.26	3.55	4.00	4.38	4.78*	6.48*	8.26*
	40	2.72	3.06	3.43	3.84	4.26	4.69	5.37	5.96	6.57*	9.18*	11.93*
	60	3.13	3.56	4.05	4.57	5.12	5.70	6.59	7.37	8.17*	11.57*	15.17*
	80	3.47	4.00	4.60	5.24	5.92	6.63	7.72	8.67	9.65*	13.78*	18.15*
	100	3.79	4.42	5.12	5.88	6.68	7.51	8.79	9.90	11.04*	15.86*	20.96*
	120	4.08	4.81	5.62	6.49	7.40	8.35	9.81	11.07	12.37*	17.83*	23.63*
	140	4.36	5.18	6.10	7.08	8.10	9.15	10.79	12.20	13.64*	19.73*	26.19*
150	10	2.00	2.18	2.39	2.61	2.83	3.05	3.38	3.66	3.94*	5.15*	6.37*
	20	2.42	2.66	2.93	3.21	3.50	3.80	4.24	4.62	5.02*	6.72*	8.49*
	40	2.99	3.33	3.71	4.11	4.53	4.96	5.62	6.20	6.80*	9.39*	12.12*
	60	3.44	3.87	4.35	4.86	5.40	5.95	6.83	7.59	8.38*	11.76*	15.34*
	80	3.81	4.33	4.91	5.53	6.19	6.87	7.95	8.88	9.84*	13.95*	18.31*
	100	4.15	4.75	5.44	6.17	6.94	7.74	9.00	10.10	11.22*	16.02*	21.11*
	120	4.46	5.15	5.93	6.77	7.65	8.57	10.02	11.26	12.54*	17.99*	23.78*
	140	4.75	5.53	6.41	7.35	8.34	9.38	10.99	12.38	13.81*	19.89*	26.33*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	2.13	2.33	2.55	2.77	3.00	3.22	3.56	3.84	4.13*	5.36*	6.60*
	20	2.59	2.84	3.12	3.41	3.71	4.01	4.46	4.84	5.23*	6.94*	8.71*
	40	3.22	3.56	3.95	4.35	4.77	5.19	5.85	6.42	7.01*	9.59*	12.31*
	60	3.69	4.12	4.61	5.12	5.65	6.20	7.06	7.80	8.58*	11.95*	15.52*
	80	4.09	4.61	5.19	5.80	6.44	7.11	8.16	9.08	10.03*	14.13*	18.48*
	100	4.45	5.05	5.72	6.43	7.19	7.98	9.21	10.29	11.41*	16.19*	21.27*
	120	4.77	5.45	6.22	7.03	7.90	8.80	10.22	11.45	12.72*	18.15*	23.92*
	140	5.08	5.84	6.69	7.61	8.58	9.59	11.18	12.56	13.98*	20.04*	26.48*
300	10	2.36	2.56	2.79	3.03	3.27	3.51	3.86	4.15	4.45*	5.73*	7.00*
	20	2.88	3.14	3.43	3.74	4.05	4.35	4.82	5.21	5.61*	7.35*	9.13*
	40	3.58	3.94	4.34	4.75	5.17	5.61	6.26	6.83	7.41*	9.99*	12.69*
	60	4.11	4.55	5.04	5.56	6.09	6.63	7.48	8.21	8.97*	12.32*	15.87*
	80	4.55	5.07	5.65	6.26	6.90	7.56	8.58	9.47	10.41*	14.48*	18.80*
	100	4.94	5.54	6.21	6.91	7.65	8.42	9.62	10.67	11.77*	16.52*	21.58*
	120	5.30	5.97	6.72	7.52	8.36	9.23	10.61	11.81	13.07*	18.47*	24.22*
	140	5.62	6.37	7.21	8.10	9.04	10.02	11.57	12.91	14.32*	20.35*	26.76*
400	10	2.53	2.75	2.99	3.24	3.49	3.74	4.11	4.41	4.72*	6.05*	7.35*
	20	3.11	3.38	3.69	4.01	4.33	4.64	5.12	5.52	5.93*	7.71*	9.51*
	40	3.88	4.25	4.66	5.09	5.52	5.96	6.62	7.19	7.78*	10.36*	13.07*
	60	4.45	4.90	5.41	5.93	6.47	7.02	7.86	8.58	9.34*	12.68*	16.21*
	80	4.93	5.46	6.05	6.66	7.30	7.95	8.97	9.85	10.77*	14.82*	19.13*
	100	5.35	5.95	6.63	7.33	8.06	8.82	10.01	11.04	12.12*	16.85*	21.88*
	120	5.73	6.40	7.16	7.95	8.78	9.64	10.99	12.17	13.41*	18.78*	24.51*
	140	6.07	6.82	7.66	8.54	9.46	10.43	11.94	13.27	14.65*	20.65*	27.05*
600	10	2.82	3.05	3.32	3.58	3.85	4.11	4.50	4.82	5.15*	6.57*	7.94*
	20	3.48	3.77	4.10	4.44	4.78	5.12	5.62	6.04	6.47*	8.33*	10.19*
	40	4.35	4.75	5.19	5.64	6.09	6.54	7.23	7.81	8.41*	11.05*	13.77*
	60	5.00	5.48	6.01	6.55	7.11	7.67	8.52	9.25	10.01*	13.37*	16.88*
	80	5.54	6.09	6.70	7.34	7.99	8.65	9.66	10.54	11.45*	15.49*	19.77*
	100	6.01	6.63	7.32	8.04	8.78	9.54	10.72	11.73	12.79*	17.49*	22.49*
	120	6.43	7.12	7.89	8.69	9.52	10.38	11.71	12.86	14.07*	19.41*	25.10*
	140	6.81	7.58	8.42	9.30	10.22	11.17	12.65	13.94	15.29*	21.25*	27.61*
800	10	3.06	3.30	3.58	3.86	4.14	4.42	4.83	5.17	5.51*	7.00*	8.43*
	20	3.78	4.09	4.44	4.80	5.15	5.51	6.03	6.47	6.91*	8.86*	10.78*
	40	4.74	5.16	5.62	6.09	6.56	7.03	7.74	8.33	8.95*	11.66*	14.41*
	60	5.45	5.95	6.50	7.07	7.64	8.22	9.09	9.83	10.60*	14.00*	17.53*
	80	6.04	6.61	7.25	7.90	8.57	9.24	10.27	11.14	12.06*	16.12*	20.39*
	100	6.55	7.19	7.91	8.64	9.40	10.16	11.34	12.35	13.41*	18.11*	23.09*
	120	7.00	7.72	8.50	9.32	10.16	11.02	12.35	13.49	14.69*	20.01*	25.68*
	140	7.42	8.20	9.06	9.96	10.88	11.83	13.30	14.57	15.91*	21.84*	28.17*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.65	2.02	2.41	2.80	3.20	3.60	4.21	4.72	5.24*	7.37*	9.58*
	20	2.13	2.70	3.27	3.85	4.43	5.02	5.92	6.69	7.46*	10.67*	14.02*
	40	2.95	3.84	4.72	5.61	6.51	7.42	8.81	10.00	11.20*	16.21*	21.49*
	60	3.66	4.84	5.99	7.15	8.33	9.52	11.35	12.90	14.48*	21.08*	28.04*
	80	4.32	5.76	7.16	8.57	10.00	11.45	13.67	15.56	17.49*	25.54*	34.06*
	100	4.94	6.62	8.26	9.90	11.57	13.26	15.85	18.07	20.32*	29.73*	39.71*
	120	5.53	7.44	9.30	11.17	13.06	14.98	17.93	20.44	23.01*	33.72*	45.08*
	140	6.09	8.23	10.30	12.38	14.49	16.63	19.92	22.73	25.59*	37.54*	50.22*
25	10	2.10	2.38	2.71	3.07	3.43	3.81	4.40	4.89	5.40*	7.52*	9.72*
	20	2.58	3.03	3.54	4.08	4.63	5.20	6.09	6.84	7.60*	10.79*	14.14*
	40	3.36	4.12	4.95	5.80	6.68	7.57	8.95	10.12	11.32*	16.32*	21.59*
	60	4.04	5.10	6.20	7.33	8.48	9.66	11.47	13.01	14.59*	21.17*	28.13*
	80	4.67	6.00	7.35	8.73	10.14	11.58	13.79	15.67	17.59*	25.63*	34.14*
	100	5.27	6.85	8.44	10.06	11.70	13.38	15.96	18.17	20.41*	29.82*	39.78*
	120	5.85	7.66	9.47	11.31	13.19	15.10	18.03	20.54	23.10*	33.80*	45.15*
	140	6.40	8.44	10.47	12.52	14.62	16.75	20.02	22.82	25.67*	37.62*	50.30*
50	10	2.36	2.64	2.96	3.30	3.65	4.02	4.58	5.07	5.57*	7.67*	9.86*
	20	2.89	3.31	3.79	4.30	4.83	5.38	6.24	6.98	7.74*	10.92*	14.26*
	40	3.70	4.39	5.17	5.99	6.85	7.73	9.08	10.25	11.44*	16.43*	21.69*
	60	4.38	5.35	6.40	7.50	8.63	9.80	11.59	13.12	14.69*	21.27*	28.22*
	80	5.01	6.24	7.54	8.90	10.29	11.71	13.90	15.77	17.69*	25.72*	34.22*
	100	5.60	7.07	8.62	10.21	11.84	13.51	16.07	18.26	20.51*	29.90*	39.86*
	120	6.16	7.87	9.65	11.46	13.32	15.22	18.14	20.63	23.19*	33.88*	45.23*
	140	6.70	8.65	10.63	12.66	14.74	16.86	20.12	22.91	25.76*	37.70*	50.37*
100	10	2.71	3.00	3.32	3.66	4.01	4.37	4.92	5.39	5.88*	7.96*	10.13*
	20	3.33	3.74	4.20	4.69	5.20	5.73	6.56	7.27	8.01*	11.17*	14.49*
	40	4.22	4.86	5.59	6.36	7.18	8.03	9.35	10.49	11.67*	16.64*	21.89*
	60	4.95	5.82	6.80	7.84	8.94	10.07	11.83	13.35	14.90*	21.46*	28.40*
	80	5.59	6.69	7.92	9.22	10.57	11.97	14.13	15.98	17.89*	25.90*	34.39*
	100	6.18	7.51	8.97	10.51	12.11	13.75	16.29	18.46	20.69*	30.07*	40.02*
	120	6.74	8.30	9.99	11.75	13.58	15.45	18.34	20.82	23.36*	34.04*	45.37*
	140	7.27	9.05	10.96	12.95	14.99	17.09	20.32	23.09	25.93*	37.85*	50.51*
150	10	2.97	3.26	3.60	3.95	4.30	4.66	5.21	5.68	6.16*	8.24*	10.40*
	20	3.65	4.06	4.53	5.02	5.52	6.04	6.85	7.55	8.28*	11.41*	14.72*
	40	4.63	5.25	5.95	6.71	7.50	8.32	9.62	10.74	11.90*	16.85*	22.08*
	60	5.39	6.23	7.17	8.17	9.24	10.35	12.08	13.57	15.11*	21.65*	28.58*
	80	6.06	7.11	8.28	9.53	10.85	12.22	14.35	16.19	18.08*	26.07*	34.56*
	100	6.67	7.92	9.32	10.81	12.38	13.99	16.50	18.66	20.88*	30.24*	40.18*
	120	7.24	8.70	10.32	12.04	13.83	15.68	18.55	21.01	23.54*	34.20*	45.52*
	140	7.78	9.45	11.29	13.22	15.24	17.31	20.52	23.27	26.10*	38.01*	50.66*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.18	3.48	3.83	4.18	4.55	4.91	5.47	5.93	6.42*	8.51*	10.66*
	20	3.92	4.34	4.81	5.30	5.81	6.32	7.13	7.82	8.53*	11.66*	14.95*
	40	4.96	5.58	6.28	7.02	7.80	8.61	9.88	10.98	12.13*	17.05*	22.28*
	60	5.77	6.59	7.51	8.49	9.53	10.61	12.32	13.79	15.32*	21.84*	28.75*
	80	6.47	7.48	8.62	9.84	11.13	12.47	14.58	16.40	18.28*	26.25*	34.72*
	100	7.10	8.30	9.66	11.11	12.64	14.23	16.71	18.86	21.06*	30.40*	40.33*
	120	7.68	9.08	10.65	12.33	14.09	15.91	18.75	21.20	23.72*	34.36*	45.67*
	140	8.23	9.83	11.61	13.50	15.48	17.53	20.71	23.45	26.27*	38.16*	50.80*
300	10	3.51	3.83	4.20	4.57	4.95	5.33	5.90	6.37	6.86*	8.99*	11.16*
	20	4.35	4.78	5.27	5.78	6.29	6.81	7.62	8.30	9.01*	12.13*	15.40*
	40	5.51	6.13	6.84	7.57	8.34	9.13	10.37	11.45	12.57*	17.47*	22.66*
	60	6.39	7.20	8.11	9.07	10.08	11.13	12.79	14.23	15.73*	22.21*	29.11*
	80	7.14	8.13	9.23	10.42	11.66	12.97	15.02	16.81	18.66*	26.60*	35.05*
	100	7.81	8.98	10.28	11.68	13.16	14.71	17.14	19.25	21.43*	30.74*	40.64*
	120	8.43	9.77	11.27	12.88	14.59	16.37	19.16	21.57	24.07*	34.68*	45.97*
	140	9.01	10.53	12.22	14.04	15.97	17.97	21.11	23.81	26.61*	38.47*	51.09*
400	10	3.79	4.12	4.50	4.89	5.28	5.67	6.26	6.74	7.25*	9.42*	11.61*
	20	4.70	5.15	5.65	6.17	6.70	7.23	8.04	8.73	9.44*	12.58*	15.84*
	40	5.95	6.59	7.31	8.05	8.82	9.61	10.84	11.89	13.00*	17.88*	23.05*
	60	6.90	7.72	8.62	9.58	10.58	11.61	13.24	14.66	16.14*	22.59*	29.46*
	80	7.70	8.69	9.78	10.95	12.17	13.45	15.46	17.21	19.04*	26.95*	35.38*
	100	8.41	9.56	10.84	12.21	13.66	15.17	17.56	19.63	21.79*	31.07*	40.95*
	120	9.06	10.38	11.84	13.42	15.08	16.82	19.56	21.95	24.42*	35.00*	46.27*
	140	9.67	11.15	12.79	14.57	16.45	18.41	21.50	24.17	26.94*	38.77*	51.37*
600	10	4.23	4.59	4.99	5.41	5.82	6.24	6.85	7.36	7.89*	10.16*	12.42*
	20	5.27	5.75	6.28	6.83	7.38	7.93	8.77	9.47	10.20*	13.39*	16.68*
	40	6.68	7.35	8.09	8.85	9.64	10.43	11.66	12.71	13.81*	18.67*	23.81*
	60	7.74	8.57	9.50	10.46	11.46	12.49	14.09	15.47	16.92*	23.33*	30.15*
	80	8.62	9.62	10.72	11.88	13.08	14.33	16.30	18.00	19.80*	27.65*	36.03*
	100	9.40	10.55	11.82	13.17	14.58	16.06	18.37	20.40	22.51*	31.73*	41.57*
	120	10.11	11.41	12.85	14.39	16.00	17.69	20.36	22.68	25.11*	35.63*	46.86*
	140	10.76	12.21	13.82	15.54	17.36	19.26	22.27	24.88	27.61*	39.38*	51.94*
800	10	4.59	4.97	5.39	5.83	6.27	6.70	7.34	7.87	8.42*	10.79*	13.12*
	20	5.73	6.23	6.79	7.36	7.94	8.51	9.37	10.09	10.84*	14.12*	17.44*
	40	7.27	7.96	8.73	9.52	10.32	11.14	12.38	13.43	14.54*	19.42*	24.55*
	60	8.42	9.28	10.23	11.21	12.22	13.25	14.85	16.22	17.66*	24.05*	30.84*
	80	9.38	10.39	11.51	12.68	13.89	15.13	17.07	18.75	20.52*	28.33*	36.68*
	100	10.21	11.38	12.66	14.01	15.41	16.87	19.15	21.13	23.22*	32.39*	42.19*
	120	10.97	12.28	13.72	15.25	16.84	18.51	21.12	23.40	25.79*	36.26*	47.45*
	140	11.67	13.12	14.72	16.42	18.21	20.07	23.02	25.58	28.28*	39.99*	52.51*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.54	0.61	0.70	0.78	0.87	0.96	1.09	1.20	1.31	1.75*	2.19*
	20	0.61	0.71	0.81	0.92	1.03	1.15	1.31	1.46	1.60	2.17*	2.76*
	40	0.72	0.86	1.01	1.16	1.31	1.46	1.69	1.89	2.08	2.89*	3.71*
	60	0.82	1.00	1.18	1.36	1.55	1.74	2.02	2.27	2.51	3.51*	4.55*
	80	0.91	1.12	1.34	1.55	1.77	1.99	2.33	2.61	2.90	4.09*	5.32*
	100	1.00	1.24	1.48	1.73	1.98	2.23	2.62	2.94	3.27	4.63*	6.04*
	120	1.08	1.35	1.63	1.90	2.18	2.46	2.89	3.25	3.62	5.14*	6.73*
	140	1.16	1.46	1.76	2.06	2.37	2.68	3.15	3.55	3.95	5.63*	7.39*
25	10	0.75	0.81	0.88	0.97	1.05	1.13	1.25	1.36	1.46	1.89*	2.32*
	20	0.85	0.92	1.02	1.11	1.21	1.32	1.47	1.60	1.74	2.30*	2.87*
	40	0.99	1.09	1.21	1.34	1.48	1.62	1.83	2.01	2.20	2.99*	3.81*
	60	1.10	1.23	1.38	1.54	1.71	1.88	2.15	2.38	2.62	3.61*	4.64*
	80	1.19	1.35	1.53	1.72	1.92	2.13	2.45	2.72	3.00	4.18*	5.40*
	100	1.28	1.46	1.67	1.89	2.12	2.36	2.73	3.04	3.36	4.71*	6.12*
	120	1.36	1.57	1.80	2.05	2.31	2.58	2.99	3.35	3.71	5.22*	6.81*
	140	1.44	1.67	1.93	2.21	2.50	2.79	3.25	3.64	4.04	5.71*	7.46*
50	10	0.83	0.89	0.97	1.06	1.14	1.23	1.36	1.46	1.57	2.01*	2.44*
	20	0.95	1.03	1.13	1.23	1.33	1.43	1.59	1.72	1.85	2.41*	2.98*
	40	1.12	1.23	1.35	1.48	1.61	1.75	1.96	2.13	2.32	3.09*	3.91*
	60	1.25	1.38	1.52	1.68	1.84	2.01	2.27	2.49	2.72	3.70*	4.73*
	80	1.36	1.51	1.68	1.86	2.05	2.25	2.56	2.83	3.10	4.26*	5.49*
	100	1.46	1.63	1.82	2.03	2.25	2.48	2.84	3.14	3.46	4.79*	6.20*
	120	1.55	1.74	1.96	2.19	2.44	2.70	3.10	3.45	3.80	5.30*	6.88*
	140	1.63	1.84	2.08	2.35	2.62	2.91	3.35	3.74	4.13	5.79*	7.53*
100	10	0.94	1.01	1.09	1.18	1.27	1.36	1.50	1.61	1.72	2.18*	2.63*
	20	1.09	1.18	1.28	1.39	1.49	1.60	1.76	1.90	2.03	2.61*	3.19*
	40	1.30	1.41	1.54	1.67	1.81	1.95	2.16	2.33	2.51	3.29*	4.10*
	60	1.46	1.59	1.74	1.90	2.06	2.23	2.48	2.70	2.92	3.88*	4.90*
	80	1.59	1.73	1.91	2.09	2.28	2.47	2.77	3.03	3.29	4.44*	5.65*
	100	1.70	1.87	2.06	2.27	2.48	2.70	3.04	3.34	3.64	4.96*	6.35*
	120	1.80	1.99	2.20	2.43	2.67	2.92	3.30	3.63	3.98	5.46*	7.03*
	140	1.90	2.10	2.34	2.59	2.85	3.12	3.55	3.92	4.30	5.94*	7.68*
150	10	1.01	1.09	1.18	1.27	1.37	1.46	1.60	1.72	1.83	2.31*	2.78*
	20	1.19	1.28	1.39	1.50	1.61	1.73	1.89	2.03	2.17	2.76*	3.36*
	40	1.43	1.54	1.68	1.82	1.96	2.10	2.32	2.50	2.68	3.46*	4.27*
	60	1.60	1.74	1.90	2.06	2.23	2.40	2.65	2.87	3.09	4.06*	5.07*
	80	1.75	1.90	2.08	2.27	2.46	2.65	2.95	3.21	3.47	4.60*	5.81*
	100	1.88	2.05	2.25	2.46	2.67	2.89	3.23	3.52	3.81	5.12*	6.51*
	120	1.99	2.18	2.40	2.63	2.87	3.11	3.49	3.81	4.15	5.61*	7.17*
	140	2.10	2.30	2.54	2.79	3.05	3.32	3.73	4.09	4.47	6.09*	7.82*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.08	1.15	1.25	1.35	1.44	1.54	1.69	1.81	1.92	2.42*	2.91*
	20	1.27	1.37	1.48	1.59	1.71	1.83	2.00	2.14	2.29	2.90*	3.51*
	40	1.53	1.65	1.79	1.93	2.08	2.23	2.45	2.63	2.82	3.62*	4.43*
	60	1.73	1.86	2.03	2.20	2.37	2.54	2.80	3.02	3.24	4.22*	5.23*
	80	1.88	2.04	2.23	2.42	2.61	2.81	3.11	3.36	3.62	4.76*	5.96*
	100	2.02	2.20	2.40	2.61	2.83	3.05	3.39	3.68	3.97	5.28*	6.66*
	120	2.15	2.34	2.56	2.79	3.03	3.28	3.65	3.98	4.31	5.77*	7.32*
	140	2.26	2.47	2.71	2.96	3.22	3.49	3.90	4.26	4.62	6.24*	7.96*
300	10	1.18	1.26	1.36	1.46	1.57	1.67	1.82	1.95	2.07	2.60*	3.11*
	20	1.40	1.50	1.62	1.75	1.87	1.99	2.18	2.33	2.48	3.12*	3.76*
	40	1.70	1.83	1.98	2.13	2.28	2.44	2.67	2.86	3.05	3.88*	4.72*
	60	1.92	2.07	2.24	2.42	2.60	2.78	3.05	3.27	3.50	4.50*	5.53*
	80	2.10	2.27	2.46	2.66	2.86	3.07	3.38	3.64	3.90	5.05*	6.26*
	100	2.26	2.44	2.65	2.87	3.10	3.33	3.67	3.96	4.26	5.57*	6.95*
	120	2.40	2.60	2.83	3.07	3.31	3.56	3.94	4.27	4.60	6.06*	7.60*
	140	2.52	2.74	2.99	3.25	3.52	3.79	4.20	4.56	4.92	6.52*	8.23*
400	10	1.26	1.35	1.45	1.56	1.67	1.78	1.94	2.07	2.19	2.74*	3.28*
	20	1.51	1.61	1.74	1.87	2.00	2.13	2.32	2.48	2.63	3.30*	3.96*
	40	1.84	1.97	2.13	2.29	2.45	2.61	2.85	3.05	3.24	4.11*	4.97*
	60	2.08	2.23	2.41	2.60	2.79	2.97	3.25	3.49	3.72	4.75*	5.80*
	80	2.28	2.45	2.65	2.86	3.07	3.28	3.60	3.87	4.13	5.31*	6.53*
	100	2.45	2.64	2.86	3.09	3.32	3.56	3.91	4.21	4.51	5.83*	7.22*
	120	2.60	2.81	3.05	3.30	3.55	3.81	4.19	4.52	4.85	6.32*	7.87*
	140	2.74	2.96	3.22	3.49	3.76	4.04	4.46	4.82	5.18	6.79*	8.50*
600	10	1.39	1.48	1.60	1.71	1.83	1.95	2.12	2.26	2.39	2.98*	3.55*
	20	1.68	1.79	1.93	2.07	2.21	2.35	2.55	2.72	2.88	3.60*	4.31*
	40	2.06	2.20	2.37	2.54	2.71	2.89	3.14	3.35	3.56	4.48*	5.39*
	60	2.33	2.50	2.69	2.89	3.09	3.29	3.59	3.84	4.08	5.16*	6.26*
	80	2.56	2.75	2.96	3.18	3.41	3.63	3.97	4.25	4.53	5.76*	7.02*
	100	2.75	2.96	3.20	3.44	3.69	3.93	4.30	4.61	4.92	6.30*	7.72*
	120	2.93	3.15	3.41	3.67	3.94	4.21	4.61	4.95	5.29	6.80*	8.38*
	140	3.08	3.32	3.60	3.88	4.17	4.46	4.89	5.26	5.63	7.28*	9.00*
800	10	1.50	1.60	1.72	1.84	1.96	2.08	2.26	2.41	2.55	3.17*	3.78*
	20	1.82	1.94	2.08	2.23	2.38	2.52	2.74	2.91	3.09	3.85*	4.59*
	40	2.24	2.39	2.56	2.75	2.93	3.11	3.38	3.60	3.82	4.79*	5.74*
	60	2.54	2.72	2.92	3.13	3.34	3.55	3.87	4.12	4.38	5.51*	6.65*
	80	2.79	2.99	3.21	3.45	3.69	3.92	4.27	4.56	4.85	6.14*	7.44*
	100	3.00	3.22	3.47	3.73	3.99	4.24	4.63	4.95	5.27	6.70*	8.16*
	120	3.19	3.43	3.70	3.98	4.26	4.54	4.95	5.30	5.65	7.22*	8.82*
	140	3.37	3.62	3.91	4.20	4.50	4.80	5.25	5.63	6.01	7.71*	9.46*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.78	0.90	1.04	1.17	1.31	1.45	1.66	1.84	2.02	2.73*	3.45*
	20	0.92	1.09	1.27	1.45	1.64	1.83	2.11	2.35	2.59	3.58*	4.59*
	40	1.14	1.40	1.66	1.92	2.19	2.46	2.87	3.22	3.57	5.01*	6.50*
	60	1.34	1.67	2.00	2.34	2.67	3.01	3.53	3.97	4.42	6.26*	8.18*
	80	1.52	1.92	2.32	2.71	3.12	3.52	4.14	4.67	5.20	7.41*	9.72*
	100	1.69	2.15	2.61	3.07	3.53	4.00	4.71	5.32	5.94	8.49*	11.17*
	120	1.85	2.38	2.89	3.41	3.93	4.45	5.26	5.94	6.64	9.51*	12.54*
	140	2.01	2.59	3.16	3.73	4.31	4.89	5.78	6.54	7.31	10.50*	13.86*
25	10	1.07	1.16	1.28	1.40	1.53	1.65	1.85	2.01	2.18	2.88*	3.59*
	20	1.23	1.36	1.51	1.67	1.84	2.01	2.28	2.50	2.73	3.70*	4.71*
	40	1.48	1.67	1.88	2.12	2.36	2.62	3.01	3.34	3.69	5.11*	6.60*
	60	1.68	1.92	2.21	2.51	2.83	3.16	3.66	4.09	4.53	6.35*	8.27*
	80	1.85	2.16	2.51	2.88	3.26	3.66	4.26	4.78	5.30	7.50*	9.80*
	100	2.01	2.39	2.80	3.23	3.67	4.13	4.83	5.42	6.03	8.57*	11.24*
	120	2.17	2.60	3.07	3.56	4.06	4.58	5.37	6.04	6.73	9.59*	12.61*
	140	2.32	2.81	3.33	3.88	4.44	5.01	5.88	6.63	7.39	10.57*	13.93*
50	10	1.19	1.29	1.41	1.54	1.66	1.79	1.99	2.15	2.32	3.01*	3.73*
	20	1.39	1.52	1.67	1.83	2.00	2.17	2.42	2.64	2.87	3.83*	4.82*
	40	1.68	1.86	2.07	2.29	2.53	2.77	3.15	3.47	3.80	5.22*	6.70*
	60	1.90	2.13	2.40	2.68	2.98	3.30	3.78	4.20	4.63	6.45*	8.36*
	80	2.09	2.37	2.69	3.04	3.41	3.79	4.38	4.88	5.40	7.59*	9.89*
	100	2.26	2.59	2.97	3.38	3.81	4.25	4.94	5.53	6.13	8.66*	11.32*
	120	2.42	2.81	3.24	3.71	4.19	4.70	5.47	6.14	6.82	9.67*	12.69*
	140	2.57	3.01	3.50	4.02	4.56	5.12	5.99	6.73	7.48	10.65*	14.00*
100	10	1.36	1.46	1.59	1.72	1.86	1.99	2.20	2.36	2.53	3.25*	3.96*
	20	1.60	1.74	1.90	2.06	2.23	2.40	2.66	2.88	3.10	4.06*	5.05*
	40	1.94	2.13	2.34	2.56	2.79	3.03	3.39	3.71	4.03	5.42*	6.89*
	60	2.20	2.43	2.69	2.97	3.26	3.56	4.03	4.43	4.84	6.64*	8.53*
	80	2.42	2.69	3.00	3.33	3.68	4.04	4.61	5.10	5.60	7.76*	10.05*
	100	2.61	2.93	3.29	3.67	4.08	4.50	5.16	5.73	6.31	8.82*	11.48*
	120	2.79	3.15	3.55	3.99	4.45	4.93	5.68	6.33	7.00	9.83*	12.84*
	140	2.95	3.36	3.81	4.30	4.81	5.35	6.19	6.91	7.65	10.81*	14.14*
150	10	1.48	1.59	1.72	1.86	2.00	2.14	2.35	2.52	2.70	3.43*	4.17*
	20	1.76	1.90	2.06	2.24	2.41	2.59	2.85	3.07	3.30	4.26*	5.26*
	40	2.14	2.33	2.54	2.77	3.01	3.24	3.61	3.92	4.24	5.62*	7.08*
	60	2.43	2.66	2.92	3.20	3.49	3.79	4.24	4.64	5.05	6.82*	8.71*
	80	2.67	2.94	3.25	3.58	3.92	4.27	4.82	5.30	5.79	7.93*	10.21*
	100	2.88	3.19	3.54	3.92	4.32	4.73	5.37	5.93	6.50	8.99*	11.63*
	120	3.07	3.42	3.82	4.25	4.69	5.16	5.89	6.52	7.18	9.99*	12.99*
	140	3.25	3.64	4.08	4.55	5.05	5.57	6.39	7.10	7.83	10.96*	14.29*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.57	1.69	1.83	1.97	2.12	2.26	2.48	2.66	2.83	3.59*	4.34*
	20	1.88	2.03	2.20	2.38	2.56	2.74	3.01	3.24	3.46	4.45*	5.45*
	40	2.30	2.49	2.71	2.95	3.19	3.43	3.80	4.11	4.42	5.81*	7.27*
	60	2.61	2.84	3.11	3.40	3.69	3.99	4.44	4.84	5.24	7.00*	8.88*
	80	2.87	3.14	3.46	3.79	4.13	4.48	5.03	5.50	5.98	8.11*	10.37*
	100	3.10	3.41	3.77	4.14	4.53	4.94	5.57	6.12	6.68	9.15*	11.79*
	120	3.30	3.65	4.05	4.47	4.91	5.37	6.09	6.71	7.35	10.15*	13.13*
	140	3.49	3.88	4.32	4.78	5.27	5.78	6.58	7.28	8.00	11.11*	14.43*
300	10	1.73	1.85	2.00	2.15	2.31	2.46	2.69	2.87	3.06	3.86*	4.64*
	20	2.08	2.24	2.42	2.61	2.80	2.99	3.27	3.51	3.74	4.76*	5.79*
	40	2.56	2.76	2.99	3.24	3.49	3.74	4.11	4.43	4.75	6.16*	7.62*
	60	2.91	3.15	3.43	3.73	4.02	4.33	4.79	5.18	5.58	7.35*	9.22*
	80	3.20	3.48	3.80	4.14	4.49	4.84	5.39	5.85	6.33	8.44*	10.69*
	100	3.45	3.77	4.14	4.52	4.91	5.31	5.94	6.47	7.03	9.47*	12.09*
	120	3.68	4.04	4.44	4.86	5.30	5.75	6.46	7.06	7.69	10.46*	13.43*
	140	3.89	4.28	4.72	5.19	5.67	6.17	6.95	7.63	8.33	11.41*	14.71*
400	10	1.85	1.98	2.14	2.30	2.46	2.62	2.86	3.05	3.24	4.07*	4.89*
	20	2.24	2.41	2.60	2.79	2.99	3.19	3.49	3.73	3.97	5.03*	6.09*
	40	2.76	2.98	3.22	3.48	3.73	3.99	4.38	4.70	5.03	6.47*	7.95*
	60	3.15	3.40	3.69	4.00	4.30	4.61	5.09	5.48	5.88	7.67*	9.54*
	80	3.46	3.76	4.09	4.44	4.79	5.15	5.70	6.17	6.64	8.76*	11.01*
	100	3.74	4.07	4.44	4.83	5.23	5.64	6.26	6.80	7.35	9.79*	12.39*
	120	3.99	4.35	4.76	5.19	5.64	6.09	6.79	7.39	8.01	10.77*	13.72*
	140	4.21	4.61	5.06	5.53	6.02	6.52	7.29	7.96	8.65	11.71*	14.99*
600	10	2.05	2.19	2.36	2.53	2.71	2.88	3.13	3.34	3.54	4.43*	5.30*
	20	2.50	2.68	2.88	3.10	3.31	3.52	3.84	4.09	4.35	5.47*	6.59*
	40	3.10	3.33	3.59	3.86	4.14	4.41	4.82	5.16	5.50	7.00*	8.52*
	60	3.54	3.81	4.12	4.44	4.76	5.09	5.58	5.99	6.40	8.24*	10.14*
	80	3.90	4.21	4.56	4.93	5.30	5.67	6.24	6.71	7.19	9.34*	11.60*
	100	4.21	4.55	4.95	5.35	5.77	6.19	6.83	7.37	7.91	10.37*	12.97*
	120	4.49	4.87	5.30	5.74	6.20	6.66	7.37	7.98	8.59	11.35*	14.28*
	140	4.74	5.15	5.62	6.11	6.60	7.11	7.89	8.55	9.23	12.28*	15.55*
800	10	2.22	2.37	2.54	2.73	2.91	3.09	3.36	3.57	3.79	4.72*	5.64*
	20	2.72	2.90	3.12	3.34	3.57	3.79	4.12	4.39	4.66	5.84*	7.01*
	40	3.37	3.61	3.89	4.18	4.47	4.75	5.18	5.53	5.88	7.44*	9.02*
	60	3.85	4.14	4.47	4.80	5.14	5.48	5.99	6.41	6.84	8.73*	10.67*
	80	4.25	4.57	4.94	5.33	5.71	6.10	6.68	7.17	7.66	9.86*	12.15*
	100	4.59	4.95	5.36	5.78	6.21	6.65	7.30	7.85	8.41	10.90*	13.52*
	120	4.89	5.29	5.74	6.20	6.67	7.15	7.87	8.48	9.10	11.88*	14.83*
	140	5.17	5.60	6.08	6.58	7.10	7.61	8.40	9.07	9.75	12.82*	16.08*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.17	1.38	1.60	1.83	2.06	2.29	2.64	2.94	3.24	4.45*	5.69*
	20	1.43	1.75	2.06	2.39	2.71	3.04	3.54	3.97	4.39	6.15*	7.97*
	40	1.88	2.37	2.84	3.33	3.81	4.31	5.06	5.69	6.34	9.00*	11.79*
	60	2.28	2.91	3.53	4.15	4.78	5.41	6.38	7.21	8.04	11.51*	15.15*
	80	2.64	3.41	4.16	4.91	5.67	6.43	7.60	8.60	9.61	13.81*	18.22*
	100	2.98	3.88	4.75	5.62	6.50	7.39	8.75	9.90	11.08	15.96*	21.12*
	120	3.31	4.32	5.31	6.29	7.29	8.30	9.84	11.14	12.48	18.02*	23.86*
	140	3.62	4.75	5.85	6.94	8.05	9.17	10.88	12.33	13.82	19.99*	26.50*
25	10	1.54	1.70	1.89	2.09	2.30	2.51	2.84	3.12	3.40	4.60*	5.83*
	20	1.84	2.06	2.33	2.62	2.92	3.23	3.71	4.12	4.53	6.27*	8.08*
	40	2.28	2.65	3.08	3.53	3.99	4.47	5.20	5.82	6.46	9.11*	11.89*
	60	2.66	3.17	3.74	4.33	4.94	5.56	6.51	7.32	8.15	11.60*	15.23*
	80	3.00	3.66	4.36	5.08	5.81	6.57	7.72	8.71	9.71	13.90*	18.31*
	100	3.32	4.11	4.94	5.78	6.64	7.52	8.86	10.01	11.17	16.05*	21.19*
	120	3.63	4.55	5.49	6.45	7.42	8.42	9.94	11.24	12.57	18.10*	23.94*
	140	3.93	4.97	6.02	7.09	8.18	9.28	10.98	12.43	13.90	20.06*	26.57*
50	10	1.73	1.89	2.08	2.28	2.48	2.69	3.01	3.29	3.56	4.74*	5.97*
	20	2.07	2.29	2.55	2.82	3.11	3.41	3.87	4.27	4.67	6.40*	8.20*
	40	2.56	2.90	3.29	3.72	4.16	4.62	5.34	5.95	6.58	9.21*	11.99*
	60	2.95	3.42	3.95	4.51	5.10	5.70	6.64	7.44	8.26	11.70*	15.32*
	80	3.31	3.89	4.55	5.24	5.96	6.70	7.84	8.81	9.81	13.98*	18.39*
	100	3.63	4.34	5.12	5.94	6.78	7.64	8.97	10.11	11.27	16.13*	21.27*
	120	3.94	4.77	5.67	6.60	7.56	8.54	10.05	11.34	12.66	18.18*	24.01*
	140	4.23	5.18	6.19	7.23	8.31	9.40	11.09	12.52	13.99	20.14*	26.64*
100	10	1.98	2.15	2.35	2.55	2.76	2.98	3.30	3.57	3.84	5.02*	6.23*
	20	2.39	2.61	2.87	3.15	3.43	3.72	4.17	4.55	4.94	6.64*	8.43*
	40	2.95	3.28	3.66	4.06	4.48	4.92	5.61	6.20	6.81	9.42*	12.18*
	60	3.39	3.83	4.32	4.85	5.40	5.98	6.89	7.67	8.47	11.89*	15.50*
	80	3.77	4.31	4.92	5.57	6.25	6.96	8.07	9.03	10.01	14.16*	18.56*
	100	4.12	4.76	5.48	6.25	7.05	7.89	9.19	10.31	11.46	16.30*	21.43*
	120	4.44	5.18	6.01	6.90	7.82	8.78	10.26	11.54	12.84	18.34*	24.16*
	140	4.74	5.59	6.53	7.52	8.56	9.63	11.29	12.71	14.17	20.29*	26.79*
150	10	2.17	2.34	2.54	2.76	2.97	3.19	3.52	3.80	4.07	5.26*	6.48*
	20	2.62	2.85	3.12	3.40	3.68	3.98	4.42	4.80	5.19	6.88*	8.66*
	40	3.25	3.58	3.95	4.35	4.77	5.20	5.87	6.45	7.04	9.63*	12.38*
	60	3.73	4.15	4.63	5.15	5.69	6.25	7.13	7.90	8.68	12.08*	15.68*
	80	4.14	4.65	5.24	5.87	6.53	7.22	8.31	9.24	10.21	14.34*	18.72*
	100	4.50	5.11	5.80	6.54	7.32	8.14	9.41	10.52	11.65	16.47*	21.58*
	120	4.84	5.54	6.34	7.19	8.08	9.02	10.47	11.73	13.02	18.50*	24.31*
	140	5.16	5.95	6.85	7.81	8.81	9.86	11.49	12.90	14.34	20.45*	26.93*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.31	2.49	2.70	2.93	3.15	3.37	3.71	3.99	4.27	5.48*	6.71*
	20	2.81	3.04	3.32	3.61	3.90	4.19	4.65	5.03	5.41	7.10*	8.88*
	40	3.49	3.82	4.20	4.60	5.02	5.45	6.11	6.68	7.26	9.83*	12.57*
	60	4.00	4.43	4.91	5.42	5.95	6.50	7.37	8.12	8.89	12.26*	15.85*
	80	4.44	4.95	5.53	6.15	6.79	7.47	8.53	9.45	10.41	14.51*	18.88*
	100	4.83	5.42	6.10	6.82	7.58	8.38	9.63	10.72	11.83	16.63*	21.74*
	120	5.18	5.86	6.63	7.46	8.34	9.25	10.68	11.92	13.20	18.66*	24.46*
	140	5.51	6.28	7.15	8.08	9.06	10.09	11.70	13.09	14.51	20.60*	27.07*
300	10	2.55	2.74	2.97	3.20	3.43	3.67	4.02	4.31	4.60	5.86*	7.12*
	20	3.12	3.36	3.65	3.95	4.25	4.56	5.02	5.41	5.80	7.52*	9.30*
	40	3.88	4.22	4.61	5.03	5.45	5.88	6.54	7.10	7.68	10.23*	12.95*
	60	4.45	4.88	5.37	5.88	6.41	6.96	7.81	8.54	9.30	12.63*	16.20*
	80	4.93	5.44	6.02	6.63	7.27	7.93	8.97	9.86	10.79	14.86*	19.21*
	100	5.36	5.95	6.61	7.32	8.07	8.84	10.05	11.11	12.21	16.96*	22.05*
	120	5.74	6.41	7.17	7.97	8.82	9.70	11.09	12.31	13.56	18.97*	24.76*
	140	6.10	6.85	7.69	8.59	9.54	10.53	12.10	13.46	14.86	20.91*	27.36*
400	10	2.74	2.94	3.18	3.42	3.67	3.91	4.28	4.58	4.88	6.17*	7.47*
	20	3.36	3.62	3.92	4.23	4.55	4.86	5.34	5.74	6.13	7.88*	9.68*
	40	4.20	4.55	4.96	5.38	5.81	6.24	6.91	7.48	8.05	10.61*	13.32*
	60	4.82	5.26	5.75	6.28	6.81	7.36	8.21	8.93	9.68	13.00*	16.54*
	80	5.34	5.86	6.44	7.06	7.69	8.35	9.37	10.25	11.17	15.20*	19.53*
	100	5.79	6.39	7.06	7.76	8.50	9.26	10.46	11.49	12.57	17.29*	22.36*
	120	6.20	6.87	7.63	8.42	9.26	10.13	11.49	12.68	13.91	19.29*	25.05*
	140	6.58	7.33	8.16	9.05	9.98	10.95	12.49	13.82	15.20	21.21*	27.64*
600	10	3.06	3.27	3.52	3.78	4.04	4.31	4.69	5.01	5.33	6.70*	8.07*
	20	3.76	4.04	4.36	4.69	5.03	5.36	5.86	6.28	6.69	8.51*	10.37*
	40	4.71	5.09	5.51	5.96	6.41	6.86	7.55	8.12	8.71	11.30*	14.03*
	60	5.41	5.87	6.39	6.93	7.48	8.04	8.90	9.63	10.37	13.69*	17.22*
	80	5.99	6.53	7.13	7.76	8.41	9.07	10.09	10.97	11.86	15.87*	20.17*
	100	6.50	7.11	7.80	8.51	9.25	10.01	11.19	12.21	13.26	17.94*	22.97*
	120	6.96	7.64	8.40	9.20	10.04	10.89	12.23	13.39	14.59	19.91*	25.64*
	140	7.38	8.13	8.97	9.85	10.77	11.73	13.22	14.52	15.86	21.81*	28.21*
800	10	3.31	3.53	3.80	4.08	4.35	4.63	5.03	5.37	5.69	7.14*	8.57*
	20	4.09	4.38	4.72	5.07	5.42	5.77	6.29	6.72	7.15	9.05*	10.96*
	40	5.13	5.52	5.97	6.43	6.90	7.37	8.08	8.67	9.26	11.92*	14.68*
	60	5.90	6.37	6.91	7.47	8.04	8.62	9.49	10.23	10.97	14.33*	17.87*
	80	6.53	7.08	7.71	8.36	9.02	9.69	10.72	11.60	12.49	16.51*	20.80*
	100	7.08	7.71	8.41	9.14	9.90	10.66	11.85	12.86	13.90	18.56*	23.57*
	120	7.58	8.27	9.05	9.87	10.71	11.57	12.90	14.05	15.23	20.52*	26.22*
	140	8.03	8.79	9.65	10.54	11.47	12.42	13.90	15.18	16.50	22.41*	28.77*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.81	2.18	2.57	2.97	3.37	3.77	4.39	4.90	5.42	7.57*	9.78*
	20	2.34	2.92	3.50	4.09	4.68	5.28	6.19	6.96	7.74	10.96*	14.33*
	40	3.24	4.16	5.06	5.97	6.88	7.80	9.21	10.41	11.63	16.67*	21.98*
	60	4.03	5.25	6.43	7.62	8.81	10.02	11.87	13.44	15.04	21.68*	28.69*
	80	4.76	6.25	7.69	9.13	10.58	12.06	14.31	16.22	18.17	26.28*	34.85*
	100	5.44	7.19	8.87	10.55	12.25	13.97	16.60	18.83	21.11	30.60*	40.63*
	120	6.09	8.08	9.99	11.90	13.83	15.78	18.77	21.31	23.90	34.70*	46.12*
	140	6.71	8.93	11.07	13.20	15.35	17.53	20.86	23.70	26.58	38.64*	51.40*
25	10	2.28	2.56	2.89	3.25	3.62	4.00	4.58	5.08	5.59	7.71*	9.92*
	20	2.81	3.26	3.78	4.32	4.89	5.47	6.35	7.11	7.88	11.09*	14.45*
	40	3.67	4.46	5.30	6.17	7.06	7.96	9.36	10.54	11.75	16.78*	22.08*
	60	4.42	5.52	6.65	7.80	8.97	10.17	12.00	13.56	15.15	21.78*	28.78*
	80	5.12	6.50	7.89	9.30	10.73	12.19	14.43	16.33	18.27	26.37*	34.93*
	100	5.79	7.42	9.06	10.71	12.39	14.09	16.71	18.93	21.20	30.68*	40.70*
	120	6.42	8.31	10.17	12.05	13.96	15.91	18.88	21.41	24.00	34.78*	46.20*
	140	7.03	9.15	11.24	13.34	15.48	17.64	20.96	23.79	26.67	38.71*	51.47*
50	10	2.56	2.83	3.15	3.49	3.84	4.21	4.78	5.26	5.76	7.86*	10.06*
	20	3.14	3.56	4.04	4.55	5.09	5.65	6.52	7.26	8.02	11.21*	14.56*
	40	4.03	4.74	5.53	6.37	7.23	8.12	9.50	10.67	11.87	16.88*	22.18*
	60	4.78	5.78	6.86	7.98	9.13	10.31	12.12	13.67	15.25	21.87*	28.86*
	80	5.47	6.75	8.09	9.47	10.88	12.33	14.54	16.44	18.37	26.46*	35.01*
	100	6.12	7.66	9.25	10.87	12.53	14.22	16.82	19.04	21.30	30.76*	40.78*
	120	6.74	8.53	10.35	12.21	14.10	16.03	18.99	21.51	24.09	34.86*	46.27*
	140	7.34	9.37	11.41	13.49	15.61	17.76	21.07	23.88	26.76	38.79*	51.54*
100	10	2.94	3.21	3.53	3.87	4.22	4.58	5.13	5.60	6.08	8.15*	10.33*
	20	3.61	4.01	4.47	4.96	5.48	6.01	6.84	7.56	8.30	11.46*	14.80*
	40	4.59	5.23	5.96	6.75	7.58	8.44	9.77	10.93	12.10	17.10*	22.37*
	60	5.38	6.27	7.27	8.33	9.45	10.60	12.38	13.91	15.47	22.06*	29.04*
	80	6.08	7.22	8.47	9.80	11.18	12.59	14.78	16.66	18.57	26.63*	35.18*
	100	6.73	8.11	9.61	11.19	12.81	14.47	17.04	19.24	21.49	30.93*	40.94*
	120	7.35	8.97	10.71	12.51	14.37	16.27	19.20	21.71	24.27	35.02*	46.42*
	140	7.94	9.79	11.76	13.78	15.86	17.99	21.27	24.07	26.94	38.95*	51.68*
150	10	3.22	3.50	3.83	4.17	4.52	4.88	5.43	5.90	6.37	8.43*	10.60*
	20	3.96	4.36	4.82	5.31	5.81	6.34	7.15	7.85	8.57	11.71*	15.03*
	40	5.02	5.64	6.35	7.11	7.91	8.74	10.05	11.18	12.34	17.30*	22.57*
	60	5.86	6.70	7.65	8.68	9.76	10.88	12.63	14.14	15.68	22.25*	29.22*
	80	6.59	7.65	8.85	10.13	11.47	12.86	15.02	16.87	18.77	26.81*	35.34*
	100	7.26	8.54	9.98	11.50	13.09	14.73	17.27	19.45	21.68	31.10*	41.10*
	120	7.88	9.39	11.05	12.81	14.63	16.51	19.41	21.90	24.45	35.18*	46.57*
	140	8.48	10.21	12.09	14.07	16.12	18.23	21.48	24.26	27.11	39.10*	51.83*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.44	3.73	4.07	4.42	4.78	5.14	5.70	6.16	6.64	8.70*	10.86*
	20	4.25	4.65	5.12	5.61	6.11	6.63	7.44	8.13	8.84	11.95*	15.26*
	40	5.38	5.99	6.69	7.44	8.22	9.04	10.32	11.43	12.58	17.51*	22.76*
	60	6.26	7.08	8.01	9.01	10.06	11.16	12.88	14.37	15.90	22.44*	29.40*
	80	7.02	8.05	9.20	10.45	11.76	13.12	15.25	17.09	18.97	26.99*	35.51*
	100	7.71	8.94	10.33	11.81	13.36	14.98	17.49	19.65	21.87	31.27*	41.25*
	120	8.35	9.79	11.40	13.11	14.90	16.75	19.63	22.10	24.63	35.34*	46.72*
	140	8.96	10.60	12.43	14.36	16.38	18.46	21.68	24.45	27.29	39.25*	51.97*
300	10	3.81	4.11	4.46	4.83	5.20	5.58	6.14	6.62	7.10	9.19*	11.36*
	20	4.71	5.13	5.61	6.11	6.62	7.14	7.95	8.63	9.33	12.42*	15.71*
	40	5.97	6.58	7.28	8.02	8.79	9.59	10.83	11.92	13.04	17.93*	23.15*
	60	6.93	7.73	8.64	9.61	10.63	11.69	13.37	14.82	16.32	22.82*	29.75*
	80	7.75	8.74	9.85	11.05	12.31	13.64	15.71	17.51	19.37	27.34*	35.83*
	100	8.48	9.66	10.98	12.40	13.90	15.47	17.93	20.06	22.25	31.60*	41.56*
	120	9.16	10.52	12.05	13.69	15.42	17.23	20.05	22.49	24.99	35.66*	47.02*
	140	9.79	11.34	13.07	14.93	16.88	18.92	22.09	24.83	27.63	39.56*	52.26*
400	10	4.10	4.42	4.78	5.17	5.55	5.94	6.52	7.01	7.49	9.63*	11.82*
	20	5.09	5.52	6.01	6.53	7.05	7.58	8.39	9.08	9.78	12.87*	16.15*
	40	6.45	7.07	7.78	8.52	9.29	10.08	11.32	12.38	13.48	18.34*	23.54*
	60	7.48	8.28	9.19	10.15	11.15	12.20	13.84	15.26	16.74	23.19*	30.10*
	80	8.35	9.33	10.43	11.60	12.84	14.13	16.16	17.93	19.76	27.69*	36.16*
	100	9.12	10.28	11.57	12.96	14.42	15.95	18.36	20.46	22.62	31.93*	41.87*
	120	9.83	11.16	12.64	14.24	15.93	17.69	20.47	22.87	25.35	35.98*	47.32*
	140	10.49	11.99	13.67	15.47	17.38	19.37	22.49	25.20	27.98	39.87*	52.54*
600	10	4.58	4.91	5.31	5.71	6.12	6.53	7.14	7.65	8.15	10.38*	12.64*
	20	5.70	6.16	6.68	7.22	7.76	8.31	9.15	9.85	10.55	13.70*	16.99*
	40	7.23	7.87	8.60	9.37	10.15	10.95	12.17	13.23	14.31	19.13*	24.30*
	60	8.38	9.19	10.11	11.08	12.08	13.11	14.72	16.11	17.55	23.93*	30.80*
	80	9.34	10.32	11.42	12.58	13.80	15.06	17.03	18.75	20.54	28.39*	36.81*
	100	10.19	11.33	12.60	13.96	15.39	16.87	19.21	21.25	23.36	32.59*	42.49*
	120	10.95	12.25	13.71	15.26	16.89	18.60	21.29	23.64	26.07	36.61*	47.91*
	140	11.67	13.12	14.75	16.49	18.33	20.26	23.29	25.94	28.67	40.48*	53.11*
800	10	4.96	5.32	5.73	6.16	6.59	7.02	7.65	8.18	8.70	11.01*	13.34*
	20	6.20	6.67	7.22	7.78	8.35	8.92	9.78	10.50	11.22	14.43*	17.76*
	40	7.87	8.53	9.29	10.07	10.87	11.68	12.92	13.98	15.06	19.89*	25.04*
	60	9.11	9.95	10.88	11.87	12.88	13.91	15.51	16.89	18.31	24.66*	31.49*
	80	10.15	11.14	12.26	13.42	14.64	15.89	17.84	19.53	21.28	29.07*	37.46*
	100	11.06	12.21	13.49	14.84	16.25	17.72	20.02	22.02	24.09	33.25*	43.11*
	120	11.88	13.18	14.63	16.16	17.77	19.45	22.08	24.38	26.77	37.24*	48.50*
	140	12.64	14.08	15.70	17.41	19.22	21.10	24.07	26.66	29.35	41.09*	53.68*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.59	0.66	0.74	0.83	0.91	1.00	1.13	1.24	1.35	1.79*	2.23*
	20	0.66	0.76	0.86	0.97	1.08	1.20	1.37	1.51	1.65	2.22*	2.81*
	40	0.79	0.93	1.07	1.22	1.38	1.53	1.76	1.96	2.15	2.96*	3.79*
	60	0.89	1.07	1.26	1.44	1.63	1.82	2.11	2.35	2.60	3.60*	4.65*
	80	0.99	1.21	1.43	1.64	1.86	2.09	2.43	2.71	3.00	4.19*	5.43*
	100	1.09	1.33	1.58	1.83	2.08	2.34	2.73	3.05	3.38	4.75*	6.17*
	120	1.17	1.45	1.73	2.01	2.29	2.58	3.01	3.38	3.75	5.28*	6.88*
	140	1.26	1.57	1.88	2.18	2.49	2.81	3.28	3.69	4.10	5.78*	7.55*
25	10	0.81	0.86	0.94	1.01	1.10	1.18	1.30	1.40	1.51	1.93*	2.36*
	20	0.92	0.99	1.08	1.17	1.27	1.37	1.53	1.66	1.79	2.35*	2.93*
	40	1.07	1.17	1.29	1.41	1.55	1.69	1.90	2.09	2.28	3.06*	3.89*
	60	1.19	1.31	1.46	1.62	1.79	1.97	2.24	2.47	2.71	3.70*	4.73*
	80	1.29	1.44	1.62	1.81	2.02	2.23	2.55	2.82	3.11	4.28*	5.52*
	100	1.38	1.56	1.77	2.00	2.23	2.47	2.84	3.16	3.48	4.83*	6.25*
	120	1.47	1.68	1.91	2.17	2.43	2.70	3.12	3.48	3.84	5.36*	6.95*
	140	1.55	1.79	2.05	2.34	2.63	2.93	3.39	3.78	4.19	5.86*	7.62*
50	10	0.89	0.95	1.03	1.11	1.20	1.28	1.41	1.51	1.62	2.05*	2.48*
	20	1.03	1.10	1.19	1.29	1.39	1.50	1.65	1.78	1.91	2.46*	3.04*
	40	1.21	1.31	1.43	1.56	1.69	1.82	2.03	2.21	2.39	3.17*	3.98*
	60	1.35	1.47	1.62	1.77	1.93	2.10	2.36	2.59	2.82	3.79*	4.82*
	80	1.47	1.61	1.78	1.97	2.16	2.36	2.67	2.93	3.21	4.37*	5.60*
	100	1.57	1.74	1.93	2.14	2.37	2.60	2.95	3.26	3.58	4.92*	6.33*
	120	1.67	1.86	2.08	2.32	2.57	2.83	3.23	3.58	3.93	5.44*	7.03*
	140	1.76	1.97	2.21	2.48	2.76	3.05	3.49	3.88	4.28	5.94*	7.69*
100	10	1.01	1.07	1.16	1.24	1.33	1.42	1.55	1.66	1.77	2.22*	2.68*
	20	1.18	1.25	1.35	1.46	1.56	1.67	1.83	1.97	2.10	2.66*	3.24*
	40	1.40	1.50	1.63	1.76	1.89	2.03	2.24	2.42	2.60	3.36*	4.17*
	60	1.57	1.69	1.84	2.00	2.16	2.32	2.58	2.80	3.02	3.98*	5.00*
	80	1.71	1.85	2.02	2.20	2.39	2.58	2.88	3.14	3.41	4.54*	5.76*
	100	1.83	1.99	2.19	2.39	2.60	2.83	3.17	3.46	3.77	5.08*	6.48*
	120	1.94	2.12	2.34	2.57	2.80	3.05	3.44	3.77	4.12	5.60*	7.17*
	140	2.04	2.24	2.48	2.73	3.00	3.27	3.70	4.07	4.45	6.09*	7.84*
150	10	1.09	1.16	1.25	1.34	1.43	1.52	1.66	1.78	1.89	2.36*	2.83*
	20	1.28	1.36	1.47	1.58	1.69	1.80	1.97	2.11	2.24	2.82*	3.41*
	40	1.54	1.64	1.77	1.91	2.05	2.19	2.41	2.59	2.77	3.54*	4.35*
	60	1.73	1.85	2.01	2.17	2.33	2.50	2.76	2.98	3.20	4.15*	5.17*
	80	1.88	2.03	2.20	2.39	2.58	2.77	3.07	3.33	3.59	4.71*	5.92*
	100	2.02	2.18	2.38	2.59	2.80	3.02	3.36	3.65	3.95	5.24*	6.64*
	120	2.14	2.33	2.54	2.77	3.01	3.25	3.63	3.96	4.29	5.75*	7.32*
	140	2.26	2.46	2.69	2.94	3.20	3.47	3.89	4.25	4.62	6.24*	7.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.16	1.23	1.32	1.41	1.51	1.61	1.75	1.87	1.99	2.47*	2.95*
	20	1.37	1.46	1.56	1.68	1.79	1.91	2.08	2.22	2.36	2.96*	3.56*
	40	1.65	1.76	1.89	2.04	2.18	2.33	2.54	2.73	2.91	3.69*	4.51*
	60	1.86	1.99	2.14	2.31	2.48	2.65	2.91	3.13	3.35	4.31*	5.33*
	80	2.03	2.18	2.36	2.54	2.74	2.93	3.24	3.49	3.75	4.87*	6.08*
	100	2.17	2.34	2.54	2.75	2.97	3.19	3.53	3.82	4.11	5.40*	6.79*
	120	2.31	2.49	2.71	2.94	3.18	3.43	3.80	4.13	4.46	5.90*	7.47*
	140	2.43	2.63	2.87	3.12	3.38	3.65	4.07	4.42	4.79	6.39*	8.12*
300	10	1.27	1.34	1.44	1.54	1.64	1.74	1.89	2.02	2.14	2.65*	3.16*
	20	1.51	1.60	1.72	1.84	1.96	2.08	2.26	2.41	2.56	3.18*	3.82*
	40	1.83	1.95	2.09	2.24	2.39	2.54	2.77	2.96	3.15	3.96*	4.80*
	60	2.06	2.20	2.37	2.54	2.72	2.90	3.17	3.40	3.62	4.60*	5.63*
	80	2.26	2.41	2.60	2.80	3.00	3.20	3.51	3.77	4.03	5.17*	6.38*
	100	2.42	2.60	2.81	3.03	3.25	3.48	3.82	4.11	4.41	5.70*	7.08*
	120	2.57	2.77	2.99	3.23	3.48	3.73	4.11	4.43	4.76	6.20*	7.75*
	140	2.71	2.92	3.17	3.42	3.69	3.96	4.37	4.73	5.09	6.68*	8.40*
400	10	1.36	1.43	1.53	1.64	1.75	1.85	2.01	2.14	2.27	2.80*	3.33*
	20	1.62	1.72	1.84	1.97	2.09	2.22	2.41	2.57	2.72	3.37*	4.03*
	40	1.98	2.10	2.25	2.41	2.56	2.72	2.96	3.16	3.35	4.19*	5.05*
	60	2.23	2.38	2.55	2.73	2.92	3.11	3.38	3.62	3.85	4.85*	5.90*
	80	2.45	2.61	2.81	3.01	3.22	3.43	3.75	4.01	4.28	5.43*	6.65*
	100	2.63	2.81	3.03	3.25	3.48	3.72	4.07	4.36	4.66	5.96*	7.35*
	120	2.79	2.99	3.23	3.47	3.72	3.98	4.36	4.69	5.02	6.47*	8.02*
	140	2.94	3.16	3.41	3.68	3.95	4.22	4.64	5.00	5.36	6.95*	8.66*
600	10	1.50	1.58	1.69	1.80	1.92	2.03	2.20	2.34	2.47	3.04*	3.61*
	20	1.80	1.91	2.04	2.17	2.31	2.45	2.65	2.82	2.98	3.67*	4.38*
	40	2.21	2.34	2.50	2.67	2.84	3.01	3.27	3.48	3.68	4.57*	5.48*
	60	2.51	2.66	2.85	3.04	3.24	3.44	3.74	3.98	4.22	5.27*	6.36*
	80	2.75	2.92	3.13	3.35	3.57	3.80	4.13	4.41	4.68	5.88*	7.14*
	100	2.96	3.15	3.38	3.62	3.87	4.11	4.48	4.79	5.10	6.43*	7.85*
	120	3.14	3.35	3.60	3.86	4.13	4.40	4.80	5.13	5.47	6.95*	8.53*
	140	3.31	3.54	3.81	4.09	4.37	4.66	5.09	5.46	5.83	7.44*	9.17*
800	10	1.61	1.70	1.81	1.93	2.05	2.17	2.35	2.49	2.64	3.23*	3.83*
	20	1.95	2.06	2.20	2.34	2.49	2.63	2.85	3.02	3.19	3.92*	4.66*
	40	2.40	2.54	2.71	2.89	3.07	3.25	3.52	3.74	3.95	4.88*	5.84*
	60	2.73	2.89	3.09	3.30	3.50	3.71	4.02	4.28	4.53	5.62*	6.76*
	80	2.99	3.18	3.40	3.63	3.86	4.10	4.45	4.73	5.02	6.26*	7.56*
	100	3.22	3.43	3.67	3.92	4.18	4.43	4.82	5.14	5.46	6.84*	8.30*
	120	3.43	3.65	3.91	4.19	4.46	4.74	5.16	5.51	5.85	7.37*	8.98*
	140	3.61	3.85	4.13	4.43	4.72	5.02	5.47	5.85	6.22	7.87*	9.63*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.85	0.97	1.10	1.24	1.38	1.51	1.73	1.90	2.08	2.79*	3.52*
	20	1.00	1.17	1.35	1.53	1.72	1.91	2.20	2.44	2.68	3.67*	4.68*
	40	1.24	1.50	1.77	2.03	2.30	2.58	2.99	3.34	3.69	5.14*	6.64*
	60	1.46	1.80	2.13	2.47	2.81	3.16	3.68	4.13	4.57	6.43*	8.36*
	80	1.66	2.07	2.47	2.87	3.28	3.69	4.32	4.85	5.39	7.61*	9.93*
	100	1.84	2.32	2.79	3.25	3.72	4.20	4.92	5.53	6.15	8.72*	11.41*
	120	2.02	2.56	3.09	3.61	4.14	4.67	5.49	6.18	6.88	9.78*	12.82*
	140	2.19	2.79	3.37	3.96	4.54	5.13	6.03	6.80	7.57	10.79*	14.17*
25	10	1.15	1.24	1.35	1.47	1.60	1.72	1.92	2.08	2.25	2.94*	3.66*
	20	1.33	1.45	1.60	1.76	1.93	2.10	2.37	2.59	2.83	3.79*	4.80*
	40	1.60	1.78	2.00	2.24	2.48	2.74	3.13	3.47	3.81	5.24*	6.74*
	60	1.81	2.06	2.35	2.66	2.98	3.31	3.81	4.25	4.69	6.52*	8.45*
	80	2.00	2.32	2.67	3.05	3.44	3.83	4.44	4.96	5.49	7.70*	10.01*
	100	2.18	2.56	2.98	3.42	3.87	4.33	5.03	5.64	6.25	8.80*	11.49*
	120	2.35	2.79	3.27	3.77	4.28	4.80	5.60	6.28	6.97	9.86*	12.89*
	140	2.51	3.01	3.55	4.11	4.68	5.25	6.14	6.89	7.66	10.87*	14.24*
50	10	1.29	1.38	1.49	1.62	1.74	1.87	2.07	2.23	2.39	3.08*	3.79*
	20	1.50	1.62	1.77	1.93	2.09	2.26	2.52	2.74	2.96	3.92*	4.92*
	40	1.81	1.98	2.19	2.42	2.65	2.89	3.27	3.60	3.93	5.35*	6.84*
	60	2.05	2.27	2.54	2.83	3.14	3.45	3.94	4.37	4.80	6.62*	8.53*
	80	2.25	2.54	2.86	3.22	3.59	3.97	4.56	5.07	5.60	7.79*	10.10*
	100	2.44	2.78	3.16	3.58	4.01	4.46	5.15	5.74	6.35	8.89*	11.57*
	120	2.61	3.01	3.45	3.92	4.42	4.92	5.71	6.38	7.06	9.94*	12.97*
	140	2.78	3.23	3.73	4.26	4.81	5.37	6.25	6.99	7.75	10.94*	14.31*
100	10	1.46	1.56	1.68	1.81	1.94	2.08	2.28	2.45	2.61	3.31*	4.03*
	20	1.73	1.85	2.01	2.17	2.34	2.51	2.77	2.99	3.21	4.15*	5.14*
	40	2.09	2.27	2.48	2.70	2.93	3.17	3.53	3.85	4.17	5.55*	7.03*
	60	2.37	2.59	2.85	3.13	3.42	3.72	4.19	4.60	5.01	6.80*	8.71*
	80	2.61	2.87	3.18	3.52	3.87	4.23	4.80	5.29	5.80	7.96*	10.26*
	100	2.82	3.13	3.49	3.88	4.28	4.71	5.38	5.95	6.54	9.05*	11.72*
	120	3.01	3.36	3.78	4.22	4.68	5.17	5.93	6.58	7.25	10.10*	13.12*
	140	3.19	3.59	4.05	4.54	5.07	5.61	6.46	7.19	7.93	11.10*	14.45*
150	10	1.59	1.69	1.82	1.96	2.09	2.23	2.44	2.61	2.79	3.50*	4.24*
	20	1.89	2.02	2.18	2.35	2.53	2.70	2.96	3.19	3.41	4.36*	5.35*
	40	2.30	2.48	2.69	2.92	3.15	3.39	3.75	4.07	4.38	5.75*	7.22*
	60	2.61	2.83	3.10	3.37	3.66	3.96	4.42	4.82	5.22	6.99*	8.88*
	80	2.87	3.13	3.44	3.77	4.12	4.47	5.03	5.51	6.00	8.14*	10.42*
	100	3.10	3.40	3.76	4.14	4.54	4.95	5.59	6.16	6.73	9.22*	11.88*
	120	3.31	3.65	4.05	4.48	4.93	5.40	6.14	6.78	7.44	10.25*	13.26*
	140	3.50	3.89	4.33	4.81	5.31	5.84	6.66	7.38	8.11	11.25*	14.60*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.69	1.80	1.93	2.07	2.22	2.36	2.57	2.75	2.93	3.66*	4.42*
	20	2.02	2.16	2.33	2.50	2.68	2.86	3.13	3.35	3.58	4.54*	5.55*
	40	2.47	2.65	2.87	3.11	3.34	3.58	3.95	4.26	4.58	5.94*	7.41*
	60	2.81	3.03	3.30	3.58	3.87	4.17	4.63	5.02	5.42	7.17*	9.06*
	80	3.09	3.35	3.66	3.99	4.33	4.69	5.23	5.71	6.19	8.31*	10.59*
	100	3.33	3.64	3.99	4.37	4.76	5.17	5.80	6.35	6.92	9.38*	12.03*
	120	3.55	3.90	4.30	4.72	5.16	5.62	6.34	6.97	7.62	10.41*	13.41*
	140	3.76	4.14	4.58	5.05	5.54	6.06	6.86	7.56	8.29	11.40*	14.74*
300	10	1.86	1.97	2.11	2.26	2.41	2.57	2.79	2.98	3.16	3.93*	4.72*
	20	2.24	2.38	2.56	2.74	2.93	3.12	3.40	3.63	3.87	4.86*	5.89*
	40	2.75	2.94	3.17	3.41	3.65	3.90	4.28	4.60	4.91	6.29*	7.76*
	60	3.12	3.36	3.63	3.92	4.22	4.52	4.99	5.38	5.78	7.52*	9.39*
	80	3.44	3.71	4.03	4.37	4.71	5.06	5.61	6.08	6.55	8.64*	10.91*
	100	3.71	4.02	4.38	4.76	5.15	5.56	6.18	6.72	7.28	9.71*	12.34*
	120	3.96	4.30	4.70	5.13	5.57	6.02	6.73	7.34	7.97	10.72*	13.70*
	140	4.18	4.57	5.00	5.47	5.96	6.46	7.25	7.93	8.63	11.70*	15.02*
400	10	1.99	2.11	2.26	2.42	2.57	2.73	2.97	3.16	3.35	4.15*	4.97*
	20	2.41	2.56	2.75	2.94	3.14	3.33	3.62	3.87	4.11	5.13*	6.19*
	40	2.97	3.17	3.41	3.66	3.91	4.17	4.56	4.88	5.20	6.61*	8.09*
	60	3.38	3.62	3.91	4.21	4.51	4.82	5.29	5.69	6.09	7.84*	9.72*
	80	3.72	4.00	4.33	4.68	5.03	5.39	5.94	6.40	6.88	8.96*	11.22*
	100	4.02	4.34	4.71	5.09	5.49	5.90	6.52	7.06	7.61	10.02*	12.64*
	120	4.29	4.64	5.05	5.47	5.92	6.37	7.07	7.68	8.30	11.03*	13.99*
	140	4.53	4.92	5.36	5.83	6.32	6.82	7.60	8.27	8.96	12.00*	15.30*
600	10	2.21	2.34	2.50	2.66	2.83	3.00	3.25	3.46	3.66	4.52*	5.38*
	20	2.69	2.85	3.05	3.26	3.47	3.68	3.99	4.25	4.50	5.58*	6.70*
	40	3.33	3.54	3.80	4.07	4.34	4.61	5.01	5.35	5.69	7.14*	8.67*
	60	3.80	4.06	4.36	4.67	5.00	5.32	5.81	6.22	6.63	8.41*	10.32*
	80	4.19	4.48	4.83	5.19	5.56	5.93	6.49	6.97	7.45	9.55*	11.82*
	100	4.52	4.85	5.24	5.64	6.05	6.47	7.11	7.65	8.20	10.61*	13.22*
	120	4.82	5.19	5.61	6.05	6.51	6.97	7.68	8.28	8.90	11.61*	14.56*
	140	5.09	5.49	5.95	6.44	6.93	7.44	8.22	8.88	9.57	12.57*	15.85*
800	10	2.38	2.52	2.69	2.87	3.04	3.22	3.49	3.70	3.92	4.81*	5.72*
	20	2.92	3.09	3.30	3.52	3.74	3.96	4.29	4.55	4.82	5.95*	7.12*
	40	3.62	3.85	4.12	4.40	4.68	4.96	5.39	5.74	6.09	7.60*	9.17*
	60	4.14	4.41	4.73	5.06	5.39	5.73	6.24	6.66	7.08	8.91*	10.86*
	80	4.56	4.87	5.23	5.61	5.99	6.38	6.96	7.44	7.94	10.08*	12.37*
	100	4.93	5.27	5.67	6.09	6.52	6.95	7.60	8.15	8.71	11.15*	13.77*
	120	5.26	5.63	6.07	6.53	7.00	7.47	8.20	8.81	9.43	12.15*	15.11*
	140	5.55	5.97	6.44	6.94	7.45	7.96	8.75	9.42	10.11	13.12*	16.39*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.27	1.48	1.70	1.93	2.16	2.39	2.75	3.04	3.34	4.56*	5.81*
	20	1.56	1.88	2.20	2.52	2.85	3.18	3.69	4.11	4.54	6.31*	8.13*
	40	2.05	2.55	3.03	3.52	4.02	4.51	5.27	5.91	6.56	9.25*	12.05*
	60	2.49	3.13	3.77	4.40	5.04	5.68	6.66	7.49	8.33	11.82*	15.48*
	80	2.88	3.67	4.44	5.20	5.97	6.75	7.94	8.94	9.96	14.19*	18.63*
	100	3.25	4.18	5.07	5.96	6.85	7.76	9.13	10.30	11.49	16.41*	21.59*
	120	3.61	4.66	5.67	6.68	7.69	8.71	10.27	11.59	12.94	18.52*	24.40*
	140	3.95	5.12	6.25	7.37	8.49	9.63	11.36	12.83	14.33	20.55*	27.10*
25	10	1.67	1.82	2.00	2.20	2.41	2.62	2.95	3.23	3.52	4.71*	5.95*
	20	1.98	2.21	2.48	2.76	3.07	3.38	3.86	4.27	4.69	6.43*	8.25*
	40	2.47	2.84	3.27	3.73	4.20	4.68	5.42	6.05	6.69	9.35*	12.15*
	60	2.88	3.41	3.99	4.59	5.20	5.83	6.79	7.61	8.45	11.92*	15.57*
	80	3.25	3.93	4.64	5.38	6.13	6.89	8.06	9.05	10.06	14.28*	18.71*
	100	3.61	4.42	5.27	6.12	7.00	7.89	9.25	10.41	11.59	16.49*	21.67*
	120	3.95	4.89	5.86	6.84	7.83	8.84	10.38	11.70	13.03	18.60*	24.48*
	140	4.28	5.35	6.43	7.52	8.63	9.75	11.47	12.93	14.42	20.62*	27.17*
50	10	1.87	2.02	2.20	2.40	2.60	2.81	3.13	3.40	3.68	4.85*	6.08*
	20	2.23	2.45	2.70	2.98	3.27	3.56	4.03	4.43	4.83	6.56*	8.37*
	40	2.76	3.10	3.50	3.93	4.38	4.84	5.56	6.18	6.81	9.46*	12.24*
	60	3.19	3.66	4.20	4.77	5.36	5.98	6.92	7.73	8.56	12.01*	15.66*
	80	3.57	4.18	4.85	5.55	6.28	7.03	8.18	9.16	10.17	14.37*	18.80*
	100	3.93	4.66	5.46	6.29	7.14	8.02	9.36	10.51	11.68	16.58*	21.74*
	120	4.27	5.12	6.04	6.99	7.97	8.96	10.49	11.80	13.13	18.68*	24.55*
	140	4.59	5.57	6.60	7.67	8.76	9.87	11.58	13.03	14.51	20.70*	27.24*
100	10	2.14	2.29	2.48	2.69	2.89	3.11	3.43	3.70	3.97	5.13*	6.35*
	20	2.57	2.78	3.04	3.31	3.60	3.89	4.34	4.72	5.11	6.80*	8.60*
	40	3.18	3.50	3.88	4.29	4.71	5.15	5.84	6.44	7.05	9.67*	12.44*
	60	3.66	4.09	4.59	5.12	5.68	6.27	7.18	7.97	8.78	12.20*	15.83*
	80	4.07	4.61	5.23	5.89	6.58	7.30	8.42	9.39	10.38	14.54*	18.96*
	100	4.45	5.09	5.83	6.61	7.43	8.28	9.59	10.72	11.88	16.74*	21.90*
	120	4.79	5.55	6.40	7.30	8.24	9.21	10.71	12.00	13.31	18.84*	24.70*
	140	5.12	5.99	6.95	7.97	9.02	10.11	11.79	13.22	14.69	20.85*	27.39*
150	10	2.33	2.49	2.69	2.90	3.12	3.33	3.66	3.93	4.21	5.38*	6.60*
	20	2.82	3.04	3.30	3.58	3.86	4.15	4.60	4.98	5.37	7.04*	8.82*
	40	3.50	3.82	4.19	4.59	5.01	5.44	6.11	6.69	7.29	9.87*	12.63*
	60	4.01	4.43	4.92	5.43	5.98	6.55	7.43	8.20	9.00	12.39*	16.01*
	80	4.46	4.97	5.56	6.20	6.87	7.57	8.66	9.61	10.58	14.72*	19.12*
	100	4.85	5.47	6.17	6.92	7.71	8.53	9.82	10.93	12.07	16.91*	22.06*
	120	5.22	5.93	6.74	7.60	8.51	9.46	10.93	12.20	13.50	19.00*	24.85*
	140	5.56	6.37	7.28	8.26	9.29	10.35	12.00	13.42	14.87	21.01*	27.53*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.49	2.66	2.86	3.08	3.30	3.52	3.86	4.13	4.41	5.60*	6.83*
	20	3.02	3.25	3.51	3.80	4.09	4.38	4.83	5.21	5.60	7.27*	9.04*
	40	3.75	4.07	4.45	4.85	5.27	5.70	6.36	6.93	7.52	10.08*	12.83*
	60	4.31	4.72	5.20	5.72	6.25	6.81	7.68	8.43	9.21	12.58*	16.19*
	80	4.78	5.29	5.87	6.49	7.14	7.83	8.90	9.83	10.78	14.89*	19.29*
	100	5.20	5.79	6.48	7.21	7.98	8.78	10.05	11.14	12.27	17.08*	22.21*
	120	5.58	6.27	7.05	7.89	8.78	9.70	11.15	12.40	13.69	19.16*	25.00*
	140	5.94	6.72	7.60	8.54	9.54	10.58	12.21	13.61	15.05	21.16*	27.67*
300	10	2.75	2.92	3.14	3.37	3.60	3.83	4.18	4.47	4.76	5.98*	7.24*
	20	3.35	3.58	3.86	4.16	4.46	4.76	5.22	5.61	6.00	7.68*	9.47*
	40	4.17	4.50	4.89	5.30	5.72	6.14	6.81	7.37	7.95	10.48*	13.21*
	60	4.79	5.21	5.69	6.20	6.73	7.28	8.14	8.87	9.63	12.95*	16.53*
	80	5.31	5.81	6.39	7.00	7.64	8.31	9.35	10.25	11.18	15.24*	19.61*
	100	5.76	6.35	7.02	7.73	8.48	9.26	10.48	11.55	12.65	17.41*	22.52*
	120	6.18	6.85	7.61	8.42	9.27	10.17	11.57	12.79	14.06	19.48*	25.29*
	140	6.56	7.31	8.16	9.07	10.04	11.04	12.62	13.99	15.41	21.47*	27.96*
400	10	2.95	3.13	3.36	3.60	3.84	4.08	4.44	4.74	5.04	6.30*	7.60*
	20	3.62	3.86	4.15	4.46	4.77	5.08	5.55	5.95	6.35	8.05*	9.86*
	40	4.51	4.85	5.25	5.67	6.09	6.53	7.19	7.76	8.34	10.86*	13.58*
	60	5.18	5.60	6.10	6.61	7.15	7.70	8.55	9.28	10.03	13.31*	16.88*
	80	5.74	6.24	6.83	7.44	8.08	8.74	9.77	10.65	11.57	15.59*	19.94*
	100	6.23	6.81	7.48	8.19	8.93	9.70	10.90	11.95	13.03	17.74*	22.83*
	120	6.67	7.34	8.09	8.89	9.73	10.61	11.98	13.18	14.42	19.79*	25.59*
	140	7.08	7.82	8.66	9.56	10.50	11.48	13.02	14.37	15.76	21.77*	28.24*
600	10	3.28	3.48	3.72	3.98	4.24	4.49	4.88	5.19	5.51	6.83*	8.20*
	20	4.04	4.30	4.61	4.94	5.27	5.60	6.10	6.51	6.92	8.69*	10.55*
	40	5.06	5.42	5.84	6.27	6.72	7.17	7.85	8.43	9.01	11.56*	14.29*
	60	5.82	6.26	6.77	7.30	7.85	8.41	9.27	10.00	10.74	14.01*	17.56*
	80	6.44	6.96	7.56	8.18	8.83	9.49	10.51	11.39	12.29	16.26*	20.58*
	100	6.99	7.58	8.26	8.98	9.72	10.48	11.67	12.69	13.74	18.38*	23.44*
	120	7.48	8.15	8.91	9.71	10.54	11.41	12.75	13.92	15.12	20.42*	26.17*
	140	7.93	8.67	9.51	10.40	11.32	12.28	13.79	15.09	16.45	22.37*	28.81*
800	10	3.55	3.76	4.02	4.29	4.56	4.83	5.23	5.56	5.89	7.28*	8.70*
	20	4.39	4.66	4.99	5.33	5.68	6.03	6.54	6.97	7.40	9.23*	11.15*
	40	5.51	5.88	6.32	6.77	7.24	7.70	8.41	9.00	9.59	12.18*	14.94*
	60	6.33	6.79	7.32	7.87	8.44	9.01	9.88	10.62	11.37	14.65*	18.20*
	80	7.01	7.55	8.16	8.81	9.47	10.14	11.17	12.05	12.94	16.90*	21.21*
	100	7.61	8.21	8.91	9.64	10.39	11.16	12.34	13.36	14.40	19.01*	24.04*
	120	8.14	8.82	9.59	10.40	11.24	12.11	13.44	14.60	15.78	21.03*	26.75*
	140	8.63	9.37	10.22	11.12	12.05	13.00	14.49	15.78	17.11	22.97*	29.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.97	2.35	2.74	3.14	3.54	3.95	4.56	5.08	5.61	7.76*	9.98*
	20	2.55	3.14	3.73	4.33	4.93	5.53	6.45	7.22	8.01	11.26*	14.64*
	40	3.54	4.49	5.41	6.33	7.25	8.19	9.62	10.82	12.05	17.13*	22.47*
	60	4.40	5.66	6.87	8.08	9.29	10.52	12.39	13.98	15.59	22.29*	29.33*
	80	5.19	6.74	8.22	9.69	11.17	12.66	14.94	16.88	18.84	27.02*	35.63*
	100	5.94	7.75	9.48	11.20	12.93	14.67	17.34	19.60	21.90	31.46*	41.55*
	120	6.64	8.72	10.68	12.64	14.60	16.58	19.61	22.18	24.80	35.68*	47.17*
	140	7.32	9.64	11.84	14.01	16.20	18.42	21.80	24.66	27.58	39.73*	52.57*
25	10	2.47	2.74	3.07	3.43	3.80	4.18	4.77	5.27	5.78	7.91*	10.12*
	20	3.04	3.50	4.02	4.57	5.14	5.73	6.62	7.38	8.16	11.38*	14.76*
	40	3.98	4.79	5.65	6.53	7.44	8.35	9.76	10.96	12.17	17.24*	22.57*
	60	4.80	5.94	7.09	8.27	9.46	10.67	12.52	14.10	15.70	22.38*	29.42*
	80	5.57	7.00	8.42	9.86	11.32	12.80	15.07	16.99	18.95	27.11*	35.71*
	100	6.30	8.00	9.68	11.37	13.07	14.81	17.45	19.70	22.00	31.54*	41.63*
	120	6.99	8.95	10.87	12.79	14.74	16.71	19.72	22.29	24.89	35.76*	47.25*
	140	7.65	9.87	12.02	14.17	16.34	18.54	21.90	24.76	27.67	39.81*	52.64*
50	10	2.76	3.02	3.34	3.68	4.03	4.40	4.97	5.46	5.96	8.06*	10.26*
	20	3.39	3.81	4.29	4.81	5.35	5.92	6.79	7.54	8.30	11.51*	14.87*
	40	4.36	5.08	5.89	6.74	7.62	8.52	9.91	11.09	12.30	17.34*	22.66*
	60	5.18	6.21	7.31	8.45	9.62	10.82	12.66	14.22	15.82	22.48*	29.51*
	80	5.94	7.25	8.63	10.04	11.48	12.94	15.19	17.10	19.05	27.19*	35.80*
	100	6.65	8.24	9.87	11.53	13.22	14.94	17.57	19.81	22.09	31.63*	41.70*
	120	7.33	9.18	11.06	12.95	14.88	16.84	19.83	22.39	24.99	35.84*	47.32*
	140	7.98	10.09	12.19	14.32	16.47	18.66	22.01	24.86	27.77	39.89*	52.71*
100	10	3.17	3.43	3.74	4.08	4.43	4.78	5.33	5.80	6.29	8.35*	10.54*
	20	3.89	4.28	4.74	5.24	5.75	6.29	7.13	7.85	8.59	11.75*	15.10*
	40	4.95	5.60	6.34	7.14	7.97	8.84	10.19	11.36	12.54	17.55*	22.86*
	60	5.81	6.72	7.74	8.82	9.95	11.12	12.92	14.46	16.04	22.67*	29.68*
	80	6.58	7.74	9.03	10.38	11.78	13.22	15.43	17.33	19.26	27.37*	35.96*
	100	7.29	8.71	10.25	11.86	13.51	15.20	17.80	20.02	22.29	31.80*	41.86*
	120	7.96	9.64	11.42	13.27	15.16	17.09	20.06	22.59	25.18	36.00*	47.47*
	140	8.60	10.53	12.55	14.62	16.74	18.90	22.22	25.06	27.95	40.04*	52.85*
150	10	3.46	3.73	4.05	4.39	4.74	5.10	5.65	6.11	6.59	8.63*	10.80*
	20	4.27	4.65	5.11	5.60	6.10	6.63	7.44	8.15	8.88	12.00*	15.34*
	40	5.41	6.03	6.74	7.51	8.32	9.16	10.48	11.62	12.79	17.76*	23.06*
	60	6.32	7.17	8.14	9.18	10.27	11.41	13.18	14.70	16.26	22.86*	29.86*
	80	7.11	8.20	9.42	10.72	12.08	13.49	15.67	17.55	19.47	27.55*	36.13*
	100	7.84	9.16	10.63	12.18	13.80	15.46	18.03	20.23	22.49	31.96*	42.02*
	120	8.52	10.08	11.78	13.58	15.43	17.34	20.28	22.79	25.37	36.16*	47.62*
	140	9.17	10.96	12.90	14.92	17.00	19.14	22.43	25.25	28.13	40.20*	53.00*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.70	3.98	4.31	4.65	5.01	5.37	5.92	6.39	6.86	8.90*	11.07*
	20	4.57	4.96	5.42	5.91	6.41	6.93	7.74	8.44	9.15	12.24*	15.56*
	40	5.79	6.40	7.10	7.85	8.64	9.47	10.76	11.88	13.03	17.97*	23.25*
	60	6.75	7.57	8.51	9.52	10.58	11.70	13.43	14.94	16.48	23.05*	30.04*
	80	7.57	8.61	9.79	11.05	12.38	13.76	15.92	17.77	19.67	27.73*	36.29*
	100	8.32	9.58	10.99	12.50	14.08	15.72	18.26	20.45	22.68	32.13*	42.17*
	120	9.02	10.50	12.14	13.88	15.70	17.58	20.50	23.00	25.55	36.32*	47.77*
	140	9.68	11.37	13.24	15.22	17.27	19.38	22.65	25.45	28.31	40.35*	53.14*
300	10	4.09	4.38	4.72	5.08	5.45	5.83	6.39	6.86	7.34	9.39*	11.57*
	20	5.07	5.47	5.94	6.44	6.95	7.47	8.27	8.96	9.66	12.72*	16.02*
	40	6.42	7.02	7.72	8.46	9.23	10.04	11.29	12.38	13.51	18.39*	23.64*
	60	7.46	8.26	9.17	10.15	11.18	12.25	13.94	15.41	16.92	23.42*	30.39*
	80	8.34	9.34	10.47	11.68	12.96	14.30	16.39	18.21	20.09	28.08*	36.62*
	100	9.14	10.33	11.67	13.12	14.64	16.23	18.71	20.86	23.07	32.46*	42.48*
	120	9.87	11.26	12.81	14.48	16.24	18.08	20.93	23.40	25.93	36.64*	48.07*
	140	10.56	12.14	13.91	15.80	17.79	19.86	23.07	25.83	28.67	40.66*	53.43*
400	10	4.41	4.70	5.06	5.44	5.82	6.20	6.78	7.27	7.75	9.84*	12.03*
	20	5.47	5.88	6.37	6.87	7.40	7.92	8.73	9.42	10.12	13.17*	16.46*
	40	6.93	7.54	8.24	8.99	9.76	10.55	11.79	12.86	13.97	18.79*	24.02*
	60	8.04	8.84	9.75	10.71	11.72	12.78	14.43	15.87	17.35	23.80*	30.74*
	80	8.99	9.96	11.07	12.26	13.51	14.81	16.86	18.65	20.49	28.43*	36.95*
	100	9.82	10.98	12.29	13.69	15.18	16.73	19.16	21.28	23.46	32.80*	42.79*
	120	10.59	11.93	13.44	15.06	16.77	18.56	21.37	23.80	26.30	36.96*	48.36*
	140	11.31	12.83	14.53	16.37	18.31	20.33	23.49	26.22	29.03	40.97*	53.71*
600	10	4.92	5.23	5.61	6.01	6.42	6.82	7.43	7.93	8.44	10.59*	12.85*
	20	6.13	6.56	7.07	7.60	8.14	8.69	9.52	10.22	10.93	14.00*	17.30*
	40	7.77	8.39	9.11	9.87	10.65	11.45	12.68	13.74	14.82	19.59*	24.78*
	60	9.00	9.80	10.72	11.68	12.69	13.72	15.34	16.74	18.19	24.54*	31.44*
	80	10.04	11.01	12.11	13.28	14.50	15.77	17.76	19.50	21.29	29.12*	37.60*
	100	10.95	12.09	13.37	14.74	16.18	17.68	20.04	22.10	24.23	33.46*	43.41*
	120	11.79	13.09	14.55	16.12	17.77	19.50	22.22	24.58	27.03	37.60*	48.96*
	140	12.56	14.02	15.67	17.43	19.29	21.24	24.31	26.98	29.74	41.58*	54.29*
800	10	5.33	5.66	6.06	6.48	6.90	7.33	7.96	8.48	9.01	11.24*	13.57*
	20	6.66	7.11	7.64	8.19	8.75	9.32	10.18	10.89	11.61	14.75*	18.08*
	40	8.45	9.09	9.83	10.61	11.41	12.22	13.46	14.52	15.60	20.36*	25.53*
	60	9.79	10.60	11.53	12.51	13.52	14.56	16.17	17.55	18.98	25.27*	32.13*
	80	10.91	11.88	12.99	14.16	15.38	16.64	18.60	20.30	22.07	29.81*	38.25*
	100	11.89	13.02	14.30	15.66	17.08	18.56	20.87	22.89	24.98	34.11*	44.03*
	120	12.77	14.06	15.52	17.06	18.69	20.38	23.04	25.36	27.76	38.23*	49.55*
	140	13.59	15.04	16.66	18.39	20.21	22.12	25.12	27.73	30.44	42.18*	54.85*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.64	0.70	0.78	0.87	0.95	1.04	1.17	1.28	1.39	1.83*	2.27*
	20	0.72	0.81	0.91	1.02	1.13	1.25	1.42	1.56	1.70	2.28*	2.86*
	40	0.85	0.99	1.14	1.29	1.44	1.60	1.83	2.03	2.22	3.03*	3.86*
	60	0.97	1.15	1.33	1.52	1.71	1.90	2.19	2.44	2.68	3.69*	4.74*
	80	1.07	1.29	1.51	1.73	1.96	2.18	2.52	2.81	3.10	4.30*	5.55*
	100	1.18	1.43	1.68	1.93	2.19	2.45	2.84	3.17	3.50	4.87*	6.30*
	120	1.27	1.56	1.84	2.12	2.41	2.70	3.13	3.50	3.88	5.42*	7.02*
	140	1.36	1.68	1.99	2.31	2.62	2.94	3.42	3.83	4.24	5.94*	7.71*
25	10	0.87	0.92	0.99	1.06	1.14	1.22	1.35	1.45	1.55	1.97*	2.40*
	20	0.98	1.05	1.13	1.23	1.33	1.43	1.58	1.71	1.85	2.40*	2.98*
	40	1.15	1.24	1.36	1.49	1.62	1.76	1.98	2.16	2.35	3.14*	3.96*
	60	1.27	1.40	1.55	1.71	1.88	2.05	2.33	2.56	2.80	3.79*	4.83*
	80	1.39	1.54	1.72	1.91	2.11	2.32	2.65	2.93	3.21	4.39*	5.63*
	100	1.49	1.66	1.88	2.10	2.34	2.58	2.96	3.28	3.60	4.96*	6.38*
	120	1.58	1.79	2.03	2.29	2.55	2.83	3.25	3.61	3.97	5.50*	7.10*
	140	1.67	1.91	2.18	2.46	2.76	3.06	3.53	3.93	4.33	6.01*	7.78*
50	10	0.96	1.01	1.09	1.17	1.25	1.33	1.46	1.56	1.67	2.09*	2.52*
	20	1.10	1.17	1.26	1.36	1.46	1.56	1.71	1.84	1.97	2.52*	3.09*
	40	1.30	1.39	1.51	1.63	1.77	1.90	2.11	2.29	2.47	3.24*	4.06*
	60	1.45	1.56	1.71	1.86	2.02	2.19	2.45	2.68	2.91	3.88*	4.92*
	80	1.57	1.71	1.88	2.07	2.26	2.46	2.77	3.04	3.32	4.48*	5.71*
	100	1.68	1.85	2.04	2.26	2.48	2.71	3.07	3.38	3.70	5.04*	6.46*
	120	1.79	1.98	2.20	2.44	2.69	2.95	3.36	3.71	4.07	5.58*	7.17*
	140	1.88	2.10	2.34	2.61	2.89	3.18	3.64	4.03	4.42	6.09*	7.86*
100	10	1.08	1.14	1.22	1.30	1.39	1.48	1.61	1.72	1.83	2.27*	2.72*
	20	1.26	1.33	1.43	1.53	1.63	1.74	1.90	2.03	2.16	2.72*	3.29*
	40	1.50	1.59	1.72	1.85	1.98	2.12	2.33	2.50	2.68	3.44*	4.25*
	60	1.68	1.79	1.94	2.10	2.26	2.42	2.68	2.90	3.12	4.07*	5.09*
	80	1.83	1.97	2.13	2.31	2.50	2.70	3.00	3.25	3.52	4.65*	5.87*
	100	1.96	2.12	2.31	2.51	2.73	2.95	3.29	3.59	3.90	5.21*	6.61*
	120	2.08	2.26	2.47	2.70	2.94	3.19	3.58	3.91	4.26	5.73*	7.32*
	140	2.19	2.39	2.62	2.87	3.14	3.41	3.85	4.22	4.61	6.24*	8.00*
150	10	1.17	1.23	1.31	1.40	1.49	1.59	1.72	1.84	1.95	2.40*	2.87*
	20	1.37	1.45	1.55	1.65	1.76	1.87	2.04	2.18	2.31	2.88*	3.47*
	40	1.65	1.74	1.87	2.01	2.14	2.28	2.50	2.68	2.86	3.61*	4.43*
	60	1.85	1.97	2.12	2.28	2.44	2.61	2.86	3.08	3.30	4.24*	5.26*
	80	2.01	2.15	2.33	2.51	2.70	2.89	3.19	3.45	3.71	4.82*	6.03*
	100	2.16	2.32	2.51	2.72	2.93	3.15	3.49	3.78	4.08	5.37*	6.77*
	120	2.29	2.47	2.68	2.91	3.15	3.39	3.77	4.10	4.44	5.89*	7.47*
	140	2.41	2.61	2.84	3.09	3.35	3.62	4.04	4.41	4.78	6.39*	8.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.24	1.30	1.39	1.48	1.58	1.67	1.81	1.93	2.05	2.51*	3.00*
	20	1.47	1.54	1.65	1.76	1.87	1.98	2.16	2.30	2.44	3.01*	3.62*
	40	1.76	1.87	2.00	2.14	2.28	2.42	2.64	2.82	3.01	3.77*	4.59*
	60	1.98	2.11	2.26	2.43	2.59	2.76	3.02	3.24	3.47	4.40*	5.42*
	80	2.17	2.31	2.48	2.67	2.86	3.06	3.36	3.61	3.87	4.98*	6.19*
	100	2.32	2.49	2.68	2.89	3.11	3.33	3.67	3.96	4.25	5.52*	6.92*
	120	2.47	2.65	2.86	3.09	3.33	3.58	3.95	4.28	4.61	6.04*	7.61*
	140	2.60	2.79	3.03	3.28	3.54	3.81	4.23	4.58	4.95	6.54*	8.28*
300	10	1.36	1.42	1.52	1.61	1.71	1.81	1.96	2.09	2.21	2.70*	3.21*
	20	1.61	1.70	1.81	1.92	2.04	2.16	2.34	2.49	2.64	3.24*	3.88*
	40	1.96	2.06	2.20	2.35	2.50	2.65	2.88	3.07	3.26	4.04*	4.88*
	60	2.21	2.34	2.50	2.67	2.85	3.02	3.29	3.52	3.74	4.69*	5.73*
	80	2.41	2.56	2.74	2.94	3.14	3.34	3.65	3.91	4.17	5.28*	6.49*
	100	2.59	2.76	2.96	3.18	3.40	3.62	3.97	4.26	4.56	5.82*	7.21*
	120	2.75	2.94	3.16	3.40	3.64	3.89	4.27	4.59	4.92	6.34*	7.90*
	140	2.90	3.10	3.34	3.60	3.86	4.13	4.55	4.90	5.27	6.83*	8.56*
400	10	1.45	1.52	1.62	1.72	1.82	1.93	2.08	2.21	2.34	2.85*	3.38*
	20	1.73	1.82	1.94	2.06	2.19	2.31	2.50	2.65	2.81	3.43*	4.09*
	40	2.11	2.22	2.37	2.52	2.68	2.84	3.07	3.27	3.46	4.27*	5.14*
	60	2.39	2.52	2.69	2.87	3.05	3.24	3.51	3.74	3.98	4.95*	6.00*
	80	2.61	2.77	2.96	3.16	3.37	3.57	3.89	4.15	4.42	5.54*	6.77*
	100	2.81	2.98	3.19	3.41	3.64	3.87	4.23	4.52	4.82	6.09*	7.49*
	120	2.98	3.17	3.40	3.65	3.90	4.15	4.53	4.86	5.19	6.61*	8.17*
	140	3.14	3.35	3.60	3.86	4.13	4.40	4.82	5.18	5.54	7.10*	8.83*
600	10	1.60	1.68	1.78	1.89	2.00	2.11	2.28	2.41	2.55	3.09*	3.66*
	20	1.93	2.02	2.15	2.28	2.41	2.55	2.75	2.91	3.08	3.74*	4.44*
	40	2.36	2.48	2.64	2.80	2.97	3.14	3.39	3.60	3.81	4.66*	5.57*
	60	2.68	2.82	3.00	3.19	3.39	3.58	3.88	4.12	4.36	5.38*	6.47*
	80	2.93	3.10	3.30	3.52	3.74	3.96	4.29	4.56	4.84	6.00*	7.26*
	100	3.16	3.34	3.56	3.80	4.04	4.28	4.65	4.96	5.27	6.57*	7.99*
	120	3.36	3.56	3.80	4.06	4.32	4.58	4.98	5.32	5.66	7.10*	8.68*
	140	3.54	3.75	4.02	4.29	4.57	4.86	5.29	5.66	6.03	7.60*	9.33*
800	10	1.72	1.80	1.91	2.03	2.14	2.26	2.44	2.58	2.72	3.29*	3.89*
	20	2.08	2.18	2.32	2.46	2.60	2.74	2.95	3.13	3.30	4.00*	4.73*
	40	2.56	2.69	2.86	3.03	3.21	3.39	3.65	3.87	4.08	4.98*	5.93*
	60	2.91	3.06	3.26	3.46	3.66	3.87	4.18	4.43	4.68	5.74*	6.87*
	80	3.20	3.37	3.58	3.81	4.04	4.27	4.62	4.90	5.19	6.39*	7.69*
	100	3.44	3.63	3.87	4.12	4.37	4.62	5.00	5.32	5.64	6.98*	8.44*
	120	3.66	3.87	4.12	4.39	4.67	4.94	5.36	5.70	6.05	7.52*	9.13*
	140	3.86	4.08	4.36	4.65	4.94	5.24	5.68	6.06	6.44	8.04*	9.80*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.92	1.03	1.16	1.30	1.44	1.58	1.79	1.97	2.14	2.86*	3.59*
	20	1.08	1.25	1.43	1.62	1.80	1.99	2.28	2.52	2.77	3.76*	4.78*
	40	1.35	1.61	1.88	2.15	2.42	2.69	3.11	3.46	3.81	5.27*	6.78*
	60	1.58	1.92	2.27	2.61	2.95	3.30	3.83	4.28	4.73	6.59*	8.53*
	80	1.79	2.21	2.63	3.04	3.45	3.87	4.50	5.03	5.57	7.81*	10.14*
	100	2.00	2.49	2.96	3.44	3.91	4.39	5.12	5.74	6.37	8.95*	11.66*
	120	2.19	2.75	3.28	3.82	4.35	4.89	5.72	6.41	7.12	10.04*	13.09*
	140	2.37	2.99	3.59	4.18	4.78	5.38	6.29	7.06	7.84	11.08*	14.47*
25	10	1.24	1.32	1.43	1.54	1.67	1.79	1.99	2.15	2.32	3.01*	3.72*
	20	1.43	1.54	1.69	1.85	2.02	2.19	2.46	2.68	2.92	3.88*	4.89*
	40	1.71	1.90	2.12	2.35	2.60	2.86	3.26	3.60	3.94	5.37*	6.88*
	60	1.95	2.20	2.49	2.80	3.12	3.46	3.97	4.40	4.85	6.69*	8.62*
	80	2.15	2.47	2.83	3.21	3.61	4.01	4.62	5.15	5.68	7.90*	10.23*
	100	2.35	2.73	3.16	3.61	4.06	4.53	5.24	5.85	6.47	9.04*	11.73*
	120	2.53	2.98	3.47	3.98	4.50	5.02	5.83	6.52	7.22	10.12*	13.17*
	140	2.70	3.22	3.77	4.34	4.91	5.50	6.40	7.16	7.93	11.16*	14.55*
50	10	1.38	1.46	1.57	1.69	1.82	1.95	2.14	2.30	2.47	3.15*	3.86*
	20	1.61	1.72	1.87	2.03	2.19	2.36	2.61	2.83	3.06	4.01*	5.01*
	40	1.94	2.11	2.32	2.54	2.78	3.02	3.40	3.73	4.07	5.48*	6.97*
	60	2.19	2.42	2.69	2.98	3.29	3.61	4.10	4.53	4.96	6.78*	8.71*
	80	2.42	2.70	3.03	3.39	3.76	4.15	4.75	5.26	5.79	7.99*	10.31*
	100	2.62	2.96	3.35	3.77	4.21	4.66	5.36	5.96	6.57	9.12*	11.81*
	120	2.81	3.20	3.66	4.14	4.64	5.15	5.94	6.62	7.31	10.20*	13.24*
	140	2.98	3.44	3.95	4.49	5.05	5.62	6.51	7.26	8.03	11.23*	14.62*
100	10	1.57	1.65	1.77	1.90	2.03	2.16	2.36	2.53	2.70	3.38*	4.10*
	20	1.85	1.97	2.12	2.28	2.44	2.61	2.87	3.09	3.31	4.24*	5.23*
	40	2.24	2.41	2.61	2.84	3.07	3.30	3.67	3.98	4.31	5.68*	7.17*
	60	2.54	2.75	3.01	3.29	3.58	3.89	4.36	4.77	5.18	6.97*	8.89*
	80	2.79	3.05	3.37	3.70	4.05	4.42	4.99	5.49	6.00	8.16*	10.47*
	100	3.02	3.33	3.69	4.08	4.49	4.92	5.59	6.17	6.77	9.29*	11.97*
	120	3.22	3.58	3.99	4.44	4.91	5.40	6.17	6.83	7.50	10.36*	13.39*
	140	3.41	3.82	4.29	4.79	5.32	5.87	6.72	7.46	8.21	11.39*	14.76*
150	10	1.70	1.79	1.92	2.05	2.19	2.32	2.53	2.70	2.87	3.57*	4.31*
	20	2.02	2.14	2.30	2.47	2.64	2.81	3.07	3.30	3.52	4.45*	5.44*
	40	2.46	2.63	2.84	3.07	3.30	3.54	3.90	4.21	4.53	5.88*	7.36*
	60	2.79	3.01	3.27	3.54	3.83	4.13	4.59	4.99	5.40	7.16*	9.06*
	80	3.07	3.33	3.64	3.97	4.31	4.67	5.22	5.71	6.21	8.34*	10.64*
	100	3.32	3.62	3.97	4.35	4.75	5.17	5.82	6.38	6.97	9.45*	12.12*
	120	3.54	3.88	4.29	4.72	5.17	5.65	6.39	7.03	7.69	10.52*	13.54*
	140	3.75	4.13	4.58	5.06	5.57	6.10	6.93	7.65	8.40	11.54*	14.90*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.81	1.91	2.04	2.17	2.31	2.46	2.67	2.84	3.02	3.74*	4.49*
	20	2.17	2.29	2.45	2.62	2.80	2.98	3.25	3.47	3.70	4.64*	5.64*
	40	2.64	2.82	3.03	3.26	3.49	3.73	4.10	4.41	4.73	6.08*	7.54*
	60	3.00	3.22	3.48	3.76	4.05	4.35	4.81	5.20	5.60	7.34*	9.23*
	80	3.30	3.56	3.87	4.20	4.54	4.89	5.44	5.92	6.40	8.51*	10.80*
	100	3.56	3.86	4.22	4.59	4.99	5.40	6.04	6.59	7.16	9.62*	12.28*
	120	3.80	4.14	4.54	4.96	5.41	5.87	6.60	7.23	7.88	10.67*	13.69*
	140	4.02	4.40	4.84	5.31	5.81	6.33	7.14	7.85	8.58	11.69*	15.05*
300	10	1.99	2.09	2.23	2.37	2.52	2.67	2.89	3.08	3.26	4.01*	4.79*
	20	2.39	2.53	2.70	2.88	3.06	3.25	3.53	3.76	3.99	4.96*	5.99*
	40	2.94	3.12	3.34	3.58	3.82	4.07	4.44	4.76	5.08	6.43*	7.90*
	60	3.34	3.56	3.83	4.12	4.42	4.72	5.18	5.57	5.97	7.69*	9.57*
	80	3.67	3.94	4.25	4.59	4.93	5.28	5.83	6.30	6.78	8.85*	11.12*
	100	3.97	4.27	4.62	5.00	5.40	5.80	6.43	6.97	7.53	9.94*	12.58*
	120	4.23	4.57	4.97	5.39	5.83	6.29	7.00	7.61	8.24	10.98*	13.98*
	140	4.47	4.85	5.29	5.75	6.24	6.75	7.54	8.22	8.93	11.99*	15.33*
400	10	2.13	2.24	2.38	2.53	2.69	2.84	3.08	3.27	3.46	4.23*	5.05*
	20	2.58	2.72	2.89	3.08	3.28	3.47	3.76	4.00	4.24	5.23*	6.29*
	40	3.17	3.36	3.59	3.84	4.09	4.35	4.73	5.05	5.38	6.74*	8.23*
	60	3.61	3.84	4.12	4.42	4.72	5.03	5.50	5.89	6.30	8.01*	9.90*
	80	3.98	4.25	4.57	4.91	5.26	5.62	6.17	6.64	7.11	9.17*	11.43*
	100	4.30	4.60	4.97	5.35	5.75	6.15	6.78	7.32	7.87	10.25*	12.88*
	120	4.58	4.92	5.33	5.75	6.20	6.65	7.35	7.96	8.59	11.29*	14.27*
	140	4.84	5.22	5.66	6.13	6.62	7.12	7.90	8.58	9.27	12.29*	15.61*
600	10	2.36	2.48	2.63	2.79	2.96	3.13	3.37	3.58	3.78	4.60*	5.47*
	20	2.88	3.02	3.21	3.42	3.62	3.83	4.14	4.39	4.65	5.69*	6.80*
	40	3.56	3.76	4.00	4.27	4.53	4.80	5.20	5.54	5.88	7.29*	8.82*
	60	4.06	4.30	4.60	4.91	5.22	5.55	6.03	6.44	6.85	8.59*	10.50*
	80	4.47	4.75	5.09	5.45	5.81	6.18	6.74	7.22	7.70	9.76*	12.03*
	100	4.83	5.15	5.52	5.92	6.33	6.75	7.39	7.93	8.48	10.85*	13.47*
	120	5.15	5.50	5.92	6.36	6.81	7.27	7.98	8.59	9.21	11.88*	14.84*
	140	5.44	5.83	6.28	6.76	7.26	7.76	8.54	9.21	9.90	12.87*	16.16*
800	10	2.55	2.67	2.83	3.00	3.18	3.36	3.62	3.83	4.04	4.90*	5.81*
	20	3.12	3.27	3.47	3.69	3.91	4.12	4.45	4.71	4.98	6.07*	7.23*
	40	3.87	4.08	4.34	4.61	4.89	5.17	5.59	5.94	6.29	7.75*	9.33*
	60	4.42	4.67	4.98	5.31	5.64	5.97	6.48	6.90	7.32	9.10*	11.04*
	80	4.87	5.16	5.52	5.89	6.26	6.65	7.23	7.71	8.20	10.29*	12.59*
	100	5.26	5.59	5.98	6.40	6.82	7.25	7.90	8.45	9.01	11.39*	14.02*
	120	5.61	5.97	6.41	6.86	7.32	7.80	8.52	9.13	9.75	12.42*	15.39*
	140	5.93	6.33	6.79	7.29	7.79	8.31	9.10	9.77	10.45	13.41*	16.70*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.37	1.58	1.80	2.03	2.26	2.50	2.85	3.15	3.45	4.67*	5.92*
	20	1.69	2.01	2.33	2.66	2.99	3.33	3.83	4.26	4.69	6.47*	8.30*
	40	2.22	2.73	3.22	3.72	4.22	4.72	5.49	6.13	6.79	9.49*	12.30*
	60	2.69	3.36	4.00	4.65	5.29	5.95	6.94	7.78	8.63	12.14*	15.81*
	80	3.12	3.94	4.72	5.50	6.28	7.07	8.27	9.28	10.31	14.57*	19.04*
	100	3.53	4.48	5.40	6.30	7.21	8.13	9.52	10.70	11.89	16.85*	22.06*
	120	3.91	5.00	6.04	7.06	8.09	9.13	10.71	12.04	13.40	19.02*	24.94*
	140	4.28	5.50	6.65	7.79	8.94	10.09	11.85	13.33	14.84	21.11*	27.70*
25	10	1.79	1.93	2.11	2.31	2.52	2.73	3.06	3.34	3.63	4.82*	6.06*
	20	2.13	2.35	2.62	2.91	3.21	3.53	4.01	4.43	4.85	6.59*	8.42*
	40	2.65	3.03	3.47	3.93	4.41	4.89	5.64	6.27	6.92	9.59*	12.40*
	60	3.10	3.64	4.23	4.84	5.46	6.10	7.07	7.90	8.74	12.23*	15.90*
	80	3.51	4.20	4.93	5.68	6.44	7.21	8.40	9.40	10.42	14.66*	19.12*
	100	3.89	4.73	5.60	6.47	7.36	8.26	9.64	10.81	12.00	16.94*	22.14*
	120	4.26	5.24	6.23	7.23	8.23	9.26	10.82	12.15	13.50	19.10*	25.01*
	140	4.62	5.73	6.84	7.95	9.07	10.22	11.96	13.43	14.94	21.18*	27.77*
50	10	2.00	2.14	2.32	2.52	2.72	2.93	3.25	3.52	3.80	4.96*	6.20*
	20	2.39	2.60	2.85	3.13	3.42	3.72	4.18	4.58	4.99	6.72*	8.53*
	40	2.96	3.30	3.71	4.14	4.59	5.06	5.79	6.41	7.04	9.70*	12.50*
	60	3.43	3.90	4.45	5.03	5.63	6.25	7.21	8.02	8.86	12.33*	15.99*
	80	3.84	4.46	5.14	5.86	6.60	7.36	8.52	9.51	10.53	14.75*	19.20*
	100	4.23	4.98	5.79	6.64	7.51	8.40	9.76	10.92	12.10	17.02*	22.22*
	120	4.59	5.48	6.42	7.39	8.38	9.39	10.93	12.25	13.59	19.19*	25.09*
	140	4.94	5.96	7.02	8.10	9.21	10.34	12.07	13.53	15.03	21.26*	27.84*
100	10	2.29	2.43	2.62	2.82	3.02	3.23	3.55	3.82	4.10	5.24*	6.46*
	20	2.75	2.96	3.21	3.48	3.76	4.05	4.50	4.89	5.28	6.96*	8.76*
	40	3.41	3.73	4.10	4.51	4.94	5.38	6.08	6.68	7.29	9.91*	12.69*
	60	3.92	4.35	4.85	5.39	5.96	6.55	7.47	8.27	9.08	12.52*	16.17*
	80	4.37	4.91	5.53	6.20	6.91	7.64	8.77	9.74	10.74	14.92*	19.37*
	100	4.77	5.43	6.17	6.97	7.80	8.66	9.99	11.13	12.30	17.19*	22.37*
	120	5.15	5.92	6.79	7.71	8.66	9.64	11.16	12.46	13.79	19.35*	25.24*
	140	5.50	6.39	7.38	8.41	9.48	10.59	12.28	13.74	15.22	21.42*	27.98*
150	10	2.50	2.64	2.84	3.04	3.26	3.47	3.80	4.07	4.34	5.49*	6.71*
	20	3.02	3.22	3.48	3.76	4.04	4.33	4.78	5.16	5.55	7.20*	8.99*
	40	3.74	4.05	4.43	4.83	5.24	5.68	6.35	6.94	7.54	10.11*	12.89*
	60	4.30	4.71	5.20	5.72	6.27	6.84	7.74	8.51	9.31	12.71*	16.34*
	80	4.77	5.29	5.89	6.53	7.21	7.91	9.02	9.97	10.95	15.10*	19.53*
	100	5.20	5.82	6.53	7.29	8.09	8.93	10.23	11.35	12.50	17.36*	22.53*
	120	5.60	6.32	7.14	8.02	8.94	9.90	11.39	12.67	13.98	19.51*	25.38*
	140	5.97	6.79	7.72	8.71	9.75	10.83	12.50	13.94	15.40	21.57*	28.13*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.66	2.82	3.02	3.23	3.45	3.67	4.00	4.28	4.56	5.71*	6.95*
	20	3.23	3.44	3.71	3.99	4.27	4.57	5.02	5.40	5.78	7.43*	9.21*
	40	4.01	4.33	4.70	5.10	5.52	5.94	6.61	7.19	7.78	10.32*	13.08*
	60	4.61	5.02	5.50	6.01	6.55	7.11	7.99	8.75	9.53	12.89*	16.52*
	80	5.11	5.62	6.20	6.83	7.49	8.18	9.26	10.20	11.16	15.28*	19.69*
	100	5.56	6.16	6.85	7.59	8.37	9.18	10.46	11.56	12.70	17.52*	22.68*
	120	5.98	6.67	7.46	8.31	9.21	10.15	11.61	12.87	14.17	19.66*	25.53*
	140	6.36	7.15	8.05	9.01	10.02	11.07	12.72	14.13	15.59	21.72*	28.27*
300	10	2.94	3.10	3.31	3.53	3.76	3.99	4.33	4.62	4.91	6.10*	7.36*
	20	3.58	3.80	4.07	4.36	4.66	4.96	5.42	5.81	6.20	7.85*	9.64*
	40	4.46	4.78	5.16	5.56	5.98	6.41	7.07	7.64	8.22	10.72*	13.46*
	60	5.12	5.53	6.01	6.52	7.05	7.60	8.46	9.20	9.96	13.26*	16.87*
	80	5.67	6.17	6.75	7.36	8.01	8.68	9.72	10.63	11.57	15.62*	20.02*
	100	6.16	6.75	7.42	8.13	8.89	9.68	10.91	11.99	13.10	17.85*	22.99*
	120	6.61	7.28	8.04	8.86	9.73	10.63	12.05	13.28	14.55	19.98*	25.83*
	140	7.02	7.78	8.64	9.56	10.53	11.55	13.14	14.53	15.95	22.03*	28.56*
400	10	3.16	3.32	3.54	3.78	4.01	4.25	4.61	4.91	5.20	6.42*	7.72*
	20	3.86	4.09	4.37	4.68	4.98	5.29	5.76	6.16	6.55	8.22*	10.03*
	40	4.82	5.14	5.54	5.95	6.37	6.81	7.47	8.04	8.62	11.10*	13.84*
	60	5.54	5.95	6.43	6.95	7.49	8.03	8.89	9.62	10.37	13.63*	17.21*
	80	6.13	6.63	7.21	7.82	8.46	9.12	10.16	11.05	11.97	15.97*	20.34*
	100	6.66	7.24	7.90	8.62	9.36	10.13	11.34	12.39	13.48	18.18*	23.30*
	120	7.13	7.79	8.55	9.36	10.20	11.09	12.47	13.68	14.93	20.30*	26.12*
	140	7.57	8.31	9.16	10.06	11.01	12.00	13.56	14.91	16.32	22.33*	28.84*
600	10	3.51	3.69	3.92	4.17	4.43	4.68	5.06	5.37	5.69	6.97*	8.33*
	20	4.32	4.56	4.86	5.18	5.51	5.84	6.33	6.74	7.15	8.87*	10.72*
	40	5.41	5.74	6.15	6.59	7.03	7.48	8.16	8.74	9.32	11.81*	14.55*
	60	6.21	6.64	7.14	7.67	8.22	8.77	9.63	10.36	11.11	14.33*	17.89*
	80	6.88	7.38	7.98	8.60	9.25	9.91	10.93	11.81	12.72	16.64*	20.99*
	100	7.47	8.05	8.72	9.44	10.18	10.94	12.13	13.16	14.22	18.83*	23.91*
	120	7.99	8.65	9.40	10.21	11.05	11.91	13.27	14.44	15.65	20.92*	26.71*
	140	8.48	9.21	10.04	10.93	11.87	12.83	14.35	15.66	17.03	22.94*	29.41*
800	10	3.79	3.99	4.23	4.50	4.76	5.03	5.43	5.76	6.08	7.42*	8.84*
	20	4.69	4.94	5.26	5.60	5.94	6.28	6.79	7.22	7.64	9.42*	11.33*
	40	5.88	6.23	6.66	7.11	7.57	8.03	8.73	9.32	9.92	12.44*	15.21*
	60	6.76	7.20	7.72	8.27	8.83	9.40	10.27	11.01	11.76	14.98*	18.54*
	80	7.49	8.00	8.61	9.25	9.91	10.58	11.61	12.49	13.39	17.29*	21.61*
	100	8.12	8.71	9.40	10.13	10.88	11.65	12.84	13.86	14.90	19.46*	24.52*
	120	8.69	9.36	10.12	10.93	11.78	12.64	13.98	15.14	16.33	21.53*	27.29*
	140	9.21	9.95	10.79	11.69	12.62	13.58	15.07	16.37	17.71	23.53*	29.97*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.13	2.51	2.91	3.31	3.71	4.12	4.74	5.27	5.79	7.96*	10.19*
	20	2.76	3.37	3.97	4.57	5.17	5.78	6.71	7.49	8.29	11.55*	14.95*
	40	3.83	4.81	5.75	6.69	7.63	8.57	10.02	11.24	12.47	17.59*	22.95*
	60	4.77	6.07	7.31	8.54	9.78	11.02	12.92	14.52	16.15	22.89*	29.97*
	80	5.63	7.23	8.75	10.25	11.75	13.27	15.58	17.53	19.52	27.75*	36.42*
	100	6.44	8.32	10.10	11.85	13.61	15.38	18.08	20.36	22.69	32.32*	42.47*
	120	7.20	9.36	11.38	13.37	15.37	17.39	20.45	23.05	25.70	36.66*	48.22*
	140	7.94	10.35	12.61	14.83	17.06	19.31	22.73	25.63	28.58	40.83*	53.74*
25	10	2.65	2.92	3.25	3.60	3.98	4.36	4.95	5.46	5.97	8.10*	10.33*
	20	3.27	3.73	4.26	4.82	5.40	5.99	6.89	7.66	8.44	11.67*	15.06*
	40	4.29	5.12	6.00	6.90	7.81	8.75	10.17	11.37	12.60	17.70*	23.05*
	60	5.19	6.36	7.54	8.74	9.95	11.18	13.05	14.64	16.26	22.98*	30.06*
	80	6.02	7.50	8.96	10.43	11.91	13.41	15.70	17.65	19.63	27.84*	36.50*
	100	6.81	8.57	10.30	12.02	13.76	15.52	18.20	20.47	22.79	32.41*	42.55*
	120	7.56	9.60	11.57	13.53	15.51	17.52	20.57	23.16	25.79	36.74*	48.30*
	140	8.28	10.58	12.79	14.99	17.20	19.44	22.84	25.74	28.68	40.91*	53.81*
50	10	2.96	3.22	3.53	3.87	4.22	4.59	5.16	5.65	6.15	8.25*	10.46*
	20	3.64	4.05	4.54	5.06	5.61	6.18	7.06	7.82	8.59	11.80*	15.18*
	40	4.69	5.42	6.25	7.11	8.00	8.91	10.32	11.51	12.73	17.80*	23.15*
	60	5.58	6.64	7.76	8.93	10.12	11.33	13.19	14.77	16.38	23.08*	30.15*
	80	6.40	7.76	9.17	10.61	12.07	13.56	15.83	17.77	19.73	27.93*	36.58*
	100	7.17	8.82	10.50	12.19	13.91	15.65	18.32	20.58	22.89	32.49*	42.62*
	120	7.91	9.84	11.76	13.70	15.66	17.65	20.68	23.26	25.89	36.83*	48.37*
	140	8.62	10.81	12.97	15.14	17.34	19.56	22.95	25.84	28.77	40.98*	53.88*
100	10	3.39	3.64	3.95	4.28	4.63	4.99	5.54	6.01	6.49	8.54*	10.74*
	20	4.17	4.55	5.01	5.51	6.03	6.57	7.41	8.14	8.89	12.05*	15.41*
	40	5.31	5.96	6.71	7.52	8.37	9.25	10.61	11.78	12.98	18.01*	23.35*
	60	6.24	7.16	8.20	9.31	10.45	11.63	13.46	15.02	16.61	23.27*	30.33*
	80	7.07	8.27	9.58	10.96	12.38	13.84	16.08	18.00	19.95	28.11*	36.75*
	100	7.84	9.31	10.89	12.53	14.21	15.92	18.56	20.80	23.09	32.66*	42.78*
	120	8.56	10.31	12.14	14.02	15.94	17.90	20.91	23.47	26.08	36.99*	48.52*
	140	9.26	11.27	13.34	15.46	17.61	19.81	23.17	26.04	28.96	41.14*	54.03*
150	10	3.71	3.96	4.27	4.61	4.96	5.32	5.86	6.33	6.81	8.83*	11.01*
	20	4.57	4.94	5.40	5.88	6.39	6.92	7.74	8.45	9.18	12.29*	15.64*
	40	5.80	6.41	7.13	7.91	8.73	9.58	10.91	12.06	13.23	18.22*	23.54*
	60	6.77	7.64	8.62	9.68	10.79	11.94	13.72	15.26	16.84	23.46*	30.50*
	80	7.63	8.74	9.99	11.31	12.70	14.12	16.33	18.23	20.16	28.29*	36.91*
	100	8.42	9.77	11.28	12.86	14.50	16.19	18.79	21.02	23.29	32.83*	42.94*
	120	9.15	10.76	12.51	14.34	16.23	18.16	21.14	23.68	26.28	37.15*	48.67*
	140	9.85	11.71	13.70	15.76	17.89	20.06	23.39	26.24	29.14	41.29*	54.17*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	3.96	4.22	4.54	4.88	5.24	5.60	6.15	6.62	7.09	9.10*	11.27*
	20	4.89	5.27	5.72	6.21	6.71	7.24	8.04	8.74	9.46	12.54*	15.87*
	40	6.20	6.80	7.51	8.27	9.06	9.89	11.19	12.32	13.48	18.43*	23.74*
	60	7.23	8.06	9.01	10.03	11.11	12.23	13.99	15.51	17.06	23.65*	30.68*
	80	8.12	9.17	10.37	11.65	13.00	14.40	16.58	18.46	20.38	28.46*	37.08*
	100	8.92	10.21	11.65	13.19	14.80	16.46	19.03	21.24	23.50	32.99*	43.09*
	120	9.68	11.19	12.88	14.66	16.51	18.42	21.36	23.89	26.47	37.31*	48.82*
	140	10.39	12.14	14.06	16.07	18.16	20.30	23.61	26.44	29.33	41.45*	54.31*
300	10	4.38	4.64	4.98	5.33	5.70	6.07	6.63	7.11	7.58	9.60*	11.78*
	20	5.42	5.80	6.27	6.76	7.27	7.79	8.59	9.28	9.99	13.01*	16.33*
	40	6.87	7.46	8.16	8.90	9.68	10.48	11.75	12.84	13.98	18.84*	24.12*
	60	7.98	8.78	9.70	10.68	11.72	12.81	14.51	15.99	17.52	24.03*	31.03*
	80	8.93	9.93	11.08	12.31	13.60	14.95	17.07	18.91	20.80	28.82*	37.41*
	100	9.79	10.99	12.36	13.83	15.37	16.98	19.50	21.67	23.90	33.33*	43.40*
	120	10.58	11.99	13.58	15.28	17.07	18.92	21.81	24.30	26.86	37.63*	49.12*
	140	11.31	12.94	14.74	16.68	18.70	20.79	24.04	26.84	29.70	41.75*	54.60*
400	10	4.71	4.99	5.34	5.70	6.08	6.46	7.04	7.52	8.01	10.04*	12.24*
	20	5.85	6.24	6.72	7.22	7.74	8.26	9.07	9.76	10.46	13.47*	16.77*
	40	7.41	8.01	8.70	9.45	10.22	11.02	12.26	13.34	14.45	19.25*	24.51*
	60	8.60	9.39	10.30	11.27	12.29	13.35	15.02	16.46	17.96	24.40*	31.38*
	80	9.61	10.59	11.71	12.91	14.17	15.49	17.56	19.36	21.22	29.17*	37.73*
	100	10.51	11.68	13.00	14.43	15.93	17.50	19.96	22.10	24.30	33.66*	43.71*
	120	11.34	12.69	14.23	15.87	17.61	19.42	22.26	24.71	27.24	37.94*	49.41*
	140	12.11	13.65	15.39	17.26	19.23	21.28	24.47	27.24	30.07	42.06*	54.89*
600	10	5.26	5.55	5.92	6.31	6.71	7.11	7.71	8.21	8.71	10.81*	13.07*
	20	6.55	6.95	7.45	7.98	8.51	9.06	9.89	10.59	11.29	14.31*	17.62*
	40	8.30	8.91	9.62	10.37	11.15	11.95	13.18	14.25	15.33	20.06*	25.27*
	60	9.62	10.41	11.32	12.28	13.29	14.33	15.96	17.37	18.82	25.14*	32.08*
	80	10.73	11.69	12.79	13.97	15.20	16.48	18.49	20.23	22.04	29.86*	38.39*
	100	11.71	12.85	14.14	15.52	16.97	18.48	20.87	22.94	25.09	34.32*	44.33*
	120	12.61	13.91	15.39	16.97	18.64	20.39	23.14	25.53	28.00	38.58*	50.01*
	140	13.43	14.91	16.57	18.36	20.25	22.22	25.33	28.02	30.80	42.67*	55.46*
800	10	5.69	6.00	6.39	6.80	7.22	7.63	8.26	8.78	9.30	11.46*	13.79*
	20	7.11	7.54	8.05	8.60	9.16	9.72	10.57	11.28	12.01	15.06*	18.40*
	40	9.02	9.64	10.37	11.14	11.94	12.75	13.99	15.05	16.14	20.82*	26.02*
	60	10.46	11.25	12.17	13.15	14.16	15.20	16.81	18.20	19.64	25.87*	32.77*
	80	11.65	12.61	13.72	14.89	16.11	17.38	19.35	21.07	22.84	30.55*	39.04*
	100	12.70	13.83	15.11	16.48	17.91	19.40	21.73	23.76	25.86	34.98*	44.95*
	120	13.65	14.94	16.40	17.96	19.59	21.30	23.99	26.33	28.75	39.21*	50.60*
	140	14.53	15.98	17.61	19.36	21.20	23.13	26.16	28.80	31.53	43.28*	56.03*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.68	0.75	0.82	0.91	0.99	1.08	1.21	1.32	1.43	1.87*	2.31*
	20	0.77	0.86	0.97	1.07	1.19	1.30	1.47	1.61	1.75	2.33*	2.92*
	40	0.91	1.05	1.20	1.35	1.51	1.66	1.90	2.09	2.29	3.10*	3.94*
	60	1.04	1.22	1.41	1.60	1.79	1.98	2.27	2.52	2.77	3.79*	4.84*
	80	1.16	1.38	1.60	1.82	2.05	2.28	2.62	2.91	3.21	4.41*	5.66*
	100	1.26	1.52	1.78	2.04	2.29	2.55	2.95	3.28	3.62	5.00*	6.43*
	120	1.37	1.66	1.95	2.24	2.53	2.82	3.26	3.63	4.01	5.55*	7.17*
	140	1.47	1.79	2.11	2.43	2.75	3.07	3.55	3.96	4.38	6.09*	7.87*
25	10	0.92	0.97	1.04	1.11	1.19	1.27	1.39	1.49	1.60	2.01*	2.44*
	20	1.05	1.11	1.19	1.29	1.38	1.48	1.64	1.77	1.90	2.45*	3.03*
	40	1.22	1.31	1.43	1.56	1.69	1.83	2.05	2.23	2.42	3.21*	4.04*
	60	1.36	1.48	1.63	1.79	1.96	2.14	2.41	2.65	2.89	3.88*	4.92*
	80	1.48	1.63	1.81	2.01	2.21	2.42	2.75	3.03	3.32	4.50*	5.74*
	100	1.59	1.77	1.98	2.21	2.45	2.69	3.07	3.39	3.72	5.08*	6.51*
	120	1.69	1.90	2.14	2.40	2.67	2.95	3.37	3.74	4.10	5.63*	7.24*
	140	1.78	2.02	2.30	2.59	2.89	3.20	3.67	4.07	4.47	6.17*	7.94*
50	10	1.02	1.07	1.14	1.22	1.30	1.38	1.51	1.61	1.71	2.13*	2.57*
	20	1.18	1.24	1.32	1.42	1.52	1.62	1.77	1.90	2.03	2.57*	3.14*
	40	1.38	1.47	1.59	1.71	1.84	1.98	2.19	2.36	2.55	3.31*	4.13*
	60	1.54	1.65	1.80	1.95	2.11	2.28	2.54	2.77	3.00	3.97*	5.01*
	80	1.68	1.81	1.98	2.17	2.36	2.56	2.88	3.15	3.42	4.59*	5.82*
	100	1.80	1.96	2.15	2.37	2.59	2.83	3.19	3.50	3.82	5.16*	6.59*
	120	1.91	2.09	2.32	2.56	2.81	3.08	3.49	3.84	4.20	5.71*	7.32*
	140	2.01	2.22	2.47	2.74	3.03	3.32	3.78	4.17	4.57	6.24*	8.02*
100	10	1.15	1.20	1.28	1.36	1.45	1.53	1.66	1.77	1.88	2.31*	2.76*
	20	1.34	1.41	1.50	1.60	1.70	1.81	1.96	2.10	2.23	2.77*	3.35*
	40	1.60	1.69	1.80	1.93	2.07	2.20	2.41	2.59	2.76	3.51*	4.32*
	60	1.79	1.90	2.04	2.20	2.36	2.52	2.78	2.99	3.22	4.16*	5.19*
	80	1.95	2.08	2.25	2.42	2.61	2.81	3.11	3.37	3.63	4.76*	5.99*
	100	2.09	2.24	2.43	2.63	2.85	3.07	3.42	3.72	4.02	5.33*	6.74*
	120	2.21	2.39	2.60	2.83	3.07	3.32	3.71	4.05	4.40	5.87*	7.46*
	140	2.33	2.53	2.76	3.01	3.28	3.56	3.99	4.37	4.76	6.40*	8.16*
150	10	1.25	1.30	1.38	1.47	1.56	1.65	1.78	1.89	2.01	2.45*	2.91*
	20	1.46	1.53	1.63	1.73	1.84	1.95	2.11	2.25	2.38	2.93*	3.53*
	40	1.75	1.84	1.97	2.10	2.24	2.37	2.59	2.76	2.94	3.69*	4.50*
	60	1.97	2.08	2.23	2.38	2.55	2.71	2.97	3.19	3.41	4.33*	5.36*
	80	2.14	2.28	2.45	2.63	2.82	3.01	3.31	3.56	3.82	4.93*	6.15*
	100	2.30	2.45	2.64	2.85	3.06	3.28	3.62	3.91	4.21	5.49*	6.90*
	120	2.44	2.61	2.82	3.05	3.29	3.53	3.92	4.24	4.58	6.03*	7.61*
	140	2.57	2.76	2.99	3.24	3.50	3.77	4.20	4.56	4.94	6.55*	8.30*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.32	1.38	1.46	1.55	1.64	1.74	1.88	1.99	2.11	2.56*	3.04*
	20	1.56	1.63	1.73	1.84	1.95	2.06	2.23	2.37	2.51	3.07*	3.68*
	40	1.88	1.97	2.10	2.24	2.38	2.52	2.74	2.92	3.10	3.85*	4.67*
	60	2.11	2.23	2.38	2.54	2.71	2.88	3.13	3.35	3.57	4.50*	5.52*
	80	2.30	2.44	2.61	2.80	2.99	3.18	3.48	3.74	4.00	5.09*	6.30*
	100	2.47	2.63	2.82	3.03	3.24	3.46	3.80	4.09	4.39	5.65*	7.05*
	120	2.62	2.80	3.01	3.24	3.48	3.72	4.10	4.43	4.76	6.18*	7.76*
	140	2.76	2.95	3.19	3.44	3.70	3.97	4.38	4.74	5.11	6.70*	8.44*
300	10	1.45	1.50	1.59	1.69	1.78	1.88	2.03	2.15	2.27	2.75*	3.26*
	20	1.72	1.79	1.90	2.01	2.13	2.25	2.43	2.57	2.72	3.30*	3.94*
	40	2.08	2.18	2.31	2.46	2.61	2.76	2.98	3.17	3.36	4.12*	4.96*
	60	2.35	2.47	2.62	2.79	2.97	3.14	3.41	3.63	3.86	4.79*	5.82*
	80	2.56	2.71	2.88	3.08	3.27	3.47	3.78	4.04	4.30	5.39*	6.61*
	100	2.75	2.91	3.11	3.33	3.55	3.77	4.11	4.41	4.70	5.95*	7.34*
	120	2.93	3.10	3.32	3.56	3.80	4.04	4.42	4.75	5.08	6.48*	8.04*
	140	3.08	3.27	3.51	3.77	4.03	4.30	4.72	5.07	5.44	6.99*	8.72*
400	10	1.54	1.61	1.70	1.80	1.90	2.00	2.16	2.28	2.41	2.90*	3.43*
	20	1.85	1.92	2.04	2.15	2.28	2.40	2.59	2.74	2.89	3.50*	4.15*
	40	2.24	2.35	2.49	2.64	2.79	2.95	3.18	3.38	3.57	4.36*	5.22*
	60	2.54	2.66	2.83	3.00	3.18	3.36	3.64	3.87	4.10	5.05*	6.10*
	80	2.78	2.92	3.11	3.31	3.51	3.72	4.03	4.29	4.56	5.66*	6.88*
	100	2.98	3.15	3.35	3.57	3.80	4.03	4.38	4.68	4.97	6.22*	7.62*
	120	3.17	3.35	3.58	3.82	4.06	4.32	4.70	5.03	5.36	6.75*	8.32*
	140	3.34	3.54	3.78	4.04	4.31	4.58	5.00	5.36	5.72	7.26*	8.99*
600	10	1.70	1.77	1.87	1.97	2.08	2.19	2.36	2.49	2.63	3.15*	3.72*
	20	2.05	2.14	2.25	2.38	2.52	2.65	2.85	3.01	3.17	3.81*	4.51*
	40	2.51	2.62	2.77	2.93	3.10	3.26	3.51	3.72	3.92	4.75*	5.65*
	60	2.84	2.98	3.15	3.34	3.53	3.73	4.02	4.26	4.50	5.48*	6.57*
	80	3.12	3.27	3.47	3.68	3.90	4.11	4.44	4.72	4.99	6.12*	7.38*
	100	3.35	3.53	3.75	3.98	4.22	4.46	4.82	5.13	5.44	6.70*	8.13*
	120	3.57	3.75	3.99	4.25	4.50	4.77	5.17	5.50	5.84	7.24*	8.83*
	140	3.76	3.96	4.22	4.49	4.77	5.06	5.49	5.85	6.22	7.76*	9.50*
800	10	1.83	1.90	2.01	2.12	2.23	2.35	2.52	2.66	2.80	3.35*	3.95*
	20	2.22	2.31	2.43	2.57	2.71	2.85	3.06	3.23	3.40	4.07*	4.80*
	40	2.72	2.84	3.00	3.17	3.35	3.52	3.78	4.00	4.21	5.07*	6.02*
	60	3.09	3.23	3.42	3.62	3.82	4.02	4.33	4.58	4.83	5.85*	6.98*
	80	3.39	3.56	3.76	3.99	4.21	4.44	4.78	5.07	5.36	6.51*	7.81*
	100	3.65	3.83	4.06	4.31	4.56	4.81	5.19	5.50	5.82	7.12*	8.58*
	120	3.89	4.08	4.33	4.60	4.87	5.14	5.55	5.90	6.25	7.67*	9.29*
	140	4.10	4.31	4.58	4.86	5.15	5.45	5.89	6.27	6.64	8.20*	9.96*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.99	1.10	1.23	1.36	1.50	1.64	1.85	2.03	2.21	2.92*	3.65*
	20	1.16	1.33	1.51	1.70	1.89	2.08	2.36	2.61	2.85	3.85*	4.87*
	40	1.45	1.71	1.98	2.26	2.53	2.81	3.23	3.58	3.94	5.40*	6.92*
	60	1.70	2.05	2.40	2.75	3.10	3.45	3.98	4.43	4.89	6.76*	8.71*
	80	1.93	2.36	2.78	3.20	3.62	4.04	4.68	5.21	5.76	8.01*	10.36*
	100	2.15	2.65	3.14	3.62	4.10	4.59	5.33	5.95	6.58	9.18*	11.90*
	120	2.36	2.93	3.48	4.02	4.57	5.11	5.95	6.65	7.36	10.30*	13.37*
	140	2.56	3.19	3.80	4.41	5.01	5.62	6.54	7.32	8.11	11.37*	14.78*
25	10	1.32	1.39	1.50	1.62	1.74	1.86	2.06	2.22	2.39	3.07*	3.79*
	20	1.53	1.64	1.78	1.94	2.11	2.28	2.54	2.77	3.01	3.97*	4.99*
	40	1.83	2.01	2.23	2.47	2.72	2.98	3.38	3.72	4.07	5.51*	7.01*
	60	2.08	2.33	2.63	2.94	3.27	3.61	4.12	4.56	5.01	6.86*	8.80*
	80	2.30	2.63	2.99	3.38	3.78	4.18	4.80	5.33	5.87	8.10*	10.44*
	100	2.51	2.91	3.34	3.79	4.26	4.73	5.45	6.06	6.69	9.27*	11.98*
	120	2.71	3.17	3.67	4.19	4.71	5.25	6.06	6.76	7.46	10.38*	13.45*
	140	2.90	3.43	3.99	4.57	5.15	5.75	6.65	7.42	8.20	11.45*	14.85*
50	10	1.47	1.55	1.65	1.77	1.90	2.02	2.21	2.38	2.54	3.21*	3.92*
	20	1.72	1.82	1.97	2.12	2.28	2.45	2.71	2.93	3.15	4.09*	5.10*
	40	2.07	2.23	2.44	2.66	2.90	3.15	3.53	3.86	4.20	5.61*	7.11*
	60	2.34	2.56	2.84	3.13	3.44	3.76	4.26	4.69	5.12	6.95*	8.89*
	80	2.58	2.86	3.20	3.56	3.94	4.33	4.93	5.45	5.98	8.19*	10.52*
	100	2.80	3.14	3.54	3.96	4.41	4.87	5.57	6.17	6.79	9.35*	12.06*
	120	3.00	3.40	3.86	4.35	4.86	5.38	6.18	6.86	7.56	10.46*	13.52*
	140	3.19	3.66	4.18	4.73	5.29	5.87	6.76	7.52	8.30	11.52*	14.93*
100	10	1.67	1.75	1.86	1.99	2.12	2.25	2.45	2.61	2.78	3.45*	4.17*
	20	1.97	2.08	2.23	2.38	2.55	2.72	2.97	3.19	3.41	4.33*	5.33*
	40	2.39	2.55	2.75	2.97	3.20	3.44	3.80	4.12	4.44	5.82*	7.30*
	60	2.70	2.91	3.17	3.45	3.74	4.05	4.52	4.93	5.35	7.14*	9.06*
	80	2.97	3.23	3.55	3.88	4.24	4.61	5.18	5.68	6.20	8.36*	10.69*
	100	3.21	3.52	3.89	4.28	4.70	5.13	5.81	6.40	6.99	9.52*	12.21*
	120	3.43	3.79	4.21	4.67	5.14	5.64	6.41	7.07	7.76	10.62*	13.67*
	140	3.64	4.05	4.52	5.03	5.57	6.12	6.99	7.73	8.49	11.68*	15.07*
150	10	1.81	1.90	2.01	2.14	2.28	2.41	2.62	2.79	2.96	3.64*	4.38*
	20	2.16	2.27	2.42	2.58	2.75	2.92	3.18	3.40	3.63	4.54*	5.54*
	40	2.62	2.78	2.99	3.21	3.44	3.68	4.04	4.35	4.67	6.02*	7.50*
	60	2.97	3.18	3.44	3.71	4.00	4.30	4.76	5.16	5.58	7.32*	9.24*
	80	3.27	3.52	3.83	4.16	4.50	4.86	5.42	5.91	6.41	8.54*	10.85*
	100	3.53	3.83	4.18	4.57	4.97	5.39	6.04	6.61	7.20	9.68*	12.37*
	120	3.77	4.11	4.52	4.95	5.41	5.89	6.64	7.28	7.95	10.78*	13.82*
	140	3.99	4.38	4.83	5.32	5.83	6.37	7.21	7.93	8.68	11.83*	15.21*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.93	2.01	2.14	2.27	2.41	2.55	2.76	2.94	3.11	3.81*	4.56*
	20	2.30	2.42	2.58	2.74	2.92	3.09	3.36	3.58	3.81	4.73*	5.74*
	40	2.81	2.98	3.19	3.41	3.65	3.89	4.25	4.56	4.88	6.21*	7.68*
	60	3.19	3.40	3.66	3.94	4.23	4.53	4.99	5.38	5.78	7.51*	9.41*
	80	3.51	3.76	4.07	4.40	4.74	5.10	5.65	6.12	6.61	8.71*	11.01*
	100	3.79	4.09	4.44	4.82	5.21	5.62	6.27	6.82	7.40	9.85*	12.52*
	120	4.05	4.38	4.78	5.21	5.65	6.12	6.85	7.49	8.14	10.93*	13.97*
	140	4.28	4.66	5.10	5.58	6.08	6.60	7.42	8.13	8.86	11.98*	15.35*
300	10	2.12	2.21	2.34	2.48	2.63	2.77	2.99	3.18	3.36	4.08*	4.87*
	20	2.55	2.67	2.83	3.01	3.19	3.38	3.65	3.88	4.12	5.06*	6.09*
	40	3.12	3.29	3.51	3.75	3.99	4.23	4.60	4.92	5.24	6.56*	8.04*
	60	3.55	3.76	4.03	4.31	4.61	4.91	5.37	5.76	6.16	7.86*	9.75*
	80	3.91	4.16	4.47	4.80	5.15	5.50	6.05	6.52	7.00	9.05*	11.33*
	100	4.22	4.51	4.87	5.24	5.64	6.04	6.67	7.22	7.78	10.17*	12.83*
	120	4.50	4.83	5.23	5.65	6.09	6.55	7.26	7.88	8.52	11.25*	14.26*
	140	4.76	5.13	5.56	6.03	6.52	7.03	7.83	8.52	9.23	12.28*	15.64*
400	10	2.27	2.36	2.50	2.65	2.80	2.96	3.19	3.38	3.56	4.31*	5.12*
	20	2.74	2.87	3.04	3.23	3.41	3.61	3.89	4.13	4.37	5.33*	6.39*
	40	3.37	3.55	3.78	4.02	4.27	4.52	4.90	5.22	5.55	6.88*	8.37*
	60	3.84	4.06	4.33	4.63	4.93	5.23	5.70	6.10	6.50	8.18*	10.08*
	80	4.23	4.49	4.80	5.14	5.49	5.85	6.40	6.87	7.35	9.37*	11.65*
	100	4.57	4.86	5.22	5.60	6.00	6.41	7.04	7.58	8.13	10.49*	13.13*
	120	4.87	5.20	5.60	6.03	6.47	6.93	7.63	8.24	8.87	11.55*	14.55*
	140	5.15	5.52	5.96	6.42	6.91	7.42	8.20	8.88	9.58	12.58*	15.92*
600	10	2.51	2.61	2.76	2.92	3.08	3.25	3.49	3.70	3.90	4.69*	5.55*
	20	3.06	3.19	3.38	3.57	3.78	3.98	4.29	4.54	4.79	5.80*	6.91*
	40	3.78	3.97	4.21	4.46	4.73	4.99	5.39	5.73	6.06	7.43*	8.96*
	60	4.31	4.54	4.83	5.14	5.45	5.77	6.25	6.66	7.07	8.77*	10.68*
	80	4.75	5.02	5.35	5.70	6.06	6.43	6.99	7.47	7.95	9.97*	12.25*
	100	5.13	5.44	5.81	6.20	6.61	7.03	7.66	8.20	8.76	11.08*	13.72*
	120	5.47	5.81	6.22	6.66	7.11	7.57	8.28	8.89	9.51	12.14*	15.12*
	140	5.78	6.16	6.61	7.08	7.58	8.08	8.86	9.53	10.22	13.16*	16.47*
800	10	2.71	2.82	2.97	3.14	3.31	3.49	3.74	3.96	4.17	4.99*	5.90*
	20	3.31	3.45	3.65	3.86	4.07	4.29	4.61	4.87	5.13	6.18*	7.34*
	40	4.11	4.30	4.56	4.83	5.10	5.38	5.80	6.15	6.49	7.90*	9.48*
	60	4.69	4.93	5.23	5.55	5.88	6.21	6.71	7.13	7.55	9.28*	11.23*
	80	5.17	5.45	5.80	6.16	6.54	6.92	7.49	7.98	8.47	10.50*	12.81*
	100	5.59	5.90	6.29	6.70	7.12	7.54	8.19	8.74	9.30	11.63*	14.27*
	120	5.96	6.31	6.73	7.18	7.64	8.12	8.84	9.45	10.07	12.69*	15.67*
	140	6.30	6.68	7.14	7.63	8.13	8.65	9.44	10.11	10.80	13.71*	17.01*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.47	1.68	1.90	2.13	2.37	2.60	2.96	3.25	3.56	4.78*	6.03*
	20	1.82	2.14	2.47	2.80	3.13	3.47	3.98	4.41	4.85	6.63*	8.47*
	40	2.39	2.91	3.41	3.92	4.42	4.93	5.70	6.36	7.02	9.73*	12.56*
	60	2.90	3.58	4.24	4.90	5.55	6.21	7.21	8.06	8.92	12.45*	16.15*
	80	3.36	4.20	5.00	5.80	6.59	7.39	8.60	9.63	10.66	14.95*	19.44*
	100	3.80	4.79	5.72	6.64	7.57	8.49	9.90	11.10	12.30	17.30*	22.53*
	120	4.21	5.34	6.40	7.45	8.49	9.54	11.14	12.49	13.86	19.53*	25.47*
	140	4.61	5.87	7.05	8.22	9.38	10.55	12.33	13.83	15.36	21.67*	28.29*
25	10	1.91	2.05	2.22	2.42	2.63	2.84	3.17	3.45	3.74	4.93*	6.17*
	20	2.27	2.49	2.76	3.05	3.36	3.68	4.16	4.58	5.00	6.75*	8.58*
	40	2.83	3.22	3.67	4.13	4.61	5.11	5.86	6.50	7.15	9.84*	12.66*
	60	3.32	3.87	4.47	5.09	5.73	6.37	7.35	8.19	9.04	12.55*	16.23*
	80	3.76	4.47	5.22	5.98	6.75	7.54	8.73	9.74	10.77	15.04*	19.52*
	100	4.17	5.04	5.93	6.82	7.72	8.63	10.03	11.21	12.41	17.38*	22.61*
	120	4.57	5.59	6.60	7.61	8.64	9.68	11.26	12.60	13.96	19.61*	25.55*
	140	4.96	6.11	7.24	8.38	9.52	10.68	12.44	13.94	15.45	21.74*	28.37*
50	10	2.14	2.27	2.44	2.64	2.84	3.05	3.36	3.64	3.91	5.07*	6.31*
	20	2.55	2.75	3.01	3.28	3.57	3.87	4.34	4.74	5.15	6.88*	8.70*
	40	3.16	3.50	3.91	4.35	4.80	5.28	6.01	6.64	7.28	9.94*	12.76*
	60	3.66	4.15	4.70	5.29	5.90	6.53	7.49	8.32	9.15	12.64*	16.32*
	80	4.11	4.74	5.43	6.16	6.92	7.68	8.86	9.86	10.88	15.13*	19.61*
	100	4.52	5.29	6.13	6.99	7.87	8.77	10.15	11.32	12.51	17.47*	22.69*
	120	4.91	5.83	6.79	7.78	8.79	9.81	11.38	12.71	14.06	19.69*	25.62*
	140	5.29	6.34	7.43	8.54	9.66	10.81	12.56	14.04	15.55	21.82*	28.44*
100	10	2.44	2.57	2.75	2.95	3.15	3.36	3.68	3.95	4.22	5.35*	6.58*
	20	2.93	3.13	3.38	3.65	3.93	4.22	4.67	5.05	5.45	7.12*	8.93*
	40	3.63	3.94	4.32	4.73	5.16	5.61	6.31	6.91	7.53	10.15*	12.95*
	60	4.18	4.61	5.12	5.66	6.24	6.83	7.77	8.57	9.39	12.83*	16.50*
	80	4.66	5.21	5.84	6.52	7.23	7.97	9.12	10.10	11.10	15.31*	19.77*
	100	5.09	5.76	6.52	7.33	8.18	9.05	10.39	11.54	12.72	17.63*	22.85*
	120	5.49	6.29	7.17	8.11	9.08	10.07	11.61	12.92	14.26	19.85*	25.77*
	140	5.88	6.79	7.80	8.86	9.95	11.06	12.78	14.25	15.74	21.98*	28.58*
150	10	2.66	2.80	2.98	3.19	3.39	3.61	3.93	4.20	4.48	5.60*	6.83*
	20	3.21	3.41	3.66	3.93	4.22	4.51	4.95	5.33	5.72	7.36*	9.16*
	40	3.98	4.29	4.66	5.06	5.48	5.91	6.59	7.18	7.79	10.36*	13.14*
	60	4.58	4.99	5.48	6.00	6.55	7.13	8.03	8.82	9.62	13.02*	16.68*
	80	5.09	5.60	6.21	6.86	7.54	8.26	9.37	10.33	11.32	15.48*	19.94*
	100	5.54	6.17	6.89	7.66	8.47	9.32	10.63	11.77	12.93	17.80*	23.00*
	120	5.97	6.70	7.53	8.43	9.36	10.33	11.84	13.13	14.46	20.01*	25.92*
	140	6.36	7.21	8.15	9.17	10.22	11.31	13.00	14.45	15.93	22.13*	28.72*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.84	2.98	3.17	3.38	3.59	3.81	4.14	4.42	4.69	5.83*	7.06*
	20	3.44	3.64	3.90	4.17	4.46	4.75	5.20	5.58	5.97	7.59*	9.38*
	40	4.27	4.58	4.95	5.34	5.76	6.19	6.86	7.44	8.03	10.56*	13.34*
	60	4.91	5.31	5.79	6.31	6.85	7.41	8.29	9.06	9.85	13.21*	16.85*
	80	5.45	5.95	6.54	7.17	7.83	8.53	9.62	10.56	11.54	15.66*	20.10*
	100	5.93	6.53	7.22	7.97	8.76	9.58	10.87	11.99	13.13	17.97*	23.16*
	120	6.37	7.07	7.87	8.73	9.64	10.59	12.07	13.35	14.66	20.17*	26.07*
	140	6.78	7.58	8.49	9.47	10.50	11.56	13.22	14.66	16.12	22.28*	28.87*
300	10	3.12	3.27	3.47	3.69	3.92	4.15	4.49	4.77	5.06	6.22*	7.48*
	20	3.81	4.02	4.28	4.57	4.86	5.16	5.62	6.00	6.39	8.01*	9.80*
	40	4.74	5.05	5.42	5.83	6.24	6.67	7.34	7.90	8.49	10.96*	13.72*
	60	5.45	5.84	6.32	6.83	7.37	7.92	8.78	9.53	10.29	13.58*	17.20*
	80	6.04	6.53	7.10	7.72	8.37	9.04	10.10	11.01	11.96	16.01*	20.43*
	100	6.56	7.14	7.81	8.54	9.30	10.09	11.34	12.42	13.54	18.30*	23.47*
	120	7.04	7.70	8.48	9.30	10.18	11.09	12.52	13.76	15.05	20.49*	26.37*
	140	7.48	8.24	9.10	10.04	11.02	12.05	13.66	15.06	16.50	22.59*	29.15*
400	10	3.36	3.51	3.72	3.95	4.18	4.42	4.77	5.07	5.36	6.55*	7.85*
	20	4.11	4.32	4.60	4.89	5.20	5.51	5.97	6.37	6.76	8.39*	10.20*
	40	5.13	5.44	5.82	6.23	6.65	7.09	7.75	8.32	8.90	11.35*	14.09*
	60	5.89	6.29	6.77	7.28	7.82	8.37	9.22	9.96	10.71	13.94*	17.55*
	80	6.52	7.01	7.58	8.20	8.84	9.51	10.54	11.44	12.37	16.35*	20.75*
	100	7.08	7.65	8.32	9.03	9.78	10.56	11.78	12.84	13.94	18.63*	23.77*
	120	7.59	8.24	9.00	9.82	10.67	11.56	12.96	14.17	15.43	20.80*	26.66*
	140	8.06	8.80	9.64	10.56	11.52	12.52	14.09	15.46	16.87	22.89*	29.44*
600	10	3.73	3.90	4.12	4.36	4.61	4.86	5.24	5.55	5.86	7.10*	8.46*
	20	4.59	4.82	5.11	5.42	5.74	6.07	6.56	6.97	7.38	9.04*	10.90*
	40	5.75	6.07	6.47	6.89	7.33	7.78	8.46	9.04	9.62	12.06*	14.81*
	60	6.60	7.01	7.51	8.03	8.58	9.13	9.99	10.72	11.47	14.65*	18.23*
	80	7.31	7.80	8.39	9.01	9.66	10.32	11.35	12.23	13.14	17.03*	21.39*
	100	7.94	8.50	9.17	9.89	10.63	11.40	12.60	13.63	14.70	19.27*	24.39*
	120	8.50	9.14	9.90	10.70	11.54	12.42	13.78	14.96	16.18	21.43*	27.25*
	140	9.01	9.73	10.57	11.47	12.40	13.38	14.90	16.23	17.60	23.50*	30.00*
800	10	4.03	4.21	4.45	4.70	4.96	5.23	5.62	5.95	6.27	7.56*	8.98*
	20	4.98	5.22	5.53	5.85	6.19	6.53	7.04	7.46	7.89	9.60*	11.51*
	40	6.25	6.58	7.00	7.44	7.90	8.36	9.05	9.64	10.24	12.70*	15.47*
	60	7.18	7.60	8.11	8.65	9.21	9.78	10.65	11.39	12.14	15.30*	18.88*
	80	7.96	8.46	9.05	9.69	10.34	11.02	12.05	12.93	13.83	17.67*	22.02*
	100	8.63	9.21	9.89	10.61	11.36	12.13	13.32	14.35	15.40	19.91*	24.99*
	120	9.24	9.89	10.65	11.46	12.30	13.17	14.52	15.68	16.88	22.04*	27.83*
	140	9.79	10.51	11.36	12.25	13.18	14.15	15.65	16.96	18.30	24.09*	30.57*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.29	2.67	3.07	3.48	3.89	4.30	4.92	5.45	5.98	8.15*	10.39*
	20	2.97	3.59	4.20	4.81	5.42	6.04	6.97	7.76	8.56	11.84*	15.26*
	40	4.12	5.13	6.09	7.04	8.00	8.96	10.42	11.65	12.90	18.05*	23.44*
	60	5.14	6.48	7.75	9.01	10.26	11.52	13.44	15.06	16.70	23.49*	30.61*
	80	6.06	7.72	9.28	10.81	12.34	13.88	16.21	18.19	20.20	28.49*	37.20*
	100	6.94	8.89	10.71	12.50	14.29	16.09	18.82	21.13	23.47	33.18*	43.39*
	120	7.76	9.99	12.07	14.11	16.14	18.19	21.29	23.92	26.59	37.65*	49.27*
	140	8.56	11.06	13.37	15.65	17.92	20.20	23.67	26.60	29.58	41.92*	54.91*
25	10	2.83	3.09	3.42	3.78	4.16	4.54	5.14	5.65	6.16	8.30*	10.53*
	20	3.50	3.97	4.50	5.07	5.65	6.24	7.16	7.93	8.72	11.97*	15.37*
	40	4.59	5.45	6.35	7.26	8.19	9.14	10.57	11.79	13.03	18.16*	23.54*
	60	5.57	6.77	7.99	9.21	10.44	11.68	13.58	15.19	16.82	23.59*	30.70*
	80	6.47	7.99	9.49	10.99	12.50	14.02	16.34	18.31	20.31	28.58*	37.29*
	100	7.32	9.14	10.91	12.67	14.44	16.23	18.94	21.24	23.58	33.27*	43.47*
	120	8.13	10.24	12.27	14.27	16.29	18.32	21.41	24.03	26.69	37.73*	49.34*
	140	8.91	11.29	13.56	15.81	18.06	20.33	23.78	26.71	29.68	42.00*	54.98*
50	10	3.16	3.41	3.72	4.05	4.41	4.78	5.35	5.84	6.35	8.45*	10.67*
	20	3.89	4.30	4.79	5.32	5.87	6.45	7.34	8.10	8.87	12.09*	15.49*
	40	5.01	5.76	6.60	7.48	8.39	9.31	10.73	11.93	13.16	18.26*	23.64*
	60	5.97	7.06	8.22	9.40	10.61	11.84	13.72	15.32	16.94	23.68*	30.79*
	80	6.85	8.26	9.71	11.18	12.66	14.17	16.47	18.43	20.42	28.67*	37.37*
	100	7.69	9.40	11.12	12.85	14.60	16.37	19.06	21.36	23.68	33.35*	43.54*
	120	8.49	10.49	12.46	14.44	16.44	18.45	21.53	24.14	26.79	37.81*	49.42*
	140	9.26	11.53	13.75	15.97	18.20	20.46	23.90	26.81	29.77	42.08*	55.05*
100	10	3.62	3.85	4.16	4.49	4.83	5.19	5.74	6.21	6.70	8.74*	10.94*
	20	4.45	4.82	5.28	5.78	6.30	6.84	7.69	8.42	9.18	12.34*	15.72*
	40	5.66	6.32	7.09	7.91	8.76	9.65	11.03	12.21	13.42	18.47*	23.83*
	60	6.66	7.61	8.67	9.79	10.96	12.15	14.00	15.57	17.18	23.87*	30.97*
	80	7.55	8.79	10.14	11.54	12.99	14.46	16.73	18.67	20.64	28.85*	37.53*
	100	8.38	9.90	11.52	13.19	14.90	16.64	19.31	21.58	23.89	33.52*	43.70*
	120	9.17	10.97	12.85	14.77	16.73	18.72	21.76	24.35	26.99	37.97*	49.57*
	140	9.92	12.00	14.13	16.29	18.49	20.71	24.12	27.02	29.97	42.23*	55.20*
150	10	3.95	4.19	4.49	4.83	5.17	5.53	6.08	6.54	7.02	9.02*	11.21*
	20	4.86	5.23	5.68	6.17	6.68	7.21	8.03	8.74	9.48	12.59*	15.95*
	40	6.18	6.80	7.52	8.30	9.13	9.99	11.33	12.49	13.68	18.68*	24.03*
	60	7.22	8.10	9.10	10.17	11.30	12.46	14.27	15.82	17.41	24.06*	31.15*
	80	8.14	9.28	10.55	11.90	13.31	14.75	16.99	18.90	20.86	29.02*	37.70*
	100	8.99	10.39	11.92	13.54	15.21	16.92	19.55	21.80	24.10	33.69*	43.86*
	120	9.78	11.44	13.23	15.10	17.02	18.98	22.00	24.57	27.19	38.13*	49.72*
	140	10.54	12.46	14.50	16.61	18.77	20.97	24.35	27.23	30.16	42.39*	55.34*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.22	4.46	4.77	5.11	5.46	5.82	6.37	6.84	7.31	9.29*	11.48*
	20	5.21	5.57	6.02	6.51	7.01	7.53	8.35	9.05	9.77	12.83*	16.18*
	40	6.60	7.20	7.91	8.67	9.48	10.32	11.63	12.77	13.94	18.89*	24.22*
	60	7.70	8.54	9.50	10.54	11.63	12.77	14.54	16.07	17.64	24.25*	31.32*
	80	8.65	9.73	10.95	12.25	13.62	15.04	17.25	19.14	21.08	29.20*	37.86*
	100	9.52	10.84	12.31	13.88	15.51	17.19	19.80	22.03	24.31	33.86*	44.01*
	120	10.33	11.89	13.61	15.43	17.31	19.25	22.23	24.78	27.39	38.29*	49.87*
	140	11.09	12.90	14.87	16.92	19.05	21.22	24.57	27.43	30.35	42.54*	55.48*
300	10	4.66	4.91	5.23	5.58	5.94	6.31	6.87	7.34	7.82	9.80*	11.98*
	20	5.77	6.13	6.59	7.08	7.59	8.11	8.91	9.60	10.31	13.31*	16.64*
	40	7.31	7.89	8.59	9.33	10.11	10.93	12.20	13.30	14.44	19.30*	24.61*
	60	8.49	9.29	10.22	11.21	12.26	13.36	15.08	16.57	18.11	24.63*	31.68*
	80	9.51	10.52	11.68	12.93	14.24	15.61	17.75	19.60	21.51	29.55*	38.19*
	100	10.43	11.65	13.04	14.53	16.10	17.73	20.28	22.47	24.72	34.19*	44.32*
	120	11.27	12.72	14.34	16.07	17.88	19.77	22.69	25.21	27.78	38.61*	50.16*
	140	12.07	13.73	15.58	17.54	19.60	21.73	25.02	27.84	30.73	42.85*	55.77*
400	10	5.01	5.27	5.61	5.97	6.34	6.72	7.29	7.77	8.26	10.25*	12.45*
	20	6.22	6.60	7.06	7.56	8.07	8.60	9.41	10.10	10.80	13.77*	17.08*
	40	7.88	8.47	9.16	9.90	10.68	11.48	12.73	13.81	14.93	19.71*	25.00*
	60	9.15	9.93	10.85	11.82	12.85	13.92	15.60	17.06	18.57	25.01*	32.03*
	80	10.23	11.21	12.34	13.55	14.82	16.16	18.25	20.07	21.94	29.90*	38.52*
	100	11.19	12.37	13.71	15.16	16.68	18.27	20.75	22.91	25.13	34.52*	44.64*
	120	12.08	13.45	15.01	16.68	18.44	20.28	23.15	25.63	28.18	38.93*	50.46*
	140	12.90	14.48	16.25	18.15	20.15	22.22	25.46	28.25	31.11	43.16*	56.06*
600	10	5.59	5.86	6.22	6.60	6.99	7.39	7.99	8.49	8.99	11.03*	13.29*
	20	6.96	7.35	7.83	8.35	8.88	9.42	10.25	10.95	11.66	14.61*	17.93*
	40	8.82	9.41	10.11	10.87	11.64	12.44	13.68	14.75	15.84	20.52*	25.76*
	60	10.23	11.00	11.91	12.88	13.89	14.94	16.57	17.99	19.45	25.75*	32.72*
	80	11.41	12.37	13.47	14.65	15.89	17.18	19.21	20.97	22.79	30.60*	39.17*
	100	12.46	13.59	14.89	16.28	17.75	19.28	21.69	23.78	25.94	35.18*	45.25*
	120	13.41	14.72	16.22	17.82	19.51	21.28	24.05	26.47	28.96	39.56*	51.05*
	140	14.30	15.79	17.47	19.29	21.20	23.20	26.34	29.06	31.86	43.77*	56.63*
800	10	6.05	6.34	6.71	7.11	7.52	7.94	8.56	9.08	9.60	11.69*	14.01*
	20	7.56	7.96	8.46	9.00	9.55	10.11	10.96	11.67	12.39	15.37*	18.72*
	40	9.59	10.19	10.91	11.67	12.46	13.27	14.52	15.58	16.67	21.29*	26.51*
	60	11.11	11.89	12.80	13.78	14.79	15.83	17.45	18.85	20.29	26.48*	33.42*
	80	12.39	13.33	14.44	15.61	16.84	18.11	20.10	21.83	23.61	31.29*	39.82*
	100	13.51	14.62	15.91	17.28	18.72	20.22	22.57	24.62	26.74	35.84*	45.87*
	120	14.52	15.80	17.27	18.84	20.50	22.22	24.93	27.29	29.73	40.19*	51.64*
	140	15.46	16.91	18.56	20.32	22.19	24.13	27.19	29.86	32.61	44.38*	57.20*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.73	0.79	0.87	0.95	1.03	1.12	1.25	1.36	1.47	1.91	2.35*
	20	0.82	0.91	1.02	1.12	1.24	1.35	1.52	1.66	1.80	2.38	2.97*
	40	0.98	1.12	1.27	1.42	1.57	1.73	1.97	2.16	2.36	3.18	4.01*
	60	1.11	1.30	1.49	1.68	1.87	2.06	2.36	2.61	2.86	3.88	4.93*
	80	1.24	1.46	1.69	1.91	2.14	2.37	2.72	3.01	3.31	4.52	5.77*
	100	1.35	1.62	1.88	2.14	2.40	2.66	3.06	3.39	3.73	5.12	6.56*
	120	1.46	1.76	2.06	2.35	2.64	2.93	3.38	3.75	4.13	5.69	7.31*
	140	1.57	1.91	2.23	2.55	2.87	3.20	3.69	4.10	4.52	6.24	8.03*
25	10	0.98	1.02	1.09	1.16	1.24	1.32	1.44	1.54	1.64	2.05	2.48*
	20	1.11	1.17	1.25	1.34	1.44	1.54	1.69	1.82	1.96	2.51	3.09*
	40	1.30	1.39	1.50	1.63	1.76	1.90	2.12	2.31	2.50	3.28	4.11*
	60	1.45	1.56	1.71	1.87	2.05	2.22	2.50	2.74	2.98	3.97	5.02*
	80	1.57	1.72	1.90	2.10	2.31	2.52	2.85	3.13	3.42	4.61	5.86*
	100	1.69	1.87	2.08	2.31	2.55	2.80	3.18	3.51	3.84	5.21	6.64*
	120	1.80	2.01	2.26	2.52	2.79	3.07	3.50	3.86	4.24	5.77	7.39*
	140	1.90	2.14	2.42	2.72	3.02	3.33	3.80	4.21	4.62	6.32	8.11*
50	10	1.09	1.13	1.20	1.27	1.35	1.43	1.56	1.66	1.76	2.17	2.61*
	20	1.25	1.30	1.39	1.48	1.58	1.68	1.83	1.96	2.09	2.63	3.20*
	40	1.47	1.55	1.66	1.79	1.92	2.05	2.26	2.44	2.62	3.39	4.21*
	60	1.64	1.74	1.89	2.04	2.20	2.37	2.64	2.86	3.09	4.07	5.11*
	80	1.78	1.91	2.08	2.27	2.46	2.66	2.98	3.25	3.53	4.70	5.94*
	100	1.91	2.07	2.26	2.48	2.70	2.94	3.31	3.62	3.94	5.29	6.72*
	120	2.03	2.21	2.44	2.68	2.94	3.20	3.62	3.97	4.34	5.86	7.46*
	140	2.13	2.35	2.60	2.87	3.16	3.46	3.92	4.31	4.72	6.40	8.18*
100	10	1.22	1.27	1.34	1.42	1.51	1.59	1.72	1.83	1.93	2.36	2.80*
	20	1.42	1.48	1.57	1.67	1.77	1.87	2.03	2.16	2.29	2.83	3.40*
	40	1.69	1.78	1.89	2.02	2.15	2.29	2.49	2.67	2.85	3.59	4.40*
	60	1.89	2.00	2.14	2.29	2.45	2.62	2.87	3.09	3.32	4.26	5.28*
	80	2.06	2.19	2.36	2.53	2.72	2.92	3.22	3.48	3.74	4.87	6.10*
	100	2.21	2.36	2.55	2.75	2.97	3.19	3.54	3.84	4.15	5.46	6.87*
	120	2.35	2.52	2.73	2.96	3.20	3.45	3.85	4.19	4.54	6.02	7.61*
	140	2.47	2.66	2.90	3.15	3.42	3.70	4.14	4.52	4.91	6.55	8.32*
150	10	1.32	1.37	1.45	1.53	1.62	1.71	1.84	1.95	2.06	2.50	2.96*
	20	1.55	1.61	1.70	1.81	1.91	2.02	2.18	2.32	2.45	3.00	3.58*
	40	1.86	1.94	2.06	2.19	2.33	2.46	2.68	2.85	3.03	3.77	4.58*
	60	2.08	2.19	2.33	2.49	2.65	2.82	3.07	3.29	3.51	4.43	5.45*
	80	2.27	2.40	2.57	2.75	2.93	3.13	3.42	3.68	3.94	5.04	6.26*
	100	2.44	2.58	2.77	2.98	3.19	3.41	3.75	4.04	4.34	5.62	7.03*
	120	2.58	2.75	2.96	3.19	3.43	3.67	4.06	4.39	4.73	6.17	7.76*
	140	2.72	2.91	3.14	3.39	3.65	3.92	4.35	4.72	5.10	6.71	8.46*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.40	1.45	1.53	1.62	1.71	1.80	1.94	2.05	2.17	2.62	3.09*
	20	1.65	1.72	1.81	1.92	2.03	2.14	2.31	2.45	2.58	3.14	3.74*
	40	1.99	2.08	2.20	2.33	2.47	2.61	2.83	3.01	3.19	3.93	4.74*
	60	2.24	2.34	2.49	2.65	2.82	2.99	3.24	3.46	3.68	4.60	5.62*
	80	2.44	2.57	2.74	2.92	3.11	3.31	3.61	3.86	4.12	5.21	6.42*
	100	2.62	2.77	2.96	3.16	3.38	3.60	3.94	4.23	4.53	5.78	7.18*
	120	2.78	2.95	3.16	3.39	3.62	3.87	4.25	4.57	4.91	6.33	7.90*
	140	2.93	3.11	3.34	3.59	3.85	4.12	4.54	4.90	5.28	6.86	8.60*
300	10	1.53	1.58	1.67	1.76	1.86	1.95	2.10	2.22	2.34	2.81	3.30*
	20	1.82	1.89	1.99	2.10	2.22	2.33	2.51	2.65	2.80	3.38	4.00*
	40	2.20	2.29	2.42	2.57	2.71	2.86	3.08	3.27	3.46	4.21	5.04*
	60	2.48	2.60	2.75	2.92	3.09	3.26	3.53	3.75	3.98	4.90	5.92*
	80	2.72	2.85	3.02	3.21	3.41	3.61	3.91	4.17	4.43	5.51	6.72*
	100	2.92	3.07	3.26	3.47	3.69	3.92	4.26	4.55	4.85	6.09	7.47*
	120	3.10	3.27	3.48	3.71	3.95	4.20	4.58	4.91	5.24	6.63	8.19*
	140	3.26	3.45	3.68	3.94	4.20	4.47	4.88	5.24	5.61	7.15	8.88*
400	10	1.64	1.69	1.78	1.87	1.97	2.08	2.23	2.35	2.48	2.96	3.48*
	20	1.95	2.02	2.13	2.25	2.37	2.49	2.67	2.83	2.98	3.57	4.22*
	40	2.38	2.47	2.61	2.75	2.91	3.06	3.29	3.49	3.68	4.45	5.30*
	60	2.68	2.80	2.96	3.13	3.31	3.49	3.77	4.00	4.23	5.16	6.20*
	80	2.94	3.08	3.26	3.45	3.65	3.86	4.17	4.43	4.70	5.79	7.00*
	100	3.16	3.31	3.51	3.73	3.96	4.19	4.53	4.83	5.13	6.36	7.75*
	120	3.35	3.53	3.75	3.99	4.23	4.48	4.87	5.19	5.53	6.91	8.46*
	140	3.53	3.72	3.96	4.22	4.49	4.76	5.18	5.54	5.90	7.43	9.15*
600	10	1.80	1.86	1.96	2.06	2.17	2.27	2.44	2.57	2.70	3.22	3.77*
	20	2.17	2.25	2.36	2.49	2.62	2.75	2.94	3.10	3.26	3.89	4.58*
	40	2.66	2.76	2.90	3.06	3.22	3.39	3.63	3.84	4.04	4.85	5.74*
	60	3.01	3.13	3.30	3.49	3.68	3.87	4.16	4.40	4.64	5.60	6.68*
	80	3.30	3.44	3.63	3.84	4.05	4.27	4.60	4.87	5.15	6.26	7.50*
	100	3.55	3.71	3.92	4.15	4.39	4.63	4.99	5.30	5.60	6.86	8.26*
	120	3.77	3.95	4.18	4.43	4.69	4.95	5.35	5.68	6.02	7.41	8.98*
	140	3.97	4.17	4.42	4.69	4.97	5.25	5.68	6.05	6.41	7.94	9.66*
800	10	1.94	2.00	2.10	2.21	2.32	2.44	2.61	2.75	2.89	3.42	4.00*
	20	2.35	2.43	2.55	2.68	2.82	2.95	3.16	3.33	3.50	4.16	4.87*
	40	2.88	2.99	3.14	3.31	3.48	3.65	3.91	4.13	4.34	5.18	6.11*
	60	3.27	3.40	3.58	3.77	3.97	4.17	4.48	4.73	4.98	5.98	7.09*
	80	3.59	3.74	3.94	4.16	4.38	4.61	4.95	5.23	5.52	6.66	7.94*
	100	3.87	4.03	4.26	4.50	4.74	4.99	5.37	5.68	6.00	7.28	8.71*
	120	4.11	4.30	4.54	4.80	5.07	5.34	5.75	6.09	6.44	7.85	9.44*
	140	4.33	4.53	4.80	5.08	5.36	5.66	6.10	6.47	6.85	8.39	10.13*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
0	10	1.05	1.16	1.29	1.43	1.57	1.71	1.92	2.09	2.27	2.99	3.72*
	20	1.24	1.41	1.59	1.78	1.97	2.16	2.45	2.69	2.94	3.94	4.96*
	40	1.55	1.82	2.09	2.37	2.64	2.92	3.35	3.70	4.06	5.53	7.05*
	60	1.82	2.18	2.53	2.88	3.24	3.59	4.13	4.59	5.04	6.93	8.88*
	80	2.07	2.51	2.93	3.36	3.78	4.21	4.85	5.40	5.95	8.21	10.57*
	100	2.30	2.82	3.31	3.80	4.29	4.78	5.53	6.16	6.80	9.42	12.15*
	120	2.52	3.11	3.67	4.23	4.78	5.33	6.17	6.88	7.60	10.56	13.65*
	140	2.74	3.40	4.02	4.63	5.24	5.86	6.79	7.58	8.38	11.66	15.09*
25	10	1.40	1.47	1.57	1.69	1.81	1.93	2.13	2.29	2.46	3.14	3.86*
	20	1.62	1.73	1.87	2.03	2.19	2.37	2.63	2.86	3.10	4.06	5.08*
	40	1.95	2.13	2.35	2.59	2.84	3.10	3.50	3.85	4.19	5.64	7.15*
	60	2.21	2.47	2.77	3.09	3.42	3.75	4.27	4.72	5.17	7.02	8.97*
	80	2.45	2.78	3.16	3.55	3.95	4.36	4.99	5.52	6.06	8.30	10.65*
	100	2.67	3.08	3.52	3.98	4.45	4.93	5.66	6.27	6.90	9.50	12.23*
	120	2.89	3.36	3.87	4.40	4.93	5.47	6.29	6.99	7.70	10.64	13.72*
	140	3.09	3.64	4.21	4.80	5.39	5.99	6.91	7.69	8.47	11.74	15.16*
50	10	1.56	1.63	1.73	1.85	1.97	2.10	2.29	2.45	2.61	3.28	3.99*
	20	1.82	1.92	2.06	2.22	2.38	2.54	2.80	3.02	3.25	4.19	5.19*
	40	2.19	2.36	2.56	2.79	3.02	3.27	3.66	3.99	4.33	5.74	7.25*
	60	2.49	2.71	2.98	3.28	3.59	3.91	4.41	4.85	5.29	7.12	9.06*
	80	2.74	3.03	3.36	3.73	4.11	4.51	5.12	5.64	6.17	8.39	10.73*
	100	2.97	3.32	3.72	4.16	4.61	5.07	5.78	6.39	7.01	9.59	12.30*
	120	3.19	3.60	4.07	4.57	5.08	5.61	6.41	7.10	7.81	10.72	13.80*
	140	3.39	3.87	4.40	4.96	5.53	6.12	7.02	7.79	8.57	11.82	15.23*
100	10	1.77	1.84	1.95	2.07	2.20	2.33	2.53	2.69	2.86	3.52	4.24*
	20	2.09	2.19	2.33	2.49	2.65	2.82	3.08	3.29	3.51	4.43	5.42*
	40	2.53	2.69	2.89	3.10	3.33	3.57	3.94	4.26	4.58	5.95	7.44*
	60	2.87	3.07	3.33	3.61	3.90	4.21	4.69	5.10	5.52	7.31	9.24*
	80	3.15	3.41	3.72	4.06	4.42	4.79	5.38	5.88	6.40	8.57	10.90*
	100	3.41	3.72	4.09	4.49	4.91	5.34	6.03	6.62	7.22	9.75	12.46*
	120	3.65	4.01	4.43	4.89	5.37	5.87	6.65	7.32	8.01	10.89	13.95*
	140	3.86	4.28	4.76	5.27	5.82	6.38	7.25	8.00	8.77	11.97	15.38*
150	10	1.92	2.00	2.11	2.24	2.37	2.50	2.71	2.88	3.04	3.72	4.45*
	20	2.28	2.39	2.53	2.70	2.86	3.03	3.29	3.51	3.73	4.64	5.63*
	40	2.78	2.93	3.13	3.35	3.58	3.82	4.18	4.50	4.82	6.16	7.63*
	60	3.15	3.35	3.61	3.88	4.17	4.47	4.94	5.34	5.75	7.50	9.41*
	80	3.47	3.71	4.02	4.35	4.70	5.06	5.62	6.11	6.61	8.75	11.06*
	100	3.74	4.04	4.39	4.78	5.18	5.61	6.27	6.84	7.43	9.92	12.61*
	120	4.00	4.34	4.74	5.18	5.64	6.13	6.88	7.54	8.21	11.05	14.10*
	140	4.23	4.62	5.08	5.57	6.09	6.63	7.48	8.21	8.96	12.13	15.52*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.04	2.12	2.24	2.37	2.51	2.65	2.85	3.03	3.20	3.89	4.63*
	20	2.44	2.55	2.70	2.87	3.04	3.21	3.48	3.70	3.92	4.83	5.83*
	40	2.98	3.14	3.34	3.56	3.80	4.03	4.40	4.71	5.03	6.35	7.82*
	60	3.38	3.58	3.84	4.12	4.40	4.70	5.16	5.56	5.97	7.69	9.59*
	80	3.72	3.97	4.27	4.60	4.94	5.30	5.85	6.33	6.82	8.92	11.22*
	100	4.02	4.31	4.66	5.04	5.43	5.85	6.49	7.05	7.63	10.09	12.77*
	120	4.29	4.62	5.02	5.45	5.90	6.37	7.11	7.75	8.41	11.21	14.24*
	140	4.54	4.91	5.36	5.84	6.34	6.87	7.70	8.41	9.15	12.28	15.66*
300	10	2.24	2.32	2.45	2.59	2.73	2.88	3.10	3.28	3.46	4.17	4.94*
	20	2.70	2.81	2.97	3.14	3.32	3.50	3.78	4.01	4.24	5.17	6.18*
	40	3.31	3.47	3.68	3.91	4.15	4.39	4.77	5.08	5.40	6.72	8.18*
	60	3.76	3.96	4.23	4.51	4.80	5.10	5.56	5.95	6.36	8.04	9.93*
	80	4.14	4.38	4.69	5.02	5.36	5.72	6.26	6.73	7.22	9.26	11.54*
	100	4.47	4.75	5.10	5.48	5.87	6.28	6.91	7.46	8.02	10.42	13.07*
	120	4.76	5.09	5.48	5.91	6.35	6.81	7.53	8.15	8.79	11.52	14.54*
	140	5.04	5.40	5.84	6.31	6.80	7.31	8.11	8.81	9.53	12.59	15.95*
400	10	2.40	2.49	2.62	2.76	2.91	3.06	3.29	3.48	3.67	4.41	5.20*
	20	2.90	3.02	3.18	3.37	3.55	3.74	4.03	4.26	4.50	5.45	6.49*
	40	3.57	3.74	3.96	4.20	4.44	4.69	5.07	5.39	5.72	7.04	8.51*
	60	4.07	4.27	4.54	4.83	5.13	5.43	5.90	6.30	6.70	8.38	10.25*
	80	4.48	4.72	5.04	5.37	5.72	6.08	6.63	7.10	7.57	9.59	11.86*
	100	4.83	5.12	5.47	5.86	6.25	6.66	7.29	7.83	8.38	10.74	13.38*
	120	5.16	5.48	5.88	6.30	6.74	7.20	7.91	8.52	9.15	11.84	14.83*
	140	5.45	5.81	6.25	6.72	7.20	7.71	8.50	9.18	9.89	12.89	16.23*
600	10	2.66	2.75	2.89	3.05	3.21	3.37	3.61	3.81	4.01	4.79	5.63*
	20	3.24	3.36	3.54	3.73	3.93	4.13	4.43	4.68	4.93	5.93	7.02*
	40	4.00	4.17	4.41	4.66	4.92	5.18	5.58	5.91	6.25	7.60	9.11*
	60	4.56	4.78	5.06	5.36	5.67	5.99	6.47	6.88	7.29	8.97	10.86*
	80	5.03	5.28	5.61	5.95	6.31	6.68	7.24	7.72	8.20	10.20	12.46*
	100	5.43	5.72	6.09	6.48	6.88	7.30	7.93	8.48	9.03	11.35	13.97*
	120	5.79	6.12	6.52	6.96	7.41	7.87	8.58	9.19	9.81	12.44	15.40*
	140	6.12	6.48	6.93	7.40	7.89	8.40	9.18	9.86	10.55	13.48	16.78*
800	10	2.87	2.96	3.11	3.28	3.45	3.62	3.87	4.08	4.29	5.10	5.98*
	20	3.50	3.63	3.82	4.03	4.23	4.45	4.76	5.03	5.29	6.32	7.45*
	40	4.35	4.53	4.77	5.04	5.31	5.58	6.00	6.34	6.69	8.08	9.63*
	60	4.96	5.19	5.48	5.80	6.12	6.45	6.95	7.37	7.79	9.50	11.42*
	80	5.47	5.73	6.07	6.43	6.80	7.18	7.76	8.24	8.73	10.75	13.02*
	100	5.91	6.21	6.59	6.99	7.41	7.83	8.48	9.03	9.59	11.90	14.52*
	120	6.30	6.64	7.06	7.50	7.96	8.43	9.15	9.76	10.39	13.00	15.95*
	140	6.66	7.03	7.49	7.97	8.47	8.99	9.78	10.45	11.14	14.04	17.32*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.58	1.78	2.00	2.23	2.47	2.70	3.06	3.36	3.66	4.89	6.15*
	20	1.94	2.27	2.60	2.93	3.27	3.61	4.13	4.56	5.00	6.79	8.63*
	40	2.56	3.09	3.60	4.11	4.62	5.14	5.92	6.58	7.24	9.97	12.81*
	60	3.10	3.81	4.48	5.15	5.81	6.48	7.49	8.34	9.21	12.77	16.48*
	80	3.60	4.47	5.29	6.09	6.90	7.71	8.93	9.97	11.02	15.33	19.85*
	100	4.07	5.09	6.04	6.98	7.92	8.86	10.29	11.49	12.71	17.74	23.01*
	120	4.51	5.68	6.76	7.83	8.89	9.96	11.58	12.94	14.32	20.03	26.01*
	140	4.94	6.24	7.46	8.64	9.83	11.01	12.81	14.33	15.87	22.23	28.89*
25	10	2.03	2.16	2.33	2.53	2.74	2.95	3.28	3.56	3.85	5.04	6.29*
	20	2.42	2.63	2.90	3.20	3.50	3.82	4.31	4.73	5.16	6.91	8.75*
	40	3.02	3.41	3.86	4.34	4.82	5.32	6.08	6.72	7.38	10.08	12.91*
	60	3.53	4.10	4.72	5.35	5.99	6.64	7.63	8.48	9.33	12.86	16.57*
	80	4.01	4.75	5.51	6.28	7.07	7.86	9.07	10.09	11.13	15.42	19.93*
	100	4.46	5.35	6.26	7.16	8.08	9.01	10.41	11.61	12.82	17.83	23.08*
	120	4.89	5.93	6.97	8.00	9.04	10.10	11.70	13.05	14.43	20.11	26.08*
	140	5.30	6.49	7.65	8.81	9.97	11.14	12.93	14.44	15.97	22.31	28.96*
50	10	2.27	2.39	2.56	2.75	2.95	3.16	3.48	3.75	4.03	5.19	6.42*
	20	2.71	2.91	3.16	3.43	3.72	4.03	4.50	4.90	5.31	7.04	8.87*
	40	3.36	3.70	4.11	4.55	5.02	5.49	6.23	6.87	7.51	10.19	13.01*
	60	3.89	4.39	4.95	5.55	6.17	6.80	7.78	8.61	9.45	12.96	16.66*
	80	4.37	5.02	5.73	6.47	7.23	8.01	9.20	10.21	11.24	15.51	20.01*
	100	4.81	5.61	6.46	7.34	8.24	9.15	10.54	11.72	12.93	17.91	23.16*
	120	5.24	6.18	7.17	8.17	9.20	10.23	11.82	13.16	14.53	20.20	26.16*
	140	5.64	6.73	7.84	8.97	10.12	11.28	13.04	14.54	16.07	22.39	29.03*
100	10	2.59	2.71	2.89	3.08	3.28	3.49	3.81	4.07	4.35	5.47	6.69*
	20	3.11	3.30	3.54	3.81	4.09	4.38	4.83	5.22	5.62	7.29	9.10*
	40	3.85	4.16	4.54	4.95	5.38	5.84	6.54	7.15	7.77	10.40	13.21*
	60	4.44	4.87	5.38	5.93	6.51	7.12	8.06	8.86	9.69	13.15	16.83*
	80	4.95	5.50	6.15	6.84	7.56	8.31	9.46	10.45	11.47	15.69	20.18*
	100	5.41	6.09	6.87	7.69	8.55	9.43	10.79	11.95	13.14	18.08	23.32*
	120	5.84	6.65	7.56	8.51	9.49	10.50	12.06	13.38	14.73	20.36	26.31*
	140	6.25	7.19	8.22	9.30	10.40	11.54	13.27	14.76	16.26	22.54	29.18*
150	10	2.82	2.94	3.13	3.32	3.53	3.74	4.06	4.34	4.61	5.73	6.94*
	20	3.41	3.59	3.84	4.11	4.39	4.68	5.12	5.51	5.89	7.53	9.32*
	40	4.22	4.52	4.89	5.29	5.71	6.15	6.83	7.42	8.03	10.61	13.40*
	60	4.85	5.26	5.75	6.28	6.84	7.42	8.33	9.12	9.93	13.34	17.01*
	80	5.40	5.92	6.53	7.18	7.88	8.60	9.72	10.69	11.69	15.87	20.34*
	100	5.88	6.52	7.25	8.03	8.85	9.71	11.04	12.18	13.35	18.25	23.47*
	120	6.33	7.08	7.93	8.84	9.79	10.77	12.29	13.60	14.94	20.52	26.46*
	140	6.76	7.62	8.59	9.62	10.69	11.79	13.50	14.97	16.46	22.70	29.32*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.01	3.14	3.32	3.53	3.74	3.95	4.28	4.56	4.83	5.96	7.18*
	20	3.65	3.83	4.09	4.36	4.64	4.93	5.38	5.76	6.15	7.76	9.55*
	40	4.53	4.82	5.19	5.59	6.00	6.43	7.11	7.69	8.28	10.82	13.59*
	60	5.20	5.60	6.08	6.60	7.14	7.71	8.60	9.37	10.17	13.54	17.19*
	80	5.77	6.27	6.87	7.50	8.18	8.88	9.98	10.93	11.91	16.05	20.50*
	100	6.29	6.89	7.59	8.35	9.15	9.98	11.28	12.41	13.56	18.42	23.63*
	120	6.76	7.46	8.28	9.15	10.08	11.03	12.53	13.82	15.14	20.68	26.61*
	140	7.20	8.01	8.93	9.93	10.97	12.05	13.73	15.18	16.65	22.85	29.47*
300	10	3.31	3.44	3.64	3.85	4.08	4.30	4.64	4.92	5.21	6.35	7.60*
	20	4.03	4.23	4.49	4.77	5.06	5.36	5.81	6.20	6.59	8.19	9.97*
	40	5.02	5.32	5.69	6.09	6.50	6.93	7.60	8.17	8.75	11.23	13.97*
	60	5.77	6.16	6.63	7.14	7.68	8.23	9.10	9.85	10.62	13.91	17.53*
	80	6.40	6.88	7.46	8.08	8.73	9.41	10.47	11.39	12.35	16.40	20.83*
	100	6.95	7.53	8.20	8.93	9.70	10.50	11.76	12.85	13.98	18.76	23.94*
	120	7.46	8.13	8.90	9.74	10.63	11.55	12.99	14.25	15.54	21.00	26.90*
	140	7.93	8.69	9.57	10.51	11.51	12.55	14.18	15.59	17.04	23.16	29.75*
400	10	3.55	3.69	3.90	4.12	4.35	4.58	4.94	5.23	5.52	6.69	7.97*
	20	4.35	4.55	4.82	5.11	5.41	5.71	6.18	6.57	6.97	8.58	10.37*
	40	5.43	5.72	6.10	6.51	6.93	7.36	8.03	8.60	9.18	11.62	14.35*
	60	6.23	6.62	7.10	7.61	8.15	8.70	9.55	10.29	11.05	14.28	17.88*
	80	6.91	7.38	7.96	8.57	9.22	9.89	10.93	11.83	12.77	16.75	21.16*
	100	7.50	8.07	8.73	9.45	10.20	10.99	12.22	13.28	14.39	19.09	24.25*
	120	8.04	8.69	9.45	10.27	11.13	12.03	13.44	14.67	15.93	21.32	27.20*
	140	8.54	9.28	10.13	11.05	12.02	13.03	14.62	16.00	17.42	23.47	30.04*
600	10	3.95	4.10	4.32	4.55	4.80	5.05	5.42	5.73	6.04	7.26	8.59*
	20	4.86	5.07	5.35	5.66	5.98	6.30	6.78	7.19	7.60	9.25	11.08*
	40	6.08	6.38	6.78	7.20	7.63	8.08	8.76	9.33	9.92	12.34	15.07*
	60	6.99	7.38	7.87	8.39	8.93	9.49	10.35	11.08	11.83	15.00	18.56*
	80	7.74	8.22	8.80	9.42	10.06	10.73	11.76	12.64	13.56	17.44	21.80*
	100	8.40	8.96	9.62	10.34	11.08	11.86	13.06	14.09	15.17	19.75	24.86*
	120	8.99	9.63	10.38	11.19	12.04	12.91	14.28	15.47	16.70	21.96	27.78*
	140	9.54	10.26	11.10	12.00	12.94	13.92	15.46	16.79	18.17	24.09	30.60*
800	10	4.27	4.43	4.66	4.91	5.16	5.42	5.81	6.14	6.46	7.72	9.11*
	20	5.27	5.49	5.79	6.11	6.44	6.78	7.28	7.70	8.13	9.82	11.70*
	40	6.61	6.92	7.33	7.77	8.22	8.68	9.37	9.96	10.55	12.99	15.73*
	60	7.60	8.00	8.50	9.04	9.59	10.16	11.03	11.77	12.52	15.66	19.22*
	80	8.42	8.90	9.49	10.12	10.78	11.45	12.48	13.36	14.27	18.10	22.43*
	100	9.13	9.69	10.37	11.09	11.84	12.61	13.81	14.83	15.89	20.39	25.46*
	120	9.78	10.41	11.17	11.98	12.82	13.69	15.05	16.22	17.42	22.58	28.37*
	140	10.36	11.07	11.91	12.81	13.75	14.72	16.23	17.54	18.89	24.69	31.16*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.45	2.83	3.24	3.65	4.06	4.47	5.10	5.63	6.16	8.34	10.59*
	20	3.18	3.81	4.43	5.05	5.67	6.29	7.23	8.03	8.83	12.13	15.56*
	40	4.42	5.45	6.43	7.40	8.37	9.35	10.82	12.06	13.32	18.51	23.93*
	60	5.50	6.89	8.19	9.47	10.74	12.02	13.96	15.60	17.26	24.10	31.26*
	80	6.50	8.21	9.81	11.37	12.92	14.48	16.85	18.85	20.87	29.23	37.99*
	100	7.43	9.45	11.32	13.15	14.97	16.79	19.56	21.90	24.26	34.05	44.31*
	120	8.32	10.63	12.76	14.84	16.91	18.99	22.14	24.79	27.49	38.63	50.32*
	140	9.18	11.76	14.14	16.46	18.77	21.09	24.61	27.57	30.58	43.02	56.08*
25	10	3.01	3.27	3.60	3.96	4.34	4.72	5.32	5.84	6.35	8.50	10.73*
	20	3.72	4.20	4.74	5.31	5.90	6.50	7.42	8.20	8.99	12.26	15.68*
	40	4.90	5.78	6.70	7.63	8.57	9.53	10.98	12.21	13.46	18.62	24.02*
	60	5.94	7.19	8.43	9.67	10.92	12.19	14.11	15.73	17.38	24.19	31.35*
	80	6.91	8.49	10.03	11.56	13.09	14.64	16.98	18.97	20.98	29.32	38.07*
	100	7.83	9.72	11.53	13.33	15.13	16.94	19.69	22.01	24.37	34.13	44.39*
	120	8.70	10.89	12.96	15.01	17.06	19.13	22.26	24.90	27.59	38.71	50.39*
	140	9.54	12.01	14.34	16.63	18.92	21.23	24.72	27.68	30.68	43.10	56.15*
50	10	3.36	3.59	3.90	4.24	4.60	4.97	5.54	6.04	6.54	8.65	10.87*
	20	4.13	4.54	5.04	5.57	6.13	6.71	7.61	8.37	9.15	12.39	15.80*
	40	5.33	6.10	6.96	7.85	8.77	9.70	11.14	12.35	13.59	18.72	24.12*
	60	6.36	7.49	8.67	9.88	11.10	12.35	14.25	15.86	17.50	24.29	31.43*
	80	7.31	8.77	10.25	11.75	13.26	14.79	17.12	19.09	21.10	29.41	38.15*
	100	8.21	9.98	11.74	13.51	15.28	17.08	19.81	22.13	24.48	34.22	44.46*
	120	9.07	11.14	13.16	15.18	17.21	19.26	22.38	25.02	27.69	38.79	50.47*
	140	9.89	12.25	14.53	16.80	19.07	21.36	24.84	27.79	30.78	43.18	56.22*
100	10	3.84	4.06	4.36	4.69	5.03	5.39	5.94	6.42	6.90	8.94	11.14*
	20	4.72	5.09	5.55	6.04	6.57	7.12	7.97	8.71	9.47	12.64	16.03*
	40	6.02	6.68	7.46	8.29	9.16	10.06	11.45	12.64	13.86	18.94	24.32*
	60	7.08	8.05	9.13	10.28	11.46	12.67	14.53	16.12	17.74	24.48	31.61*
	80	8.03	9.31	10.69	12.12	13.59	15.09	17.38	19.33	21.32	29.59	38.32*
	100	8.92	10.50	12.16	13.86	15.60	17.36	20.06	22.36	24.69	34.39	44.62*
	120	9.77	11.63	13.56	15.52	17.51	19.53	22.62	25.24	27.90	38.95	50.62*
	140	10.58	12.73	14.92	17.12	19.36	21.62	25.07	28.00	30.98	43.33	56.37*
150	10	4.19	4.41	4.71	5.04	5.39	5.74	6.29	6.76	7.23	9.23	11.41*
	20	5.16	5.52	5.96	6.45	6.96	7.49	8.32	9.04	9.77	12.89	16.26*
	40	6.55	7.17	7.91	8.70	9.53	10.40	11.76	12.93	14.12	19.15	24.51*
	60	7.67	8.56	9.58	10.67	11.81	12.99	14.82	16.38	17.98	24.68	31.79*
	80	8.65	9.81	11.11	12.49	13.92	15.38	17.64	19.58	21.55	29.77	38.48*
	100	9.55	10.99	12.57	14.21	15.91	17.65	20.31	22.59	24.90	34.56	44.78*
	120	10.40	12.12	13.96	15.86	17.81	19.80	22.86	25.46	28.10	39.12	50.77*
	140	11.22	13.20	15.30	17.45	19.65	21.88	25.30	28.21	31.17	43.49	56.51*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.47	4.70	5.01	5.34	5.69	6.05	6.59	7.06	7.53	9.51	11.68*
	20	5.52	5.87	6.32	6.80	7.31	7.83	8.65	9.35	10.07	13.14	16.49*
	40	7.00	7.60	8.31	9.08	9.89	10.74	12.06	13.21	14.39	19.36	24.71*
	60	8.17	9.01	9.99	11.04	12.15	13.30	15.10	16.64	18.22	24.87	31.97*
	80	9.19	10.28	11.52	12.85	14.24	15.68	17.91	19.82	21.77	29.95	38.65*
	100	10.11	11.46	12.97	14.56	16.22	17.93	20.56	22.82	25.12	34.73	44.93*
	120	10.98	12.58	14.34	16.20	18.11	20.07	23.10	25.67	28.31	39.28	50.91*
	140	11.79	13.66	15.67	17.77	19.93	22.14	25.53	28.42	31.37	43.65	56.65*
300	10	4.93	5.17	5.48	5.83	6.19	6.55	7.11	7.58	8.06	10.02	12.19*
	20	6.11	6.46	6.91	7.40	7.90	8.42	9.23	9.92	10.63	13.63	16.95*
	40	7.74	8.32	9.01	9.76	10.55	11.37	12.65	13.76	14.90	19.78	25.10*
	60	9.00	9.80	10.74	11.74	12.80	13.91	15.65	17.15	18.70	25.25	32.32*
	80	10.09	11.11	12.28	13.54	14.87	16.26	18.43	20.30	22.22	30.31	38.98*
	100	11.06	12.31	13.72	15.24	16.83	18.48	21.06	23.27	25.54	35.07	45.24*
	120	11.96	13.44	15.09	16.85	18.70	20.61	23.57	26.11	28.71	39.60	51.21*
	140	12.81	14.51	16.41	18.41	20.50	22.66	25.99	28.84	31.76	43.96	56.94*
400	10	5.31	5.55	5.88	6.23	6.60	6.97	7.54	8.02	8.51	10.48	12.66*
	20	6.59	6.94	7.40	7.90	8.41	8.93	9.74	10.43	11.13	14.09	17.39*
	40	8.35	8.92	9.61	10.35	11.13	11.94	13.19	14.28	15.41	20.20	25.48*
	60	9.70	10.47	11.39	12.37	13.41	14.49	16.18	17.65	19.17	25.63	32.67*
	80	10.84	11.83	12.96	14.19	15.48	16.82	18.94	20.77	22.66	30.66	39.31*
	100	11.87	13.06	14.42	15.88	17.42	19.03	21.55	23.72	25.96	35.41	45.56*
	120	12.81	14.20	15.79	17.49	19.28	21.14	24.04	26.54	29.12	39.93	51.51*
	140	13.69	15.29	17.10	19.03	21.06	23.17	26.44	29.26	32.15	44.27	57.23*
600	10	5.91	6.16	6.51	6.89	7.27	7.67	8.26	8.76	9.26	11.27	13.50*
	20	7.36	7.73	8.21	8.72	9.25	9.79	10.61	11.31	12.02	14.95	18.24*
	40	9.34	9.91	10.61	11.35	12.13	12.93	14.18	15.24	16.34	21.02	26.25*
	60	10.83	11.59	12.50	13.47	14.48	15.54	17.18	18.61	20.08	26.39	33.37*
	80	12.09	13.03	14.14	15.33	16.58	17.88	19.92	21.70	23.53	31.37	39.96*
	100	13.20	14.33	15.64	17.05	18.53	20.07	22.50	24.61	26.79	36.08	46.18*
	120	14.21	15.53	17.04	18.66	20.37	22.16	24.97	27.40	29.92	40.57	52.10*
	140	15.15	16.66	18.37	20.21	22.15	24.17	27.34	30.09	32.92	44.89	57.80*
800	10	6.40	6.67	7.03	7.42	7.83	8.24	8.85	9.37	9.88	11.95	14.23*
	20	8.00	8.37	8.87	9.40	9.94	10.50	11.34	12.05	12.77	15.72	19.04*
	40	10.15	10.72	11.43	12.19	12.98	13.79	15.04	16.10	17.19	21.80	27.00*
	60	11.76	12.52	13.43	14.40	15.42	16.46	18.09	19.49	20.94	27.13	34.06*
	80	13.11	14.05	15.15	16.33	17.56	18.84	20.84	22.58	24.37	32.07	40.61*
	100	14.30	15.41	16.70	18.08	19.53	21.04	23.42	25.48	27.61	36.75	46.79*
	120	15.38	16.66	18.14	19.72	21.39	23.13	25.86	28.24	30.71	41.21	52.69*
	140	16.37	17.83	19.49	21.28	23.16	25.13	28.22	30.91	33.69	45.51	58.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.78	0.83	0.91	0.99	1.08	1.16	1.29	1.40	1.51	1.95	2.39*
	20	0.87	0.96	1.07	1.18	1.29	1.40	1.57	1.71	1.85	2.43	3.02*
	40	1.04	1.18	1.33	1.48	1.64	1.80	2.03	2.23	2.43	3.25	4.09*
	60	1.18	1.37	1.56	1.76	1.95	2.15	2.44	2.69	2.94	3.97	5.03*
	80	1.32	1.55	1.78	2.00	2.23	2.47	2.82	3.11	3.41	4.63	5.89*
	100	1.44	1.71	1.98	2.24	2.50	2.77	3.17	3.51	3.85	5.24	6.69*
	120	1.56	1.87	2.17	2.46	2.76	3.05	3.50	3.88	4.26	5.83	7.46*
	140	1.68	2.02	2.35	2.67	3.00	3.33	3.82	4.24	4.66	6.39	8.20*
25	10	1.04	1.08	1.14	1.21	1.29	1.36	1.48	1.58	1.68	2.10	2.52*
	20	1.18	1.23	1.31	1.40	1.50	1.60	1.75	1.88	2.01	2.56	3.14*
	40	1.38	1.46	1.57	1.70	1.83	1.97	2.19	2.38	2.57	3.36	4.19*
	60	1.53	1.64	1.79	1.96	2.13	2.31	2.59	2.82	3.07	4.07	5.11*
	80	1.67	1.81	2.00	2.20	2.40	2.62	2.95	3.24	3.52	4.72	5.97*
	100	1.79	1.97	2.19	2.42	2.66	2.91	3.30	3.62	3.96	5.33	6.77*
	120	1.90	2.12	2.37	2.63	2.91	3.19	3.63	3.99	4.37	5.91	7.53*
	140	2.01	2.26	2.54	2.84	3.15	3.46	3.94	4.35	4.76	6.47	8.27*
50	10	1.15	1.19	1.25	1.33	1.40	1.48	1.60	1.71	1.81	2.22	2.65*
	20	1.32	1.37	1.45	1.54	1.64	1.74	1.89	2.02	2.15	2.68	3.25*
	40	1.55	1.63	1.74	1.86	1.99	2.13	2.34	2.52	2.70	3.47	4.29*
	60	1.73	1.83	1.97	2.13	2.29	2.46	2.73	2.95	3.19	4.16	5.20*
	80	1.88	2.01	2.18	2.37	2.56	2.77	3.08	3.36	3.64	4.81	6.05*
	100	2.02	2.18	2.37	2.59	2.82	3.05	3.42	3.74	4.06	5.42	6.85*
	120	2.14	2.33	2.55	2.80	3.06	3.33	3.75	4.10	4.47	6.00	7.61*
	140	2.26	2.47	2.73	3.00	3.29	3.59	4.06	4.46	4.86	6.55	8.34*
100	10	1.30	1.33	1.40	1.48	1.56	1.65	1.77	1.88	1.99	2.41	2.85*
	20	1.50	1.56	1.64	1.74	1.84	1.94	2.10	2.23	2.36	2.89	3.46*
	40	1.79	1.87	1.98	2.10	2.23	2.37	2.57	2.75	2.93	3.67	4.47*
	60	2.00	2.10	2.24	2.39	2.55	2.72	2.97	3.19	3.41	4.36	5.38*
	80	2.18	2.30	2.47	2.64	2.83	3.03	3.33	3.59	3.86	4.99	6.21*
	100	2.34	2.48	2.67	2.87	3.09	3.31	3.66	3.96	4.28	5.59	7.00*
	120	2.48	2.65	2.86	3.09	3.33	3.58	3.98	4.32	4.67	6.16	7.76*
	140	2.61	2.80	3.04	3.29	3.56	3.85	4.29	4.67	5.06	6.71	8.48*
150	10	1.40	1.44	1.51	1.59	1.68	1.77	1.90	2.01	2.12	2.55	3.00*
	20	1.64	1.69	1.78	1.88	1.98	2.09	2.25	2.39	2.52	3.06	3.64*
	40	1.96	2.04	2.15	2.28	2.42	2.55	2.76	2.94	3.12	3.86	4.65*
	60	2.20	2.30	2.44	2.59	2.76	2.92	3.18	3.39	3.61	4.54	5.55*
	80	2.40	2.52	2.68	2.86	3.05	3.24	3.54	3.80	4.06	5.17	6.37*
	100	2.57	2.71	2.90	3.10	3.32	3.54	3.88	4.17	4.48	5.76	7.16*
	120	2.73	2.89	3.10	3.33	3.56	3.81	4.20	4.53	4.87	6.32	7.90*
	140	2.87	3.06	3.29	3.54	3.80	4.07	4.50	4.87	5.25	6.87	8.62*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.48	1.52	1.60	1.68	1.77	1.86	2.00	2.11	2.23	2.67	3.13*
	20	1.75	1.80	1.89	2.00	2.11	2.21	2.38	2.52	2.66	3.21	3.79*
	40	2.10	2.18	2.30	2.43	2.57	2.71	2.92	3.10	3.28	4.02	4.82*
	60	2.36	2.46	2.61	2.76	2.93	3.09	3.35	3.57	3.79	4.71	5.71*
	80	2.58	2.70	2.86	3.04	3.23	3.43	3.73	3.98	4.24	5.33	6.53*
	100	2.76	2.91	3.09	3.30	3.51	3.73	4.07	4.36	4.66	5.92	7.31*
	120	2.93	3.10	3.30	3.53	3.77	4.01	4.39	4.72	5.06	6.48	8.05*
	140	3.09	3.27	3.50	3.75	4.01	4.28	4.70	5.06	5.44	7.03	8.76*
300	10	1.62	1.66	1.74	1.83	1.93	2.02	2.16	2.28	2.40	2.87	3.35*
	20	1.92	1.98	2.08	2.19	2.30	2.42	2.59	2.73	2.88	3.45	4.06*
	40	2.32	2.41	2.53	2.67	2.82	2.96	3.18	3.37	3.56	4.31	5.12*
	60	2.62	2.73	2.87	3.04	3.21	3.38	3.65	3.87	4.09	5.01	6.02*
	80	2.86	2.99	3.16	3.35	3.54	3.74	4.04	4.30	4.56	5.65	6.83*
	100	3.08	3.22	3.41	3.62	3.84	4.06	4.40	4.69	4.99	6.23	7.60*
	120	3.27	3.43	3.64	3.87	4.11	4.36	4.74	5.06	5.39	6.79	8.34*
	140	3.44	3.62	3.85	4.10	4.36	4.63	5.05	5.41	5.78	7.33	9.04*
400	10	1.73	1.77	1.86	1.95	2.05	2.15	2.30	2.42	2.55	3.03	3.53*
	20	2.06	2.12	2.23	2.34	2.46	2.58	2.76	2.91	3.06	3.65	4.28*
	40	2.51	2.59	2.72	2.87	3.02	3.17	3.40	3.59	3.78	4.56	5.38*
	60	2.83	2.94	3.09	3.26	3.44	3.62	3.89	4.12	4.35	5.28	6.30*
	80	3.10	3.23	3.40	3.60	3.80	4.00	4.31	4.57	4.84	5.92	7.12*
	100	3.33	3.48	3.67	3.89	4.11	4.34	4.69	4.98	5.28	6.52	7.88*
	120	3.54	3.70	3.92	4.15	4.40	4.65	5.03	5.36	5.69	7.08	8.61*
	140	3.73	3.91	4.14	4.40	4.66	4.94	5.36	5.71	6.08	7.61	9.31*
600	10	1.90	1.95	2.04	2.14	2.25	2.35	2.51	2.65	2.78	3.29	3.82*
	20	2.29	2.36	2.47	2.59	2.72	2.84	3.04	3.20	3.36	3.98	4.64*
	40	2.80	2.89	3.03	3.19	3.35	3.51	3.75	3.96	4.16	4.96	5.83*
	60	3.17	3.29	3.45	3.63	3.82	4.01	4.29	4.53	4.77	5.74	6.78*
	80	3.48	3.61	3.80	4.00	4.21	4.43	4.75	5.02	5.30	6.41	7.62*
	100	3.74	3.89	4.10	4.32	4.56	4.80	5.16	5.46	5.77	7.02	8.40*
	120	3.98	4.14	4.37	4.62	4.87	5.13	5.53	5.86	6.20	7.59	9.13*
	140	4.19	4.38	4.62	4.89	5.16	5.44	5.87	6.24	6.61	8.13	9.83*
800	10	2.04	2.10	2.19	2.30	2.41	2.52	2.69	2.83	2.97	3.50	4.06*
	20	2.47	2.54	2.66	2.79	2.92	3.06	3.26	3.43	3.60	4.25	4.95*
	40	3.04	3.13	3.28	3.44	3.61	3.78	4.04	4.25	4.46	5.30	6.20*
	60	3.45	3.57	3.74	3.93	4.13	4.32	4.62	4.87	5.12	6.12	7.19*
	80	3.78	3.92	4.12	4.33	4.55	4.78	5.11	5.40	5.68	6.82	8.06*
	100	4.07	4.23	4.45	4.68	4.93	5.17	5.55	5.86	6.18	7.45	8.85*
	120	4.33	4.51	4.74	5.00	5.26	5.53	5.94	6.28	6.63	8.04	9.59*
	140	4.56	4.76	5.01	5.29	5.57	5.86	6.30	6.68	7.05	8.60	10.30*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.12	1.23	1.36	1.49	1.63	1.77	1.98	2.16	2.33	3.05	3.78*
	20	1.32	1.49	1.67	1.86	2.05	2.24	2.53	2.78	3.02	4.03	5.05*
	40	1.65	1.92	2.20	2.48	2.76	3.04	3.46	3.82	4.18	5.66	7.19*
	60	1.94	2.30	2.66	3.02	3.38	3.74	4.28	4.74	5.20	7.10	9.06*
	80	2.21	2.65	3.09	3.52	3.95	4.38	5.03	5.58	6.13	8.41	10.78*
	100	2.45	2.98	3.49	3.99	4.48	4.98	5.73	6.37	7.01	9.65	12.39*
	120	2.69	3.30	3.87	4.43	4.99	5.55	6.40	7.12	7.84	10.82	13.93*
	140	2.92	3.60	4.23	4.86	5.48	6.10	7.05	7.84	8.64	11.95	15.40*
25	10	1.49	1.55	1.65	1.76	1.88	2.00	2.19	2.36	2.52	3.21	3.92*
	20	1.72	1.82	1.96	2.12	2.28	2.45	2.72	2.95	3.19	4.16	5.17*
	40	2.06	2.24	2.46	2.70	2.96	3.22	3.63	3.97	4.32	5.77	7.29*
	60	2.35	2.60	2.90	3.23	3.56	3.90	4.43	4.87	5.32	7.19	9.15*
	80	2.60	2.94	3.32	3.71	4.12	4.53	5.17	5.70	6.25	8.50	10.86*
	100	2.84	3.25	3.70	4.17	4.64	5.13	5.86	6.49	7.12	9.73	12.47*
	120	3.06	3.55	4.07	4.61	5.15	5.69	6.53	7.23	7.95	10.91	14.00*
	140	3.28	3.84	4.43	5.03	5.63	6.24	7.16	7.95	8.74	12.03	15.47*
50	10	1.65	1.71	1.81	1.93	2.05	2.17	2.36	2.52	2.69	3.35	4.06*
	20	1.93	2.02	2.16	2.31	2.47	2.64	2.90	3.12	3.34	4.28	5.29*
	40	2.32	2.48	2.68	2.91	3.15	3.40	3.78	4.12	4.46	5.88	7.38*
	60	2.63	2.85	3.13	3.42	3.74	4.06	4.57	5.00	5.45	7.29	9.24*
	80	2.90	3.19	3.53	3.90	4.29	4.68	5.30	5.83	6.36	8.60	10.94*
	100	3.15	3.50	3.91	4.35	4.80	5.27	5.99	6.60	7.23	9.82	12.55*
	120	3.38	3.80	4.27	4.78	5.30	5.83	6.65	7.34	8.05	10.99	14.08*
	140	3.59	4.08	4.63	5.19	5.78	6.37	7.28	8.06	8.84	12.11	15.54*
100	10	1.87	1.94	2.04	2.16	2.29	2.41	2.61	2.77	2.94	3.60	4.30*
	20	2.21	2.30	2.44	2.59	2.76	2.92	3.18	3.39	3.61	4.53	5.51*
	40	2.67	2.82	3.02	3.24	3.47	3.70	4.07	4.39	4.72	6.09	7.58*
	60	3.03	3.23	3.49	3.77	4.06	4.37	4.85	5.26	5.69	7.49	9.41*
	80	3.33	3.59	3.90	4.24	4.60	4.98	5.57	6.07	6.59	8.78	11.11*
	100	3.60	3.91	4.28	4.69	5.11	5.55	6.24	6.84	7.45	9.99	12.70*
	120	3.85	4.22	4.65	5.11	5.60	6.10	6.89	7.57	8.26	11.15	14.23*
	140	4.09	4.51	4.99	5.52	6.07	6.63	7.52	8.27	9.04	12.27	15.69*
150	10	2.03	2.10	2.21	2.33	2.46	2.59	2.79	2.96	3.13	3.80	4.51*
	20	2.41	2.51	2.65	2.81	2.97	3.14	3.40	3.62	3.84	4.75	5.73*
	40	2.93	3.08	3.28	3.50	3.73	3.96	4.33	4.64	4.96	6.30	7.77*
	60	3.33	3.52	3.78	4.05	4.34	4.64	5.11	5.51	5.92	7.68	9.59*
	80	3.66	3.90	4.21	4.54	4.89	5.25	5.82	6.31	6.82	8.96	11.27*
	100	3.95	4.25	4.60	4.99	5.40	5.82	6.49	7.06	7.66	10.17	12.86*
	120	4.22	4.56	4.97	5.41	5.88	6.37	7.13	7.79	8.46	11.32	14.37*
	140	4.47	4.86	5.32	5.82	6.34	6.89	7.75	8.48	9.24	12.43	15.83*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.16	2.23	2.34	2.47	2.60	2.74	2.95	3.12	3.29	3.98	4.70*
	20	2.58	2.68	2.82	2.98	3.15	3.33	3.59	3.81	4.03	4.95	5.92*
	40	3.15	3.29	3.49	3.72	3.95	4.18	4.55	4.86	5.18	6.50	7.96*
	60	3.57	3.76	4.02	4.29	4.58	4.88	5.34	5.74	6.14	7.87	9.76*
	80	3.93	4.17	4.47	4.80	5.14	5.50	6.05	6.54	7.03	9.14	11.43*
	100	4.24	4.53	4.88	5.26	5.66	6.07	6.72	7.29	7.87	10.34	13.01*
	120	4.53	4.86	5.25	5.69	6.14	6.62	7.36	8.00	8.67	11.48	14.52*
	140	4.79	5.16	5.61	6.09	6.60	7.14	7.97	8.69	9.44	12.59	15.97*
300	10	2.37	2.44	2.56	2.69	2.84	2.98	3.19	3.37	3.55	4.27	5.01*
	20	2.85	2.95	3.10	3.27	3.45	3.63	3.90	4.13	4.36	5.29	6.28*
	40	3.49	3.64	3.85	4.07	4.31	4.55	4.92	5.24	5.56	6.87	8.32*
	60	3.97	4.16	4.42	4.70	4.99	5.29	5.75	6.14	6.54	8.24	10.10*
	80	4.36	4.60	4.90	5.23	5.58	5.93	6.48	6.95	7.44	9.49	11.76*
	100	4.71	4.99	5.34	5.72	6.11	6.52	7.15	7.70	8.27	10.68	13.32*
	120	5.03	5.35	5.74	6.16	6.61	7.07	7.79	8.42	9.06	11.81	14.82*
	140	5.32	5.68	6.11	6.58	7.08	7.59	8.40	9.10	9.82	12.90	16.25*
400	10	2.53	2.61	2.74	2.88	3.02	3.17	3.40	3.58	3.77	4.51	5.28*
	20	3.06	3.17	3.33	3.50	3.69	3.88	4.16	4.39	4.63	5.58	6.59*
	40	3.77	3.92	4.14	4.37	4.61	4.86	5.24	5.56	5.88	7.21	8.65*
	60	4.29	4.49	4.75	5.03	5.33	5.63	6.10	6.50	6.90	8.58	10.43*
	80	4.72	4.96	5.27	5.60	5.95	6.30	6.85	7.32	7.80	9.83	12.07*
	100	5.10	5.38	5.73	6.10	6.50	6.91	7.54	8.08	8.64	11.00	13.62*
	120	5.44	5.75	6.15	6.57	7.01	7.47	8.18	8.80	9.43	12.13	15.11*
	140	5.75	6.10	6.54	7.01	7.50	8.00	8.80	9.48	10.19	13.21	16.54*
600	10	2.80	2.89	3.02	3.17	3.33	3.49	3.73	3.93	4.12	4.90	5.71*
	20	3.41	3.52	3.69	3.88	4.08	4.28	4.58	4.83	5.08	6.06	7.12*
	40	4.22	4.38	4.60	4.85	5.11	5.37	5.77	6.10	6.43	7.78	9.25*
	60	4.81	5.01	5.29	5.58	5.89	6.21	6.69	7.09	7.50	9.19	11.04*
	80	5.30	5.54	5.86	6.20	6.56	6.93	7.49	7.96	8.44	10.45	12.68*
	100	5.72	6.00	6.36	6.75	7.15	7.57	8.20	8.75	9.30	11.63	14.21*
	120	6.10	6.42	6.82	7.25	7.70	8.16	8.87	9.48	10.10	12.74	15.68*
	140	6.45	6.80	7.24	7.71	8.21	8.72	9.50	10.18	10.87	13.81	17.09*
800	10	3.02	3.11	3.25	3.41	3.58	3.74	3.99	4.20	4.41	5.22	6.07*
	20	3.69	3.81	3.99	4.19	4.40	4.60	4.92	5.18	5.44	6.47	7.56*
	40	4.58	4.75	4.99	5.25	5.51	5.79	6.20	6.54	6.89	8.27	9.78*
	60	5.23	5.44	5.73	6.04	6.36	6.68	7.18	7.60	8.02	9.72	11.60*
	80	5.77	6.02	6.34	6.70	7.07	7.45	8.02	8.50	8.99	11.01	13.24*
	100	6.23	6.52	6.89	7.29	7.70	8.12	8.77	9.32	9.88	12.20	14.77*
	120	6.64	6.97	7.38	7.82	8.27	8.74	9.46	10.08	10.70	13.32	16.23*
	140	7.02	7.38	7.83	8.31	8.81	9.32	10.11	10.79	11.48	14.39	17.63*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.68	1.88	2.10	2.34	2.57	2.81	3.16	3.47	3.77	5.00	6.26*
	20	2.07	2.40	2.73	3.07	3.41	3.75	4.27	4.71	5.15	6.95	8.80*
	40	2.73	3.27	3.79	4.31	4.83	5.35	6.13	6.80	7.47	10.22	13.07*
	60	3.31	4.03	4.72	5.39	6.07	6.74	7.77	8.63	9.50	13.08	16.81*
	80	3.84	4.73	5.57	6.39	7.21	8.03	9.27	10.31	11.37	15.71	20.25*
	100	4.34	5.39	6.37	7.33	8.28	9.23	10.67	11.89	13.12	18.19	23.48*
	120	4.82	6.02	7.13	8.21	9.29	10.38	12.01	13.39	14.79	20.54	26.55*
	140	5.27	6.62	7.86	9.07	10.27	11.47	13.30	14.83	16.38	22.79	29.49*
25	10	2.15	2.27	2.45	2.64	2.85	3.06	3.39	3.67	3.96	5.16	6.40*
	20	2.56	2.77	3.04	3.34	3.65	3.97	4.46	4.88	5.31	7.08	8.92*
	40	3.20	3.60	4.06	4.54	5.03	5.53	6.30	6.95	7.60	10.32	13.17*
	60	3.75	4.34	4.96	5.60	6.25	6.91	7.91	8.76	9.62	13.18	16.90*
	80	4.26	5.02	5.80	6.58	7.38	8.18	9.40	10.44	11.48	15.81	20.33*
	100	4.74	5.66	6.58	7.51	8.44	9.38	10.80	12.01	13.23	18.27	23.56*
	120	5.20	6.27	7.34	8.39	9.45	10.52	12.14	13.50	14.89	20.62	26.62*
	140	5.64	6.87	8.06	9.24	10.42	11.61	13.41	14.94	16.49	22.87	29.56*
50	10	2.40	2.52	2.68	2.87	3.07	3.28	3.59	3.87	4.15	5.31	6.54*
	20	2.87	3.06	3.31	3.58	3.87	4.18	4.65	5.06	5.47	7.20	9.03*
	40	3.56	3.90	4.31	4.76	5.23	5.71	6.46	7.09	7.74	10.43	13.27*
	60	4.12	4.63	5.20	5.81	6.43	7.07	8.06	8.90	9.75	13.28	16.99*
	80	4.63	5.29	6.02	6.78	7.55	8.34	9.54	10.56	11.60	15.90	20.42*
	100	5.11	5.93	6.80	7.69	8.60	9.52	10.93	12.13	13.34	18.36	23.63*
	120	5.56	6.53	7.54	8.57	9.60	10.66	12.26	13.62	15.00	20.70	26.70*
	140	5.99	7.11	8.25	9.41	10.57	11.74	13.53	15.05	16.59	22.95	29.63*
100	10	2.74	2.85	3.02	3.21	3.41	3.62	3.93	4.20	4.47	5.60	6.80*
	20	3.29	3.47	3.71	3.97	4.25	4.54	5.00	5.38	5.78	7.46	9.26*
	40	4.07	4.38	4.76	5.17	5.61	6.06	6.77	7.38	8.01	10.65	13.46*
	60	4.69	5.13	5.64	6.20	6.79	7.40	8.35	9.16	10.00	13.48	17.17*
	80	5.23	5.80	6.45	7.15	7.88	8.64	9.81	10.81	11.83	16.08	20.58*
	100	5.72	6.42	7.21	8.05	8.92	9.81	11.19	12.36	13.56	18.53	23.79*
	120	6.18	7.02	7.94	8.91	9.91	10.93	12.50	13.84	15.20	20.87	26.84*
	140	6.62	7.59	8.64	9.74	10.86	12.01	13.77	15.27	16.79	23.11	29.78*
150	10	2.98	3.09	3.27	3.46	3.67	3.88	4.20	4.47	4.74	5.86	7.06*
	20	3.60	3.77	4.02	4.28	4.56	4.85	5.30	5.68	6.07	7.71	9.49*
	40	4.46	4.75	5.12	5.52	5.94	6.38	7.07	7.67	8.28	10.87	13.66*
	60	5.13	5.54	6.03	6.56	7.12	7.71	8.63	9.42	10.24	13.67	17.34*
	80	5.70	6.23	6.84	7.51	8.21	8.94	10.07	11.05	12.06	16.27	20.75*
	100	6.22	6.86	7.60	8.40	9.23	10.10	11.44	12.59	13.77	18.71	23.95*
	120	6.70	7.46	8.32	9.25	10.21	11.21	12.75	14.07	15.41	21.04	26.99*
	140	7.15	8.03	9.02	10.07	11.15	12.27	14.00	15.48	16.99	23.27	29.92*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.18	3.29	3.47	3.67	3.88	4.10	4.42	4.69	4.97	6.09	7.30*
	20	3.85	4.03	4.27	4.54	4.82	5.11	5.56	5.94	6.33	7.95	9.71*
	40	4.78	5.07	5.43	5.83	6.24	6.68	7.35	7.93	8.53	11.08	13.85*
	60	5.49	5.89	6.37	6.89	7.44	8.01	8.90	9.68	10.48	13.87	17.52*
	80	6.10	6.60	7.19	7.84	8.52	9.23	10.34	11.30	12.28	16.45	20.91*
	100	6.64	7.25	7.96	8.73	9.53	10.38	11.69	12.83	13.99	18.88	24.10*
	120	7.14	7.86	8.68	9.57	10.51	11.48	12.99	14.29	15.62	21.20	27.14*
	140	7.61	8.43	9.38	10.38	11.44	12.54	14.24	15.69	17.19	23.43	30.06*
300	10	3.49	3.62	3.80	4.01	4.23	4.45	4.79	5.07	5.36	6.50	7.72*
	20	4.26	4.44	4.69	4.97	5.26	5.55	6.01	6.39	6.78	8.39	10.14*
	40	5.30	5.58	5.95	6.35	6.76	7.19	7.86	8.43	9.01	11.50	14.23*
	60	6.09	6.47	6.94	7.45	7.99	8.55	9.42	10.17	10.95	14.25	17.87*
	80	6.75	7.23	7.81	8.43	9.09	9.77	10.84	11.77	12.73	16.81	21.24*
	100	7.34	7.91	8.59	9.33	10.10	10.91	12.18	13.28	14.42	19.23	24.41*
	120	7.88	8.55	9.33	10.18	11.07	12.00	13.46	14.73	16.03	21.53	27.44*
	140	8.37	9.14	10.03	10.99	12.00	13.05	14.70	16.12	17.58	23.75	30.35*
400	10	3.75	3.88	4.07	4.29	4.52	4.75	5.10	5.39	5.68	6.85	8.09*
	20	4.59	4.77	5.03	5.32	5.62	5.92	6.38	6.78	7.17	8.78	10.54*
	40	5.72	6.01	6.38	6.78	7.20	7.63	8.30	8.87	9.45	11.90	14.61*
	60	6.57	6.95	7.43	7.94	8.47	9.02	9.88	10.62	11.39	14.63	18.22*
	80	7.29	7.76	8.33	8.94	9.59	10.26	11.31	12.22	13.16	17.17	21.56*
	100	7.92	8.47	9.14	9.86	10.62	11.41	12.65	13.72	14.83	19.57	24.72*
	120	8.49	9.13	9.90	10.72	11.59	12.50	13.92	15.16	16.43	21.86	27.73*
	140	9.01	9.75	10.61	11.54	12.52	13.54	15.15	16.54	17.98	24.06	30.63*
600	10	4.17	4.30	4.51	4.74	4.98	5.23	5.59	5.90	6.21	7.42	8.72*
	20	5.12	5.32	5.59	5.89	6.21	6.53	7.01	7.41	7.82	9.47	11.25*
	40	6.41	6.70	7.08	7.50	7.93	8.38	9.05	9.63	10.21	12.64	15.33*
	60	7.37	7.74	8.23	8.75	9.29	9.84	10.70	11.44	12.19	15.36	18.90*
	80	8.16	8.63	9.20	9.82	10.46	11.13	12.16	13.05	13.97	17.87	22.20*
	100	8.86	9.40	10.07	10.78	11.53	12.31	13.51	14.56	15.63	20.24	25.33*
	120	9.49	10.11	10.87	11.68	12.53	13.41	14.79	15.98	17.22	22.51	28.32*
	140	10.06	10.77	11.61	12.52	13.47	14.46	16.01	17.35	18.74	24.69	31.20*
800	10	4.50	4.64	4.86	5.11	5.36	5.62	6.00	6.32	6.64	7.90	9.25*
	20	5.56	5.76	6.05	6.36	6.69	7.02	7.52	7.94	8.36	10.05	11.88*
	40	6.97	7.26	7.66	8.09	8.54	8.99	9.69	10.27	10.87	13.31	16.00*
	60	8.01	8.39	8.89	9.42	9.97	10.54	11.41	12.14	12.90	16.05	19.55*
	80	8.87	9.34	9.92	10.55	11.20	11.87	12.91	13.80	14.70	18.55	22.84*
	100	9.63	10.17	10.84	11.56	12.31	13.09	14.28	15.32	16.38	20.90	25.94*
	120	10.31	10.93	11.68	12.49	13.34	14.21	15.57	16.75	17.96	23.15	28.90*
	140	10.93	11.63	12.46	13.36	14.30	15.28	16.80	18.12	19.48	25.31	31.76*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.61	3.00	3.40	3.82	4.23	4.65	5.28	5.81	6.35	8.54	10.80*
	20	3.39	4.03	4.66	5.29	5.91	6.54	7.50	8.30	9.11	12.43	15.87*
	40	4.71	5.77	6.78	7.76	8.75	9.73	11.22	12.48	13.75	18.97	24.41*
	60	5.87	7.30	8.63	9.93	11.23	12.52	14.49	16.14	17.81	24.70	31.90*
	80	6.94	8.70	10.33	11.93	13.51	15.09	17.48	19.50	21.55	29.97	38.77*
	100	7.93	10.02	11.93	13.80	15.65	17.50	20.30	22.66	25.05	34.91	45.23*
	120	8.88	11.27	13.45	15.58	17.68	19.79	22.98	25.66	28.38	39.61	51.37*
	140	9.79	12.47	14.91	17.28	19.63	21.99	25.54	28.54	31.58	44.12	57.25*
25	10	3.19	3.44	3.77	4.14	4.51	4.91	5.51	6.02	6.54	8.69	10.93*
	20	3.95	4.43	4.98	5.56	6.16	6.76	7.69	8.47	9.27	12.56	15.99*
	40	5.21	6.11	7.05	7.99	8.95	9.91	11.38	12.62	13.88	19.08	24.51*
	60	6.32	7.61	8.88	10.14	11.41	12.69	14.63	16.27	17.94	24.80	31.99*
	80	7.36	8.99	10.56	12.12	13.68	15.25	17.62	19.63	21.66	30.06	38.86*
	100	8.33	10.29	12.15	13.98	15.81	17.65	20.43	22.78	25.16	35.00	45.31*
	120	9.27	11.53	13.66	15.75	17.84	19.93	23.10	25.78	28.49	39.69	51.44*
	140	10.16	12.72	15.11	17.45	19.78	22.12	25.66	28.65	31.68	44.20	57.32*
50	10	3.55	3.78	4.09	4.42	4.78	5.15	5.73	6.23	6.73	8.85	11.07*
	20	4.37	4.78	5.28	5.83	6.39	6.98	7.88	8.65	9.43	12.69	16.11*
	40	5.65	6.44	7.31	8.22	9.15	10.10	11.54	12.77	14.02	19.19	24.61*
	60	6.75	7.91	9.12	10.35	11.60	12.86	14.78	16.41	18.06	24.90	32.08*
	80	7.77	9.27	10.79	12.31	13.85	15.40	17.76	19.75	21.78	30.15	38.94*
	100	8.73	10.56	12.36	14.16	15.97	17.79	20.56	22.90	25.27	35.08	45.39*
	120	9.64	11.79	13.87	15.93	17.99	20.07	23.22	25.89	28.59	39.78	51.51*
	140	10.53	12.97	15.31	17.62	19.93	22.26	25.78	28.76	31.78	44.28	57.39*
100	10	4.05	4.27	4.56	4.89	5.23	5.59	6.14	6.62	7.10	9.15	11.35*
	20	4.99	5.35	5.81	6.31	6.84	7.39	8.25	8.99	9.76	12.95	16.34*
	40	6.37	7.04	7.83	8.67	9.55	10.46	11.86	13.07	14.29	19.41	24.81*
	60	7.50	8.49	9.60	10.76	11.96	13.19	15.07	16.68	18.31	25.10	32.25*
	80	8.51	9.83	11.24	12.70	14.19	15.71	18.03	20.00	22.01	30.34	39.11*
	100	9.46	11.09	12.79	14.53	16.29	18.08	20.82	23.13	25.49	35.26	45.54*
	120	10.37	12.30	14.27	16.28	18.30	20.35	23.47	26.12	28.80	39.94	51.66*
	140	11.23	13.46	15.70	17.96	20.23	22.52	26.02	28.98	31.98	44.44	57.54*
150	10	4.42	4.63	4.93	5.26	5.60	5.95	6.50	6.97	7.44	9.45	11.62*
	20	5.45	5.80	6.24	6.73	7.24	7.78	8.61	9.33	10.07	13.20	16.57*
	40	6.93	7.55	8.29	9.09	9.94	10.81	12.18	13.36	14.57	19.62	25.00*
	60	8.11	9.02	10.05	11.16	12.32	13.51	15.36	16.94	18.56	25.30	32.43*
	80	9.16	10.35	11.68	13.08	14.53	16.01	18.30	20.25	22.24	30.52	39.27*
	100	10.12	11.60	13.21	14.89	16.61	18.37	21.07	23.37	25.71	35.43	45.70*
	120	11.02	12.79	14.68	16.62	18.61	20.63	23.71	26.34	29.01	40.11	51.81*
	140	11.89	13.94	16.09	18.29	20.52	22.79	26.25	29.20	32.19	44.60	57.68*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.72	4.93	5.23	5.56	5.91	6.27	6.81	7.28	7.75	9.73	11.88*
	20	5.83	6.17	6.61	7.09	7.60	8.13	8.94	9.65	10.38	13.46	16.80*
	40	7.40	7.99	8.71	9.48	10.30	11.16	12.49	13.65	14.84	19.84	25.20*
	60	8.63	9.49	10.48	11.55	12.67	13.83	15.65	17.20	18.80	25.49	32.61*
	80	9.71	10.83	12.10	13.45	14.86	16.31	18.57	20.50	22.47	30.70	39.44*
	100	10.70	12.08	13.62	15.25	16.93	18.66	21.33	23.60	25.93	35.61	45.85*
	120	11.62	13.27	15.08	16.96	18.91	20.90	23.96	26.57	29.22	40.28	51.96*
	140	12.49	14.41	16.48	18.62	20.82	23.06	26.49	29.41	32.39	44.76	57.83*
300	10	5.21	5.42	5.73	6.07	6.43	6.79	7.35	7.82	8.29	10.25	12.39*
	20	6.45	6.78	7.23	7.71	8.22	8.74	9.54	10.24	10.95	13.95	17.25*
	40	8.17	8.74	9.44	10.19	10.98	11.80	13.09	14.21	15.37	20.27	25.58*
	60	9.51	10.31	11.25	12.27	13.34	14.46	16.21	17.73	19.29	25.88	32.96*
	80	10.66	11.69	12.88	14.16	15.51	16.91	19.10	20.99	22.93	31.07	39.76*
	100	11.69	12.96	14.40	15.94	17.55	19.23	21.83	24.07	26.36	35.95	46.17*
	120	12.65	14.16	15.84	17.64	19.51	21.45	24.44	27.01	29.64	40.61	52.26*
	140	13.55	15.30	17.23	19.28	21.40	23.59	26.96	29.84	32.79	45.08	58.11*
400	10	5.60	5.82	6.14	6.49	6.86	7.23	7.79	8.27	8.75	10.72	12.87*
	20	6.95	7.29	7.74	8.23	8.74	9.26	10.07	10.76	11.47	14.43	17.70*
	40	8.81	9.37	10.06	10.80	11.58	12.39	13.65	14.75	15.88	20.70	25.97*
	60	10.24	11.01	11.93	12.92	13.96	15.05	16.76	18.24	19.77	26.27	33.31*
	80	11.45	12.44	13.58	14.82	16.13	17.49	19.62	21.47	23.38	31.43	40.09*
	100	12.53	13.74	15.12	16.60	18.16	19.79	22.33	24.53	26.79	36.30	46.48*
	120	13.53	14.95	16.56	18.29	20.10	21.99	24.93	27.46	30.05	40.94	52.56*
	140	14.46	16.10	17.95	19.91	21.97	24.11	27.42	30.27	33.19	45.40	58.40*
600	10	6.24	6.47	6.80	7.17	7.56	7.94	8.53	9.03	9.53	11.54	13.71*
	20	7.77	8.11	8.58	9.08	9.61	10.15	10.97	11.66	12.37	15.31	18.56*
	40	9.85	10.40	11.09	11.84	12.62	13.42	14.67	15.74	16.84	21.53	26.74*
	60	11.43	12.17	13.08	14.05	15.07	16.13	17.79	19.22	20.70	27.05	34.01*
	80	12.75	13.70	14.81	16.00	17.26	18.58	20.63	22.42	24.27	32.16	40.75*
	100	13.93	15.06	16.38	17.80	19.30	20.86	23.31	25.44	27.64	36.99	47.10*
	120	15.00	16.33	17.86	19.50	21.23	23.04	25.88	28.34	30.87	41.60	53.15*
	140	16.00	17.52	19.26	21.12	23.09	25.14	28.34	31.12	33.98	46.03	58.97*
800	10	6.75	6.99	7.34	7.73	8.13	8.53	9.15	9.66	10.17	12.23	14.46*
	20	8.43	8.78	9.27	9.79	10.33	10.88	11.72	12.43	13.15	16.10	19.36*
	40	10.70	11.25	11.95	12.71	13.50	14.31	15.55	16.62	17.71	22.34	27.49*
	60	12.40	13.14	14.05	15.02	16.04	17.09	18.72	20.13	21.59	27.81	34.70*
	80	13.83	14.75	15.85	17.04	18.28	19.56	21.58	23.33	25.13	32.88	41.39*
	100	15.08	16.19	17.48	18.87	20.34	21.86	24.25	26.33	28.48	37.67	47.71*
	120	16.22	17.51	19.00	20.60	22.28	24.04	26.80	29.20	31.68	42.25	53.74*
	140	17.28	18.74	20.42	22.23	24.13	26.12	29.25	31.96	34.76	46.67	59.54*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.82	0.88	0.95	1.03	1.12	1.20	1.33	1.44	1.55	1.99	2.43*
	20	0.93	1.01	1.12	1.23	1.34	1.45	1.62	1.76	1.90	2.49	3.08*
	40	1.10	1.24	1.40	1.55	1.71	1.86	2.10	2.30	2.50	3.32	4.17*
	60	1.26	1.45	1.64	1.83	2.03	2.23	2.52	2.78	3.03	4.06	5.12*
	80	1.40	1.63	1.86	2.10	2.33	2.56	2.91	3.21	3.51	4.73	6.00*
	100	1.53	1.80	2.07	2.34	2.61	2.87	3.28	3.62	3.96	5.37	6.82*
	120	1.66	1.97	2.27	2.57	2.87	3.17	3.63	4.01	4.39	5.97	7.61*
	140	1.78	2.13	2.47	2.80	3.13	3.46	3.96	4.38	4.80	6.55	8.36*
25	10	1.10	1.13	1.19	1.26	1.33	1.41	1.53	1.63	1.73	2.14	2.56*
	20	1.24	1.29	1.37	1.46	1.55	1.65	1.80	1.93	2.07	2.62	3.19*
	40	1.45	1.53	1.64	1.77	1.91	2.05	2.26	2.45	2.64	3.44	4.26*
	60	1.61	1.73	1.88	2.04	2.21	2.39	2.67	2.91	3.15	4.16	5.21*
	80	1.76	1.90	2.09	2.29	2.50	2.72	3.05	3.34	3.63	4.83	6.08*
	100	1.89	2.07	2.29	2.53	2.77	3.02	3.41	3.74	4.07	5.46	6.90*
	120	2.01	2.23	2.48	2.75	3.03	3.31	3.75	4.12	4.50	6.05	7.68*
	140	2.13	2.38	2.67	2.97	3.28	3.60	4.08	4.49	4.91	6.63	8.43*
50	10	1.21	1.24	1.31	1.38	1.45	1.53	1.65	1.75	1.86	2.27	2.69*
	20	1.39	1.44	1.51	1.60	1.70	1.80	1.95	2.08	2.21	2.74	3.30*
	40	1.64	1.71	1.82	1.94	2.07	2.20	2.41	2.59	2.78	3.54	4.36*
	60	1.82	1.92	2.06	2.22	2.38	2.55	2.82	3.04	3.28	4.26	5.30*
	80	1.98	2.11	2.28	2.47	2.66	2.87	3.19	3.46	3.74	4.92	6.16*
	100	2.13	2.28	2.48	2.70	2.93	3.17	3.54	3.86	4.18	5.54	6.98*
	120	2.26	2.44	2.67	2.92	3.18	3.45	3.87	4.24	4.60	6.14	7.75*
	140	2.38	2.60	2.85	3.13	3.43	3.73	4.20	4.60	5.01	6.71	8.50*
100	10	1.36	1.40	1.46	1.54	1.62	1.70	1.83	1.93	2.04	2.46	2.89*
	20	1.58	1.63	1.71	1.81	1.90	2.01	2.16	2.29	2.42	2.96	3.51*
	40	1.88	1.95	2.06	2.19	2.32	2.45	2.66	2.83	3.01	3.75	4.55*
	60	2.11	2.20	2.34	2.49	2.65	2.81	3.07	3.29	3.51	4.46	5.47*
	80	2.29	2.41	2.57	2.75	2.94	3.13	3.44	3.70	3.97	5.11	6.33*
	100	2.46	2.60	2.79	2.99	3.21	3.43	3.78	4.09	4.40	5.72	7.13*
	120	2.61	2.77	2.99	3.22	3.46	3.72	4.11	4.46	4.81	6.31	7.90*
	140	2.75	2.94	3.17	3.43	3.70	3.99	4.43	4.82	5.21	6.87	8.64*
150	10	1.47	1.51	1.58	1.66	1.74	1.83	1.96	2.07	2.17	2.61	3.05*
	20	1.72	1.77	1.86	1.95	2.06	2.16	2.32	2.46	2.59	3.13	3.69*
	40	2.06	2.13	2.25	2.37	2.51	2.64	2.85	3.03	3.21	3.94	4.73*
	60	2.31	2.41	2.55	2.70	2.86	3.02	3.28	3.49	3.72	4.64	5.64*
	80	2.52	2.64	2.80	2.98	3.16	3.36	3.66	3.91	4.18	5.28	6.49*
	100	2.71	2.84	3.03	3.23	3.44	3.66	4.01	4.30	4.60	5.89	7.29*
	120	2.87	3.03	3.24	3.46	3.70	3.95	4.34	4.67	5.01	6.47	8.05*
	140	3.02	3.20	3.43	3.68	3.95	4.22	4.65	5.02	5.41	7.03	8.78*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.56	1.60	1.67	1.75	1.84	1.93	2.06	2.17	2.29	2.73	3.18*
	20	1.84	1.89	1.98	2.08	2.18	2.29	2.45	2.59	2.73	3.28	3.85*
	40	2.21	2.28	2.40	2.53	2.66	2.80	3.01	3.19	3.37	4.11	4.90*
	60	2.48	2.58	2.72	2.87	3.03	3.20	3.46	3.68	3.90	4.82	5.81*
	80	2.71	2.83	2.99	3.17	3.36	3.55	3.85	4.10	4.36	5.46	6.65*
	100	2.91	3.04	3.23	3.43	3.64	3.86	4.20	4.50	4.80	6.06	7.44*
	120	3.09	3.24	3.45	3.67	3.91	4.16	4.54	4.87	5.20	6.64	8.19*
	140	3.25	3.43	3.65	3.90	4.16	4.43	4.86	5.22	5.60	7.19	8.92*
300	10	1.70	1.74	1.82	1.90	2.00	2.09	2.23	2.35	2.47	2.93	3.40*
	20	2.02	2.07	2.17	2.27	2.38	2.50	2.67	2.81	2.96	3.53	4.12*
	40	2.44	2.52	2.64	2.78	2.92	3.06	3.28	3.47	3.66	4.41	5.20*
	60	2.76	2.85	3.00	3.16	3.33	3.50	3.76	3.98	4.21	5.13	6.12*
	80	3.01	3.13	3.30	3.48	3.67	3.87	4.17	4.43	4.69	5.78	6.95*
	100	3.23	3.37	3.56	3.77	3.98	4.20	4.55	4.84	5.13	6.38	7.73*
	120	3.43	3.59	3.80	4.03	4.27	4.51	4.89	5.22	5.55	6.95	8.48*
	140	3.62	3.79	4.02	4.27	4.53	4.80	5.22	5.58	5.94	7.50	9.20*
400	10	1.82	1.86	1.94	2.03	2.12	2.22	2.37	2.49	2.61	3.09	3.58*
	20	2.17	2.22	2.32	2.43	2.55	2.67	2.85	3.00	3.14	3.73	4.34*
	40	2.63	2.71	2.84	2.98	3.13	3.28	3.51	3.70	3.89	4.66	5.47*
	60	2.98	3.08	3.23	3.39	3.57	3.74	4.01	4.24	4.47	5.40	6.40*
	80	3.26	3.38	3.55	3.74	3.94	4.14	4.45	4.71	4.97	6.06	7.23*
	100	3.50	3.64	3.83	4.04	4.26	4.49	4.84	5.13	5.43	6.67	8.01*
	120	3.72	3.87	4.09	4.32	4.56	4.81	5.20	5.52	5.85	7.24	8.76*
	140	3.92	4.09	4.32	4.58	4.84	5.11	5.53	5.89	6.26	7.79	9.47*
600	10	2.00	2.04	2.13	2.23	2.33	2.43	2.59	2.72	2.85	3.36	3.88*
	20	2.41	2.47	2.57	2.69	2.81	2.94	3.13	3.29	3.45	4.07	4.71*
	40	2.94	3.03	3.16	3.31	3.47	3.63	3.87	4.07	4.27	5.08	5.91*
	60	3.33	3.44	3.60	3.77	3.96	4.14	4.43	4.67	4.91	5.87	6.88*
	80	3.65	3.78	3.96	4.16	4.37	4.58	4.90	5.17	5.45	6.56	7.74*
	100	3.93	4.07	4.27	4.50	4.73	4.96	5.32	5.63	5.93	7.18	8.53*
	120	4.18	4.34	4.56	4.80	5.05	5.31	5.71	6.04	6.38	7.77	9.28*
	140	4.40	4.58	4.82	5.08	5.35	5.63	6.06	6.43	6.80	8.33	9.99*
800	10	2.15	2.20	2.29	2.39	2.50	2.61	2.77	2.91	3.05	3.58	4.12*
	20	2.60	2.66	2.77	2.90	3.03	3.16	3.36	3.53	3.70	4.35	5.02*
	40	3.19	3.28	3.42	3.58	3.74	3.91	4.17	4.38	4.59	5.42	6.29*
	60	3.62	3.73	3.90	4.08	4.28	4.47	4.77	5.02	5.27	6.26	7.30*
	80	3.97	4.10	4.29	4.50	4.72	4.94	5.28	5.56	5.84	6.98	8.19*
	100	4.28	4.42	4.64	4.87	5.11	5.35	5.72	6.04	6.35	7.63	8.99*
	120	4.55	4.71	4.94	5.19	5.46	5.72	6.13	6.47	6.82	8.23	9.75*
	140	4.79	4.97	5.22	5.50	5.78	6.07	6.51	6.88	7.25	8.80	10.47*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.19	1.29	1.42	1.55	1.69	1.83	2.04	2.22	2.40	3.12	3.85*
	20	1.40	1.57	1.75	1.94	2.13	2.33	2.62	2.86	3.11	4.12	5.15*
	40	1.75	2.03	2.31	2.59	2.87	3.15	3.58	3.94	4.31	5.79	7.33*
	60	2.06	2.43	2.80	3.16	3.52	3.88	4.43	4.89	5.36	7.26	9.24*
	80	2.34	2.80	3.24	3.68	4.11	4.55	5.21	5.76	6.32	8.61	10.99*
	100	2.61	3.15	3.66	4.17	4.67	5.18	5.94	6.58	7.23	9.88	12.64*
	120	2.86	3.48	4.06	4.64	5.20	5.77	6.63	7.36	8.09	11.08	14.20*
	140	3.10	3.80	4.45	5.08	5.71	6.35	7.30	8.10	8.91	12.24	15.71*
25	10	1.57	1.62	1.72	1.83	1.95	2.07	2.26	2.43	2.59	3.28	3.99*
	20	1.81	1.91	2.05	2.20	2.37	2.54	2.81	3.04	3.28	4.25	5.26*
	40	2.18	2.35	2.58	2.82	3.08	3.34	3.75	4.10	4.45	5.90	7.42*
	60	2.48	2.74	3.04	3.37	3.71	4.05	4.58	5.03	5.48	7.36	9.33*
	80	2.75	3.09	3.48	3.88	4.29	4.71	5.35	5.89	6.44	8.71	11.07*
	100	3.00	3.42	3.88	4.36	4.84	5.33	6.07	6.70	7.34	9.97	12.72*
	120	3.24	3.74	4.27	4.82	5.36	5.92	6.76	7.47	8.19	11.17	14.28*
	140	3.47	4.05	4.65	5.26	5.87	6.48	7.42	8.21	9.01	12.32	15.78*
50	10	1.74	1.80	1.89	2.01	2.12	2.25	2.44	2.60	2.76	3.42	4.12*
	20	2.03	2.12	2.25	2.40	2.56	2.73	2.99	3.21	3.43	4.38	5.38*
	40	2.45	2.60	2.80	3.03	3.27	3.52	3.91	4.24	4.59	6.02	7.52*
	60	2.77	2.99	3.27	3.57	3.89	4.22	4.73	5.16	5.61	7.46	9.41*
	80	3.06	3.35	3.70	4.07	4.46	4.86	5.48	6.02	6.56	8.80	11.16*
	100	3.32	3.68	4.10	4.54	5.00	5.47	6.20	6.82	7.45	10.06	12.79*
	120	3.56	3.99	4.48	4.99	5.52	6.06	6.88	7.59	8.30	11.25	14.35*
	140	3.80	4.30	4.85	5.43	6.02	6.62	7.54	8.32	9.12	12.40	15.85*
100	10	1.97	2.03	2.13	2.25	2.37	2.50	2.69	2.85	3.01	3.68	4.37*
	20	2.33	2.41	2.55	2.70	2.86	3.02	3.28	3.49	3.71	4.63	5.60*
	40	2.82	2.96	3.15	3.37	3.60	3.84	4.21	4.53	4.85	6.23	7.72*
	60	3.19	3.39	3.64	3.92	4.22	4.53	5.01	5.43	5.86	7.66	9.59*
	80	3.51	3.76	4.08	4.42	4.79	5.16	5.75	6.27	6.79	8.99	11.32*
	100	3.80	4.11	4.48	4.89	5.32	5.76	6.46	7.06	7.67	10.23	12.95*
	120	4.06	4.43	4.86	5.33	5.82	6.34	7.13	7.81	8.51	11.42	14.50*
	140	4.31	4.73	5.23	5.76	6.31	6.89	7.78	8.54	9.32	12.57	15.99*
150	10	2.14	2.20	2.30	2.42	2.55	2.68	2.88	3.05	3.21	3.89	4.58*
	20	2.54	2.63	2.76	2.92	3.08	3.25	3.51	3.73	3.95	4.85	5.82*
	40	3.09	3.23	3.42	3.64	3.87	4.10	4.47	4.78	5.10	6.45	7.91*
	60	3.50	3.69	3.94	4.22	4.51	4.81	5.27	5.68	6.10	7.86	9.76*
	80	3.85	4.09	4.40	4.73	5.08	5.44	6.01	6.51	7.02	9.17	11.48*
	100	4.16	4.45	4.81	5.20	5.61	6.04	6.71	7.29	7.89	10.41	13.11*
	120	4.45	4.78	5.20	5.64	6.11	6.60	7.37	8.04	8.72	11.59	14.65*
	140	4.71	5.10	5.56	6.07	6.60	7.15	8.01	8.76	9.52	12.73	16.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.27	2.33	2.44	2.57	2.70	2.83	3.04	3.21	3.38	4.06	4.77*
	20	2.71	2.80	2.94	3.10	3.27	3.44	3.70	3.92	4.15	5.06	6.02*
	40	3.31	3.45	3.65	3.86	4.09	4.33	4.69	5.01	5.32	6.65	8.10*
	60	3.76	3.94	4.19	4.47	4.75	5.05	5.51	5.91	6.32	8.06	9.94*
	80	4.13	4.37	4.67	4.99	5.34	5.70	6.26	6.74	7.24	9.36	11.65*
	100	4.46	4.74	5.09	5.47	5.88	6.29	6.95	7.52	8.10	10.58	13.26*
	120	4.76	5.09	5.49	5.92	6.38	6.86	7.61	8.26	8.93	11.76	14.80*
	140	5.04	5.41	5.86	6.35	6.87	7.40	8.24	8.97	9.72	12.89	16.28*
300	10	2.49	2.55	2.67	2.80	2.94	3.08	3.29	3.47	3.65	4.36	5.09*
	20	2.99	3.08	3.23	3.40	3.57	3.75	4.02	4.25	4.48	5.41	6.38*
	40	3.67	3.81	4.01	4.24	4.47	4.71	5.08	5.40	5.71	7.03	8.46*
	60	4.17	4.36	4.61	4.89	5.18	5.47	5.94	6.33	6.73	8.43	10.28*
	80	4.59	4.82	5.12	5.45	5.79	6.14	6.69	7.17	7.65	9.71	11.97*
	100	4.96	5.23	5.57	5.95	6.34	6.75	7.39	7.94	8.51	10.93	13.57*
	120	5.29	5.60	5.99	6.42	6.86	7.33	8.05	8.68	9.33	12.09	15.09*
	140	5.59	5.95	6.38	6.86	7.35	7.87	8.68	9.39	10.12	13.21	16.56*
400	10	2.67	2.73	2.85	2.99	3.13	3.28	3.50	3.69	3.87	4.60	5.35*
	20	3.22	3.32	3.47	3.64	3.82	4.01	4.29	4.52	4.76	5.70	6.69*
	40	3.96	4.10	4.31	4.54	4.78	5.03	5.41	5.73	6.05	7.37	8.79*
	60	4.51	4.70	4.95	5.23	5.53	5.83	6.30	6.69	7.10	8.78	10.61*
	80	4.96	5.19	5.49	5.82	6.17	6.53	7.08	7.55	8.03	10.06	12.28*
	100	5.36	5.63	5.97	6.35	6.75	7.16	7.79	8.33	8.89	11.27	13.87*
	120	5.72	6.02	6.41	6.84	7.28	7.74	8.46	9.07	9.71	12.42	15.38*
	140	6.04	6.39	6.82	7.29	7.78	8.29	9.09	9.78	10.49	13.53	16.84*
600	10	2.95	3.02	3.15	3.30	3.45	3.61	3.84	4.04	4.24	5.01	5.79*
	20	3.59	3.69	3.85	4.03	4.23	4.42	4.72	4.97	5.22	6.20	7.23*
	40	4.43	4.58	4.80	5.04	5.30	5.55	5.95	6.28	6.61	7.96	9.40*
	60	5.05	5.24	5.51	5.81	6.11	6.43	6.90	7.31	7.72	9.40	11.23*
	80	5.57	5.80	6.11	6.45	6.81	7.17	7.73	8.20	8.69	10.70	12.89*
	100	6.01	6.28	6.64	7.02	7.42	7.84	8.47	9.02	9.57	11.90	14.46*
	120	6.41	6.72	7.11	7.54	7.99	8.45	9.16	9.77	10.40	13.05	15.96*
	140	6.78	7.12	7.56	8.03	8.52	9.03	9.82	10.49	11.19	14.14	17.40*
800	10	3.18	3.25	3.39	3.54	3.71	3.87	4.12	4.32	4.53	5.33	6.16*
	20	3.88	3.99	4.16	4.35	4.56	4.76	5.07	5.33	5.59	6.61	7.67*
	40	4.81	4.97	5.20	5.45	5.72	5.98	6.39	6.74	7.08	8.46	9.93*
	60	5.50	5.69	5.97	6.28	6.59	6.92	7.41	7.82	8.24	9.95	11.78*
	80	6.06	6.29	6.61	6.97	7.33	7.71	8.28	8.76	9.25	11.27	13.46*
	100	6.54	6.82	7.18	7.58	7.99	8.41	9.06	9.60	10.16	12.49	15.02*
	120	6.98	7.29	7.69	8.13	8.58	9.05	9.77	10.39	11.01	13.63	16.51*
	140	7.38	7.72	8.16	8.64	9.14	9.65	10.44	11.12	11.81	14.73	17.94*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.78	1.98	2.20	2.44	2.67	2.91	3.27	3.57	3.88	5.11	6.37*
	20	2.20	2.53	2.87	3.21	3.55	3.90	4.42	4.86	5.30	7.10	8.97*
	40	2.90	3.45	3.98	4.51	5.03	5.56	6.35	7.02	7.69	10.46	13.33*
	60	3.52	4.26	4.96	5.64	6.33	7.01	8.04	8.91	9.79	13.40	17.15*
	80	4.08	5.00	5.85	6.69	7.52	8.35	9.60	10.65	11.72	16.10	20.66*
	100	4.61	5.69	6.69	7.67	8.63	9.60	11.06	12.29	13.53	18.63	23.95*
	120	5.12	6.35	7.49	8.60	9.70	10.79	12.45	13.84	15.25	21.04	27.08*
	140	5.60	6.99	8.26	9.49	10.71	11.94	13.78	15.33	16.90	23.35	30.09*
25	10	2.27	2.38	2.56	2.75	2.95	3.17	3.50	3.78	4.07	5.27	6.51*
	20	2.70	2.91	3.19	3.48	3.80	4.12	4.61	5.04	5.47	7.24	9.08*
	40	3.38	3.79	4.25	4.74	5.24	5.74	6.52	7.17	7.83	10.57	13.42*
	60	3.97	4.57	5.21	5.86	6.51	7.18	8.19	9.05	9.92	13.50	17.24*
	80	4.51	5.29	6.08	6.89	7.69	8.50	9.74	10.78	11.84	16.19	20.74*
	100	5.02	5.97	6.91	7.85	8.80	9.75	11.19	12.41	13.64	18.72	24.03*
	120	5.51	6.62	7.70	8.78	9.85	10.94	12.57	13.96	15.36	21.12	27.16*
	140	5.98	7.24	8.46	9.67	10.87	12.07	13.90	15.44	17.00	23.43	30.16*
50	10	2.53	2.64	2.80	2.99	3.19	3.39	3.71	3.98	4.26	5.42	6.65*
	20	3.02	3.21	3.46	3.73	4.03	4.33	4.80	5.21	5.63	7.37	9.20*
	40	3.75	4.10	4.52	4.97	5.44	5.93	6.68	7.32	7.97	10.68	13.52*
	60	4.35	4.86	5.45	6.06	6.70	7.35	8.34	9.19	10.05	13.60	17.32*
	80	4.89	5.57	6.31	7.08	7.86	8.66	9.88	10.91	11.96	16.28	20.82*
	100	5.40	6.24	7.13	8.04	8.96	9.90	11.32	12.53	13.75	18.81	24.11*
	120	5.88	6.88	7.91	8.96	10.01	11.08	12.70	14.07	15.46	21.21	27.23*
	140	6.34	7.50	8.66	9.84	11.02	12.21	14.02	15.55	17.10	23.51	30.23*
100	10	2.88	2.98	3.15	3.34	3.54	3.74	4.05	4.32	4.59	5.72	6.92*
	20	3.46	3.63	3.87	4.14	4.42	4.71	5.16	5.55	5.95	7.63	9.43*
	40	4.29	4.59	4.97	5.39	5.83	6.29	7.00	7.62	8.25	10.90	13.72*
	60	4.95	5.38	5.90	6.47	7.06	7.68	8.64	9.46	10.30	13.80	17.50*
	80	5.52	6.09	6.75	7.47	8.21	8.97	10.15	11.16	12.19	16.47	20.99*
	100	6.04	6.75	7.56	8.41	9.29	10.19	11.58	12.77	13.98	18.99	24.26*
	120	6.53	7.38	8.32	9.31	10.32	11.36	12.95	14.30	15.68	21.38	27.38*
	140	6.99	7.98	9.06	10.18	11.32	12.48	14.26	15.77	17.31	23.68	30.37*
150	10	3.14	3.24	3.41	3.60	3.80	4.01	4.33	4.60	4.87	5.99	7.17*
	20	3.79	3.95	4.19	4.46	4.73	5.02	5.47	5.85	6.24	7.88	9.66*
	40	4.70	4.98	5.35	5.75	6.17	6.62	7.31	7.91	8.52	11.12	13.91*
	60	5.40	5.81	6.30	6.84	7.41	8.00	8.93	9.73	10.55	14.00	17.68*
	80	6.01	6.53	7.16	7.83	8.54	9.28	10.42	11.41	12.42	16.66	21.15*
	100	6.56	7.20	7.96	8.76	9.61	10.49	11.84	13.01	14.20	19.16	24.42*
	120	7.06	7.84	8.72	9.65	10.63	11.64	13.20	14.53	15.89	21.55	27.53*
	140	7.54	8.44	9.45	10.51	11.62	12.75	14.50	15.99	17.51	23.84	30.52*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.34	3.45	3.62	3.82	4.02	4.24	4.56	4.83	5.11	6.23	7.41*
	20	4.05	4.22	4.46	4.72	5.00	5.29	5.74	6.12	6.51	8.13	9.88*
	40	5.03	5.31	5.67	6.07	6.48	6.92	7.60	8.18	8.78	11.34	14.10*
	60	5.78	6.17	6.65	7.17	7.73	8.30	9.21	9.99	10.79	14.20	17.85*
	80	6.42	6.92	7.52	8.17	8.86	9.57	10.69	11.66	12.66	16.85	21.31*
	100	6.99	7.61	8.33	9.10	9.92	10.77	12.10	13.24	14.42	19.34	24.57*
	120	7.52	8.25	9.09	9.99	10.93	11.92	13.44	14.76	16.10	21.72	27.68*
	140	8.01	8.85	9.81	10.84	11.91	13.02	14.74	16.21	17.72	24.00	30.66*
300	10	3.68	3.78	3.97	4.17	4.39	4.61	4.94	5.22	5.50	6.64	7.84*
	20	4.48	4.65	4.89	5.17	5.45	5.75	6.20	6.58	6.97	8.58	10.31*
	40	5.57	5.85	6.21	6.60	7.02	7.45	8.12	8.69	9.28	11.77	14.49*
	60	6.40	6.78	7.25	7.76	8.30	8.86	9.73	10.49	11.27	14.60	18.20*
	80	7.10	7.58	8.15	8.78	9.44	10.13	11.21	12.15	13.11	17.22	21.64*
	100	7.72	8.30	8.98	9.72	10.51	11.32	12.60	13.71	14.85	19.69	24.88*
	120	8.29	8.96	9.75	10.61	11.51	12.46	13.93	15.21	16.52	22.06	27.98*
	140	8.81	9.59	10.49	11.46	12.48	13.55	15.21	16.65	18.12	24.33	30.95*
400	10	3.95	4.06	4.25	4.46	4.68	4.91	5.26	5.55	5.84	7.00	8.21*
	20	4.83	5.00	5.25	5.53	5.83	6.13	6.59	6.98	7.37	8.98	10.71*
	40	6.02	6.29	6.66	7.06	7.47	7.91	8.57	9.14	9.72	12.18	14.86*
	60	6.91	7.28	7.75	8.26	8.80	9.35	10.21	10.96	11.72	14.98	18.55*
	80	7.66	8.12	8.70	9.31	9.96	10.64	11.69	12.61	13.55	17.58	21.97*
	100	8.33	8.88	9.55	10.27	11.04	11.83	13.08	14.16	15.28	20.04	25.19*
	120	8.93	9.57	10.34	11.18	12.05	12.97	14.40	15.65	16.93	22.39	28.27*
	140	9.48	10.22	11.09	12.03	13.02	14.05	15.67	17.08	18.52	24.65	31.23*
600	10	4.38	4.50	4.70	4.93	5.16	5.40	5.77	6.07	6.38	7.59	8.85*
	20	5.39	5.56	5.83	6.13	6.44	6.75	7.23	7.63	8.04	9.68	11.43*
	40	6.74	7.01	7.39	7.80	8.23	8.67	9.35	9.92	10.51	12.94	15.59*
	60	7.74	8.11	8.58	9.10	9.64	10.19	11.05	11.79	12.54	15.73	19.23*
	80	8.58	9.03	9.60	10.22	10.86	11.53	12.57	13.46	14.38	18.30	22.61*
	100	9.31	9.85	10.51	11.23	11.98	12.75	13.97	15.02	16.10	20.73	25.80*
	120	9.97	10.59	11.35	12.16	13.01	13.90	15.29	16.49	17.74	23.06	28.86*
	140	10.58	11.29	12.13	13.04	14.00	14.99	16.55	17.91	19.31	25.29	31.80*
800	10	4.73	4.86	5.07	5.31	5.55	5.81	6.19	6.51	6.82	8.08	9.38*
	20	5.84	6.02	6.30	6.61	6.93	7.26	7.76	8.18	8.60	10.28	12.06*
	40	7.32	7.60	7.99	8.41	8.86	9.31	10.00	10.58	11.18	13.62	16.26*
	60	8.42	8.78	9.27	9.80	10.35	10.91	11.78	12.52	13.27	16.43	19.89*
	80	9.32	9.77	10.35	10.98	11.63	12.30	13.33	14.22	15.13	18.99	23.24*
	100	10.12	10.65	11.31	12.03	12.78	13.56	14.76	15.80	16.86	21.40	26.41*
	120	10.83	11.44	12.19	13.00	13.85	14.73	16.09	17.28	18.50	23.71	29.44*
	140	11.48	12.17	13.01	13.91	14.86	15.84	17.37	18.69	20.06	25.93	32.36*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.77	3.16	3.57	3.98	4.40	4.82	5.46	6.00	6.53	8.73	11.00*
	20	3.60	4.25	4.89	5.53	6.16	6.80	7.76	8.57	9.38	12.72	16.18*
	40	5.01	6.10	7.12	8.12	9.12	10.12	11.62	12.89	14.17	19.43	24.90*
	60	6.24	7.71	9.07	10.40	11.71	13.03	15.01	16.68	18.37	25.31	32.54*
	80	7.37	9.19	10.86	12.49	14.09	15.70	18.12	20.16	22.22	30.70	39.56*
	100	8.43	10.58	12.55	14.45	16.33	18.21	21.04	23.43	25.84	35.77	46.15*
	120	9.44	11.91	14.15	16.31	18.45	20.59	23.82	26.53	29.28	40.59	52.41*
	140	10.41	13.18	15.68	18.10	20.49	22.88	26.48	29.51	32.58	45.21	58.42*
25	10	3.37	3.62	3.95	4.31	4.69	5.09	5.69	6.21	6.73	8.89	11.14*
	20	4.17	4.66	5.22	5.81	6.41	7.02	7.95	8.75	9.55	12.85	16.30*
	40	5.51	6.44	7.40	8.36	9.33	10.30	11.79	13.04	14.31	19.54	25.00*
	60	6.70	8.02	9.32	10.61	11.90	13.20	15.16	16.82	18.49	25.41	32.63*
	80	7.80	9.49	11.10	12.68	14.27	15.86	18.26	20.29	22.34	30.80	39.64*
	100	8.84	10.86	12.77	14.63	16.49	18.36	21.17	23.55	25.95	35.86	46.23*
	120	9.83	12.17	14.36	16.49	18.61	20.73	23.94	26.65	29.39	40.68	52.49*
	140	10.79	13.43	15.88	18.27	20.64	23.02	26.60	29.62	32.68	45.29	58.49*
50	10	3.75	3.97	4.27	4.61	4.97	5.34	5.92	6.42	6.93	9.05	11.28*
	20	4.62	5.03	5.53	6.08	6.65	7.24	8.15	8.93	9.72	12.99	16.42*
	40	5.97	6.78	7.67	8.59	9.53	10.49	11.95	13.19	14.45	19.65	25.10*
	60	7.14	8.33	9.57	10.82	12.09	13.36	15.31	16.95	18.62	25.51	32.72*
	80	8.22	9.78	11.33	12.88	14.44	16.01	18.40	20.42	22.46	30.89	39.73*
	100	9.24	11.14	12.99	14.82	16.66	18.50	21.30	23.67	26.06	35.95	46.31*
	120	10.22	12.44	14.57	16.67	18.77	20.88	24.07	26.77	29.50	40.76	52.56*
	140	11.16	13.69	16.09	18.44	20.79	23.15	26.72	29.74	32.79	45.38	58.57*
100	10	4.27	4.47	4.77	5.09	5.43	5.79	6.34	6.82	7.31	9.36	11.55*
	20	5.26	5.61	6.07	6.58	7.11	7.66	8.53	9.28	10.04	13.25	16.65*
	40	6.71	7.39	8.19	9.05	9.94	10.86	12.28	13.49	14.73	19.87	25.29*
	60	7.91	8.93	10.06	11.24	12.46	13.70	15.61	17.23	18.88	25.71	32.90*
	80	8.99	10.34	11.79	13.27	14.79	16.33	18.68	20.67	22.70	31.08	39.89*
	100	10.00	11.68	13.42	15.19	16.99	18.80	21.57	23.91	26.29	36.13	46.46*
	120	10.96	12.96	14.99	17.03	19.08	21.16	24.32	27.00	29.71	40.93	52.71*
	140	11.88	14.19	16.49	18.79	21.10	23.43	26.97	29.96	32.99	45.54	58.71*
150	10	4.66	4.85	5.15	5.47	5.81	6.16	6.71	7.18	7.65	9.66	11.82*
	20	5.74	6.08	6.52	7.01	7.52	8.06	8.90	9.62	10.37	13.51	16.88*
	40	7.30	7.92	8.67	9.48	10.34	11.22	12.60	13.79	15.01	20.10	25.49*
	60	8.55	9.47	10.53	11.65	12.82	14.03	15.90	17.50	19.13	25.91	33.07*
	80	9.66	10.88	12.24	13.66	15.13	16.64	18.95	20.92	22.93	31.27	40.06*
	100	10.68	12.20	13.85	15.56	17.31	19.10	21.83	24.15	26.51	36.31	46.62*
	120	11.64	13.47	15.40	17.38	19.40	21.44	24.57	27.23	29.92	41.10	52.86*
	140	12.56	14.68	16.89	19.13	21.40	23.70	27.21	30.18	33.20	45.70	58.85*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.97	5.17	5.46	5.79	6.13	6.49	7.03	7.50	7.97	9.95	12.09*
	20	6.13	6.47	6.90	7.38	7.89	8.42	9.24	9.95	10.68	13.77	17.11*
	40	7.79	8.38	9.10	9.89	10.71	11.58	12.92	14.09	15.28	20.32	25.68*
	60	9.10	9.96	10.97	12.05	13.18	14.36	16.19	17.77	19.38	26.11	33.25*
	80	10.24	11.38	12.67	14.04	15.47	16.95	19.23	21.18	23.17	31.46	40.22*
	100	11.28	12.70	14.27	15.93	17.64	19.39	22.09	24.39	26.73	36.49	46.77*
	120	12.26	13.96	15.81	17.73	19.71	21.73	24.82	27.46	30.14	41.27	53.01*
	140	13.18	15.17	17.28	19.47	21.70	23.97	27.45	30.40	33.40	45.87	59.00*
300	10	5.48	5.68	5.98	6.31	6.67	7.03	7.58	8.05	8.52	10.49	12.60*
	20	6.78	7.11	7.54	8.02	8.53	9.05	9.86	10.55	11.26	14.28	17.56*
	40	8.60	9.16	9.86	10.61	11.41	12.24	13.54	14.66	15.83	20.76	26.07*
	60	10.01	10.81	11.76	12.79	13.87	15.00	16.77	18.30	19.88	26.51	33.60*
	80	11.22	12.27	13.47	14.77	16.14	17.56	19.77	21.68	23.63	31.83	40.55*
	100	12.32	13.61	15.07	16.64	18.28	19.98	22.61	24.87	27.18	36.84	47.09*
	120	13.33	14.87	16.59	18.42	20.32	22.29	25.32	27.91	30.56	41.61	53.31*
	140	14.28	16.08	18.05	20.14	22.30	24.51	27.93	30.84	33.81	46.20	59.28*
400	10	5.89	6.09	6.40	6.75	7.11	7.48	8.04	8.52	9.00	10.97	13.07*
	20	7.31	7.63	8.08	8.56	9.07	9.59	10.40	11.09	11.80	14.77	18.01*
	40	9.27	9.82	10.50	11.25	12.03	12.84	14.11	15.21	16.35	21.20	26.46*
	60	10.77	11.54	12.46	13.46	14.51	15.61	17.33	18.83	20.37	26.91	33.96*
	80	12.05	13.04	14.20	15.45	16.77	18.15	20.31	22.17	24.10	32.20	40.88*
	100	13.19	14.41	15.81	17.32	18.90	20.55	23.12	25.34	27.62	37.19	47.40*
	120	14.25	15.69	17.33	19.09	20.93	22.84	25.81	28.37	30.98	41.95	53.61*
	140	15.23	16.91	18.79	20.79	22.88	25.05	28.40	31.28	34.22	46.52	59.57*
600	10	6.56	6.77	7.09	7.46	7.83	8.22	8.80	9.30	9.79	11.80	13.93*
	20	8.16	8.49	8.95	9.45	9.97	10.50	11.32	12.02	12.73	15.67	18.87*
	40	10.35	10.89	11.58	12.32	13.10	13.90	15.15	16.23	17.34	22.05	27.22*
	60	12.01	12.75	13.65	14.63	15.66	16.72	18.39	19.83	21.32	27.70	34.65*
	80	13.41	14.35	15.47	16.67	17.94	19.27	21.34	23.14	25.01	32.95	41.53*
	100	14.65	15.79	17.12	18.56	20.07	21.65	24.12	26.27	28.49	37.90	48.02*
	120	15.78	17.12	18.67	20.33	22.09	23.92	26.78	29.26	31.82	42.62	54.20*
	140	16.83	18.38	20.14	22.03	24.02	26.10	29.34	32.15	35.03	47.17	60.14*
800	10	7.10	7.32	7.66	8.03	8.43	8.83	9.43	9.94	10.46	12.51	14.68*
	20	8.86	9.19	9.66	10.18	10.71	11.26	12.10	12.81	13.52	16.48	19.67*
	40	11.24	11.78	12.47	13.22	14.01	14.81	16.06	17.13	18.23	22.87	27.97*
	60	13.03	13.76	14.66	15.63	16.65	17.70	19.35	20.77	22.23	28.48	35.35*
	80	14.53	15.45	16.55	17.74	18.99	20.28	22.31	24.07	25.89	33.68	42.18*
	100	15.86	16.96	18.26	19.66	21.14	22.67	25.08	27.18	29.35	38.60	48.63*
	120	17.06	18.34	19.85	21.46	23.16	24.94	27.72	30.15	32.65	43.29	54.79*
	140	18.17	19.64	21.34	23.17	25.10	27.11	30.27	33.01	35.83	47.82	60.71*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.87	0.92	0.99	1.07	1.16	1.24	1.37	1.48	1.59	2.03	2.47*
	20	0.98	1.06	1.17	1.28	1.39	1.50	1.67	1.81	1.96	2.54	3.13*
	40	1.17	1.31	1.46	1.61	1.77	1.93	2.17	2.37	2.57	3.40	4.24*
	60	1.33	1.52	1.72	1.91	2.11	2.31	2.61	2.86	3.11	4.15	5.22*
	80	1.48	1.72	1.95	2.19	2.42	2.66	3.01	3.31	3.61	4.84	6.11*
	100	1.62	1.90	2.17	2.44	2.71	2.98	3.39	3.73	4.08	5.49	6.95*
	120	1.75	2.07	2.38	2.69	2.99	3.29	3.75	4.13	4.52	6.11	7.75*
	140	1.88	2.24	2.58	2.92	3.25	3.59	4.09	4.52	4.95	6.70	8.52*
25	10	1.16	1.18	1.24	1.31	1.38	1.46	1.57	1.67	1.77	2.18	2.60*
	20	1.31	1.35	1.43	1.51	1.61	1.71	1.86	1.99	2.12	2.67	3.25*
	40	1.53	1.60	1.71	1.84	1.98	2.12	2.34	2.52	2.72	3.51	4.34*
	60	1.70	1.81	1.96	2.12	2.30	2.48	2.76	3.00	3.24	4.25	5.30*
	80	1.85	2.00	2.18	2.38	2.60	2.82	3.15	3.44	3.73	4.94	6.19*
	100	1.99	2.17	2.39	2.63	2.88	3.13	3.52	3.85	4.19	5.58	7.03*
	120	2.12	2.34	2.59	2.87	3.15	3.44	3.88	4.25	4.63	6.19	7.83*
	140	2.24	2.49	2.79	3.09	3.41	3.73	4.22	4.63	5.05	6.78	8.59*
50	10	1.28	1.30	1.36	1.43	1.51	1.58	1.70	1.80	1.90	2.31	2.73*
	20	1.46	1.50	1.58	1.67	1.76	1.86	2.01	2.13	2.26	2.80	3.36*
	40	1.72	1.79	1.89	2.02	2.14	2.28	2.49	2.67	2.85	3.62	4.44*
	60	1.92	2.01	2.15	2.30	2.47	2.64	2.90	3.13	3.37	4.35	5.39*
	80	2.08	2.21	2.38	2.57	2.76	2.97	3.29	3.57	3.85	5.03	6.28*
	100	2.24	2.39	2.59	2.81	3.04	3.28	3.65	3.98	4.30	5.67	7.11*
	120	2.37	2.56	2.79	3.04	3.30	3.58	4.00	4.37	4.74	6.28	7.90*
	140	2.50	2.72	2.98	3.26	3.56	3.87	4.34	4.74	5.16	6.87	8.66*
100	10	1.43	1.46	1.52	1.60	1.68	1.76	1.88	1.99	2.09	2.51	2.93*
	20	1.66	1.70	1.78	1.87	1.97	2.07	2.23	2.36	2.49	3.02	3.57*
	40	1.98	2.04	2.15	2.27	2.40	2.53	2.74	2.91	3.09	3.84	4.63*
	60	2.21	2.30	2.44	2.58	2.74	2.91	3.16	3.38	3.61	4.55	5.57*
	80	2.41	2.52	2.68	2.86	3.05	3.24	3.55	3.81	4.08	5.22	6.44*
	100	2.58	2.72	2.91	3.11	3.33	3.55	3.91	4.21	4.52	5.85	7.26*
	120	2.74	2.90	3.11	3.35	3.59	3.85	4.25	4.59	4.95	6.45	8.05*
	140	2.89	3.07	3.31	3.57	3.84	4.13	4.58	4.96	5.36	7.03	8.80*
150	10	1.55	1.57	1.64	1.72	1.80	1.88	2.01	2.12	2.23	2.66	3.09*
	20	1.81	1.85	1.93	2.03	2.13	2.23	2.39	2.52	2.66	3.20	3.75*
	40	2.16	2.23	2.34	2.46	2.59	2.73	2.94	3.11	3.29	4.03	4.81*
	60	2.43	2.52	2.65	2.80	2.96	3.12	3.38	3.60	3.82	4.75	5.74*
	80	2.65	2.76	2.92	3.09	3.28	3.47	3.77	4.03	4.29	5.40	6.60*
	100	2.84	2.97	3.15	3.36	3.57	3.79	4.13	4.43	4.73	6.03	7.42*
	120	3.01	3.17	3.37	3.60	3.84	4.09	4.47	4.81	5.16	6.62	8.20*
	140	3.17	3.35	3.58	3.83	4.09	4.37	4.80	5.18	5.56	7.20	8.95*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.64	1.67	1.74	1.82	1.90	1.99	2.12	2.23	2.34	2.79	3.23*
	20	1.93	1.97	2.06	2.15	2.26	2.36	2.53	2.66	2.80	3.35	3.91*
	40	2.32	2.38	2.50	2.62	2.76	2.89	3.11	3.28	3.46	4.20	4.98*
	60	2.60	2.69	2.83	2.98	3.14	3.31	3.56	3.78	4.00	4.92	5.90*
	80	2.84	2.95	3.11	3.29	3.48	3.67	3.97	4.22	4.48	5.58	6.76*
	100	3.05	3.18	3.36	3.56	3.78	4.00	4.34	4.63	4.93	6.20	7.57*
	120	3.24	3.39	3.59	3.82	4.05	4.30	4.68	5.01	5.35	6.79	8.34*
	140	3.41	3.58	3.81	4.05	4.31	4.59	5.01	5.38	5.75	7.36	9.09*
300	10	1.79	1.82	1.89	1.97	2.06	2.16	2.30	2.41	2.53	2.99	3.45*
	20	2.12	2.16	2.25	2.36	2.47	2.58	2.75	2.89	3.03	3.60	4.18*
	40	2.56	2.63	2.75	2.88	3.02	3.16	3.38	3.57	3.75	4.50	5.28*
	60	2.89	2.98	3.12	3.28	3.44	3.61	3.88	4.10	4.32	5.24	6.21*
	80	3.16	3.27	3.43	3.61	3.80	4.00	4.30	4.56	4.82	5.91	7.06*
	100	3.39	3.52	3.71	3.91	4.12	4.35	4.69	4.98	5.28	6.52	7.86*
	120	3.60	3.75	3.95	4.18	4.42	4.66	5.04	5.37	5.70	7.11	8.63*
	140	3.79	3.96	4.18	4.43	4.69	4.96	5.38	5.74	6.11	7.67	9.36*
400	10	1.91	1.94	2.01	2.10	2.20	2.29	2.44	2.56	2.68	3.16	3.63*
	20	2.27	2.32	2.41	2.52	2.64	2.75	2.93	3.08	3.23	3.81	4.40*
	40	2.76	2.83	2.95	3.09	3.24	3.39	3.61	3.80	3.99	4.76	5.55*
	60	3.12	3.21	3.36	3.52	3.69	3.87	4.14	4.36	4.59	5.52	6.49*
	80	3.41	3.52	3.69	3.88	4.08	4.28	4.58	4.85	5.11	6.20	7.35*
	100	3.67	3.80	3.99	4.20	4.42	4.64	4.99	5.28	5.58	6.82	8.15*
	120	3.90	4.04	4.25	4.48	4.73	4.97	5.36	5.68	6.02	7.41	8.91*
	140	4.10	4.27	4.50	4.75	5.01	5.29	5.70	6.06	6.43	7.97	9.64*
600	10	2.10	2.13	2.22	2.31	2.41	2.51	2.67	2.80	2.93	3.43	3.93*
	20	2.52	2.57	2.67	2.79	2.91	3.04	3.22	3.38	3.54	4.16	4.78*
	40	3.08	3.16	3.29	3.43	3.59	3.75	3.99	4.19	4.39	5.19	6.00*
	60	3.49	3.59	3.74	3.91	4.10	4.28	4.56	4.80	5.04	6.00	6.99*
	80	3.83	3.94	4.12	4.31	4.52	4.73	5.05	5.32	5.60	6.70	7.86*
	100	4.12	4.25	4.45	4.67	4.89	5.13	5.49	5.79	6.09	7.35	8.67*
	120	4.38	4.53	4.74	4.98	5.23	5.49	5.88	6.22	6.55	7.95	9.43*
	140	4.61	4.78	5.01	5.27	5.54	5.82	6.25	6.61	6.98	8.52	10.16*
800	10	2.25	2.29	2.38	2.48	2.58	2.69	2.85	2.99	3.13	3.65	4.17*
	20	2.72	2.78	2.88	3.01	3.13	3.27	3.46	3.63	3.79	4.44	5.08*
	40	3.34	3.42	3.56	3.71	3.87	4.04	4.29	4.50	4.71	5.54	6.38*
	60	3.79	3.89	4.05	4.24	4.43	4.62	4.91	5.16	5.41	6.40	7.41*
	80	4.16	4.28	4.46	4.67	4.88	5.10	5.44	5.72	6.00	7.14	8.31*
	100	4.48	4.62	4.82	5.05	5.29	5.53	5.90	6.21	6.53	7.80	9.13*
	120	4.76	4.92	5.14	5.39	5.65	5.91	6.32	6.66	7.01	8.42	9.90*
	140	5.02	5.19	5.43	5.70	5.98	6.27	6.71	7.08	7.45	9.00	10.63*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.26	1.36	1.48	1.62	1.76	1.90	2.11	2.28	2.46	3.18	3.92*
	20	1.48	1.65	1.83	2.02	2.21	2.41	2.70	2.95	3.20	4.21	5.24*
	40	1.85	2.13	2.42	2.70	2.98	3.27	3.70	4.07	4.43	5.92	7.46*
	60	2.18	2.56	2.93	3.29	3.66	4.03	4.58	5.04	5.51	7.43	9.41*
	80	2.48	2.95	3.40	3.84	4.28	4.72	5.39	5.94	6.51	8.81	11.20*
	100	2.76	3.32	3.84	4.35	4.86	5.37	6.14	6.79	7.44	10.11	12.88*
	120	3.03	3.66	4.26	4.84	5.42	5.99	6.86	7.59	8.33	11.35	14.48*
	140	3.28	4.00	4.66	5.31	5.95	6.59	7.55	8.36	9.18	12.53	16.01*
25	10	1.65	1.70	1.79	1.90	2.02	2.14	2.33	2.49	2.66	3.34	4.05*
	20	1.91	2.00	2.13	2.29	2.46	2.63	2.90	3.13	3.37	4.34	5.36*
	40	2.29	2.47	2.69	2.94	3.19	3.46	3.87	4.22	4.57	6.04	7.56*
	60	2.61	2.87	3.18	3.51	3.85	4.20	4.73	5.18	5.64	7.53	9.50*
	80	2.89	3.24	3.63	4.04	4.46	4.88	5.53	6.07	6.63	8.91	11.29*
	100	3.16	3.60	4.06	4.54	5.03	5.53	6.28	6.91	7.55	10.20	12.96*
	120	3.42	3.93	4.47	5.02	5.58	6.14	6.99	7.71	8.44	11.43	14.56*
	140	3.66	4.26	4.87	5.48	6.10	6.73	7.67	8.47	9.28	12.61	16.09*
50	10	1.83	1.88	1.97	2.08	2.20	2.32	2.51	2.67	2.83	3.50	4.19*
	20	2.14	2.22	2.35	2.50	2.66	2.82	3.08	3.30	3.53	4.47	5.47*
	40	2.57	2.72	2.92	3.15	3.39	3.64	4.03	4.37	4.72	6.15	7.66*
	60	2.92	3.14	3.41	3.72	4.04	4.37	4.88	5.32	5.77	7.64	9.59*
	80	3.22	3.51	3.86	4.24	4.63	5.04	5.67	6.20	6.75	9.00	11.37*
	100	3.49	3.86	4.28	4.73	5.20	5.68	6.41	7.03	7.67	10.29	13.04*
	120	3.75	4.19	4.68	5.20	5.74	6.28	7.12	7.83	8.55	11.52	14.63*
	140	4.00	4.51	5.07	5.66	6.26	6.87	7.80	8.59	9.39	12.70	16.16*
100	10	2.07	2.12	2.22	2.33	2.45	2.58	2.77	2.93	3.09	3.75	4.44*
	20	2.44	2.52	2.65	2.80	2.96	3.12	3.38	3.59	3.81	4.73	5.70*
	40	2.96	3.09	3.29	3.50	3.73	3.97	4.34	4.66	4.99	6.37	7.85*
	60	3.35	3.54	3.80	4.08	4.38	4.69	5.17	5.59	6.02	7.84	9.77*
	80	3.69	3.94	4.25	4.60	4.97	5.35	5.94	6.46	6.99	9.20	11.53*
	100	3.99	4.30	4.68	5.09	5.52	5.97	6.67	7.28	7.89	10.47	13.20*
	120	4.27	4.64	5.08	5.55	6.05	6.57	7.37	8.06	8.76	11.69	14.78*
	140	4.53	4.96	5.46	6.00	6.56	7.14	8.04	8.81	9.60	12.86	16.30*
150	10	2.25	2.29	2.40	2.51	2.64	2.77	2.96	3.13	3.30	3.97	4.65*
	20	2.67	2.74	2.88	3.03	3.19	3.36	3.61	3.83	4.05	4.96	5.91*
	40	3.24	3.37	3.56	3.78	4.01	4.24	4.61	4.92	5.24	6.59	8.04*
	60	3.68	3.86	4.11	4.38	4.67	4.97	5.44	5.85	6.27	8.04	9.94*
	80	4.04	4.28	4.58	4.91	5.27	5.63	6.21	6.71	7.22	9.38	11.70*
	100	4.37	4.66	5.01	5.41	5.82	6.25	6.93	7.51	8.12	10.65	13.35*
	120	4.67	5.01	5.42	5.87	6.35	6.84	7.62	8.29	8.98	11.86	14.93*
	140	4.94	5.34	5.81	6.31	6.85	7.41	8.28	9.03	9.80	13.03	16.44*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.39	2.44	2.54	2.66	2.79	2.92	3.13	3.30	3.47	4.15	4.84*
	20	2.85	2.93	3.06	3.22	3.38	3.55	3.81	4.03	4.26	5.17	6.11*
	40	3.47	3.60	3.80	4.01	4.24	4.48	4.84	5.15	5.47	6.80	8.23*
	60	3.94	4.12	4.37	4.64	4.93	5.23	5.69	6.09	6.50	8.24	10.11*
	80	4.34	4.56	4.86	5.19	5.53	5.89	6.46	6.94	7.44	9.57	11.86*
	100	4.68	4.96	5.31	5.69	6.09	6.52	7.17	7.75	8.33	10.83	13.51*
	120	5.00	5.32	5.72	6.16	6.62	7.10	7.86	8.51	9.19	12.04	15.08*
	140	5.29	5.66	6.12	6.61	7.13	7.67	8.52	9.25	10.01	13.19	16.59*
300	10	2.61	2.67	2.78	2.91	3.04	3.18	3.39	3.57	3.75	4.45	5.16*
	20	3.14	3.22	3.36	3.53	3.70	3.88	4.15	4.37	4.60	5.52	6.48*
	40	3.85	3.98	4.18	4.40	4.63	4.87	5.24	5.55	5.87	7.19	8.59*
	60	4.37	4.55	4.80	5.07	5.36	5.66	6.12	6.52	6.92	8.62	10.46*
	80	4.81	5.03	5.33	5.66	6.00	6.35	6.90	7.38	7.87	9.94	12.18*
	100	5.20	5.46	5.81	6.18	6.58	6.99	7.63	8.18	8.75	11.18	13.81*
	120	5.54	5.85	6.24	6.67	7.12	7.58	8.31	8.94	9.60	12.37	15.37*
	140	5.86	6.22	6.65	7.13	7.63	8.15	8.97	9.68	10.41	13.52	16.87*
400	10	2.80	2.85	2.97	3.10	3.24	3.39	3.61	3.79	3.97	4.70	5.43*
	20	3.38	3.46	3.61	3.78	3.96	4.14	4.42	4.65	4.89	5.83	6.79*
	40	4.15	4.28	4.49	4.72	4.95	5.20	5.57	5.89	6.21	7.54	8.93*
	60	4.73	4.90	5.15	5.43	5.73	6.03	6.49	6.89	7.29	8.98	10.79*
	80	5.20	5.42	5.72	6.05	6.39	6.75	7.30	7.77	8.25	10.29	12.50*
	100	5.62	5.88	6.22	6.60	6.99	7.40	8.04	8.58	9.14	11.53	14.11*
	120	5.99	6.29	6.68	7.10	7.55	8.01	8.73	9.35	9.99	12.71	15.66*
	140	6.34	6.68	7.11	7.58	8.07	8.58	9.38	10.08	10.79	13.85	17.15*
600	10	3.09	3.15	3.28	3.42	3.57	3.72	3.96	4.15	4.35	5.11	5.88*
	20	3.76	3.85	4.01	4.19	4.37	4.57	4.86	5.11	5.35	6.34	7.33*
	40	4.64	4.78	4.99	5.23	5.48	5.74	6.13	6.46	6.79	8.14	9.54*
	60	5.30	5.47	5.74	6.03	6.33	6.64	7.12	7.52	7.93	9.62	11.41*
	80	5.83	6.05	6.36	6.70	7.05	7.41	7.97	8.44	8.93	10.94	13.11*
	100	6.30	6.56	6.91	7.29	7.69	8.10	8.74	9.28	9.84	12.18	14.71*
	120	6.72	7.02	7.41	7.83	8.28	8.74	9.45	10.07	10.69	13.35	16.24*
	140	7.10	7.44	7.87	8.34	8.83	9.34	10.13	10.81	11.51	14.47	17.71*
800	10	3.33	3.40	3.53	3.68	3.83	4.00	4.24	4.45	4.65	5.45	6.24*
	20	4.07	4.16	4.33	4.52	4.71	4.92	5.23	5.48	5.74	6.76	7.78*
	40	5.04	5.18	5.41	5.66	5.92	6.18	6.59	6.93	7.27	8.65	10.08*
	60	5.76	5.94	6.21	6.51	6.83	7.15	7.64	8.05	8.47	10.18	11.97*
	80	6.35	6.57	6.88	7.23	7.59	7.96	8.53	9.02	9.51	11.53	13.68*
	100	6.86	7.11	7.47	7.86	8.27	8.69	9.34	9.89	10.45	12.77	15.27*
	120	7.31	7.61	8.00	8.44	8.89	9.36	10.08	10.69	11.32	13.95	16.79*
	140	7.73	8.06	8.50	8.97	9.47	9.98	10.77	11.45	12.14	15.07	18.25*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.88	2.08	2.31	2.54	2.77	3.01	3.37	3.68	3.98	5.22	6.49*
	20	2.32	2.66	3.00	3.34	3.69	4.04	4.56	5.01	5.45	7.26	9.13*
	40	3.07	3.63	4.17	4.70	5.23	5.76	6.57	7.24	7.92	10.70	13.58*
	60	3.72	4.48	5.19	5.89	6.58	7.28	8.32	9.20	10.08	13.71	17.48*
	80	4.32	5.26	6.13	6.98	7.82	8.67	9.93	11.00	12.07	16.48	21.06*
	100	4.89	6.00	7.02	8.01	8.99	9.97	11.44	12.68	13.94	19.07	24.42*
	120	5.42	6.69	7.86	8.98	10.10	11.21	12.88	14.29	15.71	21.54	27.62*
	140	5.93	7.36	8.66	9.92	11.16	12.40	14.26	15.83	17.41	23.91	30.68*
25	10	2.39	2.50	2.67	2.86	3.06	3.28	3.61	3.89	4.18	5.38	6.63*
	20	2.85	3.05	3.33	3.63	3.94	4.26	4.76	5.19	5.62	7.40	9.25*
	40	3.56	3.98	4.45	4.94	5.44	5.96	6.73	7.39	8.06	10.81	13.68*
	60	4.18	4.80	5.45	6.11	6.78	7.45	8.47	9.34	10.21	13.82	17.57*
	80	4.76	5.56	6.37	7.19	8.00	8.83	10.07	11.13	12.19	16.57	21.14*
	100	5.30	6.28	7.24	8.20	9.16	10.12	11.58	12.81	14.05	19.17	24.50*
	120	5.82	6.96	8.07	9.17	10.26	11.35	13.01	14.41	15.82	21.63	27.69*
	140	6.32	7.62	8.87	10.09	11.32	12.54	14.39	15.94	17.52	23.99	30.76*
50	10	2.66	2.76	2.92	3.10	3.30	3.51	3.82	4.10	4.38	5.54	6.76*
	20	3.18	3.36	3.61	3.88	4.18	4.48	4.96	5.37	5.79	7.53	9.37*
	40	3.95	4.29	4.72	5.17	5.65	6.14	6.90	7.55	8.21	10.93	13.78*
	60	4.58	5.10	5.70	6.32	6.96	7.62	8.62	9.48	10.34	13.92	17.66*
	80	5.15	5.85	6.61	7.39	8.18	8.99	10.22	11.26	12.31	16.67	21.23*
	100	5.69	6.55	7.46	8.39	9.33	10.27	11.71	12.93	14.17	19.26	24.58*
	120	6.20	7.23	8.29	9.35	10.42	11.50	13.14	14.53	15.93	21.72	27.77*
	140	6.69	7.88	9.07	10.27	11.47	12.68	14.51	16.06	17.62	24.08	30.83*
100	10	3.03	3.12	3.28	3.47	3.66	3.86	4.18	4.44	4.72	5.84	7.03*
	20	3.64	3.80	4.03	4.30	4.58	4.87	5.32	5.71	6.11	7.80	9.60*
	40	4.51	4.81	5.19	5.60	6.05	6.51	7.23	7.85	8.49	11.16	13.97*
	60	5.20	5.63	6.16	6.73	7.34	7.96	8.93	9.75	10.60	14.12	17.83*
	80	5.80	6.38	7.06	7.78	8.53	9.30	10.50	11.52	12.55	16.86	21.39*
	100	6.35	7.08	7.90	8.76	9.66	10.57	11.98	13.18	14.39	19.44	24.74*
	120	6.87	7.74	8.70	9.71	10.74	11.79	13.40	14.76	16.15	21.89	27.92*
	140	7.36	8.38	9.48	10.62	11.78	12.96	14.76	16.28	17.83	24.25	30.97*
150	10	3.29	3.39	3.55	3.74	3.94	4.14	4.46	4.73	5.00	6.12	7.29*
	20	3.98	4.13	4.37	4.63	4.91	5.19	5.64	6.02	6.41	8.06	9.82*
	40	4.93	5.21	5.58	5.98	6.40	6.85	7.54	8.15	8.76	11.38	14.17*
	60	5.67	6.07	6.57	7.12	7.69	8.29	9.22	10.03	10.85	14.33	18.01*
	80	6.31	6.84	7.47	8.15	8.87	9.62	10.77	11.77	12.79	17.05	21.56*
	100	6.89	7.54	8.31	9.13	9.99	10.87	12.24	13.42	14.62	19.62	24.89*
	120	7.42	8.21	9.11	10.06	11.05	12.07	13.65	14.99	16.36	22.06	28.07*
	140	7.93	8.85	9.87	10.96	12.08	13.23	15.00	16.51	18.04	24.41	31.12*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.51	3.60	3.77	3.96	4.17	4.38	4.70	4.97	5.24	6.36	7.53*
	20	4.25	4.41	4.64	4.91	5.18	5.47	5.92	6.30	6.68	8.31	10.05*
	40	5.28	5.55	5.91	6.30	6.72	7.16	7.84	8.43	9.03	11.60	14.36*
	60	6.07	6.45	6.93	7.46	8.02	8.60	9.51	10.29	11.11	14.53	18.19*
	80	6.74	7.24	7.85	8.50	9.20	9.92	11.05	12.02	13.03	17.24	21.72*
	100	7.34	7.96	8.69	9.48	10.30	11.17	12.51	13.66	14.84	19.80	25.05*
	120	7.90	8.63	9.49	10.40	11.36	12.36	13.90	15.23	16.58	22.24	28.22*
	140	8.42	9.27	10.25	11.29	12.38	13.51	15.24	16.73	18.25	24.58	31.26*
300	10	3.86	3.95	4.13	4.33	4.54	4.76	5.09	5.37	5.65	6.79	7.96*
	20	4.70	4.85	5.09	5.36	5.65	5.94	6.39	6.77	7.16	8.77	10.48*
	40	5.85	6.11	6.47	6.86	7.27	7.70	8.37	8.95	9.54	12.04	14.74*
	60	6.72	7.08	7.55	8.06	8.60	9.17	10.05	10.81	11.59	14.94	18.54*
	80	7.45	7.92	8.50	9.13	9.80	10.49	11.58	12.52	13.49	17.62	22.05*
	100	8.10	8.68	9.37	10.11	10.90	11.73	13.02	14.14	15.29	20.16	25.36*
	120	8.70	9.37	10.18	11.04	11.96	12.91	14.40	15.68	17.01	22.58	28.51*
	140	9.25	10.03	10.95	11.93	12.97	14.04	15.72	17.17	18.66	24.91	31.54*
400	10	4.14	4.24	4.42	4.63	4.85	5.07	5.41	5.70	5.99	7.15	8.34*
	20	5.06	5.22	5.46	5.74	6.03	6.33	6.79	7.18	7.57	9.18	10.88*
	40	6.31	6.57	6.93	7.33	7.74	8.17	8.84	9.41	9.99	12.46	15.12*
	60	7.25	7.61	8.07	8.58	9.12	9.67	10.54	11.29	12.06	15.33	18.88*
	80	8.04	8.49	9.06	9.68	10.33	11.01	12.07	12.99	13.94	18.00	22.37*
	100	8.73	9.28	9.95	10.68	11.45	12.25	13.51	14.60	15.73	20.52	25.66*
	120	9.36	10.01	10.78	11.62	12.51	13.43	14.88	16.13	17.43	22.92	28.81*
	140	9.95	10.69	11.57	12.52	13.52	14.56	16.20	17.61	19.07	25.24	31.83*
600	10	4.59	4.70	4.89	5.11	5.34	5.58	5.94	6.25	6.55	7.76	8.98*
	20	5.64	5.81	6.07	6.36	6.66	6.97	7.45	7.85	8.26	9.90	11.61*
	40	7.06	7.32	7.69	8.10	8.52	8.96	9.64	10.21	10.80	13.23	15.84*
	60	8.11	8.46	8.93	9.45	9.99	10.54	11.40	12.14	12.90	16.09	19.57*
	80	8.99	9.43	10.00	10.61	11.26	11.93	12.97	13.87	14.79	18.73	23.02*
	100	9.76	10.29	10.95	11.66	12.42	13.20	14.42	15.47	16.56	21.22	26.28*
	120	10.45	11.07	11.82	12.64	13.50	14.39	15.79	17.00	18.25	23.60	29.40*
	140	11.09	11.79	12.64	13.56	14.52	15.52	17.10	18.46	19.87	25.90	32.40*
800	10	4.96	5.07	5.27	5.50	5.75	6.00	6.37	6.69	7.01	8.26	9.52*
	20	6.12	6.29	6.56	6.86	7.18	7.50	8.00	8.41	8.83	10.51	12.24*
	40	7.67	7.93	8.31	8.73	9.17	9.62	10.31	10.89	11.48	13.93	16.52*
	60	8.82	9.17	9.65	10.17	10.72	11.28	12.15	12.89	13.64	16.81	20.23*
	80	9.77	10.21	10.78	11.40	12.05	12.72	13.76	14.65	15.56	19.43	23.65*
	100	10.60	11.12	11.78	12.50	13.25	14.02	15.23	16.27	17.34	21.91	26.88*
	120	11.35	11.95	12.70	13.51	14.36	15.24	16.61	17.80	19.03	24.27	29.98*
	140	12.04	12.72	13.55	14.46	15.40	16.39	17.93	19.26	20.64	26.54	32.96*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.93	3.32	3.74	4.15	4.58	5.00	5.64	6.18	6.72	8.93	11.20*
	20	3.81	4.48	5.13	5.77	6.41	7.05	8.02	8.83	9.66	13.01	16.49*
	40	5.30	6.42	7.46	8.48	9.49	10.50	12.02	13.30	14.59	19.89	25.39*
	60	6.61	8.12	9.51	10.86	12.19	13.53	15.53	17.22	18.92	25.91	33.18*
	80	7.81	9.68	11.39	13.04	14.68	16.30	18.76	20.82	22.90	31.44	40.35*
	100	8.93	11.15	13.16	15.09	17.01	18.91	21.78	24.19	26.63	36.63	47.07*
	120	10.00	12.55	14.84	17.04	19.22	21.39	24.66	27.40	30.18	41.57	53.46*
	140	11.03	13.88	16.45	18.91	21.35	23.77	27.42	30.48	33.58	46.31	59.59*
25	10	3.55	3.79	4.12	4.49	4.87	5.27	5.88	6.40	6.92	9.09	11.34*
	20	4.40	4.89	5.46	6.05	6.66	7.28	8.22	9.02	9.83	13.15	16.61*
	40	5.82	6.77	7.74	8.72	9.70	10.69	12.19	13.46	14.74	20.00	25.48*
	60	7.08	8.44	9.77	11.08	12.39	13.70	15.69	17.36	19.05	26.01	33.27*
	80	8.25	9.98	11.63	13.25	14.86	16.47	18.90	20.95	23.02	31.54	40.43*
	100	9.35	11.43	13.38	15.29	17.18	19.06	21.92	24.32	26.74	36.73	47.15*
	120	10.40	12.82	15.05	17.23	19.38	21.54	24.79	27.52	30.29	41.66	53.54*
	140	11.41	14.14	16.66	19.09	21.50	23.91	27.54	30.60	33.68	46.39	59.66*
50	10	3.94	4.15	4.46	4.79	5.15	5.53	6.11	6.61	7.12	9.25	11.48*
	20	4.86	5.27	5.78	6.33	6.91	7.50	8.42	9.20	10.00	13.29	16.72*
	40	6.29	7.12	8.02	8.96	9.91	10.88	12.36	13.61	14.88	20.11	25.58*
	60	7.53	8.76	10.02	11.29	12.58	13.87	15.84	17.50	19.18	26.12	33.36*
	80	8.68	10.28	11.87	13.45	15.03	16.63	19.04	21.08	23.14	31.63	40.51*
	100	9.76	11.71	13.61	15.48	17.34	19.22	22.05	24.44	26.86	36.82	47.23*
	120	10.80	13.09	15.27	17.41	19.55	21.68	24.92	27.64	30.40	41.75	53.61*
	140	11.79	14.40	16.86	19.27	21.66	24.05	27.67	30.71	33.79	46.48	59.74*
100	10	4.49	4.68	4.97	5.29	5.63	5.99	6.54	7.02	7.51	9.57	11.75*
	20	5.52	5.88	6.34	6.84	7.38	7.94	8.81	9.56	10.33	13.56	16.96*
	40	7.06	7.75	8.56	9.43	10.33	11.26	12.70	13.92	15.17	20.34	25.78*
	60	8.33	9.37	10.52	11.72	12.96	14.22	16.14	17.78	19.44	26.32	33.54*
	80	9.47	10.86	12.34	13.85	15.39	16.95	19.32	21.34	23.38	31.83	40.68*
	100	10.54	12.27	14.05	15.86	17.68	19.52	22.32	24.69	27.09	37.00	47.38*
	120	11.56	13.62	15.69	17.78	19.87	21.97	25.17	27.88	30.61	41.92	53.76*
	140	12.53	14.92	17.27	19.62	21.97	24.33	27.91	30.94	34.00	46.64	59.88*
150	10	4.89	5.07	5.36	5.68	6.02	6.37	6.92	7.38	7.86	9.88	12.02*
	20	6.02	6.36	6.80	7.29	7.80	8.34	9.18	9.91	10.66	13.82	17.19*
	40	7.66	8.29	9.05	9.87	10.73	11.63	13.03	14.22	15.45	20.57	25.97*
	60	8.99	9.92	11.00	12.14	13.33	14.56	16.44	18.06	19.70	26.53	33.72*
	80	10.16	11.41	12.79	14.25	15.74	17.27	19.61	21.60	23.62	32.02	40.84*
	100	11.24	12.80	14.49	16.24	18.01	19.82	22.59	24.93	27.31	37.18	47.54*
	120	12.26	14.14	16.12	18.14	20.19	22.26	25.43	28.11	30.83	42.09	53.91*
	140	13.23	15.42	17.68	19.97	22.28	24.61	28.16	31.16	34.21	46.81	60.02*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.22	5.40	5.69	6.01	6.35	6.70	7.25	7.71	8.19	10.17	12.29*
	20	6.44	6.76	7.19	7.67	8.18	8.71	9.53	10.25	10.98	14.09	17.42*
	40	8.18	8.77	9.50	10.29	11.12	11.99	13.35	14.52	15.73	20.80	26.17*
	60	9.55	10.43	11.45	12.55	13.70	14.89	16.74	18.33	19.95	26.73	33.89*
	80	10.76	11.92	13.24	14.63	16.09	17.58	19.89	21.85	23.86	32.21	41.01*
	100	11.86	13.32	14.92	16.61	18.35	20.12	22.85	25.18	27.54	37.36	47.69*
	120	12.89	14.64	16.53	18.49	20.50	22.55	25.68	28.34	31.05	42.27	54.06*
	140	13.87	15.92	18.09	20.31	22.58	24.89	28.40	31.39	34.42	46.98	60.17*
300	10	5.75	5.93	6.22	6.55	6.90	7.26	7.81	8.28	8.75	10.72	12.80*
	20	7.11	7.42	7.86	8.33	8.84	9.36	10.17	10.86	11.58	14.61	17.87*
	40	9.02	9.58	10.28	11.03	11.84	12.67	13.98	15.11	16.28	21.25	26.56*
	60	10.50	11.31	12.27	13.31	14.40	15.55	17.33	18.88	20.46	27.14	34.25*
	80	11.78	12.84	14.07	15.38	16.77	18.20	20.44	22.37	24.34	32.59	41.34*
	100	12.94	14.25	15.74	17.34	19.00	20.72	23.38	25.66	27.99	37.72	48.01*
	120	14.00	15.58	17.34	19.20	21.13	23.12	26.19	28.81	31.48	42.61	54.36*
	140	15.01	16.85	18.87	21.00	23.19	25.44	28.89	31.84	34.84	47.31	60.45*
400	10	6.18	6.36	6.67	7.00	7.36	7.73	8.29	8.76	9.24	11.21	13.28*
	20	7.66	7.97	8.41	8.89	9.39	9.92	10.72	11.42	12.12	15.10	18.32*
	40	9.72	10.26	10.94	11.69	12.47	13.29	14.57	15.68	16.82	21.69	26.94*
	60	11.29	12.06	12.99	14.00	15.06	16.17	17.91	19.41	20.97	27.55	34.60*
	80	12.64	13.64	14.82	16.08	17.42	18.81	20.99	22.87	24.81	32.97	41.66*
	100	13.85	15.08	16.50	18.03	19.63	21.30	23.90	26.15	28.44	38.09	48.32*
	120	14.96	16.43	18.10	19.88	21.75	23.69	26.69	29.27	31.91	42.96	54.66*
	140	16.00	17.71	19.63	21.67	23.79	25.99	29.38	32.29	35.25	47.64	60.74*
600	10	6.87	7.07	7.38	7.74	8.11	8.49	9.07	9.56	10.06	12.06	14.14*
	20	8.55	8.86	9.31	9.80	10.32	10.85	11.67	12.37	13.08	16.03	19.18*
	40	10.85	11.38	12.06	12.80	13.58	14.38	15.64	16.72	17.83	22.56	27.71*
	60	12.59	13.32	14.23	15.21	16.24	17.31	18.98	20.44	21.94	28.36	35.30*
	80	14.06	15.00	16.12	17.34	18.62	19.95	22.05	23.86	25.74	33.73	42.32*
	100	15.37	16.51	17.86	19.31	20.83	22.43	24.93	27.10	29.33	38.80	48.94*
	120	16.56	17.91	19.48	21.16	22.94	24.79	27.69	30.19	32.77	43.65	55.25*
	140	17.66	19.23	21.02	22.94	24.96	27.06	30.34	33.17	36.08	48.31	61.31*
800	10	7.44	7.64	7.96	8.33	8.72	9.12	9.72	10.23	10.74	12.79	14.90*
	20	9.28	9.59	10.05	10.56	11.09	11.64	12.47	13.18	13.90	16.85	19.99*
	40	11.78	12.30	12.98	13.73	14.51	15.32	16.57	17.64	18.74	23.40	28.46*
	60	13.66	14.37	15.27	16.24	17.26	18.32	19.97	21.40	22.87	29.15	35.99*
	80	15.23	16.14	17.24	18.44	19.69	21.00	23.04	24.81	26.64	34.48	42.97*
	100	16.62	17.72	19.03	20.44	21.93	23.48	25.91	28.02	30.21	39.52	49.55*
	120	17.89	19.18	20.69	22.32	24.04	25.84	28.65	31.09	33.61	44.33	55.84*
	140	19.06	20.54	22.26	24.11	26.06	28.10	31.28	34.05	36.90	48.97	61.88*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.92	0.96	1.04	1.12	1.20	1.28	1.41	1.52	1.63	2.07	2.51
	20	1.03	1.12	1.22	1.33	1.44	1.55	1.72	1.86	2.01	2.59	3.18
	40	1.23	1.37	1.52	1.68	1.84	2.00	2.24	2.44	2.64	3.47	4.32
	60	1.40	1.59	1.79	1.99	2.19	2.39	2.69	2.94	3.20	4.24	5.31
	80	1.56	1.80	2.04	2.28	2.51	2.75	3.11	3.41	3.71	4.95	6.22
	100	1.71	1.99	2.27	2.54	2.82	3.09	3.50	3.84	4.19	5.61	7.08
	120	1.85	2.18	2.49	2.80	3.10	3.41	3.87	4.26	4.65	6.25	7.90
	140	1.99	2.35	2.70	3.04	3.38	3.72	4.23	4.66	5.09	6.85	8.68
25	10	1.21	1.23	1.29	1.35	1.43	1.50	1.62	1.72	1.82	2.23	2.65
	20	1.37	1.41	1.48	1.57	1.66	1.76	1.91	2.04	2.18	2.73	3.30
	40	1.60	1.67	1.78	1.91	2.05	2.19	2.41	2.60	2.79	3.59	4.42
	60	1.78	1.89	2.04	2.21	2.38	2.56	2.85	3.09	3.33	4.35	5.40
	80	1.94	2.09	2.27	2.48	2.69	2.91	3.25	3.54	3.84	5.05	6.31
	100	2.09	2.27	2.49	2.74	2.99	3.24	3.64	3.97	4.31	5.71	7.16
	120	2.22	2.44	2.71	2.98	3.27	3.56	4.00	4.38	4.76	6.33	7.97
	140	2.35	2.61	2.91	3.22	3.54	3.86	4.35	4.77	5.20	6.94	8.75
50	10	1.34	1.36	1.41	1.48	1.56	1.63	1.75	1.85	1.95	2.36	2.77
	20	1.53	1.57	1.64	1.73	1.82	1.92	2.07	2.19	2.32	2.86	3.41
	40	1.80	1.87	1.97	2.09	2.22	2.35	2.56	2.74	2.93	3.70	4.51
	60	2.01	2.10	2.24	2.39	2.56	2.73	2.99	3.22	3.46	4.45	5.49
	80	2.19	2.31	2.48	2.66	2.86	3.07	3.39	3.67	3.96	5.14	6.39
	100	2.34	2.50	2.70	2.92	3.15	3.39	3.77	4.09	4.42	5.80	7.24
	120	2.49	2.67	2.91	3.16	3.43	3.70	4.13	4.50	4.87	6.42	8.05
	140	2.63	2.84	3.11	3.39	3.69	4.00	4.48	4.89	5.30	7.02	8.82
100	10	1.50	1.52	1.58	1.65	1.73	1.81	1.93	2.04	2.14	2.56	2.98
	20	1.74	1.78	1.85	1.94	2.04	2.14	2.29	2.42	2.55	3.08	3.62
	40	2.07	2.13	2.23	2.35	2.48	2.61	2.82	2.99	3.17	3.92	4.71
	60	2.32	2.40	2.53	2.68	2.84	3.00	3.26	3.48	3.70	4.65	5.67
	80	2.52	2.63	2.79	2.97	3.15	3.35	3.65	3.92	4.19	5.34	6.56
	100	2.70	2.84	3.02	3.23	3.45	3.67	4.03	4.33	4.65	5.98	7.40
	120	2.87	3.03	3.24	3.47	3.72	3.98	4.38	4.73	5.09	6.60	8.20
	140	3.02	3.21	3.44	3.71	3.98	4.27	4.72	5.11	5.51	7.19	8.97
150	10	1.62	1.64	1.70	1.78	1.86	1.94	2.07	2.18	2.29	2.71	3.14
	20	1.90	1.93	2.01	2.10	2.20	2.30	2.46	2.59	2.72	3.26	3.81
	40	2.27	2.32	2.43	2.55	2.68	2.82	3.02	3.20	3.38	4.12	4.89
	60	2.54	2.62	2.76	2.90	3.06	3.23	3.48	3.70	3.92	4.85	5.84
	80	2.77	2.88	3.03	3.21	3.39	3.59	3.88	4.14	4.41	5.52	6.72
	100	2.97	3.10	3.28	3.48	3.69	3.91	4.26	4.56	4.86	6.16	7.55
	120	3.15	3.30	3.51	3.73	3.97	4.22	4.61	4.95	5.30	6.77	8.35
	140	3.32	3.49	3.72	3.97	4.24	4.52	4.95	5.33	5.72	7.36	9.11

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.72	1.74	1.80	1.88	1.96	2.05	2.18	2.29	2.40	2.84	3.27
	20	2.02	2.06	2.14	2.23	2.33	2.44	2.60	2.74	2.87	3.42	3.97
	40	2.42	2.48	2.59	2.72	2.85	2.99	3.20	3.37	3.55	4.29	5.06
	60	2.72	2.81	2.94	3.09	3.25	3.42	3.67	3.89	4.11	5.03	6.00
	80	2.97	3.08	3.23	3.41	3.60	3.79	4.09	4.34	4.60	5.70	6.88
	100	3.19	3.32	3.49	3.70	3.91	4.13	4.47	4.76	5.06	6.34	7.70
	120	3.39	3.53	3.73	3.96	4.20	4.44	4.82	5.16	5.50	6.94	8.49
	140	3.57	3.73	3.96	4.20	4.47	4.74	5.16	5.53	5.91	7.52	9.25
300	10	1.87	1.89	1.96	2.04	2.13	2.22	2.36	2.48	2.59	3.05	3.50
	20	2.22	2.26	2.34	2.44	2.55	2.66	2.83	2.97	3.11	3.68	4.24
	40	2.68	2.74	2.85	2.98	3.12	3.26	3.48	3.67	3.85	4.60	5.37
	60	3.02	3.10	3.24	3.40	3.56	3.73	3.99	4.21	4.44	5.36	6.32
	80	3.30	3.40	3.56	3.74	3.93	4.13	4.43	4.69	4.95	6.03	7.19
	100	3.55	3.67	3.85	4.05	4.27	4.49	4.83	5.12	5.42	6.67	8.00
	120	3.77	3.91	4.11	4.33	4.57	4.82	5.20	5.52	5.86	7.27	8.78
	140	3.97	4.13	4.35	4.60	4.86	5.13	5.55	5.91	6.28	7.84	9.53
400	10	2.00	2.02	2.09	2.18	2.27	2.36	2.51	2.63	2.75	3.22	3.69
	20	2.38	2.42	2.51	2.61	2.72	2.84	3.01	3.16	3.31	3.89	4.47
	40	2.89	2.95	3.07	3.20	3.35	3.49	3.72	3.91	4.10	4.86	5.64
	60	3.26	3.35	3.49	3.65	3.82	3.99	4.26	4.48	4.71	5.64	6.60
	80	3.57	3.67	3.84	4.02	4.21	4.41	4.72	4.98	5.25	6.33	7.47
	100	3.84	3.96	4.14	4.35	4.57	4.79	5.14	5.43	5.73	6.97	8.29
	120	4.07	4.21	4.42	4.65	4.89	5.14	5.52	5.84	6.18	7.57	9.06
	140	4.29	4.45	4.67	4.92	5.19	5.46	5.88	6.24	6.60	8.15	9.81
600	10	2.20	2.22	2.30	2.39	2.49	2.59	2.74	2.87	3.00	3.50	3.99
	20	2.64	2.68	2.78	2.89	3.01	3.13	3.32	3.47	3.63	4.25	4.85
	40	3.22	3.29	3.41	3.56	3.71	3.86	4.10	4.30	4.50	5.30	6.10
	60	3.65	3.74	3.89	4.05	4.23	4.42	4.70	4.93	5.17	6.13	7.10
	80	4.00	4.11	4.28	4.47	4.67	4.88	5.20	5.47	5.74	6.85	7.99
	100	4.30	4.43	4.62	4.83	5.06	5.29	5.65	5.95	6.26	7.51	8.81
	120	4.57	4.71	4.93	5.16	5.41	5.67	6.06	6.39	6.73	8.12	9.59
	140	4.82	4.98	5.21	5.46	5.73	6.01	6.44	6.80	7.17	8.70	10.33
800	10	2.36	2.39	2.47	2.57	2.67	2.77	2.94	3.07	3.20	3.73	4.24
	20	2.85	2.89	2.99	3.11	3.24	3.37	3.56	3.73	3.89	4.54	5.17
	40	3.49	3.56	3.69	3.84	4.00	4.17	4.42	4.62	4.83	5.66	6.49
	60	3.96	4.05	4.21	4.39	4.57	4.77	5.06	5.30	5.55	6.54	7.53
	80	4.35	4.46	4.64	4.84	5.05	5.27	5.60	5.88	6.16	7.29	8.45
	100	4.68	4.81	5.01	5.23	5.46	5.71	6.07	6.38	6.70	7.97	9.29
	120	4.98	5.12	5.34	5.58	5.84	6.10	6.51	6.85	7.19	8.60	10.07
	140	5.25	5.41	5.64	5.91	6.19	6.47	6.91	7.28	7.65	9.20	10.82

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.33	1.42	1.55	1.68	1.82	1.96	2.17	2.35	2.53	3.25	3.98
	20	1.56	1.73	1.91	2.10	2.30	2.49	2.79	3.03	3.28	4.30	5.33
	40	1.95	2.24	2.52	2.81	3.10	3.39	3.82	4.19	4.55	6.05	7.60
	60	2.30	2.68	3.06	3.43	3.80	4.17	4.73	5.20	5.67	7.60	9.59
	80	2.62	3.10	3.55	4.00	4.45	4.89	5.56	6.13	6.69	9.01	11.42
	100	2.91	3.48	4.02	4.54	5.05	5.57	6.35	7.00	7.65	10.34	13.13
	120	3.20	3.85	4.46	5.05	5.63	6.21	7.09	7.83	8.57	11.61	14.76
	140	3.47	4.20	4.88	5.53	6.18	6.83	7.80	8.62	9.45	12.82	16.32
25	10	1.73	1.77	1.86	1.97	2.09	2.21	2.40	2.56	2.73	3.41	4.12
	20	2.00	2.09	2.22	2.38	2.54	2.72	2.99	3.22	3.46	4.43	5.45
	40	2.41	2.58	2.80	3.05	3.31	3.58	3.99	4.34	4.70	6.17	7.70
	60	2.74	3.00	3.32	3.65	4.00	4.35	4.88	5.34	5.80	7.70	9.68
	80	3.04	3.40	3.79	4.21	4.63	5.06	5.71	6.26	6.82	9.11	11.50
	100	3.32	3.77	4.24	4.73	5.23	5.72	6.48	7.12	7.77	10.44	13.21
	120	3.59	4.12	4.67	5.23	5.79	6.36	7.22	7.95	8.68	11.70	14.84
	140	3.85	4.46	5.09	5.71	6.34	6.97	7.93	8.74	9.55	12.90	16.40
50	10	1.92	1.96	2.05	2.16	2.27	2.40	2.58	2.74	2.90	3.57	4.26
	20	2.24	2.31	2.44	2.59	2.75	2.92	3.17	3.39	3.62	4.57	5.57
	40	2.70	2.84	3.05	3.27	3.51	3.77	4.16	4.50	4.84	6.29	7.80
	60	3.06	3.28	3.56	3.86	4.19	4.52	5.04	5.48	5.93	7.81	9.77
	80	3.37	3.67	4.02	4.41	4.81	5.22	5.85	6.39	6.94	9.21	11.58
	100	3.66	4.03	4.47	4.92	5.40	5.88	6.62	7.25	7.89	10.53	13.29
	120	3.94	4.38	4.89	5.42	5.96	6.51	7.35	8.07	8.79	11.78	14.91
	140	4.20	4.72	5.29	5.89	6.50	7.12	8.06	8.85	9.66	12.99	16.47
100	10	2.17	2.21	2.30	2.42	2.53	2.66	2.85	3.01	3.17	3.83	4.51
	20	2.56	2.63	2.76	2.90	3.06	3.23	3.48	3.69	3.91	4.83	5.79
	40	3.10	3.23	3.42	3.63	3.86	4.10	4.47	4.79	5.12	6.51	7.99
	60	3.51	3.70	3.95	4.23	4.53	4.85	5.33	5.76	6.19	8.02	9.95
	80	3.86	4.11	4.43	4.78	5.15	5.53	6.13	6.65	7.18	9.40	11.75
	100	4.18	4.49	4.87	5.29	5.72	6.18	6.89	7.50	8.12	10.71	13.44
	120	4.47	4.84	5.29	5.77	6.28	6.80	7.61	8.30	9.01	11.96	15.06
	140	4.75	5.18	5.69	6.24	6.81	7.40	8.30	9.08	9.87	13.16	16.61
150	10	2.35	2.39	2.49	2.60	2.73	2.85	3.05	3.21	3.38	4.05	4.73
	20	2.79	2.86	2.99	3.14	3.30	3.47	3.72	3.94	4.16	5.06	6.01
	40	3.39	3.52	3.71	3.92	4.14	4.38	4.74	5.06	5.38	6.74	8.19
	60	3.85	4.03	4.27	4.55	4.84	5.14	5.61	6.02	6.44	8.22	10.12
	80	4.23	4.46	4.77	5.10	5.45	5.82	6.40	6.90	7.42	9.60	11.91
	100	4.57	4.86	5.22	5.61	6.03	6.47	7.15	7.74	8.34	10.90	13.60
	120	4.89	5.23	5.64	6.10	6.58	7.08	7.86	8.54	9.23	12.14	15.21
	140	5.18	5.57	6.05	6.56	7.10	7.67	8.55	9.31	10.08	13.33	16.76

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.50	2.54	2.64	2.76	2.89	3.02	3.22	3.39	3.55	4.23	4.92
	20	2.98	3.05	3.18	3.34	3.50	3.67	3.93	4.15	4.37	5.27	6.22
	40	3.63	3.76	3.95	4.16	4.39	4.62	4.98	5.30	5.61	6.95	8.38
	60	4.12	4.30	4.54	4.81	5.10	5.40	5.86	6.26	6.68	8.42	10.30
	80	4.54	4.76	5.06	5.38	5.73	6.09	6.66	7.15	7.65	9.79	12.08
	100	4.90	5.17	5.52	5.91	6.31	6.74	7.40	7.97	8.57	11.08	13.76
	120	5.23	5.55	5.96	6.40	6.86	7.35	8.11	8.77	9.44	12.31	15.36
	140	5.54	5.91	6.37	6.86	7.39	7.93	8.79	9.53	10.29	13.50	16.90
300	10	2.74	2.78	2.88	3.01	3.14	3.28	3.49	3.66	3.84	4.54	5.24
	20	3.28	3.36	3.49	3.65	3.82	4.00	4.27	4.49	4.72	5.64	6.58
	40	4.02	4.15	4.34	4.56	4.79	5.03	5.39	5.71	6.02	7.35	8.74
	60	4.57	4.74	4.99	5.26	5.55	5.84	6.31	6.70	7.11	8.81	10.64
	80	5.03	5.25	5.54	5.86	6.21	6.56	7.12	7.59	8.08	10.16	12.40
	100	5.44	5.69	6.04	6.41	6.81	7.22	7.86	8.42	8.99	11.44	14.07
	120	5.80	6.10	6.49	6.92	7.37	7.84	8.57	9.21	9.86	12.66	15.66
	140	6.13	6.48	6.92	7.40	7.90	8.43	9.25	9.96	10.70	13.83	17.19
400	10	2.93	2.97	3.08	3.21	3.35	3.49	3.71	3.89	4.07	4.80	5.52
	20	3.53	3.61	3.75	3.91	4.09	4.27	4.55	4.78	5.01	5.95	6.90
	40	4.34	4.46	4.66	4.89	5.12	5.37	5.74	6.06	6.38	7.70	9.09
	60	4.94	5.11	5.36	5.63	5.92	6.22	6.69	7.08	7.49	9.17	10.98
	80	5.44	5.65	5.94	6.27	6.61	6.97	7.52	7.99	8.48	10.52	12.72
	100	5.87	6.13	6.47	6.84	7.24	7.64	8.28	8.83	9.39	11.79	14.37
	120	6.27	6.56	6.94	7.37	7.81	8.28	9.00	9.62	10.26	13.00	15.95
	140	6.63	6.96	7.39	7.86	8.36	8.87	9.68	10.37	11.09	14.16	17.47
600	10	3.23	3.28	3.40	3.54	3.69	3.84	4.07	4.26	4.46	5.22	5.97
	20	3.93	4.01	4.16	4.33	4.52	4.71	5.00	5.25	5.49	6.47	7.45
	40	4.85	4.98	5.19	5.42	5.67	5.92	6.31	6.64	6.97	8.32	9.70
	60	5.53	5.70	5.96	6.24	6.54	6.85	7.33	7.73	8.14	9.83	11.60
	80	6.10	6.30	6.60	6.94	7.29	7.65	8.21	8.68	9.17	11.18	13.34
	100	6.58	6.83	7.18	7.56	7.95	8.37	9.00	9.55	10.10	12.45	14.97
	120	7.02	7.31	7.70	8.12	8.57	9.03	9.74	10.35	10.98	13.65	16.53
	140	7.42	7.75	8.18	8.64	9.14	9.65	10.44	11.12	11.82	14.80	18.03
800	10	3.48	3.54	3.66	3.81	3.96	4.12	4.36	4.56	4.77	5.56	6.34
	20	4.25	4.33	4.49	4.68	4.87	5.07	5.38	5.63	5.89	6.90	7.91
	40	5.27	5.40	5.61	5.86	6.11	6.38	6.78	7.12	7.46	8.84	10.24
	60	6.02	6.19	6.45	6.75	7.06	7.37	7.86	8.28	8.69	10.40	12.17
	80	6.63	6.84	7.15	7.49	7.85	8.22	8.79	9.27	9.76	11.78	13.91
	100	7.16	7.41	7.76	8.15	8.56	8.97	9.62	10.17	10.73	13.06	15.54
	120	7.64	7.92	8.32	8.75	9.20	9.66	10.38	11.00	11.63	14.26	17.09
	140	8.07	8.39	8.83	9.30	9.80	10.31	11.10	11.78	12.48	15.41	18.58

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.98	2.18	2.41	2.64	2.88	3.12	3.48	3.78	4.09	5.33	6.60
	20	2.45	2.79	3.13	3.48	3.83	4.18	4.71	5.15	5.60	7.42	9.30
	40	3.24	3.81	4.36	4.90	5.43	5.97	6.78	7.46	8.14	10.94	13.84
	60	3.93	4.70	5.43	6.14	6.84	7.54	8.60	9.48	10.37	14.03	17.81
	80	4.56	5.53	6.42	7.28	8.13	8.98	10.26	11.34	12.42	16.86	21.47
	100	5.16	6.30	7.34	8.35	9.35	10.34	11.83	13.08	14.34	19.52	24.89
	120	5.72	7.03	8.22	9.37	10.50	11.62	13.32	14.74	16.17	22.05	28.16
	140	6.26	7.73	9.06	10.34	11.60	12.86	14.75	16.33	17.93	24.47	31.28
25	10	2.51	2.61	2.77	2.97	3.17	3.38	3.72	4.00	4.29	5.50	6.74
	20	2.99	3.19	3.47	3.77	4.08	4.41	4.91	5.34	5.77	7.56	9.42
	40	3.74	4.17	4.64	5.14	5.65	6.17	6.95	7.62	8.29	11.06	13.94
	60	4.40	5.03	5.69	6.36	7.04	7.72	8.75	9.63	10.51	14.13	17.90
	80	5.01	5.83	6.66	7.49	8.32	9.15	10.41	11.47	12.55	16.96	21.55
	100	5.58	6.59	7.57	8.55	9.52	10.49	11.97	13.21	14.46	19.61	24.97
	120	6.13	7.31	8.44	9.55	10.66	11.77	13.45	14.86	16.28	22.14	28.23
	140	6.66	8.00	9.28	10.52	11.76	13.00	14.87	16.44	18.03	24.56	31.35
50	10	2.79	2.88	3.04	3.22	3.42	3.62	3.94	4.21	4.49	5.66	6.88
	20	3.33	3.51	3.75	4.03	4.33	4.63	5.11	5.52	5.95	7.70	9.53
	40	4.14	4.49	4.92	5.38	5.86	6.36	7.12	7.77	8.44	11.18	14.03
	60	4.81	5.34	5.94	6.58	7.23	7.89	8.91	9.77	10.64	14.24	17.99
	80	5.41	6.13	6.90	7.69	8.50	9.31	10.55	11.60	12.67	17.06	21.63
	100	5.98	6.87	7.80	8.74	9.69	10.65	12.10	13.33	14.58	19.70	25.05
	120	6.52	7.58	8.66	9.74	10.83	11.92	13.58	14.98	16.40	22.22	28.31
	140	7.03	8.26	9.49	10.70	11.92	13.15	15.00	16.56	18.14	24.64	31.43
100	10	3.17	3.25	3.41	3.59	3.79	3.99	4.30	4.57	4.84	5.97	7.15
	20	3.81	3.96	4.20	4.46	4.74	5.03	5.48	5.87	6.28	7.97	9.77
	40	4.72	5.02	5.40	5.82	6.27	6.73	7.46	8.08	8.72	11.41	14.23
	60	5.45	5.89	6.42	7.00	7.61	8.24	9.21	10.05	10.90	14.45	18.17
	80	6.08	6.67	7.36	8.09	8.85	9.64	10.84	11.87	12.91	17.25	21.80
	100	6.66	7.40	8.24	9.12	10.03	10.96	12.38	13.58	14.81	19.89	25.21
	120	7.20	8.10	9.09	10.11	11.15	12.22	13.84	15.22	16.62	22.40	28.46
	140	7.72	8.77	9.90	11.06	12.23	13.43	15.25	16.79	18.35	24.81	31.57
150	10	3.45	3.53	3.69	3.87	4.07	4.28	4.59	4.86	5.13	6.24	7.41
	20	4.16	4.31	4.54	4.80	5.07	5.36	5.81	6.19	6.58	8.24	10.00
	40	5.16	5.44	5.80	6.20	6.63	7.08	7.78	8.38	9.01	11.64	14.43
	60	5.94	6.34	6.84	7.39	7.97	8.57	9.51	10.33	11.16	14.66	18.35
	80	6.61	7.14	7.78	8.47	9.20	9.95	11.12	12.13	13.16	17.45	21.97
	100	7.22	7.88	8.66	9.49	10.36	11.26	12.65	13.83	15.04	20.07	25.37
	120	7.78	8.58	9.50	10.47	11.47	12.51	14.10	15.46	16.84	22.58	28.61
	140	8.31	9.25	10.30	11.41	12.54	13.71	15.50	17.02	18.57	24.98	31.72

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.67	3.76	3.92	4.11	4.31	4.52	4.83	5.10	5.38	6.50	7.65
	20	4.45	4.59	4.82	5.09	5.36	5.65	6.09	6.47	6.86	8.49	10.22
	40	5.52	5.79	6.14	6.54	6.96	7.40	8.08	8.67	9.28	11.86	14.62
	60	6.35	6.73	7.22	7.75	8.31	8.89	9.81	10.60	11.42	14.86	18.53
	80	7.06	7.56	8.17	8.83	9.53	10.26	11.40	12.39	13.40	17.64	22.13
	100	7.69	8.31	9.05	9.85	10.69	11.56	12.91	14.08	15.27	20.26	25.52
	120	8.27	9.02	9.89	10.82	11.79	12.80	14.36	15.69	17.06	22.75	28.76
	140	8.82	9.69	10.69	11.75	12.85	13.99	15.75	17.25	18.78	25.15	31.86
300	10	4.03	4.12	4.29	4.48	4.69	4.91	5.24	5.52	5.80	6.93	8.09
	20	4.91	5.06	5.29	5.56	5.84	6.13	6.58	6.96	7.35	8.96	10.66
	40	6.11	6.37	6.72	7.11	7.53	7.96	8.63	9.20	9.80	12.31	15.01
	60	7.03	7.38	7.85	8.37	8.91	9.47	10.36	11.12	11.91	15.27	18.88
	80	7.80	8.26	8.84	9.48	10.15	10.85	11.94	12.89	13.87	18.03	22.46
	100	8.48	9.05	9.75	10.50	11.30	12.13	13.44	14.56	15.72	20.62	25.84
	120	9.10	9.79	10.60	11.47	12.40	13.36	14.86	16.16	17.49	23.10	29.06
	140	9.68	10.48	11.40	12.40	13.45	14.54	16.24	17.70	19.20	25.49	32.15
400	10	4.33	4.42	4.59	4.79	5.01	5.23	5.57	5.86	6.14	7.30	8.47
	20	5.29	5.44	5.68	5.95	6.24	6.53	6.99	7.38	7.77	9.38	11.07
	40	6.60	6.85	7.20	7.59	8.01	8.44	9.11	9.68	10.26	12.73	15.39
	60	7.58	7.93	8.39	8.90	9.44	9.99	10.86	11.61	12.39	15.68	19.23
	80	8.40	8.85	9.42	10.04	10.70	11.38	12.45	13.38	14.33	18.41	22.79
	100	9.13	9.68	10.35	11.09	11.86	12.67	13.94	15.04	16.17	20.99	26.15
	120	9.80	10.44	11.22	12.07	12.96	13.89	15.35	16.62	17.93	23.45	29.36
	140	10.41	11.15	12.04	13.00	14.01	15.07	16.72	18.15	19.62	25.83	32.44
600	10	4.80	4.89	5.08	5.29	5.52	5.76	6.11	6.41	6.72	7.92	9.12
	20	5.90	6.05	6.30	6.58	6.89	7.20	7.67	8.07	8.47	10.11	11.80
	40	7.38	7.62	7.99	8.39	8.81	9.25	9.93	10.50	11.09	13.52	16.12
	60	8.48	8.82	9.28	9.79	10.33	10.89	11.75	12.49	13.25	16.46	19.92
	80	9.40	9.83	10.39	11.01	11.65	12.32	13.37	14.27	15.20	19.15	23.44
	100	10.20	10.72	11.38	12.10	12.85	13.64	14.87	15.93	17.02	21.70	26.77
	120	10.93	11.54	12.29	13.11	13.98	14.88	16.28	17.50	18.76	24.14	29.95
	140	11.60	12.30	13.15	14.07	15.04	16.05	17.64	19.01	20.44	26.49	33.01
800	10	5.18	5.28	5.47	5.70	5.94	6.19	6.56	6.87	7.19	8.43	9.67
	20	6.39	6.55	6.81	7.10	7.42	7.74	8.23	8.64	9.06	10.74	12.44
	40	8.01	8.26	8.63	9.05	9.48	9.93	10.62	11.20	11.79	14.23	16.81
	60	9.21	9.55	10.02	10.54	11.08	11.65	12.51	13.25	14.01	17.18	20.59
	80	10.21	10.63	11.20	11.82	12.46	13.14	14.18	15.07	15.99	19.87	24.08
	100	11.08	11.59	12.24	12.96	13.71	14.49	15.70	16.74	17.82	22.40	27.38
	120	11.86	12.45	13.20	14.01	14.86	15.75	17.13	18.32	19.56	24.82	30.54
	140	12.58	13.25	14.09	15.00	15.95	16.94	18.49	19.83	21.22	27.15	33.58

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.09	3.48	3.90	4.32	4.75	5.17	5.82	6.36	6.90	9.12	11.40
	20	4.02	4.70	5.36	6.01	6.66	7.30	8.28	9.10	9.93	13.31	16.80
	40	5.59	6.74	7.80	8.84	9.86	10.89	12.42	13.72	15.02	20.34	25.87
	60	6.97	8.53	9.95	11.32	12.68	14.03	16.06	17.76	19.48	26.51	33.83
	80	8.24	10.17	11.92	13.60	15.26	16.91	19.39	21.47	23.57	32.18	41.13
	100	9.43	11.72	13.77	15.74	17.69	19.62	22.52	24.96	27.42	37.50	47.99
	120	10.56	13.18	15.53	17.78	19.99	22.19	25.50	28.27	31.07	42.55	54.51
	140	11.65	14.59	17.22	19.73	22.20	24.66	28.35	31.45	34.58	47.40	60.76
25	10	3.72	3.97	4.30	4.66	5.05	5.45	6.06	6.58	7.11	9.29	11.54
	20	4.62	5.12	5.70	6.30	6.91	7.54	8.49	9.29	10.10	13.45	16.92
	40	6.12	7.10	8.09	9.09	10.08	11.08	12.60	13.87	15.16	20.46	25.97
	60	7.46	8.86	10.21	11.55	12.87	14.20	16.21	17.90	19.61	26.62	33.92
	80	8.69	10.48	12.16	13.81	15.44	17.08	19.54	21.61	23.70	32.28	41.22
	100	9.86	12.01	14.00	15.94	17.86	19.77	22.66	25.09	27.53	37.59	48.07
	120	10.97	13.46	15.75	17.97	20.16	22.34	25.63	28.39	31.18	42.64	54.59
	140	12.04	14.86	17.43	19.91	22.36	24.80	28.48	31.57	34.69	47.49	60.84
50	10	4.13	4.34	4.64	4.98	5.34	5.71	6.30	6.80	7.31	9.45	11.68
	20	5.09	5.51	6.02	6.58	7.16	7.76	8.69	9.48	10.28	13.58	17.03
	40	6.61	7.45	8.38	9.33	10.30	11.28	12.77	14.03	15.31	20.58	26.07
	60	7.92	9.18	10.47	11.77	13.07	14.38	16.37	18.04	19.74	26.72	34.01
	80	9.13	10.78	12.41	14.02	15.63	17.24	19.68	21.74	23.82	32.38	41.30
	100	10.28	12.29	14.23	16.14	18.03	19.93	22.80	25.21	27.65	37.68	48.15
	120	11.37	13.73	15.97	18.15	20.32	22.49	25.76	28.51	31.30	42.73	54.66
	140	12.43	15.12	17.64	20.09	22.52	24.95	28.61	31.68	34.79	47.57	60.91
100	10	4.70	4.88	5.17	5.49	5.83	6.18	6.74	7.22	7.71	9.77	11.96
	20	5.78	6.13	6.60	7.11	7.65	8.21	9.09	9.84	10.62	13.86	17.27
	40	7.40	8.10	8.92	9.80	10.72	11.66	13.11	14.34	15.60	20.81	26.27
	60	8.74	9.80	10.98	12.20	13.46	14.73	16.68	18.33	20.01	26.94	34.19
	80	9.94	11.37	12.88	14.42	15.99	17.57	19.97	22.00	24.07	32.57	41.47
	100	11.07	12.86	14.68	16.52	18.37	20.24	23.07	25.46	27.88	37.87	48.31
	120	12.15	14.28	16.40	18.52	20.65	22.79	26.02	28.75	31.52	42.91	54.81
	140	13.18	15.64	18.06	20.45	22.84	25.23	28.86	31.92	35.01	47.75	61.05
150	10	5.12	5.29	5.57	5.89	6.23	6.58	7.12	7.59	8.07	10.09	12.23
	20	6.31	6.63	7.07	7.56	8.08	8.62	9.47	10.20	10.95	14.13	17.50
	40	8.03	8.66	9.43	10.26	11.13	12.04	13.45	14.65	15.89	21.04	26.47
	60	9.42	10.38	11.47	12.63	13.84	15.08	16.98	18.61	20.27	27.15	34.36
	80	10.65	11.94	13.35	14.83	16.34	17.89	20.26	22.27	24.31	32.77	41.63
	100	11.79	13.41	15.13	16.91	18.71	20.55	23.34	25.71	28.12	38.05	48.46
	120	12.87	14.81	16.83	18.89	20.98	23.08	26.28	28.99	31.74	43.09	54.96
	140	13.90	16.16	18.47	20.80	23.15	25.52	29.11	32.15	35.22	47.92	61.20

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.46	5.63	5.91	6.23	6.57	6.92	7.46	7.93	8.40	10.39	12.50
	20	6.74	7.05	7.48	7.96	8.47	9.00	9.83	10.54	11.28	14.40	17.73
	40	8.56	9.16	9.89	10.69	11.53	12.41	13.78	14.96	16.18	21.27	26.66
	60	10.01	10.90	11.93	13.05	14.21	15.42	17.29	18.89	20.53	27.35	34.54
	80	11.28	12.46	13.80	15.23	16.70	18.21	20.54	22.53	24.55	32.96	41.80
	100	12.44	13.93	15.57	17.29	19.05	20.85	23.61	25.96	28.35	38.24	48.62
	120	13.52	15.32	17.26	19.26	21.30	23.37	26.54	29.23	31.96	43.26	55.11
	140	14.56	16.67	18.89	21.16	23.46	25.80	29.36	32.38	35.44	48.09	61.34
300	10	6.01	6.18	6.47	6.79	7.14	7.49	8.04	8.51	8.98	10.95	13.02
	20	7.44	7.74	8.17	8.64	9.14	9.67	10.48	11.18	11.89	14.93	18.19
	40	9.44	9.99	10.69	11.45	12.26	13.10	14.42	15.56	16.74	21.73	27.06
	60	11.00	11.80	12.77	13.83	14.93	16.09	17.89	19.45	21.05	27.77	34.90
	80	12.34	13.41	14.65	15.99	17.39	18.85	21.11	23.05	25.04	33.35	42.13
	100	13.55	14.89	16.41	18.03	19.72	21.46	24.15	26.46	28.81	38.61	48.94
	120	14.68	16.29	18.08	19.98	21.94	23.96	27.06	29.71	32.40	43.62	55.41
	140	15.74	17.62	19.69	21.86	24.08	26.36	29.86	32.83	35.86	48.43	61.63
400	10	6.46	6.63	6.92	7.26	7.61	7.97	8.53	9.00	9.48	11.45	13.51
	20	8.01	8.31	8.74	9.21	9.72	10.24	11.05	11.74	12.45	15.44	18.65
	40	10.16	10.69	11.38	12.13	12.92	13.74	15.02	16.14	17.29	22.18	27.45
	60	11.82	12.58	13.52	14.53	15.61	16.72	18.48	20.00	21.56	28.19	35.25
	80	13.23	14.24	15.43	16.71	18.06	19.47	21.67	23.57	25.52	33.74	42.46
	100	14.50	15.75	17.19	18.74	20.37	22.06	24.69	26.95	29.27	38.98	49.25
	120	15.66	17.16	18.86	20.68	22.57	24.53	27.57	30.18	32.84	43.97	55.71
	140	16.76	18.51	20.46	22.54	24.70	26.92	30.35	33.29	36.28	48.77	61.92
600	10	7.19	7.36	7.67	8.01	8.38	8.76	9.34	9.83	10.32	12.32	14.38
	20	8.94	9.24	9.67	10.16	10.68	11.21	12.02	12.72	13.43	16.38	19.52
	40	11.35	11.86	12.53	13.27	14.05	14.86	16.12	17.20	18.32	23.07	28.22
	60	13.17	13.89	14.79	15.78	16.81	17.89	19.58	21.04	22.56	29.01	35.96
	80	14.71	15.64	16.77	18.00	19.29	20.64	22.75	24.58	26.47	34.51	43.12
	100	16.08	17.23	18.58	20.05	21.60	23.21	25.73	27.92	30.17	39.71	49.87
	120	17.32	18.69	20.28	21.99	23.79	25.66	28.59	31.12	33.72	44.67	56.31
	140	18.49	20.07	21.89	23.84	25.89	28.02	31.33	34.19	37.13	49.44	62.50
800	10	7.77	7.95	8.27	8.63	9.01	9.41	10.00	10.51	11.02	13.06	15.14
	20	9.70	9.99	10.44	10.94	11.47	12.01	12.84	13.55	14.26	17.22	20.33
	40	12.31	12.81	13.49	14.23	15.02	15.82	17.08	18.15	19.26	23.93	28.98
	60	14.28	14.98	15.87	16.84	17.87	18.93	20.59	22.02	23.50	29.82	36.66
	80	15.93	16.82	17.93	19.13	20.39	21.71	23.76	25.55	27.39	35.27	43.78
	100	17.38	18.48	19.80	21.22	22.72	24.29	26.74	28.87	31.07	40.43	50.50
	120	18.71	20.00	21.53	23.18	24.92	26.73	29.57	32.04	34.58	45.37	56.91
	140	19.93	21.43	23.17	25.04	27.02	29.08	32.30	35.09	37.96	50.11	63.07

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	0.96	1.01	1.08	1.16	1.24	1.32	1.45	1.56	1.67	2.11	2.55
	20	1.09	1.17	1.27	1.38	1.49	1.60	1.77	1.91	2.06	2.64	3.24
	40	1.29	1.43	1.59	1.75	1.90	2.06	2.31	2.51	2.71	3.54	4.39
	60	1.48	1.67	1.87	2.07	2.27	2.47	2.77	3.03	3.29	4.33	5.41
	80	1.64	1.88	2.13	2.37	2.61	2.84	3.21	3.51	3.81	5.06	6.34
	100	1.80	2.09	2.37	2.64	2.92	3.20	3.61	3.96	4.31	5.74	7.21
	120	1.95	2.28	2.60	2.91	3.22	3.53	3.99	4.39	4.78	6.38	8.04
	140	2.09	2.46	2.82	3.16	3.51	3.85	4.36	4.80	5.23	7.00	8.84
25	10	1.27	1.28	1.34	1.40	1.47	1.55	1.66	1.76	1.86	2.27	2.69
	20	1.44	1.47	1.54	1.63	1.72	1.82	1.97	2.10	2.23	2.78	3.36
	40	1.68	1.74	1.85	1.98	2.12	2.26	2.48	2.67	2.86	3.66	4.49
	60	1.87	1.97	2.12	2.29	2.46	2.65	2.93	3.17	3.42	4.44	5.50
	80	2.03	2.18	2.37	2.57	2.79	3.01	3.35	3.64	3.94	5.16	6.42
	100	2.18	2.37	2.60	2.84	3.09	3.35	3.75	4.09	4.43	5.83	7.29
	120	2.33	2.55	2.82	3.10	3.39	3.68	4.13	4.51	4.89	6.47	8.12
	140	2.46	2.73	3.03	3.35	3.67	3.99	4.49	4.91	5.34	7.09	8.91
50	10	1.40	1.41	1.47	1.53	1.61	1.68	1.80	1.90	2.00	2.40	2.82
	20	1.60	1.63	1.70	1.79	1.88	1.98	2.12	2.25	2.38	2.91	3.47
	40	1.88	1.94	2.05	2.17	2.29	2.43	2.64	2.82	3.00	3.78	4.59
	60	2.10	2.19	2.33	2.48	2.64	2.81	3.08	3.31	3.55	4.54	5.59
	80	2.29	2.41	2.57	2.76	2.96	3.17	3.50	3.78	4.06	5.26	6.51
	100	2.45	2.60	2.80	3.03	3.26	3.51	3.89	4.21	4.54	5.93	7.37
	120	2.60	2.79	3.02	3.28	3.55	3.83	4.26	4.63	5.00	6.56	8.20
	140	2.75	2.96	3.23	3.52	3.82	4.14	4.62	5.03	5.45	7.18	8.99
100	10	1.57	1.59	1.64	1.71	1.79	1.87	1.99	2.09	2.19	2.61	3.02
	20	1.82	1.85	1.92	2.01	2.10	2.20	2.35	2.48	2.61	3.14	3.69
	40	2.16	2.22	2.32	2.44	2.56	2.70	2.90	3.07	3.25	4.00	4.79
	60	2.42	2.50	2.63	2.78	2.93	3.10	3.35	3.57	3.80	4.75	5.77
	80	2.63	2.74	2.90	3.07	3.26	3.46	3.76	4.03	4.30	5.45	6.67
	100	2.83	2.96	3.14	3.34	3.56	3.79	4.15	4.46	4.77	6.11	7.53
	120	3.00	3.15	3.37	3.60	3.85	4.11	4.51	4.86	5.22	6.74	8.35
	140	3.16	3.34	3.58	3.84	4.12	4.41	4.87	5.26	5.66	7.35	9.13
150	10	1.69	1.71	1.77	1.84	1.92	2.00	2.13	2.23	2.34	2.77	3.19
	20	1.98	2.01	2.08	2.17	2.27	2.37	2.53	2.66	2.79	3.33	3.87
	40	2.37	2.42	2.52	2.64	2.77	2.90	3.11	3.28	3.46	4.20	4.97
	60	2.65	2.73	2.86	3.01	3.16	3.33	3.58	3.80	4.02	4.95	5.94
	80	2.89	2.99	3.15	3.32	3.51	3.70	4.00	4.26	4.52	5.64	6.84
	100	3.10	3.23	3.40	3.60	3.82	4.04	4.38	4.68	4.99	6.29	7.69
	120	3.29	3.44	3.64	3.87	4.11	4.36	4.75	5.09	5.44	6.92	8.50
	140	3.47	3.64	3.86	4.12	4.38	4.66	5.10	5.48	5.87	7.52	9.28

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.79	1.81	1.87	1.95	2.03	2.11	2.24	2.35	2.46	2.90	3.33
	20	2.11	2.14	2.22	2.31	2.41	2.51	2.67	2.81	2.94	3.49	4.04
	40	2.53	2.58	2.69	2.81	2.94	3.08	3.29	3.46	3.64	4.38	5.15
	60	2.84	2.92	3.05	3.20	3.36	3.52	3.78	3.99	4.21	5.14	6.11
	80	3.10	3.20	3.35	3.53	3.71	3.91	4.20	4.46	4.72	5.82	7.00
	100	3.33	3.45	3.63	3.83	4.04	4.26	4.60	4.89	5.19	6.47	7.84
	120	3.53	3.68	3.88	4.10	4.34	4.58	4.97	5.30	5.64	7.09	8.65
	140	3.72	3.88	4.11	4.36	4.62	4.89	5.32	5.69	6.07	7.69	9.42
300	10	1.95	1.97	2.04	2.11	2.20	2.29	2.43	2.54	2.66	3.11	3.56
	20	2.32	2.35	2.43	2.53	2.63	2.74	2.91	3.05	3.19	3.75	4.32
	40	2.80	2.85	2.96	3.09	3.22	3.36	3.58	3.76	3.95	4.70	5.46
	60	3.15	3.23	3.36	3.51	3.68	3.85	4.10	4.32	4.55	5.47	6.43
	80	3.44	3.54	3.70	3.87	4.06	4.26	4.56	4.81	5.08	6.16	7.32
	100	3.70	3.82	3.99	4.19	4.41	4.63	4.97	5.26	5.56	6.81	8.15
	120	3.93	4.06	4.26	4.49	4.72	4.97	5.35	5.68	6.01	7.42	8.94
	140	4.14	4.29	4.51	4.76	5.02	5.29	5.71	6.07	6.44	8.01	9.71
400	10	2.08	2.10	2.17	2.25	2.34	2.43	2.58	2.70	2.82	3.29	3.75
	20	2.48	2.52	2.60	2.70	2.81	2.93	3.10	3.24	3.39	3.97	4.55
	40	3.01	3.07	3.18	3.31	3.45	3.60	3.82	4.01	4.20	4.96	5.74
	60	3.40	3.48	3.61	3.77	3.94	4.11	4.38	4.60	4.83	5.76	6.72
	80	3.72	3.82	3.98	4.16	4.35	4.55	4.86	5.12	5.38	6.47	7.61
	100	4.00	4.11	4.30	4.50	4.72	4.94	5.28	5.58	5.88	7.12	8.44
	120	4.25	4.38	4.58	4.81	5.05	5.30	5.68	6.00	6.34	7.74	9.23
	140	4.48	4.63	4.85	5.10	5.36	5.63	6.05	6.41	6.78	8.33	9.99
600	10	2.29	2.31	2.38	2.47	2.57	2.67	2.82	2.95	3.07	3.57	4.06
	20	2.75	2.79	2.88	2.99	3.10	3.22	3.41	3.56	3.72	4.33	4.94
	40	3.36	3.42	3.54	3.68	3.83	3.98	4.22	4.41	4.61	5.41	6.21
	60	3.81	3.88	4.03	4.19	4.37	4.55	4.83	5.06	5.30	6.26	7.23
	80	4.17	4.27	4.43	4.62	4.82	5.03	5.35	5.62	5.89	7.00	8.14
	100	4.49	4.60	4.79	5.00	5.22	5.45	5.81	6.11	6.42	7.67	8.98
	120	4.77	4.90	5.11	5.34	5.59	5.84	6.23	6.56	6.90	8.30	9.77
	140	5.02	5.17	5.40	5.65	5.92	6.20	6.62	6.99	7.36	8.89	10.52
800	10	2.46	2.48	2.56	2.65	2.75	2.86	3.02	3.15	3.28	3.80	4.31
	20	2.97	3.01	3.10	3.22	3.34	3.47	3.66	3.82	3.99	4.63	5.26
	40	3.64	3.70	3.83	3.97	4.13	4.29	4.54	4.75	4.95	5.78	6.60
	60	4.13	4.21	4.36	4.54	4.72	4.91	5.20	5.44	5.69	6.67	7.67
	80	4.53	4.63	4.80	5.00	5.21	5.43	5.76	6.03	6.31	7.45	8.60
	100	4.88	5.00	5.19	5.41	5.64	5.88	6.25	6.56	6.87	8.14	9.46
	120	5.19	5.32	5.53	5.78	6.03	6.29	6.69	7.03	7.38	8.79	10.26
	140	5.47	5.62	5.85	6.11	6.39	6.67	7.11	7.48	7.85	9.40	11.02

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.39	1.49	1.61	1.75	1.88	2.02	2.23	2.41	2.59	3.31	4.05
	20	1.64	1.81	1.99	2.18	2.38	2.57	2.87	3.12	3.37	4.39	5.42
	40	2.06	2.34	2.63	2.92	3.21	3.50	3.94	4.31	4.68	6.19	7.74
	60	2.42	2.81	3.19	3.57	3.94	4.32	4.88	5.35	5.83	7.76	9.76
	80	2.75	3.24	3.71	4.16	4.61	5.06	5.74	6.31	6.88	9.21	11.63
	100	3.07	3.65	4.19	4.72	5.24	5.77	6.55	7.21	7.87	10.57	13.37
	120	3.36	4.03	4.65	5.25	5.84	6.43	7.32	8.06	8.81	11.87	15.04
	140	3.65	4.40	5.09	5.76	6.42	7.07	8.06	8.88	9.71	13.11	16.63
25	10	1.81	1.85	1.94	2.04	2.16	2.28	2.47	2.63	2.80	3.48	4.19
	20	2.10	2.18	2.31	2.46	2.63	2.80	3.08	3.31	3.54	4.53	5.54
	40	2.52	2.69	2.92	3.17	3.43	3.70	4.12	4.47	4.83	6.30	7.84
	60	2.87	3.14	3.46	3.79	4.14	4.50	5.04	5.50	5.96	7.87	9.86
	80	3.19	3.55	3.95	4.37	4.80	5.23	5.89	6.44	7.01	9.31	11.71
	100	3.48	3.94	4.42	4.92	5.42	5.92	6.69	7.34	7.99	10.67	13.46
	120	3.77	4.31	4.87	5.44	6.01	6.58	7.45	8.18	8.92	11.96	15.11
	140	4.04	4.67	5.31	5.94	6.58	7.22	8.19	9.00	9.82	13.20	16.70
50	10	2.01	2.04	2.13	2.23	2.35	2.47	2.65	2.81	2.97	3.64	4.33
	20	2.34	2.41	2.54	2.68	2.84	3.01	3.26	3.49	3.71	4.66	5.66
	40	2.82	2.96	3.17	3.39	3.64	3.89	4.29	4.63	4.97	6.42	7.94
	60	3.20	3.42	3.70	4.01	4.33	4.67	5.19	5.64	6.09	7.98	9.95
	80	3.53	3.83	4.19	4.58	4.98	5.40	6.03	6.58	7.13	9.41	11.80
	100	3.84	4.21	4.65	5.11	5.59	6.08	6.83	7.46	8.11	10.76	13.54
	120	4.12	4.58	5.09	5.63	6.18	6.73	7.59	8.31	9.04	12.05	15.19
	140	4.39	4.93	5.52	6.12	6.74	7.36	8.31	9.12	9.93	13.28	16.78
100	10	2.27	2.30	2.39	2.50	2.62	2.74	2.93	3.09	3.25	3.91	4.58
	20	2.67	2.74	2.86	3.01	3.16	3.32	3.58	3.79	4.01	4.93	5.89
	40	3.24	3.36	3.55	3.76	3.99	4.23	4.60	4.93	5.26	6.65	8.14
	60	3.67	3.85	4.11	4.39	4.69	5.00	5.50	5.92	6.36	8.19	10.13
	80	4.04	4.28	4.60	4.96	5.33	5.72	6.32	6.84	7.38	9.61	11.97
	100	4.37	4.68	5.06	5.48	5.93	6.39	7.10	7.71	8.34	10.95	13.70
	120	4.67	5.05	5.50	5.99	6.50	7.03	7.85	8.55	9.26	12.23	15.34
	140	4.96	5.40	5.92	6.47	7.05	7.65	8.57	9.35	10.15	13.46	16.93
150	10	2.46	2.49	2.58	2.69	2.82	2.94	3.13	3.30	3.46	4.13	4.81
	20	2.92	2.98	3.10	3.25	3.41	3.57	3.83	4.04	4.26	5.17	6.12
	40	3.54	3.66	3.85	4.06	4.28	4.52	4.88	5.20	5.52	6.88	8.33
	60	4.02	4.19	4.44	4.71	5.00	5.30	5.78	6.19	6.61	8.40	10.31
	80	4.42	4.65	4.95	5.29	5.64	6.01	6.60	7.10	7.62	9.81	12.13
	100	4.78	5.06	5.42	5.82	6.24	6.68	7.37	7.96	8.57	11.14	13.85
	120	5.10	5.44	5.87	6.32	6.81	7.32	8.11	8.79	9.48	12.41	15.50
	140	5.41	5.81	6.29	6.81	7.36	7.93	8.82	9.58	10.36	13.63	17.07

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.61	2.64	2.74	2.85	2.98	3.11	3.31	3.47	3.64	4.32	5.00
	20	3.11	3.17	3.30	3.45	3.61	3.78	4.04	4.25	4.48	5.38	6.32
	40	3.79	3.91	4.09	4.31	4.53	4.77	5.13	5.44	5.76	7.10	8.53
	60	4.31	4.47	4.71	4.98	5.27	5.57	6.04	6.44	6.85	8.60	10.49
	80	4.74	4.95	5.25	5.58	5.93	6.29	6.86	7.35	7.85	10.00	12.30
	100	5.12	5.38	5.74	6.12	6.53	6.96	7.62	8.20	8.80	11.32	14.01
	120	5.46	5.78	6.19	6.63	7.10	7.59	8.36	9.02	9.70	12.58	15.65
	140	5.78	6.16	6.61	7.12	7.65	8.20	9.06	9.81	10.57	13.80	17.22
300	10	2.86	2.89	2.99	3.11	3.24	3.38	3.58	3.76	3.93	4.63	5.33
	20	3.43	3.49	3.62	3.78	3.95	4.12	4.39	4.61	4.84	5.76	6.70
	40	4.20	4.31	4.50	4.72	4.95	5.18	5.55	5.86	6.18	7.50	8.90
	60	4.77	4.93	5.17	5.44	5.73	6.03	6.49	6.89	7.29	9.00	10.84
	80	5.25	5.46	5.75	6.07	6.42	6.77	7.33	7.80	8.30	10.38	12.63
	100	5.67	5.92	6.26	6.64	7.04	7.45	8.10	8.66	9.23	11.69	14.33
	120	6.05	6.35	6.74	7.17	7.62	8.09	8.83	9.47	10.13	12.94	15.95
	140	6.40	6.75	7.18	7.66	8.17	8.70	9.53	10.25	10.99	14.14	17.51
400	10	3.06	3.09	3.20	3.32	3.46	3.60	3.81	3.99	4.17	4.90	5.61
	20	3.69	3.75	3.89	4.05	4.22	4.40	4.67	4.90	5.14	6.07	7.03
	40	4.53	4.64	4.83	5.05	5.29	5.53	5.90	6.22	6.54	7.86	9.25
	60	5.15	5.31	5.55	5.83	6.12	6.42	6.88	7.28	7.68	9.37	11.18
	80	5.67	5.87	6.17	6.49	6.83	7.19	7.74	8.21	8.70	10.75	12.96
	100	6.13	6.37	6.71	7.08	7.48	7.89	8.53	9.08	9.64	12.04	14.64
	120	6.54	6.82	7.21	7.63	8.08	8.54	9.26	9.89	10.53	13.28	16.25
	140	6.91	7.24	7.67	8.14	8.64	9.16	9.97	10.67	11.39	14.48	17.80
600	10	3.38	3.42	3.53	3.66	3.81	3.95	4.18	4.37	4.57	5.32	6.07
	20	4.10	4.17	4.31	4.48	4.67	4.85	5.14	5.39	5.63	6.60	7.58
	40	5.06	5.17	5.38	5.61	5.85	6.10	6.49	6.82	7.15	8.49	9.88
	60	5.77	5.93	6.18	6.46	6.76	7.07	7.54	7.94	8.35	10.04	11.82
	80	6.36	6.55	6.85	7.18	7.53	7.89	8.45	8.92	9.40	11.43	13.58
	100	6.87	7.10	7.44	7.82	8.22	8.63	9.27	9.81	10.37	12.72	15.25
	120	7.32	7.60	7.98	8.40	8.85	9.31	10.03	10.64	11.27	13.95	16.84
	140	7.74	8.06	8.48	8.95	9.44	9.95	10.75	11.43	12.14	15.13	18.37
800	10	3.64	3.68	3.79	3.94	4.09	4.24	4.48	4.68	4.88	5.68	6.45
	20	4.43	4.50	4.66	4.84	5.03	5.23	5.53	5.78	6.03	7.04	8.05
	40	5.49	5.61	5.82	6.06	6.31	6.57	6.97	7.31	7.65	9.03	10.43
	60	6.27	6.43	6.69	6.98	7.28	7.60	8.09	8.50	8.91	10.62	12.40
	80	6.91	7.11	7.41	7.75	8.11	8.47	9.04	9.52	10.01	12.04	14.17
	100	7.47	7.70	8.05	8.43	8.84	9.25	9.90	10.45	11.00	13.34	15.83
	120	7.96	8.24	8.62	9.05	9.50	9.97	10.69	11.30	11.93	14.57	17.41
	140	8.42	8.73	9.15	9.62	10.12	10.63	11.43	12.11	12.80	15.75	18.93

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.09	2.28	2.51	2.74	2.98	3.22	3.58	3.89	4.20	5.44	6.72
	20	2.58	2.92	3.27	3.62	3.97	4.32	4.86	5.30	5.75	7.58	9.47
	40	3.41	3.99	4.55	5.09	5.64	6.18	7.00	7.68	8.37	11.18	14.09
	60	4.14	4.93	5.67	6.39	7.10	7.81	8.87	9.77	10.67	14.34	18.15
	80	4.80	5.79	6.70	7.58	8.44	9.30	10.60	11.68	12.77	17.24	21.87
	100	5.43	6.60	7.67	8.69	9.70	10.71	12.22	13.48	14.75	19.96	25.37
	120	6.02	7.37	8.58	9.75	10.90	12.04	13.75	15.19	16.63	22.55	28.69
	140	6.60	8.11	9.47	10.77	12.05	13.32	15.23	16.83	18.44	25.03	31.88
25	10	2.63	2.72	2.88	3.07	3.28	3.49	3.83	4.11	4.40	5.61	6.86
	20	3.13	3.33	3.61	3.91	4.23	4.56	5.06	5.49	5.93	7.72	9.59
	40	3.93	4.35	4.84	5.34	5.86	6.38	7.17	7.84	8.52	11.30	14.19
	60	4.62	5.26	5.93	6.61	7.30	7.99	9.03	9.91	10.80	14.45	18.24
	80	5.25	6.10	6.95	7.79	8.63	9.47	10.74	11.82	12.90	17.34	21.96
	100	5.86	6.89	7.90	8.89	9.88	10.87	12.36	13.61	14.87	20.06	25.45
	120	6.44	7.65	8.81	9.94	11.07	12.19	13.89	15.31	16.75	22.64	28.77
	140	6.99	8.38	9.68	10.95	12.21	13.47	15.36	16.95	18.55	25.12	31.95
50	10	2.92	3.00	3.16	3.34	3.53	3.73	4.05	4.32	4.60	5.77	7.00
	20	3.49	3.66	3.90	4.18	4.47	4.78	5.27	5.68	6.10	7.86	9.71
	40	4.33	4.69	5.12	5.59	6.07	6.57	7.35	8.00	8.67	11.42	14.29
	60	5.04	5.58	6.19	6.84	7.50	8.17	9.19	10.06	10.94	14.56	18.33
	80	5.67	6.40	7.19	7.99	8.81	9.64	10.89	11.95	13.03	17.44	22.04
	100	6.27	7.18	8.13	9.09	10.05	11.02	12.49	13.74	14.99	20.15	25.53
	120	6.83	7.93	9.03	10.13	11.23	12.34	14.02	15.43	16.86	22.73	28.85
	140	7.38	8.64	9.89	11.13	12.37	13.61	15.49	17.06	18.66	25.21	32.03
100	10	3.31	3.39	3.54	3.72	3.91	4.11	4.42	4.69	4.96	6.09	7.27
	20	3.98	4.13	4.36	4.62	4.90	5.19	5.64	6.04	6.44	8.14	9.94
	40	4.94	5.23	5.61	6.04	6.49	6.95	7.69	8.32	8.96	11.66	14.49
	60	5.69	6.14	6.68	7.27	7.88	8.52	9.50	10.34	11.20	14.77	18.51
	80	6.36	6.96	7.66	8.40	9.17	9.97	11.18	12.22	13.27	17.64	22.21
	100	6.97	7.73	8.58	9.48	10.40	11.34	12.77	13.99	15.23	20.34	25.69
	120	7.54	8.46	9.47	10.50	11.57	12.64	14.29	15.68	17.09	22.91	29.00
	140	8.09	9.16	10.32	11.50	12.69	13.90	15.74	17.30	18.88	25.38	32.17
150	10	3.60	3.67	3.83	4.01	4.20	4.41	4.72	4.99	5.26	6.37	7.54
	20	4.35	4.49	4.71	4.97	5.24	5.53	5.98	6.36	6.75	8.41	10.18
	40	5.39	5.66	6.03	6.43	6.86	7.31	8.01	8.62	9.25	11.89	14.69
	60	6.21	6.61	7.11	7.67	8.25	8.86	9.81	10.63	11.47	14.98	18.69
	80	6.91	7.45	8.09	8.79	9.53	10.29	11.47	12.49	13.52	17.84	22.38
	100	7.54	8.22	9.01	9.86	10.74	11.64	13.05	14.24	15.46	20.53	25.85
	120	8.13	8.95	9.89	10.87	11.89	12.94	14.55	15.92	17.31	23.09	29.15
	140	8.69	9.66	10.73	11.85	13.01	14.19	16.00	17.53	19.09	25.55	32.32

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.84	3.91	4.06	4.25	4.45	4.65	4.97	5.24	5.51	6.63	7.79
	20	4.64	4.78	5.01	5.26	5.54	5.82	6.27	6.65	7.04	8.67	10.41
	40	5.77	6.02	6.38	6.78	7.20	7.64	8.32	8.92	9.53	12.12	14.89
	60	6.63	7.01	7.50	8.03	8.59	9.18	10.11	10.91	11.73	15.19	18.87
	80	7.37	7.87	8.49	9.16	9.87	10.61	11.76	12.75	13.77	18.04	22.55
	100	8.03	8.66	9.41	10.22	11.07	11.95	13.32	14.49	15.70	20.72	26.01
	120	8.65	9.40	10.29	11.23	12.21	13.23	14.81	16.16	17.54	23.27	29.30
	140	9.22	10.11	11.12	12.20	13.32	14.47	16.25	17.76	19.31	25.73	32.47
300	10	4.21	4.28	4.45	4.64	4.84	5.06	5.38	5.66	5.94	7.07	8.23
	20	5.13	5.26	5.49	5.75	6.03	6.32	6.77	7.15	7.54	9.15	10.85
	40	6.38	6.62	6.97	7.37	7.78	8.21	8.88	9.46	10.05	12.57	15.29
	60	7.33	7.69	8.15	8.67	9.21	9.78	10.67	11.44	12.24	15.61	19.23
	80	8.14	8.60	9.18	9.82	10.50	11.20	12.31	13.26	14.25	18.43	22.88
	100	8.85	9.43	10.13	10.89	11.70	12.54	13.85	14.99	16.16	21.09	26.33
	120	9.51	10.19	11.01	11.90	12.83	13.81	15.33	16.64	17.98	23.63	29.61
	140	10.11	10.92	11.85	12.87	13.93	15.03	16.75	18.22	19.74	26.07	32.76
400	10	4.52	4.59	4.76	4.96	5.17	5.39	5.73	6.01	6.30	7.45	8.62
	20	5.52	5.65	5.89	6.15	6.44	6.73	7.19	7.57	7.97	9.58	11.27
	40	6.88	7.12	7.47	7.86	8.28	8.71	9.37	9.95	10.53	13.01	15.67
	60	7.91	8.25	8.71	9.22	9.75	10.31	11.19	11.94	12.72	16.02	19.59
	80	8.77	9.21	9.78	10.40	11.06	11.75	12.83	13.76	14.72	18.82	23.22
	100	9.53	10.07	10.75	11.49	12.27	13.09	14.36	15.47	16.61	21.46	26.64
	120	10.22	10.87	11.66	12.51	13.41	14.35	15.83	17.10	18.42	23.98	29.91
	140	10.87	11.62	12.51	13.48	14.50	15.57	17.24	18.68	20.16	26.41	33.06
600	10	5.01	5.09	5.26	5.47	5.70	5.93	6.29	6.58	6.88	8.08	9.28
	20	6.15	6.29	6.53	6.81	7.11	7.42	7.89	8.28	8.69	10.32	12.01
	40	7.69	7.93	8.28	8.68	9.10	9.54	10.21	10.79	11.37	13.82	16.42
	60	8.84	9.17	9.63	10.14	10.68	11.23	12.09	12.84	13.60	16.82	20.29
	80	9.80	10.22	10.78	11.40	12.04	12.72	13.77	14.67	15.60	19.58	23.88
	100	10.64	11.15	11.81	12.53	13.29	14.08	15.31	16.38	17.48	22.19	27.27
	120	11.40	12.01	12.76	13.59	14.45	15.36	16.78	18.00	19.27	24.69	30.52
	140	12.10	12.80	13.65	14.58	15.56	16.58	18.18	19.56	21.00	27.09	33.64
800	10	5.41	5.49	5.67	5.89	6.13	6.37	6.74	7.05	7.36	8.60	9.84
	20	6.67	6.80	7.06	7.35	7.66	7.97	8.46	8.87	9.29	10.96	12.67
	40	8.35	8.59	8.95	9.36	9.79	10.24	10.92	11.50	12.09	14.54	17.12
	60	9.61	9.93	10.39	10.91	11.45	12.01	12.88	13.62	14.38	17.56	20.97
	80	10.64	11.05	11.61	12.23	12.88	13.55	14.59	15.49	16.41	20.31	24.53
	100	11.55	12.05	12.70	13.42	14.17	14.95	16.17	17.22	18.30	22.90	27.90
	120	12.37	12.95	13.70	14.51	15.37	16.25	17.64	18.84	20.08	25.38	31.12
	140	13.12	13.79	14.62	15.53	16.49	17.49	19.05	20.40	21.80	27.76	34.22

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.24	3.65	4.07	4.49	4.92	5.35	6.00	6.54	7.09	9.32	11.61
	20	4.23	4.92	5.59	6.25	6.90	7.56	8.54	9.37	10.20	13.60	17.11
	40	5.89	7.06	8.15	9.20	10.24	11.27	12.83	14.13	15.44	20.80	26.36
	60	7.34	8.94	10.39	11.79	13.16	14.53	16.58	18.30	20.03	27.12	34.47
	80	8.68	10.66	12.45	14.16	15.85	17.52	20.03	22.13	24.25	32.92	41.92
	100	9.93	12.28	14.38	16.39	18.37	20.32	23.26	25.72	28.21	38.36	48.91
	120	11.12	13.82	16.22	18.51	20.76	22.99	26.34	29.14	31.97	43.54	55.56
	140	12.26	15.30	17.99	20.55	23.06	25.55	29.29	32.42	35.58	48.50	61.93
25	10	3.90	4.14	4.47	4.84	5.23	5.63	6.24	6.77	7.30	9.49	11.75
	20	4.85	5.35	5.94	6.54	7.16	7.79	8.75	9.56	10.38	13.74	17.23
	40	6.43	7.43	8.44	9.45	10.46	11.47	13.00	14.29	15.59	20.92	26.46
	60	7.83	9.27	10.66	12.01	13.36	14.71	16.74	18.44	20.17	27.23	34.56
	80	9.13	10.97	12.70	14.37	16.03	17.69	20.17	22.27	24.37	33.02	42.00
	100	10.36	12.58	14.62	16.59	18.54	20.48	23.40	25.85	28.32	38.45	48.99
	120	11.54	14.10	16.45	18.71	20.93	23.15	26.47	29.27	32.08	43.63	55.64
	140	12.66	15.57	18.20	20.73	23.22	25.70	29.42	32.54	35.69	48.59	62.01
50	10	4.32	4.52	4.82	5.16	5.52	5.90	6.49	6.99	7.51	9.65	11.89
	20	5.33	5.75	6.27	6.83	7.42	8.03	8.96	9.75	10.56	13.88	17.35
	40	6.92	7.79	8.73	9.70	10.68	11.67	13.18	14.45	15.74	21.04	26.56
	60	8.30	9.60	10.92	12.24	13.56	14.89	16.90	18.59	20.30	27.33	34.65
	80	9.58	11.28	12.94	14.58	16.22	17.85	20.32	22.40	24.50	33.12	42.09
	100	10.79	12.87	14.85	16.79	18.72	20.64	23.54	25.98	28.44	38.55	49.07
	120	11.95	14.38	16.67	18.90	21.10	23.30	26.61	29.39	32.20	43.72	55.71
	140	13.06	15.84	18.42	20.91	23.38	25.84	29.55	32.66	35.80	48.67	62.08
100	10	4.91	5.08	5.36	5.68	6.02	6.38	6.94	7.42	7.91	9.98	12.17
	20	6.05	6.39	6.86	7.37	7.91	8.48	9.36	10.13	10.91	14.16	17.59
	40	7.74	8.45	9.29	10.18	11.11	12.06	13.52	14.77	16.04	21.28	26.76
	60	9.15	10.24	11.44	12.68	13.95	15.24	17.21	18.88	20.57	27.55	34.83
	80	10.42	11.89	13.43	15.00	16.58	18.19	20.62	22.67	24.75	33.32	42.26
	100	11.61	13.44	15.31	17.19	19.07	20.96	23.82	26.24	28.68	38.74	49.23
	120	12.74	14.94	17.11	19.27	21.43	23.60	26.87	29.63	32.42	43.90	55.87
	140	13.83	16.37	18.84	21.28	23.71	26.14	29.80	32.89	36.01	48.85	62.23
150	10	5.35	5.51	5.78	6.10	6.43	6.79	7.33	7.80	8.28	10.30	12.45
	20	6.59	6.91	7.35	7.84	8.36	8.90	9.75	10.49	11.25	14.44	17.82
	40	8.39	9.03	9.81	10.65	11.53	12.45	13.87	15.08	16.33	21.51	26.96
	60	9.85	10.82	11.94	13.12	14.34	15.60	17.53	19.17	20.84	27.76	35.02
	80	11.15	12.46	13.91	15.41	16.95	18.52	20.91	22.94	25.00	33.52	42.43
	100	12.35	14.00	15.77	17.58	19.41	21.27	24.10	26.49	28.92	38.93	49.39
	120	13.48	15.48	17.55	19.65	21.76	23.90	27.14	29.88	32.65	44.08	56.02
	140	14.56	16.90	19.27	21.64	24.03	26.42	30.06	33.13	36.23	49.02	62.38

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.70	5.86	6.13	6.45	6.79	7.14	7.68	8.14	8.62	10.61	12.72
	20	7.04	7.34	7.77	8.25	8.76	9.29	10.12	10.84	11.58	14.71	18.06
	40	8.94	9.54	10.28	11.08	11.93	12.82	14.20	15.40	16.62	21.75	27.16
	60	10.46	11.36	12.41	13.54	14.72	15.95	17.84	19.45	21.10	27.97	35.20
	80	11.79	13.00	14.37	15.82	17.31	18.84	21.20	23.21	25.25	33.71	42.60
	100	13.01	14.54	16.22	17.96	19.76	21.58	24.37	26.75	29.15	39.12	49.55
	120	14.15	16.00	17.98	20.02	22.09	24.20	27.40	30.12	32.87	44.26	56.17
	140	15.24	17.41	19.69	22.00	24.34	26.71	30.32	33.36	36.45	49.19	62.53
300	10	6.28	6.43	6.71	7.03	7.37	7.73	8.27	8.74	9.21	11.18	13.25
	20	7.77	8.05	8.48	8.95	9.45	9.97	10.78	11.48	12.20	15.25	18.53
	40	9.85	10.40	11.10	11.87	12.68	13.53	14.86	16.01	17.20	22.21	27.56
	60	11.48	12.30	13.28	14.34	15.46	16.63	18.45	20.02	21.63	28.40	35.56
	80	12.89	13.98	15.24	16.60	18.02	19.49	21.78	23.74	25.74	34.11	42.94
	100	14.16	15.53	17.08	18.72	20.44	22.20	24.92	27.25	29.62	39.49	49.87
	120	15.34	16.99	18.83	20.75	22.75	24.79	27.93	30.60	33.32	44.62	56.48
	140	16.46	18.39	20.51	22.71	24.98	27.29	30.82	33.83	36.88	49.54	62.82
400	10	6.74	6.90	7.18	7.51	7.86	8.22	8.77	9.24	9.72	11.69	13.75
	20	8.36	8.64	9.06	9.54	10.04	10.56	11.37	12.06	12.77	15.77	18.99
	40	10.61	11.13	11.81	12.56	13.36	14.18	15.48	16.60	17.76	22.68	27.96
	60	12.34	13.10	14.04	15.07	16.15	17.28	19.05	20.58	22.15	28.82	35.92
	80	13.81	14.83	16.03	17.33	18.70	20.12	22.35	24.26	26.23	34.51	43.27
	100	15.14	16.41	17.88	19.45	21.10	22.81	25.47	27.75	30.09	39.87	50.19
	120	16.37	17.89	19.62	21.47	23.39	25.38	28.45	31.08	33.77	44.98	56.78
	140	17.51	19.30	21.30	23.41	25.60	27.85	31.33	34.29	37.32	49.89	63.11
600	10	7.50	7.65	7.95	8.29	8.65	9.03	9.60	10.09	10.58	12.58	14.64
	20	9.33	9.60	10.03	10.51	11.03	11.55	12.37	13.06	13.77	16.73	19.88
	40	11.83	12.33	13.00	13.74	14.52	15.33	16.59	17.68	18.81	23.58	28.75
	60	13.74	14.45	15.36	16.35	17.39	18.47	20.17	21.65	23.17	29.66	36.64
	80	15.35	16.28	17.42	18.66	19.96	21.32	23.45	25.30	27.20	35.29	43.94
	100	16.78	17.94	19.31	20.79	22.35	23.98	26.53	28.74	31.01	40.61	50.83
	120	18.08	19.47	21.08	22.81	24.63	26.53	29.48	32.04	34.66	45.69	57.39
	140	19.30	20.91	22.76	24.74	26.82	28.97	32.33	35.21	38.17	50.57	63.70
800	10	8.11	8.27	8.57	8.93	9.30	9.69	10.29	10.79	11.29	13.33	15.41
	20	10.11	10.39	10.82	11.32	11.84	12.38	13.21	13.92	14.63	17.59	20.71
	40	12.84	13.32	13.99	14.73	15.51	16.32	17.58	18.66	19.76	24.45	29.52
	60	14.89	15.58	16.47	17.44	18.47	19.54	21.20	22.65	24.13	30.48	37.35
	80	16.61	17.50	18.61	19.82	21.09	22.41	24.49	26.28	28.14	36.07	44.61
	100	18.13	19.23	20.56	21.99	23.51	25.09	27.56	29.71	31.92	41.35	51.46
	120	19.52	20.82	22.37	24.03	25.79	27.62	30.49	32.98	35.54	46.40	58.00
	140	20.80	22.31	24.08	25.97	27.97	30.05	33.31	36.12	39.02	51.26	64.29

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.01	1.05	1.12	1.20	1.28	1.36	1.49	1.60	1.71	2.15	2.59
	20	1.14	1.22	1.32	1.43	1.54	1.65	1.82	1.96	2.11	2.69	3.29
	40	1.36	1.50	1.65	1.81	1.97	2.13	2.37	2.58	2.78	3.62	4.47
	60	1.55	1.74	1.95	2.15	2.35	2.55	2.86	3.11	3.37	4.42	5.50
	80	1.72	1.97	2.21	2.46	2.70	2.94	3.30	3.61	3.91	5.16	6.45
	100	1.89	2.18	2.47	2.75	3.02	3.30	3.72	4.07	4.42	5.86	7.34
	120	2.05	2.38	2.71	3.02	3.34	3.65	4.12	4.51	4.91	6.52	8.19
	140	2.20	2.58	2.94	3.29	3.63	3.98	4.50	4.93	5.37	7.16	9.00
25	10	1.33	1.34	1.39	1.45	1.52	1.59	1.71	1.80	1.90	2.31	2.73
	20	1.50	1.53	1.60	1.68	1.77	1.87	2.02	2.15	2.28	2.84	3.41
	40	1.75	1.82	1.92	2.05	2.19	2.33	2.55	2.74	2.93	3.74	4.57
	60	1.95	2.05	2.20	2.37	2.55	2.73	3.02	3.26	3.51	4.53	5.59
	80	2.12	2.27	2.46	2.67	2.88	3.11	3.45	3.74	4.04	5.27	6.54
	100	2.28	2.47	2.70	2.95	3.20	3.46	3.86	4.20	4.54	5.96	7.42
	120	2.43	2.66	2.93	3.21	3.50	3.80	4.25	4.64	5.02	6.61	8.27
	140	2.58	2.85	3.15	3.47	3.80	4.13	4.63	5.05	5.48	7.25	9.08
50	10	1.46	1.47	1.52	1.59	1.66	1.73	1.85	1.95	2.04	2.45	2.86
	20	1.67	1.70	1.76	1.85	1.94	2.03	2.18	2.31	2.44	2.97	3.53
	40	1.97	2.02	2.12	2.24	2.37	2.50	2.71	2.89	3.08	3.85	4.67
	60	2.19	2.28	2.41	2.57	2.73	2.90	3.17	3.40	3.64	4.64	5.69
	80	2.38	2.50	2.67	2.86	3.06	3.27	3.60	3.88	4.17	5.37	6.62
	100	2.56	2.71	2.91	3.14	3.37	3.62	4.00	4.33	4.66	6.05	7.50
	120	2.72	2.90	3.14	3.40	3.67	3.95	4.39	4.76	5.14	6.71	8.34
	140	2.87	3.09	3.36	3.65	3.96	4.27	4.76	5.17	5.59	7.33	9.15
100	10	1.64	1.65	1.70	1.77	1.84	1.92	2.04	2.14	2.25	2.66	3.07
	20	1.90	1.92	1.99	2.08	2.17	2.27	2.42	2.54	2.67	3.20	3.75
	40	2.25	2.30	2.40	2.52	2.64	2.78	2.98	3.15	3.33	4.08	4.87
	60	2.52	2.60	2.72	2.87	3.03	3.19	3.45	3.67	3.89	4.85	5.87
	80	2.75	2.85	3.00	3.18	3.37	3.56	3.87	4.14	4.41	5.57	6.79
	100	2.95	3.07	3.26	3.46	3.68	3.91	4.27	4.58	4.90	6.24	7.67
	120	3.13	3.28	3.49	3.73	3.98	4.24	4.65	5.00	5.36	6.89	8.50
	140	3.29	3.47	3.71	3.98	4.26	4.55	5.01	5.40	5.81	7.51	9.30
150	10	1.77	1.78	1.83	1.90	1.98	2.06	2.18	2.29	2.40	2.82	3.24
	20	2.06	2.09	2.16	2.25	2.34	2.44	2.60	2.73	2.86	3.39	3.94
	40	2.47	2.51	2.61	2.73	2.86	2.99	3.19	3.37	3.55	4.29	5.06
	60	2.76	2.84	2.96	3.11	3.26	3.43	3.68	3.90	4.12	5.05	6.05
	80	3.01	3.11	3.26	3.43	3.62	3.81	4.11	4.37	4.64	5.76	6.96
	100	3.23	3.35	3.53	3.73	3.94	4.16	4.51	4.81	5.12	6.43	7.83
	120	3.43	3.57	3.78	4.00	4.24	4.49	4.89	5.23	5.58	7.07	8.65
	140	3.61	3.78	4.01	4.26	4.53	4.81	5.25	5.63	6.02	7.68	9.45

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	1.87	1.88	1.94	2.01	2.09	2.17	2.30	2.41	2.52	2.95	3.38
	20	2.20	2.22	2.29	2.38	2.48	2.59	2.74	2.88	3.01	3.55	4.10
	40	2.64	2.68	2.78	2.91	3.03	3.17	3.38	3.55	3.73	4.47	5.24
	60	2.96	3.03	3.16	3.31	3.46	3.63	3.88	4.10	4.32	5.24	6.22
	80	3.23	3.32	3.48	3.65	3.83	4.02	4.32	4.58	4.84	5.95	7.13
	100	3.47	3.58	3.76	3.96	4.17	4.39	4.73	5.02	5.33	6.61	7.98
	120	3.68	3.82	4.02	4.24	4.48	4.72	5.11	5.44	5.79	7.24	8.80
	140	3.88	4.03	4.26	4.50	4.77	5.04	5.47	5.84	6.23	7.85	9.60
300	10	2.04	2.05	2.11	2.18	2.27	2.36	2.49	2.60	2.72	3.17	3.62
	20	2.41	2.44	2.51	2.61	2.71	2.82	2.98	3.12	3.26	3.83	4.39
	40	2.91	2.96	3.06	3.19	3.32	3.46	3.68	3.86	4.04	4.79	5.56
	60	3.28	3.35	3.48	3.63	3.79	3.96	4.22	4.44	4.66	5.58	6.54
	80	3.59	3.68	3.83	4.00	4.19	4.38	4.68	4.94	5.20	6.29	7.45
	100	3.85	3.96	4.14	4.33	4.55	4.77	5.11	5.40	5.70	6.95	8.29
	120	4.09	4.22	4.42	4.64	4.87	5.12	5.50	5.83	6.16	7.58	9.11
	140	4.31	4.46	4.67	4.92	5.18	5.45	5.87	6.23	6.61	8.18	9.89
400	10	2.17	2.18	2.25	2.33	2.41	2.50	2.65	2.76	2.88	3.35	3.81
	20	2.59	2.61	2.69	2.79	2.90	3.01	3.18	3.33	3.47	4.05	4.63
	40	3.14	3.18	3.29	3.42	3.56	3.70	3.93	4.11	4.30	5.06	5.84
	60	3.54	3.61	3.74	3.90	4.06	4.23	4.50	4.72	4.95	5.88	6.84
	80	3.87	3.96	4.12	4.30	4.49	4.69	4.99	5.25	5.51	6.60	7.75
	100	4.16	4.27	4.45	4.65	4.86	5.09	5.43	5.72	6.02	7.27	8.59
	120	4.42	4.55	4.75	4.97	5.21	5.45	5.84	6.16	6.50	7.90	9.40
	140	4.66	4.80	5.02	5.27	5.53	5.80	6.22	6.58	6.95	8.50	10.17
600	10	2.39	2.40	2.47	2.55	2.65	2.74	2.89	3.02	3.14	3.64	4.13
	20	2.87	2.89	2.98	3.08	3.20	3.32	3.50	3.65	3.81	4.42	5.02
	40	3.50	3.55	3.66	3.80	3.95	4.10	4.33	4.53	4.72	5.52	6.32
	60	3.96	4.03	4.17	4.33	4.51	4.69	4.96	5.19	5.43	6.38	7.36
	80	4.34	4.43	4.59	4.78	4.97	5.18	5.50	5.76	6.03	7.14	8.28
	100	4.67	4.77	4.96	5.16	5.39	5.62	5.97	6.27	6.57	7.83	9.14
	120	4.96	5.08	5.29	5.52	5.76	6.01	6.40	6.74	7.07	8.47	9.94
	140	5.23	5.37	5.59	5.84	6.11	6.38	6.81	7.17	7.54	9.08	10.71
800	10	2.56	2.58	2.65	2.74	2.84	2.94	3.10	3.23	3.36	3.88	4.38
	20	3.09	3.12	3.21	3.32	3.44	3.57	3.76	3.92	4.08	4.72	5.35
	40	3.79	3.84	3.96	4.10	4.26	4.42	4.66	4.87	5.07	5.90	6.72
	60	4.30	4.37	4.51	4.68	4.87	5.05	5.34	5.58	5.83	6.81	7.80
	80	4.72	4.80	4.97	5.17	5.37	5.59	5.91	6.19	6.47	7.60	8.75
	100	5.08	5.18	5.37	5.59	5.82	6.05	6.42	6.73	7.04	8.31	9.62
	120	5.40	5.52	5.73	5.97	6.22	6.48	6.88	7.22	7.56	8.97	10.44
	140	5.69	5.83	6.06	6.31	6.59	6.87	7.30	7.67	8.05	9.59	11.22

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.46	1.55	1.68	1.81	1.95	2.09	2.30	2.48	2.65	3.38	4.12
	20	1.72	1.89	2.07	2.27	2.46	2.66	2.95	3.20	3.46	4.47	5.52
	40	2.16	2.45	2.74	3.03	3.33	3.62	4.06	4.43	4.80	6.32	7.87
	60	2.54	2.94	3.33	3.71	4.08	4.46	5.03	5.50	5.98	7.93	9.94
	80	2.89	3.39	3.86	4.32	4.78	5.24	5.92	6.49	7.07	9.41	11.84
	100	3.22	3.81	4.37	4.90	5.43	5.96	6.75	7.42	8.08	10.81	13.62
	120	3.53	4.22	4.85	5.46	6.06	6.65	7.55	8.30	9.05	12.13	15.31
	140	3.83	4.60	5.31	5.98	6.65	7.32	8.31	9.14	9.98	13.40	16.94
25	10	1.89	1.92	2.01	2.11	2.23	2.35	2.54	2.70	2.86	3.55	4.26
	20	2.19	2.26	2.40	2.55	2.72	2.89	3.16	3.40	3.63	4.62	5.64
	40	2.63	2.80	3.03	3.28	3.55	3.82	4.24	4.59	4.95	6.44	7.98
	60	3.00	3.27	3.59	3.93	4.29	4.64	5.19	5.65	6.12	8.04	10.03
	80	3.33	3.70	4.11	4.54	4.97	5.41	6.07	6.63	7.19	9.52	11.93
	100	3.65	4.11	4.60	5.11	5.61	6.12	6.90	7.55	8.21	10.90	13.70
	120	3.94	4.50	5.07	5.65	6.23	6.81	7.68	8.42	9.17	12.22	15.39
	140	4.23	4.88	5.52	6.17	6.82	7.46	8.44	9.26	10.09	13.49	17.01
50	10	2.10	2.12	2.21	2.31	2.42	2.54	2.73	2.88	3.04	3.71	4.40
	20	2.44	2.51	2.63	2.78	2.93	3.10	3.36	3.58	3.81	4.76	5.76
	40	2.94	3.08	3.28	3.51	3.76	4.01	4.41	4.75	5.10	6.56	8.08
	60	3.34	3.56	3.84	4.15	4.48	4.82	5.35	5.80	6.26	8.15	10.13
	80	3.69	3.99	4.35	4.74	5.15	5.57	6.22	6.76	7.32	9.62	12.01
	100	4.01	4.39	4.83	5.30	5.79	6.28	7.04	7.68	8.33	11.00	13.78
	120	4.31	4.77	5.29	5.84	6.39	6.96	7.82	8.55	9.28	12.31	15.47
	140	4.59	5.14	5.74	6.35	6.98	7.61	8.57	9.38	10.20	13.58	17.09
100	10	2.37	2.39	2.48	2.58	2.70	2.82	3.01	3.17	3.33	3.98	4.66
	20	2.79	2.84	2.97	3.11	3.26	3.42	3.68	3.89	4.11	5.03	6.00
	40	3.37	3.49	3.68	3.89	4.12	4.36	4.73	5.06	5.39	6.79	8.28
	60	3.82	4.01	4.26	4.54	4.85	5.16	5.66	6.08	6.52	8.36	10.31
	80	4.21	4.46	4.78	5.13	5.51	5.90	6.51	7.03	7.57	9.82	12.18
	100	4.56	4.87	5.26	5.68	6.13	6.59	7.31	7.93	8.56	11.19	13.95
	120	4.88	5.26	5.71	6.21	6.73	7.26	8.09	8.79	9.51	12.50	15.63
	140	5.18	5.62	6.15	6.71	7.30	7.90	8.83	9.62	10.42	13.75	17.24
150	10	2.56	2.59	2.67	2.78	2.90	3.03	3.22	3.38	3.55	4.21	4.89
	20	3.04	3.09	3.21	3.36	3.52	3.68	3.93	4.15	4.37	5.27	6.22
	40	3.69	3.80	3.99	4.20	4.42	4.65	5.02	5.34	5.66	7.02	8.48
	60	4.19	4.35	4.60	4.87	5.16	5.47	5.94	6.36	6.78	8.58	10.49
	80	4.61	4.83	5.13	5.47	5.83	6.20	6.79	7.30	7.82	10.02	12.35
	100	4.98	5.26	5.63	6.03	6.45	6.89	7.59	8.18	8.80	11.38	14.11
	120	5.32	5.66	6.09	6.55	7.04	7.55	8.35	9.03	9.74	12.68	15.78
	140	5.64	6.04	6.53	7.05	7.61	8.19	9.08	9.85	10.64	13.93	17.39

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.72	2.75	2.84	2.95	3.07	3.20	3.39	3.56	3.73	4.40	5.08
	20	3.24	3.30	3.42	3.57	3.73	3.89	4.15	4.36	4.58	5.49	6.43
	40	3.95	4.06	4.24	4.45	4.68	4.91	5.27	5.58	5.90	7.25	8.68
	60	4.49	4.64	4.88	5.15	5.44	5.74	6.21	6.61	7.03	8.79	10.67
	80	4.93	5.15	5.44	5.77	6.12	6.48	7.05	7.55	8.06	10.22	12.52
	100	5.33	5.60	5.95	6.33	6.75	7.17	7.85	8.43	9.03	11.57	14.27
	120	5.69	6.01	6.42	6.86	7.34	7.83	8.60	9.27	9.96	12.86	15.94
	140	6.03	6.40	6.86	7.37	7.90	8.46	9.33	10.08	10.86	14.10	17.54
300	10	2.98	3.00	3.10	3.21	3.34	3.48	3.68	3.85	4.03	4.72	5.42
	20	3.57	3.62	3.75	3.91	4.07	4.24	4.50	4.73	4.95	5.87	6.81
	40	4.37	4.48	4.66	4.87	5.10	5.34	5.70	6.01	6.33	7.66	9.06
	60	4.97	5.12	5.36	5.63	5.91	6.21	6.67	7.07	7.47	9.19	11.03
	80	5.47	5.67	5.96	6.28	6.62	6.98	7.53	8.01	8.51	10.60	12.86
	100	5.91	6.15	6.49	6.87	7.27	7.68	8.33	8.89	9.47	11.94	14.59
	120	6.30	6.60	6.99	7.42	7.87	8.34	9.09	9.73	10.39	13.22	16.24
	140	6.67	7.01	7.45	7.93	8.44	8.98	9.81	10.53	11.28	14.45	17.83
400	10	3.18	3.21	3.31	3.43	3.56	3.70	3.91	4.09	4.27	4.99	5.70
	20	3.84	3.89	4.02	4.18	4.35	4.53	4.80	5.03	5.26	6.20	7.15
	40	4.71	4.82	5.00	5.22	5.45	5.69	6.07	6.38	6.70	8.02	9.41
	60	5.37	5.51	5.75	6.02	6.31	6.61	7.07	7.47	7.87	9.57	11.38
	80	5.91	6.10	6.39	6.71	7.05	7.41	7.96	8.43	8.92	10.98	13.19
	100	6.38	6.62	6.95	7.32	7.72	8.13	8.77	9.32	9.89	12.30	14.91
	120	6.81	7.09	7.47	7.89	8.34	8.80	9.53	10.16	10.81	13.57	16.55
	140	7.20	7.52	7.95	8.42	8.92	9.44	10.26	10.96	11.69	14.79	18.13
600	10	3.52	3.54	3.65	3.78	3.92	4.07	4.29	4.48	4.67	5.43	6.17
	20	4.27	4.32	4.46	4.63	4.81	5.00	5.28	5.52	5.76	6.74	7.71
	40	5.27	5.37	5.56	5.79	6.03	6.28	6.67	6.99	7.32	8.67	10.05
	60	6.01	6.15	6.39	6.67	6.97	7.28	7.75	8.15	8.56	10.25	12.03
	80	6.61	6.80	7.09	7.42	7.77	8.13	8.68	9.16	9.64	11.67	13.83
	100	7.15	7.37	7.71	8.08	8.48	8.89	9.53	10.07	10.63	12.99	15.53
	120	7.62	7.89	8.27	8.69	9.13	9.59	10.31	10.93	11.56	14.25	17.15
	140	8.06	8.36	8.79	9.25	9.74	10.26	11.05	11.74	12.45	15.46	18.71
800	10	3.78	3.82	3.93	4.06	4.21	4.37	4.60	4.80	5.00	5.79	6.56
	20	4.61	4.67	4.82	4.99	5.18	5.38	5.68	5.93	6.18	7.19	8.19
	40	5.72	5.82	6.02	6.26	6.51	6.77	7.16	7.50	7.84	9.21	10.61
	60	6.52	6.67	6.92	7.21	7.51	7.83	8.31	8.72	9.14	10.84	12.62
	80	7.19	7.38	7.67	8.01	8.36	8.73	9.29	9.77	10.26	12.29	14.43
	100	7.77	7.99	8.33	8.71	9.11	9.53	10.17	10.72	11.28	13.62	16.12
	120	8.29	8.55	8.93	9.35	9.80	10.27	10.99	11.60	12.23	14.88	17.73
	140	8.76	9.06	9.48	9.95	10.44	10.95	11.75	12.43	13.13	16.09	19.28

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.19	2.38	2.61	2.84	3.08	3.32	3.69	3.99	4.30	5.55	6.83
	20	2.71	3.05	3.40	3.76	4.11	4.47	5.00	5.45	5.90	7.74	9.63
	40	3.58	4.17	4.74	5.29	5.84	6.39	7.21	7.90	8.60	11.43	14.35
	60	4.34	5.15	5.91	6.64	7.36	8.07	9.15	10.05	10.96	14.66	18.48
	80	5.04	6.06	6.98	7.87	8.75	9.62	10.93	12.02	13.13	17.62	22.28
	100	5.70	6.90	7.99	9.03	10.06	11.08	12.60	13.88	15.16	20.41	25.84
	120	6.33	7.71	8.95	10.14	11.30	12.46	14.19	15.64	17.10	23.05	29.23
	140	6.93	8.48	9.87	11.19	12.49	13.78	15.71	17.33	18.95	25.59	32.48
25	10	2.74	2.83	2.99	3.18	3.39	3.60	3.94	4.22	4.51	5.72	6.97
	20	3.27	3.47	3.75	4.05	4.37	4.70	5.21	5.64	6.08	7.89	9.75
	40	4.11	4.54	5.03	5.54	6.06	6.59	7.39	8.07	8.75	11.55	14.45
	60	4.83	5.49	6.18	6.87	7.56	8.26	9.31	10.20	11.09	14.77	18.57
	80	5.50	6.37	7.23	8.09	8.94	9.79	11.08	12.16	13.25	17.72	22.36
	100	6.14	7.20	8.23	9.24	10.24	11.24	12.74	14.01	15.28	20.50	25.92
	120	6.75	7.99	9.18	10.33	11.47	12.61	14.33	15.76	17.21	23.15	29.31
	140	7.33	8.76	10.09	11.38	12.66	13.93	15.84	17.45	19.06	25.68	32.55
50	10	3.05	3.12	3.27	3.45	3.64	3.85	4.16	4.44	4.72	5.89	7.12
	20	3.64	3.80	4.05	4.33	4.62	4.93	5.42	5.83	6.26	8.03	9.88
	40	4.53	4.88	5.32	5.79	6.28	6.79	7.57	8.23	8.90	11.67	14.55
	60	5.26	5.81	6.44	7.09	7.76	8.44	9.47	10.35	11.23	14.88	18.67
	80	5.93	6.68	7.48	8.30	9.13	9.96	11.23	12.30	13.38	17.83	22.45
	100	6.55	7.49	8.46	9.44	10.41	11.40	12.88	14.14	15.40	20.60	26.00
	120	7.15	8.27	9.40	10.52	11.64	12.76	14.46	15.89	17.33	23.24	29.38
	140	7.73	9.03	10.30	11.57	12.82	14.08	15.97	17.57	19.18	25.77	32.63
100	10	3.46	3.52	3.67	3.85	4.04	4.23	4.54	4.81	5.08	6.21	7.40
	20	4.15	4.29	4.52	4.78	5.06	5.35	5.80	6.20	6.60	8.31	10.12
	40	5.15	5.44	5.82	6.25	6.70	7.18	7.91	8.55	9.20	11.91	14.76
	60	5.94	6.39	6.94	7.53	8.15	8.80	9.79	10.64	11.50	15.09	18.85
	80	6.64	7.25	7.96	8.71	9.50	10.30	11.53	12.57	13.63	18.03	22.62
	100	7.28	8.05	8.92	9.83	10.77	11.72	13.17	14.40	15.64	20.79	26.17
	120	7.88	8.82	9.84	10.90	11.98	13.07	14.73	16.13	17.56	23.42	29.54
	140	8.45	9.56	10.73	11.93	13.15	14.37	16.23	17.81	19.40	25.95	32.78
150	10	3.75	3.82	3.97	4.14	4.34	4.54	4.85	5.11	5.38	6.50	7.67
	20	4.53	4.66	4.88	5.14	5.41	5.70	6.14	6.53	6.92	8.58	10.35
	40	5.62	5.88	6.25	6.65	7.09	7.54	8.25	8.86	9.49	12.14	14.96
	60	6.47	6.87	7.38	7.94	8.53	9.14	10.10	10.93	11.77	15.31	19.04
	80	7.20	7.75	8.40	9.11	9.86	10.63	11.82	12.84	13.89	18.23	22.79
	100	7.87	8.56	9.36	10.22	11.11	12.03	13.45	14.65	15.88	20.98	26.33
	120	8.49	9.33	10.27	11.28	12.31	13.37	15.00	16.38	17.79	23.60	29.70
	140	9.07	10.06	11.15	12.30	13.47	14.66	16.49	18.04	19.62	26.12	32.93

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	4.00	4.06	4.21	4.39	4.59	4.79	5.11	5.37	5.64	6.76	7.92
	20	4.84	4.96	5.19	5.44	5.72	6.00	6.44	6.82	7.21	8.85	10.59
	40	6.01	6.26	6.61	7.01	7.43	7.87	8.56	9.16	9.77	12.38	15.16
	60	6.91	7.29	7.77	8.31	8.88	9.48	10.41	11.21	12.04	15.52	19.22
	80	7.68	8.19	8.81	9.49	10.20	10.95	12.11	13.11	14.14	18.43	22.97
	100	8.38	9.01	9.77	10.59	11.45	12.34	13.72	14.91	16.12	21.17	26.49
	120	9.02	9.79	10.68	11.64	12.64	13.67	15.26	16.63	18.01	23.79	29.85
	140	9.62	10.52	11.56	12.65	13.79	14.95	16.75	18.28	19.84	26.30	33.08
300	10	4.39	4.45	4.61	4.79	5.00	5.21	5.53	5.81	6.08	7.21	8.37
	20	5.34	5.46	5.68	5.94	6.22	6.51	6.95	7.34	7.72	9.34	11.04
	40	6.65	6.88	7.23	7.62	8.03	8.46	9.13	9.71	10.31	12.84	15.56
	60	7.64	7.98	8.45	8.97	9.51	10.09	10.98	11.76	12.55	15.95	19.58
	80	8.48	8.94	9.52	10.17	10.85	11.56	12.67	13.64	14.63	18.83	23.31
	100	9.22	9.80	10.51	11.28	12.09	12.94	14.27	15.41	16.59	21.55	26.82
	120	9.91	10.60	11.43	12.33	13.27	14.25	15.79	17.11	18.47	24.15	30.16
	140	10.54	11.35	12.31	13.33	14.41	15.52	17.26	18.75	20.27	26.65	33.38
400	10	4.70	4.77	4.93	5.12	5.33	5.55	5.88	6.16	6.45	7.60	8.77
	20	5.75	5.87	6.09	6.36	6.64	6.93	7.39	7.77	8.16	9.77	11.46
	40	7.17	7.39	7.74	8.13	8.54	8.97	9.64	10.21	10.80	13.28	15.96
	60	8.23	8.56	9.02	9.53	10.07	10.63	11.51	12.27	13.05	16.37	19.95
	80	9.13	9.57	10.14	10.76	11.43	12.12	13.20	14.14	15.11	19.23	23.65
	100	9.93	10.47	11.15	11.89	12.68	13.50	14.79	15.90	17.05	21.93	27.14
	120	10.65	11.30	12.09	12.95	13.86	14.81	16.30	17.59	18.91	24.51	30.47
	140	11.32	12.07	12.98	13.96	15.00	16.07	17.76	19.21	20.71	27.00	33.67
600	10	5.22	5.28	5.45	5.65	5.87	6.10	6.45	6.75	7.05	8.24	9.44
	20	6.41	6.52	6.76	7.04	7.33	7.63	8.10	8.50	8.90	10.54	12.22
	40	8.01	8.23	8.58	8.97	9.39	9.83	10.50	11.07	11.66	14.11	16.72
	60	9.20	9.52	9.97	10.48	11.02	11.57	12.44	13.18	13.94	17.17	20.66
	80	10.20	10.61	11.17	11.78	12.43	13.11	14.16	15.07	16.01	20.00	24.32
	100	11.08	11.58	12.24	12.96	13.72	14.52	15.76	16.83	17.94	22.67	27.78
	120	11.87	12.47	13.23	14.06	14.93	15.84	17.27	18.50	19.78	25.23	31.09
	140	12.60	13.29	14.15	15.09	16.07	17.10	18.71	20.11	21.55	27.69	34.27
800	10	5.63	5.70	5.87	6.09	6.32	6.56	6.92	7.23	7.54	8.78	10.01
	20	6.94	7.06	7.30	7.59	7.89	8.21	8.69	9.10	9.51	11.18	12.89
	40	8.69	8.91	9.27	9.67	10.10	10.54	11.22	11.80	12.40	14.84	17.43
	60	9.99	10.30	10.76	11.27	11.81	12.37	13.24	13.98	14.74	17.93	21.35
	80	11.08	11.47	12.03	12.64	13.29	13.96	15.01	15.91	16.83	20.75	24.98
	100	12.02	12.51	13.16	13.87	14.63	15.41	16.63	17.68	18.77	23.40	28.41
	120	12.87	13.45	14.19	15.00	15.86	16.76	18.15	19.36	20.61	25.93	31.69
	140	13.66	14.32	15.15	16.07	17.03	18.04	19.61	20.97	22.37	28.37	34.86

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.40	3.81	4.23	4.66	5.09	5.52	6.18	6.72	7.27	9.51	11.81
	20	4.44	5.14	5.82	6.49	7.15	7.81	8.81	9.64	10.48	13.89	17.42
	40	6.18	7.38	8.49	9.56	10.61	11.66	13.23	14.54	15.86	21.26	26.85
	60	7.71	9.35	10.83	12.25	13.64	15.03	17.10	18.84	20.59	27.72	35.11
	80	9.11	11.15	12.98	14.72	16.43	18.12	20.66	22.79	24.92	33.65	42.70
	100	10.43	12.85	15.00	17.04	19.05	21.03	24.00	26.49	28.99	39.22	49.83
	120	11.68	14.46	16.91	19.25	21.53	23.79	27.18	30.01	32.86	44.52	56.61
	140	12.88	16.00	18.75	21.37	23.92	26.44	30.23	33.39	36.58	49.60	63.10
25	10	4.08	4.31	4.64	5.02	5.41	5.81	6.43	6.95	7.49	9.68	11.95
	20	5.07	5.58	6.17	6.79	7.42	8.05	9.02	9.83	10.66	14.04	17.54
	40	6.73	7.76	8.79	9.81	10.84	11.86	13.41	14.71	16.02	21.38	26.95
	60	8.21	9.69	11.10	12.48	13.85	15.21	17.26	18.99	20.72	27.83	35.20
	80	9.58	11.47	13.23	14.94	16.62	18.30	20.81	22.92	25.05	33.76	42.79
	100	10.87	13.15	15.23	17.25	19.22	21.19	24.15	26.62	29.11	39.32	49.91
	120	12.10	14.75	17.14	19.44	21.70	23.95	27.32	30.14	32.98	44.61	56.68
	140	13.29	16.28	18.97	21.55	24.08	26.59	30.36	33.51	36.69	49.68	63.18
50	10	4.52	4.71	5.00	5.34	5.70	6.08	6.67	7.18	7.70	9.85	12.10
	20	5.57	5.99	6.51	7.08	7.68	8.29	9.23	10.03	10.84	14.18	17.66
	40	7.24	8.12	9.08	10.06	11.06	12.06	13.58	14.87	16.17	21.50	27.05
	60	8.69	10.02	11.37	12.71	14.05	15.39	17.43	19.14	20.86	27.94	35.30
	80	10.03	11.78	13.48	15.15	16.81	18.47	20.96	23.06	25.18	33.86	42.88
	100	11.30	13.45	15.47	17.45	19.40	21.35	24.29	26.75	29.24	39.41	49.99
	120	12.52	15.03	17.37	19.64	21.87	24.10	27.45	30.26	33.10	44.70	56.76
	140	13.69	16.55	19.19	21.74	24.25	26.74	30.49	33.63	36.80	49.77	63.26
100	10	5.12	5.29	5.56	5.88	6.22	6.57	7.13	7.61	8.11	10.19	12.38
	20	6.31	6.65	7.11	7.63	8.18	8.75	9.64	10.41	11.19	14.47	17.90
	40	8.08	8.80	9.65	10.56	11.50	12.46	13.94	15.19	16.47	21.74	27.26
	60	9.55	10.67	11.90	13.16	14.45	15.76	17.75	19.43	21.13	28.16	35.48
	80	10.89	12.40	13.98	15.57	17.18	18.80	21.26	23.34	25.43	34.06	43.05
	100	12.14	14.03	15.94	17.85	19.76	21.67	24.57	27.01	29.48	39.61	50.16
	120	13.33	15.59	17.82	20.02	22.21	24.41	27.72	30.51	33.33	44.89	56.92
	140	14.48	17.10	19.63	22.11	24.57	27.04	30.75	33.87	37.02	49.95	63.41
150	10	5.57	5.72	5.99	6.31	6.64	6.99	7.54	8.00	8.49	10.51	12.67
	20	6.87	7.18	7.62	8.11	8.63	9.18	10.04	10.78	11.54	14.75	18.14
	40	8.75	9.40	10.18	11.03	11.93	12.85	14.29	15.51	16.77	21.98	27.46
	60	10.28	11.27	12.41	13.61	14.85	16.12	18.06	19.72	21.41	28.38	35.67
	80	11.64	12.99	14.46	15.99	17.55	19.14	21.56	23.61	25.69	34.26	43.22
	100	12.90	14.60	16.41	18.25	20.11	21.99	24.85	27.27	29.72	39.80	50.32
	120	14.09	16.15	18.27	20.40	22.55	24.72	27.99	30.76	33.56	45.07	57.08
	140	15.23	17.63	20.06	22.48	24.90	27.33	31.01	34.11	37.24	50.13	63.56

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.94	6.09	6.36	6.67	7.00	7.35	7.89	8.36	8.83	10.83	12.95
	20	7.33	7.63	8.05	8.53	9.04	9.58	10.41	11.13	11.88	15.03	18.38
	40	9.32	9.92	10.67	11.48	12.34	13.23	14.63	15.83	17.07	22.22	27.66
	60	10.91	11.82	12.89	14.04	15.24	16.47	18.38	20.01	21.68	28.59	35.85
	80	12.30	13.54	14.94	16.40	17.92	19.47	21.86	23.88	25.94	34.47	43.39
	100	13.58	15.15	16.86	18.64	20.46	22.31	25.13	27.53	29.96	39.99	50.48
	120	14.78	16.68	18.71	20.78	22.89	25.02	28.26	31.01	33.79	45.25	57.23
	140	15.92	18.16	20.48	22.84	25.22	27.62	31.27	34.35	37.46	50.30	63.71
300	10	6.54	6.68	6.95	7.26	7.60	7.96	8.50	8.97	9.44	11.41	13.48
	20	8.09	8.36	8.78	9.25	9.75	10.28	11.09	11.79	12.52	15.58	18.86
	40	10.27	10.81	11.51	12.29	13.11	13.96	15.30	16.46	17.65	22.70	28.07
	60	11.97	12.79	13.78	14.85	15.99	17.17	19.01	20.59	22.21	29.02	36.22
	80	13.44	14.54	15.83	17.20	18.64	20.13	22.44	24.42	26.44	34.87	43.74
	100	14.77	16.16	17.74	19.41	21.15	22.94	25.69	28.04	30.44	40.37	50.81
	120	16.00	17.69	19.57	21.53	23.55	25.62	28.80	31.50	34.24	45.62	57.54
	140	17.17	19.16	21.32	23.57	25.87	28.21	31.79	34.82	37.91	50.65	64.01
400	10	7.02	7.16	7.44	7.76	8.10	8.46	9.01	9.48	9.96	11.93	13.99
	20	8.71	8.97	9.39	9.86	10.36	10.88	11.69	12.38	13.10	16.10	19.33
	40	11.05	11.56	12.24	13.00	13.79	14.63	15.93	17.06	18.22	23.17	28.47
	60	12.85	13.62	14.57	15.60	16.69	17.83	19.61	21.16	22.75	29.45	36.59
	80	14.39	15.42	16.64	17.95	19.34	20.78	23.02	24.96	26.94	35.27	44.08
	100	15.78	17.07	18.56	20.16	21.83	23.56	26.25	28.55	30.91	40.75	51.14
	120	17.06	18.62	20.38	22.26	24.21	26.22	29.33	31.99	34.70	45.98	57.85
	140	18.26	20.09	22.13	24.28	26.50	28.79	32.30	35.30	38.34	51.01	64.31
600	10	7.80	7.94	8.23	8.56	8.92	9.29	9.86	10.35	10.84	12.83	14.89
	20	9.71	9.97	10.39	10.87	11.37	11.90	12.71	13.41	14.12	17.08	20.23
	40	12.32	12.80	13.47	14.21	14.99	15.80	17.07	18.16	19.29	24.09	29.28
	60	14.30	15.01	15.92	16.91	17.96	19.05	20.76	22.25	23.78	30.31	37.32
	80	15.98	16.92	18.06	19.31	20.63	22.00	24.15	26.01	27.93	36.07	44.76
	100	17.47	18.64	20.03	21.53	23.11	24.76	27.33	29.56	31.85	41.51	51.78
	120	18.84	20.24	21.87	23.63	25.47	27.39	30.38	32.96	35.60	46.71	58.47
	140	20.11	21.75	23.63	25.64	27.74	29.93	33.32	36.23	39.22	51.71	64.90
800	10	8.44	8.58	8.87	9.22	9.59	9.98	10.57	11.06	11.57	13.61	15.68
	20	10.52	10.78	11.21	11.69	12.21	12.75	13.58	14.28	14.99	17.96	21.08
	40	13.36	13.83	14.49	15.23	16.01	16.82	18.08	19.16	20.27	24.98	30.06
	60	15.49	16.17	17.06	18.04	19.07	20.14	21.82	23.27	24.76	31.14	38.05
	80	17.29	18.18	19.29	20.50	21.78	23.12	25.20	27.02	28.89	36.86	45.44
	100	18.88	19.98	21.31	22.76	24.29	25.88	28.38	30.54	32.78	42.26	52.43
	120	20.33	21.64	23.20	24.88	26.66	28.51	31.40	33.91	36.50	47.43	59.09
	140	21.66	23.19	24.98	26.90	28.92	31.03	34.32	37.16	40.08	52.40	65.50

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.06	1.10	1.16	1.24	1.32	1.40	1.53	1.64	1.75	2.19	2.63
	20	1.19	1.27	1.37	1.48	1.59	1.70	1.87	2.02	2.16	2.75	3.34
	40	1.42	1.56	1.72	1.88	2.04	2.20	2.44	2.65	2.85	3.69	4.54
	60	1.62	1.82	2.02	2.23	2.43	2.63	2.94	3.20	3.46	4.51	5.60
	80	1.81	2.05	2.30	2.55	2.79	3.03	3.40	3.71	4.02	5.27	6.56
	100	1.98	2.28	2.56	2.85	3.13	3.41	3.83	4.18	4.54	5.98	7.47
	120	2.14	2.49	2.81	3.13	3.45	3.77	4.24	4.64	5.04	6.66	8.33
	140	2.30	2.69	3.05	3.41	3.76	4.11	4.63	5.07	5.51	7.31	9.16
25	10	1.38	1.39	1.43	1.50	1.57	1.64	1.75	1.85	1.95	2.35	2.77
	20	1.57	1.59	1.65	1.74	1.83	1.93	2.08	2.21	2.34	2.89	3.47
	40	1.82	1.89	1.99	2.12	2.26	2.40	2.62	2.81	3.01	3.81	4.65
	60	2.03	2.13	2.28	2.45	2.63	2.82	3.10	3.35	3.60	4.62	5.69
	80	2.21	2.36	2.55	2.76	2.98	3.21	3.55	3.85	4.15	5.38	6.65
	100	2.38	2.57	2.80	3.05	3.31	3.57	3.97	4.32	4.66	6.08	7.55
	120	2.54	2.77	3.04	3.33	3.62	3.92	4.38	4.76	5.15	6.75	8.41
	140	2.69	2.96	3.27	3.60	3.93	4.26	4.77	5.19	5.63	7.40	9.24
50	10	1.52	1.53	1.57	1.64	1.71	1.78	1.89	1.99	2.09	2.49	2.91
	20	1.74	1.76	1.83	1.91	2.00	2.09	2.24	2.37	2.49	3.03	3.59
	40	2.05	2.10	2.20	2.31	2.44	2.58	2.79	2.97	3.15	3.93	4.75
	60	2.28	2.36	2.50	2.65	2.82	2.99	3.26	3.49	3.73	4.73	5.78
	80	2.48	2.60	2.77	2.96	3.16	3.37	3.70	3.98	4.27	5.48	6.74
	100	2.66	2.81	3.02	3.24	3.48	3.73	4.12	4.45	4.78	6.18	7.64
	120	2.83	3.02	3.26	3.52	3.79	4.08	4.51	4.89	5.27	6.85	8.49
	140	2.99	3.21	3.48	3.78	4.09	4.41	4.90	5.31	5.74	7.49	9.31
100	10	1.71	1.71	1.76	1.82	1.90	1.97	2.09	2.19	2.30	2.71	3.12
	20	1.98	1.99	2.06	2.14	2.24	2.33	2.48	2.61	2.74	3.26	3.81
	40	2.35	2.39	2.49	2.60	2.73	2.86	3.06	3.23	3.41	4.16	4.95
	60	2.62	2.69	2.82	2.97	3.12	3.29	3.54	3.76	3.99	4.95	5.97
	80	2.86	2.95	3.11	3.28	3.47	3.67	3.98	4.25	4.52	5.68	6.91
	100	3.06	3.19	3.37	3.58	3.80	4.03	4.39	4.70	5.02	6.37	7.80
	120	3.25	3.40	3.62	3.85	4.10	4.37	4.78	5.13	5.50	7.03	8.65
	140	3.43	3.61	3.85	4.11	4.40	4.69	5.15	5.55	5.96	7.67	9.47
150	10	1.84	1.84	1.89	1.96	2.04	2.12	2.24	2.34	2.45	2.87	3.29
	20	2.15	2.16	2.23	2.32	2.41	2.51	2.66	2.79	2.92	3.46	4.00
	40	2.56	2.61	2.70	2.82	2.94	3.08	3.28	3.45	3.63	4.37	5.15
	60	2.87	2.94	3.06	3.21	3.36	3.53	3.78	4.00	4.22	5.15	6.15
	80	3.13	3.22	3.37	3.55	3.73	3.92	4.22	4.48	4.75	5.88	7.08
	100	3.36	3.48	3.65	3.85	4.06	4.29	4.63	4.94	5.25	6.56	7.96
	120	3.57	3.71	3.91	4.13	4.38	4.63	5.02	5.37	5.72	7.21	8.81
	140	3.76	3.92	4.15	4.40	4.67	4.95	5.40	5.78	6.17	7.84	9.62

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	1.95	1.95	2.00	2.07	2.15	2.23	2.36	2.47	2.58	3.01	3.44
	20	2.29	2.30	2.37	2.46	2.56	2.66	2.81	2.95	3.08	3.62	4.17
	40	2.74	2.78	2.88	3.00	3.13	3.26	3.47	3.64	3.82	4.56	5.33
	60	3.08	3.14	3.27	3.41	3.57	3.73	3.98	4.20	4.42	5.35	6.33
	80	3.36	3.45	3.60	3.77	3.95	4.14	4.44	4.70	4.96	6.07	7.25
	100	3.61	3.71	3.89	4.08	4.30	4.52	4.86	5.15	5.46	6.74	8.12
	120	3.83	3.96	4.16	4.38	4.62	4.86	5.25	5.59	5.93	7.39	8.96
	140	4.03	4.18	4.41	4.65	4.92	5.19	5.62	6.00	6.38	8.02	9.77
300	10	2.12	2.12	2.18	2.25	2.34	2.42	2.55	2.67	2.78	3.23	3.68
	20	2.51	2.52	2.60	2.69	2.79	2.90	3.06	3.20	3.34	3.90	4.46
	40	3.03	3.07	3.17	3.29	3.42	3.56	3.77	3.95	4.14	4.88	5.65
	60	3.41	3.47	3.60	3.75	3.91	4.07	4.33	4.55	4.77	5.69	6.66
	80	3.73	3.81	3.96	4.13	4.32	4.51	4.81	5.07	5.33	6.42	7.58
	100	4.00	4.11	4.28	4.47	4.69	4.90	5.25	5.54	5.84	7.09	8.44
	120	4.25	4.37	4.57	4.79	5.02	5.27	5.65	5.98	6.31	7.74	9.27
	140	4.48	4.62	4.84	5.08	5.34	5.61	6.03	6.40	6.77	8.35	10.06
400	10	2.26	2.26	2.32	2.40	2.48	2.57	2.71	2.83	2.95	3.41	3.87
	20	2.69	2.71	2.78	2.88	2.98	3.09	3.26	3.41	3.55	4.13	4.70
	40	3.26	3.30	3.40	3.53	3.67	3.81	4.03	4.21	4.40	5.16	5.94
	60	3.68	3.74	3.87	4.02	4.19	4.36	4.62	4.84	5.07	6.00	6.96
	80	4.03	4.11	4.26	4.43	4.62	4.82	5.12	5.38	5.64	6.73	7.88
	100	4.33	4.43	4.60	4.80	5.01	5.23	5.58	5.87	6.17	7.42	8.74
	120	4.59	4.71	4.91	5.13	5.37	5.61	5.99	6.32	6.66	8.06	9.56
	140	4.84	4.98	5.19	5.44	5.70	5.97	6.39	6.75	7.12	8.68	10.35
600	10	2.48	2.49	2.55	2.63	2.73	2.82	2.97	3.09	3.22	3.71	4.19
	20	2.98	3.00	3.08	3.18	3.29	3.41	3.59	3.74	3.90	4.50	5.10
	40	3.63	3.67	3.78	3.92	4.06	4.21	4.44	4.64	4.83	5.63	6.42
	60	4.11	4.17	4.31	4.47	4.64	4.82	5.09	5.32	5.56	6.51	7.48
	80	4.51	4.59	4.74	4.93	5.12	5.33	5.64	5.91	6.18	7.28	8.43
	100	4.85	4.94	5.12	5.33	5.55	5.78	6.13	6.43	6.73	7.98	9.30
	120	5.15	5.27	5.46	5.69	5.94	6.19	6.58	6.91	7.24	8.64	10.12
	140	5.43	5.56	5.78	6.03	6.29	6.57	6.99	7.35	7.72	9.26	10.90
800	10	2.66	2.67	2.74	2.82	2.92	3.02	3.18	3.31	3.44	3.95	4.45
	20	3.21	3.23	3.32	3.43	3.54	3.67	3.86	4.02	4.18	4.81	5.43
	40	3.94	3.98	4.09	4.23	4.38	4.54	4.78	4.99	5.19	6.01	6.83
	60	4.46	4.53	4.67	4.83	5.01	5.20	5.48	5.72	5.96	6.94	7.94
	80	4.90	4.98	5.14	5.33	5.53	5.74	6.07	6.34	6.62	7.75	8.91
	100	5.27	5.37	5.55	5.76	5.99	6.23	6.59	6.89	7.21	8.48	9.79
	120	5.60	5.72	5.92	6.15	6.40	6.66	7.06	7.40	7.74	9.15	10.62
	140	5.91	6.04	6.26	6.51	6.79	7.07	7.50	7.87	8.24	9.79	11.41

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.53	1.62	1.74	1.87	2.01	2.15	2.36	2.54	2.72	3.44	4.18
	20	1.80	1.97	2.15	2.35	2.54	2.74	3.04	3.29	3.54	4.56	5.61
	40	2.26	2.55	2.85	3.14	3.44	3.73	4.18	4.55	4.93	6.45	8.01
	60	2.66	3.07	3.46	3.84	4.23	4.61	5.18	5.66	6.14	8.10	10.12
	80	3.03	3.54	4.02	4.49	4.95	5.41	6.10	6.67	7.25	9.62	12.05
	100	3.37	3.98	4.54	5.09	5.62	6.16	6.96	7.63	8.30	11.04	13.87
	120	3.70	4.40	5.04	5.66	6.27	6.87	7.78	8.53	9.29	12.39	15.59
	140	4.01	4.80	5.52	6.21	6.89	7.56	8.56	9.40	10.25	13.69	17.25
25	10	1.97	2.00	2.08	2.18	2.30	2.42	2.60	2.77	2.93	3.62	4.33
	20	2.28	2.35	2.48	2.64	2.80	2.98	3.25	3.48	3.72	4.71	5.73
	40	2.74	2.91	3.14	3.40	3.66	3.94	4.36	4.72	5.08	6.57	8.12
	60	3.13	3.40	3.73	4.07	4.43	4.79	5.34	5.81	6.28	8.21	10.21
	80	3.48	3.85	4.27	4.70	5.14	5.58	6.25	6.81	7.38	9.72	12.14
	100	3.81	4.28	4.78	5.29	5.81	6.32	7.10	7.76	8.42	11.14	13.95
	120	4.12	4.69	5.27	5.86	6.44	7.03	7.92	8.66	9.41	12.49	15.67
	140	4.42	5.08	5.74	6.40	7.05	7.71	8.70	9.52	10.36	13.78	17.32
50	10	2.18	2.20	2.28	2.39	2.50	2.61	2.80	2.95	3.11	3.78	4.47
	20	2.55	2.60	2.72	2.87	3.03	3.19	3.45	3.67	3.90	4.85	5.86
	40	3.06	3.20	3.40	3.63	3.88	4.14	4.54	4.88	5.23	6.69	8.22
	60	3.48	3.70	3.98	4.30	4.63	4.97	5.50	5.96	6.42	8.32	10.31
	80	3.84	4.14	4.52	4.91	5.33	5.75	6.40	6.95	7.51	9.82	12.23
	100	4.18	4.57	5.02	5.49	5.98	6.48	7.25	7.89	8.54	11.23	14.03
	120	4.49	4.97	5.50	6.05	6.61	7.18	8.05	8.79	9.53	12.58	15.75
	140	4.79	5.35	5.96	6.59	7.22	7.86	8.83	9.65	10.47	13.87	17.40
100	10	2.46	2.48	2.56	2.67	2.78	2.90	3.08	3.24	3.40	4.06	4.73
	20	2.90	2.95	3.07	3.21	3.36	3.52	3.77	3.99	4.21	5.13	6.10
	40	3.51	3.62	3.81	4.02	4.25	4.49	4.87	5.19	5.52	6.93	8.43
	60	3.98	4.16	4.41	4.70	5.00	5.32	5.82	6.25	6.69	8.54	10.49
	80	4.38	4.63	4.95	5.31	5.69	6.08	6.70	7.23	7.77	10.03	12.40
	100	4.74	5.06	5.45	5.88	6.33	6.80	7.53	8.15	8.79	11.43	14.20
	120	5.08	5.46	5.93	6.43	6.95	7.49	8.32	9.04	9.76	12.76	15.91
	140	5.39	5.85	6.38	6.95	7.54	8.15	9.09	9.89	10.70	14.05	17.55
150	10	2.67	2.68	2.77	2.87	2.99	3.11	3.30	3.46	3.63	4.29	4.96
	20	3.16	3.21	3.33	3.47	3.62	3.78	4.04	4.25	4.47	5.37	6.33
	40	3.84	3.94	4.12	4.33	4.56	4.79	5.16	5.47	5.80	7.17	8.63
	60	4.36	4.52	4.76	5.03	5.33	5.63	6.11	6.52	6.95	8.76	10.68
	80	4.79	5.01	5.32	5.66	6.02	6.39	6.98	7.49	8.02	10.23	12.57
	100	5.18	5.46	5.83	6.23	6.66	7.11	7.80	8.41	9.03	11.62	14.36
	120	5.54	5.88	6.31	6.78	7.27	7.79	8.59	9.28	9.99	12.95	16.07
	140	5.87	6.27	6.76	7.30	7.86	8.44	9.35	10.12	10.92	14.23	17.70

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.83	2.85	2.93	3.04	3.16	3.29	3.48	3.65	3.81	4.49	5.17
	20	3.37	3.42	3.54	3.68	3.84	4.00	4.26	4.47	4.69	5.60	6.54
	40	4.11	4.21	4.39	4.60	4.82	5.05	5.41	5.73	6.05	7.39	8.83
	60	4.66	4.82	5.05	5.32	5.61	5.91	6.38	6.78	7.20	8.97	10.86
	80	5.13	5.34	5.63	5.96	6.31	6.68	7.25	7.75	8.26	10.43	12.75
	100	5.54	5.81	6.16	6.55	6.96	7.39	8.07	8.66	9.26	11.81	14.53
	120	5.92	6.24	6.65	7.10	7.57	8.07	8.85	9.52	10.22	13.13	16.22
	140	6.27	6.64	7.11	7.62	8.16	8.72	9.60	10.36	11.14	14.40	17.86
300	10	3.10	3.11	3.20	3.32	3.44	3.57	3.78	3.95	4.12	4.81	5.51
	20	3.71	3.76	3.88	4.03	4.19	4.36	4.62	4.84	5.07	5.99	6.93
	40	4.54	4.64	4.82	5.03	5.26	5.49	5.86	6.17	6.48	7.81	9.21
	60	5.17	5.31	5.54	5.81	6.10	6.39	6.85	7.25	7.66	9.38	11.23
	80	5.68	5.88	6.16	6.48	6.83	7.18	7.74	8.22	8.72	10.82	13.09
	100	6.14	6.38	6.72	7.09	7.49	7.91	8.56	9.13	9.71	12.19	14.85
	120	6.55	6.84	7.23	7.66	8.12	8.60	9.34	9.99	10.66	13.50	16.54
	140	6.93	7.27	7.71	8.20	8.71	9.25	10.09	10.82	11.57	14.76	18.16
400	10	3.31	3.33	3.42	3.54	3.67	3.81	4.02	4.19	4.37	5.09	5.80
	20	3.99	4.03	4.16	4.31	4.48	4.66	4.93	5.15	5.38	6.32	7.27
	40	4.90	4.99	5.17	5.39	5.62	5.86	6.23	6.54	6.86	8.19	9.58
	60	5.58	5.71	5.95	6.22	6.50	6.80	7.26	7.66	8.06	9.76	11.58
	80	6.14	6.32	6.61	6.93	7.27	7.62	8.17	8.65	9.14	11.20	13.43
	100	6.63	6.86	7.19	7.56	7.96	8.37	9.01	9.56	10.14	12.56	15.17
	120	7.07	7.35	7.73	8.15	8.60	9.07	9.80	10.43	11.08	13.85	16.85
	140	7.48	7.80	8.23	8.70	9.20	9.73	10.54	11.25	11.99	15.10	18.46
600	10	3.65	3.67	3.77	3.90	4.04	4.18	4.41	4.59	4.78	5.53	6.28
	20	4.43	4.48	4.61	4.78	4.95	5.14	5.42	5.66	5.90	6.87	7.84
	40	5.47	5.56	5.75	5.97	6.21	6.46	6.84	7.17	7.49	8.84	10.23
	60	6.24	6.37	6.61	6.89	7.18	7.48	7.95	8.36	8.76	10.45	12.24
	80	6.87	7.05	7.33	7.66	8.00	8.36	8.92	9.39	9.88	11.91	14.08
	100	7.42	7.64	7.97	8.34	8.74	9.15	9.79	10.33	10.89	13.26	15.80
	120	7.92	8.17	8.55	8.97	9.41	9.88	10.59	11.21	11.85	14.54	17.46
	140	8.37	8.67	9.09	9.55	10.05	10.56	11.36	12.05	12.76	15.78	19.05
800	10	3.93	3.95	4.06	4.19	4.34	4.49	4.72	4.92	5.11	5.90	6.67
	20	4.79	4.84	4.98	5.15	5.34	5.53	5.82	6.07	6.32	7.33	8.33
	40	5.94	6.03	6.22	6.45	6.70	6.96	7.35	7.69	8.02	9.39	10.80
	60	6.78	6.91	7.15	7.44	7.74	8.05	8.53	8.94	9.35	11.06	12.84
	80	7.47	7.64	7.93	8.26	8.61	8.98	9.54	10.02	10.51	12.54	14.68
	100	8.07	8.28	8.61	8.99	9.39	9.81	10.45	11.00	11.56	13.90	16.41
	120	8.60	8.85	9.23	9.65	10.10	10.57	11.28	11.90	12.53	15.19	18.05
	140	9.09	9.38	9.80	10.27	10.76	11.27	12.07	12.75	13.46	16.42	19.63

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.29	2.48	2.71	2.94	3.18	3.43	3.79	4.10	4.41	5.66	6.94
	20	2.83	3.18	3.54	3.89	4.25	4.61	5.15	5.60	6.05	7.90	9.80
	40	3.75	4.35	4.93	5.49	6.04	6.60	7.43	8.12	8.82	11.67	14.60
	60	4.55	5.38	6.14	6.89	7.61	8.34	9.43	10.34	11.25	14.97	18.81
	80	5.28	6.32	7.26	8.17	9.06	9.94	11.26	12.37	13.48	18.00	22.68
	100	5.97	7.20	8.31	9.37	10.41	11.44	12.99	14.27	15.57	20.85	26.31
	120	6.63	8.05	9.31	10.52	11.70	12.87	14.62	16.09	17.56	23.56	29.76
	140	7.26	8.85	10.27	11.62	12.94	14.24	16.20	17.83	19.47	26.15	33.07
25	10	2.86	2.94	3.10	3.29	3.49	3.71	4.04	4.33	4.62	5.84	7.09
	20	3.41	3.61	3.89	4.19	4.52	4.85	5.36	5.80	6.24	8.05	9.92
	40	4.28	4.73	5.23	5.74	6.27	6.80	7.61	8.29	8.98	11.79	14.71
	60	5.05	5.72	6.42	7.12	7.82	8.53	9.59	10.49	11.39	15.08	18.91
	80	5.75	6.64	7.52	8.39	9.25	10.11	11.42	12.51	13.61	18.11	22.77
	100	6.42	7.51	8.56	9.58	10.60	11.61	13.13	14.41	15.69	20.95	26.40
	120	7.06	8.34	9.54	10.72	11.88	13.03	14.76	16.21	17.68	23.65	29.84
	140	7.67	9.13	10.49	11.81	13.11	14.39	16.33	17.95	19.58	26.24	33.15
50	10	3.18	3.24	3.39	3.56	3.76	3.96	4.28	4.55	4.83	6.01	7.24
	20	3.79	3.95	4.20	4.47	4.77	5.08	5.57	5.99	6.42	8.19	10.05
	40	4.72	5.07	5.52	6.00	6.49	7.00	7.79	8.45	9.13	11.91	14.81
	60	5.49	6.05	6.69	7.35	8.02	8.71	9.75	10.64	11.53	15.19	19.00
	80	6.19	6.95	7.77	8.60	9.44	10.29	11.57	12.65	13.74	18.21	22.86
	100	6.84	7.81	8.79	9.78	10.78	11.77	13.27	14.54	15.82	21.05	26.48
	120	7.47	8.62	9.77	10.91	12.05	13.19	14.90	16.34	17.79	23.75	29.92
	140	8.07	9.41	10.71	12.00	13.27	14.54	16.46	18.07	19.69	26.33	33.23
100	10	3.60	3.65	3.80	3.97	4.16	4.36	4.67	4.93	5.20	6.33	7.52
	20	4.32	4.45	4.68	4.94	5.21	5.51	5.96	6.36	6.77	8.48	10.29
	40	5.36	5.65	6.04	6.47	6.92	7.40	8.14	8.78	9.43	12.16	15.02
	60	6.19	6.64	7.19	7.79	8.42	9.07	10.08	10.93	11.80	15.41	19.19
	80	6.91	7.54	8.26	9.02	9.82	10.63	11.87	12.92	13.99	18.42	23.03
	100	7.58	8.38	9.26	10.19	11.13	12.09	13.56	14.80	16.06	21.24	26.64
	120	8.21	9.18	10.22	11.30	12.39	13.50	15.17	16.59	18.03	23.93	30.08
	140	8.81	9.95	11.15	12.37	13.60	14.84	16.73	18.31	19.92	26.51	33.38
150	10	3.91	3.96	4.10	4.28	4.47	4.67	4.98	5.24	5.51	6.63	7.79
	20	4.71	4.83	5.05	5.31	5.58	5.87	6.31	6.70	7.09	8.76	10.53
	40	5.85	6.11	6.47	6.88	7.31	7.77	8.48	9.10	9.73	12.40	15.23
	60	6.73	7.13	7.65	8.21	8.81	9.43	10.39	11.23	12.08	15.63	19.38
	80	7.50	8.05	8.71	9.43	10.18	10.96	12.17	13.20	14.25	18.62	23.21
	100	8.19	8.89	9.71	10.58	11.49	12.41	13.84	15.06	16.30	21.44	26.81
	120	8.84	9.69	10.66	11.68	12.73	13.80	15.45	16.84	18.26	24.12	30.24
	140	9.45	10.46	11.58	12.74	13.93	15.14	16.99	18.55	20.14	26.69	33.53

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.16	4.21	4.35	4.53	4.72	4.93	5.24	5.51	5.78	6.89	8.05
	20	5.03	5.15	5.37	5.62	5.89	6.17	6.62	7.00	7.39	9.03	10.77
	40	6.25	6.49	6.85	7.24	7.67	8.11	8.80	9.40	10.02	12.64	15.43
	60	7.19	7.56	8.05	8.59	9.17	9.77	10.70	11.51	12.35	15.85	19.56
	80	7.99	8.50	9.13	9.81	10.54	11.29	12.46	13.47	14.50	18.83	23.38
	100	8.72	9.36	10.13	10.96	11.83	12.73	14.13	15.32	16.54	21.63	26.98
	120	9.38	10.17	11.08	12.05	13.06	14.11	15.72	17.09	18.49	24.30	30.40
	140	10.01	10.94	11.99	13.10	14.25	15.43	17.25	18.79	20.36	26.87	33.69
300	10	4.56	4.61	4.76	4.95	5.15	5.35	5.68	5.95	6.23	7.35	8.51
	20	5.55	5.66	5.88	6.14	6.41	6.70	7.14	7.52	7.91	9.52	11.23
	40	6.91	7.13	7.48	7.87	8.28	8.71	9.38	9.97	10.57	13.11	15.84
	60	7.94	8.28	8.75	9.26	9.82	10.39	11.29	12.07	12.87	16.28	19.94
	80	8.81	9.27	9.86	10.51	11.20	11.91	13.03	14.01	15.01	19.23	23.73
	100	9.59	10.17	10.88	11.66	12.48	13.34	14.68	15.83	17.02	22.01	27.30
	120	10.30	11.00	11.84	12.75	13.71	14.70	16.25	17.58	18.95	24.67	30.71
	140	10.97	11.79	12.75	13.79	14.88	16.01	17.77	19.27	20.81	27.23	33.99
400	10	4.89	4.94	5.09	5.28	5.49	5.70	6.04	6.32	6.60	7.75	8.91
	20	5.97	6.08	6.30	6.56	6.84	7.13	7.58	7.97	8.36	9.97	11.66
	40	7.45	7.66	8.00	8.39	8.80	9.23	9.90	10.47	11.06	13.56	16.24
	60	8.56	8.88	9.34	9.84	10.38	10.95	11.83	12.59	13.37	16.71	20.30
	80	9.49	9.92	10.49	11.12	11.79	12.48	13.57	14.52	15.49	19.63	24.07
	100	10.32	10.86	11.54	12.29	13.09	13.91	15.21	16.33	17.49	22.40	27.63
	120	11.07	11.72	12.52	13.39	14.31	15.27	16.77	18.07	19.41	25.04	31.03
	140	11.77	12.53	13.45	14.44	15.49	16.57	18.27	19.74	21.25	27.58	34.29
600	10	5.42	5.47	5.63	5.83	6.05	6.28	6.62	6.92	7.21	8.40	9.60
	20	6.65	6.76	6.99	7.26	7.55	7.85	8.32	8.71	9.11	10.74	12.43
	40	8.32	8.52	8.87	9.26	9.68	10.11	10.78	11.35	11.94	14.39	17.01
	60	9.56	9.87	10.31	10.82	11.36	11.91	12.78	13.52	14.29	17.53	21.03
	80	10.60	11.00	11.55	12.17	12.82	13.50	14.55	15.47	16.41	20.42	24.76
	100	11.51	12.01	12.66	13.39	14.15	14.95	16.20	17.28	18.40	23.15	28.28
	120	12.33	12.93	13.69	14.52	15.40	16.32	17.76	19.00	20.29	25.77	31.65
	140	13.09	13.79	14.65	15.59	16.59	17.62	19.25	20.66	22.11	28.28	34.89
800	10	5.85	5.90	6.07	6.28	6.50	6.74	7.10	7.41	7.72	8.95	10.18
	20	7.21	7.31	7.55	7.83	8.13	8.44	8.92	9.33	9.74	11.41	13.11
	40	9.03	9.23	9.58	9.98	10.40	10.84	11.52	12.10	12.69	15.15	17.73
	60	10.38	10.67	11.13	11.63	12.17	12.73	13.60	14.34	15.10	18.30	21.74
	80	11.50	11.89	12.44	13.05	13.70	14.37	15.42	16.32	17.25	21.18	25.43
	100	12.49	12.96	13.61	14.32	15.08	15.87	17.09	18.15	19.24	23.89	28.93
	120	13.37	13.94	14.68	15.50	16.36	17.26	18.66	19.88	21.13	26.48	32.27
	140	14.19	14.84	15.68	16.60	17.57	18.58	20.16	21.53	22.94	28.98	35.49

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.56	3.97	4.40	4.83	5.26	5.70	6.36	6.91	7.46	9.71	12.01
	20	4.65	5.36	6.05	6.73	7.40	8.07	9.07	9.91	10.75	14.19	17.72
	40	6.48	7.71	8.83	9.92	10.98	12.04	13.63	14.95	16.29	21.72	27.33
	60	8.08	9.76	11.27	12.71	14.13	15.53	17.63	19.38	21.14	28.33	35.75
	80	9.55	11.64	13.51	15.28	17.02	18.73	21.30	23.44	25.60	34.39	43.49
	100	10.93	13.41	15.61	17.69	19.73	21.74	24.74	27.26	29.78	40.08	50.75
	120	12.24	15.10	17.61	19.98	22.30	24.60	28.02	30.88	33.76	45.50	57.65
	140	13.50	16.71	19.52	22.18	24.77	27.34	31.16	34.36	37.58	50.69	64.28
25	10	4.25	4.48	4.82	5.19	5.58	5.99	6.61	7.14	7.68	9.88	12.16
	20	5.29	5.81	6.41	7.03	7.67	8.31	9.28	10.11	10.93	14.33	17.85
	40	7.03	8.09	9.14	10.18	11.21	12.25	13.81	15.12	16.44	21.84	27.44
	60	8.59	10.10	11.54	12.95	14.33	15.72	17.79	19.53	21.28	28.44	35.85
	80	10.02	11.97	13.76	15.50	17.21	18.90	21.45	23.58	25.73	34.49	43.58
	100	11.38	13.72	15.85	17.90	19.91	21.90	24.89	27.39	29.91	40.18	50.83
	120	12.67	15.39	17.84	20.18	22.48	24.75	28.16	31.01	33.88	45.59	57.73
	140	13.91	16.99	19.75	22.37	24.94	27.49	31.30	34.48	37.69	50.78	64.35
50	10	4.70	4.89	5.18	5.52	5.89	6.27	6.86	7.37	7.89	10.05	12.31
	20	5.80	6.22	6.76	7.33	7.93	8.55	9.50	10.30	11.12	14.48	17.97
	40	7.55	8.46	9.44	10.43	11.44	12.45	13.99	15.29	16.60	21.97	27.54
	60	9.08	10.44	11.82	13.18	14.54	15.90	17.95	19.68	21.42	28.55	35.94
	80	10.49	12.28	14.02	15.72	17.40	19.08	21.60	23.72	25.86	34.60	43.67
	100	11.82	14.02	16.09	18.10	20.09	22.07	25.03	27.52	30.03	40.28	50.92
	120	13.09	15.68	18.07	20.38	22.65	24.91	28.30	31.14	34.00	45.69	57.81
	140	14.32	17.27	19.97	22.56	25.11	27.64	31.43	34.61	37.80	50.87	64.43
100	10	5.33	5.49	5.76	6.07	6.41	6.77	7.33	7.81	8.31	10.39	12.60
	20	6.57	6.91	7.37	7.89	8.44	9.02	9.92	10.69	11.48	14.77	18.22
	40	8.42	9.15	10.02	10.93	11.89	12.86	14.35	15.62	16.90	22.21	27.75
	60	9.96	11.10	12.35	13.64	14.95	16.27	18.28	19.98	21.70	28.77	36.13
	80	11.36	12.91	14.52	16.15	17.78	19.42	21.91	24.00	26.12	34.80	43.84
	100	12.67	14.62	16.57	18.51	20.45	22.39	25.32	27.79	30.27	40.48	51.08
	120	13.92	16.25	18.53	20.77	23.00	25.22	28.57	31.39	34.23	45.87	57.97
	140	15.12	17.82	20.41	22.94	25.44	27.94	31.70	34.85	38.03	51.05	64.58
150	10	5.80	5.94	6.20	6.51	6.85	7.20	7.74	8.21	8.69	10.72	12.88
	20	7.15	7.45	7.89	8.38	8.91	9.46	10.32	11.07	11.83	15.05	18.46
	40	9.11	9.76	10.56	11.42	12.32	13.26	14.70	15.94	17.21	22.46	27.96
	60	10.71	11.72	12.87	14.09	15.35	16.63	18.60	20.28	21.97	28.99	36.32
	80	12.13	13.51	15.02	16.57	18.16	19.76	22.21	24.28	26.38	35.01	44.02
	100	13.45	15.20	17.04	18.92	20.81	22.72	25.61	28.05	30.52	40.67	51.25
	120	14.69	16.81	18.98	21.16	23.34	25.53	28.85	31.64	34.46	46.06	58.13
	140	15.89	18.37	20.85	23.31	25.77	28.24	31.96	35.09	38.25	51.23	64.73

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	6.18	6.31	6.58	6.88	7.22	7.56	8.10	8.57	9.05	11.04	13.17
	20	7.63	7.91	8.34	8.82	9.33	9.86	10.70	11.43	12.18	15.34	18.71
	40	9.70	10.30	11.05	11.87	12.74	13.65	15.06	16.27	17.51	22.70	28.16
	60	11.36	12.28	13.37	14.53	15.75	17.00	18.93	20.57	22.25	29.21	36.51
	80	12.81	14.08	15.50	16.99	18.53	20.10	22.51	24.56	26.63	35.22	44.19
	100	14.15	15.76	17.51	19.32	21.16	23.04	25.89	28.31	30.76	40.87	51.42
	120	15.40	17.36	19.43	21.54	23.68	25.84	29.12	31.89	34.70	46.25	58.29
	140	16.60	18.90	21.28	23.68	26.10	28.54	32.22	35.33	38.48	51.41	64.89
300	10	6.80	6.92	7.19	7.50	7.83	8.18	8.73	9.19	9.66	11.63	13.71
	20	8.41	8.67	9.09	9.56	10.06	10.58	11.40	12.10	12.83	15.90	19.19
	40	10.68	11.22	11.92	12.70	13.52	14.39	15.73	16.90	18.10	23.18	28.58
	60	12.45	13.27	14.28	15.37	16.51	17.70	19.56	21.16	22.80	29.65	36.88
	80	13.98	15.10	16.41	17.81	19.27	20.77	23.11	25.11	27.14	35.63	44.54
	100	15.37	16.79	18.40	20.10	21.87	23.68	26.46	28.83	31.25	41.25	51.75
	120	16.66	18.39	20.30	22.30	24.36	26.46	29.67	32.39	35.16	46.62	58.61
	140	17.88	19.93	22.14	24.42	26.76	29.13	32.75	35.82	38.93	51.77	65.19
400	10	7.30	7.42	7.69	8.01	8.35	8.70	9.25	9.72	10.20	12.17	14.23
	20	9.05	9.30	9.71	10.18	10.68	11.20	12.01	12.70	13.42	16.43	19.67
	40	11.48	11.99	12.67	13.43	14.23	15.07	16.38	17.51	18.68	23.66	28.99
	60	13.36	14.13	15.09	16.13	17.23	18.38	20.18	21.74	23.34	30.09	37.26
	80	14.97	16.01	17.24	18.57	19.97	21.43	23.70	25.65	27.65	36.03	44.89
	100	16.42	17.73	19.24	20.86	22.56	24.31	27.02	29.35	31.73	41.64	52.08
	120	17.75	19.34	21.14	23.04	25.02	27.06	30.21	32.89	35.63	46.99	58.92
	140	19.01	20.88	22.96	25.14	27.40	29.72	33.27	36.30	39.37	52.12	65.50
600	10	8.11	8.23	8.51	8.83	9.19	9.56	10.12	10.61	11.09	13.09	15.15
	20	10.09	10.33	10.74	11.21	11.72	12.24	13.05	13.75	14.46	17.43	20.59
	40	12.80	13.27	13.93	14.67	15.46	16.27	17.54	18.64	19.78	24.60	29.80
	60	14.86	15.57	16.47	17.47	18.53	19.63	21.35	22.85	24.39	30.95	38.00
	80	16.61	17.55	18.70	19.96	21.29	22.67	24.84	26.72	28.65	36.85	45.58
	100	18.17	19.34	20.75	22.27	23.86	25.53	28.13	30.38	32.69	42.41	52.74
	120	19.59	21.01	22.66	24.44	26.31	28.25	31.27	33.88	36.54	47.73	59.55
	140	20.92	22.58	24.49	26.53	28.67	30.88	34.31	37.25	40.26	52.84	66.10
800	10	8.76	8.89	9.17	9.51	9.88	10.26	10.84	11.34	11.84	13.87	15.95
	20	10.93	11.17	11.58	12.07	12.58	13.12	13.94	14.64	15.36	18.32	21.45
	40	13.87	14.33	14.99	15.72	16.50	17.31	18.57	19.66	20.77	25.50	30.60
	60	16.10	16.76	17.65	18.63	19.67	20.74	22.43	23.89	25.39	31.80	38.74
	80	17.97	18.85	19.97	21.19	22.47	23.82	25.92	27.74	29.63	37.65	46.27
	100	19.62	20.72	22.07	23.53	25.07	26.68	29.19	31.38	33.63	43.18	53.39
	120	21.12	22.45	24.02	25.73	27.52	29.39	32.32	34.85	37.45	48.46	60.18
	140	22.52	24.07	25.88	27.82	29.87	32.00	35.32	38.19	41.14	53.54	66.71

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.10	1.14	1.20	1.28	1.36	1.45	1.57	1.68	1.79	2.23	2.67
	20	1.25	1.32	1.42	1.53	1.64	1.75	1.92	2.07	2.21	2.80	3.40
	40	1.48	1.63	1.78	1.94	2.10	2.26	2.51	2.72	2.92	3.76	4.62
	60	1.69	1.89	2.10	2.30	2.51	2.71	3.02	3.28	3.55	4.61	5.69
	80	1.89	2.14	2.39	2.64	2.88	3.13	3.50	3.81	4.12	5.38	6.68
	100	2.07	2.37	2.66	2.95	3.23	3.52	3.94	4.30	4.65	6.11	7.60
	120	2.24	2.59	2.92	3.25	3.57	3.89	4.36	4.76	5.17	6.80	8.48
	140	2.40	2.80	3.17	3.53	3.89	4.24	4.77	5.21	5.66	7.46	9.32
25	10	1.44	1.44	1.48	1.54	1.61	1.68	1.80	1.89	1.99	2.40	2.82
	20	1.63	1.65	1.71	1.79	1.88	1.98	2.13	2.26	2.39	2.95	3.52
	40	1.90	1.96	2.06	2.19	2.33	2.47	2.69	2.88	3.08	3.89	4.72
	60	2.11	2.21	2.37	2.53	2.71	2.90	3.19	3.44	3.69	4.72	5.79
	80	2.30	2.45	2.64	2.85	3.08	3.30	3.65	3.95	4.25	5.48	6.77
	100	2.48	2.67	2.90	3.16	3.42	3.68	4.09	4.43	4.78	6.21	7.69
	120	2.64	2.88	3.15	3.44	3.74	4.04	4.50	4.89	5.28	6.89	8.56
	140	2.80	3.08	3.39	3.72	4.06	4.39	4.90	5.33	5.77	7.55	9.40
50	10	1.59	1.58	1.63	1.69	1.76	1.83	1.94	2.04	2.14	2.54	2.95
	20	1.81	1.83	1.89	1.97	2.06	2.15	2.30	2.42	2.55	3.08	3.64
	40	2.13	2.17	2.27	2.39	2.52	2.65	2.86	3.04	3.23	4.01	4.83
	60	2.37	2.45	2.58	2.74	2.90	3.08	3.35	3.58	3.82	4.83	5.88
	80	2.58	2.70	2.86	3.05	3.26	3.47	3.80	4.09	4.38	5.59	6.85
	100	2.77	2.92	3.12	3.35	3.59	3.84	4.23	4.56	4.90	6.30	7.77
	120	2.94	3.13	3.37	3.63	3.91	4.20	4.64	5.02	5.40	6.99	8.64
	140	3.11	3.33	3.61	3.91	4.22	4.54	5.04	5.46	5.88	7.64	9.48
100	10	1.77	1.77	1.82	1.88	1.95	2.03	2.15	2.25	2.35	2.76	3.17
	20	2.06	2.07	2.13	2.21	2.30	2.40	2.54	2.67	2.80	3.32	3.87
	40	2.44	2.48	2.57	2.68	2.81	2.94	3.14	3.31	3.49	4.24	5.03
	60	2.73	2.79	2.91	3.06	3.22	3.38	3.64	3.86	4.09	5.05	6.07
	80	2.97	3.06	3.21	3.39	3.58	3.78	4.09	4.35	4.63	5.79	7.03
	100	3.18	3.30	3.49	3.69	3.91	4.14	4.51	4.82	5.14	6.50	7.94
	120	3.38	3.53	3.74	3.98	4.23	4.50	4.91	5.27	5.63	7.17	8.80
	140	3.56	3.74	3.98	4.25	4.53	4.83	5.30	5.70	6.11	7.82	9.63
150	10	1.91	1.91	1.96	2.02	2.10	2.17	2.30	2.40	2.50	2.92	3.34
	20	2.23	2.24	2.31	2.39	2.48	2.58	2.73	2.86	2.99	3.52	4.07
	40	2.66	2.70	2.79	2.91	3.03	3.16	3.36	3.54	3.72	4.45	5.23
	60	2.98	3.04	3.17	3.31	3.46	3.63	3.88	4.10	4.32	5.26	6.25
	80	3.25	3.34	3.49	3.66	3.84	4.03	4.34	4.60	4.86	5.99	7.20
	100	3.49	3.60	3.77	3.97	4.19	4.41	4.76	5.06	5.37	6.69	8.10
	120	3.70	3.84	4.04	4.27	4.51	4.76	5.16	5.50	5.86	7.36	8.96
	140	3.90	4.06	4.29	4.54	4.82	5.10	5.54	5.93	6.33	8.00	9.78

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.02	2.02	2.07	2.14	2.21	2.29	2.42	2.53	2.63	3.06	3.49
	20	2.37	2.38	2.45	2.54	2.63	2.73	2.89	3.02	3.15	3.69	4.24
	40	2.85	2.88	2.97	3.09	3.22	3.35	3.55	3.73	3.91	4.64	5.41
	60	3.20	3.25	3.37	3.52	3.67	3.84	4.09	4.30	4.53	5.45	6.43
	80	3.49	3.57	3.71	3.88	4.07	4.26	4.56	4.81	5.08	6.19	7.37
	100	3.74	3.85	4.02	4.21	4.42	4.64	4.99	5.28	5.59	6.88	8.26
	120	3.97	4.10	4.29	4.52	4.75	5.00	5.39	5.73	6.07	7.54	9.12
	140	4.18	4.33	4.55	4.80	5.07	5.34	5.78	6.15	6.54	8.18	9.94
300	10	2.20	2.20	2.25	2.32	2.40	2.49	2.62	2.73	2.84	3.29	3.73
	20	2.60	2.61	2.68	2.77	2.87	2.98	3.14	3.28	3.41	3.97	4.53
	40	3.14	3.17	3.27	3.39	3.52	3.66	3.87	4.05	4.23	4.98	5.74
	60	3.54	3.59	3.72	3.86	4.02	4.19	4.44	4.66	4.88	5.80	6.77
	80	3.87	3.94	4.09	4.26	4.44	4.64	4.94	5.19	5.45	6.54	7.70
	100	4.15	4.25	4.42	4.61	4.82	5.04	5.38	5.68	5.97	7.24	8.58
	120	4.41	4.53	4.72	4.94	5.17	5.42	5.80	6.13	6.47	7.89	9.43
	140	4.64	4.78	5.00	5.24	5.50	5.77	6.19	6.56	6.93	8.52	10.24
400	10	2.34	2.34	2.40	2.47	2.56	2.64	2.78	2.90	3.01	3.48	3.93
	20	2.79	2.80	2.87	2.97	3.07	3.18	3.35	3.49	3.63	4.20	4.78
	40	3.38	3.41	3.51	3.64	3.77	3.91	4.13	4.32	4.50	5.26	6.03
	60	3.82	3.87	3.99	4.14	4.31	4.48	4.74	4.96	5.18	6.11	7.07
	80	4.18	4.25	4.40	4.57	4.76	4.95	5.26	5.51	5.78	6.87	8.01
	100	4.49	4.58	4.75	4.95	5.16	5.38	5.72	6.01	6.31	7.56	8.89
	120	4.76	4.88	5.07	5.29	5.52	5.77	6.15	6.48	6.81	8.22	9.73
	140	5.02	5.15	5.36	5.61	5.87	6.14	6.56	6.92	7.29	8.85	10.53
600	10	2.58	2.57	2.63	2.71	2.80	2.90	3.04	3.16	3.29	3.78	4.26
	20	3.09	3.10	3.18	3.28	3.39	3.50	3.68	3.83	3.98	4.59	5.19
	40	3.77	3.80	3.91	4.04	4.18	4.33	4.56	4.75	4.94	5.73	6.53
	60	4.27	4.32	4.45	4.60	4.77	4.95	5.22	5.45	5.69	6.64	7.61
	80	4.67	4.74	4.90	5.08	5.27	5.47	5.79	6.05	6.32	7.42	8.57
	100	5.03	5.11	5.29	5.49	5.71	5.94	6.29	6.59	6.89	8.14	9.46
	120	5.34	5.45	5.64	5.87	6.11	6.36	6.75	7.08	7.41	8.81	10.29
	140	5.63	5.75	5.97	6.21	6.48	6.75	7.17	7.54	7.91	9.45	11.09
800	10	2.76	2.76	2.83	2.91	3.00	3.10	3.25	3.38	3.51	4.02	4.53
	20	3.33	3.34	3.42	3.53	3.65	3.77	3.95	4.11	4.27	4.90	5.52
	40	4.08	4.11	4.22	4.36	4.51	4.66	4.90	5.11	5.31	6.13	6.94
	60	4.63	4.68	4.81	4.98	5.15	5.34	5.62	5.86	6.10	7.08	8.07
	80	5.08	5.15	5.30	5.49	5.69	5.90	6.22	6.50	6.77	7.90	9.06
	100	5.46	5.55	5.73	5.94	6.16	6.40	6.76	7.06	7.37	8.64	9.96
	120	5.81	5.91	6.11	6.34	6.59	6.85	7.24	7.58	7.92	9.33	10.81
	140	6.12	6.24	6.46	6.71	6.98	7.26	7.69	8.06	8.43	9.98	11.61

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.60	1.68	1.80	1.94	2.07	2.21	2.42	2.60	2.78	3.51	4.25
	20	1.88	2.05	2.23	2.43	2.62	2.82	3.12	3.37	3.63	4.65	5.70
	40	2.36	2.66	2.96	3.26	3.55	3.85	4.30	4.67	5.05	6.58	8.15
	60	2.78	3.19	3.59	3.98	4.37	4.75	5.33	5.81	6.30	8.27	10.29
	80	3.16	3.68	4.17	4.65	5.11	5.58	6.27	6.86	7.44	9.82	12.26
	100	3.52	4.15	4.72	5.27	5.81	6.35	7.16	7.84	8.51	11.27	14.11
	120	3.87	4.58	5.24	5.87	6.48	7.09	8.01	8.77	9.54	12.65	15.87
	140	4.20	5.00	5.74	6.44	7.12	7.80	8.82	9.66	10.52	13.98	17.56
25	10	2.05	2.07	2.15	2.25	2.37	2.48	2.67	2.83	3.00	3.68	4.40
	20	2.37	2.44	2.57	2.72	2.89	3.07	3.34	3.57	3.81	4.80	5.83
	40	2.86	3.03	3.26	3.51	3.78	4.06	4.48	4.84	5.21	6.70	8.25
	60	3.26	3.53	3.87	4.22	4.57	4.94	5.49	5.96	6.44	8.38	10.39
	80	3.62	4.01	4.43	4.87	5.31	5.75	6.43	7.00	7.57	9.92	12.35
	100	3.97	4.45	4.96	5.48	6.00	6.52	7.31	7.97	8.64	11.37	14.20
	120	4.29	4.88	5.47	6.06	6.66	7.25	8.15	8.90	9.65	12.75	15.95
	140	4.61	5.29	5.96	6.63	7.29	7.95	8.95	9.79	10.63	14.07	17.63
50	10	2.27	2.28	2.36	2.46	2.57	2.69	2.87	3.03	3.19	3.85	4.54
	20	2.65	2.70	2.82	2.96	3.12	3.28	3.54	3.76	3.99	4.95	5.95
	40	3.19	3.32	3.52	3.75	4.00	4.26	4.66	5.01	5.36	6.83	8.36
	60	3.62	3.84	4.12	4.44	4.78	5.12	5.66	6.11	6.58	8.49	10.48
	80	4.00	4.30	4.68	5.08	5.50	5.93	6.58	7.14	7.70	10.03	12.44
	100	4.35	4.74	5.20	5.68	6.18	6.68	7.45	8.10	8.76	11.47	14.28
	120	4.67	5.16	5.70	6.26	6.83	7.41	8.29	9.03	9.77	12.84	16.03
	140	4.99	5.56	6.18	6.82	7.46	8.11	9.08	9.91	10.74	14.16	17.71
100	10	2.56	2.57	2.65	2.75	2.86	2.98	3.16	3.32	3.48	4.13	4.81
	20	3.01	3.06	3.17	3.31	3.46	3.62	3.87	4.09	4.31	5.22	6.20
	40	3.65	3.75	3.94	4.15	4.38	4.62	5.00	5.32	5.66	7.07	8.57
	60	4.13	4.31	4.56	4.85	5.16	5.48	5.98	6.41	6.85	8.71	10.67
	80	4.55	4.80	5.12	5.48	5.87	6.26	6.88	7.42	7.96	10.23	12.62
	100	4.93	5.25	5.64	6.08	6.53	7.01	7.74	8.37	9.01	11.67	14.45
	120	5.28	5.67	6.14	6.64	7.17	7.72	8.56	9.28	10.01	13.03	16.19
	140	5.60	6.07	6.61	7.19	7.79	8.41	9.35	10.15	10.97	14.34	17.87
150	10	2.77	2.78	2.86	2.96	3.08	3.20	3.39	3.55	3.71	4.37	5.04
	20	3.28	3.32	3.44	3.58	3.73	3.89	4.14	4.35	4.57	5.48	6.43
	40	3.99	4.08	4.26	4.47	4.69	4.93	5.29	5.61	5.94	7.31	8.78
	60	4.52	4.68	4.92	5.19	5.49	5.79	6.27	6.69	7.12	8.93	10.86
	80	4.98	5.19	5.50	5.84	6.20	6.58	7.17	7.69	8.22	10.44	12.79
	100	5.38	5.66	6.03	6.44	6.87	7.32	8.02	8.63	9.25	11.86	14.62
	120	5.75	6.09	6.53	7.00	7.50	8.02	8.83	9.53	10.24	13.22	16.35
	140	6.10	6.50	7.00	7.54	8.11	8.70	9.61	10.40	11.20	14.53	18.02

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.94	2.95	3.03	3.14	3.25	3.38	3.57	3.73	3.90	4.57	5.25
	20	3.50	3.54	3.65	3.80	3.95	4.11	4.37	4.58	4.80	5.70	6.65
	40	4.26	4.36	4.53	4.74	4.96	5.19	5.56	5.87	6.19	7.54	8.98
	60	4.84	4.99	5.22	5.49	5.78	6.08	6.55	6.96	7.37	9.15	11.05
	80	5.33	5.53	5.82	6.15	6.50	6.87	7.45	7.95	8.46	10.64	12.97
	100	5.76	6.01	6.37	6.76	7.18	7.61	8.29	8.88	9.49	12.06	14.78
	120	6.15	6.46	6.87	7.33	7.81	8.31	9.10	9.78	10.47	13.41	16.51
	140	6.51	6.88	7.36	7.87	8.42	8.98	9.87	10.64	11.42	14.70	18.17
300	10	3.21	3.22	3.31	3.42	3.54	3.67	3.87	4.04	4.21	4.90	5.60
	20	3.85	3.89	4.01	4.15	4.31	4.48	4.74	4.96	5.18	6.10	7.04
	40	4.72	4.80	4.98	5.19	5.41	5.64	6.01	6.32	6.64	7.96	9.37
	60	5.36	5.50	5.73	5.99	6.28	6.57	7.03	7.43	7.84	9.57	11.42
	80	5.90	6.08	6.37	6.69	7.03	7.39	7.95	8.43	8.93	11.04	13.32
	100	6.37	6.61	6.94	7.32	7.72	8.14	8.80	9.36	9.95	12.44	15.11
	120	6.80	7.08	7.47	7.91	8.37	8.85	9.60	10.25	10.92	13.78	16.83
	140	7.19	7.53	7.97	8.46	8.98	9.52	10.37	11.10	11.86	15.06	18.48
400	10	3.43	3.44	3.53	3.65	3.78	3.91	4.12	4.29	4.47	5.18	5.89
	20	4.14	4.17	4.29	4.45	4.61	4.78	5.05	5.28	5.51	6.44	7.39
	40	5.08	5.17	5.34	5.55	5.78	6.02	6.39	6.70	7.02	8.35	9.74
	60	5.78	5.91	6.14	6.41	6.70	6.99	7.45	7.85	8.26	9.96	11.78
	80	6.37	6.54	6.82	7.14	7.48	7.84	8.39	8.87	9.36	11.43	13.66
	100	6.88	7.10	7.43	7.80	8.20	8.61	9.25	9.81	10.38	12.81	15.44
	120	7.34	7.60	7.98	8.41	8.86	9.33	10.06	10.70	11.35	14.14	17.14
	140	7.76	8.07	8.50	8.98	9.48	10.01	10.83	11.55	12.28	15.42	18.78
600	10	3.79	3.80	3.89	4.02	4.15	4.30	4.52	4.70	4.89	5.64	6.38
	20	4.60	4.63	4.76	4.92	5.09	5.28	5.56	5.79	6.03	7.00	7.97
	40	5.67	5.75	5.94	6.16	6.39	6.64	7.02	7.34	7.67	9.01	10.40
	60	6.47	6.59	6.83	7.10	7.39	7.69	8.16	8.56	8.97	10.66	12.45
	80	7.12	7.29	7.57	7.89	8.24	8.59	9.15	9.62	10.11	12.14	14.32
	100	7.70	7.90	8.23	8.60	9.00	9.41	10.04	10.59	11.15	13.53	16.08
	120	8.21	8.46	8.83	9.25	9.69	10.16	10.88	11.50	12.13	14.84	17.76
	140	8.68	8.97	9.39	9.85	10.35	10.86	11.66	12.36	13.07	16.10	19.38
800	10	4.08	4.09	4.19	4.32	4.46	4.61	4.84	5.03	5.23	6.01	6.78
	20	4.97	5.01	5.14	5.31	5.49	5.68	5.97	6.22	6.47	7.47	8.47
	40	6.15	6.23	6.42	6.65	6.89	7.15	7.54	7.87	8.21	9.58	10.98
	60	7.02	7.15	7.38	7.66	7.96	8.27	8.75	9.16	9.57	11.28	13.06
	80	7.74	7.90	8.19	8.51	8.86	9.23	9.79	10.27	10.76	12.79	14.94
	100	8.36	8.56	8.89	9.27	9.67	10.08	10.72	11.27	11.83	14.18	16.69
	120	8.92	9.16	9.53	9.95	10.40	10.86	11.58	12.20	12.83	15.50	18.36
	140	9.43	9.71	10.12	10.59	11.08	11.59	12.39	13.08	13.78	16.76	19.97

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.39	2.58	2.81	3.05	3.29	3.53	3.90	4.20	4.51	5.77	7.06
	20	2.96	3.31	3.67	4.03	4.39	4.75	5.29	5.75	6.21	8.06	9.97
	40	3.92	4.53	5.11	5.68	6.25	6.80	7.64	8.34	9.05	11.91	14.86
	60	4.75	5.60	6.38	7.13	7.87	8.61	9.70	10.62	11.54	15.29	19.15
	80	5.52	6.58	7.55	8.47	9.37	10.26	11.60	12.71	13.83	18.39	23.09
	100	6.24	7.51	8.64	9.72	10.77	11.81	13.37	14.67	15.98	21.30	26.78
	120	6.93	8.38	9.68	10.90	12.10	13.29	15.06	16.54	18.02	24.06	30.30
	140	7.59	9.23	10.67	12.04	13.38	14.71	16.68	18.33	19.98	26.72	33.67
25	10	2.98	3.05	3.21	3.40	3.60	3.82	4.15	4.44	4.73	5.95	7.21
	20	3.55	3.75	4.03	4.34	4.66	5.00	5.51	5.95	6.39	8.21	10.09
	40	4.46	4.91	5.42	5.94	6.48	7.01	7.83	8.51	9.20	12.04	14.96
	60	5.26	5.95	6.66	7.37	8.08	8.79	9.87	10.77	11.68	15.40	19.24
	80	6.00	6.91	7.80	8.69	9.56	10.44	11.75	12.85	13.96	18.49	23.18
	100	6.70	7.82	8.88	9.92	10.95	11.98	13.52	14.81	16.10	21.40	26.87
	120	7.36	8.68	9.91	11.10	12.28	13.45	15.20	16.67	18.14	24.16	30.38
	140	8.01	9.51	10.90	12.24	13.55	14.86	16.81	18.45	20.10	26.81	33.75
50	10	3.30	3.36	3.50	3.68	3.87	4.07	4.39	4.66	4.95	6.12	7.35
	20	3.94	4.10	4.34	4.62	4.92	5.24	5.72	6.14	6.57	8.36	10.22
	40	4.91	5.27	5.72	6.20	6.70	7.22	8.01	8.68	9.36	12.16	15.07
	60	5.71	6.29	6.93	7.60	8.29	8.98	10.04	10.92	11.82	15.51	19.34
	80	6.44	7.23	8.06	8.91	9.76	10.61	11.90	12.99	14.09	18.60	23.27
	100	7.13	8.12	9.13	10.13	11.14	12.14	13.66	14.94	16.23	21.49	26.95
	120	7.78	8.97	10.14	11.30	12.46	13.61	15.34	16.79	18.26	24.25	30.46
	140	8.41	9.79	11.12	12.43	13.72	15.01	16.95	18.57	20.21	26.90	33.83
100	10	3.74	3.79	3.92	4.10	4.28	4.48	4.79	5.05	5.32	6.45	7.64
	20	4.49	4.61	4.84	5.09	5.37	5.67	6.12	6.52	6.93	8.65	10.47
	40	5.57	5.86	6.25	6.68	7.14	7.62	8.37	9.01	9.67	12.41	15.28
	60	6.43	6.89	7.45	8.06	8.69	9.35	10.36	11.23	12.10	15.74	19.53
	80	7.19	7.82	8.56	9.33	10.14	10.96	12.21	13.28	14.35	18.81	23.44
	100	7.89	8.70	9.60	10.54	11.50	12.47	13.95	15.21	16.48	21.69	27.12
	120	8.54	9.53	10.60	11.70	12.80	13.92	15.62	17.05	18.50	24.44	30.62
	140	9.17	10.34	11.57	12.81	14.06	15.31	17.22	18.82	20.44	27.08	33.98
150	10	4.06	4.10	4.24	4.41	4.60	4.80	5.10	5.37	5.64	6.75	7.92
	20	4.89	5.01	5.22	5.47	5.75	6.03	6.48	6.86	7.26	8.93	10.71
	40	6.07	6.33	6.69	7.10	7.54	8.00	8.71	9.33	9.97	12.65	15.49
	60	6.99	7.40	7.91	8.48	9.08	9.71	10.69	11.52	12.38	15.96	19.72
	80	7.79	8.35	9.02	9.75	10.51	11.30	12.51	13.55	14.61	19.01	23.62
	100	8.52	9.23	10.06	10.94	11.86	12.80	14.24	15.47	16.72	21.89	27.29
	120	9.19	10.06	11.05	12.08	13.15	14.23	15.89	17.30	18.73	24.63	30.78
	140	9.83	10.86	12.00	13.18	14.39	15.62	17.48	19.06	20.67	27.26	34.14

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.32	4.36	4.50	4.67	4.86	5.06	5.37	5.64	5.91	7.02	8.18
	20	5.23	5.33	5.54	5.79	6.07	6.35	6.79	7.17	7.56	9.20	10.95
	40	6.49	6.73	7.08	7.47	7.90	8.34	9.04	9.64	10.27	12.90	15.70
	60	7.46	7.84	8.33	8.87	9.45	10.06	11.00	11.82	12.66	16.18	19.91
	80	8.30	8.81	9.45	10.14	10.87	11.63	12.81	13.83	14.87	19.22	23.80
	100	9.05	9.71	10.49	11.33	12.21	13.12	14.53	15.74	16.97	22.09	27.46
	120	9.75	10.55	11.47	12.46	13.49	14.54	16.17	17.56	18.97	24.82	30.94
	140	10.41	11.35	12.42	13.55	14.72	15.91	17.75	19.31	20.89	27.44	34.29
300	10	4.74	4.77	4.92	5.10	5.29	5.50	5.82	6.09	6.37	7.49	8.65
	20	5.76	5.86	6.07	6.33	6.60	6.88	7.33	7.71	8.09	9.71	11.42
	40	7.17	7.38	7.73	8.11	8.53	8.96	9.64	10.22	10.82	13.37	16.11
	60	8.24	8.58	9.04	9.56	10.11	10.69	11.60	12.38	13.19	16.62	20.29
	80	9.15	9.60	10.20	10.85	11.54	12.26	13.40	14.37	15.38	19.63	24.15
	100	9.96	10.54	11.26	12.04	12.87	13.74	15.09	16.26	17.45	22.48	27.79
	120	10.70	11.40	12.25	13.17	14.14	15.15	16.71	18.06	19.43	25.19	31.26
	140	11.39	12.22	13.20	14.26	15.36	16.50	18.27	19.79	21.34	27.80	34.60
400	10	5.08	5.11	5.26	5.45	5.65	5.86	6.19	6.47	6.75	7.89	9.06
	20	6.20	6.29	6.51	6.76	7.04	7.33	7.78	8.16	8.55	10.16	11.86
	40	7.72	7.93	8.27	8.65	9.06	9.49	10.16	10.74	11.33	13.83	16.52
	60	8.88	9.19	9.65	10.16	10.70	11.26	12.15	12.91	13.70	17.05	20.66
	80	9.85	10.27	10.85	11.48	12.15	12.85	13.95	14.90	15.88	20.04	24.50
	100	10.71	11.25	11.93	12.69	13.49	14.33	15.63	16.76	17.93	22.87	28.12
	120	11.49	12.14	12.95	13.83	14.76	15.73	17.24	18.55	19.90	25.57	31.58
	140	12.22	12.98	13.91	14.92	15.97	17.07	18.79	20.27	21.79	28.16	34.91
600	10	5.62	5.66	5.81	6.01	6.22	6.45	6.79	7.08	7.38	8.56	9.76
	20	6.90	6.99	7.21	7.48	7.77	8.07	8.53	8.92	9.32	10.95	12.64
	40	8.63	8.82	9.16	9.55	9.96	10.39	11.06	11.64	12.22	14.68	17.30
	60	9.92	10.21	10.65	11.16	11.69	12.25	13.12	13.86	14.63	17.89	21.40
	80	10.99	11.38	11.94	12.55	13.20	13.88	14.95	15.86	16.81	20.84	25.20
	100	11.94	12.43	13.09	13.81	14.58	15.39	16.64	17.73	18.85	23.63	28.79
	120	12.79	13.39	14.15	14.99	15.87	16.80	18.25	19.50	20.80	26.30	32.22
	140	13.58	14.28	15.15	16.10	17.10	18.15	19.78	21.20	22.67	28.88	35.52
800	10	6.07	6.10	6.26	6.47	6.69	6.92	7.28	7.58	7.89	9.12	10.34
	20	7.47	7.56	7.79	8.07	8.36	8.67	9.15	9.55	9.96	11.63	13.33
	40	9.36	9.55	9.89	10.28	10.71	11.14	11.82	12.40	12.99	15.45	18.04
	60	10.76	11.04	11.49	11.99	12.53	13.09	13.96	14.70	15.46	18.67	22.11
	80	11.93	12.30	12.85	13.46	14.11	14.78	15.83	16.74	17.67	21.61	25.88
	100	12.95	13.41	14.06	14.77	15.53	16.32	17.55	18.62	19.71	24.38	29.44
	120	13.87	14.42	15.17	15.99	16.85	17.76	19.17	20.39	21.65	27.03	32.85
	140	14.71	15.36	16.20	17.13	18.10	19.12	20.71	22.09	23.51	29.58	36.13

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.72	4.13	4.57	5.00	5.44	5.88	6.54	7.09	7.64	9.90	12.21
	20	4.86	5.59	6.28	6.97	7.64	8.32	9.33	10.18	11.03	14.48	18.03
	40	6.77	8.03	9.17	10.28	11.36	12.43	14.03	15.37	16.71	22.18	27.82
	60	8.45	10.17	11.71	13.18	14.61	16.03	18.15	19.92	21.70	28.93	36.40
	80	9.98	12.14	14.04	15.84	17.60	19.34	21.93	24.10	26.27	35.13	44.28
	100	11.43	13.98	16.22	18.34	20.41	22.44	25.49	28.02	30.57	40.95	51.67
	120	12.80	15.74	18.30	20.72	23.07	25.40	28.86	31.75	34.66	46.48	58.70
	140	14.12	17.42	20.29	23.00	25.63	28.23	32.10	35.33	38.58	51.79	65.45
25	10	4.43	4.65	4.99	5.37	5.76	6.17	6.79	7.33	7.87	10.08	12.36
	20	5.51	6.04	6.65	7.28	7.92	8.57	9.55	10.38	11.21	14.63	18.16
	40	7.34	8.41	9.48	10.54	11.59	12.64	14.21	15.54	16.87	22.30	27.92
	60	8.96	10.52	11.99	13.41	14.82	16.22	18.32	20.07	21.84	29.04	36.49
	80	10.46	12.46	14.30	16.06	17.80	19.51	22.09	24.24	26.41	35.23	44.36
	100	11.88	14.29	16.47	18.55	20.59	22.61	25.63	28.16	30.70	41.05	51.76
	120	13.24	16.03	18.53	20.92	23.25	25.56	29.00	31.88	34.78	46.58	58.78
	140	14.54	17.70	20.52	23.19	25.80	28.38	32.24	35.46	38.69	51.88	65.52
50	10	4.89	5.07	5.36	5.70	6.07	6.45	7.05	7.56	8.08	10.25	12.51
	20	6.04	6.46	7.00	7.58	8.19	8.81	9.77	10.58	11.40	14.78	18.28
	40	7.87	8.79	9.79	10.80	11.82	12.84	14.40	15.71	17.02	22.43	28.03
	60	9.46	10.86	12.27	13.65	15.03	16.41	18.48	20.22	21.98	29.16	36.59
	80	10.94	12.79	14.56	16.28	17.99	19.69	22.24	24.38	26.54	35.34	44.45
	100	12.33	14.60	16.71	18.76	20.77	22.78	25.78	28.29	30.82	41.15	51.84
	120	13.67	16.32	18.77	21.12	23.43	25.71	29.14	32.01	34.90	46.67	58.86
	140	14.95	17.99	20.74	23.38	25.97	28.53	32.37	35.58	38.81	51.97	65.60
100	10	5.54	5.69	5.95	6.27	6.61	6.96	7.52	8.01	8.51	10.60	12.81
	20	6.83	7.16	7.63	8.15	8.71	9.29	10.19	10.97	11.76	15.07	18.54
	40	8.75	9.50	10.38	11.31	12.27	13.26	14.76	16.04	17.34	22.68	28.24
	60	10.36	11.54	12.81	14.12	15.44	16.78	18.81	20.53	22.26	29.38	36.78
	80	11.82	13.42	15.07	16.72	18.38	20.04	22.55	24.67	26.80	35.55	44.63
	100	13.20	15.20	17.20	19.17	21.14	23.11	26.07	28.56	31.07	41.34	52.01
	120	14.51	16.91	19.23	21.52	23.78	26.03	29.42	32.27	35.13	46.86	59.03
	140	15.77	18.55	21.19	23.77	26.31	28.84	32.64	35.83	39.03	52.15	65.76
150	10	6.02	6.15	6.41	6.72	7.05	7.40	7.94	8.41	8.90	10.93	13.10
	20	7.42	7.72	8.16	8.65	9.18	9.74	10.60	11.35	12.12	15.36	18.78
	40	9.47	10.13	10.93	11.80	12.72	13.66	15.12	16.37	17.64	22.93	28.45
	60	11.13	12.16	13.34	14.58	15.85	17.15	19.14	20.83	22.54	29.60	36.97
	80	12.62	14.03	15.57	17.15	18.76	20.39	22.86	24.95	27.06	35.76	44.81
	100	13.99	15.79	17.68	19.58	21.50	23.44	26.36	28.83	31.32	41.54	52.18
	120	15.30	17.48	19.69	21.91	24.13	26.35	29.70	32.52	35.37	47.05	59.19
	140	16.55	19.10	21.64	24.15	26.64	29.14	32.91	36.07	39.26	52.33	65.91

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	6.42	6.54	6.79	7.10	7.43	7.78	8.32	8.78	9.26	11.26	13.39
	20	7.92	8.20	8.62	9.10	9.61	10.15	10.99	11.72	12.47	15.65	19.03
	40	10.08	10.68	11.44	12.27	13.15	14.06	15.48	16.70	17.95	23.17	28.66
	60	11.80	12.74	13.85	15.03	16.26	17.52	19.47	21.13	22.82	29.83	37.16
	80	13.32	14.61	16.06	17.58	19.14	20.73	23.17	25.23	27.32	35.97	44.99
	100	14.71	16.36	18.15	19.99	21.87	23.77	26.65	29.09	31.57	41.74	52.35
	120	16.03	18.04	20.15	22.30	24.47	26.66	29.98	32.78	35.61	47.24	59.35
	140	17.28	19.65	22.08	24.52	26.98	29.45	33.18	36.32	39.49	52.52	66.07
300	10	7.05	7.17	7.42	7.73	8.06	8.41	8.95	9.42	9.89	11.86	13.94
	20	8.73	8.98	9.39	9.86	10.36	10.88	11.70	12.41	13.13	16.22	19.52
	40	11.08	11.62	12.33	13.11	13.94	14.81	16.17	17.35	18.56	23.66	29.08
	60	12.93	13.76	14.77	15.88	17.04	18.24	20.11	21.73	23.38	30.27	37.54
	80	14.52	15.66	16.99	18.41	19.89	21.41	23.77	25.79	27.84	36.38	45.34
	100	15.97	17.42	19.06	20.79	22.58	24.42	27.23	29.62	32.06	42.14	52.68
	120	17.32	19.09	21.04	23.07	25.16	27.29	30.53	33.29	36.08	47.62	59.67
	140	18.59	20.69	22.95	25.27	27.64	30.05	33.71	36.81	39.95	52.88	66.38
400	10	7.57	7.68	7.94	8.25	8.59	8.94	9.49	9.96	10.43	12.40	14.46
	20	9.39	9.63	10.03	10.50	11.00	11.51	12.32	13.02	13.74	16.76	20.01
	40	11.91	12.42	13.10	13.86	14.66	15.51	16.82	17.97	19.15	24.15	29.50
	60	13.87	14.64	15.60	16.66	17.77	18.93	20.74	22.31	23.93	30.72	37.92
	80	15.54	16.59	17.84	19.19	20.61	22.08	24.37	26.34	28.36	36.80	45.70
	100	17.05	18.38	19.92	21.56	23.28	25.06	27.80	30.15	32.55	42.53	53.02
	120	18.44	20.06	21.89	23.83	25.84	27.90	31.08	33.79	36.55	47.99	59.99
	140	19.75	21.66	23.79	26.01	28.30	30.65	34.24	37.30	40.40	53.24	66.69
600	10	8.41	8.51	8.78	9.10	9.45	9.82	10.38	10.86	11.35	13.34	15.40
	20	10.46	10.69	11.09	11.56	12.06	12.58	13.40	14.09	14.80	17.77	20.94
	40	13.27	13.74	14.40	15.13	15.92	16.74	18.01	19.12	20.26	25.10	30.33
	60	15.42	16.12	17.03	18.03	19.09	20.20	21.94	23.44	25.00	31.60	38.68
	80	17.23	18.18	19.34	20.61	21.95	23.35	25.53	27.43	29.38	37.62	46.40
	100	18.85	20.04	21.46	23.00	24.62	26.30	28.92	31.19	33.52	43.31	53.69
	120	20.33	21.77	23.45	25.26	27.15	29.11	32.17	34.79	37.48	48.74	60.63
	140	21.72	23.41	25.35	27.42	29.59	31.82	35.29	38.26	41.30	53.97	67.30
800	10	9.09	9.19	9.47	9.80	10.16	10.54	11.12	11.61	12.11	14.14	16.22
	20	11.33	11.55	11.96	12.44	12.95	13.48	14.30	15.00	15.72	18.68	21.81
	40	14.39	14.83	15.48	16.21	16.99	17.80	19.07	20.15	21.27	26.02	31.14
	60	16.69	17.35	18.24	19.22	20.26	21.34	23.04	24.50	26.01	32.46	39.43
	80	18.64	19.52	20.64	21.86	23.16	24.52	26.63	28.47	30.37	38.44	47.10
	100	20.35	21.46	22.82	24.29	25.85	27.47	30.01	32.21	34.48	44.09	54.35
	120	21.92	23.25	24.85	26.57	28.38	30.27	33.23	35.78	38.41	49.49	61.27
	140	23.37	24.93	26.77	28.74	30.81	32.97	36.32	39.22	42.19	54.68	67.92

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.15	1.18	1.25	1.32	1.40	1.49	1.61	1.72	1.83	2.27	2.71
	20	1.30	1.37	1.47	1.58	1.69	1.80	1.97	2.12	2.26	2.85	3.45
	40	1.55	1.69	1.85	2.01	2.17	2.33	2.58	2.78	2.99	3.83	4.69
	60	1.77	1.97	2.17	2.38	2.59	2.80	3.11	3.37	3.63	4.70	5.79
	80	1.97	2.22	2.48	2.73	2.98	3.22	3.60	3.91	4.22	5.49	6.79
	100	2.16	2.46	2.76	3.05	3.34	3.62	4.05	4.41	4.77	6.23	7.73
	120	2.34	2.69	3.03	3.36	3.68	4.00	4.49	4.89	5.29	6.94	8.63
	140	2.51	2.91	3.29	3.65	4.01	4.37	4.90	5.35	5.80	7.61	9.48
25	10	1.50	1.49	1.53	1.59	1.66	1.73	1.84	1.94	2.03	2.44	2.86
	20	1.69	1.70	1.77	1.85	1.94	2.03	2.18	2.31	2.45	3.00	3.58
	40	1.97	2.03	2.13	2.26	2.40	2.54	2.76	2.95	3.15	3.96	4.80
	60	2.20	2.30	2.45	2.62	2.80	2.99	3.28	3.52	3.77	4.81	5.88
	80	2.39	2.54	2.73	2.95	3.17	3.40	3.75	4.05	4.35	5.59	6.88
	100	2.57	2.77	3.01	3.26	3.52	3.79	4.20	4.55	4.90	6.33	7.82
	120	2.75	2.98	3.26	3.56	3.86	4.16	4.63	5.02	5.42	7.03	8.71
	140	2.91	3.19	3.52	3.85	4.18	4.52	5.04	5.47	5.91	7.71	9.56
50	10	1.65	1.64	1.68	1.74	1.81	1.88	1.99	2.09	2.18	2.58	2.99
	20	1.88	1.89	1.95	2.03	2.12	2.21	2.35	2.48	2.61	3.14	3.70
	40	2.21	2.25	2.35	2.46	2.59	2.72	2.93	3.11	3.30	4.08	4.91
	60	2.46	2.54	2.67	2.82	2.99	3.16	3.44	3.67	3.91	4.92	5.98
	80	2.68	2.79	2.96	3.15	3.36	3.57	3.90	4.19	4.48	5.70	6.97
	100	2.87	3.02	3.23	3.46	3.70	3.96	4.35	4.68	5.02	6.43	7.90
	120	3.06	3.24	3.49	3.75	4.03	4.32	4.77	5.15	5.53	7.13	8.79
	140	3.23	3.45	3.73	4.04	4.35	4.68	5.18	5.60	6.03	7.80	9.64
100	10	1.84	1.83	1.88	1.94	2.01	2.08	2.20	2.30	2.40	2.81	3.22
	20	2.13	2.14	2.20	2.28	2.37	2.46	2.61	2.73	2.86	3.38	3.93
	40	2.53	2.56	2.65	2.76	2.89	3.02	3.22	3.39	3.57	4.32	5.12
	60	2.83	2.89	3.01	3.15	3.31	3.47	3.73	3.95	4.18	5.14	6.17
	80	3.08	3.17	3.32	3.49	3.68	3.88	4.19	4.46	4.74	5.91	7.15
	100	3.30	3.42	3.60	3.81	4.03	4.26	4.63	4.94	5.27	6.63	8.07
	120	3.50	3.65	3.86	4.10	4.36	4.62	5.04	5.40	5.77	7.32	8.95
	140	3.69	3.87	4.11	4.38	4.67	4.97	5.44	5.84	6.26	7.98	9.80
150	10	1.98	1.97	2.02	2.08	2.15	2.23	2.35	2.45	2.56	2.98	3.39
	20	2.31	2.32	2.38	2.46	2.55	2.65	2.80	2.93	3.06	3.59	4.13
	40	2.76	2.79	2.88	2.99	3.12	3.25	3.45	3.62	3.80	4.54	5.32
	60	3.09	3.15	3.27	3.41	3.56	3.72	3.98	4.19	4.42	5.36	6.36
	80	3.37	3.45	3.60	3.77	3.95	4.15	4.45	4.71	4.98	6.11	7.32
	100	3.62	3.72	3.90	4.10	4.31	4.53	4.88	5.19	5.50	6.82	8.24
	120	3.84	3.97	4.17	4.40	4.64	4.90	5.30	5.64	6.00	7.51	9.11
	140	4.04	4.20	4.43	4.69	4.96	5.24	5.69	6.08	6.48	8.16	9.95

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.10	2.09	2.13	2.20	2.28	2.35	2.48	2.58	2.69	3.12	3.54
	20	2.46	2.46	2.53	2.61	2.70	2.80	2.96	3.09	3.22	3.76	4.30
	40	2.95	2.98	3.07	3.18	3.31	3.44	3.64	3.82	4.00	4.73	5.50
	60	3.31	3.36	3.48	3.62	3.78	3.94	4.19	4.41	4.63	5.55	6.54
	80	3.61	3.69	3.83	4.00	4.18	4.37	4.67	4.93	5.19	6.31	7.50
	100	3.88	3.98	4.15	4.34	4.55	4.77	5.12	5.41	5.72	7.01	8.40
	120	4.12	4.24	4.43	4.65	4.89	5.14	5.53	5.87	6.22	7.69	9.27
	140	4.34	4.48	4.70	4.95	5.21	5.49	5.93	6.31	6.69	8.34	10.11
300	10	2.28	2.27	2.32	2.39	2.47	2.55	2.68	2.79	2.90	3.35	3.79
	20	2.70	2.70	2.77	2.86	2.95	3.06	3.22	3.35	3.49	4.04	4.60
	40	3.26	3.28	3.37	3.49	3.62	3.76	3.97	4.14	4.33	5.07	5.84
	60	3.67	3.71	3.83	3.98	4.13	4.30	4.55	4.77	4.99	5.91	6.88
	80	4.01	4.07	4.22	4.39	4.57	4.76	5.06	5.32	5.58	6.67	7.83
	100	4.30	4.39	4.56	4.75	4.96	5.18	5.52	5.81	6.11	7.38	8.73
	120	4.57	4.68	4.87	5.09	5.32	5.57	5.95	6.28	6.62	8.05	9.59
	140	4.81	4.94	5.16	5.40	5.66	5.93	6.35	6.72	7.09	8.69	10.41
400	10	2.43	2.42	2.47	2.54	2.63	2.71	2.85	2.96	3.08	3.54	3.99
	20	2.89	2.89	2.96	3.05	3.15	3.26	3.43	3.57	3.71	4.28	4.85
	40	3.50	3.53	3.62	3.74	3.88	4.02	4.23	4.42	4.60	5.36	6.13
	60	3.95	4.00	4.12	4.27	4.43	4.59	4.85	5.08	5.30	6.23	7.19
	80	4.32	4.39	4.53	4.71	4.89	5.09	5.39	5.64	5.91	7.00	8.15
	100	4.65	4.73	4.90	5.09	5.30	5.52	5.87	6.16	6.46	7.71	9.04
	120	4.93	5.04	5.23	5.45	5.68	5.93	6.31	6.64	6.97	8.38	9.89
	140	5.20	5.32	5.53	5.77	6.03	6.30	6.72	7.09	7.46	9.02	10.71
600	10	2.67	2.66	2.72	2.79	2.88	2.97	3.12	3.24	3.36	3.85	4.33
	20	3.20	3.20	3.28	3.37	3.48	3.59	3.77	3.92	4.07	4.67	5.27
	40	3.90	3.93	4.03	4.15	4.29	4.44	4.67	4.86	5.05	5.84	6.63
	60	4.42	4.46	4.58	4.74	4.91	5.08	5.35	5.58	5.81	6.76	7.74
	80	4.84	4.90	5.05	5.23	5.42	5.62	5.93	6.19	6.46	7.57	8.71
	100	5.20	5.28	5.45	5.65	5.87	6.10	6.44	6.74	7.04	8.30	9.61
	120	5.53	5.63	5.82	6.04	6.28	6.53	6.92	7.25	7.58	8.98	10.47
	140	5.83	5.94	6.15	6.40	6.66	6.93	7.35	7.72	8.09	9.63	11.28
800	10	2.86	2.85	2.91	2.99	3.09	3.18	3.33	3.46	3.59	4.10	4.60
	20	3.45	3.45	3.53	3.63	3.75	3.86	4.05	4.21	4.36	4.99	5.61
	40	4.23	4.25	4.35	4.49	4.63	4.79	5.02	5.22	5.43	6.24	7.06
	60	4.79	4.83	4.96	5.12	5.30	5.48	5.76	6.00	6.24	7.21	8.20
	80	5.25	5.31	5.47	5.65	5.85	6.06	6.38	6.65	6.93	8.05	9.21
	100	5.65	5.73	5.91	6.11	6.33	6.57	6.92	7.23	7.54	8.81	10.13
	120	6.01	6.11	6.30	6.53	6.77	7.03	7.42	7.76	8.10	9.51	10.99
	140	6.34	6.45	6.66	6.91	7.18	7.46	7.88	8.25	8.63	10.17	11.81

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.67	1.75	1.87	2.00	2.14	2.28	2.49	2.67	2.85	3.57	4.31
	20	1.96	2.13	2.31	2.51	2.71	2.91	3.21	3.46	3.71	4.74	5.79
	40	2.46	2.76	3.06	3.37	3.67	3.97	4.42	4.79	5.17	6.71	8.29
	60	2.90	3.32	3.72	4.12	4.51	4.90	5.48	5.96	6.45	8.43	10.47
	80	3.30	3.83	4.33	4.81	5.28	5.75	6.45	7.04	7.63	10.02	12.47
	100	3.68	4.31	4.89	5.45	6.01	6.55	7.37	8.05	8.73	11.50	14.36
	120	4.04	4.77	5.43	6.07	6.69	7.31	8.24	9.00	9.78	12.92	16.15
	140	4.38	5.21	5.95	6.66	7.36	8.04	9.07	9.92	10.78	14.27	17.86
25	10	2.13	2.15	2.22	2.32	2.43	2.55	2.74	2.90	3.06	3.75	4.46
	20	2.47	2.53	2.66	2.81	2.98	3.15	3.43	3.66	3.90	4.89	5.92
	40	2.97	3.14	3.37	3.63	3.90	4.18	4.60	4.96	5.33	6.84	8.39
	60	3.39	3.67	4.00	4.36	4.72	5.09	5.65	6.12	6.60	8.55	10.57
	80	3.77	4.16	4.59	5.03	5.48	5.93	6.61	7.18	7.76	10.12	12.56
	100	4.13	4.62	5.14	5.67	6.19	6.72	7.51	8.18	8.86	11.60	14.44
	120	4.47	5.06	5.67	6.27	6.87	7.47	8.38	9.13	9.90	13.01	16.23
	140	4.80	5.49	6.18	6.86	7.53	8.20	9.21	10.05	10.90	14.36	17.94
50	10	2.36	2.36	2.44	2.54	2.64	2.76	2.94	3.10	3.26	3.92	4.61
	20	2.75	2.79	2.91	3.05	3.21	3.37	3.63	3.85	4.08	5.04	6.05
	40	3.31	3.44	3.64	3.87	4.12	4.38	4.78	5.13	5.49	6.96	8.50
	60	3.76	3.97	4.27	4.59	4.92	5.27	5.81	6.27	6.74	8.66	10.66
	80	4.15	4.46	4.84	5.25	5.67	6.10	6.76	7.32	7.89	10.23	12.66
	100	4.51	4.92	5.38	5.87	6.38	6.89	7.66	8.32	8.98	11.70	14.53
	120	4.86	5.35	5.90	6.47	7.05	7.63	8.52	9.26	10.02	13.11	16.31
	140	5.18	5.77	6.40	7.05	7.70	8.35	9.34	10.17	11.01	14.46	18.02
100	10	2.66	2.66	2.73	2.83	2.94	3.06	3.24	3.40	3.56	4.21	4.88
	20	3.13	3.16	3.27	3.41	3.56	3.72	3.97	4.18	4.40	5.32	6.30
	40	3.78	3.88	4.07	4.28	4.51	4.75	5.13	5.45	5.79	7.21	8.71
	60	4.29	4.46	4.71	5.00	5.31	5.63	6.14	6.57	7.02	8.89	10.86
	80	4.72	4.97	5.29	5.66	6.04	6.45	7.07	7.61	8.16	10.44	12.84
	100	5.11	5.43	5.83	6.27	6.74	7.21	7.95	8.59	9.23	11.90	14.70
	120	5.48	5.87	6.35	6.86	7.40	7.95	8.80	9.52	10.26	13.30	16.47
	140	5.82	6.29	6.84	7.43	8.03	8.66	9.61	10.42	11.25	14.64	18.18
150	10	2.87	2.87	2.95	3.05	3.16	3.28	3.47	3.63	3.79	4.45	5.12
	20	3.40	3.44	3.55	3.68	3.83	3.99	4.24	4.46	4.67	5.58	6.53
	40	4.13	4.22	4.40	4.61	4.83	5.06	5.43	5.75	6.07	7.45	8.92
	60	4.69	4.84	5.08	5.35	5.65	5.96	6.44	6.86	7.29	9.11	11.05
	80	5.16	5.37	5.68	6.02	6.39	6.77	7.37	7.88	8.41	10.65	13.01
	100	5.58	5.86	6.23	6.64	7.07	7.53	8.24	8.85	9.48	12.10	14.87
	120	5.96	6.31	6.75	7.22	7.73	8.26	9.07	9.78	10.49	13.49	16.64
	140	6.32	6.73	7.24	7.79	8.36	8.96	9.88	10.67	11.47	14.82	18.33

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.05	3.05	3.13	3.23	3.34	3.47	3.66	3.82	3.98	4.65	5.33
	20	3.63	3.66	3.77	3.91	4.06	4.22	4.47	4.69	4.91	5.81	6.75
	40	4.42	4.50	4.68	4.88	5.10	5.34	5.70	6.01	6.33	7.68	9.13
	60	5.02	5.16	5.39	5.66	5.95	6.25	6.72	7.13	7.55	9.33	11.24
	80	5.52	5.72	6.01	6.34	6.70	7.07	7.65	8.15	8.67	10.86	13.19
	100	5.97	6.22	6.58	6.97	7.39	7.83	8.51	9.11	9.72	12.30	15.04
	120	6.37	6.69	7.10	7.56	8.04	8.55	9.34	10.03	10.73	13.68	16.80
	140	6.75	7.12	7.60	8.12	8.67	9.25	10.14	10.91	11.70	15.01	18.49
300	10	3.33	3.33	3.41	3.52	3.64	3.77	3.97	4.13	4.30	4.99	5.68
	20	3.99	4.02	4.13	4.28	4.43	4.60	4.86	5.08	5.30	6.21	7.15
	40	4.88	4.96	5.14	5.34	5.56	5.80	6.16	6.47	6.79	8.12	9.53
	60	5.55	5.68	5.91	6.17	6.46	6.75	7.21	7.61	8.02	9.75	11.61
	80	6.11	6.29	6.57	6.89	7.24	7.59	8.16	8.64	9.14	11.26	13.54
	100	6.60	6.83	7.17	7.54	7.95	8.37	9.03	9.60	10.19	12.69	15.37
	120	7.04	7.33	7.72	8.15	8.61	9.10	9.85	10.51	11.19	14.05	17.12
	140	7.45	7.79	8.23	8.72	9.25	9.79	10.65	11.38	12.15	15.37	18.80
400	10	3.56	3.56	3.64	3.75	3.88	4.01	4.22	4.39	4.57	5.28	5.98
	20	4.29	4.31	4.43	4.58	4.74	4.91	5.17	5.40	5.63	6.56	7.50
	40	5.26	5.34	5.51	5.72	5.95	6.18	6.55	6.86	7.18	8.50	9.90
	60	5.99	6.11	6.34	6.60	6.89	7.18	7.64	8.04	8.45	10.15	11.97
	80	6.59	6.76	7.04	7.36	7.70	8.05	8.61	9.08	9.58	11.65	13.89
	100	7.12	7.34	7.67	8.04	8.43	8.85	9.49	10.05	10.63	13.07	15.70
	120	7.60	7.86	8.24	8.66	9.11	9.59	10.32	10.96	11.62	14.42	17.44
	140	8.04	8.35	8.78	9.25	9.76	10.29	11.12	11.84	12.58	15.73	19.11
600	10	3.93	3.93	4.02	4.14	4.27	4.41	4.63	4.81	4.99	5.74	6.48
	20	4.76	4.79	4.91	5.06	5.24	5.41	5.69	5.93	6.17	7.13	8.10
	40	5.87	5.94	6.12	6.34	6.57	6.82	7.19	7.51	7.84	9.18	10.57
	60	6.70	6.81	7.04	7.31	7.60	7.90	8.37	8.76	9.17	10.87	12.66
	80	7.38	7.53	7.81	8.13	8.47	8.83	9.38	9.86	10.34	12.38	14.56
	100	7.97	8.17	8.49	8.86	9.25	9.66	10.30	10.85	11.41	13.79	16.35
	120	8.50	8.74	9.11	9.53	9.97	10.43	11.16	11.78	12.42	15.14	18.07
	140	8.98	9.27	9.68	10.15	10.64	11.16	11.97	12.66	13.38	16.43	19.72
800	10	4.23	4.23	4.32	4.44	4.58	4.73	4.96	5.15	5.34	6.12	6.88
	20	5.15	5.17	5.30	5.46	5.64	5.83	6.12	6.36	6.61	7.60	8.60
	40	6.37	6.44	6.62	6.84	7.08	7.34	7.73	8.06	8.39	9.76	11.16
	60	7.27	7.38	7.61	7.89	8.18	8.49	8.97	9.38	9.79	11.49	13.28
	80	8.01	8.16	8.44	8.77	9.11	9.47	10.03	10.51	11.00	13.04	15.19
	100	8.66	8.85	9.17	9.54	9.94	10.35	10.99	11.54	12.10	14.46	16.98
	120	9.23	9.46	9.83	10.25	10.69	11.16	11.88	12.50	13.13	15.80	18.68
	140	9.76	10.03	10.44	10.90	11.40	11.91	12.71	13.40	14.10	17.09	20.32

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.50	2.68	2.91	3.15	3.39	3.63	4.00	4.31	4.62	5.88	7.17
	20	3.09	3.44	3.80	4.17	4.53	4.89	5.44	5.90	6.36	8.22	10.13
	40	4.09	4.71	5.30	5.88	6.45	7.01	7.86	8.56	9.27	12.15	15.11
	60	4.96	5.83	6.62	7.38	8.13	8.87	9.98	10.90	11.83	15.60	19.48
	80	5.76	6.85	7.83	8.76	9.68	10.58	11.93	13.05	14.18	18.77	23.49
	100	6.52	7.81	8.96	10.06	11.13	12.18	13.76	15.07	16.39	21.74	27.26
	120	7.23	8.72	10.04	11.29	12.51	13.71	15.50	16.99	18.48	24.57	30.84
	140	7.92	9.60	11.07	12.47	13.83	15.17	17.16	18.83	20.49	27.28	34.27
25	10	3.09	3.16	3.32	3.51	3.71	3.92	4.26	4.55	4.84	6.06	7.32
	20	3.69	3.89	4.17	4.48	4.81	5.14	5.66	6.10	6.54	8.37	10.26
	40	4.64	5.10	5.61	6.15	6.68	7.22	8.05	8.74	9.43	12.28	15.22
	60	5.47	6.18	6.90	7.62	8.34	9.06	10.15	11.06	11.98	15.72	19.58
	80	6.25	7.18	8.09	8.99	9.87	10.76	12.09	13.20	14.32	18.87	23.58
	100	6.98	8.12	9.21	10.27	11.31	12.35	13.91	15.21	16.51	21.84	27.34
	120	7.67	9.02	10.28	11.49	12.68	13.87	15.64	17.12	18.60	24.66	30.92
	140	8.34	9.89	11.30	12.67	14.00	15.32	17.30	18.95	20.61	27.37	34.35
50	10	3.43	3.48	3.62	3.79	3.98	4.19	4.50	4.78	5.06	6.24	7.47
	20	4.09	4.24	4.49	4.77	5.07	5.38	5.88	6.30	6.73	8.52	10.39
	40	5.10	5.46	5.91	6.40	6.91	7.43	8.23	8.91	9.59	12.41	15.33
	60	5.94	6.52	7.18	7.86	8.55	9.25	10.32	11.21	12.12	15.83	19.68
	80	6.70	7.50	8.35	9.21	10.07	10.94	12.24	13.34	14.45	18.98	23.67
	100	7.42	8.43	9.46	10.48	11.50	12.52	14.05	15.34	16.64	21.94	27.43
	120	8.10	9.32	10.51	11.69	12.86	14.03	15.78	17.25	18.73	24.76	31.00
	140	8.76	10.17	11.53	12.86	14.17	15.48	17.44	19.08	20.73	27.46	34.43
100	10	3.88	3.92	4.05	4.22	4.40	4.60	4.91	5.17	5.44	6.57	7.77
	20	4.66	4.78	4.99	5.25	5.53	5.82	6.28	6.68	7.09	8.82	10.64
	40	5.78	6.06	6.45	6.89	7.36	7.84	8.59	9.24	9.90	12.66	15.54
	60	6.67	7.14	7.71	8.32	8.97	9.63	10.65	11.52	12.40	16.06	19.87
	80	7.46	8.11	8.86	9.64	10.46	11.29	12.55	13.63	14.71	19.19	23.85
	100	8.19	9.02	9.94	10.90	11.87	12.85	14.35	15.61	16.89	22.14	27.60
	120	8.88	9.89	10.98	12.09	13.22	14.35	16.06	17.51	18.97	24.95	31.16
	140	9.53	10.73	11.98	13.24	14.51	15.78	17.71	19.33	20.96	27.65	34.59
150	10	4.21	4.24	4.37	4.54	4.73	4.93	5.23	5.49	5.76	6.88	8.05
	20	5.07	5.18	5.39	5.64	5.91	6.20	6.64	7.03	7.43	9.10	10.89
	40	6.30	6.55	6.91	7.32	7.76	8.22	8.95	9.57	10.21	12.91	15.76
	60	7.25	7.66	8.18	8.75	9.36	9.99	10.98	11.82	12.69	16.28	20.06
	80	8.08	8.65	9.33	10.07	10.84	11.63	12.86	13.91	14.98	19.40	24.03
	100	8.84	9.56	10.41	11.30	12.23	13.18	14.64	15.88	17.14	22.34	27.77
	120	9.54	10.43	11.43	12.48	13.56	14.66	16.34	17.76	19.21	25.14	31.33
	140	10.20	11.26	12.42	13.62	14.85	16.09	17.98	19.57	21.19	27.83	34.74

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	4.48	4.51	4.64	4.81	5.00	5.20	5.51	5.77	6.04	7.15	8.31
	20	5.42	5.51	5.72	5.97	6.24	6.52	6.96	7.34	7.73	9.38	11.13
	40	6.73	6.96	7.31	7.71	8.13	8.58	9.28	9.89	10.51	13.15	15.97
	60	7.74	8.11	8.60	9.15	9.74	10.34	11.30	12.12	12.96	16.51	20.25
	80	8.61	9.12	9.76	10.46	11.20	11.97	13.17	14.19	15.24	19.61	24.21
	100	9.39	10.05	10.84	11.69	12.59	13.51	14.93	16.15	17.39	22.54	27.94
	120	10.12	10.93	11.87	12.87	13.91	14.98	16.62	18.02	19.44	25.33	31.49
	140	10.80	11.76	12.85	14.00	15.18	16.39	18.25	19.82	21.42	28.01	34.90
300	10	4.91	4.94	5.07	5.25	5.44	5.65	5.96	6.23	6.51	7.63	8.79
	20	5.97	6.06	6.26	6.51	6.79	7.07	7.51	7.89	8.28	9.89	11.61
	40	7.43	7.64	7.97	8.36	8.77	9.21	9.89	10.47	11.08	13.64	16.39
	60	8.54	8.87	9.33	9.86	10.41	10.99	11.90	12.69	13.51	16.95	20.64
	80	9.48	9.94	10.53	11.19	11.89	12.62	13.76	14.74	15.76	20.03	24.57
	100	10.32	10.90	11.63	12.43	13.27	14.14	15.50	16.68	17.88	22.94	28.28
	120	11.09	11.80	12.66	13.60	14.58	15.59	17.17	18.53	19.92	25.71	31.81
	140	11.81	12.65	13.65	14.72	15.84	16.99	18.78	20.31	21.88	28.38	35.21
400	10	5.26	5.28	5.43	5.61	5.81	6.02	6.34	6.62	6.90	8.04	9.20
	20	6.42	6.50	6.71	6.96	7.24	7.53	7.97	8.35	8.74	10.36	12.05
	40	8.00	8.20	8.53	8.91	9.32	9.75	10.42	11.00	11.59	14.10	16.80
	60	9.20	9.50	9.96	10.47	11.01	11.58	12.46	13.23	14.03	17.39	21.02
	80	10.20	10.62	11.20	11.83	12.51	13.21	14.32	15.27	16.26	20.45	24.93
	100	11.09	11.63	12.32	13.09	13.89	14.74	16.05	17.19	18.37	23.33	28.62
	120	11.91	12.56	13.38	14.27	15.20	16.18	17.71	19.03	20.39	26.09	32.14
	140	12.66	13.44	14.37	15.39	16.46	17.57	19.31	20.80	22.33	28.75	35.52
600	10	5.82	5.85	6.00	6.19	6.40	6.62	6.96	7.25	7.54	8.72	9.91
	20	7.15	7.23	7.44	7.70	7.98	8.28	8.74	9.13	9.53	11.16	12.85
	40	8.93	9.11	9.44	9.83	10.24	10.67	11.34	11.92	12.50	14.97	17.60
	60	10.27	10.55	10.99	11.49	12.03	12.58	13.45	14.20	14.97	18.24	21.77
	80	11.38	11.77	12.32	12.93	13.59	14.27	15.34	16.26	17.21	21.26	25.63
	100	12.36	12.85	13.51	14.24	15.01	15.82	17.08	18.18	19.30	24.11	29.29
	120	13.25	13.84	14.61	15.45	16.34	17.27	18.73	20.00	21.30	26.84	32.78
	140	14.07	14.76	15.64	16.60	17.61	18.66	20.32	21.75	23.22	29.47	36.14
800	10	6.28	6.31	6.46	6.66	6.88	7.10	7.46	7.76	8.06	9.28	10.51
	20	7.74	7.81	8.03	8.30	8.59	8.90	9.37	9.78	10.18	11.85	13.55
	40	9.69	9.86	10.20	10.59	11.01	11.44	12.12	12.70	13.29	15.74	18.34
	60	11.14	11.41	11.85	12.35	12.89	13.44	14.31	15.06	15.82	19.04	22.49
	80	12.35	12.71	13.25	13.86	14.51	15.19	16.24	17.15	18.08	22.04	26.33
	100	13.40	13.86	14.50	15.22	15.98	16.77	18.01	19.08	20.18	24.87	29.95
	120	14.36	14.91	15.65	16.47	17.35	18.25	19.67	20.90	22.17	27.58	33.42
	140	15.23	15.88	16.72	17.65	18.63	19.66	21.26	22.65	24.08	30.19	36.76

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.88	4.30	4.73	5.17	5.61	6.05	6.71	7.27	7.83	10.10	12.42
	20	5.07	5.81	6.52	7.21	7.89	8.57	9.59	10.44	11.30	14.77	18.34
	40	7.06	8.35	9.52	10.64	11.73	12.81	14.43	15.78	17.14	22.64	28.30
	60	8.81	10.58	12.15	13.64	15.09	16.53	18.67	20.46	22.25	29.53	37.04
	80	10.42	12.63	14.57	16.40	18.18	19.95	22.57	24.76	26.95	35.87	45.06
	100	11.93	14.55	16.83	18.99	21.09	23.15	26.23	28.79	31.36	41.81	52.59
	120	13.36	16.37	18.99	21.45	23.84	26.20	29.70	32.62	35.55	47.46	59.75
	140	14.73	18.13	21.06	23.82	26.49	29.12	33.04	36.30	39.57	52.88	66.62
25	10	4.60	4.83	5.16	5.54	5.94	6.35	6.98	7.51	8.05	10.28	12.57
	20	5.73	6.27	6.89	7.52	8.17	8.82	9.81	10.65	11.49	14.92	18.47
	40	7.64	8.74	9.83	10.90	11.96	13.03	14.62	15.95	17.29	22.77	28.41
	60	9.34	10.93	12.43	13.88	15.31	16.72	18.84	20.61	22.39	29.65	37.14
	80	10.91	12.96	14.83	16.62	18.38	20.12	22.73	24.90	27.08	35.97	45.15
	100	12.39	14.86	17.08	19.20	21.27	23.32	26.38	28.93	31.49	41.91	52.68
	120	13.80	16.67	19.23	21.66	24.02	26.36	29.85	32.75	35.67	47.56	59.83
	140	15.16	18.41	21.29	24.01	26.66	29.28	33.18	36.43	39.69	52.98	66.70
50	10	5.08	5.25	5.55	5.89	6.25	6.64	7.23	7.75	8.27	10.45	12.72
	20	6.27	6.70	7.24	7.83	8.44	9.07	10.03	10.85	11.68	15.07	18.60
	40	8.18	9.13	10.14	11.17	12.20	13.24	14.80	16.12	17.45	22.89	28.52
	60	9.84	11.29	12.71	14.12	15.52	16.91	19.01	20.77	22.54	29.76	37.23
	80	11.39	13.29	15.09	16.85	18.58	20.30	22.88	25.04	27.22	36.08	45.24
	100	12.85	15.17	17.33	19.41	21.46	23.49	26.52	29.06	31.61	42.01	52.76
	120	14.24	16.97	19.47	21.86	24.20	26.52	29.99	32.88	35.80	47.66	59.92
	140	15.58	18.70	21.52	24.21	26.83	29.43	33.31	36.55	39.81	53.07	66.78
100	10	5.75	5.88	6.15	6.46	6.80	7.16	7.72	8.20	8.70	10.80	13.02
	20	7.08	7.41	7.88	8.41	8.97	9.56	10.47	11.25	12.05	15.37	18.85
	40	9.09	9.85	10.74	11.68	12.66	13.65	15.17	16.46	17.77	23.14	28.73
	60	10.77	11.97	13.27	14.60	15.94	17.29	19.35	21.08	22.83	29.99	37.43
	80	12.29	13.93	15.61	17.29	18.97	20.66	23.20	25.33	27.48	36.29	45.42
	100	13.73	15.79	17.83	19.84	21.83	23.82	26.82	29.33	31.87	42.21	52.93
	120	15.09	17.56	19.94	22.26	24.56	26.84	30.27	33.15	36.04	47.85	60.08
	140	16.41	19.27	21.97	24.59	27.18	29.74	33.59	36.80	40.04	53.25	66.93
150	10	6.25	6.36	6.62	6.92	7.25	7.60	8.15	8.62	9.10	11.14	13.32
	20	7.70	7.99	8.43	8.92	9.46	10.01	10.88	11.64	12.41	15.67	19.10
	40	9.82	10.49	11.30	12.19	13.11	14.07	15.54	16.80	18.08	23.40	28.95
	60	11.56	12.61	13.81	15.06	16.35	17.67	19.68	21.38	23.11	30.22	37.62
	80	13.10	14.55	16.12	17.73	19.36	21.01	23.51	25.62	27.75	36.50	45.60
	100	14.54	16.39	18.31	20.25	22.20	24.16	27.12	29.61	32.12	42.41	53.11
	120	15.90	18.14	20.41	22.66	24.91	27.16	30.56	33.40	36.28	48.04	60.24
	140	17.20	19.83	22.43	24.98	27.52	30.05	33.86	37.05	40.27	53.44	67.09

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	6.65	6.76	7.01	7.31	7.64	7.99	8.53	8.99	9.47	11.47	13.61
	20	8.21	8.48	8.90	9.38	9.89	10.43	11.28	12.01	12.77	15.96	19.36
	40	10.45	11.05	11.82	12.66	13.55	14.47	15.90	17.13	18.39	23.65	29.16
	60	12.24	13.20	14.32	15.52	16.76	18.04	20.01	21.69	23.39	30.45	37.82
	80	13.82	15.14	16.62	18.16	19.75	21.36	23.82	25.90	28.02	36.72	45.78
	100	15.28	16.97	18.79	20.67	22.57	24.49	27.41	29.88	32.37	42.61	53.28
	120	16.64	18.71	20.87	23.06	25.26	27.48	30.84	33.66	36.52	48.23	60.41
	140	17.95	20.39	22.87	25.36	27.86	30.36	34.13	37.30	40.50	53.62	67.25
300	10	7.31	7.41	7.66	7.96	8.29	8.64	9.18	9.64	10.11	12.09	14.17
	20	9.04	9.29	9.69	10.16	10.66	11.18	12.00	12.71	13.44	16.54	19.85
	40	11.49	12.02	12.73	13.52	14.36	15.24	16.61	17.79	19.01	24.14	29.59
	60	13.40	14.24	15.27	16.38	17.56	18.77	20.67	22.29	23.96	30.90	38.20
	80	15.06	16.22	17.57	19.01	20.51	22.05	24.44	26.47	28.54	37.14	46.15
	100	16.57	18.05	19.72	21.48	23.29	25.15	28.00	30.41	32.87	43.02	53.62
	120	17.97	19.79	21.78	23.85	25.96	28.11	31.40	34.18	37.00	48.61	60.73
	140	19.30	21.45	23.76	26.12	28.53	30.97	34.67	37.80	40.97	53.99	67.56
400	10	7.85	7.94	8.19	8.50	8.83	9.18	9.73	10.19	10.67	12.64	14.70
	20	9.73	9.95	10.35	10.81	11.31	11.83	12.64	13.34	14.06	17.09	20.35
	40	12.34	12.84	13.52	14.29	15.10	15.94	17.27	18.42	19.61	24.64	30.01
	60	14.37	15.14	16.12	17.18	18.30	19.48	21.31	22.89	24.51	31.35	38.59
	80	16.11	17.17	18.44	19.80	21.24	22.73	25.04	27.03	29.07	37.56	46.50
	100	17.68	19.03	20.60	22.27	24.01	25.80	28.58	30.95	33.37	43.41	53.96
	120	19.12	20.78	22.64	24.61	26.65	28.74	31.96	34.69	37.48	49.00	61.06
	140	20.49	22.45	24.61	26.87	29.20	31.57	35.21	38.30	41.43	54.36	67.88
600	10	8.71	8.80	9.06	9.37	9.72	10.08	10.64	11.12	11.60	13.59	15.65
	20	10.83	11.04	11.44	11.90	12.40	12.92	13.73	14.43	15.14	18.12	21.29
	40	13.75	14.20	14.86	15.59	16.38	17.20	18.48	19.59	20.74	25.60	30.85
	60	15.97	16.66	17.58	18.59	19.66	20.77	22.52	24.04	25.60	32.24	39.35
	80	17.85	18.80	19.97	21.26	22.61	24.02	26.23	28.13	30.10	38.40	47.22
	100	19.53	20.73	22.17	23.73	25.36	27.07	29.72	32.01	34.35	44.21	54.64
	120	21.07	22.53	24.24	26.07	27.98	29.97	33.06	35.71	38.42	49.76	61.71
	140	22.51	24.23	26.21	28.31	30.51	32.77	36.28	39.28	42.34	55.09	68.50
800	10	9.41	9.50	9.76	10.09	10.44	10.82	11.39	11.88	12.38	14.41	16.48
	20	11.73	11.93	12.33	12.81	13.31	13.84	14.66	15.36	16.07	19.04	22.18
	40	14.90	15.32	15.97	16.70	17.48	18.29	19.56	20.65	21.77	26.53	31.68
	60	17.29	17.94	18.82	19.81	20.85	21.94	23.64	25.12	26.64	33.12	40.11
	80	19.30	20.18	21.30	22.54	23.85	25.21	27.35	29.20	31.11	39.22	47.93
	100	21.08	22.19	23.56	25.05	26.62	28.26	30.82	33.04	35.32	45.00	55.31
	120	22.71	24.05	25.66	27.41	29.24	31.15	34.13	36.71	39.36	50.51	62.35
	140	24.21	25.80	27.66	29.66	31.75	33.93	37.33	40.25	43.25	55.82	69.13

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.20	1.23	1.29	1.36	1.44	1.53	1.65	1.76	1.87	2.31	2.75
	20	1.35	1.42	1.52	1.63	1.74	1.85	2.02	2.17	2.31	2.90	3.50
	40	1.61	1.75	1.91	2.07	2.23	2.40	2.65	2.85	3.06	3.91	4.77
	60	1.84	2.04	2.25	2.46	2.67	2.88	3.19	3.45	3.72	4.79	5.88
	80	2.05	2.31	2.56	2.82	3.07	3.32	3.69	4.01	4.32	5.60	6.90
	100	2.25	2.56	2.86	3.15	3.44	3.73	4.16	4.52	4.89	6.35	7.86
	120	2.43	2.80	3.14	3.47	3.80	4.12	4.61	5.02	5.42	7.08	8.77
	140	2.61	3.02	3.41	3.78	4.14	4.50	5.04	5.49	5.94	7.77	9.64
25	10	1.55	1.54	1.58	1.64	1.70	1.77	1.88	1.98	2.08	2.48	2.90
	20	1.75	1.76	1.82	1.90	1.99	2.09	2.24	2.37	2.50	3.05	3.63
	40	2.04	2.10	2.20	2.33	2.46	2.61	2.83	3.03	3.22	4.03	4.88
	60	2.28	2.38	2.53	2.70	2.88	3.07	3.36	3.61	3.86	4.90	5.98
	80	2.48	2.63	2.82	3.04	3.27	3.50	3.85	4.15	4.46	5.70	6.99
	100	2.67	2.87	3.11	3.36	3.63	3.90	4.31	4.66	5.01	6.46	7.95
	120	2.85	3.09	3.38	3.67	3.98	4.29	4.75	5.15	5.55	7.17	8.85
	140	3.02	3.31	3.64	3.97	4.31	4.66	5.18	5.62	6.06	7.86	9.72
50	10	1.71	1.69	1.73	1.79	1.86	1.93	2.04	2.13	2.23	2.63	3.04
	20	1.95	1.95	2.01	2.09	2.17	2.27	2.41	2.54	2.66	3.20	3.76
	40	2.29	2.33	2.42	2.54	2.66	2.80	3.01	3.19	3.38	4.16	4.99
	60	2.55	2.62	2.76	2.91	3.08	3.25	3.53	3.76	4.00	5.02	6.08
	80	2.78	2.89	3.06	3.25	3.46	3.67	4.01	4.29	4.59	5.81	7.09
	100	2.98	3.13	3.34	3.57	3.81	4.07	4.46	4.80	5.14	6.56	8.03
	120	3.17	3.36	3.60	3.87	4.15	4.45	4.90	5.28	5.67	7.27	8.94
	140	3.34	3.57	3.86	4.16	4.48	4.81	5.31	5.74	6.17	7.95	9.80
100	10	1.91	1.89	1.93	1.99	2.06	2.14	2.25	2.35	2.45	2.85	3.26
	20	2.21	2.21	2.27	2.34	2.43	2.52	2.67	2.79	2.92	3.45	3.99
	40	2.62	2.65	2.73	2.84	2.97	3.10	3.30	3.47	3.65	4.40	5.20
	60	2.93	2.98	3.10	3.25	3.40	3.57	3.82	4.05	4.27	5.24	6.27
	80	3.19	3.27	3.42	3.60	3.79	3.99	4.30	4.57	4.85	6.02	7.27
	100	3.42	3.53	3.71	3.92	4.15	4.38	4.75	5.06	5.39	6.76	8.21
	120	3.63	3.77	3.99	4.23	4.48	4.75	5.17	5.53	5.91	7.46	9.10
	140	3.82	4.00	4.25	4.52	4.81	5.11	5.58	5.99	6.40	8.14	9.96
150	10	2.05	2.04	2.08	2.14	2.21	2.29	2.41	2.51	2.61	3.03	3.44
	20	2.40	2.39	2.45	2.53	2.62	2.72	2.86	2.99	3.12	3.65	4.19
	40	2.86	2.88	2.97	3.08	3.20	3.33	3.53	3.71	3.88	4.62	5.40
	60	3.20	3.25	3.37	3.51	3.66	3.82	4.07	4.29	4.52	5.46	6.46
	80	3.49	3.57	3.71	3.88	4.06	4.26	4.56	4.82	5.09	6.23	7.44
	100	3.74	3.85	4.02	4.22	4.43	4.65	5.01	5.31	5.63	6.96	8.38
	120	3.97	4.10	4.30	4.53	4.77	5.03	5.43	5.78	6.14	7.65	9.26
	140	4.19	4.34	4.57	4.83	5.10	5.39	5.84	6.23	6.63	8.32	10.12

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.17	2.16	2.20	2.26	2.34	2.41	2.54	2.64	2.75	3.17	3.60
	20	2.55	2.54	2.60	2.69	2.78	2.88	3.03	3.16	3.29	3.82	4.37
	40	3.05	3.07	3.16	3.27	3.40	3.53	3.73	3.91	4.08	4.82	5.59
	60	3.43	3.47	3.59	3.73	3.88	4.04	4.29	4.51	4.73	5.66	6.65
	80	3.74	3.81	3.95	4.12	4.30	4.49	4.79	5.05	5.31	6.43	7.62
	100	4.01	4.11	4.27	4.47	4.68	4.90	5.24	5.54	5.85	7.15	8.54
	120	4.26	4.38	4.57	4.79	5.03	5.28	5.67	6.01	6.36	7.84	9.43
	140	4.49	4.63	4.85	5.10	5.36	5.64	6.08	6.46	6.85	8.51	10.28
300	10	2.36	2.35	2.39	2.46	2.54	2.62	2.75	2.85	2.96	3.41	3.85
	20	2.79	2.79	2.85	2.94	3.03	3.13	3.29	3.43	3.56	4.12	4.67
	40	3.37	3.39	3.48	3.59	3.72	3.85	4.06	4.24	4.42	5.16	5.93
	60	3.79	3.83	3.95	4.09	4.25	4.41	4.66	4.88	5.10	6.02	6.99
	80	4.14	4.21	4.35	4.51	4.70	4.89	5.18	5.44	5.70	6.80	7.96
	100	4.45	4.53	4.70	4.89	5.10	5.32	5.66	5.95	6.25	7.52	8.87
	120	4.72	4.83	5.02	5.23	5.47	5.71	6.10	6.43	6.77	8.20	9.75
	140	4.98	5.10	5.31	5.56	5.81	6.09	6.51	6.88	7.26	8.86	10.59
400	10	2.52	2.50	2.55	2.62	2.70	2.78	2.91	3.03	3.14	3.60	4.05
	20	2.99	2.99	3.05	3.14	3.24	3.34	3.51	3.65	3.79	4.36	4.93
	40	3.62	3.64	3.73	3.85	3.98	4.12	4.33	4.52	4.70	5.46	6.23
	60	4.09	4.13	4.24	4.39	4.55	4.71	4.97	5.19	5.42	6.34	7.31
	80	4.47	4.53	4.67	4.84	5.02	5.22	5.52	5.77	6.04	7.13	8.28
	100	4.80	4.88	5.05	5.24	5.45	5.67	6.01	6.30	6.60	7.85	9.19
	120	5.10	5.20	5.39	5.60	5.84	6.08	6.46	6.79	7.13	8.54	10.06
	140	5.37	5.49	5.70	5.94	6.20	6.47	6.89	7.25	7.63	9.20	10.89
600	10	2.76	2.75	2.80	2.87	2.96	3.05	3.19	3.31	3.43	3.91	4.39
	20	3.31	3.31	3.37	3.47	3.57	3.69	3.86	4.01	4.16	4.75	5.35
	40	4.04	4.05	4.15	4.27	4.41	4.55	4.78	4.97	5.16	5.95	6.74
	60	4.57	4.60	4.72	4.87	5.04	5.21	5.48	5.71	5.94	6.89	7.86
	80	5.00	5.06	5.20	5.37	5.56	5.76	6.07	6.34	6.60	7.71	8.85
	100	5.38	5.45	5.62	5.81	6.03	6.25	6.60	6.90	7.20	8.45	9.77
	120	5.72	5.81	5.99	6.21	6.45	6.70	7.08	7.41	7.75	9.15	10.64
	140	6.02	6.13	6.34	6.58	6.84	7.11	7.53	7.90	8.27	9.82	11.47
800	10	2.96	2.95	3.00	3.08	3.17	3.26	3.41	3.54	3.66	4.17	4.67
	20	3.57	3.56	3.64	3.73	3.85	3.96	4.14	4.30	4.45	5.08	5.70
	40	4.37	4.38	4.48	4.61	4.76	4.91	5.14	5.34	5.54	6.35	7.17
	60	4.95	4.99	5.11	5.27	5.44	5.62	5.90	6.13	6.37	7.34	8.33
	80	5.43	5.48	5.63	5.81	6.01	6.21	6.53	6.80	7.08	8.20	9.36
	100	5.84	5.91	6.08	6.29	6.51	6.74	7.09	7.40	7.70	8.97	10.29
	120	6.21	6.30	6.49	6.71	6.96	7.21	7.60	7.94	8.28	9.69	11.17
	140	6.55	6.65	6.86	7.11	7.37	7.65	8.08	8.44	8.82	10.37	12.00

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.73	1.81	1.93	2.06	2.20	2.34	2.55	2.73	2.91	3.64	4.38
	20	2.04	2.21	2.40	2.59	2.79	2.99	3.29	3.54	3.80	4.83	5.89
	40	2.56	2.87	3.17	3.48	3.78	4.08	4.54	4.92	5.30	6.84	8.42
	60	3.02	3.45	3.86	4.25	4.65	5.04	5.63	6.12	6.61	8.60	10.64
	80	3.44	3.98	4.48	4.97	5.45	5.92	6.63	7.22	7.81	10.22	12.69
	100	3.83	4.48	5.07	5.64	6.20	6.75	7.57	8.26	8.94	11.73	14.60
	120	4.20	4.95	5.63	6.28	6.91	7.53	8.46	9.24	10.02	13.18	16.42
	140	4.56	5.41	6.17	6.89	7.59	8.29	9.32	10.18	11.05	14.56	18.17
25	10	2.21	2.22	2.29	2.39	2.50	2.62	2.81	2.97	3.13	3.82	4.53
	20	2.56	2.62	2.74	2.90	3.06	3.24	3.51	3.75	3.99	4.98	6.02
	40	3.08	3.25	3.48	3.74	4.02	4.30	4.72	5.09	5.46	6.97	8.53
	60	3.52	3.80	4.14	4.50	4.86	5.23	5.80	6.27	6.75	8.72	10.74
	80	3.91	4.31	4.75	5.19	5.65	6.10	6.79	7.37	7.95	10.33	12.78
	100	4.29	4.79	5.32	5.85	6.38	6.92	7.72	8.39	9.07	11.84	14.69
	120	4.64	5.25	5.87	6.48	7.09	7.70	8.61	9.37	10.14	13.28	16.51
	140	4.99	5.70	6.40	7.08	7.76	8.44	9.46	10.31	11.17	14.65	18.25
50	10	2.45	2.44	2.52	2.61	2.72	2.83	3.01	3.17	3.33	3.99	4.68
	20	2.85	2.89	3.00	3.14	3.30	3.46	3.72	3.94	4.17	5.13	6.14
	40	3.43	3.56	3.76	3.99	4.24	4.50	4.91	5.26	5.62	7.10	8.64
	60	3.89	4.11	4.41	4.73	5.07	5.42	5.97	6.43	6.90	8.83	10.84
	80	4.30	4.62	5.00	5.42	5.84	6.28	6.95	7.51	8.08	10.43	12.87
	100	4.68	5.09	5.57	6.06	6.57	7.09	7.87	8.53	9.20	11.94	14.78
	120	5.04	5.54	6.11	6.68	7.27	7.86	8.75	9.50	10.26	13.37	16.59
	140	5.38	5.98	6.63	7.28	7.94	8.60	9.60	10.44	11.29	14.75	18.33
100	10	2.75	2.75	2.82	2.91	3.02	3.14	3.32	3.47	3.63	4.28	4.96
	20	3.24	3.27	3.38	3.51	3.66	3.82	4.07	4.28	4.50	5.42	6.40
	40	3.92	4.01	4.19	4.41	4.64	4.88	5.26	5.59	5.92	7.35	8.85
	60	4.44	4.61	4.87	5.15	5.46	5.79	6.30	6.73	7.18	9.06	11.04
	80	4.89	5.14	5.47	5.83	6.22	6.63	7.26	7.80	8.35	10.65	13.05
	100	5.30	5.62	6.03	6.47	6.94	7.42	8.17	8.80	9.45	12.14	14.95
	120	5.67	6.07	6.56	7.08	7.62	8.18	9.04	9.76	10.51	13.57	16.76
	140	6.03	6.51	7.07	7.66	8.28	8.91	9.87	10.69	11.52	14.94	18.49
150	10	2.98	2.97	3.04	3.14	3.25	3.37	3.55	3.71	3.87	4.53	5.20
	20	3.52	3.55	3.65	3.79	3.94	4.10	4.35	4.56	4.78	5.68	6.64
	40	4.28	4.36	4.54	4.74	4.96	5.20	5.57	5.88	6.21	7.59	9.07
	60	4.85	5.00	5.24	5.51	5.81	6.12	6.60	7.02	7.46	9.29	11.23
	80	5.34	5.55	5.86	6.20	6.57	6.95	7.56	8.08	8.61	10.86	13.23
	100	5.78	6.05	6.43	6.84	7.28	7.74	8.46	9.07	9.70	12.34	15.12
	120	6.18	6.52	6.96	7.45	7.96	8.49	9.31	10.02	10.75	13.76	16.92
	140	6.55	6.96	7.47	8.03	8.61	9.21	10.14	10.94	11.75	15.12	18.65

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.16	3.15	3.22	3.32	3.44	3.56	3.74	3.91	4.07	4.73	5.41
	20	3.76	3.78	3.88	4.02	4.17	4.33	4.58	4.80	5.01	5.92	6.86
	40	4.57	4.65	4.82	5.02	5.25	5.48	5.84	6.15	6.47	7.83	9.28
	60	5.19	5.33	5.56	5.83	6.11	6.42	6.89	7.30	7.72	9.51	11.42
	80	5.71	5.91	6.20	6.53	6.89	7.26	7.84	8.35	8.87	11.07	13.41
	100	6.17	6.43	6.78	7.18	7.60	8.04	8.74	9.33	9.95	12.54	15.29
	120	6.60	6.91	7.33	7.79	8.28	8.79	9.59	10.28	10.98	13.95	17.08
	140	6.99	7.36	7.84	8.37	8.93	9.51	10.41	11.19	11.98	15.31	18.81
300	10	3.45	3.44	3.51	3.62	3.74	3.86	4.06	4.23	4.40	5.08	5.77
	20	4.13	4.15	4.26	4.40	4.55	4.72	4.97	5.19	5.41	6.33	7.27
	40	5.05	5.12	5.29	5.49	5.72	5.95	6.31	6.62	6.94	8.27	9.68
	60	5.74	5.87	6.09	6.35	6.63	6.93	7.39	7.79	8.20	9.94	11.80
	80	6.32	6.49	6.77	7.09	7.44	7.80	8.36	8.85	9.35	11.48	13.77
	100	6.83	7.05	7.39	7.77	8.17	8.60	9.26	9.83	10.42	12.94	15.63
	120	7.29	7.57	7.96	8.39	8.86	9.35	10.11	10.77	11.45	14.33	17.41
	140	7.71	8.05	8.49	8.99	9.51	10.06	10.92	11.67	12.43	15.67	19.12
400	10	3.68	3.67	3.75	3.86	3.98	4.11	4.32	4.49	4.66	5.37	6.07
	20	4.44	4.45	4.56	4.71	4.87	5.04	5.30	5.52	5.75	6.67	7.62
	40	5.44	5.51	5.68	5.88	6.11	6.34	6.71	7.02	7.34	8.66	10.06
	60	6.19	6.31	6.53	6.79	7.07	7.37	7.83	8.23	8.63	10.34	12.17
	80	6.82	6.98	7.25	7.57	7.91	8.27	8.82	9.30	9.79	11.88	14.12
	100	7.37	7.57	7.90	8.27	8.67	9.08	9.73	10.29	10.87	13.32	15.97
	120	7.86	8.12	8.49	8.92	9.37	9.85	10.59	11.23	11.89	14.71	17.73
	140	8.31	8.62	9.05	9.53	10.04	10.57	11.40	12.13	12.87	16.04	19.44
600	10	4.06	4.05	4.14	4.25	4.38	4.52	4.73	4.92	5.10	5.84	6.58
	20	4.93	4.94	5.06	5.21	5.38	5.55	5.83	6.06	6.30	7.26	8.23
	40	6.07	6.13	6.31	6.52	6.75	6.99	7.37	7.69	8.01	9.35	10.74
	60	6.92	7.03	7.25	7.52	7.80	8.10	8.57	8.97	9.38	11.07	12.86
	80	7.63	7.77	8.04	8.36	8.70	9.06	9.61	10.09	10.57	12.62	14.80
	100	8.24	8.43	8.75	9.11	9.51	9.92	10.56	11.11	11.67	14.06	16.63
	120	8.79	9.02	9.39	9.80	10.25	10.71	11.44	12.06	12.70	15.43	18.37
	140	9.29	9.57	9.98	10.45	10.94	11.46	12.27	12.97	13.69	16.75	20.05
800	10	4.37	4.36	4.45	4.57	4.70	4.85	5.07	5.26	5.46	6.23	6.99
	20	5.32	5.33	5.46	5.61	5.79	5.97	6.26	6.50	6.75	7.74	8.74
	40	6.59	6.64	6.82	7.04	7.28	7.52	7.91	8.24	8.57	9.94	11.34
	60	7.52	7.61	7.84	8.11	8.40	8.71	9.19	9.59	10.00	11.71	13.50
	80	8.28	8.42	8.69	9.01	9.36	9.72	10.28	10.76	11.25	13.28	15.44
	100	8.95	9.13	9.45	9.81	10.21	10.62	11.26	11.81	12.38	14.74	17.26
	120	9.54	9.76	10.13	10.54	10.99	11.45	12.17	12.79	13.43	16.11	18.99
	140	10.09	10.35	10.76	11.22	11.71	12.22	13.02	13.71	14.42	17.42	20.66

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.60	2.79	3.01	3.25	3.49	3.74	4.11	4.42	4.73	5.99	7.28
	20	3.22	3.57	3.94	4.30	4.67	5.04	5.59	6.05	6.51	8.38	10.30
	40	4.25	4.89	5.49	6.08	6.65	7.22	8.07	8.79	9.50	12.40	15.37
	60	5.17	6.05	6.86	7.63	8.39	9.14	10.26	11.19	12.12	15.92	19.81
	80	6.00	7.11	8.11	9.06	9.98	10.90	12.26	13.40	14.53	19.15	23.90
	100	6.79	8.11	9.29	10.40	11.48	12.55	14.14	15.47	16.79	22.18	27.73
	120	7.54	9.06	10.40	11.67	12.91	14.12	15.93	17.44	18.95	25.07	31.37
	140	8.25	9.97	11.48	12.90	14.27	15.63	17.65	19.32	21.01	27.84	34.87
25	10	3.21	3.27	3.43	3.61	3.82	4.03	4.37	4.66	4.95	6.17	7.44
	20	3.83	4.02	4.31	4.62	4.95	5.29	5.81	6.25	6.70	8.53	10.43
	40	4.82	5.29	5.81	6.35	6.89	7.44	8.26	8.96	9.66	12.52	15.48
	60	5.69	6.41	7.14	7.87	8.60	9.33	10.43	11.35	12.27	16.03	19.91
	80	6.49	7.45	8.38	9.29	10.18	11.08	12.42	13.54	14.67	19.26	23.99
	100	7.25	8.43	9.54	10.61	11.67	12.72	14.29	15.60	16.92	22.29	27.82
	120	7.98	9.36	10.65	11.88	13.09	14.29	16.07	17.57	19.07	25.17	31.46
	140	8.68	10.26	11.71	13.09	14.45	15.79	17.78	19.45	21.13	27.93	34.95
50	10	3.55	3.60	3.73	3.91	4.10	4.30	4.61	4.89	5.17	6.35	7.59
	20	4.24	4.39	4.63	4.91	5.22	5.53	6.03	6.45	6.89	8.68	10.56
	40	5.29	5.65	6.11	6.61	7.12	7.65	8.45	9.13	9.82	12.65	15.59
	60	6.16	6.76	7.42	8.12	8.82	9.52	10.60	11.50	12.41	16.15	20.01
	80	6.95	7.78	8.64	9.51	10.38	11.26	12.58	13.69	14.80	19.37	24.08
	100	7.70	8.74	9.79	10.83	11.86	12.89	14.44	15.74	17.05	22.39	27.90
	120	8.41	9.66	10.89	12.08	13.27	14.45	16.22	17.70	19.19	25.27	31.54
	140	9.10	10.55	11.94	13.29	14.62	15.94	17.92	19.58	21.24	28.02	35.03
100	10	4.02	4.05	4.18	4.34	4.53	4.72	5.03	5.29	5.56	6.69	7.89
	20	4.82	4.94	5.15	5.41	5.69	5.98	6.44	6.84	7.25	8.98	10.81
	40	5.99	6.27	6.66	7.10	7.57	8.06	8.82	9.47	10.14	12.91	15.80
	60	6.92	7.38	7.96	8.58	9.24	9.91	10.94	11.81	12.70	16.38	20.21
	80	7.74	8.39	9.15	9.95	10.78	11.62	12.89	13.98	15.07	19.58	24.26
	100	8.49	9.34	10.28	11.25	12.23	13.23	14.74	16.02	17.31	22.59	28.08
	120	9.21	10.25	11.36	12.49	13.63	14.77	16.51	17.96	19.43	25.46	31.71
	140	9.89	11.12	12.40	13.68	14.97	16.26	18.20	19.83	21.48	28.21	35.19
150	10	4.36	4.38	4.51	4.68	4.86	5.05	5.36	5.62	5.89	7.00	8.17
	20	5.25	5.35	5.56	5.81	6.08	6.36	6.81	7.20	7.59	9.27	11.07
	40	6.52	6.77	7.13	7.55	7.99	8.45	9.18	9.81	10.45	13.16	16.02
	60	7.51	7.92	8.44	9.02	9.64	10.28	11.27	12.12	12.99	16.61	20.40
	80	8.37	8.94	9.64	10.38	11.16	11.97	13.21	14.26	15.34	19.79	24.45
	100	9.16	9.89	10.75	11.66	12.60	13.57	15.04	16.29	17.56	22.80	28.25
	120	9.89	10.80	11.82	12.89	13.98	15.09	16.79	18.23	19.68	25.65	31.87
	140	10.58	11.66	12.85	14.07	15.31	16.57	18.47	20.08	21.71	28.40	35.35

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.63	4.65	4.78	4.95	5.14	5.33	5.64	5.90	6.17	7.28	8.44
	20	5.61	5.69	5.90	6.14	6.41	6.69	7.14	7.52	7.91	9.56	11.31
	40	6.96	7.19	7.54	7.94	8.36	8.81	9.52	10.13	10.75	13.41	16.23
	60	8.01	8.38	8.88	9.43	10.02	10.63	11.59	12.42	13.27	16.84	20.60
	80	8.91	9.43	10.08	10.79	11.54	12.31	13.52	14.55	15.61	20.01	24.63
	100	9.73	10.39	11.20	12.06	12.96	13.90	15.33	16.56	17.81	23.00	28.42
	120	10.48	11.30	12.26	13.28	14.33	15.41	17.07	18.49	19.92	25.85	32.04
	140	11.19	12.17	13.28	14.45	15.65	16.87	18.75	20.34	21.95	28.59	35.51
300	10	5.08	5.10	5.23	5.40	5.59	5.79	6.11	6.37	6.65	7.77	8.92
	20	6.18	6.25	6.46	6.70	6.97	7.25	7.69	8.07	8.46	10.08	11.80
	40	7.68	7.88	8.22	8.60	9.02	9.45	10.13	10.72	11.33	13.90	16.66
	60	8.83	9.16	9.63	10.15	10.71	11.29	12.21	13.01	13.82	17.29	20.99
	80	9.81	10.27	10.87	11.53	12.23	12.97	14.12	15.11	16.13	20.43	24.99
	100	10.68	11.27	12.00	12.81	13.65	14.54	15.91	17.10	18.31	23.40	28.77
	120	11.48	12.20	13.07	14.02	15.01	16.04	17.63	19.00	20.40	26.23	32.37
	140	12.22	13.08	14.09	15.18	16.31	17.48	19.29	20.83	22.41	28.96	35.82
400	10	5.44	5.45	5.59	5.77	5.96	6.17	6.49	6.77	7.05	8.18	9.35
	20	6.64	6.71	6.92	7.16	7.44	7.72	8.17	8.55	8.94	10.55	12.25
	40	8.28	8.46	8.79	9.17	9.58	10.01	10.68	11.26	11.85	14.37	17.08
	60	9.51	9.81	10.26	10.77	11.32	11.89	12.78	13.55	14.35	17.73	21.37
	80	10.55	10.97	11.55	12.19	12.86	13.57	14.69	15.65	16.64	20.85	25.35
	100	11.48	12.02	12.71	13.48	14.30	15.14	16.47	17.62	18.81	23.80	29.11
	120	12.32	12.98	13.80	14.70	15.65	16.64	18.18	19.51	20.88	26.62	32.69
	140	13.10	13.88	14.83	15.86	16.95	18.07	19.82	21.33	22.87	29.33	36.14
600	10	6.02	6.03	6.18	6.36	6.57	6.78	7.12	7.41	7.70	8.88	10.07
	20	7.39	7.46	7.66	7.92	8.20	8.49	8.95	9.34	9.74	11.37	13.06
	40	9.23	9.40	9.73	10.11	10.52	10.95	11.62	12.20	12.78	15.25	17.89
	60	10.62	10.89	11.33	11.83	12.36	12.92	13.79	14.54	15.32	18.59	22.13
	80	11.77	12.15	12.69	13.31	13.97	14.65	15.72	16.65	17.61	21.68	26.07
	100	12.79	13.27	13.93	14.66	15.44	16.25	17.52	18.62	19.76	24.59	29.79
	120	13.70	14.29	15.06	15.91	16.81	17.75	19.22	20.49	21.80	27.38	33.35
	140	14.55	15.25	16.13	17.10	18.12	19.18	20.85	22.29	23.78	30.06	36.77
800	10	6.50	6.51	6.65	6.84	7.06	7.29	7.64	7.93	8.24	9.45	10.67
	20	8.00	8.06	8.27	8.54	8.83	9.13	9.60	10.00	10.41	12.06	13.77
	40	10.02	10.18	10.50	10.89	11.30	11.74	12.42	12.99	13.58	16.04	18.64
	60	11.52	11.77	12.21	12.71	13.24	13.80	14.66	15.41	16.18	19.40	22.87
	80	12.76	13.12	13.65	14.26	14.91	15.59	16.65	17.56	18.49	22.47	26.77
	100	13.86	14.31	14.95	15.67	16.43	17.22	18.46	19.54	20.65	25.36	30.46
	120	14.84	15.39	16.13	16.96	17.83	18.75	20.18	21.41	22.69	28.13	33.99
	140	15.75	16.40	17.24	18.18	19.16	20.19	21.81	23.21	24.65	30.79	37.39

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	4.04	4.46	4.90	5.34	5.78	6.23	6.89	7.45	8.01	10.29	12.62
	20	5.28	6.03	6.75	7.45	8.14	8.83	9.85	10.71	11.57	15.07	18.65
	40	7.36	8.67	9.86	10.99	12.10	13.20	14.83	16.19	17.56	23.10	28.79
	60	9.18	10.99	12.59	14.10	15.58	17.03	19.20	21.00	22.81	30.14	37.68
	80	10.85	13.12	15.09	16.96	18.77	20.55	23.20	25.41	27.62	36.60	45.85
	100	12.43	15.11	17.45	19.64	21.76	23.86	26.97	29.55	32.15	42.67	53.51
	120	13.92	17.01	19.68	22.19	24.61	27.00	30.54	33.49	36.45	48.44	60.80
	140	15.35	18.83	21.83	24.63	27.35	30.01	33.98	37.27	40.57	53.98	67.79
25	10	4.77	5.00	5.34	5.72	6.12	6.53	7.16	7.70	8.24	10.47	12.77
	20	5.95	6.50	7.12	7.77	8.42	9.08	10.08	10.92	11.77	15.22	18.78
	40	7.94	9.07	10.18	11.26	12.34	13.41	15.02	16.37	17.72	23.23	28.90
	60	9.71	11.35	12.88	14.35	15.79	17.23	19.37	21.16	22.95	30.25	37.78
	80	11.35	13.45	15.36	17.19	18.97	20.73	23.36	25.56	27.76	36.71	45.94
	100	12.90	15.43	17.70	19.86	21.96	24.03	27.12	29.69	32.28	42.78	53.60
	120	14.37	17.32	19.93	22.39	24.80	27.16	30.69	33.63	36.57	48.54	60.88
	140	15.78	19.13	22.06	24.83	27.52	30.17	34.11	37.40	40.69	54.07	67.87
50	10	5.27	5.43	5.73	6.07	6.43	6.82	7.42	7.94	8.47	10.65	12.93
	20	6.51	6.94	7.49	8.08	8.70	9.33	10.30	11.12	11.96	15.37	18.91
	40	8.49	9.46	10.49	11.53	12.58	13.63	15.21	16.54	17.88	23.35	29.01
	60	10.23	11.71	13.16	14.59	16.01	17.42	19.54	21.31	23.10	30.37	37.88
	80	11.84	13.79	15.63	17.41	19.17	20.91	23.52	25.70	27.90	36.82	46.03
	100	13.36	15.75	17.95	20.07	22.14	24.20	27.27	29.83	32.41	42.88	53.69
	120	14.81	17.62	20.17	22.60	24.98	27.33	30.83	33.76	36.69	48.64	60.97
	140	16.21	19.42	22.29	25.03	27.69	30.33	34.25	37.53	40.81	54.17	67.95
100	10	5.96	6.08	6.34	6.65	6.99	7.35	7.91	8.40	8.90	11.01	13.23
	20	7.34	7.67	8.14	8.67	9.24	9.82	10.74	11.53	12.33	15.67	19.17
	40	9.42	10.19	11.10	12.06	13.05	14.05	15.59	16.89	18.20	23.61	29.23
	60	11.17	12.40	13.72	15.07	16.43	17.81	19.88	21.63	23.39	30.60	38.08
	80	12.76	14.44	16.15	17.86	19.57	21.27	23.84	26.00	28.17	37.04	46.21
	100	14.25	16.37	18.45	20.50	22.52	24.54	27.57	30.11	32.66	43.08	53.86
	120	15.68	18.22	20.65	23.01	25.34	27.65	31.12	34.02	36.94	48.83	61.13
	140	17.05	19.99	22.76	25.42	28.04	30.64	34.53	37.78	41.05	54.35	68.11
150	10	6.47	6.58	6.82	7.13	7.46	7.80	8.35	8.82	9.31	11.35	13.53
	20	7.97	8.26	8.70	9.19	9.73	10.29	11.17	11.92	12.70	15.97	19.42
	40	10.18	10.85	11.67	12.57	13.50	14.47	15.96	17.23	18.52	23.86	29.44
	60	11.98	13.05	14.27	15.55	16.86	18.19	20.22	21.94	23.68	30.83	38.27
	80	13.59	15.07	16.67	18.31	19.96	21.63	24.16	26.29	28.44	37.25	46.40
	100	15.08	16.98	18.95	20.92	22.90	24.88	27.87	30.38	32.92	43.29	54.03
	120	16.50	18.81	21.12	23.41	25.70	27.98	31.41	34.29	37.18	49.03	61.30
	140	17.86	20.57	23.21	25.81	28.39	30.95	34.81	38.03	41.28	54.54	68.27

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	6.89	6.98	7.23	7.53	7.85	8.20	8.74	9.20	9.68	11.69	13.83
	20	8.50	8.76	9.18	9.66	10.18	10.72	11.57	12.31	13.06	16.27	19.68
	40	10.82	11.43	12.20	13.05	13.95	14.88	16.32	17.57	18.84	24.12	29.66
	60	12.68	13.65	14.79	16.01	17.27	18.57	20.56	22.25	23.96	31.06	38.47
	80	14.32	15.68	17.18	18.75	20.35	21.99	24.47	26.58	28.71	37.47	46.58
	100	15.84	17.57	19.43	21.34	23.27	25.22	28.17	30.66	33.17	43.49	54.21
	120	17.26	19.38	21.59	23.82	26.05	28.30	31.69	34.55	37.43	49.22	61.46
	140	18.62	21.13	23.67	26.20	28.73	31.27	35.08	38.29	41.52	54.73	68.43
300	10	7.57	7.65	7.89	8.19	8.52	8.86	9.40	9.86	10.34	12.31	14.40
	20	9.36	9.59	9.99	10.45	10.96	11.48	12.30	13.02	13.75	16.85	20.18
	40	11.89	12.42	13.14	13.93	14.78	15.66	17.04	18.23	19.46	24.62	30.09
	60	13.87	14.72	15.76	16.89	18.08	19.31	21.22	22.86	24.54	31.52	38.86
	80	15.60	16.77	18.14	19.61	21.13	22.69	25.10	27.15	29.24	37.89	46.95
	100	17.16	18.68	20.38	22.17	24.01	25.89	28.76	31.20	33.68	43.89	54.55
	120	18.62	20.48	22.51	24.61	26.76	28.94	32.26	35.07	37.91	49.61	61.79
	140	20.00	22.21	24.56	26.97	29.42	31.89	35.63	38.79	41.99	55.10	68.75
400	10	8.12	8.20	8.44	8.74	9.07	9.42	9.96	10.43	10.90	12.87	14.94
	20	10.06	10.28	10.67	11.13	11.62	12.14	12.95	13.65	14.37	17.42	20.68
	40	12.77	13.26	13.95	14.71	15.53	16.38	17.72	18.87	20.07	25.12	30.52
	60	14.87	15.65	16.63	17.70	18.84	20.02	21.87	23.46	25.10	31.98	39.25
	80	16.68	17.75	19.03	20.42	21.87	23.38	25.72	27.72	29.77	38.32	47.31
	100	18.30	19.68	21.27	22.96	24.73	26.55	29.35	31.75	34.18	44.30	54.90
	120	19.81	21.49	23.39	25.39	27.46	29.58	32.83	35.59	38.40	50.00	62.12
	140	21.22	23.23	25.43	27.73	30.10	32.50	36.18	39.29	42.45	55.48	69.06
600	10	9.01	9.08	9.33	9.64	9.98	10.34	10.90	11.37	11.85	13.84	15.90
	20	11.20	11.40	11.79	12.25	12.74	13.26	14.07	14.77	15.48	18.46	21.64
	40	14.22	14.66	15.31	16.05	16.84	17.66	18.95	20.07	21.22	26.10	31.37
	60	16.52	17.21	18.13	19.14	20.22	21.34	23.11	24.63	26.21	32.88	40.03
	80	18.47	19.42	20.61	21.90	23.27	24.69	26.92	28.84	30.82	39.17	48.04
	100	20.21	21.42	22.88	24.46	26.11	27.83	30.51	32.82	35.19	45.10	55.59
	120	21.81	23.29	25.02	26.88	28.82	30.83	33.95	36.62	39.36	50.77	62.78
	140	23.30	25.05	27.06	29.20	31.42	33.72	37.26	40.29	43.38	56.22	69.70
800	10	9.73	9.80	10.05	10.37	10.72	11.09	11.67	12.16	12.65	14.67	16.75
	20	12.13	12.31	12.70	13.17	13.67	14.20	15.02	15.72	16.43	19.40	22.54
	40	15.40	15.81	16.45	17.18	17.96	18.78	20.05	21.14	22.27	27.05	32.21
	60	17.87	18.51	19.40	20.39	21.44	22.53	24.24	25.73	27.26	33.77	40.80
	80	19.96	20.83	21.97	23.21	24.53	25.90	28.05	29.92	31.84	40.01	48.76
	100	21.80	22.92	24.30	25.80	27.39	29.04	31.63	33.87	36.17	45.90	56.27
	120	23.49	24.85	26.48	28.24	30.10	32.03	35.04	37.64	40.31	51.54	63.44
	140	25.05	26.66	28.54	30.57	32.69	34.90	38.33	41.28	44.30	56.96	70.33

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.24	1.27	1.33	1.41	1.49	1.57	1.69	1.80	1.91	2.35	2.79
	20	1.41	1.47	1.57	1.68	1.79	1.90	2.07	2.22	2.37	2.96	3.56
	40	1.68	1.82	1.97	2.14	2.30	2.47	2.71	2.92	3.13	3.98	4.85
	60	1.91	2.12	2.33	2.54	2.75	2.96	3.27	3.54	3.80	4.88	5.98
	80	2.13	2.39	2.65	2.91	3.16	3.41	3.79	4.11	4.42	5.70	7.02
	100	2.33	2.65	2.96	3.25	3.55	3.84	4.27	4.64	5.00	6.48	7.99
	120	2.53	2.90	3.25	3.58	3.91	4.24	4.73	5.14	5.55	7.21	8.92
	140	2.72	3.13	3.52	3.90	4.27	4.63	5.17	5.63	6.08	7.92	9.81
25	10	1.61	1.59	1.63	1.68	1.75	1.82	1.93	2.02	2.12	2.52	2.94
	20	1.82	1.82	1.88	1.96	2.05	2.14	2.29	2.42	2.55	3.11	3.69
	40	2.12	2.17	2.27	2.40	2.53	2.68	2.90	3.10	3.29	4.11	4.96
	60	2.36	2.46	2.61	2.78	2.96	3.15	3.45	3.70	3.95	5.00	6.08
	80	2.57	2.72	2.92	3.13	3.36	3.59	3.95	4.25	4.56	5.81	7.11
	100	2.77	2.96	3.21	3.47	3.74	4.01	4.43	4.78	5.13	6.58	8.08
	120	2.95	3.20	3.49	3.79	4.10	4.41	4.88	5.28	5.68	7.31	9.00
	140	3.13	3.43	3.76	4.10	4.44	4.79	5.31	5.76	6.20	8.02	9.89
50	10	1.77	1.75	1.78	1.84	1.90	1.97	2.08	2.18	2.28	2.67	3.08
	20	2.02	2.02	2.07	2.15	2.23	2.32	2.47	2.59	2.72	3.25	3.81
	40	2.37	2.40	2.49	2.61	2.74	2.87	3.08	3.26	3.45	4.24	5.06
	60	2.64	2.71	2.84	3.00	3.16	3.34	3.61	3.85	4.10	5.11	6.18
	80	2.87	2.98	3.15	3.35	3.55	3.77	4.11	4.40	4.69	5.92	7.20
	100	3.08	3.23	3.44	3.68	3.92	4.18	4.58	4.91	5.26	6.68	8.17
	120	3.28	3.47	3.72	3.99	4.27	4.57	5.02	5.41	5.80	7.41	9.08
	140	3.46	3.69	3.98	4.29	4.61	4.95	5.45	5.88	6.32	8.11	9.97
100	10	1.98	1.95	1.99	2.05	2.12	2.19	2.30	2.40	2.50	2.90	3.31
	20	2.28	2.28	2.33	2.41	2.50	2.59	2.73	2.86	2.98	3.51	4.05
	40	2.71	2.73	2.82	2.93	3.05	3.17	3.38	3.55	3.73	4.48	5.28
	60	3.03	3.08	3.20	3.34	3.49	3.66	3.92	4.14	4.37	5.34	6.37
	80	3.30	3.38	3.53	3.70	3.89	4.09	4.41	4.68	4.96	6.13	7.38
	100	3.53	3.65	3.83	4.04	4.26	4.50	4.86	5.18	5.51	6.89	8.34
	120	3.75	3.90	4.11	4.35	4.61	4.88	5.30	5.67	6.04	7.61	9.25
	140	3.95	4.13	4.38	4.65	4.94	5.25	5.73	6.13	6.55	8.30	10.13
150	10	2.13	2.10	2.14	2.20	2.27	2.35	2.46	2.56	2.67	3.08	3.50
	20	2.48	2.47	2.52	2.60	2.69	2.78	2.93	3.06	3.19	3.71	4.26
	40	2.95	2.97	3.06	3.17	3.29	3.42	3.62	3.79	3.97	4.70	5.48
	60	3.31	3.35	3.47	3.61	3.76	3.92	4.17	4.39	4.61	5.56	6.56
	80	3.61	3.68	3.82	3.99	4.17	4.37	4.67	4.93	5.20	6.34	7.57
	100	3.87	3.97	4.14	4.34	4.55	4.78	5.13	5.44	5.75	7.09	8.51
	120	4.11	4.23	4.43	4.66	4.91	5.16	5.57	5.92	6.28	7.80	9.42
	140	4.33	4.48	4.71	4.97	5.24	5.53	5.99	6.38	6.78	8.48	10.29

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.25	2.22	2.26	2.33	2.40	2.47	2.59	2.70	2.80	3.23	3.65
	20	2.63	2.62	2.68	2.76	2.85	2.95	3.10	3.23	3.36	3.89	4.44
	40	3.15	3.17	3.26	3.37	3.49	3.62	3.82	3.99	4.17	4.90	5.68
	60	3.54	3.58	3.69	3.83	3.98	4.15	4.40	4.61	4.83	5.76	6.75
	80	3.86	3.93	4.07	4.23	4.42	4.61	4.90	5.16	5.43	6.55	7.74
	100	4.15	4.24	4.40	4.60	4.80	5.03	5.37	5.67	5.98	7.28	8.68
	120	4.40	4.52	4.71	4.93	5.17	5.42	5.81	6.15	6.50	7.99	9.58
	140	4.64	4.77	4.99	5.24	5.51	5.79	6.23	6.61	7.00	8.67	10.45
300	10	2.44	2.42	2.46	2.53	2.60	2.68	2.81	2.92	3.02	3.47	3.90
	20	2.89	2.88	2.93	3.02	3.11	3.21	3.37	3.50	3.64	4.19	4.74
	40	3.48	3.49	3.58	3.69	3.82	3.95	4.16	4.33	4.51	5.25	6.02
	60	3.92	3.95	4.06	4.20	4.36	4.52	4.77	4.99	5.21	6.13	7.10
	80	4.28	4.34	4.47	4.64	4.82	5.01	5.31	5.56	5.82	6.92	8.09
	100	4.60	4.67	4.83	5.03	5.23	5.45	5.79	6.09	6.39	7.66	9.02
	120	4.88	4.98	5.16	5.38	5.61	5.86	6.24	6.57	6.91	8.36	9.90
	140	5.14	5.26	5.47	5.71	5.97	6.24	6.67	7.04	7.42	9.03	10.76
400	10	2.60	2.58	2.62	2.69	2.77	2.85	2.98	3.09	3.21	3.66	4.11
	20	3.09	3.08	3.14	3.23	3.32	3.43	3.59	3.73	3.87	4.43	5.00
	40	3.74	3.75	3.84	3.96	4.09	4.22	4.43	4.62	4.80	5.55	6.33
	60	4.22	4.25	4.37	4.51	4.67	4.83	5.09	5.31	5.53	6.46	7.42
	80	4.62	4.67	4.81	4.97	5.16	5.35	5.65	5.90	6.17	7.26	8.41
	100	4.96	5.03	5.19	5.39	5.59	5.81	6.15	6.45	6.74	8.00	9.34
	120	5.27	5.36	5.54	5.76	5.99	6.24	6.62	6.95	7.28	8.70	10.22
	140	5.55	5.66	5.87	6.11	6.37	6.64	7.06	7.42	7.79	9.37	11.07
600	10	2.85	2.83	2.88	2.95	3.03	3.12	3.26	3.38	3.50	3.98	4.46
	20	3.42	3.41	3.47	3.56	3.67	3.78	3.95	4.09	4.24	4.84	5.43
	40	4.17	4.17	4.27	4.39	4.52	4.67	4.89	5.08	5.27	6.05	6.84
	60	4.71	4.74	4.86	5.01	5.17	5.34	5.61	5.83	6.06	7.01	7.98
	80	5.16	5.21	5.35	5.52	5.71	5.91	6.21	6.48	6.74	7.85	8.99
	100	5.55	5.62	5.78	5.97	6.19	6.41	6.76	7.05	7.35	8.61	9.93
	120	5.90	5.98	6.17	6.38	6.62	6.87	7.25	7.58	7.92	9.32	10.81
	140	6.22	6.32	6.52	6.76	7.02	7.29	7.71	8.08	8.45	10.00	11.65
800	10	3.06	3.04	3.09	3.16	3.25	3.34	3.49	3.61	3.74	4.24	4.74
	20	3.69	3.67	3.74	3.84	3.94	4.06	4.24	4.39	4.55	5.17	5.78
	40	4.51	4.52	4.61	4.74	4.88	5.03	5.26	5.46	5.66	6.47	7.28
	60	5.11	5.14	5.26	5.41	5.58	5.76	6.03	6.27	6.51	7.48	8.47
	80	5.61	5.65	5.79	5.97	6.16	6.37	6.68	6.95	7.23	8.35	9.50
	100	6.03	6.09	6.26	6.46	6.67	6.90	7.26	7.56	7.87	9.14	10.46
	120	6.41	6.49	6.67	6.90	7.14	7.39	7.78	8.12	8.46	9.87	11.35
	140	6.76	6.85	7.06	7.30	7.56	7.84	8.27	8.63	9.01	10.56	12.20

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.80	1.88	2.00	2.13	2.26	2.40	2.61	2.79	2.97	3.70	4.45
	20	2.12	2.29	2.48	2.67	2.87	3.07	3.38	3.63	3.89	4.92	5.98
	40	2.66	2.97	3.28	3.59	3.89	4.20	4.65	5.04	5.42	6.97	8.56
	60	3.14	3.57	3.99	4.39	4.79	5.19	5.78	6.27	6.76	8.77	10.82
	80	3.57	4.12	4.64	5.13	5.61	6.09	6.81	7.40	8.00	10.42	12.90
	100	3.98	4.64	5.25	5.82	6.39	6.94	7.77	8.47	9.16	11.97	14.85
	120	4.37	5.14	5.82	6.48	7.12	7.75	8.69	9.48	10.26	13.44	16.70
	140	4.74	5.61	6.38	7.11	7.83	8.53	9.57	10.45	11.32	14.85	18.48
25	10	2.29	2.29	2.36	2.46	2.57	2.69	2.87	3.03	3.20	3.89	4.60
	20	2.65	2.70	2.83	2.98	3.15	3.33	3.60	3.84	4.08	5.08	6.11
	40	3.19	3.36	3.60	3.86	4.13	4.41	4.85	5.21	5.58	7.10	8.67
	60	3.64	3.93	4.28	4.64	5.01	5.38	5.95	6.43	6.91	8.89	10.92
	80	4.06	4.46	4.91	5.36	5.82	6.27	6.97	7.55	8.14	10.53	12.99
	100	4.45	4.96	5.50	6.04	6.58	7.12	7.93	8.61	9.29	12.07	14.94
	120	4.82	5.44	6.07	6.69	7.30	7.92	8.84	9.61	10.38	13.54	16.79
	140	5.18	5.90	6.61	7.31	8.00	8.69	9.72	10.57	11.44	14.95	18.56
50	10	2.53	2.52	2.59	2.68	2.79	2.90	3.08	3.24	3.40	4.06	4.75
	20	2.95	2.98	3.09	3.23	3.39	3.55	3.81	4.03	4.26	5.23	6.24
	40	3.55	3.67	3.88	4.11	4.36	4.62	5.03	5.38	5.74	7.23	8.78
	60	4.03	4.25	4.55	4.87	5.22	5.57	6.12	6.59	7.06	9.00	11.02
	80	4.46	4.77	5.17	5.58	6.01	6.46	7.13	7.70	8.27	10.64	13.08
	100	4.85	5.27	5.75	6.25	6.77	7.29	8.08	8.74	9.42	12.17	15.02
	120	5.22	5.74	6.31	6.89	7.49	8.08	8.98	9.74	10.51	13.64	16.87
	140	5.58	6.19	6.85	7.51	8.18	8.85	9.86	10.70	11.56	15.04	18.64
100	10	2.85	2.84	2.90	3.00	3.10	3.22	3.40	3.55	3.71	4.36	5.03
	20	3.35	3.37	3.48	3.61	3.76	3.92	4.16	4.38	4.60	5.52	6.49
	40	4.05	4.14	4.32	4.53	4.76	5.01	5.39	5.72	6.06	7.48	9.00
	60	4.59	4.76	5.02	5.31	5.62	5.94	6.45	6.89	7.35	9.23	11.22
	80	5.06	5.30	5.64	6.01	6.40	6.81	7.44	7.99	8.54	10.85	13.27
	100	5.48	5.80	6.22	6.67	7.14	7.62	8.38	9.02	9.67	12.38	15.20
	120	5.87	6.27	6.77	7.29	7.84	8.41	9.27	10.01	10.75	13.83	17.04
	140	6.24	6.72	7.29	7.90	8.52	9.16	10.13	10.96	11.79	15.23	18.80
150	10	3.08	3.06	3.13	3.23	3.33	3.45	3.63	3.79	3.95	4.61	5.28
	20	3.64	3.66	3.76	3.90	4.04	4.20	4.45	4.66	4.88	5.78	6.74
	40	4.42	4.50	4.67	4.88	5.10	5.33	5.70	6.02	6.35	7.73	9.21
	60	5.02	5.16	5.40	5.67	5.97	6.28	6.77	7.19	7.63	9.46	11.42
	80	5.52	5.73	6.04	6.38	6.75	7.14	7.75	8.27	8.81	11.07	13.45
	100	5.97	6.25	6.63	7.04	7.49	7.95	8.67	9.29	9.93	12.58	15.37
	120	6.39	6.73	7.18	7.67	8.19	8.72	9.56	10.27	11.00	14.03	17.20
	140	6.77	7.19	7.71	8.27	8.86	9.47	10.41	11.21	12.03	15.42	18.96

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.26	3.25	3.32	3.41	3.53	3.64	3.83	3.99	4.15	4.82	5.49
	20	3.88	3.90	4.00	4.13	4.28	4.44	4.69	4.90	5.12	6.02	6.97
	40	4.73	4.80	4.96	5.17	5.39	5.62	5.98	6.29	6.62	7.97	9.43
	60	5.37	5.50	5.73	5.99	6.28	6.58	7.06	7.47	7.89	9.69	11.61
	80	5.90	6.10	6.39	6.72	7.08	7.45	8.04	8.55	9.07	11.28	13.64
	100	6.38	6.63	6.99	7.39	7.81	8.26	8.96	9.56	10.18	12.79	15.55
	120	6.82	7.13	7.55	8.02	8.51	9.03	9.83	10.53	11.24	14.22	17.37
	140	7.22	7.60	8.09	8.62	9.18	9.77	10.68	11.46	12.26	15.61	19.12
300	10	3.56	3.55	3.62	3.72	3.84	3.96	4.15	4.32	4.49	5.17	5.86
	20	4.27	4.28	4.38	4.52	4.67	4.84	5.09	5.31	5.53	6.44	7.38
	40	5.22	5.28	5.45	5.65	5.87	6.10	6.46	6.77	7.09	8.42	9.84
	60	5.93	6.05	6.27	6.53	6.81	7.11	7.57	7.97	8.38	10.13	12.00
	80	6.53	6.70	6.98	7.30	7.64	8.00	8.57	9.06	9.56	11.70	14.00
	100	7.05	7.28	7.61	7.99	8.40	8.82	9.49	10.06	10.66	13.19	15.89
	120	7.53	7.81	8.20	8.64	9.10	9.59	10.36	11.03	11.71	14.61	17.70
	140	7.97	8.30	8.75	9.25	9.78	10.33	11.20	11.95	12.72	15.98	19.44
400	10	3.81	3.79	3.86	3.97	4.09	4.22	4.42	4.59	4.76	5.46	6.17
	20	4.58	4.59	4.70	4.84	4.99	5.16	5.42	5.64	5.87	6.79	7.74
	40	5.62	5.68	5.84	6.05	6.27	6.50	6.86	7.18	7.50	8.82	10.22
	60	6.40	6.50	6.72	6.98	7.26	7.56	8.02	8.42	8.82	10.54	12.37
	80	7.04	7.20	7.47	7.78	8.12	8.48	9.03	9.52	10.01	12.10	14.36
	100	7.61	7.81	8.13	8.51	8.90	9.32	9.97	10.53	11.11	13.58	16.23
	120	8.12	8.37	8.75	9.17	9.63	10.10	10.85	11.49	12.16	14.99	18.03
	140	8.59	8.89	9.32	9.80	10.31	10.85	11.69	12.41	13.16	16.35	19.76
600	10	4.20	4.18	4.26	4.37	4.49	4.63	4.84	5.02	5.21	5.94	6.68
	20	5.09	5.09	5.20	5.35	5.51	5.69	5.96	6.19	6.43	7.39	8.36
	40	6.27	6.32	6.49	6.70	6.92	7.16	7.54	7.86	8.18	9.52	10.91
	60	7.15	7.24	7.46	7.72	8.01	8.31	8.77	9.17	9.58	11.27	13.07
	80	7.87	8.01	8.28	8.59	8.93	9.29	9.84	10.32	10.80	12.85	15.04
	100	8.50	8.69	9.00	9.37	9.76	10.17	10.81	11.36	11.93	14.32	16.90
	120	9.07	9.30	9.66	10.08	10.52	10.99	11.71	12.34	12.99	15.72	18.68
	140	9.59	9.86	10.27	10.74	11.24	11.76	12.57	13.27	13.99	17.07	20.39
800	10	4.51	4.49	4.58	4.69	4.83	4.97	5.19	5.38	5.57	6.33	7.10
	20	5.50	5.50	5.61	5.77	5.94	6.12	6.40	6.65	6.89	7.88	8.87
	40	6.80	6.84	7.01	7.23	7.46	7.71	8.10	8.42	8.76	10.12	11.52
	60	7.76	7.85	8.07	8.33	8.62	8.93	9.40	9.81	10.22	11.92	13.71
	80	8.55	8.68	8.95	9.26	9.61	9.96	10.52	11.00	11.49	13.53	15.69
	100	9.24	9.41	9.72	10.09	10.48	10.89	11.53	12.08	12.65	15.01	17.54
	120	9.85	10.06	10.42	10.84	11.28	11.74	12.46	13.08	13.72	16.41	19.31
	140	10.41	10.67	11.07	11.53	12.02	12.54	13.34	14.03	14.74	17.75	21.00

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.70	2.89	3.11	3.35	3.59	3.84	4.21	4.52	4.83	6.10	7.40
	20	3.34	3.70	4.07	4.44	4.81	5.18	5.73	6.19	6.66	8.54	10.46
	40	4.42	5.07	5.68	6.27	6.85	7.43	8.29	9.01	9.73	12.64	15.62
	60	5.37	6.27	7.09	7.88	8.65	9.40	10.53	11.47	12.42	16.23	20.15
	80	6.24	7.38	8.39	9.36	10.29	11.22	12.59	13.74	14.88	19.53	24.30
	100	7.06	8.41	9.61	10.74	11.84	12.92	14.53	15.86	17.20	22.63	28.20
	120	7.84	9.40	10.77	12.06	13.31	14.54	16.37	17.89	19.41	25.57	31.91
	140	8.58	10.34	11.88	13.32	14.72	16.09	18.13	19.82	21.52	28.40	35.47
25	10	3.32	3.38	3.53	3.72	3.92	4.14	4.48	4.77	5.06	6.29	7.55
	20	3.97	4.16	4.44	4.76	5.09	5.43	5.96	6.40	6.85	8.70	10.60
	40	5.00	5.47	6.00	6.55	7.09	7.65	8.48	9.18	9.89	12.77	15.74
	60	5.90	6.64	7.39	8.13	8.86	9.60	10.71	11.63	12.56	16.35	20.25
	80	6.74	7.72	8.66	9.59	10.50	11.40	12.76	13.89	15.02	19.64	24.40
	100	7.53	8.74	9.87	10.96	12.03	13.09	14.68	16.00	17.33	22.73	28.29
	120	8.29	9.71	11.01	12.27	13.49	14.70	16.51	18.02	19.53	25.67	31.99
	140	9.02	10.64	12.11	13.52	14.89	16.25	18.27	19.95	21.64	28.49	35.55
50	10	3.68	3.71	3.85	4.02	4.21	4.41	4.73	5.00	5.28	6.47	7.71
	20	4.39	4.53	4.78	5.06	5.37	5.68	6.18	6.61	7.04	8.85	10.73
	40	5.47	5.85	6.31	6.81	7.33	7.86	8.67	9.36	10.05	12.90	15.85
	60	6.38	6.99	7.67	8.37	9.08	9.80	10.88	11.79	12.71	16.47	20.35
	80	7.21	8.05	8.93	9.81	10.70	11.58	12.92	14.03	15.16	19.75	24.49
	100	7.99	9.05	10.12	11.17	12.22	13.27	14.83	16.14	17.46	22.84	28.38
	120	8.73	10.01	11.26	12.47	13.67	14.87	16.66	18.15	19.66	25.77	32.08
	140	9.45	10.93	12.35	13.72	15.07	16.41	18.41	20.08	21.76	28.59	35.63
100	10	4.16	4.18	4.30	4.47	4.65	4.84	5.15	5.41	5.68	6.81	8.01
	20	4.99	5.09	5.31	5.56	5.84	6.14	6.60	7.00	7.41	9.15	10.99
	40	6.19	6.47	6.87	7.32	7.79	8.28	9.05	9.70	10.37	13.16	16.07
	60	7.16	7.63	8.21	8.85	9.51	10.18	11.22	12.11	13.00	16.70	20.55
	80	8.01	8.68	9.45	10.26	11.10	11.94	13.24	14.33	15.43	19.97	24.67
	100	8.80	9.66	10.62	11.60	12.60	13.61	15.14	16.42	17.72	23.04	28.55
	120	9.54	10.60	11.74	12.88	14.04	15.20	16.95	18.42	19.90	25.97	32.25
	140	10.24	11.51	12.81	14.12	15.42	16.73	18.69	20.34	22.00	28.78	35.79
150	10	4.51	4.52	4.64	4.81	4.99	5.18	5.49	5.75	6.01	7.13	8.30
	20	5.43	5.52	5.72	5.97	6.24	6.53	6.97	7.36	7.76	9.45	11.24
	40	6.74	6.98	7.35	7.77	8.21	8.68	9.41	10.04	10.69	13.41	16.28
	60	7.77	8.18	8.71	9.29	9.91	10.56	11.56	12.42	13.29	16.93	20.75
	80	8.66	9.24	9.94	10.70	11.49	12.30	13.55	14.62	15.70	20.19	24.86
	100	9.47	10.23	11.10	12.02	12.97	13.95	15.44	16.70	17.98	23.25	28.73
	120	10.23	11.16	12.20	13.29	14.40	15.52	17.24	18.69	20.15	26.17	32.41
	140	10.95	12.06	13.27	14.51	15.77	17.04	18.97	20.59	22.24	28.97	35.95

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.79	4.80	4.92	5.09	5.27	5.47	5.77	6.03	6.30	7.41	8.57
	20	5.79	5.87	6.07	6.32	6.58	6.87	7.31	7.69	8.08	9.73	11.50
	40	7.20	7.42	7.76	8.16	8.59	9.05	9.75	10.37	11.00	13.67	16.50
	60	8.28	8.65	9.15	9.71	10.30	10.92	11.89	12.72	13.58	17.16	20.94
	80	9.22	9.74	10.39	11.11	11.87	12.65	13.87	14.91	15.97	20.40	25.04
	100	10.06	10.74	11.55	12.43	13.34	14.28	15.74	16.97	18.24	23.45	28.90
	120	10.84	11.68	12.65	13.68	14.75	15.85	17.52	18.95	20.40	26.36	32.58
	140	11.57	12.58	13.71	14.89	16.11	17.35	19.25	20.85	22.47	29.16	36.11
300	10	5.25	5.25	5.38	5.55	5.74	5.94	6.25	6.52	6.79	7.91	9.06
	20	6.38	6.45	6.65	6.89	7.16	7.44	7.88	8.25	8.64	10.26	11.98
	40	7.94	8.13	8.46	8.85	9.26	9.70	10.38	10.97	11.58	14.16	16.93
	60	9.13	9.45	9.92	10.44	11.01	11.59	12.52	13.32	14.14	17.62	21.34
	80	10.14	10.59	11.20	11.87	12.58	13.32	14.48	15.48	16.50	20.83	25.41
	100	11.04	11.63	12.37	13.19	14.04	14.93	16.32	17.52	18.74	23.86	29.25
	120	11.87	12.60	13.48	14.44	15.44	16.48	18.09	19.47	20.88	26.75	32.91
	140	12.64	13.51	14.54	15.64	16.78	17.97	19.79	21.35	22.94	29.53	36.43
400	10	5.62	5.62	5.75	5.92	6.12	6.32	6.64	6.92	7.19	8.33	9.49
	20	6.86	6.92	7.12	7.36	7.63	7.92	8.36	8.74	9.13	10.74	12.44
	40	8.55	8.72	9.05	9.43	9.84	10.27	10.94	11.52	12.12	14.64	17.36
	60	9.83	10.12	10.57	11.08	11.63	12.20	13.10	13.87	14.67	18.07	21.73
	80	10.90	11.32	11.89	12.54	13.22	13.93	15.05	16.02	17.02	21.26	25.78
	100	11.86	12.40	13.10	13.87	14.70	15.55	16.89	18.05	19.24	24.27	29.60
	120	12.73	13.39	14.23	15.13	16.09	17.09	18.65	19.99	21.36	27.14	33.25
	140	13.54	14.33	15.29	16.33	17.43	18.57	20.33	21.85	23.41	29.91	36.75
600	10	6.22	6.22	6.35	6.53	6.74	6.95	7.29	7.57	7.86	9.03	10.22
	20	7.63	7.68	7.88	8.14	8.41	8.71	9.16	9.55	9.94	11.57	13.26
	40	9.54	9.69	10.01	10.39	10.80	11.23	11.90	12.47	13.06	15.53	18.18
	60	10.96	11.22	11.66	12.16	12.69	13.25	14.12	14.88	15.66	18.95	22.50
	80	12.15	12.52	13.07	13.69	14.35	15.03	16.11	17.04	18.00	22.09	26.50
	100	13.20	13.68	14.34	15.08	15.86	16.68	17.95	19.06	20.21	25.07	30.29
	120	14.15	14.74	15.52	16.37	17.28	18.22	19.70	20.98	22.31	27.91	33.91
	140	15.03	15.73	16.62	17.59	18.62	19.70	21.38	22.83	24.33	30.65	37.39
800	10	6.71	6.70	6.84	7.03	7.24	7.46	7.81	8.11	8.41	9.62	10.84
	20	8.26	8.31	8.51	8.77	9.05	9.36	9.82	10.22	10.63	12.28	13.99
	40	10.34	10.49	10.81	11.19	11.60	12.04	12.71	13.29	13.88	16.34	18.95
	60	11.89	12.13	12.56	13.06	13.59	14.15	15.02	15.76	16.53	19.77	23.24
	80	13.18	13.52	14.06	14.66	15.31	15.99	17.05	17.96	18.91	22.90	27.22
	100	14.31	14.75	15.39	16.11	16.87	17.67	18.92	20.00	21.11	25.85	30.97
	120	15.33	15.87	16.61	17.44	18.32	19.24	20.68	21.92	23.20	28.67	34.57
	140	16.27	16.91	17.76	18.70	19.69	20.73	22.35	23.76	25.21	31.39	38.03

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	4.20	4.62	5.06	5.51	5.95	6.40	7.07	7.64	8.20	10.49	12.82
	20	5.49	6.25	6.98	7.69	8.39	9.08	10.12	10.98	11.85	15.36	18.96
	40	7.65	8.99	10.20	11.35	12.48	13.58	15.23	16.61	17.98	23.56	29.28
	60	9.55	11.40	13.03	14.57	16.06	17.53	19.72	21.54	23.36	30.74	38.32
	80	11.29	13.61	15.62	17.52	19.35	21.16	23.84	26.07	28.30	37.34	46.63
	100	12.93	15.68	18.06	20.29	22.44	24.56	27.71	30.32	32.94	43.54	54.43
	120	14.48	17.65	20.38	22.92	25.38	27.80	31.39	34.36	37.35	49.43	61.85
	140	15.97	19.54	22.60	25.45	28.20	30.90	34.91	38.24	41.57	55.07	68.96
25	10	4.95	5.17	5.51	5.89	6.29	6.71	7.34	7.88	8.43	10.67	12.98
	20	6.17	6.73	7.36	8.01	8.67	9.34	10.34	11.19	12.04	15.51	19.09
	40	8.24	9.40	10.52	11.63	12.72	13.80	15.43	16.78	18.15	23.69	29.39
	60	10.09	11.76	13.32	14.82	16.28	17.73	19.89	21.70	23.51	30.86	38.42
	80	11.79	13.95	15.89	17.75	19.56	21.34	24.00	26.22	28.44	37.45	46.73
	100	13.40	16.00	18.32	20.51	22.64	24.74	27.86	30.46	33.07	43.64	54.52
	120	14.93	17.96	20.62	23.13	25.57	27.97	31.53	34.50	37.47	49.52	61.93
	140	16.41	19.84	22.83	25.65	28.38	31.06	35.05	38.37	41.69	55.17	69.04
50	10	5.45	5.61	5.90	6.25	6.62	7.00	7.61	8.13	8.66	10.85	13.13
	20	6.74	7.17	7.73	8.33	8.95	9.59	10.57	11.40	12.23	15.67	19.22
	40	8.80	9.79	10.84	11.90	12.96	14.02	15.62	16.96	18.31	23.82	29.50
	60	10.61	12.13	13.61	15.06	16.50	17.93	20.07	21.86	23.66	30.98	38.52
	80	12.29	14.28	16.16	17.98	19.76	21.53	24.16	26.37	28.58	37.56	46.82
	100	13.87	16.32	18.57	20.72	22.83	24.91	28.01	30.60	33.20	43.74	54.61
	120	15.38	18.26	20.87	23.34	25.75	28.13	31.68	34.63	37.59	49.62	62.02
	140	16.84	20.13	23.07	25.85	28.56	31.22	35.19	38.50	41.81	55.26	69.12
100	10	6.16	6.28	6.54	6.85	7.19	7.54	8.11	8.60	9.10	11.21	13.44
	20	7.59	7.92	8.39	8.93	9.50	10.09	11.02	11.81	12.62	15.98	19.48
	40	9.75	10.54	11.46	12.43	13.43	14.45	16.00	17.31	18.63	24.08	29.72
	60	11.57	12.83	14.18	15.55	16.93	18.32	20.41	22.17	23.95	31.21	38.72
	80	13.22	14.95	16.70	18.44	20.16	21.89	24.49	26.66	28.85	37.78	47.01
	100	14.78	16.95	19.08	21.16	23.21	25.26	28.32	30.88	33.46	43.95	54.78
	120	16.26	18.87	21.35	23.75	26.12	28.46	31.97	34.90	37.84	49.82	62.18
	140	17.69	20.72	23.54	26.25	28.91	31.54	35.48	38.76	42.05	55.46	69.28
150	10	6.69	6.79	7.03	7.33	7.66	8.01	8.55	9.03	9.51	11.56	13.75
	20	8.24	8.53	8.96	9.46	10.00	10.56	11.45	12.21	12.99	16.28	19.74
	40	10.53	11.21	12.04	12.95	13.90	14.87	16.37	17.65	18.96	24.33	29.94
	60	12.40	13.49	14.73	16.03	17.36	18.70	20.76	22.49	24.24	31.45	38.92
	80	14.07	15.59	17.22	18.89	20.56	22.25	24.81	26.96	29.12	38.00	47.19
	100	15.62	17.58	19.58	21.59	23.59	25.60	28.62	31.16	33.72	44.16	54.96
	120	17.10	19.47	21.83	24.17	26.48	28.79	32.26	35.17	38.09	50.02	62.35
	140	18.52	21.30	24.00	26.65	29.26	31.86	35.76	39.01	42.29	55.65	69.45

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	7.12	7.20	7.44	7.74	8.07	8.41	8.95	9.41	9.89	11.90	14.05
	20	8.79	9.04	9.46	9.94	10.46	11.00	11.86	12.60	13.36	16.58	20.00
	40	11.19	11.80	12.58	13.44	14.35	15.29	16.75	18.00	19.28	24.59	30.16
	60	13.12	14.11	15.27	16.50	17.78	19.09	21.10	22.80	24.54	31.68	39.12
	80	14.82	16.21	17.74	19.33	20.96	22.61	25.13	27.25	29.40	38.21	47.38
	100	16.40	18.18	20.08	22.01	23.97	25.94	28.93	31.44	33.97	44.36	55.14
	120	17.88	20.06	22.31	24.57	26.84	29.12	32.55	35.43	38.34	50.22	62.52
	140	19.29	21.87	24.46	27.04	29.61	32.18	36.03	39.27	42.53	55.84	69.61
300	10	7.82	7.89	8.13	8.42	8.75	9.09	9.62	10.09	10.56	12.53	14.63
	20	9.67	9.89	10.29	10.75	11.25	11.78	12.60	13.32	14.05	17.17	20.51
	40	12.29	12.82	13.54	14.34	15.19	16.08	17.47	18.67	19.91	25.10	30.60
	60	14.34	15.20	16.25	17.40	18.60	19.84	21.77	23.43	25.11	32.14	39.52
	80	16.13	17.33	18.72	20.20	21.74	23.33	25.76	27.83	29.94	38.65	47.75
	100	17.75	19.30	21.04	22.85	24.72	26.62	29.53	31.99	34.49	44.77	55.49
	120	19.27	21.17	23.24	25.38	27.56	29.77	33.13	35.96	38.83	50.61	62.86
	140	20.70	22.97	25.37	27.82	30.30	32.80	36.59	39.78	43.00	56.21	69.93
400	10	8.39	8.45	8.69	8.98	9.31	9.66	10.20	10.66	11.14	13.10	15.17
	20	10.39	10.60	10.98	11.44	11.94	12.46	13.27	13.97	14.69	17.74	21.02
	40	13.20	13.68	14.37	15.14	15.96	16.82	18.16	19.33	20.53	25.61	31.03
	60	15.37	16.15	17.14	18.23	19.37	20.57	22.43	24.04	25.69	32.61	39.92
	80	17.24	18.32	19.63	21.03	22.50	24.02	26.39	28.41	30.48	39.08	48.12
	100	18.92	20.32	21.94	23.66	25.45	27.29	30.13	32.54	35.00	45.18	55.84
	120	20.48	22.21	24.14	26.17	28.27	30.42	33.70	36.49	39.32	51.00	63.19
	140	21.95	24.00	26.25	28.59	30.99	33.43	37.14	40.29	43.48	56.59	70.25
600	10	9.31	9.36	9.60	9.90	10.24	10.60	11.15	11.62	12.11	14.09	16.15
	20	11.57	11.75	12.13	12.59	13.08	13.60	14.41	15.10	15.81	18.80	21.99
	40	14.68	15.11	15.77	16.51	17.30	18.12	19.42	20.54	21.69	26.60	31.89
	60	17.06	17.75	18.67	19.69	20.78	21.91	23.69	25.22	26.81	33.52	40.70
	80	19.08	20.04	21.23	22.54	23.92	25.36	27.60	29.55	31.54	39.94	48.85
	100	20.89	22.11	23.59	25.18	26.86	28.59	31.30	33.63	36.02	46.00	56.53
	120	22.54	24.04	25.80	27.68	29.65	31.68	34.84	37.54	40.30	51.78	63.86
	140	24.08	25.87	27.91	30.08	32.34	34.66	38.24	41.30	44.42	57.35	70.90
800	10	10.05	10.10	10.34	10.66	11.00	11.37	11.94	12.42	12.92	14.93	17.01
	20	12.53	12.69	13.07	13.53	14.03	14.56	15.37	16.07	16.78	19.76	22.91
	40	15.90	16.30	16.94	17.67	18.45	19.26	20.53	21.63	22.76	27.56	32.74
	60	18.46	19.09	19.98	20.97	22.02	23.12	24.85	26.34	27.88	34.43	41.48
	80	20.61	21.49	22.63	23.88	25.21	26.59	28.76	30.64	32.58	40.79	49.58
	100	22.52	23.64	25.04	26.56	28.16	29.83	32.44	34.69	37.01	46.81	57.23
	120	24.27	25.64	27.29	29.07	30.95	32.90	35.94	38.57	41.26	52.56	64.52
	140	25.89	27.51	29.43	31.48	33.63	35.86	39.32	42.30	45.35	58.10	71.54

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.29	1.31	1.37	1.45	1.53	1.61	1.73	1.84	1.95	2.39	2.83
	20	1.46	1.52	1.62	1.73	1.84	1.95	2.12	2.27	2.42	3.01	3.61
	40	1.74	1.88	2.04	2.20	2.37	2.53	2.78	2.99	3.20	4.05	4.92
	60	1.99	2.19	2.40	2.62	2.83	3.04	3.36	3.62	3.89	4.97	6.07
	80	2.21	2.48	2.74	3.00	3.25	3.51	3.89	4.20	4.52	5.81	7.13
	100	2.42	2.75	3.05	3.35	3.65	3.94	4.38	4.75	5.12	6.60	8.12
	120	2.63	3.00	3.35	3.69	4.03	4.36	4.86	5.27	5.68	7.35	9.06
	140	2.82	3.25	3.64	4.02	4.39	4.76	5.31	5.77	6.22	8.07	9.97
25	10	1.66	1.64	1.68	1.73	1.79	1.86	1.97	2.07	2.16	2.57	2.98
	20	1.88	1.88	1.94	2.01	2.10	2.20	2.35	2.47	2.61	3.16	3.74
	40	2.19	2.24	2.34	2.47	2.60	2.75	2.97	3.17	3.37	4.18	5.03
	60	2.44	2.54	2.69	2.86	3.05	3.24	3.53	3.78	4.04	5.09	6.17
	80	2.66	2.81	3.01	3.23	3.46	3.69	4.05	4.35	4.66	5.92	7.22
	100	2.86	3.06	3.31	3.57	3.84	4.12	4.54	4.89	5.25	6.71	8.21
	120	3.06	3.31	3.60	3.90	4.21	4.53	5.00	5.40	5.81	7.45	9.15
	140	3.24	3.54	3.88	4.22	4.57	4.92	5.45	5.90	6.34	8.17	10.05
50	10	1.83	1.80	1.84	1.89	1.95	2.02	2.13	2.23	2.32	2.72	3.13
	20	2.09	2.08	2.13	2.21	2.29	2.38	2.53	2.65	2.78	3.31	3.87
	40	2.45	2.48	2.57	2.68	2.81	2.94	3.15	3.34	3.52	4.31	5.14
	60	2.73	2.80	2.93	3.08	3.25	3.42	3.70	3.94	4.19	5.21	6.27
	80	2.97	3.08	3.25	3.44	3.65	3.87	4.21	4.50	4.80	6.03	7.32
	100	3.19	3.34	3.55	3.78	4.03	4.29	4.69	5.03	5.38	6.81	8.30
	120	3.39	3.58	3.83	4.11	4.40	4.69	5.15	5.54	5.93	7.55	9.23
	140	3.58	3.81	4.10	4.42	4.75	5.08	5.59	6.02	6.46	8.26	10.13
100	10	2.04	2.01	2.05	2.10	2.17	2.24	2.35	2.45	2.55	2.95	3.36
	20	2.36	2.35	2.40	2.47	2.56	2.65	2.79	2.92	3.04	3.57	4.11
	40	2.80	2.81	2.90	3.01	3.13	3.25	3.46	3.63	3.81	4.56	5.36
	60	3.13	3.17	3.29	3.43	3.59	3.75	4.01	4.23	4.46	5.44	6.47
	80	3.40	3.48	3.63	3.81	4.00	4.20	4.51	4.78	5.06	6.25	7.50
	100	3.65	3.76	3.94	4.15	4.38	4.61	4.98	5.30	5.63	7.02	8.47
	120	3.88	4.02	4.23	4.48	4.74	5.01	5.43	5.80	6.18	7.75	9.40
	140	4.08	4.26	4.51	4.79	5.08	5.39	5.87	6.28	6.70	8.46	10.29
150	10	2.20	2.17	2.20	2.26	2.33	2.40	2.52	2.62	2.72	3.13	3.55
	20	2.56	2.54	2.60	2.67	2.76	2.85	3.00	3.12	3.25	3.78	4.32
	40	3.05	3.06	3.14	3.25	3.37	3.50	3.70	3.87	4.05	4.79	5.57
	60	3.42	3.46	3.57	3.71	3.86	4.02	4.27	4.49	4.71	5.66	6.67
	80	3.73	3.79	3.93	4.10	4.28	4.48	4.78	5.04	5.31	6.46	7.69
	100	4.00	4.09	4.26	4.46	4.67	4.90	5.25	5.56	5.88	7.22	8.65
	120	4.24	4.36	4.56	4.79	5.04	5.30	5.70	6.05	6.42	7.94	9.57
	140	4.47	4.62	4.85	5.11	5.38	5.68	6.13	6.53	6.93	8.64	10.46

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.32	2.29	2.33	2.39	2.46	2.53	2.65	2.75	2.86	3.28	3.70
	20	2.72	2.70	2.76	2.83	2.92	3.02	3.17	3.29	3.42	3.96	4.50
	40	3.26	3.27	3.35	3.46	3.58	3.71	3.91	4.08	4.26	4.99	5.76
	60	3.66	3.69	3.80	3.94	4.09	4.25	4.50	4.71	4.94	5.87	6.86
	80	3.99	4.05	4.18	4.35	4.53	4.72	5.02	5.28	5.54	6.66	7.87
	100	4.28	4.36	4.53	4.72	4.93	5.15	5.50	5.80	6.11	7.42	8.82
	120	4.54	4.65	4.84	5.06	5.30	5.56	5.95	6.29	6.64	8.14	9.74
	140	4.79	4.92	5.14	5.39	5.66	5.94	6.38	6.76	7.16	8.83	10.62
300	10	2.52	2.49	2.53	2.59	2.67	2.75	2.87	2.98	3.09	3.52	3.96
	20	2.98	2.96	3.02	3.10	3.19	3.29	3.44	3.58	3.71	4.26	4.81
	40	3.59	3.60	3.68	3.79	3.91	4.04	4.25	4.43	4.61	5.35	6.11
	60	4.04	4.07	4.18	4.32	4.47	4.63	4.88	5.10	5.32	6.24	7.21
	80	4.42	4.47	4.60	4.76	4.94	5.13	5.43	5.69	5.95	7.05	8.22
	100	4.74	4.81	4.97	5.16	5.37	5.59	5.93	6.22	6.52	7.80	9.16
	120	5.03	5.13	5.31	5.53	5.76	6.01	6.39	6.72	7.06	8.51	10.06
	140	5.30	5.42	5.63	5.87	6.13	6.40	6.83	7.20	7.58	9.20	10.93
400	10	2.68	2.65	2.70	2.76	2.84	2.92	3.05	3.16	3.27	3.72	4.17
	20	3.19	3.17	3.23	3.31	3.41	3.51	3.67	3.81	3.95	4.51	5.08
	40	3.86	3.86	3.95	4.06	4.19	4.32	4.53	4.71	4.90	5.65	6.42
	60	4.36	4.38	4.49	4.63	4.78	4.95	5.20	5.42	5.65	6.57	7.54
	80	4.76	4.81	4.94	5.11	5.29	5.48	5.78	6.03	6.30	7.39	8.54
	100	5.12	5.18	5.34	5.53	5.74	5.95	6.29	6.59	6.89	8.14	9.48
	120	5.44	5.52	5.70	5.92	6.15	6.39	6.77	7.10	7.44	8.86	10.38
	140	5.73	5.83	6.04	6.27	6.53	6.80	7.22	7.59	7.96	9.54	11.24
600	10	2.95	2.92	2.96	3.03	3.11	3.20	3.33	3.45	3.57	4.05	4.52
	20	3.53	3.51	3.57	3.66	3.76	3.87	4.04	4.18	4.33	4.92	5.51
	40	4.30	4.30	4.39	4.50	4.64	4.78	5.00	5.19	5.38	6.16	6.95
	60	4.86	4.88	4.99	5.14	5.30	5.47	5.73	5.96	6.19	7.13	8.11
	80	5.32	5.36	5.50	5.67	5.85	6.05	6.36	6.62	6.88	7.99	9.13
	100	5.73	5.78	5.94	6.13	6.34	6.57	6.91	7.21	7.51	8.76	10.08
	120	6.08	6.16	6.34	6.55	6.79	7.03	7.42	7.75	8.08	9.49	10.98
	140	6.41	6.51	6.70	6.94	7.20	7.47	7.89	8.25	8.63	10.18	11.84
800	10	3.16	3.13	3.17	3.25	3.33	3.42	3.57	3.69	3.81	4.31	4.81
	20	3.80	3.78	3.84	3.94	4.04	4.16	4.33	4.49	4.64	5.26	5.87
	40	4.65	4.65	4.74	4.86	5.00	5.15	5.38	5.57	5.77	6.58	7.39
	60	5.27	5.29	5.40	5.55	5.72	5.89	6.17	6.40	6.64	7.61	8.60
	80	5.78	5.81	5.95	6.13	6.32	6.52	6.83	7.10	7.38	8.50	9.65
	100	6.22	6.27	6.43	6.63	6.84	7.07	7.42	7.72	8.03	9.30	10.62
	120	6.61	6.68	6.86	7.08	7.32	7.57	7.96	8.29	8.63	10.04	11.53
	140	6.97	7.05	7.25	7.50	7.76	8.03	8.46	8.82	9.20	10.75	12.39

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.87	1.94	2.06	2.19	2.33	2.47	2.68	2.86	3.04	3.77	4.51
	20	2.20	2.37	2.56	2.75	2.95	3.15	3.46	3.72	3.97	5.01	6.07
	40	2.77	3.08	3.39	3.70	4.01	4.31	4.77	5.16	5.54	7.10	8.70
	60	3.26	3.70	4.12	4.53	4.93	5.33	5.93	6.42	6.92	8.94	11.00
	80	3.71	4.27	4.79	5.29	5.78	6.26	6.98	7.58	8.19	10.62	13.11
	100	4.14	4.81	5.42	6.01	6.58	7.14	7.98	8.67	9.37	12.20	15.09
	120	4.54	5.32	6.02	6.69	7.33	7.97	8.92	9.71	10.50	13.70	16.98
	140	4.93	5.81	6.59	7.34	8.06	8.77	9.83	10.71	11.58	15.14	18.79
25	10	2.37	2.37	2.44	2.53	2.64	2.76	2.94	3.10	3.27	3.95	4.67
	20	2.74	2.79	2.92	3.07	3.24	3.41	3.69	3.93	4.17	5.17	6.20
	40	3.30	3.47	3.71	3.97	4.25	4.53	4.97	5.34	5.71	7.23	8.81
	60	3.77	4.06	4.41	4.78	5.15	5.53	6.10	6.58	7.07	9.05	11.10
	80	4.20	4.61	5.06	5.52	5.98	6.45	7.15	7.73	8.32	10.73	13.20
	100	4.61	5.13	5.68	6.23	6.77	7.31	8.13	8.82	9.50	12.30	15.18
	120	4.99	5.63	6.27	6.90	7.52	8.14	9.07	9.85	10.63	13.80	17.06
	140	5.36	6.11	6.83	7.54	8.24	8.93	9.97	10.84	11.71	15.24	18.87
50	10	2.62	2.60	2.67	2.76	2.86	2.98	3.15	3.31	3.47	4.13	4.82
	20	3.05	3.08	3.19	3.32	3.48	3.64	3.90	4.13	4.36	5.32	6.34
	40	3.67	3.79	3.99	4.23	4.48	4.75	5.16	5.51	5.87	7.36	8.92
	60	4.17	4.39	4.69	5.02	5.37	5.72	6.27	6.74	7.22	9.17	11.20
	80	4.61	4.93	5.33	5.75	6.19	6.63	7.31	7.88	8.46	10.84	13.30
	100	5.02	5.44	5.93	6.44	6.96	7.49	8.29	8.96	9.64	12.41	15.27
	120	5.40	5.93	6.51	7.10	7.70	8.31	9.22	9.98	10.75	13.90	17.15
	140	5.77	6.40	7.07	7.74	8.42	9.09	10.11	10.97	11.83	15.33	18.95
100	10	2.94	2.92	2.99	3.08	3.18	3.30	3.47	3.63	3.78	4.43	5.11
	20	3.46	3.48	3.58	3.71	3.86	4.01	4.26	4.47	4.69	5.62	6.59
	40	4.18	4.27	4.45	4.66	4.89	5.13	5.52	5.85	6.19	7.62	9.14
	60	4.75	4.91	5.17	5.46	5.77	6.10	6.61	7.06	7.51	9.41	11.40
	80	5.23	5.47	5.81	6.18	6.58	6.99	7.63	8.18	8.74	11.06	13.49
	100	5.66	5.99	6.41	6.86	7.34	7.83	8.59	9.24	9.90	12.62	15.45
	120	6.07	6.48	6.98	7.51	8.07	8.63	9.51	10.25	11.00	14.10	17.32
	140	6.45	6.94	7.52	8.13	8.77	9.41	10.39	11.22	12.07	15.53	19.12
150	10	3.18	3.16	3.22	3.31	3.42	3.54	3.72	3.87	4.03	4.68	5.35
	20	3.76	3.77	3.87	4.00	4.15	4.31	4.55	4.76	4.98	5.88	6.84
	40	4.57	4.64	4.81	5.01	5.23	5.47	5.84	6.16	6.48	7.87	9.36
	60	5.18	5.32	5.56	5.83	6.13	6.44	6.93	7.36	7.79	9.64	11.60
	80	5.70	5.91	6.22	6.57	6.94	7.33	7.94	8.47	9.01	11.28	13.67
	100	6.17	6.45	6.83	7.25	7.69	8.16	8.89	9.51	10.15	12.82	15.63
	120	6.60	6.95	7.40	7.89	8.41	8.96	9.80	10.52	11.25	14.30	17.49
	140	7.00	7.42	7.94	8.51	9.11	9.72	10.67	11.48	12.31	15.72	19.28

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	3.37	3.35	3.41	3.51	3.62	3.73	3.92	4.08	4.24	4.90	5.57
	20	4.01	4.01	4.11	4.24	4.39	4.55	4.80	5.01	5.23	6.13	7.07
	40	4.88	4.94	5.11	5.31	5.53	5.76	6.12	6.43	6.76	8.12	9.57
	60	5.54	5.66	5.89	6.16	6.45	6.75	7.23	7.64	8.07	9.87	11.80
	80	6.10	6.28	6.57	6.91	7.27	7.64	8.23	8.74	9.27	11.49	13.86
	100	6.59	6.84	7.20	7.60	8.03	8.47	9.18	9.78	10.41	13.03	15.80
	120	7.04	7.35	7.78	8.25	8.75	9.27	10.08	10.78	11.49	14.50	17.66
	140	7.46	7.84	8.33	8.87	9.44	10.03	10.94	11.73	12.54	15.91	19.44
300	10	3.68	3.65	3.72	3.82	3.93	4.05	4.25	4.41	4.58	5.26	5.94
	20	4.41	4.41	4.51	4.64	4.79	4.95	5.21	5.42	5.64	6.55	7.49
	40	5.39	5.44	5.60	5.80	6.02	6.25	6.61	6.92	7.24	8.57	9.99
	60	6.12	6.23	6.45	6.71	6.99	7.29	7.75	8.15	8.56	10.31	12.19
	80	6.74	6.90	7.18	7.50	7.84	8.20	8.77	9.26	9.77	11.92	14.22
	100	7.28	7.50	7.83	8.21	8.62	9.05	9.72	10.30	10.90	13.43	16.15
	120	7.77	8.04	8.44	8.88	9.35	9.84	10.61	11.28	11.97	14.89	17.99
	140	8.22	8.55	9.01	9.51	10.04	10.60	11.47	12.23	13.01	16.28	19.76
400	10	3.93	3.90	3.97	4.07	4.19	4.32	4.51	4.68	4.86	5.55	6.26
	20	4.73	4.73	4.83	4.97	5.12	5.29	5.54	5.76	5.99	6.91	7.86
	40	5.80	5.85	6.01	6.21	6.43	6.66	7.02	7.33	7.65	8.98	10.38
	60	6.60	6.70	6.91	7.17	7.45	7.74	8.21	8.60	9.01	10.73	12.57
	80	7.26	7.41	7.68	8.00	8.33	8.69	9.25	9.73	10.23	12.33	14.59
	100	7.85	8.05	8.37	8.74	9.14	9.55	10.21	10.77	11.36	13.83	16.50
	120	8.37	8.62	9.00	9.43	9.88	10.36	11.11	11.76	12.43	15.27	18.32
	140	8.86	9.16	9.59	10.07	10.59	11.13	11.97	12.70	13.46	16.66	20.09
600	10	4.33	4.30	4.38	4.48	4.61	4.74	4.95	5.13	5.31	6.04	6.77
	20	5.25	5.24	5.35	5.49	5.65	5.83	6.10	6.33	6.56	7.51	8.48
	40	6.47	6.51	6.67	6.87	7.10	7.34	7.71	8.03	8.35	9.69	11.08
	60	7.37	7.46	7.67	7.93	8.21	8.51	8.97	9.37	9.78	11.48	13.28
	80	8.12	8.25	8.51	8.82	9.16	9.52	10.07	10.55	11.03	13.09	15.28
	100	8.77	8.94	9.26	9.62	10.01	10.42	11.06	11.62	12.18	14.59	17.17
	120	9.36	9.58	9.94	10.35	10.80	11.26	11.99	12.62	13.27	16.01	18.98
	140	9.89	10.16	10.57	11.03	11.53	12.05	12.87	13.57	14.30	17.39	20.72
800	10	4.66	4.63	4.70	4.82	4.95	5.09	5.30	5.49	5.68	6.44	7.20
	20	5.67	5.66	5.77	5.92	6.09	6.27	6.55	6.79	7.03	8.01	9.01
	40	7.01	7.04	7.21	7.42	7.65	7.90	8.28	8.60	8.94	10.30	11.70
	60	8.00	8.08	8.29	8.55	8.84	9.14	9.62	10.02	10.43	12.14	13.93
	80	8.81	8.93	9.19	9.51	9.85	10.21	10.77	11.24	11.73	13.77	15.94
	100	9.52	9.68	9.99	10.36	10.75	11.16	11.80	12.35	12.91	15.29	17.82
	120	10.16	10.36	10.71	11.13	11.57	12.03	12.75	13.38	14.02	16.71	19.62
	140	10.74	10.98	11.38	11.84	12.33	12.85	13.65	14.35	15.06	18.08	21.34

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.80	2.99	3.21	3.45	3.70	3.94	4.31	4.63	4.94	6.21	7.51
	20	3.47	3.83	4.20	4.58	4.95	5.32	5.88	6.34	6.81	8.70	10.63
	40	4.59	5.25	5.87	6.47	7.06	7.64	8.51	9.23	9.95	12.88	15.88
	60	5.58	6.50	7.33	8.13	8.90	9.67	10.81	11.76	12.71	16.55	20.48
	80	6.48	7.64	8.67	9.65	10.60	11.54	12.93	14.08	15.24	19.91	24.71
	100	7.33	8.72	9.93	11.08	12.19	13.29	14.91	16.26	17.61	23.07	28.67
	120	8.14	9.74	11.13	12.44	13.71	14.95	16.80	18.33	19.87	26.08	32.45
	140	8.91	10.72	12.28	13.75	15.16	16.55	18.61	20.32	22.04	28.96	36.06
25	10	3.44	3.49	3.64	3.83	4.03	4.25	4.59	4.88	5.17	6.40	7.67
	20	4.11	4.30	4.58	4.90	5.24	5.58	6.11	6.55	7.01	8.86	10.76
	40	5.18	5.66	6.20	6.75	7.30	7.86	8.70	9.41	10.12	13.01	15.99
	60	6.12	6.87	7.63	8.38	9.13	9.87	10.99	11.92	12.86	16.67	20.58
	80	6.99	7.99	8.95	9.89	10.81	11.72	13.09	14.23	15.38	20.02	24.80
	100	7.81	9.04	10.19	11.30	12.39	13.46	15.07	16.40	17.74	23.18	28.76
	120	8.60	10.05	11.38	12.65	13.90	15.12	16.95	18.47	20.00	26.18	32.53
	140	9.36	11.02	12.52	13.95	15.34	16.71	18.76	20.45	22.16	29.06	36.15
50	10	3.80	3.83	3.96	4.13	4.32	4.52	4.84	5.11	5.40	6.58	7.82
	20	4.54	4.68	4.92	5.21	5.51	5.83	6.33	6.76	7.20	9.01	10.90
	40	5.66	6.04	6.51	7.02	7.54	8.08	8.89	9.58	10.28	13.14	16.10
	60	6.60	7.22	7.92	8.63	9.34	10.07	11.16	12.08	13.01	16.78	20.68
	80	7.46	8.32	9.22	10.12	11.01	11.91	13.25	14.38	15.51	20.13	24.90
	100	8.27	9.36	10.45	11.52	12.58	13.64	15.22	16.55	17.87	23.28	28.85
	120	9.04	10.36	11.63	12.86	14.08	15.29	17.10	18.61	20.12	26.28	32.62
	140	9.79	11.31	12.76	14.15	15.52	16.87	18.90	20.58	22.28	29.15	36.23
100	10	4.30	4.31	4.43	4.59	4.77	4.96	5.27	5.53	5.80	6.93	8.13
	20	5.16	5.25	5.47	5.72	6.00	6.29	6.76	7.16	7.58	9.32	11.16
	40	6.40	6.68	7.08	7.53	8.00	8.50	9.27	9.93	10.61	13.41	16.33
	60	7.40	7.88	8.47	9.11	9.77	10.46	11.51	12.40	13.30	17.02	20.89
	80	8.28	8.96	9.75	10.57	11.42	12.27	13.58	14.68	15.79	20.36	25.08
	100	9.10	9.98	10.96	11.96	12.97	13.99	15.53	16.83	18.14	23.49	29.03
	120	9.87	10.96	12.11	13.28	14.45	15.62	17.39	18.88	20.37	26.48	32.79
	140	10.60	11.90	13.23	14.55	15.87	17.19	19.18	20.84	22.52	29.34	36.39
150	10	4.65	4.66	4.78	4.94	5.12	5.31	5.61	5.87	6.14	7.25	8.42
	20	5.61	5.69	5.89	6.14	6.41	6.69	7.14	7.53	7.93	9.62	11.42
	40	6.96	7.20	7.57	7.99	8.43	8.90	9.64	10.28	10.93	13.66	16.55
	60	8.02	8.43	8.97	9.56	10.19	10.84	11.85	12.71	13.60	17.26	21.09
	80	8.95	9.53	10.25	11.01	11.81	12.63	13.90	14.97	16.07	20.58	25.27
	100	9.79	10.56	11.44	12.38	13.35	14.33	15.83	17.11	18.40	23.70	29.21
	120	10.58	11.53	12.59	13.69	14.81	15.95	17.68	19.14	20.62	26.68	32.96
	140	11.32	12.46	13.69	14.95	16.23	17.51	19.46	21.10	22.76	29.54	36.55

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	4.95	4.95	5.06	5.23	5.41	5.60	5.90	6.17	6.43	7.54	8.70
	20	5.98	6.05	6.25	6.49	6.76	7.04	7.48	7.86	8.25	9.91	11.68
	40	7.43	7.64	7.99	8.39	8.82	9.28	9.99	10.61	11.24	13.92	16.77
	60	8.55	8.92	9.42	9.99	10.58	11.21	12.18	13.02	13.89	17.49	21.29
	80	9.52	10.04	10.71	11.43	12.20	12.99	14.22	15.27	16.34	20.79	25.46
	100	10.39	11.08	11.90	12.79	13.72	14.67	16.14	17.39	18.66	23.91	29.39
	120	11.20	12.05	13.04	14.09	15.17	16.28	17.97	19.41	20.87	26.88	33.13
	140	11.96	12.98	14.14	15.34	16.57	17.83	19.74	21.36	23.00	29.73	36.72
300	10	5.42	5.41	5.53	5.70	5.88	6.08	6.39	6.66	6.93	8.04	9.20
	20	6.59	6.64	6.84	7.08	7.34	7.62	8.06	8.44	8.82	10.45	12.17
	40	8.19	8.38	8.71	9.09	9.51	9.94	10.63	11.22	11.83	14.43	17.21
	60	9.42	9.74	10.21	10.74	11.30	11.89	12.82	13.63	14.45	17.96	21.69
	80	10.47	10.92	11.53	12.20	12.92	13.67	14.83	15.84	16.88	21.23	25.83
	100	11.40	11.99	12.74	13.56	14.43	15.33	16.73	17.94	19.17	24.32	29.74
	120	12.25	12.99	13.89	14.86	15.87	16.92	18.55	19.94	21.36	27.27	33.46
	140	13.05	13.94	14.98	16.10	17.26	18.45	20.30	21.87	23.48	30.11	37.04
400	10	5.80	5.79	5.91	6.08	6.27	6.47	6.79	7.06	7.34	8.47	9.63
	20	7.08	7.13	7.32	7.56	7.83	8.11	8.55	8.93	9.32	10.93	12.63
	40	8.82	8.99	9.31	9.69	10.09	10.52	11.20	11.78	12.38	14.91	17.64
	60	10.14	10.43	10.88	11.39	11.94	12.51	13.41	14.19	15.00	18.41	22.08
	80	11.25	11.66	12.24	12.89	13.57	14.29	15.42	16.40	17.40	21.66	26.20
	100	12.24	12.78	13.49	14.27	15.09	15.96	17.31	18.48	19.68	24.73	30.09
	120	13.14	13.81	14.65	15.57	16.53	17.54	19.11	20.46	21.85	27.67	33.80
	140	13.98	14.78	15.75	16.81	17.91	19.06	20.85	22.38	23.95	30.49	37.37
600	10	6.42	6.41	6.53	6.71	6.91	7.12	7.45	7.73	8.02	9.19	10.38
	20	7.87	7.91	8.11	8.35	8.63	8.92	9.37	9.76	10.15	11.78	13.47
	40	9.84	9.98	10.30	10.67	11.08	11.51	12.17	12.75	13.34	15.82	18.47
	60	11.31	11.56	11.99	12.49	13.02	13.58	14.46	15.22	15.99	19.30	22.86
	80	12.54	12.90	13.45	14.06	14.72	15.42	16.50	17.43	18.40	22.51	26.94
	100	13.62	14.09	14.75	15.49	16.28	17.10	18.39	19.51	20.66	25.54	30.79
	120	14.60	15.19	15.97	16.83	17.74	18.69	20.18	21.48	22.81	28.45	34.47
	140	15.51	16.21	17.10	18.09	19.13	20.21	21.90	23.37	24.88	31.24	38.02
800	10	6.92	6.90	7.03	7.22	7.42	7.64	7.99	8.28	8.58	9.78	11.00
	20	8.52	8.55	8.75	9.00	9.28	9.58	10.04	10.44	10.84	12.50	14.20
	40	10.66	10.80	11.11	11.49	11.90	12.33	13.00	13.58	14.17	16.63	19.25
	60	12.26	12.49	12.92	13.41	13.94	14.50	15.37	16.12	16.89	20.13	23.62
	80	13.59	13.92	14.45	15.06	15.71	16.39	17.45	18.37	19.32	23.33	27.66
	100	14.76	15.19	15.83	16.55	17.31	18.12	19.37	20.46	21.58	26.34	31.48
	120	15.81	16.34	17.09	17.92	18.81	19.73	21.18	22.43	23.72	29.22	35.14
	140	16.78	17.42	18.27	19.21	20.22	21.26	22.90	24.32	25.78	31.99	38.66

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	4.36	4.78	5.23	5.68	6.13	6.58	7.25	7.82	8.38	10.68	13.02
	20	5.70	6.47	7.21	7.93	8.63	9.33	10.38	11.25	12.12	15.65	19.27
	40	7.95	9.32	10.55	11.71	12.85	13.97	15.63	17.02	18.41	24.02	29.76
	60	9.92	11.81	13.47	15.03	16.54	18.03	20.24	22.08	23.92	31.35	38.97
	80	11.73	14.10	16.15	18.08	19.94	21.77	24.48	26.72	28.98	38.08	47.42
	100	13.42	16.25	18.67	20.94	23.12	25.27	28.45	31.09	33.73	44.40	55.35
	120	15.04	18.29	21.07	23.66	26.15	28.60	32.23	35.23	38.24	50.41	62.90
	140	16.59	20.25	23.36	26.27	29.06	31.80	35.85	39.21	42.57	56.17	70.13
25	10	5.12	5.34	5.68	6.06	6.47	6.89	7.53	8.07	8.62	10.87	13.18
	20	6.39	6.96	7.60	8.26	8.92	9.60	10.61	11.46	12.32	15.81	19.40
	40	8.55	9.73	10.87	11.99	13.09	14.19	15.83	17.20	18.57	24.15	29.88
	60	10.46	12.18	13.76	15.28	16.77	18.23	20.42	22.24	24.07	31.47	39.07
	80	12.23	14.44	16.43	18.31	20.15	21.95	24.64	26.88	29.12	38.19	47.51
	100	13.91	16.57	18.93	21.16	23.32	25.45	28.60	31.23	33.86	44.50	55.44
	120	15.50	18.60	21.32	23.87	26.34	28.77	32.37	35.37	38.37	50.51	62.98
	140	17.03	20.55	23.60	26.47	29.24	31.96	35.99	39.34	42.69	56.27	70.21
50	10	5.64	5.79	6.08	6.43	6.80	7.19	7.79	8.32	8.85	11.05	13.34
	20	6.97	7.41	7.97	8.58	9.21	9.85	10.84	11.67	12.51	15.97	19.53
	40	9.11	10.13	11.19	12.26	13.34	14.41	16.02	17.38	18.74	24.28	29.99
	60	10.99	12.54	14.06	15.53	16.99	18.43	20.60	22.40	24.22	31.58	39.17
	80	12.73	14.78	16.70	18.54	20.35	22.14	24.80	27.03	29.25	38.30	47.61
	100	14.38	16.90	19.19	21.38	23.51	25.62	28.76	31.37	33.99	44.61	55.53
	120	15.96	18.91	21.56	24.08	26.53	28.94	32.52	35.51	38.49	50.61	63.07
	140	17.47	20.85	23.84	26.67	29.42	32.12	36.13	39.47	42.82	56.36	70.29
100	10	6.37	6.47	6.73	7.04	7.38	7.74	8.30	8.79	9.30	11.42	13.65
	20	7.85	8.17	8.65	9.19	9.76	10.36	11.29	12.09	12.90	16.28	19.80
	40	10.08	10.89	11.82	12.81	13.82	14.84	16.41	17.73	19.07	24.54	30.21
	60	11.97	13.26	14.63	16.03	17.42	18.83	20.95	22.72	24.51	31.82	39.37
	80	13.69	15.46	17.24	19.01	20.76	22.51	25.13	27.33	29.53	38.52	47.80
	100	15.30	17.54	19.70	21.82	23.90	25.97	29.07	31.65	34.25	44.82	55.71
	120	16.85	19.53	22.06	24.50	26.90	29.27	32.82	35.78	38.75	50.81	63.24
	140	18.34	21.44	24.32	27.08	29.78	32.44	36.42	39.73	43.06	56.56	70.46
150	10	6.91	6.99	7.23	7.53	7.86	8.21	8.75	9.23	9.71	11.77	13.96
	20	8.52	8.79	9.23	9.73	10.27	10.84	11.73	12.49	13.28	16.58	20.06
	40	10.88	11.57	12.41	13.33	14.29	15.27	16.79	18.08	19.39	24.80	30.44
	60	12.81	13.93	15.20	16.51	17.86	19.22	21.29	23.04	24.81	32.06	39.57
	80	14.55	16.11	17.78	19.46	21.16	22.87	25.45	27.62	29.81	38.74	47.98
	100	16.16	18.17	20.21	22.25	24.29	26.32	29.38	31.94	34.51	45.03	55.89
	120	17.70	20.13	22.54	24.92	27.27	29.61	33.11	36.05	39.00	51.01	63.41
	140	19.17	22.03	24.79	27.48	30.13	32.76	36.70	39.99	43.30	56.75	70.62

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	TEMPERATURE RISE °F	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
200	10	7.35	7.42	7.66	7.95	8.28	8.62	9.16	9.62	10.10	12.12	14.27
	20	9.07	9.32	9.73	10.22	10.74	11.28	12.14	12.89	13.65	16.89	20.32
	40	11.56	12.17	12.96	13.83	14.75	15.70	17.17	18.43	19.72	25.06	30.66
	60	13.55	14.56	15.74	16.99	18.29	19.61	21.64	23.36	25.11	32.30	39.78
	80	15.32	16.74	18.30	19.92	21.57	23.24	25.78	27.92	30.09	38.96	48.17
	100	16.95	18.78	20.72	22.68	24.67	26.67	29.68	32.22	34.78	45.24	56.07
	120	18.49	20.73	23.03	25.33	27.63	29.94	33.41	36.32	39.25	51.21	63.58
	140	19.96	22.61	25.26	27.88	30.48	33.08	36.99	40.25	43.54	56.94	70.79
300	10	8.07	8.13	8.36	8.65	8.97	9.31	9.85	10.31	10.78	12.76	14.85
	20	9.98	10.19	10.58	11.05	11.55	12.08	12.90	13.62	14.36	17.49	20.84
	40	12.68	13.21	13.94	14.75	15.60	16.50	17.90	19.11	20.36	25.58	31.10
	60	14.81	15.68	16.74	17.90	19.12	20.37	22.32	23.99	25.69	32.77	40.18
	80	16.66	17.88	19.30	20.80	22.36	23.96	26.42	28.51	30.63	39.40	48.55
	100	18.34	19.92	21.69	23.54	25.43	27.35	30.29	32.78	35.30	45.65	56.42
	120	19.91	21.86	23.98	26.15	28.36	30.60	33.99	36.85	39.75	51.61	63.92
	140	21.40	23.73	26.18	28.67	31.19	33.72	37.55	40.77	44.02	57.32	71.11
400	10	8.65	8.70	8.93	9.23	9.55	9.89	10.43	10.89	11.37	13.33	15.40
	20	10.73	10.91	11.30	11.75	12.25	12.77	13.58	14.28	15.01	18.07	21.35
	40	13.62	14.10	14.79	15.56	16.39	17.25	18.60	19.78	20.98	26.09	31.54
	60	15.86	16.65	17.65	18.74	19.90	21.11	22.99	24.61	26.27	33.24	40.58
	80	17.80	18.90	20.22	21.64	23.13	24.67	27.05	29.10	31.18	39.84	48.92
	100	19.54	20.97	22.61	24.36	26.17	28.03	30.90	33.34	35.82	46.07	56.78
	120	21.16	22.92	24.89	26.95	29.08	31.25	34.57	37.39	40.24	52.00	64.26
	140	22.68	24.78	27.07	29.45	31.89	34.35	38.11	41.29	44.50	57.71	71.44
600	10	9.60	9.64	9.87	10.17	10.50	10.85	11.40	11.88	12.36	14.34	16.40
	20	11.93	12.10	12.47	12.92	13.42	13.93	14.74	15.44	16.15	19.14	22.34
	40	15.15	15.57	16.22	16.96	17.75	18.58	19.88	21.01	22.17	27.10	32.41
	60	17.60	18.29	19.22	20.24	21.34	22.48	24.27	25.81	27.41	34.16	41.38
	80	19.69	20.65	21.86	23.18	24.57	26.02	28.29	30.25	32.26	40.71	49.67
	100	21.56	22.80	24.29	25.90	27.60	29.36	32.09	34.44	36.84	46.90	57.48
	120	23.27	24.79	26.58	28.49	30.48	32.54	35.72	38.45	41.23	52.80	64.93
	140	24.86	26.69	28.76	30.96	33.25	35.60	39.22	42.31	45.45	58.47	72.09
800	10	10.37	10.40	10.63	10.94	11.28	11.64	12.21	12.69	13.18	15.20	17.27
	20	12.92	13.07	13.44	13.89	14.39	14.91	15.73	16.42	17.14	20.11	23.27
	40	16.40	16.78	17.42	18.15	18.93	19.74	21.02	22.12	23.26	28.08	33.28
	60	19.04	19.66	20.55	21.55	22.61	23.71	25.45	26.95	28.49	35.08	42.17
	80	21.26	22.14	23.28	24.55	25.89	27.28	29.47	31.36	33.31	41.58	50.41
	100	23.24	24.37	25.77	27.31	28.93	30.61	33.24	35.52	37.86	47.72	58.19
	120	25.04	26.43	28.10	29.90	31.80	33.78	36.85	39.49	42.21	53.58	65.61
	140	26.71	28.36	30.30	32.38	34.56	36.82	40.32	43.32	46.40	59.23	72.74

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.34	1.36	1.42	1.49	1.57	1.65	1.77	1.88	1.99	2.43	2.87
	20	1.51	1.58	1.67	1.78	1.89	2.00	2.18	2.32	2.47	3.06	3.66
	40	1.80	1.94	2.10	2.27	2.43	2.60	2.85	3.06	3.27	4.13	5.00
	60	2.06	2.27	2.48	2.69	2.91	3.12	3.44	3.71	3.98	5.06	6.17
	80	2.29	2.56	2.83	3.09	3.35	3.60	3.98	4.30	4.62	5.92	7.24
	100	2.51	2.84	3.15	3.46	3.76	4.05	4.49	4.86	5.23	6.72	8.25
	120	2.72	3.10	3.46	3.81	4.15	4.48	4.98	5.39	5.81	7.49	9.21
	140	2.92	3.36	3.76	4.14	4.52	4.89	5.44	5.90	6.36	8.23	10.13
25	10	1.72	1.69	1.73	1.78	1.84	1.91	2.02	2.11	2.21	2.61	3.03
	20	1.94	1.94	1.99	2.07	2.16	2.25	2.40	2.53	2.66	3.22	3.80
	40	2.26	2.31	2.41	2.54	2.67	2.82	3.04	3.24	3.44	4.26	5.11
	60	2.52	2.62	2.77	2.94	3.13	3.32	3.62	3.87	4.13	5.18	6.27
	80	2.75	2.90	3.10	3.32	3.55	3.79	4.15	4.46	4.76	6.03	7.34
	100	2.96	3.16	3.41	3.68	3.95	4.23	4.65	5.01	5.37	6.83	8.34
	120	3.16	3.41	3.71	4.02	4.33	4.65	5.13	5.53	5.94	7.59	9.29
	140	3.35	3.66	4.00	4.35	4.70	5.05	5.59	6.04	6.49	8.32	10.21
50	10	1.89	1.86	1.89	1.94	2.00	2.07	2.18	2.27	2.37	2.76	3.17
	20	2.15	2.14	2.19	2.27	2.35	2.44	2.58	2.71	2.83	3.37	3.93
	40	2.53	2.55	2.64	2.76	2.88	3.01	3.23	3.41	3.60	4.39	5.22
	60	2.82	2.88	3.01	3.17	3.33	3.51	3.79	4.03	4.28	5.30	6.37
	80	3.07	3.17	3.34	3.54	3.75	3.97	4.31	4.60	4.90	6.14	7.43
	100	3.29	3.44	3.65	3.89	4.14	4.40	4.80	5.15	5.50	6.94	8.43
	120	3.50	3.69	3.95	4.22	4.52	4.82	5.28	5.67	6.06	7.69	9.38
	140	3.70	3.93	4.23	4.55	4.88	5.21	5.73	6.17	6.61	8.42	10.29
100	10	2.11	2.08	2.11	2.16	2.22	2.29	2.41	2.50	2.60	3.00	3.41
	20	2.44	2.42	2.47	2.54	2.62	2.71	2.86	2.98	3.10	3.63	4.17
	40	2.88	2.90	2.98	3.09	3.21	3.33	3.53	3.71	3.89	4.64	5.44
	60	3.22	3.27	3.38	3.52	3.68	3.84	4.10	4.33	4.56	5.53	6.57
	80	3.51	3.59	3.73	3.91	4.10	4.30	4.62	4.89	5.17	6.36	7.62
	100	3.77	3.87	4.05	4.26	4.49	4.73	5.10	5.42	5.76	7.14	8.61
	120	4.00	4.14	4.35	4.60	4.86	5.14	5.56	5.93	6.31	7.89	9.55
	140	4.21	4.39	4.64	4.92	5.22	5.53	6.01	6.42	6.85	8.61	10.46
150	10	2.27	2.23	2.26	2.32	2.39	2.46	2.57	2.67	2.77	3.18	3.60
	20	2.64	2.62	2.67	2.74	2.83	2.92	3.06	3.19	3.32	3.84	4.38
	40	3.15	3.15	3.23	3.34	3.46	3.58	3.78	3.95	4.13	4.87	5.65
	60	3.52	3.56	3.67	3.80	3.96	4.12	4.37	4.59	4.81	5.76	6.77
	80	3.84	3.90	4.04	4.21	4.39	4.59	4.89	5.15	5.43	6.58	7.81
	100	4.12	4.21	4.38	4.58	4.79	5.02	5.38	5.68	6.00	7.35	8.78
	120	4.37	4.49	4.69	4.92	5.17	5.43	5.84	6.19	6.55	8.09	9.72
	140	4.61	4.76	4.98	5.25	5.53	5.82	6.28	6.68	7.08	8.80	10.62

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.39	2.36	2.39	2.45	2.52	2.59	2.71	2.81	2.91	3.33	3.75
	20	2.81	2.78	2.83	2.91	3.00	3.09	3.24	3.36	3.49	4.02	4.57
	40	3.36	3.36	3.44	3.55	3.67	3.79	3.99	4.17	4.34	5.08	5.85
	60	3.77	3.80	3.90	4.04	4.19	4.35	4.60	4.82	5.04	5.97	6.96
	80	4.11	4.17	4.30	4.46	4.64	4.83	5.13	5.39	5.66	6.78	7.99
	100	4.41	4.49	4.65	4.85	5.06	5.28	5.63	5.93	6.24	7.55	8.96
	120	4.68	4.79	4.98	5.20	5.44	5.69	6.09	6.43	6.79	8.29	9.89
	140	4.93	5.07	5.28	5.53	5.80	6.09	6.53	6.92	7.31	8.99	10.78
300	10	2.60	2.57	2.60	2.66	2.73	2.81	2.93	3.04	3.15	3.58	4.02
	20	3.07	3.05	3.10	3.18	3.27	3.36	3.52	3.65	3.78	4.33	4.88
	40	3.70	3.70	3.78	3.89	4.01	4.14	4.34	4.52	4.70	5.44	6.21
	60	4.17	4.19	4.29	4.43	4.58	4.74	4.99	5.21	5.43	6.35	7.32
	80	4.55	4.59	4.73	4.89	5.07	5.26	5.55	5.81	6.07	7.17	8.34
	100	4.89	4.95	5.11	5.30	5.50	5.72	6.06	6.36	6.66	7.93	9.30
	120	5.19	5.28	5.46	5.67	5.91	6.15	6.54	6.87	7.21	8.66	10.22
	140	5.46	5.58	5.78	6.02	6.28	6.56	6.99	7.36	7.74	9.36	11.11
400	10	2.77	2.73	2.77	2.83	2.91	2.99	3.11	3.22	3.33	3.78	4.23
	20	3.29	3.26	3.32	3.40	3.49	3.59	3.75	3.88	4.02	4.58	5.15
	40	3.98	3.97	4.06	4.17	4.29	4.42	4.63	4.81	5.00	5.75	6.52
	60	4.49	4.50	4.61	4.75	4.90	5.06	5.32	5.54	5.76	6.68	7.65
	80	4.91	4.95	5.08	5.24	5.42	5.61	5.91	6.16	6.42	7.52	8.67
	100	5.27	5.33	5.49	5.67	5.88	6.10	6.44	6.73	7.03	8.29	9.63
	120	5.60	5.68	5.86	6.07	6.30	6.54	6.93	7.25	7.59	9.02	10.54
	140	5.90	6.00	6.20	6.44	6.69	6.96	7.39	7.75	8.13	9.71	11.42
600	10	3.04	3.00	3.04	3.11	3.18	3.27	3.41	3.52	3.64	4.11	4.59
	20	3.64	3.61	3.66	3.75	3.85	3.96	4.12	4.27	4.41	5.00	5.59
	40	4.43	4.42	4.50	4.62	4.75	4.89	5.11	5.30	5.49	6.26	7.05
	60	5.01	5.02	5.13	5.27	5.43	5.60	5.86	6.08	6.31	7.26	8.23
	80	5.48	5.51	5.65	5.81	6.00	6.19	6.50	6.76	7.02	8.12	9.27
	100	5.90	5.95	6.10	6.29	6.50	6.72	7.06	7.36	7.66	8.92	10.24
	120	6.27	6.33	6.51	6.72	6.96	7.20	7.58	7.91	8.25	9.66	11.15
	140	6.60	6.69	6.89	7.12	7.38	7.65	8.07	8.43	8.80	10.36	12.02
800	10	3.26	3.22	3.26	3.33	3.41	3.50	3.64	3.76	3.89	4.38	4.87
	20	3.92	3.89	3.95	4.04	4.14	4.25	4.43	4.58	4.73	5.34	5.96
	40	4.79	4.78	4.87	4.99	5.12	5.27	5.50	5.69	5.89	6.69	7.50
	60	5.43	5.44	5.55	5.69	5.86	6.03	6.30	6.54	6.77	7.74	8.73
	80	5.95	5.98	6.11	6.28	6.47	6.67	6.98	7.25	7.52	8.64	9.80
	100	6.41	6.45	6.60	6.80	7.01	7.24	7.59	7.89	8.19	9.46	10.78
	120	6.81	6.87	7.04	7.26	7.50	7.75	8.14	8.47	8.81	10.22	11.70
	140	7.18	7.25	7.45	7.69	7.95	8.22	8.65	9.01	9.38	10.94	12.58

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft · (RADIUS = 36.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.94	2.01	2.12	2.25	2.39	2.53	2.74	2.92	3.10	3.83	4.58
	20	2.28	2.45	2.64	2.83	3.04	3.24	3.54	3.80	4.06	5.10	6.16
	40	2.87	3.18	3.50	3.81	4.12	4.43	4.89	5.28	5.67	7.23	8.83
	60	3.38	3.83	4.25	4.67	5.07	5.47	6.08	6.58	7.08	9.10	11.17
	80	3.85	4.42	4.95	5.45	5.95	6.43	7.16	7.77	8.37	10.82	13.32
	100	4.29	4.97	5.60	6.19	6.77	7.34	8.18	8.88	9.59	12.43	15.34
	120	4.71	5.50	6.22	6.89	7.55	8.19	9.15	9.95	10.74	13.96	17.26
	140	5.11	6.01	6.81	7.56	8.29	9.01	10.08	10.97	11.85	15.43	19.10
25	10	2.45	2.44	2.51	2.60	2.71	2.82	3.01	3.17	3.33	4.02	4.74
	20	2.83	2.88	3.00	3.15	3.32	3.50	3.77	4.01	4.26	5.26	6.30
	40	3.41	3.58	3.82	4.09	4.37	4.65	5.09	5.46	5.83	7.37	8.95
	60	3.90	4.19	4.55	4.92	5.29	5.68	6.25	6.74	7.23	9.22	11.28
	80	4.35	4.76	5.22	5.69	6.15	6.62	7.33	7.92	8.51	10.93	13.42
	100	4.76	5.30	5.86	6.41	6.96	7.51	8.34	9.03	9.72	12.54	15.43
	120	5.17	5.82	6.47	7.10	7.73	8.36	9.30	10.08	10.87	14.06	17.34
	140	5.55	6.31	7.05	7.77	8.48	9.18	10.22	11.10	11.98	15.53	19.18
50	10	2.70	2.68	2.74	2.83	2.94	3.05	3.22	3.38	3.54	4.20	4.89
	20	3.15	3.17	3.28	3.42	3.57	3.73	3.99	4.22	4.45	5.41	6.43
	40	3.79	3.91	4.11	4.35	4.60	4.87	5.28	5.64	6.00	7.50	9.06
	60	4.30	4.53	4.83	5.16	5.51	5.87	6.43	6.90	7.38	9.34	11.38
	80	4.76	5.09	5.49	5.92	6.36	6.81	7.49	8.07	8.65	11.04	13.51
	100	5.18	5.62	6.11	6.63	7.16	7.69	8.49	9.17	9.85	12.64	15.52
	120	5.58	6.12	6.71	7.31	7.92	8.53	9.45	10.22	11.00	14.17	17.43
	140	5.96	6.61	7.29	7.97	8.65	9.34	10.37	11.23	12.10	15.63	19.26
100	10	3.04	3.01	3.07	3.16	3.26	3.37	3.55	3.70	3.86	4.51	5.18
	20	3.57	3.58	3.68	3.81	3.95	4.11	4.36	4.57	4.79	5.71	6.69
	40	4.32	4.40	4.58	4.79	5.02	5.26	5.65	5.98	6.32	7.76	9.28
	60	4.90	5.06	5.31	5.61	5.92	6.25	6.77	7.22	7.67	9.58	11.58
	80	5.40	5.64	5.98	6.35	6.75	7.17	7.81	8.37	8.93	11.27	13.70
	100	5.85	6.17	6.60	7.06	7.54	8.04	8.80	9.45	10.12	12.85	15.70
	120	6.26	6.68	7.18	7.73	8.29	8.86	9.74	10.49	11.25	14.37	17.60
	140	6.66	7.16	7.75	8.37	9.01	9.66	10.65	11.49	12.34	15.82	19.43
150	10	3.28	3.25	3.31	3.40	3.50	3.62	3.80	3.95	4.11	4.76	5.43
	20	3.88	3.88	3.98	4.11	4.25	4.41	4.65	4.86	5.08	5.99	6.94
	40	4.71	4.78	4.94	5.14	5.37	5.60	5.97	6.29	6.62	8.02	9.50
	60	5.34	5.48	5.71	5.99	6.29	6.60	7.10	7.52	7.96	9.82	11.78
	80	5.88	6.09	6.40	6.75	7.12	7.51	8.13	8.66	9.20	11.49	13.89
	100	6.36	6.64	7.02	7.45	7.90	8.37	9.10	9.73	10.38	13.06	15.88
	120	6.80	7.16	7.61	8.11	8.64	9.19	10.04	10.76	11.50	14.57	17.77
	140	7.22	7.65	8.18	8.75	9.36	9.98	10.93	11.75	12.58	16.01	19.59

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.48	3.44	3.51	3.60	3.70	3.82	4.00	4.16	4.32	4.98	5.65
	20	4.13	4.13	4.23	4.36	4.50	4.66	4.90	5.12	5.33	6.23	7.18
	40	5.03	5.09	5.25	5.45	5.67	5.90	6.26	6.57	6.90	8.26	9.72
	60	5.71	5.83	6.06	6.32	6.61	6.92	7.39	7.81	8.24	10.05	11.98
	80	6.28	6.47	6.76	7.10	7.46	7.83	8.43	8.94	9.47	11.70	14.08
	100	6.79	7.04	7.40	7.81	8.24	8.69	9.40	10.01	10.63	13.27	16.06
	120	7.26	7.57	8.00	8.48	8.98	9.50	10.32	11.03	11.75	14.77	17.94
	140	7.69	8.08	8.57	9.11	9.69	10.29	11.21	12.01	12.82	16.21	19.76
300	10	3.79	3.76	3.82	3.92	4.03	4.15	4.34	4.50	4.67	5.34	6.03
	20	4.54	4.53	4.63	4.76	4.91	5.07	5.32	5.54	5.76	6.66	7.60
	40	5.55	5.60	5.76	5.95	6.17	6.40	6.76	7.07	7.39	8.72	10.14
	60	6.31	6.41	6.63	6.89	7.17	7.46	7.93	8.33	8.74	10.50	12.38
	80	6.95	7.10	7.38	7.70	8.04	8.40	8.97	9.47	9.98	12.13	14.45
	100	7.50	7.72	8.05	8.43	8.84	9.27	9.94	10.53	11.13	13.68	16.41
	120	8.01	8.28	8.67	9.12	9.59	10.09	10.87	11.54	12.23	15.16	18.28
	140	8.48	8.81	9.26	9.77	10.31	10.87	11.75	12.51	13.29	16.59	20.08
400	10	4.05	4.01	4.08	4.18	4.29	4.42	4.61	4.78	4.95	5.65	6.35
	20	4.87	4.86	4.96	5.09	5.25	5.41	5.67	5.89	6.11	7.03	7.97
	40	5.98	6.02	6.17	6.37	6.59	6.82	7.18	7.49	7.81	9.14	10.54
	60	6.80	6.89	7.10	7.36	7.64	7.93	8.39	8.79	9.20	10.92	12.76
	80	7.49	7.63	7.89	8.21	8.54	8.90	9.46	9.94	10.44	12.55	14.82
	100	8.09	8.28	8.60	8.97	9.37	9.79	10.44	11.01	11.60	14.08	16.76
	120	8.63	8.87	9.25	9.68	10.14	10.62	11.37	12.02	12.69	15.55	18.62
	140	9.13	9.43	9.86	10.34	10.86	11.40	12.25	12.99	13.75	16.97	20.41
600	10	4.47	4.43	4.49	4.60	4.72	4.85	5.06	5.23	5.41	6.14	6.87
	20	5.41	5.39	5.49	5.63	5.79	5.96	6.23	6.46	6.69	7.64	8.61
	40	6.66	6.69	6.85	7.05	7.27	7.51	7.88	8.20	8.52	9.86	11.25
	60	7.59	7.67	7.88	8.13	8.42	8.71	9.17	9.57	9.98	11.68	13.48
	80	8.36	8.48	8.74	9.05	9.39	9.74	10.30	10.77	11.26	13.32	15.52
	100	9.03	9.20	9.51	9.87	10.26	10.67	11.32	11.87	12.44	14.85	17.45
	120	9.64	9.85	10.21	10.62	11.07	11.54	12.27	12.90	13.55	16.31	19.28
	140	10.19	10.45	10.86	11.32	11.82	12.35	13.16	13.87	14.60	17.71	21.05
800	10	4.80	4.76	4.83	4.94	5.07	5.20	5.42	5.60	5.79	6.55	7.30
	20	5.84	5.82	5.92	6.07	6.24	6.41	6.69	6.93	7.17	8.15	9.14
	40	7.22	7.24	7.40	7.61	7.84	8.08	8.46	8.79	9.12	10.47	11.88
	60	8.24	8.30	8.51	8.77	9.06	9.36	9.83	10.23	10.64	12.35	14.14
	80	9.08	9.19	9.44	9.75	10.09	10.45	11.01	11.48	11.97	14.02	16.19
	100	9.81	9.96	10.26	10.62	11.02	11.43	12.07	12.62	13.18	15.56	18.10
	120	10.46	10.65	11.01	11.42	11.86	12.32	13.04	13.67	14.31	17.02	19.93
	140	11.06	11.30	11.69	12.15	12.64	13.16	13.97	14.66	15.38	18.41	21.68

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.90	3.09	3.31	3.55	3.80	4.04	4.42	4.73	5.05	6.32	7.62
	20	3.60	3.96	4.34	4.71	5.09	5.46	6.02	6.49	6.96	8.86	10.80
	40	4.76	5.43	6.06	6.67	7.26	7.85	8.72	9.45	10.18	13.12	16.14
	60	5.78	6.72	7.57	8.38	9.16	9.94	11.09	12.04	13.00	16.86	20.81
	80	6.72	7.91	8.96	9.95	10.91	11.86	13.26	14.42	15.59	20.29	25.11
	100	7.60	9.02	10.26	11.42	12.55	13.66	15.30	16.66	18.02	23.52	29.15
	120	8.44	10.08	11.50	12.83	14.11	15.37	17.24	18.78	20.33	26.58	32.98
	140	9.24	11.09	12.68	14.17	15.61	17.01	19.10	20.82	22.55	29.52	36.66
25	10	3.55	3.60	3.75	3.93	4.14	4.35	4.69	4.98	5.28	6.51	7.78
	20	4.24	4.43	4.72	5.04	5.38	5.73	6.26	6.70	7.16	9.02	10.93
	40	5.35	5.84	6.39	6.95	7.51	8.07	8.92	9.63	10.35	13.26	16.25
	60	6.33	7.10	7.87	8.63	9.39	10.14	11.26	12.21	13.15	16.98	20.92
	80	7.23	8.26	9.23	10.18	11.12	12.04	13.42	14.58	15.73	20.41	25.21
	100	8.09	9.35	10.52	11.65	12.75	13.83	15.45	16.80	18.15	23.62	29.24
	120	8.91	10.39	11.75	13.04	14.30	15.54	17.39	18.92	20.46	26.68	33.07
	140	9.69	11.39	12.93	14.38	15.79	17.18	19.24	20.95	22.67	29.62	36.74
50	10	3.93	3.95	4.08	4.24	4.43	4.63	4.95	5.23	5.51	6.70	7.94
	20	4.69	4.82	5.07	5.35	5.66	5.98	6.48	6.92	7.36	9.18	11.07
	40	5.85	6.23	6.71	7.22	7.75	8.29	9.11	9.81	10.51	13.39	16.36
	60	6.83	7.46	8.16	8.88	9.61	10.34	11.44	12.37	13.30	17.10	21.02
	80	7.72	8.60	9.51	10.42	11.33	12.23	13.59	14.73	15.87	20.52	25.30
	100	8.56	9.67	10.78	11.87	12.94	14.01	15.61	16.95	18.29	23.73	29.33
	120	9.36	10.70	12.00	13.25	14.49	15.71	17.54	19.06	20.59	26.78	33.16
	140	10.13	11.69	13.17	14.58	15.97	17.34	19.38	21.09	22.79	29.71	36.83
100	10	4.43	4.44	4.55	4.71	4.89	5.08	5.38	5.65	5.92	7.05	8.25
	20	5.32	5.41	5.62	5.88	6.16	6.45	6.92	7.32	7.74	9.49	11.33
	40	6.60	6.88	7.29	7.74	8.22	8.72	9.50	10.16	10.84	13.65	16.59
	60	7.64	8.12	8.72	9.37	10.04	10.73	11.79	12.69	13.60	17.34	21.22
	80	8.55	9.25	10.04	10.88	11.73	12.60	13.92	15.03	16.15	20.74	25.49
	100	9.40	10.30	11.29	12.31	13.33	14.36	15.92	17.23	18.55	23.94	29.51
	120	10.19	11.31	12.49	13.67	14.86	16.05	17.83	19.33	20.84	26.99	33.33
	140	10.96	12.29	13.64	14.99	16.33	17.66	19.67	21.35	23.04	29.91	36.99
150	10	4.80	4.80	4.91	5.07	5.25	5.44	5.74	6.00	6.26	7.38	8.55
	20	5.79	5.86	6.06	6.30	6.57	6.85	7.30	7.69	8.09	9.79	11.60
	40	7.18	7.42	7.79	8.21	8.66	9.13	9.87	10.51	11.17	13.92	16.81
	60	8.28	8.69	9.23	9.83	10.47	11.12	12.14	13.01	13.90	17.58	21.43
	80	9.24	9.83	10.55	11.33	12.14	12.97	14.24	15.33	16.43	20.97	25.68
	100	10.11	10.89	11.79	12.74	13.72	14.71	16.23	17.52	18.82	24.15	29.69
	120	10.92	11.89	12.97	14.09	15.23	16.38	18.13	19.60	21.09	27.19	33.50
	140	11.69	12.85	14.11	15.39	16.68	17.99	19.96	21.61	23.28	30.10	37.16

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.10	5.09	5.21	5.36	5.54	5.73	6.03	6.30	6.56	7.67	8.83
	20	6.17	6.23	6.42	6.66	6.93	7.21	7.65	8.03	8.42	10.08	11.85
	40	7.66	7.87	8.22	8.62	9.05	9.51	10.22	10.84	11.48	14.18	17.04
	60	8.82	9.19	9.69	10.26	10.87	11.49	12.48	13.32	14.19	17.82	21.63
	80	9.82	10.35	11.02	11.75	12.53	13.33	14.56	15.62	16.70	21.19	25.87
	100	10.72	11.42	12.26	13.16	14.09	15.06	16.54	17.80	19.08	24.36	29.87
	120	11.56	12.43	13.43	14.50	15.59	16.71	18.42	19.88	21.34	27.39	33.67
	140	12.34	13.39	14.56	15.79	17.04	18.31	20.24	21.87	23.52	30.30	37.32
300	10	5.59	5.57	5.68	5.84	6.03	6.22	6.53	6.80	7.07	8.18	9.33
	20	6.79	6.84	7.02	7.26	7.52	7.80	8.24	8.62	9.00	10.63	12.35
	40	8.45	8.62	8.95	9.33	9.75	10.19	10.88	11.47	12.08	14.69	17.48
	60	9.71	10.03	10.49	11.03	11.59	12.19	13.12	13.93	14.77	18.29	22.03
	80	10.79	11.24	11.86	12.54	13.26	14.01	15.19	16.21	17.25	21.63	26.25
	100	11.75	12.35	13.11	13.94	14.82	15.73	17.14	18.36	19.60	24.78	30.22
	120	12.64	13.38	14.29	15.27	16.30	17.36	19.01	20.41	21.84	27.79	34.01
	140	13.46	14.36	15.42	16.55	17.73	18.94	20.80	22.39	24.01	30.68	37.65
400	10	5.98	5.96	6.08	6.24	6.43	6.63	6.94	7.21	7.49	8.61	9.77
	20	7.30	7.33	7.52	7.76	8.02	8.30	8.74	9.12	9.51	11.12	12.82
	40	9.09	9.25	9.56	9.94	10.35	10.78	11.45	12.04	12.64	15.18	17.91
	60	10.45	10.73	11.18	11.69	12.24	12.82	13.72	14.51	15.32	18.75	22.43
	80	11.60	12.01	12.59	13.24	13.93	14.65	15.79	16.77	17.78	22.07	26.63
	100	12.62	13.16	13.87	14.66	15.49	16.36	17.73	18.90	20.11	25.20	30.58
	120	13.55	14.22	15.07	16.00	16.97	17.99	19.58	20.94	22.34	28.19	34.35
	140	14.41	15.22	16.21	17.27	18.40	19.56	21.36	22.91	24.49	31.07	37.98
600	10	6.62	6.59	6.71	6.88	7.07	7.28	7.61	7.89	8.18	9.34	10.53
	20	8.11	8.14	8.32	8.57	8.84	9.13	9.58	9.96	10.35	11.98	13.67
	40	10.13	10.27	10.58	10.95	11.35	11.78	12.45	13.02	13.61	16.10	18.75
	60	11.65	11.89	12.32	12.82	13.35	13.91	14.79	15.55	16.33	19.65	23.22
	80	12.92	13.27	13.82	14.44	15.10	15.79	16.88	17.82	18.79	22.92	27.37
	100	14.03	14.50	15.17	15.91	16.70	17.53	18.82	19.95	21.10	26.02	31.29
	120	15.05	15.63	16.41	17.28	18.20	19.16	20.67	21.97	23.31	28.98	35.03
	140	15.98	16.69	17.59	18.58	19.63	20.72	22.43	23.91	25.43	31.83	38.64
800	10	7.13	7.10	7.22	7.40	7.60	7.82	8.16	8.45	8.75	9.95	11.16
	20	8.77	8.79	8.98	9.23	9.51	9.80	10.27	10.66	11.06	12.71	14.42
	40	10.98	11.10	11.41	11.78	12.19	12.62	13.29	13.87	14.46	16.93	19.54
	60	12.63	12.85	13.27	13.76	14.29	14.85	15.72	16.47	17.24	20.49	23.99
	80	14.00	14.32	14.85	15.46	16.11	16.79	17.85	18.78	19.72	23.75	28.10
	100	15.20	15.63	16.26	16.99	17.76	18.56	19.82	20.91	22.04	26.82	31.99
	120	16.29	16.82	17.56	18.40	19.29	20.22	21.67	22.93	24.23	29.76	35.71
	140	17.28	17.92	18.78	19.73	20.74	21.79	23.44	24.87	26.34	32.59	39.29

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	4.52	4.95	5.40	5.85	6.30	6.75	7.43	8.00	8.57	10.88	13.23
	20	5.91	6.70	7.44	8.17	8.88	9.59	10.64	11.52	12.40	15.95	19.58
	40	8.24	9.64	10.89	12.07	13.22	14.35	16.04	17.43	18.83	24.47	30.25
	60	10.28	12.22	13.91	15.49	17.03	18.53	20.77	22.62	24.47	31.95	39.61
	80	12.16	14.59	16.68	18.64	20.52	22.37	25.11	27.38	29.65	38.82	48.20
	100	13.92	16.81	19.28	21.59	23.80	25.98	29.19	31.85	34.51	45.26	56.27
	120	15.60	18.93	21.76	24.39	26.92	29.40	33.07	36.10	39.14	51.39	63.94
	140	17.21	20.95	24.13	27.08	29.92	32.69	36.79	40.18	43.57	57.27	71.30
25	10	5.29	5.51	5.85	6.24	6.65	7.07	7.71	8.25	8.81	11.06	13.39
	20	6.61	7.18	7.83	8.50	9.17	9.85	10.87	11.73	12.59	16.11	19.71
	40	8.85	10.05	11.22	12.35	13.47	14.58	16.23	17.61	19.00	24.61	30.36
	60	10.84	12.59	14.21	15.75	17.25	18.74	20.95	22.78	24.62	32.07	39.71
	80	12.68	14.94	16.96	18.87	20.73	22.56	25.28	27.53	29.79	38.93	48.30
	100	14.41	17.14	19.55	21.81	24.00	26.15	29.35	32.00	34.65	45.37	56.36
	120	16.07	19.24	22.01	24.61	27.11	29.57	33.22	36.24	39.27	51.49	64.03
	140	17.65	21.26	24.38	27.29	30.10	32.85	36.93	40.31	43.69	57.36	71.38
50	10	5.82	5.97	6.26	6.61	6.98	7.37	7.98	8.50	9.04	11.25	13.55
	20	7.20	7.64	8.21	8.83	9.46	10.11	11.11	11.95	12.79	16.26	19.84
	40	9.42	10.46	11.54	12.63	13.72	14.80	16.43	17.79	19.17	24.74	30.48
	60	11.37	12.96	14.50	16.00	17.48	18.94	21.12	22.95	24.77	32.19	39.81
	80	13.18	15.28	17.24	19.11	20.94	22.75	25.44	27.69	29.93	39.04	48.40
	100	14.89	17.47	19.81	22.03	24.20	26.33	29.50	32.14	34.78	45.47	56.45
	120	16.53	19.56	22.26	24.82	27.30	29.74	33.37	36.38	39.39	51.59	64.12
	140	18.10	21.56	24.62	27.49	30.28	33.02	37.08	40.44	43.82	57.46	71.47
100	10	6.57	6.67	6.92	7.23	7.57	7.93	8.50	8.99	9.49	11.62	13.86
	20	8.10	8.42	8.90	9.45	10.02	10.63	11.56	12.37	13.19	16.58	20.11
	40	10.42	11.23	12.18	13.18	14.20	15.24	16.82	18.15	19.50	25.01	30.70
	60	12.37	13.69	15.09	16.50	17.92	19.34	21.48	23.27	25.08	32.43	40.02
	80	14.15	15.97	17.78	19.58	21.35	23.12	25.77	27.99	30.21	39.26	48.59
	100	15.83	18.12	20.33	22.48	24.59	26.69	29.82	32.43	35.05	45.69	56.63
	120	17.43	20.18	22.76	25.25	27.68	30.08	33.67	36.65	39.65	51.79	64.29
	140	18.98	22.16	25.10	27.90	30.64	33.34	37.36	40.71	44.06	57.66	71.63
150	10	7.13	7.20	7.44	7.73	8.06	8.41	8.95	9.43	9.92	11.98	14.18
	20	8.79	9.06	9.49	10.00	10.54	11.11	12.01	12.78	13.57	16.89	20.38
	40	11.23	11.92	12.78	13.71	14.68	15.68	17.21	18.51	19.83	25.27	30.93
	60	13.23	14.37	15.66	17.00	18.36	19.74	21.83	23.59	25.38	32.67	40.22
	80	15.03	16.63	18.32	20.04	21.77	23.49	26.10	28.29	30.50	39.49	48.78
	100	16.70	18.76	20.85	22.92	24.98	27.04	30.13	32.71	35.31	45.90	56.81
	120	18.30	20.79	23.25	25.67	28.05	30.42	33.97	36.93	39.90	52.00	64.46
	140	19.82	22.76	25.57	28.31	31.00	33.67	37.65	40.97	44.31	57.85	71.80

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	7.58	7.64	7.87	8.16	8.48	8.83	9.36	9.83	10.31	12.33	14.48
	20	9.36	9.59	10.01	10.49	11.01	11.56	12.43	13.18	13.95	17.20	20.65
	40	11.92	12.54	13.34	14.22	15.14	16.10	17.59	18.86	20.16	25.54	31.16
	60	13.99	15.01	16.21	17.48	18.79	20.13	22.18	23.92	25.68	32.91	40.43
	80	15.82	17.26	18.86	20.50	22.17	23.86	26.43	28.59	30.77	39.71	48.97
	100	17.51	19.38	21.35	23.36	25.37	27.39	30.44	33.00	35.58	46.11	56.99
	120	19.10	21.40	23.74	26.09	28.42	30.76	34.26	37.20	40.16	52.20	64.63
	140	20.63	23.34	26.05	28.72	31.36	33.99	37.94	41.24	44.55	58.05	71.97
300	10	8.32	8.36	8.59	8.88	9.20	9.53	10.07	10.53	11.00	12.98	15.08
	20	10.29	10.49	10.88	11.34	11.84	12.37	13.20	13.92	14.66	17.81	21.17
	40	13.08	13.61	14.34	15.15	16.02	16.92	18.33	19.55	20.81	26.06	31.60
	60	15.27	16.15	17.23	18.41	19.63	20.90	22.87	24.55	26.27	33.39	40.84
	80	17.19	18.43	19.87	21.40	22.98	24.60	27.08	29.19	31.33	40.16	49.35
	100	18.93	20.54	22.34	24.22	26.14	28.09	31.06	33.57	36.11	46.53	57.35
	120	20.56	22.55	24.71	26.92	29.16	31.42	34.85	37.74	40.66	52.60	64.98
	140	22.10	24.48	26.98	29.52	32.07	34.64	38.51	41.76	45.04	58.44	72.30
400	10	8.92	8.95	9.18	9.47	9.79	10.13	10.66	11.13	11.60	13.56	15.64
	20	11.05	11.23	11.61	12.06	12.56	13.08	13.89	14.59	15.32	18.39	21.69
	40	14.04	14.51	15.20	15.98	16.81	17.68	19.04	20.22	21.44	26.58	32.05
	60	16.35	17.14	18.16	19.26	20.43	21.65	23.55	25.18	26.86	33.86	41.24
	80	18.35	19.47	20.81	22.25	23.76	25.31	27.72	29.78	31.88	40.60	49.73
	100	20.16	21.61	23.28	25.05	26.89	28.78	31.67	34.13	36.63	46.95	57.71
	120	21.83	23.63	25.63	27.73	29.89	32.09	35.44	38.29	41.16	53.01	65.32
	140	23.40	25.55	27.89	30.31	32.78	35.28	39.08	42.28	45.52	58.82	72.63
600	10	9.89	9.91	10.14	10.43	10.76	11.11	11.66	12.13	12.61	14.58	16.65
	20	12.30	12.44	12.81	13.26	13.75	14.27	15.07	15.77	16.48	19.48	22.69
	40	15.61	16.02	16.67	17.41	18.21	19.04	20.34	21.48	22.64	27.60	32.93
	60	18.14	18.82	19.76	20.79	21.89	23.04	24.84	26.40	28.01	34.80	42.05
	80	20.30	21.26	22.48	23.82	25.22	26.69	28.98	30.95	32.98	41.48	50.48
	100	22.22	23.48	24.99	26.62	28.34	30.12	32.88	35.25	37.67	47.79	58.43
	120	23.99	25.54	27.35	29.29	31.31	33.39	36.61	39.36	42.16	53.81	66.01
	140	25.64	27.50	29.61	31.85	34.16	36.54	40.20	43.32	46.49	59.60	73.29
800	10	10.68	10.69	10.92	11.22	11.56	11.92	12.48	12.96	13.45	15.46	17.53
	20	13.31	13.44	13.80	14.25	14.75	15.27	16.08	16.77	17.49	20.47	23.63
	40	16.89	17.27	17.90	18.62	19.40	20.22	21.50	22.61	23.75	28.59	33.81
	60	19.61	20.23	21.12	22.12	23.19	24.30	26.04	27.55	29.11	35.73	42.85
	80	21.91	22.78	23.94	25.21	26.56	27.97	30.17	32.08	34.04	42.36	51.23
	100	23.95	25.08	26.50	28.05	29.69	31.39	34.05	36.34	38.70	48.62	59.14
	120	25.81	27.21	28.90	30.73	32.65	34.65	37.75	40.42	43.15	54.61	66.69
	140	27.54	29.21	31.18	33.29	35.49	37.78	41.31	44.35	47.45	60.37	73.94

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.38	1.40	1.46	1.53	1.61	1.69	1.81	1.92	2.03	2.47	2.91
	20	1.56	1.63	1.72	1.83	1.94	2.05	2.23	2.37	2.52	3.11	3.72
	40	1.87	2.01	2.17	2.33	2.50	2.67	2.92	3.13	3.34	4.20	5.07
	60	2.13	2.34	2.56	2.77	2.99	3.20	3.52	3.79	4.06	5.15	6.26
	80	2.37	2.65	2.91	3.18	3.44	3.70	4.08	4.40	4.73	6.03	7.35
	100	2.60	2.93	3.25	3.56	3.86	4.16	4.60	4.98	5.35	6.85	8.38
	120	2.82	3.21	3.57	3.92	4.26	4.60	5.10	5.52	5.94	7.63	9.35
	140	3.03	3.47	3.88	4.27	4.65	5.02	5.58	6.04	6.51	8.38	10.29
25	10	1.78	1.74	1.77	1.82	1.89	1.95	2.06	2.15	2.25	2.65	3.07
	20	2.00	2.00	2.05	2.12	2.21	2.30	2.45	2.58	2.71	3.27	3.85
	40	2.34	2.38	2.48	2.60	2.74	2.89	3.11	3.31	3.51	4.33	5.19
	60	2.60	2.69	2.85	3.02	3.21	3.40	3.70	3.96	4.22	5.27	6.37
	80	2.84	2.99	3.19	3.41	3.65	3.88	4.25	4.56	4.87	6.14	7.45
	100	3.06	3.26	3.51	3.78	4.06	4.34	4.76	5.12	5.48	6.96	8.47
	120	3.26	3.52	3.82	4.13	4.45	4.77	5.25	5.66	6.07	7.73	9.44
	140	3.46	3.77	4.12	4.47	4.83	5.19	5.72	6.18	6.63	8.48	10.37
50	10	1.95	1.91	1.94	1.99	2.05	2.12	2.23	2.32	2.41	2.81	3.21
	20	2.22	2.21	2.25	2.32	2.41	2.50	2.64	2.76	2.89	3.42	3.98
	40	2.61	2.63	2.72	2.83	2.95	3.09	3.30	3.48	3.67	4.47	5.30
	60	2.90	2.97	3.10	3.25	3.42	3.60	3.88	4.12	4.37	5.39	6.47
	80	3.16	3.27	3.44	3.64	3.85	4.07	4.41	4.71	5.01	6.25	7.55
	100	3.40	3.54	3.76	4.00	4.25	4.51	4.92	5.26	5.62	7.06	8.56
	120	3.61	3.80	4.06	4.34	4.64	4.94	5.40	5.80	6.20	7.83	9.53
	140	3.81	4.05	4.35	4.67	5.01	5.35	5.87	6.31	6.75	8.57	10.46
100	10	2.17	2.14	2.16	2.22	2.28	2.35	2.46	2.55	2.65	3.05	3.45
	20	2.51	2.49	2.53	2.60	2.69	2.78	2.92	3.04	3.16	3.69	4.23
	40	2.97	2.98	3.06	3.17	3.28	3.41	3.61	3.79	3.96	4.72	5.52
	60	3.32	3.36	3.47	3.62	3.77	3.93	4.19	4.42	4.65	5.63	6.67
	80	3.62	3.69	3.84	4.01	4.20	4.41	4.72	5.00	5.28	6.47	7.74
	100	3.88	3.99	4.17	4.38	4.61	4.84	5.22	5.54	5.88	7.27	8.74
	120	4.12	4.26	4.48	4.72	4.99	5.26	5.69	6.07	6.45	8.04	9.70
	140	4.34	4.52	4.77	5.05	5.35	5.66	6.15	6.57	7.00	8.77	10.62
150	10	2.34	2.30	2.33	2.38	2.44	2.51	2.63	2.73	2.82	3.23	3.64
	20	2.72	2.69	2.74	2.81	2.90	2.99	3.13	3.25	3.38	3.90	4.44
	40	3.24	3.24	3.32	3.42	3.54	3.67	3.86	4.04	4.21	4.95	5.74
	60	3.63	3.66	3.77	3.90	4.05	4.21	4.46	4.68	4.91	5.86	6.87
	80	3.96	4.01	4.15	4.32	4.50	4.70	5.00	5.26	5.54	6.69	7.92
	100	4.24	4.33	4.50	4.70	4.91	5.14	5.50	5.81	6.13	7.48	8.92
	120	4.51	4.62	4.82	5.05	5.30	5.56	5.97	6.33	6.69	8.24	9.87
	140	4.75	4.89	5.12	5.38	5.67	5.96	6.42	6.82	7.23	8.96	10.79

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.47	2.43	2.46	2.51	2.58	2.65	2.77	2.87	2.97	3.39	3.81
	20	2.89	2.86	2.91	2.98	3.07	3.16	3.31	3.43	3.56	4.09	4.63
	40	3.46	3.46	3.53	3.64	3.75	3.88	4.08	4.25	4.43	5.16	5.94
	60	3.88	3.90	4.01	4.14	4.29	4.45	4.70	4.92	5.14	6.07	7.07
	80	4.23	4.28	4.42	4.58	4.76	4.95	5.25	5.51	5.77	6.90	8.11
	100	4.54	4.62	4.78	4.97	5.18	5.40	5.75	6.05	6.37	7.69	9.10
	120	4.82	4.93	5.11	5.34	5.58	5.83	6.23	6.57	6.93	8.43	10.04
	140	5.08	5.21	5.43	5.68	5.95	6.23	6.68	7.07	7.47	9.15	10.95
300	10	2.68	2.64	2.67	2.73	2.80	2.87	2.99	3.10	3.21	3.64	4.07
	20	3.16	3.13	3.18	3.26	3.35	3.44	3.59	3.72	3.86	4.40	4.95
	40	3.81	3.80	3.88	3.98	4.11	4.23	4.44	4.61	4.79	5.53	6.30
	60	4.29	4.30	4.41	4.54	4.69	4.85	5.10	5.31	5.54	6.46	7.43
	80	4.68	4.72	4.85	5.01	5.19	5.38	5.67	5.93	6.19	7.29	8.47
	100	5.03	5.09	5.25	5.43	5.64	5.86	6.20	6.49	6.79	8.07	9.45
	120	5.34	5.43	5.60	5.82	6.05	6.30	6.68	7.02	7.36	8.82	10.38
	140	5.63	5.73	5.94	6.18	6.44	6.71	7.14	7.52	7.90	9.53	11.28
400	10	2.85	2.81	2.84	2.90	2.97	3.05	3.18	3.29	3.40	3.84	4.29
	20	3.39	3.35	3.40	3.48	3.57	3.67	3.83	3.96	4.10	4.66	5.22
	40	4.10	4.08	4.16	4.27	4.39	4.53	4.73	4.91	5.09	5.84	6.61
	60	4.62	4.63	4.73	4.87	5.02	5.18	5.43	5.65	5.87	6.80	7.76
	80	5.05	5.08	5.21	5.37	5.55	5.74	6.04	6.29	6.55	7.65	8.80
	100	5.43	5.48	5.63	5.82	6.02	6.24	6.58	6.87	7.17	8.43	9.78
	120	5.76	5.84	6.01	6.22	6.45	6.70	7.08	7.41	7.75	9.17	10.71
	140	6.07	6.17	6.37	6.60	6.86	7.13	7.55	7.92	8.29	9.89	11.60
600	10	3.13	3.08	3.12	3.18	3.26	3.34	3.48	3.59	3.71	4.18	4.65
	20	3.74	3.71	3.76	3.84	3.94	4.04	4.21	4.35	4.50	5.08	5.67
	40	4.56	4.54	4.62	4.73	4.86	5.00	5.22	5.40	5.59	6.36	7.15
	60	5.15	5.16	5.26	5.40	5.56	5.72	5.98	6.21	6.44	7.38	8.35
	80	5.64	5.67	5.79	5.96	6.14	6.33	6.64	6.90	7.16	8.26	9.41
	100	6.07	6.11	6.26	6.45	6.66	6.87	7.22	7.51	7.81	9.07	10.39
	120	6.45	6.51	6.68	6.89	7.12	7.37	7.75	8.08	8.42	9.82	11.32
	140	6.79	6.87	7.07	7.30	7.56	7.83	8.25	8.61	8.98	10.54	12.21
800	10	3.35	3.31	3.34	3.41	3.49	3.58	3.72	3.84	3.96	4.45	4.94
	20	4.03	4.00	4.05	4.14	4.24	4.35	4.52	4.67	4.82	5.43	6.04
	40	4.93	4.91	4.99	5.11	5.24	5.39	5.61	5.81	6.00	6.80	7.61
	60	5.59	5.59	5.69	5.83	6.00	6.17	6.44	6.67	6.90	7.87	8.85
	80	6.12	6.14	6.27	6.44	6.62	6.82	7.13	7.40	7.67	8.79	9.95
	100	6.59	6.62	6.77	6.97	7.18	7.40	7.75	8.05	8.36	9.62	10.94
	120	7.00	7.06	7.23	7.44	7.68	7.92	8.31	8.65	8.98	10.40	11.88
	140	7.38	7.45	7.64	7.88	8.14	8.41	8.83	9.20	9.57	11.13	12.77

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.01	2.07	2.19	2.32	2.45	2.59	2.81	2.98	3.17	3.90	4.64
	20	2.37	2.53	2.72	2.92	3.12	3.32	3.63	3.89	4.14	5.19	6.26
	40	2.97	3.29	3.61	3.92	4.23	4.55	5.01	5.40	5.79	7.36	8.97
	60	3.50	3.95	4.38	4.80	5.21	5.62	6.23	6.73	7.23	9.27	11.35
	80	3.98	4.57	5.10	5.61	6.11	6.61	7.34	7.95	8.56	11.02	13.53
	100	4.44	5.14	5.77	6.37	6.96	7.53	8.39	9.09	9.80	12.66	15.58
	120	4.88	5.69	6.41	7.10	7.76	8.41	9.38	10.18	10.99	14.22	17.53
	140	5.29	6.21	7.02	7.79	8.53	9.26	10.33	11.23	12.12	15.72	19.40
25	10	2.53	2.51	2.58	2.67	2.78	2.89	3.07	3.23	3.40	4.09	4.80
	20	2.92	2.96	3.09	3.24	3.41	3.58	3.86	4.10	4.34	5.35	6.39
	40	3.52	3.69	3.93	4.20	4.48	4.77	5.21	5.58	5.96	7.50	9.08
	60	4.03	4.33	4.68	5.06	5.44	5.82	6.41	6.89	7.39	9.39	11.45
	80	4.49	4.91	5.38	5.85	6.32	6.80	7.51	8.10	8.70	11.13	13.63
	100	4.92	5.47	6.04	6.60	7.16	7.71	8.54	9.24	9.94	12.77	15.68
	120	5.34	6.00	6.66	7.31	7.95	8.58	9.53	10.32	11.11	14.33	17.62
	140	5.74	6.52	7.27	8.00	8.71	9.42	10.48	11.36	12.24	15.82	19.49
50	10	2.79	2.76	2.82	2.91	3.01	3.12	3.30	3.45	3.61	4.27	4.96
	20	3.25	3.26	3.37	3.51	3.66	3.82	4.08	4.31	4.54	5.51	6.53
	40	3.91	4.02	4.23	4.47	4.72	4.99	5.41	5.76	6.13	7.63	9.20
	60	4.44	4.66	4.97	5.31	5.66	6.02	6.58	7.06	7.54	9.51	11.56
	80	4.91	5.24	5.65	6.08	6.53	6.98	7.67	8.26	8.84	11.25	13.73
	100	5.35	5.79	6.30	6.82	7.35	7.89	8.70	9.38	10.07	12.88	15.77
	120	5.76	6.31	6.91	7.52	8.14	8.75	9.68	10.46	11.24	14.43	17.71
	140	6.16	6.82	7.51	8.20	8.89	9.59	10.62	11.49	12.37	15.92	19.57
100	10	3.13	3.10	3.15	3.24	3.34	3.45	3.63	3.78	3.93	4.58	5.25
	20	3.68	3.68	3.78	3.91	4.05	4.21	4.45	4.67	4.89	5.81	6.79
	40	4.45	4.53	4.70	4.91	5.14	5.39	5.77	6.11	6.45	7.90	9.43
	60	5.05	5.21	5.46	5.76	6.08	6.41	6.93	7.38	7.84	9.75	11.76
	80	5.56	5.81	6.15	6.53	6.93	7.35	8.00	8.56	9.12	11.47	13.92
	100	6.03	6.36	6.79	7.25	7.74	8.24	9.01	9.67	10.34	13.09	15.95
	120	6.46	6.88	7.39	7.94	8.51	9.09	9.98	10.73	11.50	14.63	17.88
	140	6.87	7.38	7.98	8.61	9.25	9.91	10.91	11.76	12.61	16.12	19.74
150	10	3.38	3.34	3.40	3.49	3.59	3.70	3.88	4.03	4.19	4.84	5.51
	20	4.00	3.99	4.09	4.21	4.36	4.51	4.75	4.96	5.18	6.09	7.04
	40	4.85	4.91	5.08	5.28	5.50	5.73	6.10	6.43	6.76	8.16	9.65
	60	5.50	5.64	5.87	6.15	6.45	6.76	7.26	7.69	8.13	9.99	11.97
	80	6.06	6.26	6.57	6.93	7.30	7.70	8.32	8.85	9.40	11.69	14.11
	100	6.56	6.84	7.22	7.65	8.11	8.58	9.32	9.95	10.60	13.30	16.13
	120	7.01	7.37	7.83	8.34	8.87	9.42	10.28	11.01	11.75	14.84	18.06
	140	7.44	7.87	8.41	8.99	9.60	10.23	11.20	12.02	12.86	16.31	19.91

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.58	3.54	3.60	3.69	3.79	3.91	4.09	4.25	4.40	5.06	5.73
	20	4.26	4.25	4.34	4.47	4.61	4.77	5.01	5.22	5.44	6.34	7.28
	40	5.18	5.23	5.39	5.59	5.81	6.04	6.40	6.71	7.04	8.41	9.87
	60	5.88	6.00	6.22	6.49	6.78	7.08	7.56	7.98	8.41	10.23	12.17
	80	6.47	6.65	6.95	7.28	7.64	8.02	8.62	9.14	9.67	11.92	14.30
	100	7.00	7.25	7.61	8.01	8.45	8.90	9.62	10.23	10.86	13.51	16.31
	120	7.48	7.79	8.22	8.70	9.21	9.74	10.56	11.27	12.00	15.04	18.23
	140	7.92	8.31	8.81	9.36	9.94	10.54	11.48	12.28	13.10	16.51	20.07
300	10	3.91	3.87	3.92	4.02	4.12	4.24	4.43	4.59	4.76	5.43	6.12
	20	4.68	4.66	4.75	4.88	5.03	5.19	5.43	5.65	5.87	6.77	7.71
	40	5.72	5.76	5.91	6.10	6.32	6.55	6.91	7.22	7.53	8.87	10.30
	60	6.50	6.59	6.80	7.06	7.34	7.64	8.10	8.51	8.92	10.68	12.57
	80	7.15	7.30	7.57	7.89	8.24	8.60	9.18	9.67	10.18	12.35	14.68
	100	7.73	7.94	8.27	8.65	9.06	9.49	10.17	10.76	11.36	13.93	16.67
	120	8.25	8.52	8.91	9.36	9.83	10.33	11.12	11.79	12.49	15.44	18.57
	140	8.73	9.06	9.52	10.03	10.57	11.14	12.02	12.79	13.58	16.89	20.40
400	10	4.17	4.13	4.19	4.28	4.39	4.52	4.71	4.88	5.05	5.74	6.44
	20	5.02	5.00	5.09	5.22	5.37	5.53	5.79	6.01	6.23	7.14	8.09
	40	6.15	6.18	6.33	6.53	6.75	6.98	7.34	7.65	7.96	9.29	10.70
	60	7.00	7.08	7.29	7.54	7.82	8.12	8.58	8.97	9.38	11.11	12.96
	80	7.71	7.84	8.10	8.42	8.75	9.11	9.67	10.16	10.65	12.77	15.05
	100	8.32	8.51	8.83	9.20	9.60	10.02	10.68	11.25	11.84	14.34	17.02
	120	8.88	9.12	9.50	9.93	10.39	10.87	11.63	12.28	12.96	15.83	18.91
	140	9.40	9.69	10.12	10.61	11.13	11.68	12.53	13.28	14.04	17.28	20.73
600	10	4.60	4.55	4.61	4.71	4.83	4.96	5.16	5.34	5.52	6.24	6.97
	20	5.57	5.54	5.63	5.77	5.93	6.10	6.36	6.59	6.82	7.77	8.73
	40	6.86	6.88	7.03	7.23	7.45	7.68	8.05	8.37	8.69	10.02	11.42
	60	7.81	7.88	8.08	8.34	8.62	8.91	9.37	9.77	10.18	11.88	13.69
	80	8.61	8.72	8.97	9.28	9.62	9.97	10.52	11.00	11.49	13.55	15.76
	100	9.30	9.46	9.76	10.12	10.51	10.92	11.57	12.12	12.69	15.11	17.72
	120	9.92	10.12	10.48	10.89	11.34	11.81	12.54	13.17	13.83	16.60	19.58
	140	10.49	10.74	11.15	11.61	12.12	12.64	13.46	14.17	14.91	18.02	21.38
800	10	4.94	4.89	4.96	5.06	5.19	5.32	5.53	5.72	5.90	6.66	7.41
	20	6.01	5.98	6.08	6.22	6.38	6.56	6.83	7.07	7.31	8.28	9.27
	40	7.43	7.44	7.60	7.80	8.02	8.27	8.64	8.97	9.29	10.65	12.05
	60	8.48	8.53	8.73	8.99	9.28	9.57	10.04	10.45	10.86	12.56	14.35
	80	9.34	9.44	9.69	10.00	10.34	10.69	11.25	11.72	12.21	14.26	16.44
	100	10.09	10.23	10.53	10.89	11.28	11.69	12.33	12.88	13.45	15.83	18.38
	120	10.76	10.95	11.30	11.70	12.15	12.61	13.33	13.96	14.60	17.32	20.24
	140	11.38	11.61	12.00	12.46	12.95	13.47	14.28	14.98	15.69	18.74	22.02

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.01	3.19	3.41	3.65	3.90	4.15	4.52	4.84	5.15	6.43	7.74
	20	3.72	4.09	4.47	4.85	5.23	5.60	6.17	6.64	7.11	9.02	10.96
	40	4.93	5.61	6.25	6.86	7.46	8.05	8.94	9.67	10.40	13.37	16.39
	60	5.99	6.95	7.81	8.63	9.42	10.20	11.36	12.33	13.29	17.18	21.15
	80	6.96	8.17	9.24	10.24	11.22	12.17	13.59	14.77	15.94	20.68	25.52
	100	7.88	9.32	10.58	11.76	12.91	14.03	15.68	17.06	18.43	23.96	29.62
	120	8.74	10.42	11.86	13.21	14.51	15.79	17.67	19.23	20.79	27.08	33.52
	140	9.58	11.46	13.09	14.60	16.05	17.47	19.58	21.32	23.06	30.08	37.26
25	10	3.67	3.71	3.86	4.04	4.24	4.46	4.80	5.09	5.39	6.62	7.90
	20	4.38	4.57	4.86	5.18	5.52	5.87	6.40	6.86	7.31	9.18	11.10
	40	5.53	6.03	6.58	7.15	7.71	8.28	9.14	9.85	10.57	13.50	16.51
	60	6.54	7.32	8.11	8.88	9.65	10.41	11.54	12.49	13.44	17.30	21.25
	80	7.48	8.52	9.52	10.48	11.43	12.36	13.76	14.92	16.08	20.79	25.61
	100	8.37	9.66	10.85	11.99	13.11	14.21	15.84	17.20	18.56	24.07	29.71
	120	9.21	10.73	12.11	13.43	14.70	15.96	17.82	19.37	20.92	27.19	33.61
	140	10.03	11.77	13.33	14.80	16.23	17.64	19.73	21.46	23.19	30.18	37.34
50	10	4.05	4.07	4.19	4.36	4.54	4.74	5.06	5.34	5.62	6.81	8.06
	20	4.84	4.97	5.21	5.50	5.81	6.13	6.64	7.07	7.51	9.34	11.24
	40	6.04	6.42	6.90	7.42	7.96	8.50	9.33	10.03	10.74	13.64	16.62
	60	7.05	7.69	8.41	9.14	9.87	10.61	11.72	12.66	13.60	17.42	21.36
	80	7.97	8.87	9.80	10.72	11.64	12.55	13.93	15.07	16.23	20.90	25.71
	100	8.84	9.98	11.11	12.22	13.30	14.39	16.00	17.35	18.70	24.18	29.80
	120	9.67	11.05	12.37	13.64	14.89	16.13	17.98	19.51	21.05	27.29	33.69
	140	10.47	12.08	13.57	15.01	16.42	17.81	19.87	21.59	23.31	30.28	37.43
100	10	4.57	4.56	4.68	4.83	5.01	5.20	5.50	5.77	6.04	7.17	8.37
	20	5.48	5.57	5.78	6.03	6.31	6.61	7.07	7.48	7.90	9.65	11.51
	40	6.81	7.09	7.49	7.95	8.44	8.94	9.72	10.39	11.08	13.90	16.85
	60	7.87	8.36	8.97	9.63	10.31	11.01	12.08	12.98	13.90	17.66	21.56
	80	8.82	9.53	10.34	11.19	12.05	12.93	14.26	15.38	16.51	21.13	25.90
	100	9.70	10.62	11.63	12.66	13.70	14.74	16.32	17.64	18.97	24.39	29.98
	120	10.52	11.67	12.87	14.07	15.27	16.47	18.28	19.79	21.31	27.50	33.87
	140	11.31	12.67	14.05	15.42	16.78	18.13	20.16	21.86	23.56	30.48	37.59
150	10	4.95	4.93	5.04	5.20	5.37	5.56	5.86	6.12	6.39	7.50	8.67
	20	5.96	6.03	6.22	6.46	6.73	7.02	7.47	7.86	8.26	9.96	11.77
	40	7.40	7.63	8.00	8.42	8.88	9.35	10.10	10.74	11.40	14.17	17.08
	60	8.53	8.95	9.50	10.10	10.74	11.40	12.43	13.31	14.20	17.90	21.77
	80	9.52	10.12	10.85	11.64	12.46	13.30	14.59	15.68	16.79	21.36	26.10
	100	10.42	11.22	12.13	13.10	14.09	15.09	16.63	17.92	19.23	24.60	30.17
	120	11.26	12.25	13.35	14.49	15.64	16.81	18.58	20.06	21.56	27.70	34.04
	140	12.06	13.25	14.53	15.83	17.14	18.46	20.45	22.12	23.80	30.67	37.76

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.26	5.24	5.34	5.50	5.68	5.87	6.17	6.43	6.69	7.80	8.96
	20	6.36	6.41	6.59	6.83	7.10	7.38	7.82	8.20	8.59	10.26	12.03
	40	7.89	8.10	8.44	8.85	9.28	9.74	10.46	11.08	11.73	14.43	17.30
	60	9.09	9.45	9.96	10.54	11.15	11.78	12.77	13.62	14.50	18.14	21.97
	80	10.12	10.65	11.33	12.08	12.86	13.66	14.91	15.98	17.07	21.58	26.29
	100	11.05	11.76	12.61	13.52	14.47	15.44	16.94	18.21	19.50	24.82	30.35
	120	11.91	12.80	13.82	14.90	16.01	17.14	18.87	20.34	21.82	27.90	34.22
	140	12.73	13.80	14.99	16.23	17.50	18.78	20.74	22.39	24.05	30.87	37.93
300	10	5.76	5.73	5.84	5.99	6.17	6.37	6.67	6.93	7.20	8.31	9.47
	20	6.99	7.03	7.21	7.45	7.71	7.98	8.42	8.80	9.18	10.81	12.54
	40	8.70	8.87	9.19	9.58	9.99	10.43	11.12	11.72	12.33	14.95	17.75
	60	10.00	10.31	10.78	11.32	11.89	12.49	13.43	14.24	15.08	18.62	22.38
	80	11.11	11.57	12.19	12.87	13.60	14.36	15.55	16.57	17.62	22.03	26.67
	100	12.11	12.71	13.48	14.32	15.20	16.12	17.55	18.77	20.03	25.24	30.71
	120	13.02	13.78	14.70	15.69	16.73	17.80	19.46	20.88	22.33	28.31	34.56
	140	13.87	14.79	15.86	17.01	18.20	19.43	21.31	22.91	24.54	31.26	38.26
400	10	6.16	6.13	6.24	6.40	6.58	6.78	7.09	7.36	7.63	8.76	9.92
	20	7.51	7.54	7.72	7.95	8.21	8.49	8.93	9.31	9.70	11.31	13.02
	40	9.36	9.51	9.82	10.20	10.60	11.03	11.71	12.29	12.90	15.45	18.19
	60	10.76	11.03	11.48	11.99	12.55	13.13	14.04	14.83	15.64	19.09	22.79
	80	11.94	12.35	12.93	13.58	14.28	15.01	16.15	17.14	18.16	22.47	27.05
	100	12.99	13.53	14.25	15.05	15.89	16.77	18.14	19.33	20.55	25.66	31.07
	120	13.95	14.63	15.49	16.43	17.41	18.44	20.04	21.42	22.83	28.71	34.91
	140	14.84	15.66	16.66	17.74	18.88	20.05	21.87	23.43	25.02	31.65	38.60
600	10	6.81	6.77	6.88	7.05	7.24	7.45	7.77	8.05	8.34	9.50	10.68
	20	8.35	8.36	8.54	8.78	9.05	9.33	9.78	10.17	10.56	12.18	13.87
	40	10.43	10.55	10.86	11.23	11.63	12.06	12.72	13.30	13.89	16.38	19.04
	60	11.99	12.22	12.65	13.14	13.68	14.24	15.12	15.88	16.67	20.00	23.59
	80	13.29	13.64	14.19	14.81	15.47	16.17	17.26	18.21	19.19	23.34	27.80
	100	14.45	14.91	15.58	16.32	17.12	17.95	19.26	20.39	21.55	26.49	31.79
	120	15.49	16.07	16.86	17.73	18.66	19.63	21.15	22.46	23.81	29.51	35.59
	140	16.45	17.16	18.07	19.07	20.13	21.23	22.96	24.45	25.98	32.42	39.26
800	10	7.34	7.29	7.41	7.58	7.78	8.00	8.33	8.62	8.92	10.11	11.32
	20	9.03	9.03	9.22	9.46	9.74	10.03	10.49	10.88	11.28	12.93	14.63
	40	11.30	11.41	11.71	12.08	12.48	12.91	13.58	14.16	14.75	17.22	19.84
	60	12.99	13.20	13.62	14.11	14.64	15.19	16.06	16.82	17.59	20.85	24.36
	80	14.40	14.72	15.24	15.85	16.50	17.19	18.25	19.18	20.13	24.18	28.54
	100	15.64	16.06	16.70	17.42	18.19	19.00	20.27	21.37	22.50	27.31	32.50
	120	16.76	17.29	18.04	18.88	19.77	20.71	22.17	23.44	24.74	30.30	36.28
	140	17.79	18.42	19.29	20.24	21.26	22.32	23.98	25.42	26.90	33.19	39.92

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	4.68	5.11	5.56	6.02	6.47	6.93	7.61	8.18	8.75	11.07	13.43
	20	6.12	6.92	7.68	8.41	9.13	9.84	10.90	11.79	12.67	16.24	19.88
	40	8.53	9.96	11.23	12.43	13.60	14.74	16.44	17.85	19.25	24.93	30.74
	60	10.65	12.63	14.35	15.96	17.51	19.03	21.29	23.16	25.03	32.55	40.25
	80	12.60	15.08	17.21	19.20	21.11	22.98	25.75	28.04	30.33	39.55	48.99
	100	14.42	17.38	19.90	22.24	24.48	26.68	29.93	32.62	35.30	46.12	57.19
	120	16.16	19.56	22.45	25.13	27.69	30.20	33.91	36.97	40.03	52.37	64.99
	140	17.82	21.66	24.90	27.90	30.77	33.58	37.72	41.15	44.57	58.36	72.47
25	10	5.46	5.68	6.02	6.41	6.82	7.24	7.89	8.44	8.99	11.26	13.59
	20	6.83	7.41	8.07	8.74	9.43	10.11	11.14	12.00	12.87	16.40	20.02
	40	9.15	10.38	11.56	12.72	13.85	14.97	16.64	18.03	19.42	25.07	30.85
	60	11.21	13.01	14.65	16.21	17.74	19.24	21.47	23.32	25.18	32.68	40.36
	80	13.12	15.43	17.49	19.44	21.32	23.17	25.92	28.19	30.47	39.67	49.09
	100	14.92	17.71	20.16	22.46	24.68	26.86	30.09	32.76	35.44	46.23	57.28
	120	16.63	19.88	22.71	25.34	27.89	30.38	34.06	37.11	40.16	52.47	65.08
	140	18.28	21.97	25.15	28.11	30.96	33.75	37.87	41.28	44.70	58.46	72.56
50	10	6.01	6.15	6.44	6.79	7.16	7.55	8.17	8.69	9.23	11.45	13.75
	20	7.43	7.88	8.45	9.08	9.72	10.37	11.37	12.22	13.07	16.56	20.16
	40	9.73	10.79	11.89	13.00	14.10	15.19	16.84	18.21	19.59	25.20	30.97
	60	11.76	13.38	14.95	16.47	17.96	19.44	21.65	23.49	25.33	32.80	40.46
	80	13.63	15.78	17.77	19.67	21.53	23.36	26.08	28.35	30.61	39.78	49.18
	100	15.40	18.04	20.43	22.69	24.88	27.04	30.25	32.91	35.57	46.34	57.38
	120	17.10	20.20	22.96	25.56	28.08	30.55	34.21	37.25	40.29	52.58	65.17
	140	18.73	22.28	25.39	28.32	31.14	33.91	38.02	41.42	44.82	58.56	72.64
100	10	6.78	6.86	7.11	7.42	7.76	8.12	8.69	9.18	9.69	11.82	14.07
	20	8.35	8.67	9.16	9.70	10.29	10.89	11.84	12.64	13.47	16.88	20.43
	40	10.74	11.57	12.54	13.55	14.59	15.64	17.23	18.57	19.93	25.47	31.20
	60	12.77	14.12	15.54	16.98	18.41	19.85	22.01	23.82	25.64	33.04	40.67
	80	14.61	16.47	18.33	20.15	21.95	23.74	26.42	28.65	30.90	40.01	49.38
	100	16.35	18.70	20.96	23.14	25.28	27.40	30.57	33.20	35.84	46.55	57.56
	120	18.01	20.83	23.46	25.99	28.46	30.89	34.52	37.53	40.55	52.78	65.34
	140	19.62	22.88	25.88	28.73	31.51	34.24	38.31	41.69	45.07	58.76	72.81
150	10	7.35	7.41	7.64	7.94	8.26	8.61	9.16	9.63	10.12	12.19	14.39
	20	9.05	9.32	9.76	10.27	10.81	11.39	12.29	13.06	13.86	17.19	20.70
	40	11.58	12.28	13.15	14.09	15.07	16.08	17.62	18.93	20.26	25.74	31.42
	60	13.65	14.81	16.12	17.48	18.86	20.25	22.37	24.15	25.94	33.29	40.87
	80	15.51	17.15	18.87	20.62	22.36	24.12	26.75	28.96	31.18	40.23	49.57
	100	17.24	19.35	21.48	23.58	25.68	27.76	30.88	33.49	36.11	46.77	57.74
	120	18.89	21.46	23.97	26.42	28.83	31.23	34.82	37.81	40.81	52.99	65.52
	140	20.48	23.49	26.36	29.14	31.87	34.57	38.60	41.95	45.32	58.95	72.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	7.81	7.86	8.09	8.37	8.69	9.03	9.57	10.04	10.52	12.54	14.70
	20	9.64	9.87	10.28	10.77	11.29	11.85	12.71	13.47	14.24	17.51	20.97
	40	12.29	12.91	13.72	14.61	15.54	16.51	18.01	19.29	20.60	26.01	31.65
	60	14.42	15.46	16.68	17.97	19.30	20.65	22.72	24.47	26.25	33.53	41.08
	80	16.31	17.79	19.41	21.08	22.78	24.49	27.08	29.26	31.46	40.46	49.76
	100	18.06	19.98	21.99	24.03	26.07	28.11	31.20	33.78	36.38	46.98	57.92
	120	19.71	22.07	24.46	26.84	29.21	31.57	35.12	38.08	41.06	53.19	65.69
	140	21.29	24.08	26.84	29.55	32.23	34.90	38.89	42.22	45.56	59.15	73.14
300	10	8.57	8.60	8.82	9.10	9.42	9.76	10.29	10.75	11.22	13.20	15.30
	20	10.60	10.79	11.17	11.64	12.14	12.67	13.50	14.22	14.97	18.12	21.50
	40	13.47	14.00	14.73	15.56	16.43	17.34	18.76	19.99	21.25	26.54	32.11
	60	15.74	16.63	17.72	18.91	20.15	21.44	23.42	25.12	26.85	34.01	41.49
	80	17.71	18.98	20.44	21.99	23.59	25.23	27.74	29.87	32.03	40.91	50.15
	100	19.51	21.16	23.00	24.90	26.85	28.82	31.82	34.35	36.91	47.41	58.29
	120	21.20	23.24	25.44	27.68	29.96	32.25	35.72	38.63	41.58	53.60	66.04
	140	22.79	25.23	27.79	30.37	32.96	35.55	39.47	42.75	46.06	59.55	73.48
400	10	9.19	9.21	9.42	9.70	10.02	10.36	10.90	11.36	11.83	13.79	15.87
	20	11.38	11.55	11.92	12.37	12.86	13.38	14.20	14.91	15.63	18.72	22.02
	40	14.45	14.93	15.62	16.40	17.24	18.11	19.49	20.67	21.90	27.06	32.56
	60	16.84	17.64	18.66	19.78	20.96	22.19	24.11	25.76	27.44	34.49	41.90
	80	18.91	20.04	21.40	22.86	24.38	25.96	28.39	30.47	32.59	41.36	50.53
	100	20.77	22.25	23.95	25.75	27.61	29.52	32.44	34.92	37.45	47.83	58.65
	120	22.50	24.33	26.38	28.51	30.70	32.92	36.31	39.18	42.08	54.01	66.39
	140	24.12	26.32	28.71	31.17	33.67	36.20	40.04	43.28	46.55	59.94	73.81
600	10	10.18	10.19	10.40	10.69	11.02	11.36	11.91	12.38	12.85	14.83	16.89
	20	12.66	12.79	13.15	13.60	14.08	14.60	15.41	16.10	16.82	19.82	23.04
	40	16.06	16.47	17.12	17.86	18.66	19.49	20.81	21.94	23.12	28.10	33.45
	60	18.67	19.36	20.29	21.34	22.45	23.61	25.42	26.99	28.61	35.44	42.72
	80	20.90	21.87	23.10	24.45	25.87	27.35	29.66	31.65	33.69	42.25	51.29
	100	22.88	24.15	25.69	27.34	29.08	30.88	33.66	36.06	38.50	48.68	59.37
	120	24.71	26.29	28.13	30.09	32.13	34.24	37.49	40.27	43.10	54.82	67.08
	140	26.42	28.31	30.45	32.72	35.07	37.48	41.18	44.33	47.52	60.72	74.48
800	10	10.99	10.99	11.20	11.50	11.83	12.19	12.74	13.22	13.71	15.72	17.79
	20	13.69	13.81	14.17	14.61	15.10	15.62	16.43	17.12	17.84	20.82	23.99
	40	17.38	17.75	18.37	19.10	19.88	20.70	21.98	23.09	24.24	29.10	34.34
	60	20.19	20.80	21.69	22.70	23.77	24.88	26.64	28.16	29.72	36.38	43.53
	80	22.55	23.43	24.59	25.87	27.23	28.65	30.87	32.79	34.77	43.14	52.05
	100	24.65	25.80	27.23	28.80	30.45	32.17	34.85	37.16	39.54	49.52	60.10
	120	26.57	27.99	29.71	31.56	33.50	35.51	38.65	41.34	44.10	55.63	67.77
	140	28.36	30.06	32.05	34.19	36.42	38.73	42.31	45.37	48.49	61.50	75.15

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.43	1.44	1.50	1.57	1.65	1.73	1.86	1.96	2.07	2.51	2.95
	20	1.62	1.68	1.77	1.88	1.99	2.10	2.28	2.42	2.57	3.16	3.77
	40	1.93	2.07	2.23	2.40	2.56	2.73	2.99	3.20	3.41	4.27	5.15
	60	2.20	2.41	2.63	2.85	3.07	3.28	3.61	3.88	4.15	5.24	6.36
	80	2.46	2.73	3.00	3.27	3.53	3.79	4.18	4.50	4.83	6.13	7.47
	100	2.69	3.03	3.35	3.66	3.96	4.27	4.72	5.09	5.46	6.97	8.51
	120	2.92	3.31	3.68	4.03	4.38	4.72	5.23	5.65	6.07	7.77	9.50
	140	3.13	3.58	3.99	4.39	4.77	5.15	5.71	6.18	6.65	8.53	10.45
25	10	1.83	1.80	1.82	1.87	1.93	2.00	2.10	2.20	2.29	2.69	3.11
	20	2.07	2.05	2.10	2.18	2.26	2.36	2.51	2.64	2.77	3.32	3.91
	40	2.41	2.44	2.55	2.67	2.81	2.96	3.19	3.38	3.58	4.41	5.26
	60	2.68	2.77	2.93	3.11	3.29	3.49	3.79	4.04	4.30	5.37	6.46
	80	2.93	3.07	3.28	3.51	3.74	3.98	4.35	4.66	4.97	6.25	7.56
	100	3.15	3.36	3.61	3.89	4.16	4.45	4.88	5.24	5.60	7.08	8.60
	120	3.37	3.63	3.93	4.25	4.57	4.89	5.38	5.79	6.20	7.87	9.59
	140	3.57	3.89	4.24	4.60	4.96	5.32	5.86	6.32	6.77	8.63	10.54
50	10	2.01	1.97	1.99	2.04	2.10	2.17	2.27	2.36	2.46	2.85	3.26
	20	2.29	2.27	2.31	2.38	2.46	2.55	2.69	2.82	2.95	3.48	4.04
	40	2.68	2.70	2.79	2.90	3.03	3.16	3.37	3.56	3.75	4.54	5.38
	60	2.99	3.05	3.18	3.34	3.50	3.68	3.96	4.21	4.45	5.49	6.57
	80	3.26	3.36	3.53	3.73	3.94	4.17	4.51	4.81	5.11	6.36	7.66
	100	3.50	3.65	3.86	4.10	4.36	4.62	5.03	5.38	5.73	7.19	8.69
	120	3.72	3.91	4.17	4.46	4.76	5.06	5.53	5.93	6.33	7.97	9.68
	140	3.93	4.17	4.48	4.80	5.14	5.48	6.01	6.45	6.90	8.73	10.62
100	10	2.24	2.20	2.22	2.27	2.33	2.40	2.51	2.60	2.70	3.09	3.50
	20	2.59	2.56	2.60	2.67	2.75	2.84	2.98	3.10	3.23	3.74	4.29
	40	3.06	3.06	3.14	3.24	3.36	3.49	3.69	3.86	4.04	4.80	5.60
	60	3.42	3.46	3.57	3.71	3.86	4.03	4.29	4.51	4.74	5.73	6.77
	80	3.72	3.79	3.94	4.11	4.31	4.51	4.83	5.10	5.39	6.59	7.85
	100	4.00	4.10	4.28	4.49	4.72	4.96	5.34	5.66	6.00	7.40	8.88
	120	4.24	4.38	4.60	4.85	5.11	5.39	5.82	6.20	6.58	8.18	9.85
	140	4.47	4.65	4.90	5.18	5.49	5.80	6.29	6.71	7.14	8.93	10.79
150	10	2.41	2.36	2.39	2.44	2.50	2.57	2.68	2.78	2.88	3.28	3.69
	20	2.80	2.77	2.81	2.88	2.96	3.05	3.20	3.32	3.44	3.97	4.51
	40	3.33	3.33	3.41	3.51	3.62	3.75	3.95	4.12	4.29	5.03	5.82
	60	3.74	3.76	3.87	4.00	4.15	4.31	4.56	4.78	5.00	5.96	6.97
	80	4.07	4.13	4.26	4.43	4.61	4.80	5.11	5.38	5.65	6.81	8.04
	100	4.37	4.45	4.62	4.82	5.03	5.26	5.62	5.93	6.25	7.61	9.06
	120	4.64	4.75	4.95	5.18	5.43	5.69	6.10	6.46	6.83	8.38	10.02
	140	4.89	5.03	5.26	5.52	5.81	6.10	6.57	6.97	7.39	9.12	10.96

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.54	2.49	2.52	2.57	2.64	2.71	2.82	2.92	3.03	3.44	3.86
	20	2.97	2.94	2.98	3.05	3.14	3.23	3.37	3.50	3.63	4.15	4.70
	40	3.56	3.55	3.62	3.73	3.84	3.97	4.17	4.34	4.51	5.25	6.02
	60	3.99	4.01	4.11	4.25	4.39	4.55	4.80	5.02	5.24	6.17	7.17
	80	4.36	4.40	4.53	4.69	4.87	5.06	5.36	5.62	5.89	7.02	8.23
	100	4.67	4.75	4.90	5.10	5.31	5.53	5.88	6.18	6.49	7.82	9.24
	120	4.96	5.06	5.25	5.47	5.71	5.96	6.36	6.71	7.07	8.58	10.20
	140	5.23	5.35	5.57	5.82	6.09	6.38	6.83	7.22	7.62	9.32	11.12
300	10	2.76	2.71	2.74	2.79	2.86	2.94	3.06	3.16	3.27	3.70	4.13
	20	3.26	3.22	3.26	3.34	3.42	3.52	3.67	3.80	3.93	4.47	5.02
	40	3.92	3.91	3.98	4.08	4.20	4.33	4.53	4.70	4.88	5.62	6.39
	60	4.41	4.42	4.52	4.65	4.80	4.96	5.21	5.42	5.64	6.57	7.54
	80	4.82	4.85	4.98	5.14	5.31	5.50	5.80	6.05	6.31	7.42	8.59
	100	5.17	5.23	5.38	5.57	5.77	5.99	6.33	6.62	6.93	8.21	9.59
	120	5.49	5.57	5.75	5.96	6.20	6.44	6.83	7.16	7.51	8.97	10.54
	140	5.79	5.89	6.09	6.33	6.59	6.87	7.30	7.67	8.06	9.69	11.45
400	10	2.94	2.89	2.91	2.97	3.04	3.12	3.24	3.35	3.46	3.91	4.35
	20	3.48	3.44	3.49	3.57	3.65	3.75	3.91	4.04	4.18	4.73	5.30
	40	4.21	4.19	4.27	4.37	4.50	4.63	4.83	5.01	5.19	5.94	6.71
	60	4.75	4.75	4.85	4.99	5.14	5.30	5.55	5.77	5.99	6.91	7.88
	80	5.19	5.22	5.34	5.50	5.68	5.87	6.16	6.42	6.68	7.78	8.94
	100	5.58	5.63	5.77	5.96	6.16	6.38	6.72	7.01	7.31	8.58	9.92
	120	5.93	5.99	6.17	6.38	6.61	6.85	7.23	7.56	7.90	9.33	10.87
	140	6.24	6.33	6.53	6.76	7.02	7.29	7.71	8.08	8.46	10.06	11.78
600	10	3.22	3.17	3.20	3.26	3.33	3.42	3.55	3.66	3.78	4.25	4.71
	20	3.85	3.81	3.86	3.93	4.03	4.13	4.30	4.44	4.58	5.16	5.75
	40	4.69	4.66	4.74	4.85	4.97	5.11	5.32	5.51	5.70	6.47	7.26
	60	5.30	5.29	5.39	5.53	5.68	5.85	6.11	6.33	6.56	7.50	8.47
	80	5.80	5.82	5.94	6.10	6.28	6.47	6.78	7.04	7.30	8.40	9.55
	100	6.24	6.27	6.42	6.60	6.81	7.03	7.37	7.66	7.97	9.22	10.55
	120	6.63	6.68	6.85	7.06	7.29	7.53	7.91	8.24	8.58	9.99	11.49
	140	6.98	7.06	7.25	7.48	7.73	8.00	8.42	8.79	9.16	10.72	12.39
800	10	3.45	3.39	3.43	3.49	3.57	3.66	3.80	3.91	4.03	4.52	5.01
	20	4.15	4.10	4.15	4.24	4.33	4.44	4.61	4.76	4.91	5.52	6.13
	40	5.07	5.04	5.12	5.23	5.36	5.51	5.73	5.92	6.11	6.91	7.72
	60	5.74	5.73	5.83	5.97	6.13	6.30	6.57	6.80	7.04	8.00	8.98
	80	6.30	6.30	6.43	6.59	6.78	6.97	7.28	7.55	7.82	8.93	10.09
	100	6.77	6.80	6.94	7.13	7.34	7.56	7.91	8.21	8.52	9.78	11.11
	120	7.20	7.24	7.41	7.62	7.85	8.10	8.49	8.82	9.16	10.57	12.06
	140	7.59	7.65	7.84	8.07	8.33	8.60	9.02	9.39	9.76	11.32	12.97

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.07	2.14	2.25	2.38	2.52	2.66	2.87	3.05	3.23	3.96	4.71
	20	2.45	2.61	2.80	3.00	3.20	3.40	3.71	3.97	4.23	5.28	6.35
	40	3.07	3.39	3.71	4.03	4.35	4.66	5.13	5.52	5.91	7.50	9.11
	60	3.62	4.08	4.52	4.94	5.35	5.76	6.37	6.88	7.39	9.44	11.53
	80	4.12	4.71	5.26	5.77	6.28	6.78	7.52	8.13	8.75	11.22	13.75
	100	4.59	5.31	5.95	6.56	7.15	7.73	8.59	9.30	10.02	12.89	15.83
	120	5.04	5.87	6.61	7.30	7.97	8.63	9.61	10.42	11.23	14.49	17.81
	140	5.47	6.41	7.24	8.01	8.76	9.50	10.59	11.49	12.39	16.01	19.71
25	10	2.61	2.59	2.65	2.74	2.84	2.96	3.14	3.30	3.47	4.15	4.87
	20	3.01	3.05	3.17	3.32	3.49	3.67	3.95	4.19	4.43	5.44	6.49
	40	3.63	3.80	4.05	4.32	4.60	4.89	5.33	5.71	6.09	7.63	9.22
	60	4.15	4.46	4.82	5.20	5.58	5.97	6.56	7.05	7.54	9.56	11.63
	80	4.63	5.07	5.54	6.01	6.49	6.97	7.69	8.29	8.89	11.34	13.84
	100	5.08	5.64	6.22	6.78	7.35	7.91	8.75	9.45	10.15	13.00	15.92
	120	5.51	6.19	6.86	7.52	8.16	8.81	9.76	10.56	11.36	14.59	17.90
	140	5.93	6.72	7.48	8.22	8.95	9.67	10.73	11.62	12.51	16.11	19.80
50	10	2.87	2.84	2.89	2.98	3.08	3.19	3.37	3.52	3.68	4.34	5.03
	20	3.34	3.36	3.46	3.60	3.75	3.91	4.17	4.40	4.63	5.60	6.62
	40	4.03	4.14	4.34	4.58	4.84	5.11	5.53	5.89	6.25	7.77	9.34
	60	4.58	4.80	5.11	5.45	5.81	6.17	6.74	7.21	7.70	9.68	11.73
	80	5.07	5.40	5.81	6.25	6.70	7.16	7.85	8.44	9.03	11.45	13.94
	100	5.52	5.96	6.48	7.01	7.55	8.09	8.91	9.60	10.29	13.11	16.01
	120	5.94	6.50	7.11	7.73	8.36	8.98	9.91	10.70	11.49	14.69	17.99
	140	6.35	7.02	7.73	8.43	9.13	9.83	10.88	11.76	12.64	16.21	19.88
100	10	3.23	3.18	3.24	3.32	3.42	3.53	3.70	3.85	4.01	4.65	5.33
	20	3.79	3.79	3.88	4.00	4.15	4.30	4.55	4.76	4.98	5.91	6.89
	40	4.58	4.65	4.83	5.04	5.27	5.52	5.90	6.24	6.58	8.03	9.57
	60	5.20	5.35	5.61	5.91	6.23	6.56	7.09	7.54	8.00	9.93	11.94
	80	5.73	5.97	6.32	6.70	7.11	7.53	8.19	8.75	9.32	11.68	14.13
	100	6.21	6.54	6.97	7.44	7.94	8.44	9.22	9.89	10.56	13.33	16.20
	120	6.65	7.08	7.60	8.16	8.73	9.32	10.22	10.98	11.75	14.90	18.16
	140	7.07	7.59	8.20	8.84	9.50	10.16	11.17	12.03	12.89	16.41	20.05
150	10	3.48	3.44	3.49	3.57	3.67	3.78	3.96	4.11	4.27	4.92	5.59
	20	4.12	4.10	4.19	4.32	4.46	4.61	4.86	5.07	5.28	6.19	7.15
	40	4.99	5.05	5.21	5.41	5.63	5.87	6.24	6.56	6.89	8.30	9.79
	60	5.67	5.79	6.03	6.31	6.61	6.92	7.42	7.85	8.30	10.17	12.15
	80	6.24	6.44	6.75	7.11	7.49	7.88	8.51	9.05	9.60	11.90	14.33
	100	6.75	7.03	7.42	7.85	8.31	8.79	9.53	10.17	10.83	13.54	16.38
	120	7.22	7.58	8.04	8.56	9.10	9.65	10.52	11.25	12.00	15.11	18.34
	140	7.66	8.10	8.64	9.24	9.85	10.49	11.46	12.29	13.13	16.61	20.22

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.69	3.64	3.69	3.78	3.88	3.99	4.17	4.33	4.49	5.14	5.81
	20	4.38	4.36	4.45	4.58	4.72	4.87	5.12	5.33	5.54	6.44	7.39
	40	5.33	5.38	5.53	5.73	5.94	6.17	6.54	6.85	7.18	8.55	10.02
	60	6.05	6.16	6.38	6.65	6.94	7.25	7.73	8.15	8.58	10.41	12.35
	80	6.66	6.84	7.13	7.47	7.83	8.21	8.81	9.33	9.87	12.13	14.52
	100	7.20	7.45	7.81	8.22	8.66	9.12	9.83	10.45	11.09	13.75	16.56
	120	7.70	8.01	8.45	8.93	9.44	9.98	10.81	11.52	12.26	15.31	18.51
	140	8.16	8.55	9.05	9.61	10.19	10.80	11.75	12.55	13.38	16.81	20.39
300	10	4.02	3.97	4.02	4.11	4.22	4.34	4.52	4.68	4.85	5.52	6.20
	20	4.81	4.79	4.87	5.00	5.15	5.30	5.55	5.76	5.98	6.88	7.82
	40	5.88	5.91	6.06	6.25	6.47	6.69	7.05	7.36	7.68	9.02	10.45
	60	6.68	6.77	6.98	7.24	7.52	7.81	8.28	8.69	9.10	10.87	12.76
	80	7.36	7.50	7.77	8.09	8.44	8.80	9.38	9.88	10.39	12.57	14.90
	100	7.95	8.15	8.49	8.87	9.28	9.72	10.40	10.99	11.60	14.18	16.93
	120	8.49	8.75	9.15	9.60	10.08	10.58	11.37	12.05	12.75	15.71	18.86
	140	8.98	9.31	9.77	10.28	10.83	11.40	12.30	13.07	13.86	17.20	20.72
400	10	4.29	4.24	4.29	4.39	4.50	4.62	4.81	4.97	5.14	5.83	6.53
	20	5.16	5.13	5.22	5.35	5.50	5.66	5.91	6.12	6.35	7.26	8.20
	40	6.33	6.35	6.50	6.69	6.90	7.13	7.49	7.80	8.12	9.45	10.85
	60	7.20	7.27	7.48	7.73	8.01	8.30	8.76	9.16	9.57	11.30	13.15
	80	7.92	8.05	8.31	8.62	8.96	9.32	9.88	10.37	10.87	12.99	15.28
	100	8.56	8.74	9.06	9.43	9.83	10.25	10.91	11.49	12.08	14.59	17.28
	120	9.14	9.37	9.75	10.18	10.64	11.13	11.89	12.55	13.23	16.11	19.21
	140	9.67	9.96	10.39	10.88	11.41	11.96	12.82	13.56	14.33	17.58	21.06
600	10	4.73	4.67	4.73	4.83	4.94	5.07	5.27	5.44	5.62	6.34	7.07
	20	5.72	5.69	5.78	5.91	6.06	6.23	6.49	6.72	6.95	7.89	8.86
	40	7.05	7.06	7.21	7.40	7.62	7.85	8.22	8.53	8.86	10.19	11.58
	60	8.03	8.09	8.29	8.54	8.82	9.11	9.57	9.97	10.38	12.08	13.89
	80	8.85	8.95	9.20	9.51	9.84	10.20	10.75	11.23	11.72	13.79	16.00
	100	9.56	9.71	10.01	10.37	10.76	11.17	11.82	12.38	12.95	15.37	17.99
	120	10.20	10.40	10.75	11.16	11.61	12.08	12.81	13.45	14.11	16.89	19.89
	140	10.78	11.03	11.44	11.90	12.41	12.93	13.76	14.47	15.21	18.34	21.72
800	10	5.08	5.02	5.08	5.18	5.30	5.44	5.65	5.83	6.01	6.76	7.51
	20	6.18	6.14	6.23	6.37	6.53	6.70	6.97	7.21	7.45	8.42	9.41
	40	7.64	7.64	7.79	7.99	8.21	8.45	8.82	9.14	9.47	10.83	12.23
	60	8.71	8.76	8.96	9.21	9.49	9.79	10.25	10.66	11.07	12.77	14.57
	80	9.60	9.69	9.94	10.24	10.58	10.93	11.49	11.96	12.45	14.50	16.68
	100	10.37	10.50	10.80	11.16	11.55	11.95	12.59	13.15	13.71	16.10	18.66
	120	11.06	11.24	11.58	11.99	12.43	12.90	13.62	14.25	14.89	17.62	20.55
	140	11.70	11.92	12.31	12.77	13.26	13.78	14.59	15.29	16.01	19.06	22.36

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.11	3.29	3.52	3.76	4.00	4.25	4.63	4.94	5.26	6.55	7.85
	20	3.85	4.22	4.61	4.99	5.37	5.75	6.31	6.79	7.26	9.18	11.13
	40	5.10	5.79	6.44	7.06	7.66	8.26	9.15	9.89	10.63	13.61	16.65
	60	6.20	7.17	8.05	8.87	9.68	10.47	11.64	12.61	13.58	17.49	21.48
	80	7.20	8.44	9.52	10.54	11.53	12.49	13.92	15.11	16.29	21.06	25.92
	100	8.15	9.62	10.91	12.11	13.26	14.39	16.07	17.45	18.84	24.41	30.09
	120	9.05	10.75	12.22	13.59	14.91	16.20	18.11	19.68	21.26	27.59	34.06
	140	9.91	11.84	13.49	15.02	16.50	17.94	20.06	21.82	23.58	30.64	37.86
25	10	3.78	3.82	3.96	4.15	4.35	4.57	4.91	5.20	5.50	6.74	8.01
	20	4.52	4.71	5.00	5.33	5.67	6.02	6.55	7.01	7.47	9.34	11.27
	40	5.71	6.21	6.77	7.34	7.92	8.49	9.35	10.08	10.80	13.75	16.76
	60	6.76	7.55	8.35	9.13	9.91	10.67	11.82	12.78	13.74	17.62	21.59
	80	7.73	8.79	9.81	10.78	11.74	12.69	14.09	15.26	16.44	21.17	26.02
	100	8.64	9.96	11.18	12.34	13.46	14.58	16.23	17.60	18.97	24.51	30.18
	120	9.52	11.08	12.48	13.81	15.11	16.38	18.26	19.82	21.39	27.69	34.14
	140	10.37	12.15	13.74	15.23	16.68	18.10	20.21	21.96	23.70	30.74	37.94
50	10	4.18	4.18	4.30	4.47	4.66	4.86	5.17	5.45	5.73	6.93	8.18
	20	4.99	5.11	5.36	5.64	5.95	6.28	6.79	7.22	7.67	9.50	11.41
	40	6.22	6.61	7.10	7.63	8.17	8.72	9.55	10.26	10.97	13.88	16.88
	60	7.27	7.92	8.65	9.39	10.13	10.88	12.00	12.94	13.89	17.74	21.69
	80	8.22	9.14	10.09	11.02	11.95	12.88	14.26	15.42	16.58	21.29	26.12
	100	9.12	10.29	11.44	12.56	13.67	14.76	16.39	17.75	19.11	24.62	30.28
	120	9.99	11.40	12.74	14.03	15.30	16.55	18.41	19.96	21.52	27.80	34.23
	140	10.81	12.46	13.98	15.44	16.87	18.27	20.36	22.09	23.83	30.84	38.03
100	10	4.71	4.69	4.80	4.95	5.13	5.32	5.62	5.88	6.15	7.29	8.49
	20	5.65	5.73	5.93	6.19	6.47	6.76	7.23	7.64	8.06	9.82	11.68
	40	7.01	7.29	7.70	8.16	8.65	9.16	9.95	10.62	11.31	14.15	17.11
	60	8.11	8.61	9.23	9.89	10.58	11.29	12.36	13.27	14.20	17.98	21.90
	80	9.09	9.81	10.64	11.50	12.37	13.26	14.60	15.73	16.87	21.52	26.31
	100	9.99	10.94	11.97	13.01	14.06	15.12	16.71	18.04	19.38	24.84	30.46
	120	10.85	12.02	13.24	14.46	15.68	16.89	18.72	20.24	21.78	28.00	34.41
	140	11.67	13.06	14.47	15.86	17.23	18.60	20.65	22.36	24.08	31.04	38.20
150	10	5.10	5.07	5.18	5.33	5.50	5.69	5.99	6.24	6.51	7.62	8.80
	20	6.14	6.19	6.39	6.63	6.90	7.18	7.63	8.02	8.43	10.13	11.95
	40	7.62	7.85	8.22	8.64	9.10	9.58	10.33	10.98	11.64	14.42	17.34
	60	8.79	9.20	9.76	10.37	11.01	11.68	12.72	13.60	14.50	18.23	22.11
	80	9.80	10.41	11.16	11.96	12.78	13.63	14.93	16.03	17.15	21.74	26.51
	100	10.73	11.54	12.48	13.45	14.46	15.48	17.02	18.33	19.65	25.06	30.64
	120	11.60	12.62	13.73	14.89	16.06	17.24	19.02	20.52	22.04	28.21	34.58
	140	12.43	13.65	14.95	16.27	17.60	18.93	20.94	22.63	24.33	31.24	38.37

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.41	5.38	5.48	5.63	5.81	6.00	6.30	6.55	6.82	7.92	9.09
	20	6.54	6.58	6.77	7.00	7.27	7.55	7.99	8.37	8.76	10.43	12.21
	40	8.12	8.32	8.67	9.07	9.51	9.97	10.69	11.32	11.97	14.69	17.57
	60	9.35	9.72	10.23	10.81	11.43	12.07	13.07	13.92	14.80	18.47	22.32
	80	10.41	10.95	11.64	12.40	13.18	14.00	15.26	16.34	17.43	21.97	26.70
	100	11.38	12.10	12.96	13.88	14.84	15.83	17.34	18.62	19.92	25.27	30.83
	120	12.27	13.17	14.21	15.31	16.43	17.58	19.32	20.80	22.29	28.42	34.76
	140	13.11	14.20	15.42	16.68	17.96	19.26	21.23	22.90	24.58	31.44	38.53
300	10	5.92	5.88	5.99	6.14	6.32	6.51	6.81	7.07	7.34	8.45	9.60
	20	7.19	7.22	7.40	7.63	7.89	8.16	8.60	8.98	9.36	10.99	12.73
	40	8.95	9.11	9.43	9.82	10.23	10.67	11.37	11.97	12.58	15.21	18.02
	60	10.29	10.60	11.07	11.60	12.18	12.78	13.73	14.55	15.39	18.95	22.73
	80	11.43	11.89	12.51	13.21	13.94	14.71	15.90	16.94	17.99	22.42	27.09
	100	12.46	13.07	13.85	14.69	15.59	16.52	17.96	19.19	20.45	25.70	31.19
	120	13.40	14.17	15.10	16.11	17.16	18.24	19.92	21.35	22.81	28.83	35.11
	140	14.28	15.21	16.30	17.46	18.67	19.91	21.81	23.43	25.07	31.83	38.87
400	10	6.34	6.29	6.40	6.55	6.73	6.93	7.24	7.50	7.78	8.90	10.06
	20	7.72	7.74	7.92	8.15	8.41	8.68	9.12	9.50	9.88	11.50	13.21
	40	9.62	9.76	10.07	10.45	10.86	11.29	11.96	12.55	13.15	15.72	18.47
	60	11.06	11.33	11.78	12.30	12.85	13.43	14.35	15.14	15.96	19.43	23.14
	80	12.28	12.69	13.27	13.93	14.63	15.37	16.52	17.52	18.54	22.87	27.47
	100	13.36	13.91	14.63	15.43	16.29	17.17	18.56	19.75	20.98	26.13	31.56
	120	14.35	15.04	15.91	16.85	17.85	18.89	20.51	21.89	23.31	29.24	35.46
	140	15.27	16.10	17.11	18.21	19.36	20.54	22.38	23.95	25.56	32.23	39.21
600	10	7.01	6.95	7.06	7.22	7.41	7.61	7.93	8.21	8.49	9.65	10.83
	20	8.58	8.59	8.76	8.99	9.26	9.54	9.99	10.37	10.76	12.38	14.08
	40	10.72	10.83	11.13	11.50	11.90	12.33	13.00	13.57	14.16	16.66	19.33
	60	12.33	12.55	12.97	13.47	14.00	14.57	15.45	16.22	17.00	20.35	23.95
	80	13.67	14.01	14.56	15.18	15.85	16.55	17.65	18.60	19.58	23.75	28.23
	100	14.85	15.32	15.98	16.74	17.54	18.38	19.69	20.83	22.00	26.97	32.28
	120	15.93	16.51	17.31	18.19	19.12	20.10	21.62	22.95	24.30	30.05	36.15
	140	16.92	17.63	18.55	19.56	20.63	21.74	23.48	24.98	26.53	33.01	39.88
800	10	7.55	7.49	7.60	7.77	7.96	8.17	8.51	8.79	9.08	10.28	11.49
	20	9.28	9.27	9.45	9.69	9.96	10.25	10.70	11.10	11.49	13.14	14.84
	40	11.62	11.71	12.00	12.37	12.78	13.20	13.87	14.45	15.04	17.51	20.14
	60	13.36	13.56	13.96	14.45	14.98	15.54	16.41	17.16	17.94	21.21	24.74
	80	14.81	15.11	15.64	16.24	16.90	17.58	18.65	19.58	20.54	24.60	28.98
	100	16.08	16.49	17.13	17.86	18.63	19.45	20.72	21.82	22.96	27.79	33.00
	120	17.23	17.75	18.51	19.35	20.25	21.19	22.66	23.94	25.26	30.85	36.84
	140	18.29	18.93	19.79	20.76	21.78	22.85	24.52	25.97	27.46	33.79	40.55

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	4.84	5.27	5.73	6.19	6.64	7.10	7.79	8.36	8.94	11.27	13.63
	20	6.33	7.14	7.91	8.65	9.38	10.09	11.16	12.05	12.94	16.53	20.19
	40	8.83	10.28	11.57	12.79	13.97	15.12	16.84	18.26	19.68	25.39	31.22
	60	11.02	13.04	14.79	16.42	17.99	19.54	21.81	23.70	25.58	33.16	40.89
	80	13.03	15.57	17.74	19.76	21.69	23.59	26.38	28.69	31.00	40.29	49.78
	100	14.92	17.94	20.51	22.89	25.16	27.39	30.67	33.38	36.09	46.99	58.11
	120	16.72	20.20	23.14	25.86	28.47	31.00	34.75	37.84	40.93	53.35	66.04
	140	18.44	22.37	25.67	28.72	31.63	34.47	38.66	42.12	45.57	59.46	73.64
25	10	5.64	5.85	6.20	6.59	7.00	7.42	8.07	8.62	9.18	11.46	13.80
	20	7.05	7.64	8.31	8.99	9.68	10.37	11.40	12.27	13.15	16.70	20.33
	40	9.45	10.71	11.91	13.08	14.22	15.35	17.04	18.44	19.85	25.53	31.34
	60	11.59	13.42	15.09	16.68	18.22	19.74	22.00	23.87	25.74	33.28	41.00
	80	13.56	15.93	18.02	20.00	21.91	23.78	26.55	28.85	31.15	40.41	49.87
	100	15.42	18.28	20.78	23.11	25.37	27.57	30.83	33.53	36.23	47.09	58.21
	120	17.20	20.53	23.40	26.08	28.66	31.18	34.90	37.98	41.06	53.46	66.13
	140	18.90	22.68	25.92	28.93	31.82	34.64	38.81	42.26	45.70	59.56	73.73
50	10	6.19	6.33	6.62	6.96	7.34	7.74	8.35	8.88	9.42	11.65	13.96
	20	7.66	8.11	8.69	9.32	9.97	10.63	11.64	12.49	13.35	16.86	20.47
	40	10.04	11.12	12.24	13.36	14.47	15.58	17.24	18.63	20.02	25.66	31.46
	60	12.14	13.80	15.40	16.94	18.45	19.95	22.18	24.03	25.89	33.41	41.10
	80	14.08	16.28	18.31	20.24	22.12	23.97	26.72	29.01	31.29	40.52	49.97
	100	15.91	18.62	21.05	23.34	25.57	27.75	30.99	33.68	36.36	47.20	58.30
	120	17.67	20.85	23.66	26.30	28.85	31.35	35.06	38.12	41.19	53.56	66.22
	140	19.36	22.99	26.17	29.14	32.00	34.81	38.96	42.39	45.82	59.66	73.81
100	10	6.98	7.06	7.30	7.61	7.95	8.31	8.88	9.38	9.89	12.03	14.28
	20	8.60	8.92	9.41	9.96	10.55	11.16	12.11	12.92	13.75	17.18	20.74
	40	11.07	11.92	12.90	13.92	14.97	16.03	17.64	19.00	20.36	25.94	31.69
	60	13.16	14.54	16.00	17.45	18.91	20.36	22.54	24.37	26.20	33.65	41.31
	80	15.08	16.98	18.87	20.72	22.54	24.35	27.06	29.32	31.58	40.75	50.17
	100	16.88	19.28	21.58	23.80	25.97	28.12	31.31	33.97	36.64	47.42	58.48
	120	18.60	21.49	24.17	26.73	29.24	31.70	35.36	38.41	41.45	53.77	66.39
	140	20.26	23.61	26.66	29.56	32.37	35.14	39.25	42.66	46.07	59.86	73.98
150	10	7.56	7.62	7.84	8.14	8.46	8.81	9.36	9.83	10.32	12.40	14.60
	20	9.32	9.58	10.02	10.53	11.08	11.66	12.56	13.35	14.15	17.50	21.02
	40	11.92	12.63	13.52	14.47	15.46	16.48	18.04	19.36	20.70	26.21	31.92
	60	14.06	15.25	16.58	17.96	19.36	20.77	22.90	24.70	26.51	33.90	41.52
	80	15.99	17.66	19.42	21.19	22.96	24.74	27.40	29.63	31.87	40.98	50.36
	100	17.78	19.94	22.11	24.25	26.37	28.48	31.63	34.27	36.91	47.64	58.67
	120	19.49	22.12	24.68	27.17	29.62	32.05	35.67	38.69	41.71	53.98	66.57
	140	21.13	24.21	27.15	29.97	32.74	35.47	39.55	42.93	46.32	60.06	74.15

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	8.04	8.08	8.30	8.58	8.90	9.24	9.78	10.24	10.73	12.75	14.92
	20	9.92	10.15	10.56	11.04	11.57	12.13	13.00	13.76	14.53	17.81	21.29
	40	12.65	13.28	14.10	14.99	15.94	16.92	18.43	19.72	21.04	26.48	32.15
	60	14.85	15.91	17.15	18.46	19.80	21.17	23.26	25.03	26.81	34.14	41.73
	80	16.81	18.32	19.97	21.66	23.38	25.11	27.73	29.93	32.15	41.21	50.56
	100	18.61	20.58	22.63	24.70	26.77	28.84	31.95	34.56	37.18	47.85	58.85
	120	20.32	22.74	25.18	27.60	30.00	32.39	35.97	38.97	41.97	54.18	66.75
	140	21.96	24.82	27.63	30.39	33.11	35.81	39.84	43.20	46.57	60.26	74.32
300	10	8.82	8.84	9.05	9.33	9.64	9.98	10.51	10.97	11.44	13.42	15.53
	20	10.90	11.08	11.47	11.93	12.43	12.96	13.80	14.52	15.27	18.44	21.83
	40	13.86	14.39	15.13	15.96	16.84	17.76	19.19	20.43	21.70	27.02	32.61
	60	16.20	17.10	18.21	19.41	20.67	21.97	23.97	25.68	27.42	34.63	42.15
	80	18.24	19.52	21.01	22.58	24.21	25.86	28.40	30.55	32.72	41.66	50.95
	100	20.09	21.78	23.65	25.58	27.55	29.55	32.58	35.14	37.72	48.29	59.22
	120	21.83	23.93	26.16	28.45	30.75	33.07	36.58	39.52	42.49	54.60	67.10
	140	23.48	25.99	28.59	31.21	33.84	36.47	40.42	43.74	47.07	60.65	74.66
400	10	9.45	9.45	9.66	9.94	10.26	10.60	11.13	11.59	12.06	14.02	16.10
	20	11.71	11.86	12.23	12.68	13.17	13.69	14.51	15.22	15.95	19.04	22.36
	40	14.87	15.34	16.03	16.82	17.66	18.54	19.92	21.12	22.35	27.55	33.07
	60	17.33	18.13	19.16	20.30	21.49	22.73	24.67	26.33	28.03	35.12	42.57
	80	19.46	20.60	21.98	23.46	25.01	26.60	29.06	31.15	33.29	42.12	51.33
	100	21.38	22.89	24.62	26.44	28.33	30.26	33.21	35.72	38.26	48.72	59.59
	120	23.16	25.04	27.12	29.29	31.50	33.75	37.18	40.08	43.00	55.01	67.45
	140	24.84	27.09	29.53	32.03	34.56	37.12	41.00	44.27	47.57	61.05	75.00
600	10	10.47	10.46	10.67	10.95	11.27	11.62	12.16	12.62	13.10	15.08	17.14
	20	13.01	13.13	13.49	13.93	14.42	14.93	15.74	16.43	17.15	20.16	23.38
	40	16.52	16.91	17.56	18.31	19.11	19.95	21.27	22.41	23.59	28.59	33.97
	60	19.21	19.89	20.83	21.88	23.00	24.17	26.00	27.58	29.21	36.08	43.39
	80	21.50	22.48	23.72	25.08	26.52	28.02	30.34	32.35	34.41	43.02	52.11
	100	23.54	24.83	26.39	28.06	29.82	31.63	34.45	36.86	39.33	49.57	60.32
	120	25.42	27.03	28.90	30.89	32.96	35.09	38.37	41.18	44.03	55.83	68.15
	140	27.19	29.11	31.30	33.60	35.98	38.42	42.16	45.33	48.56	61.84	75.68
800	10	11.30	11.28	11.49	11.78	12.10	12.46	13.01	13.49	13.97	15.97	18.05
	20	14.08	14.18	14.53	14.97	15.45	15.97	16.78	17.47	18.19	21.17	24.35
	40	17.87	18.22	18.84	19.57	20.35	21.17	22.46	23.58	24.73	29.61	34.86
	60	20.75	21.36	22.26	23.27	24.34	25.47	27.23	28.76	30.34	37.03	44.21
	80	23.19	24.07	25.24	26.53	27.90	29.33	31.57	33.51	35.50	43.92	52.87
	100	25.35	26.51	27.96	29.54	31.21	32.95	35.65	37.98	40.38	50.43	61.05
	120	27.33	28.77	30.51	32.38	34.35	36.38	39.55	42.26	45.04	56.65	68.85
	140	29.17	30.90	32.92	35.09	37.35	39.69	43.30	46.39	49.54	62.63	76.35

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.48	1.49	1.54	1.61	1.69	1.77	1.90	2.00	2.11	2.55	2.99
	20	1.67	1.73	1.82	1.93	2.04	2.15	2.33	2.47	2.62	3.22	3.82
	40	1.99	2.13	2.30	2.46	2.63	2.80	3.05	3.27	3.48	4.34	5.22
	60	2.28	2.49	2.71	2.93	3.15	3.37	3.69	3.96	4.24	5.33	6.45
	80	2.54	2.82	3.09	3.36	3.62	3.89	4.28	4.60	4.93	6.24	7.58
	100	2.78	3.12	3.45	3.76	4.07	4.37	4.83	5.20	5.58	7.09	8.64
	120	3.01	3.41	3.79	4.14	4.49	4.84	5.35	5.77	6.20	7.91	9.65
	140	3.24	3.69	4.11	4.51	4.90	5.28	5.85	6.32	6.79	8.68	10.61
25	10	1.89	1.85	1.87	1.92	1.98	2.04	2.15	2.24	2.34	2.73	3.15
	20	2.13	2.11	2.16	2.23	2.32	2.41	2.56	2.69	2.82	3.38	3.96
	40	2.48	2.51	2.62	2.74	2.88	3.03	3.26	3.45	3.65	4.48	5.34
	60	2.76	2.85	3.01	3.19	3.38	3.57	3.87	4.13	4.39	5.46	6.56
	80	3.02	3.16	3.37	3.60	3.84	4.08	4.45	4.76	5.07	6.36	7.68
	100	3.25	3.46	3.71	3.99	4.27	4.56	4.99	5.35	5.72	7.20	8.73
	120	3.47	3.73	4.04	4.36	4.69	5.01	5.50	5.91	6.33	8.01	9.74
	140	3.68	4.00	4.36	4.72	5.09	5.45	6.00	6.46	6.92	8.78	10.70
50	10	2.07	2.02	2.04	2.09	2.15	2.21	2.32	2.41	2.50	2.90	3.30
	20	2.36	2.33	2.37	2.44	2.52	2.61	2.75	2.87	3.00	3.53	4.10
	40	2.76	2.78	2.86	2.97	3.10	3.23	3.44	3.63	3.82	4.62	5.46
	60	3.08	3.14	3.26	3.42	3.59	3.77	4.05	4.30	4.54	5.58	6.66
	80	3.35	3.45	3.63	3.83	4.04	4.27	4.61	4.91	5.22	6.47	7.78
	100	3.60	3.75	3.97	4.21	4.47	4.74	5.15	5.50	5.85	7.31	8.83
	120	3.83	4.03	4.29	4.58	4.88	5.18	5.66	6.05	6.46	8.11	9.82
	140	4.05	4.29	4.60	4.93	5.27	5.62	6.15	6.59	7.04	8.88	10.78
100	10	2.30	2.25	2.28	2.33	2.39	2.45	2.56	2.65	2.75	3.14	3.55
	20	2.66	2.63	2.67	2.73	2.81	2.90	3.04	3.16	3.29	3.80	4.35
	40	3.15	3.15	3.22	3.32	3.44	3.57	3.77	3.94	4.12	4.88	5.68
	60	3.52	3.55	3.66	3.80	3.95	4.12	4.38	4.60	4.84	5.82	6.87
	80	3.83	3.90	4.04	4.22	4.41	4.61	4.93	5.21	5.50	6.70	7.97
	100	4.11	4.21	4.39	4.60	4.83	5.08	5.46	5.78	6.12	7.53	9.01
	120	4.36	4.50	4.72	4.97	5.24	5.52	5.95	6.33	6.72	8.32	10.00
	140	4.60	4.78	5.03	5.32	5.62	5.94	6.44	6.86	7.29	9.08	10.95
150	10	2.48	2.42	2.45	2.50	2.56	2.63	2.74	2.83	2.93	3.33	3.74
	20	2.88	2.84	2.88	2.95	3.03	3.12	3.26	3.38	3.51	4.03	4.57
	40	3.43	3.42	3.49	3.59	3.71	3.83	4.03	4.20	4.38	5.12	5.90
	60	3.84	3.86	3.96	4.10	4.25	4.41	4.66	4.88	5.10	6.06	7.08
	80	4.19	4.24	4.37	4.54	4.72	4.91	5.22	5.49	5.76	6.92	8.16
	100	4.49	4.57	4.74	4.94	5.15	5.38	5.74	6.06	6.38	7.74	9.19
	120	4.77	4.88	5.08	5.31	5.56	5.82	6.24	6.60	6.97	8.53	10.18
	140	5.02	5.17	5.40	5.66	5.95	6.25	6.71	7.12	7.54	9.28	11.12

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.61	2.56	2.58	2.64	2.70	2.77	2.88	2.98	3.08	3.49	3.91
	20	3.06	3.02	3.06	3.13	3.21	3.30	3.44	3.57	3.69	4.22	4.76
	40	3.66	3.64	3.71	3.81	3.93	4.05	4.25	4.42	4.60	5.33	6.11
	60	4.11	4.12	4.22	4.35	4.50	4.65	4.90	5.12	5.34	6.28	7.27
	80	4.48	4.52	4.65	4.81	4.99	5.18	5.48	5.74	6.00	7.14	8.35
	100	4.81	4.87	5.03	5.22	5.43	5.65	6.00	6.31	6.62	7.95	9.37
	120	5.10	5.20	5.38	5.60	5.85	6.10	6.50	6.85	7.21	8.73	10.35
	140	5.37	5.50	5.71	5.97	6.24	6.53	6.98	7.37	7.77	9.48	11.29
300	10	2.84	2.78	2.81	2.86	2.93	3.00	3.12	3.22	3.32	3.75	4.18
	20	3.35	3.30	3.34	3.41	3.50	3.59	3.74	3.87	4.00	4.54	5.09
	40	4.03	4.01	4.08	4.18	4.30	4.42	4.62	4.80	4.97	5.71	6.48
	60	4.53	4.54	4.63	4.76	4.91	5.07	5.32	5.53	5.75	6.67	7.65
	80	4.95	4.98	5.10	5.26	5.43	5.62	5.92	6.17	6.43	7.54	8.72
	100	5.32	5.37	5.52	5.70	5.91	6.12	6.46	6.76	7.06	8.35	9.73
	120	5.64	5.72	5.89	6.11	6.34	6.59	6.97	7.31	7.65	9.12	10.69
	140	5.95	6.04	6.25	6.49	6.75	7.02	7.46	7.83	8.22	9.86	11.62
400	10	3.02	2.96	2.99	3.04	3.11	3.19	3.31	3.42	3.52	3.97	4.41
	20	3.58	3.53	3.58	3.65	3.74	3.83	3.99	4.12	4.25	4.81	5.37
	40	4.33	4.30	4.37	4.48	4.60	4.73	4.93	5.11	5.29	6.03	6.80
	60	4.88	4.88	4.97	5.10	5.25	5.41	5.66	5.88	6.10	7.02	7.99
	80	5.34	5.35	5.47	5.63	5.81	6.00	6.29	6.55	6.81	7.90	9.07
	100	5.73	5.77	5.92	6.10	6.30	6.52	6.86	7.15	7.45	8.72	10.07
	120	6.09	6.15	6.32	6.53	6.76	7.00	7.38	7.71	8.05	9.49	11.03
	140	6.41	6.50	6.69	6.93	7.18	7.45	7.88	8.25	8.62	10.23	11.95
600	10	3.31	3.25	3.28	3.34	3.41	3.49	3.62	3.73	3.85	4.31	4.78
	20	3.96	3.91	3.95	4.03	4.12	4.22	4.38	4.52	4.66	5.24	5.83
	40	4.81	4.78	4.85	4.96	5.08	5.22	5.43	5.62	5.80	6.57	7.36
	60	5.44	5.43	5.53	5.66	5.81	5.98	6.23	6.46	6.68	7.62	8.59
	80	5.96	5.97	6.09	6.24	6.42	6.61	6.91	7.17	7.44	8.54	9.69
	100	6.41	6.43	6.58	6.76	6.96	7.18	7.52	7.82	8.12	9.37	10.70
	120	6.81	6.85	7.02	7.23	7.45	7.70	8.08	8.41	8.74	10.16	11.66
	140	7.17	7.24	7.43	7.66	7.91	8.18	8.60	8.96	9.33	10.90	12.58
800	10	3.54	3.48	3.51	3.57	3.65	3.74	3.87	3.99	4.11	4.59	5.08
	20	4.26	4.21	4.25	4.33	4.43	4.54	4.71	4.85	5.00	5.60	6.21
	40	5.21	5.17	5.24	5.35	5.48	5.62	5.84	6.03	6.23	7.02	7.83
	60	5.90	5.88	5.98	6.11	6.27	6.44	6.71	6.93	7.17	8.12	9.11
	80	6.46	6.46	6.58	6.75	6.93	7.12	7.43	7.70	7.97	9.08	10.24
	100	6.96	6.97	7.11	7.30	7.51	7.73	8.07	8.37	8.68	9.94	11.27
	120	7.39	7.43	7.59	7.80	8.03	8.28	8.66	8.99	9.33	10.75	12.23
	140	7.79	7.85	8.03	8.26	8.51	8.78	9.21	9.57	9.94	11.50	13.16

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.14	2.20	2.32	2.44	2.58	2.72	2.93	3.11	3.29	4.03	4.78
	20	2.53	2.69	2.88	3.08	3.28	3.49	3.80	4.06	4.32	5.37	6.44
	40	3.17	3.50	3.82	4.14	4.46	4.78	5.25	5.64	6.04	7.63	9.24
	60	3.74	4.21	4.65	5.08	5.50	5.91	6.52	7.04	7.55	9.60	11.70
	80	4.26	4.86	5.41	5.93	6.45	6.95	7.69	8.31	8.93	11.42	13.96
	100	4.75	5.47	6.12	6.74	7.34	7.92	8.79	9.51	10.23	13.13	16.08
	120	5.21	6.06	6.80	7.51	8.18	8.85	9.84	10.65	11.47	14.75	18.09
	140	5.66	6.61	7.45	8.24	9.00	9.74	10.84	11.75	12.65	16.30	20.02
25	10	2.69	2.66	2.72	2.81	2.91	3.03	3.21	3.37	3.53	4.22	4.94
	20	3.10	3.14	3.26	3.41	3.58	3.76	4.04	4.28	4.52	5.53	6.58
	40	3.74	3.91	4.16	4.43	4.72	5.01	5.45	5.83	6.21	7.76	9.36
	60	4.28	4.59	4.96	5.34	5.73	6.12	6.71	7.20	7.70	9.73	11.81
	80	4.78	5.22	5.70	6.18	6.66	7.14	7.87	8.47	9.08	11.54	14.06
	100	5.24	5.81	6.39	6.97	7.54	8.11	8.96	9.66	10.37	13.24	16.17
	120	5.69	6.38	7.06	7.73	8.38	9.03	9.99	10.80	11.60	14.85	18.18
	140	6.12	6.93	7.70	8.45	9.19	9.91	10.99	11.89	12.78	16.40	20.11
50	10	2.96	2.92	2.97	3.05	3.15	3.26	3.44	3.59	3.75	4.41	5.10
	20	3.44	3.45	3.55	3.69	3.84	4.00	4.26	4.49	4.72	5.69	6.72
	40	4.14	4.26	4.46	4.70	4.96	5.23	5.65	6.01	6.38	7.90	9.48
	60	4.71	4.94	5.25	5.59	5.95	6.32	6.89	7.37	7.86	9.85	11.91
	80	5.22	5.56	5.97	6.42	6.87	7.33	8.04	8.63	9.22	11.65	14.15
	100	5.68	6.14	6.66	7.20	7.74	8.29	9.12	9.81	10.51	13.35	16.26
	120	6.12	6.70	7.32	7.94	8.57	9.20	10.15	10.94	11.73	14.96	18.27
	140	6.55	7.23	7.95	8.66	9.37	10.08	11.14	12.02	12.91	16.50	20.19
100	10	3.32	3.27	3.32	3.40	3.50	3.61	3.78	3.93	4.08	4.73	5.40
	20	3.90	3.89	3.98	4.10	4.25	4.40	4.64	4.86	5.08	6.00	6.99
	40	4.71	4.78	4.95	5.16	5.40	5.64	6.03	6.37	6.71	8.17	9.71
	60	5.35	5.50	5.76	6.06	6.38	6.72	7.25	7.70	8.16	10.10	12.12
	80	5.89	6.14	6.49	6.87	7.28	7.71	8.37	8.94	9.51	11.88	14.35
	100	6.39	6.73	7.16	7.64	8.14	8.65	9.44	10.10	10.78	13.56	16.45
	120	6.85	7.28	7.81	8.37	8.95	9.55	10.45	11.22	11.99	15.17	18.45
	140	7.28	7.81	8.43	9.08	9.74	10.41	11.43	12.29	13.16	16.71	20.36
150	10	3.58	3.53	3.58	3.66	3.76	3.87	4.04	4.19	4.35	4.99	5.66
	20	4.23	4.21	4.30	4.42	4.56	4.71	4.96	5.17	5.38	6.29	7.25
	40	5.13	5.18	5.34	5.54	5.76	6.00	6.37	6.69	7.03	8.44	9.94
	60	5.83	5.95	6.18	6.46	6.76	7.08	7.58	8.02	8.46	10.34	12.33
	80	6.41	6.61	6.93	7.28	7.67	8.07	8.70	9.24	9.79	12.11	14.55
	100	6.94	7.22	7.61	8.05	8.51	9.00	9.75	10.39	11.05	13.78	16.63
	120	7.43	7.79	8.26	8.78	9.32	9.88	10.75	11.50	12.25	15.37	18.62
	140	7.88	8.32	8.88	9.48	10.10	10.74	11.72	12.56	13.41	16.91	20.53

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.79	3.74	3.79	3.87	3.97	4.08	4.26	4.41	4.57	5.22	5.89
	20	4.51	4.48	4.56	4.69	4.83	4.98	5.22	5.43	5.65	6.55	7.49
	40	5.48	5.52	5.67	5.87	6.08	6.31	6.68	6.99	7.32	8.69	10.16
	60	6.22	6.33	6.55	6.81	7.10	7.41	7.90	8.32	8.75	10.58	12.54
	80	6.85	7.02	7.31	7.65	8.02	8.40	9.01	9.53	10.07	12.34	14.74
	100	7.40	7.65	8.01	8.43	8.87	9.33	10.05	10.68	11.32	14.00	16.82
	120	7.91	8.23	8.67	9.16	9.67	10.21	11.05	11.77	12.51	15.58	18.80
	140	8.39	8.78	9.29	9.85	10.45	11.06	12.01	12.83	13.66	17.10	20.70
300	10	4.14	4.08	4.12	4.21	4.32	4.43	4.61	4.77	4.94	5.60	6.29
	20	4.95	4.91	5.00	5.12	5.26	5.42	5.66	5.87	6.09	6.99	7.93
	40	6.04	6.07	6.21	6.40	6.62	6.84	7.20	7.51	7.83	9.17	10.60
	60	6.87	6.95	7.16	7.41	7.69	7.99	8.46	8.86	9.28	11.05	12.95
	80	7.56	7.70	7.97	8.29	8.64	9.00	9.58	10.08	10.60	12.78	15.13
	100	8.17	8.37	8.70	9.09	9.50	9.94	10.63	11.22	11.83	14.42	17.18
	120	8.72	8.98	9.38	9.83	10.32	10.82	11.62	12.30	13.01	15.99	19.15
	140	9.23	9.56	10.02	10.54	11.09	11.67	12.57	13.35	14.15	17.50	21.04
400	10	4.41	4.35	4.40	4.49	4.60	4.72	4.90	5.07	5.24	5.92	6.62
	20	5.30	5.27	5.35	5.47	5.62	5.78	6.03	6.24	6.46	7.38	8.32
	40	6.50	6.52	6.66	6.85	7.06	7.29	7.65	7.96	8.27	9.60	11.01
	60	7.40	7.46	7.66	7.91	8.19	8.48	8.94	9.34	9.75	11.49	13.35
	80	8.14	8.26	8.52	8.83	9.17	9.53	10.09	10.58	11.08	13.21	15.51
	100	8.80	8.97	9.29	9.66	10.06	10.48	11.15	11.72	12.32	14.84	17.55
	120	9.39	9.62	9.99	10.43	10.89	11.38	12.14	12.81	13.49	16.39	19.50
	140	9.93	10.22	10.66	11.15	11.68	12.23	13.10	13.85	14.62	17.89	21.38
600	10	4.86	4.79	4.84	4.94	5.05	5.18	5.38	5.55	5.72	6.44	7.16
	20	5.88	5.83	5.92	6.05	6.20	6.36	6.62	6.85	7.08	8.02	8.98
	40	7.24	7.24	7.38	7.58	7.79	8.02	8.39	8.70	9.02	10.36	11.75
	60	8.25	8.30	8.49	8.74	9.02	9.31	9.77	10.17	10.58	12.28	14.10
	80	9.09	9.18	9.43	9.73	10.07	10.42	10.97	11.45	11.94	14.02	16.24
	100	9.82	9.96	10.26	10.62	11.01	11.42	12.07	12.63	13.20	15.64	18.26
	120	10.47	10.67	11.02	11.43	11.88	12.35	13.09	13.73	14.38	17.18	20.19
	140	11.08	11.32	11.72	12.19	12.69	13.22	14.05	14.77	15.51	18.66	22.05
800	10	5.22	5.15	5.21	5.30	5.42	5.55	5.76	5.94	6.12	6.87	7.62
	20	6.35	6.30	6.38	6.52	6.67	6.84	7.11	7.35	7.58	8.55	9.54
	40	7.84	7.83	7.98	8.17	8.39	8.63	9.00	9.32	9.65	11.00	12.40
	60	8.95	8.98	9.17	9.43	9.70	10.00	10.47	10.87	11.28	12.98	14.78
	80	9.86	9.94	10.18	10.48	10.82	11.17	11.72	12.20	12.69	14.74	16.93
	100	10.65	10.77	11.07	11.42	11.81	12.22	12.86	13.41	13.98	16.37	18.94
	120	11.36	11.53	11.87	12.28	12.72	13.18	13.91	14.54	15.18	17.91	20.86
	140	12.01	12.22	12.61	13.07	13.57	14.08	14.90	15.60	16.32	19.39	22.70

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.21	3.39	3.62	3.86	4.10	4.35	4.73	5.05	5.37	6.66	7.96
	20	3.98	4.35	4.74	5.12	5.51	5.89	6.46	6.94	7.41	9.34	11.30
	40	5.27	5.97	6.63	7.25	7.87	8.47	9.37	10.11	10.86	13.85	16.90
	60	6.40	7.40	8.28	9.12	9.94	10.73	11.92	12.90	13.87	17.81	21.82
	80	7.44	8.70	9.80	10.84	11.84	12.81	14.26	15.45	16.64	21.44	26.33
	100	8.42	9.93	11.23	12.45	13.62	14.76	16.45	17.85	19.24	24.85	30.56
	120	9.35	11.09	12.59	13.98	15.31	16.62	18.54	20.13	21.72	28.09	34.59
	140	10.24	12.21	13.89	15.45	16.94	18.40	20.55	22.32	24.09	31.20	38.45
25	10	3.90	3.93	4.07	4.25	4.46	4.67	5.02	5.31	5.61	6.85	8.13
	20	4.66	4.84	5.14	5.47	5.81	6.16	6.70	7.16	7.62	9.50	11.44
	40	5.89	6.40	6.97	7.54	8.12	8.70	9.57	10.30	11.03	13.99	17.02
	60	6.97	7.78	8.59	9.39	10.17	10.94	12.10	13.06	14.03	17.93	21.92
	80	7.97	9.06	10.09	11.08	12.05	13.01	14.43	15.61	16.79	21.56	26.43
	100	8.92	10.27	11.50	12.68	13.82	14.95	16.62	18.00	19.38	24.96	30.66
	120	9.83	11.42	12.85	14.20	15.51	16.79	18.70	20.27	21.85	28.20	34.68
	140	10.70	12.52	14.14	15.66	17.13	18.57	20.70	22.46	24.22	31.30	38.54
50	10	4.30	4.30	4.42	4.58	4.77	4.97	5.28	5.56	5.85	7.04	8.29
	20	5.13	5.26	5.50	5.79	6.10	6.43	6.94	7.38	7.82	9.67	11.58
	40	6.41	6.80	7.30	7.83	8.37	8.93	9.77	10.48	11.20	14.13	17.14
	60	7.49	8.16	8.90	9.64	10.40	11.15	12.28	13.23	14.19	18.06	22.03
	80	8.48	9.42	10.38	11.32	12.27	13.20	14.60	15.77	16.94	21.67	26.53
	100	9.41	10.60	11.77	12.91	14.03	15.13	16.78	18.15	19.52	25.07	30.75
	120	10.30	11.74	13.11	14.42	15.70	16.97	18.85	20.42	21.98	28.30	34.77
	140	11.16	12.83	14.39	15.87	17.32	18.74	20.84	22.59	24.34	31.40	38.63
100	10	4.84	4.82	4.92	5.08	5.25	5.44	5.74	6.00	6.27	7.41	8.62
	20	5.81	5.88	6.09	6.34	6.62	6.92	7.39	7.80	8.22	9.99	11.85
	40	7.21	7.49	7.91	8.37	8.86	9.38	10.17	10.85	11.54	14.40	17.37
	60	8.35	8.85	9.48	10.15	10.85	11.56	12.65	13.57	14.50	18.30	22.24
	80	9.36	10.09	10.93	11.80	12.69	13.58	14.94	16.08	17.23	21.90	26.72
	100	10.29	11.26	12.30	13.36	14.43	15.50	17.10	18.44	19.80	25.29	30.94
	120	11.17	12.37	13.62	14.86	16.09	17.32	19.16	20.70	22.24	28.51	34.95
	140	12.02	13.45	14.88	16.29	17.69	19.07	21.14	22.87	24.60	31.61	38.80
150	10	5.24	5.21	5.31	5.46	5.63	5.81	6.11	6.37	6.63	7.75	8.92
	20	6.31	6.36	6.55	6.79	7.06	7.34	7.79	8.19	8.59	10.30	12.12
	40	7.83	8.06	8.43	8.86	9.32	9.80	10.56	11.21	11.88	14.67	17.60
	60	9.04	9.46	10.02	10.64	11.29	11.96	13.01	13.90	14.80	18.55	22.45
	80	10.09	10.71	11.46	12.27	13.11	13.96	15.28	16.39	17.51	22.13	26.92
	100	11.05	11.87	12.82	13.81	14.83	15.86	17.42	18.74	20.07	25.51	31.12
	120	11.94	12.98	14.12	15.29	16.47	17.67	19.47	20.98	22.51	28.72	35.13
	140	12.80	14.04	15.37	16.71	18.06	19.41	21.44	23.14	24.85	31.81	38.97

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.56	5.52	5.62	5.77	5.94	6.13	6.43	6.68	6.95	8.05	9.21
	20	6.72	6.76	6.94	7.17	7.43	7.71	8.16	8.54	8.93	10.61	12.39
	40	8.35	8.55	8.89	9.30	9.74	10.20	10.93	11.56	12.21	14.94	17.83
	60	9.62	9.98	10.50	11.09	11.71	12.35	13.36	14.22	15.11	18.80	22.66
	80	10.71	11.26	11.95	12.71	13.51	14.34	15.61	16.70	17.80	22.36	27.12
	100	11.70	12.43	13.31	14.25	15.22	16.21	17.74	19.03	20.34	25.72	31.31
	120	12.62	13.54	14.60	15.71	16.85	18.01	19.77	21.26	22.77	28.93	35.30
	140	13.49	14.60	15.84	17.12	18.42	19.74	21.73	23.41	25.10	32.01	39.14
300	10	6.09	6.04	6.14	6.28	6.46	6.65	6.95	7.21	7.48	8.59	9.74
	20	7.39	7.41	7.58	7.81	8.07	8.34	8.78	9.16	9.54	11.17	12.91
	40	9.19	9.35	9.67	10.06	10.47	10.92	11.61	12.21	12.83	15.47	18.29
	60	10.58	10.88	11.35	11.89	12.47	13.08	14.03	14.86	15.71	19.28	23.08
	80	11.75	12.21	12.84	13.54	14.28	15.05	16.26	17.30	18.37	22.82	27.51
	100	12.81	13.42	14.21	15.07	15.97	16.91	18.36	19.61	20.88	26.16	31.68
	120	13.78	14.56	15.50	16.52	17.59	18.68	20.38	21.82	23.28	29.34	35.66
	140	14.68	15.63	16.74	17.92	19.14	20.39	22.32	23.95	25.60	32.41	39.48
400	10	6.51	6.46	6.55	6.71	6.88	7.08	7.38	7.65	7.92	9.04	10.20
	20	7.94	7.94	8.11	8.34	8.60	8.87	9.31	9.69	10.07	11.69	13.40
	40	9.89	10.02	10.33	10.70	11.11	11.54	12.22	12.81	13.41	15.98	18.74
	60	11.37	11.63	12.08	12.60	13.15	13.74	14.66	15.46	16.28	19.76	23.49
	80	12.62	13.02	13.61	14.27	14.98	15.72	16.88	17.89	18.92	23.27	27.89
	100	13.73	14.28	15.01	15.82	16.68	17.58	18.97	20.18	21.41	26.59	32.05
	120	14.75	15.44	16.32	17.28	18.29	19.34	20.97	22.37	23.80	29.76	36.01
	140	15.70	16.54	17.57	18.68	19.84	21.04	22.89	24.48	26.10	32.81	39.82
600	10	7.20	7.13	7.23	7.39	7.58	7.78	8.10	8.37	8.65	9.80	10.98
	20	8.82	8.81	8.98	9.21	9.47	9.75	10.19	10.57	10.96	12.58	14.28
	40	11.01	11.11	11.41	11.77	12.18	12.60	13.27	13.84	14.44	16.94	19.61
	60	12.66	12.88	13.30	13.79	14.33	14.89	15.78	16.55	17.34	20.70	24.31
	80	14.04	14.38	14.92	15.55	16.22	16.92	18.03	18.99	19.97	24.16	28.66
	100	15.26	15.72	16.39	17.15	17.95	18.80	20.12	21.26	22.44	27.44	32.78
	120	16.37	16.95	17.75	18.64	19.58	20.56	22.10	23.43	24.80	30.58	36.71
	140	17.39	18.10	19.03	20.05	21.13	22.25	24.01	25.52	27.07	33.60	40.50
800	10	7.75	7.68	7.78	7.95	8.14	8.35	8.68	8.96	9.25	10.44	11.65
	20	9.53	9.51	9.68	9.92	10.18	10.47	10.92	11.31	11.71	13.35	15.05
	40	11.93	12.01	12.30	12.66	13.07	13.49	14.16	14.73	15.33	17.80	20.44
	60	13.72	13.91	14.31	14.80	15.33	15.88	16.76	17.51	18.29	21.57	25.11
	80	15.21	15.51	16.03	16.63	17.29	17.97	19.05	19.98	20.94	25.02	29.42
	100	16.52	16.92	17.56	18.29	19.07	19.88	21.16	22.27	23.42	28.28	33.51
	120	17.70	18.22	18.97	19.82	20.73	21.67	23.16	24.44	25.77	31.39	37.41
	140	18.79	19.42	20.30	21.27	22.30	23.38	25.06	26.52	28.02	34.38	41.17

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	5.00	5.43	5.89	6.35	6.82	7.28	7.97	8.55	9.12	11.46	13.84
	20	6.54	7.36	8.14	8.89	9.62	10.35	11.43	12.32	13.22	16.83	20.50
	40	9.12	10.60	11.92	13.15	14.34	15.51	17.24	18.67	20.10	25.85	31.71
	60	11.39	13.45	15.23	16.88	18.48	20.04	22.34	24.24	26.14	33.76	41.54
	80	13.47	16.06	18.27	20.31	22.28	24.19	27.02	29.35	31.68	41.03	50.56
	100	15.42	18.51	21.12	23.53	25.84	28.09	31.41	34.15	36.88	47.85	59.03
	120	17.28	20.84	23.84	26.60	29.24	31.81	35.59	38.71	41.83	54.33	67.09
	140	19.06	23.07	26.44	29.53	32.49	35.36	39.60	43.09	46.57	60.55	74.81
25	10	5.81	6.02	6.37	6.76	7.18	7.60	8.26	8.81	9.37	11.65	14.00
	20	7.27	7.87	8.54	9.23	9.93	10.62	11.67	12.54	13.42	16.99	20.64
	40	9.75	11.03	12.26	13.44	14.60	15.74	17.44	18.86	20.27	25.99	31.83
	60	11.96	13.84	15.54	17.15	18.71	20.25	22.52	24.41	26.29	33.89	41.64
	80	14.00	16.42	18.56	20.56	22.49	24.39	27.19	29.51	31.82	41.14	50.66
	100	15.93	18.85	21.39	23.77	26.05	28.28	31.57	34.30	37.02	47.96	59.13
	120	17.76	21.17	24.10	26.82	29.43	31.98	35.75	38.86	41.96	54.44	67.18
	140	19.52	23.39	26.69	29.75	32.68	35.53	39.75	43.23	46.70	60.65	74.90
50	10	6.38	6.51	6.80	7.14	7.52	7.92	8.54	9.07	9.61	11.85	14.17
	20	7.89	8.35	8.94	9.57	10.23	10.89	11.91	12.77	13.63	17.15	20.78
	40	10.35	11.45	12.59	13.73	14.85	15.97	17.65	19.05	20.45	26.13	31.95
	60	12.52	14.22	15.84	17.41	18.94	20.45	22.71	24.58	26.45	34.01	41.75
	80	14.53	16.78	18.84	20.80	22.71	24.58	27.36	29.67	31.97	41.26	50.76
	100	16.43	19.19	21.67	24.00	26.25	28.46	31.74	34.45	37.16	48.07	59.22
	120	18.24	21.49	24.36	27.04	29.63	32.16	35.90	39.00	42.09	54.54	67.27
	140	19.98	23.70	26.94	29.96	32.86	35.70	39.90	43.36	46.82	60.76	74.99
100	10	7.18	7.25	7.49	7.80	8.14	8.50	9.07	9.57	10.08	12.23	14.49
	20	8.85	9.17	9.66	10.22	10.81	11.43	12.38	13.20	14.04	17.48	21.06
	40	11.40	12.26	13.26	14.30	15.36	16.43	18.05	19.42	20.79	26.40	32.18
	60	13.56	14.97	16.45	17.93	19.40	20.87	23.07	24.91	26.76	34.26	41.96
	80	15.54	17.49	19.41	21.29	23.14	24.97	27.70	29.98	32.26	41.49	50.96
	100	17.40	19.87	22.21	24.46	26.66	28.83	32.06	34.75	37.43	48.29	59.41
	120	19.18	22.14	24.87	27.48	30.01	32.51	36.21	39.28	42.35	54.75	67.45
	140	20.89	24.33	27.44	30.38	33.24	36.04	40.19	43.64	47.08	60.96	75.16
150	10	7.78	7.82	8.05	8.34	8.66	9.01	9.55	10.03	10.52	12.61	14.82
	20	9.59	9.84	10.28	10.80	11.35	11.93	12.84	13.63	14.44	17.80	21.33
	40	12.27	12.99	13.89	14.85	15.85	16.88	18.45	19.79	21.14	26.68	32.41
	60	14.47	15.69	17.04	18.44	19.86	21.28	23.44	25.25	27.07	34.51	42.17
	80	16.46	18.18	19.97	21.77	23.56	25.36	28.04	30.29	32.55	41.72	51.15
	100	18.32	20.53	22.74	24.91	27.06	29.20	32.38	35.04	37.71	48.51	59.59
	120	20.08	22.78	25.38	27.92	30.40	32.86	36.52	39.57	42.62	54.96	67.63
	140	21.78	24.94	27.93	30.80	33.61	36.38	40.49	43.91	47.33	61.16	75.33

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	8.27	8.29	8.51	8.79	9.11	9.45	9.98	10.45	10.93	12.97	15.14
	20	10.20	10.42	10.83	11.32	11.85	12.41	13.28	14.04	14.83	18.12	21.61
	40	13.01	13.64	14.47	15.38	16.34	17.32	18.85	20.15	21.48	26.95	32.65
	60	15.28	16.36	17.62	18.94	20.30	21.69	23.80	25.58	27.38	34.76	42.38
	80	17.30	18.84	20.52	22.25	23.99	25.74	28.38	30.60	32.84	41.96	51.35
	100	19.17	21.17	23.27	25.37	27.46	29.56	32.71	35.34	37.98	48.73	59.78
	120	20.93	23.40	25.89	28.35	30.79	33.21	36.83	39.85	42.88	55.17	67.80
	140	22.62	25.55	28.42	31.22	33.98	36.71	40.79	44.18	47.58	61.36	75.50
300	10	9.06	9.07	9.27	9.55	9.86	10.20	10.73	11.19	11.66	13.64	15.75
	20	11.21	11.38	11.76	12.22	12.72	13.25	14.09	14.82	15.57	18.75	22.15
	40	14.25	14.78	15.53	16.36	17.25	18.18	19.62	20.87	22.15	27.49	33.11
	60	16.66	17.57	18.69	19.91	21.18	22.49	24.52	26.24	28.00	35.25	42.81
	80	18.76	20.07	21.58	23.18	24.82	26.50	29.06	31.22	33.42	42.42	51.74
	100	20.67	22.40	24.30	26.26	28.26	30.28	33.35	35.93	38.53	49.16	60.15
	120	22.47	24.61	26.89	29.21	31.55	33.90	37.44	40.41	43.40	55.59	68.16
	140	24.17	26.74	29.39	32.06	34.72	37.38	41.38	44.73	48.09	61.76	75.84
400	10	9.71	9.70	9.90	10.18	10.49	10.83	11.36	11.82	12.29	14.25	16.33
	20	12.03	12.17	12.54	12.99	13.48	14.00	14.82	15.53	16.26	19.36	22.69
	40	15.28	15.75	16.44	17.24	18.08	18.97	20.36	21.57	22.81	28.03	33.57
	60	17.82	18.62	19.67	20.81	22.02	23.27	25.22	26.90	28.61	35.74	43.23
	80	20.00	21.17	22.57	24.07	25.63	27.24	29.72	31.84	33.99	42.88	52.14
	100	21.99	23.52	25.28	27.13	29.04	31.00	33.98	36.51	39.07	49.60	60.52
	120	23.82	25.74	27.86	30.06	32.31	34.59	38.05	40.97	43.92	56.01	68.51
	140	25.56	27.86	30.34	32.88	35.45	38.05	41.97	45.27	48.59	62.17	76.19
600	10	10.76	10.73	10.93	11.21	11.53	11.87	12.41	12.87	13.35	15.32	17.38
	20	13.37	13.48	13.82	14.26	14.75	15.26	16.06	16.76	17.48	20.50	23.73
	40	16.97	17.36	18.00	18.75	19.56	20.40	21.73	22.87	24.06	29.09	34.49
	60	19.74	20.42	21.37	22.42	23.55	24.73	26.57	28.16	29.80	36.72	44.06
	80	22.09	23.08	24.34	25.71	27.17	28.68	31.03	33.05	35.12	43.79	52.92
	100	24.20	25.50	27.08	28.78	30.55	32.39	35.23	37.67	40.15	50.47	61.27
	120	26.14	27.77	29.67	31.68	33.78	35.94	39.26	42.08	44.96	56.84	69.22
	140	27.95	29.92	32.14	34.48	36.89	39.36	43.14	46.34	49.59	62.97	76.87
800	10	11.61	11.57	11.77	12.05	12.38	12.72	13.27	13.75	14.23	16.23	18.30
	20	14.46	14.54	14.88	15.32	15.80	16.32	17.12	17.82	18.53	21.52	24.70
	40	18.36	18.70	19.31	20.04	20.82	21.65	22.94	24.06	25.21	30.11	35.39
	60	21.32	21.92	22.82	23.83	24.92	26.05	27.82	29.36	30.95	37.68	44.89
	80	23.83	24.70	25.88	27.19	28.57	30.02	32.27	34.22	36.23	44.69	53.69
	100	26.05	27.22	28.68	30.28	31.97	33.72	36.45	38.80	41.21	51.33	62.00
	120	28.09	29.54	31.30	33.20	35.19	37.25	40.44	43.18	45.99	57.66	69.93
	140	29.98	31.74	33.79	35.99	38.28	40.64	44.29	47.40	50.58	63.76	77.55

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	1.53	1.53	1.59	1.65	1.73	1.81	1.94	2.04	2.15	2.59	3.03
	20	1.72	1.78	1.87	1.98	2.09	2.20	2.38	2.52	2.67	3.27	3.88
	40	2.06	2.20	2.36	2.53	2.70	2.87	3.12	3.34	3.55	4.42	5.30
	60	2.35	2.56	2.79	3.01	3.23	3.45	3.77	4.05	4.32	5.43	6.55
	80	2.62	2.90	3.18	3.45	3.72	3.98	4.37	4.70	5.03	6.35	7.69
	100	2.87	3.22	3.54	3.86	4.17	4.48	4.94	5.32	5.69	7.22	8.77
	120	3.11	3.52	3.89	4.26	4.61	4.96	5.47	5.90	6.33	8.04	9.79
	140	3.34	3.80	4.23	4.63	5.03	5.41	5.98	6.46	6.93	8.84	10.77
25	10	1.94	1.90	1.92	1.96	2.02	2.09	2.19	2.28	2.38	2.78	3.19
	20	2.19	2.17	2.22	2.29	2.37	2.47	2.61	2.74	2.88	3.43	4.02
	40	2.55	2.58	2.68	2.81	2.95	3.10	3.33	3.52	3.72	4.56	5.42
	60	2.84	2.93	3.09	3.27	3.46	3.66	3.96	4.22	4.48	5.55	6.65
	80	3.10	3.25	3.46	3.69	3.93	4.17	4.55	4.86	5.18	6.47	7.79
	100	3.34	3.55	3.82	4.09	4.38	4.66	5.10	5.47	5.83	7.33	8.86
	120	3.57	3.84	4.15	4.48	4.80	5.13	5.63	6.04	6.46	8.15	9.88
	140	3.79	4.12	4.48	4.85	5.21	5.58	6.13	6.60	7.06	8.94	10.86
50	10	2.13	2.08	2.10	2.14	2.20	2.26	2.37	2.46	2.55	2.94	3.34
	20	2.42	2.39	2.43	2.50	2.58	2.67	2.81	2.93	3.06	3.59	4.15
	40	2.84	2.85	2.93	3.05	3.17	3.30	3.52	3.70	3.89	4.69	5.53
	60	3.17	3.22	3.35	3.50	3.68	3.86	4.14	4.38	4.63	5.68	6.76
	80	3.45	3.55	3.72	3.92	4.14	4.37	4.72	5.02	5.32	6.58	7.89
	100	3.70	3.85	4.07	4.32	4.58	4.85	5.26	5.61	5.97	7.44	8.96
	120	3.94	4.14	4.40	4.69	5.00	5.31	5.78	6.18	6.59	8.26	9.97
	140	4.16	4.41	4.72	5.06	5.40	5.75	6.28	6.73	7.19	9.04	10.95
100	10	2.37	2.31	2.33	2.38	2.44	2.50	2.61	2.70	2.80	3.19	3.59
	20	2.73	2.70	2.73	2.80	2.88	2.96	3.10	3.22	3.35	3.86	4.41
	40	3.23	3.23	3.30	3.40	3.52	3.64	3.84	4.02	4.20	4.96	5.76
	60	3.62	3.64	3.75	3.89	4.04	4.21	4.47	4.70	4.93	5.92	6.97
	80	3.94	4.00	4.14	4.32	4.51	4.72	5.04	5.32	5.60	6.81	8.09
	100	4.22	4.32	4.50	4.72	4.95	5.19	5.57	5.90	6.24	7.66	9.14
	120	4.48	4.62	4.84	5.09	5.36	5.64	6.08	6.46	6.85	8.46	10.15
	140	4.73	4.90	5.16	5.45	5.76	6.08	6.58	7.00	7.44	9.24	11.12
150	10	2.54	2.49	2.51	2.55	2.61	2.68	2.79	2.89	2.98	3.38	3.79
	20	2.96	2.92	2.95	3.02	3.10	3.19	3.33	3.45	3.57	4.09	4.63
	40	3.52	3.51	3.58	3.68	3.79	3.91	4.11	4.28	4.46	5.20	5.98
	60	3.95	3.96	4.06	4.19	4.34	4.50	4.75	4.97	5.20	6.16	7.18
	80	4.30	4.35	4.48	4.64	4.83	5.02	5.33	5.60	5.87	7.04	8.28
	100	4.61	4.69	4.85	5.05	5.27	5.50	5.86	6.18	6.50	7.87	9.33
	120	4.90	5.01	5.20	5.44	5.69	5.95	6.37	6.73	7.11	8.67	10.33
	140	5.16	5.30	5.53	5.80	6.09	6.39	6.86	7.27	7.69	9.44	11.29

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	2.69	2.63	2.65	2.70	2.76	2.83	2.94	3.04	3.14	3.54	3.96
	20	3.14	3.10	3.13	3.20	3.28	3.37	3.51	3.63	3.76	4.29	4.83
	40	3.76	3.74	3.80	3.90	4.02	4.14	4.34	4.51	4.68	5.42	6.19
	60	4.22	4.22	4.32	4.45	4.60	4.75	5.00	5.22	5.44	6.38	7.38
	80	4.60	4.63	4.76	4.92	5.10	5.29	5.59	5.85	6.12	7.26	8.48
	100	4.93	5.00	5.15	5.34	5.55	5.78	6.13	6.43	6.75	8.08	9.51
	120	5.24	5.33	5.52	5.74	5.98	6.24	6.64	6.99	7.35	8.88	10.50
	140	5.52	5.64	5.86	6.11	6.38	6.67	7.13	7.52	7.93	9.64	11.46
300	10	2.92	2.85	2.88	2.93	2.99	3.06	3.18	3.28	3.38	3.81	4.24
	20	3.44	3.39	3.43	3.49	3.58	3.67	3.82	3.94	4.07	4.61	5.16
	40	4.14	4.11	4.18	4.27	4.39	4.52	4.72	4.89	5.06	5.80	6.57
	60	4.65	4.65	4.74	4.87	5.02	5.17	5.42	5.64	5.86	6.78	7.76
	80	5.08	5.10	5.22	5.38	5.56	5.74	6.04	6.29	6.56	7.66	8.85
	100	5.46	5.50	5.65	5.83	6.04	6.25	6.60	6.89	7.20	8.49	9.87
	120	5.79	5.86	6.04	6.25	6.48	6.73	7.12	7.45	7.80	9.27	10.85
	140	6.10	6.20	6.40	6.64	6.90	7.18	7.61	7.99	8.38	10.03	11.80
400	10	3.10	3.04	3.06	3.11	3.18	3.25	3.37	3.48	3.59	4.03	4.47
	20	3.68	3.62	3.66	3.73	3.82	3.91	4.06	4.20	4.33	4.88	5.44
	40	4.44	4.41	4.48	4.58	4.70	4.83	5.03	5.20	5.38	6.13	6.90
	60	5.01	5.00	5.09	5.22	5.37	5.53	5.78	5.99	6.21	7.13	8.10
	80	5.48	5.49	5.61	5.76	5.94	6.12	6.42	6.67	6.93	8.03	9.20
	100	5.88	5.92	6.06	6.24	6.44	6.66	7.00	7.29	7.59	8.86	10.22
	120	6.25	6.31	6.47	6.68	6.91	7.15	7.53	7.87	8.21	9.65	11.19
	140	6.58	6.66	6.85	7.09	7.34	7.61	8.04	8.41	8.79	10.40	12.13
600	10	3.40	3.33	3.36	3.41	3.48	3.56	3.69	3.80	3.91	4.38	4.84
	20	4.06	4.00	4.04	4.12	4.21	4.31	4.47	4.61	4.75	5.33	5.91
	40	4.94	4.90	4.97	5.07	5.20	5.33	5.54	5.72	5.91	6.67	7.46
	60	5.59	5.57	5.66	5.79	5.94	6.10	6.36	6.58	6.81	7.74	8.71
	80	6.12	6.11	6.23	6.39	6.56	6.75	7.05	7.31	7.58	8.67	9.83
	100	6.58	6.59	6.73	6.91	7.12	7.33	7.67	7.97	8.27	9.53	10.85
	120	6.99	7.03	7.19	7.39	7.62	7.86	8.24	8.57	8.91	10.32	11.83
	140	7.36	7.42	7.60	7.83	8.09	8.35	8.77	9.14	9.51	11.08	12.76
800	10	3.64	3.57	3.60	3.66	3.73	3.81	3.95	4.06	4.18	4.66	5.15
	20	4.37	4.31	4.35	4.43	4.53	4.63	4.80	4.94	5.09	5.69	6.29
	40	5.34	5.30	5.37	5.47	5.60	5.74	5.96	6.15	6.34	7.13	7.93
	60	6.05	6.02	6.12	6.25	6.41	6.57	6.84	7.06	7.30	8.25	9.24
	80	6.63	6.62	6.74	6.90	7.08	7.27	7.58	7.84	8.11	9.22	10.38
	100	7.14	7.15	7.28	7.47	7.67	7.89	8.24	8.53	8.84	10.10	11.43
	120	7.58	7.61	7.77	7.98	8.21	8.45	8.84	9.17	9.51	10.92	12.41
	140	7.99	8.04	8.22	8.45	8.70	8.97	9.39	9.76	10.13	11.69	13.35

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	2.21	2.27	2.38	2.51	2.64	2.78	3.00	3.18	3.36	4.09	4.84
	20	2.61	2.77	2.96	3.16	3.36	3.57	3.88	4.14	4.40	5.46	6.53
	40	3.27	3.60	3.93	4.25	4.57	4.89	5.37	5.77	6.16	7.76	9.38
	60	3.86	4.33	4.78	5.21	5.64	6.05	6.67	7.19	7.70	9.77	11.88
	80	4.40	5.01	5.56	6.10	6.61	7.12	7.87	8.50	9.12	11.62	14.17
	100	4.90	5.64	6.30	6.92	7.53	8.12	9.00	9.72	10.45	13.36	16.32
	120	5.38	6.24	7.00	7.71	8.40	9.07	10.07	10.89	11.71	15.01	18.37
	140	5.84	6.81	7.67	8.46	9.23	9.98	11.09	12.01	12.92	16.59	20.33
25	10	2.76	2.73	2.79	2.87	2.98	3.09	3.28	3.43	3.60	4.29	5.01
	20	3.19	3.22	3.34	3.49	3.66	3.84	4.12	4.36	4.61	5.63	6.68
	40	3.85	4.02	4.27	4.54	4.83	5.13	5.57	5.95	6.34	7.90	9.50
	60	4.41	4.72	5.09	5.48	5.87	6.26	6.86	7.36	7.86	9.90	11.98
	80	4.92	5.37	5.85	6.34	6.83	7.32	8.05	8.65	9.27	11.74	14.27
	100	5.40	5.98	6.57	7.16	7.73	8.31	9.16	9.87	10.59	13.47	16.42
	120	5.86	6.57	7.26	7.93	8.59	9.25	10.22	11.03	11.84	15.12	18.46
	140	6.30	7.13	7.92	8.68	9.42	10.15	11.24	12.15	13.05	16.69	20.42
50	10	3.04	3.00	3.05	3.13	3.23	3.33	3.51	3.66	3.82	4.48	5.17
	20	3.54	3.54	3.64	3.78	3.93	4.09	4.35	4.58	4.81	5.79	6.81
	40	4.26	4.37	4.58	4.82	5.08	5.35	5.78	6.14	6.51	8.04	9.62
	60	4.85	5.07	5.39	5.73	6.10	6.47	7.04	7.53	8.02	10.02	12.09
	80	5.37	5.71	6.13	6.58	7.04	7.51	8.22	8.81	9.41	11.86	14.37
	100	5.85	6.31	6.84	7.39	7.94	8.49	9.32	10.02	10.73	13.58	16.51
	120	6.30	6.89	7.52	8.15	8.79	9.43	10.38	11.18	11.98	15.22	18.55
	140	6.74	7.44	8.17	8.89	9.61	10.32	11.39	12.28	13.18	16.80	20.50
100	10	3.41	3.36	3.40	3.48	3.58	3.68	3.86	4.00	4.16	4.80	5.47
	20	4.01	3.99	4.08	4.20	4.34	4.50	4.74	4.95	5.17	6.10	7.09
	40	4.84	4.91	5.08	5.29	5.52	5.77	6.16	6.50	6.85	8.31	9.85
	60	5.49	5.65	5.91	6.21	6.53	6.87	7.40	7.86	8.33	10.27	12.30
	80	6.06	6.30	6.65	7.05	7.46	7.89	8.56	9.12	9.70	12.09	14.57
	100	6.57	6.91	7.35	7.83	8.34	8.85	9.65	10.32	11.00	13.80	16.70
	120	7.04	7.48	8.02	8.59	9.17	9.77	10.69	11.46	12.24	15.43	18.73
	140	7.49	8.03	8.65	9.31	9.98	10.66	11.69	12.56	13.43	17.00	20.68
150	10	3.68	3.62	3.66	3.74	3.84	3.95	4.12	4.27	4.43	5.07	5.74
	20	4.35	4.32	4.41	4.53	4.66	4.82	5.06	5.27	5.48	6.39	7.35
	40	5.28	5.32	5.48	5.68	5.90	6.13	6.50	6.83	7.16	8.58	10.08
	60	5.98	6.11	6.34	6.62	6.92	7.24	7.74	8.18	8.63	10.52	12.52
	80	6.59	6.79	7.10	7.46	7.85	8.25	8.89	9.43	9.99	12.32	14.76
	100	7.13	7.41	7.81	8.25	8.72	9.21	9.96	10.61	11.27	14.02	16.88
	120	7.63	8.00	8.47	9.00	9.55	10.12	10.99	11.74	12.50	15.64	18.91
	140	8.10	8.55	9.11	9.72	10.35	10.99	11.99	12.83	13.69	17.20	20.85

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	3.90	3.83	3.88	3.96	4.06	4.17	4.34	4.50	4.65	5.30	5.97
	20	4.63	4.60	4.68	4.80	4.93	5.09	5.33	5.54	5.75	6.65	7.60
	40	5.63	5.66	5.81	6.00	6.22	6.45	6.81	7.13	7.46	8.84	10.31
	60	6.39	6.49	6.71	6.98	7.27	7.58	8.06	8.48	8.92	10.76	12.72
	80	7.03	7.20	7.50	7.84	8.21	8.59	9.20	9.73	10.27	12.55	14.96
	100	7.61	7.85	8.22	8.63	9.08	9.54	10.27	10.90	11.54	14.24	17.07
	120	8.13	8.45	8.89	9.38	9.90	10.45	11.29	12.02	12.76	15.85	19.08
	140	8.62	9.01	9.53	10.10	10.70	11.32	12.28	13.10	13.94	17.40	21.02
300	10	4.25	4.18	4.22	4.31	4.41	4.52	4.71	4.86	5.02	5.69	6.37
	20	5.08	5.04	5.12	5.24	5.38	5.53	5.78	5.99	6.20	7.10	8.04
	40	6.21	6.22	6.36	6.55	6.76	6.99	7.35	7.66	7.98	9.32	10.75
	60	7.05	7.13	7.33	7.59	7.87	8.16	8.63	9.04	9.46	11.23	13.14
	80	7.76	7.90	8.17	8.49	8.84	9.20	9.78	10.28	10.80	13.00	15.35
	100	8.39	8.59	8.92	9.31	9.72	10.16	10.85	11.45	12.06	14.67	17.44
	120	8.96	9.22	9.62	10.07	10.56	11.07	11.87	12.56	13.27	16.27	19.44
	140	9.48	9.81	10.28	10.80	11.35	11.93	12.84	13.63	14.43	17.80	21.36
400	10	4.53	4.46	4.51	4.59	4.70	4.81	5.00	5.16	5.33	6.01	6.70
	20	5.45	5.40	5.48	5.60	5.74	5.90	6.15	6.36	6.58	7.49	8.43
	40	6.68	6.68	6.82	7.01	7.22	7.44	7.80	8.11	8.43	9.76	11.17
	60	7.59	7.65	7.85	8.10	8.37	8.67	9.13	9.53	9.94	11.68	13.54
	80	8.36	8.47	8.73	9.04	9.38	9.74	10.30	10.79	11.29	13.43	15.73
	100	9.03	9.20	9.52	9.89	10.29	10.72	11.38	11.96	12.56	15.09	17.81
	120	9.64	9.87	10.24	10.67	11.14	11.63	12.40	13.07	13.76	16.67	19.79
	140	10.20	10.48	10.92	11.42	11.95	12.50	13.38	14.13	14.91	18.20	21.70
600	10	4.99	4.91	4.96	5.05	5.16	5.29	5.48	5.65	5.83	6.54	7.26
	20	6.04	5.98	6.06	6.19	6.34	6.50	6.76	6.98	7.21	8.14	9.10
	40	7.43	7.42	7.56	7.75	7.96	8.19	8.56	8.87	9.19	10.52	11.92
	60	8.47	8.51	8.70	8.94	9.22	9.51	9.97	10.37	10.77	12.48	14.30
	80	9.33	9.41	9.66	9.96	10.29	10.64	11.20	11.68	12.17	14.25	16.48
	100	10.08	10.21	10.51	10.87	11.26	11.67	12.32	12.88	13.45	15.90	18.53
	120	10.75	10.94	11.29	11.70	12.15	12.62	13.36	14.00	14.66	17.47	20.49
	140	11.37	11.60	12.01	12.48	12.98	13.51	14.35	15.07	15.81	18.97	22.38
800	10	5.36	5.28	5.33	5.42	5.54	5.67	5.87	6.05	6.23	6.97	7.72
	20	6.51	6.45	6.53	6.66	6.82	6.99	7.25	7.48	7.72	8.68	9.67
	40	8.05	8.03	8.17	8.36	8.58	8.81	9.18	9.50	9.83	11.18	12.58
	60	9.18	9.20	9.39	9.64	9.92	10.21	10.68	11.07	11.48	13.19	14.99
	80	10.12	10.18	10.42	10.72	11.06	11.41	11.96	12.44	12.93	14.98	17.17
	100	10.93	11.04	11.33	11.68	12.07	12.48	13.12	13.67	14.24	16.64	19.22
	120	11.66	11.82	12.16	12.56	13.00	13.47	14.19	14.82	15.47	18.21	21.16
	140	12.33	12.53	12.92	13.38	13.87	14.39	15.20	15.91	16.64	19.72	23.04

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	3.31	3.49	3.72	3.96	4.21	4.46	4.84	5.15	5.47	6.77	8.08
	20	4.11	4.48	4.87	5.26	5.65	6.03	6.61	7.09	7.56	9.50	11.46
	40	5.44	6.15	6.82	7.45	8.07	8.68	9.58	10.33	11.08	14.09	17.16
	60	6.61	7.62	8.52	9.37	10.19	11.00	12.19	13.18	14.16	18.12	22.15
	80	7.68	8.97	10.09	11.13	12.14	13.13	14.59	15.79	17.00	21.82	26.73
	100	8.69	10.23	11.56	12.79	13.97	15.13	16.84	18.25	19.65	25.29	31.04
	120	9.65	11.43	12.95	14.36	15.72	17.03	18.98	20.58	22.18	28.60	35.13
	140	10.57	12.58	14.29	15.87	17.38	18.86	21.03	22.82	24.60	31.76	39.05
25	10	4.01	4.03	4.18	4.36	4.56	4.78	5.12	5.42	5.72	6.96	8.25
	20	4.79	4.98	5.28	5.61	5.95	6.31	6.85	7.31	7.77	9.66	11.60
	40	6.06	6.58	7.16	7.74	8.33	8.91	9.79	10.52	11.26	14.23	17.28
	60	7.18	8.01	8.83	9.64	10.43	11.21	12.38	13.35	14.32	18.25	22.26
	80	8.22	9.33	10.38	11.38	12.36	13.33	14.76	15.95	17.14	21.94	26.83
	100	9.20	10.57	11.83	13.02	14.18	15.32	17.00	18.40	19.79	25.41	31.13
	120	10.14	11.76	13.22	14.59	15.91	17.21	19.13	20.73	22.31	28.70	35.22
	140	11.04	12.90	14.55	16.09	17.57	19.03	21.18	22.96	24.73	31.87	39.14
50	10	4.42	4.41	4.53	4.69	4.88	5.08	5.40	5.67	5.96	7.16	8.41
	20	5.28	5.40	5.64	5.93	6.25	6.58	7.09	7.53	7.98	9.83	11.75
	40	6.59	6.99	7.50	8.03	8.58	9.14	9.99	10.71	11.43	14.37	17.39
	60	7.71	8.39	9.14	9.90	10.66	11.42	12.56	13.52	14.48	18.37	22.36
	80	8.73	9.69	10.66	11.63	12.58	13.52	14.94	16.11	17.29	22.06	26.93
	100	9.69	10.91	12.10	13.26	14.39	15.50	17.17	18.55	19.93	25.52	31.23
	120	10.61	12.09	13.48	14.81	16.11	17.39	19.29	20.87	22.45	28.81	35.31
	140	11.50	13.21	14.80	16.30	17.76	19.20	21.33	23.10	24.86	31.97	39.23
100	10	4.98	4.95	5.05	5.20	5.37	5.56	5.86	6.12	6.39	7.53	8.74
	20	5.97	6.04	6.24	6.49	6.77	7.07	7.55	7.96	8.38	10.15	12.02
	40	7.42	7.70	8.11	8.58	9.08	9.60	10.40	11.08	11.78	14.65	17.63
	60	8.59	9.10	9.73	10.41	11.12	11.84	12.93	13.86	14.79	18.62	22.58
	80	9.63	10.37	11.23	12.11	13.01	13.91	15.28	16.43	17.58	22.29	27.13
	100	10.59	11.58	12.64	13.72	14.79	15.87	17.49	18.85	20.21	25.74	31.41
	120	11.50	12.73	13.99	15.25	16.50	17.74	19.60	21.16	22.71	29.02	35.49
	140	12.37	13.83	15.29	16.73	18.14	19.54	21.63	23.37	25.12	32.17	39.40
150	10	5.39	5.34	5.44	5.58	5.75	5.94	6.23	6.49	6.76	7.87	9.05
	20	6.49	6.53	6.71	6.95	7.22	7.50	7.96	8.35	8.76	10.47	12.30
	40	8.05	8.27	8.65	9.08	9.54	10.03	10.79	11.44	12.12	14.92	17.87
	60	9.29	9.71	10.28	10.90	11.56	12.24	13.29	14.19	15.11	18.87	22.79
	80	10.37	11.00	11.76	12.58	13.43	14.30	15.62	16.74	17.87	22.52	27.33
	100	11.36	12.20	13.16	14.17	15.20	16.24	17.82	19.15	20.49	25.96	31.60
	120	12.28	13.34	14.50	15.69	16.89	18.09	19.91	21.44	22.98	29.23	35.67
	140	13.16	14.44	15.79	17.15	18.51	19.88	21.93	23.65	25.37	32.37	39.57

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	5.72	5.67	5.76	5.90	6.08	6.26	6.56	6.81	7.08	8.18	9.34
	20	6.91	6.93	7.11	7.34	7.60	7.88	8.32	8.71	9.10	10.78	12.57
	40	8.58	8.77	9.12	9.52	9.97	10.43	11.16	11.80	12.45	15.20	18.10
	60	9.88	10.25	10.77	11.36	11.98	12.64	13.65	14.52	15.41	19.12	23.00
	80	11.01	11.56	12.26	13.03	13.84	14.67	15.96	17.05	18.16	22.76	27.53
	100	12.03	12.77	13.66	14.61	15.59	16.60	18.14	19.44	20.76	26.18	31.79
	120	12.97	13.91	14.99	16.11	17.27	18.44	20.22	21.72	23.24	29.44	35.85
	140	13.87	15.01	16.26	17.56	18.88	20.21	22.23	23.92	25.62	32.58	39.75
300	10	6.25	6.19	6.28	6.43	6.60	6.79	7.09	7.35	7.61	8.72	9.87
	20	7.59	7.60	7.77	7.99	8.25	8.52	8.96	9.33	9.72	11.35	13.09
	40	9.44	9.59	9.91	10.29	10.71	11.16	11.85	12.46	13.08	15.73	18.56
	60	10.86	11.16	11.64	12.18	12.76	13.37	14.33	15.16	16.02	19.62	23.42
	80	12.07	12.53	13.16	13.87	14.62	15.40	16.62	17.66	18.74	23.22	27.92
	100	13.16	13.78	14.57	15.44	16.36	17.30	18.77	20.03	21.31	26.62	32.16
	120	14.15	14.94	15.90	16.94	18.02	19.12	20.83	22.29	23.76	29.86	36.21
	140	15.09	16.05	17.18	18.37	19.61	20.88	22.82	24.46	26.13	32.98	40.09
400	10	6.69	6.62	6.71	6.86	7.04	7.23	7.53	7.80	8.07	9.18	10.34
	20	8.15	8.14	8.31	8.53	8.79	9.06	9.50	9.87	10.26	11.88	13.59
	40	10.15	10.28	10.58	10.95	11.36	11.79	12.47	13.06	13.67	16.25	19.02
	60	11.67	11.93	12.38	12.90	13.46	14.05	14.97	15.77	16.60	20.10	23.84
	80	12.96	13.36	13.95	14.62	15.33	16.08	17.25	18.26	19.30	23.67	28.32
	100	14.10	14.65	15.39	16.21	17.07	17.98	19.39	20.60	21.84	27.05	32.54
	120	15.15	15.85	16.74	17.71	18.73	19.79	21.43	22.84	24.28	30.28	36.56
	140	16.13	16.98	18.02	19.14	20.31	21.53	23.40	25.00	26.63	33.39	40.43
600	10	7.39	7.31	7.41	7.56	7.74	7.94	8.26	8.53	8.81	9.96	11.13
	20	9.05	9.03	9.19	9.42	9.68	9.96	10.40	10.78	11.16	12.78	14.48
	40	11.30	11.39	11.68	12.05	12.45	12.87	13.54	14.12	14.71	17.22	19.90
	60	13.00	13.20	13.62	14.12	14.65	15.22	16.11	16.88	17.67	21.04	24.67
	80	14.41	14.75	15.29	15.92	16.59	17.30	18.41	19.37	20.36	24.57	29.09
	100	15.67	16.12	16.80	17.56	18.37	19.22	20.55	21.70	22.89	27.91	33.28
	120	16.80	17.39	18.19	19.09	20.04	21.03	22.58	23.92	25.30	31.11	37.27
	140	17.85	18.57	19.51	20.54	21.63	22.76	24.53	26.06	27.62	34.19	41.12
800	10	7.96	7.87	7.97	8.13	8.32	8.52	8.85	9.13	9.42	10.60	11.80
	20	9.78	9.75	9.91	10.14	10.41	10.69	11.14	11.53	11.92	13.56	15.26
	40	12.24	12.31	12.59	12.95	13.35	13.78	14.45	15.02	15.61	18.09	20.73
	60	14.08	14.25	14.66	15.14	15.67	16.23	17.10	17.86	18.64	21.93	25.48
	80	15.61	15.90	16.41	17.02	17.68	18.37	19.45	20.38	21.35	25.45	29.86
	100	16.95	17.35	17.99	18.72	19.50	20.32	21.61	22.73	23.87	28.76	34.01
	120	18.17	18.68	19.44	20.29	21.20	22.16	23.65	24.94	26.27	31.93	37.98
	140	19.28	19.92	20.80	21.78	22.81	23.90	25.60	27.07	28.58	34.98	41.80

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
0	10	5.16	5.60	6.06	6.52	6.99	7.45	8.15	8.73	9.31	11.65	14.04
	20	6.75	7.58	8.37	9.13	9.87	10.60	11.69	12.59	13.49	17.12	20.81
	40	9.42	10.93	12.26	13.51	14.71	15.90	17.64	19.08	20.52	26.31	32.20
	60	11.76	13.86	15.67	17.35	18.96	20.54	22.86	24.78	26.69	34.37	42.18
	80	13.90	16.55	18.80	20.87	22.86	24.80	27.65	30.01	32.35	41.77	51.35
	100	15.92	19.08	21.73	24.18	26.52	28.80	32.15	34.92	37.67	48.71	59.95
	120	17.84	21.48	24.53	27.33	30.01	32.61	36.43	39.58	42.72	55.32	68.14
	140	19.68	23.78	27.21	30.35	33.34	36.25	40.53	44.06	47.57	61.65	75.99
25	10	5.98	6.19	6.54	6.93	7.35	7.78	8.44	8.99	9.56	11.85	14.21
	20	7.49	8.09	8.78	9.48	10.18	10.88	11.93	12.82	13.70	17.29	20.95
	40	10.05	11.36	12.60	13.80	14.97	16.13	17.85	19.27	20.70	26.45	32.32
	60	12.33	14.25	15.98	17.61	19.20	20.75	23.05	24.95	26.85	34.49	42.29
	80	14.44	16.91	19.09	21.12	23.08	25.00	27.83	30.17	32.50	41.88	51.45
	100	16.43	19.42	22.01	24.42	26.73	28.99	32.32	35.07	37.81	48.82	60.05
	120	18.33	21.81	24.79	27.56	30.20	32.78	36.59	39.73	42.86	55.42	68.23
	140	20.15	24.10	27.46	30.57	33.53	36.43	40.69	44.20	47.70	61.75	76.07
50	10	6.56	6.69	6.97	7.32	7.70	8.10	8.72	9.26	9.80	12.05	14.37
	20	8.12	8.58	9.18	9.82	10.48	11.15	12.18	13.04	13.91	17.45	21.09
	40	10.66	11.79	12.95	14.09	15.23	16.36	18.05	19.46	20.88	26.59	32.43
	60	12.90	14.64	16.29	17.88	19.43	20.96	23.23	25.12	27.01	34.62	42.39
	80	14.97	17.28	19.38	21.37	23.30	25.19	28.00	30.33	32.65	42.00	51.55
	100	16.94	19.77	22.28	24.65	26.94	29.17	32.48	35.22	37.95	48.93	60.14
	120	18.81	22.14	25.05	27.78	30.40	32.96	36.75	39.87	42.99	55.53	68.32
	140	20.61	24.42	27.71	30.78	33.72	36.60	40.84	44.34	47.83	61.85	76.16
100	10	7.38	7.44	7.68	7.99	8.33	8.69	9.27	9.76	10.28	12.43	14.70
	20	9.10	9.42	9.91	10.47	11.07	11.69	12.66	13.48	14.32	17.78	21.37
	40	11.73	12.60	13.61	14.67	15.74	16.82	18.46	19.84	21.22	26.87	32.67
	60	13.96	15.40	16.90	18.40	19.89	21.38	23.60	25.46	27.32	34.87	42.61
	80	16.00	17.99	19.95	21.86	23.73	25.59	28.35	30.64	32.94	42.24	51.75
	100	17.92	20.45	22.83	25.12	27.35	29.54	32.81	35.52	38.23	49.16	60.33
	120	19.76	22.79	25.58	28.22	30.79	33.32	37.06	40.16	43.26	55.74	68.50
	140	21.53	25.05	28.22	31.21	34.10	36.94	41.14	44.61	48.08	62.06	76.33
150	10	7.99	8.03	8.25	8.53	8.86	9.20	9.75	10.23	10.73	12.81	15.03
	20	9.85	10.11	10.55	11.06	11.62	12.20	13.12	13.91	14.72	18.11	21.65
	40	12.61	13.34	14.25	15.23	16.24	17.28	18.87	20.21	21.57	27.14	32.91
	60	14.89	16.13	17.50	18.92	20.35	21.80	23.97	25.80	27.64	35.12	42.82
	80	16.94	18.69	20.52	22.34	24.16	25.97	28.69	30.96	33.24	42.47	51.95
	100	18.85	21.12	23.37	25.58	27.76	29.91	33.14	35.82	38.50	49.38	60.52
	120	20.67	23.44	26.09	28.67	31.18	33.67	37.37	40.44	43.52	55.95	68.68
	140	22.43	25.67	28.72	31.64	34.48	37.28	41.44	44.89	48.34	62.26	76.51

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	TEMPERATURE RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F	4	8	12	16	20	24	30	35	40	60	80
200	10	8.49	8.51	8.72	9.00	9.32	9.65	10.19	10.66	11.14	13.18	15.35
	20	10.48	10.69	11.10	11.59	12.12	12.68	13.57	14.33	15.12	18.43	21.93
	40	13.37	14.01	14.85	15.77	16.73	17.73	19.27	20.58	21.91	27.42	33.14
	60	15.71	16.81	18.09	19.43	20.81	22.21	24.34	26.14	27.95	35.37	43.04
	80	17.79	19.37	21.08	22.83	24.59	26.36	29.03	31.27	33.53	42.70	52.15
	100	19.72	21.77	23.90	26.04	28.16	30.28	33.46	36.12	38.78	49.60	60.71
	120	21.54	24.07	26.61	29.11	31.57	34.02	37.68	40.73	43.79	56.16	68.86
	140	23.28	26.29	29.21	32.06	34.85	37.62	41.74	45.16	48.59	62.47	76.68
300	10	9.31	9.30	9.50	9.77	10.08	10.42	10.95	11.40	11.88	13.86	15.98
	20	11.51	11.67	12.05	12.51	13.01	13.55	14.39	15.12	15.87	19.07	22.48
	40	14.64	15.17	15.92	16.76	17.66	18.59	20.05	21.31	22.59	27.97	33.61
	60	17.11	18.04	19.18	20.41	21.70	23.02	25.06	26.81	28.57	35.87	43.46
	80	19.28	20.61	22.15	23.77	25.43	27.13	29.71	31.90	34.11	43.17	52.54
	100	21.25	23.01	24.95	26.94	28.97	31.01	34.11	36.71	39.33	50.04	61.09
	120	23.10	25.29	27.62	29.98	32.35	34.72	38.30	41.30	44.32	56.59	69.22
	140	24.86	27.49	30.19	32.90	35.60	38.30	42.34	45.71	49.10	62.87	77.03
400	10	9.97	9.95	10.14	10.42	10.73	11.06	11.59	12.04	12.51	14.48	16.56
	20	12.35	12.48	12.85	13.29	13.78	14.30	15.12	15.84	16.57	19.68	23.02
	40	15.69	16.15	16.86	17.65	18.51	19.40	20.80	22.01	23.26	28.51	34.08
	60	18.30	19.11	20.17	21.32	22.54	23.81	25.78	27.47	29.19	36.37	43.89
	80	20.55	21.73	23.15	24.67	26.26	27.88	30.39	32.52	34.69	43.63	52.94
	100	22.59	24.16	25.94	27.82	29.76	31.73	34.75	37.30	39.88	50.48	61.46
	120	24.49	26.44	28.60	30.83	33.11	35.42	38.92	41.87	44.84	57.01	69.58
	140	26.27	28.63	31.15	33.73	36.34	38.97	42.93	46.26	49.61	63.28	77.37
600	10	11.04	11.00	11.19	11.47	11.78	12.12	12.65	13.12	13.59	15.56	17.63
	20	13.72	13.82	14.16	14.59	15.07	15.59	16.39	17.09	17.81	20.83	24.07
	40	17.42	17.80	18.45	19.19	20.00	20.85	22.18	23.34	24.53	29.58	35.01
	60	20.26	20.94	21.90	22.96	24.10	25.29	27.14	28.75	30.40	37.35	44.73
	80	22.68	23.68	24.95	26.34	27.81	29.34	31.71	33.75	35.83	44.56	53.73
	100	24.85	26.17	27.77	29.49	31.29	33.15	36.02	38.47	40.97	51.36	62.21
	120	26.85	28.51	30.43	32.48	34.60	36.79	40.14	42.99	45.89	57.85	70.29
	140	28.71	30.72	32.98	35.35	37.80	40.29	44.11	47.35	50.62	64.09	78.06
800	10	11.92	11.86	12.05	12.33	12.65	12.99	13.54	14.01	14.49	16.49	18.56
	20	14.84	14.91	15.24	15.67	16.15	16.67	17.47	18.17	18.88	21.87	25.06
	40	18.84	19.17	19.78	20.51	21.29	22.12	23.42	24.54	25.70	30.62	35.92
	60	21.88	22.48	23.38	24.40	25.49	26.63	28.42	29.96	31.56	38.33	45.57
	80	24.46	25.34	26.53	27.84	29.24	30.69	32.97	34.93	36.95	45.47	54.51
	100	26.75	27.92	29.40	31.02	32.72	34.49	37.25	39.62	42.05	52.23	62.96
	120	28.84	30.31	32.10	34.02	36.03	38.11	41.34	44.10	46.93	58.68	71.01
	140	30.79	32.57	34.66	36.89	39.20	41.59	45.28	48.42	51.62	64.89	78.75

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APPENDIX D.

DETECTOR ACTIVATION TIME TABLES: RATE OF TEMPERATURE RISE

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.13*	0.23*	0.33*	0.43*	0.52*	0.61*	0.75*	0.86*	0.98*	1.45*	1.98*
	20	0.13*	0.24*	0.35*	0.45*	0.55*	0.65*	0.79*	0.92*	1.05*	1.59*	2.28*
	25	0.14*	0.25*	0.36*	0.47*	0.57*	0.68*	0.84*	0.97*	1.11*	1.75*	2.70*
200	15	0.14*	0.26*	0.37*	0.48*	0.59*	0.70*	0.86*	0.99*	1.13*	1.70*	2.34*
	20	0.15*	0.27*	0.39*	0.51*	0.63*	0.75*	0.92*	1.08*	1.23*	1.89*	2.70*
	25	0.15*	0.28*	0.41*	0.54*	0.67*	0.79*	0.99*	1.15*	1.33*	2.10*	3.16*
300	15	0.15*	0.28*	0.40*	0.52*	0.64*	0.76*	0.94*	1.10*	1.25*	1.90*	2.62*
	20	0.16*	0.29*	0.43*	0.56*	0.69*	0.83*	1.03*	1.20*	1.38*	2.13*	3.05*
	25	0.16*	0.31*	0.45*	0.60*	0.74*	0.89*	1.11*	1.30*	1.50*	2.38*	3.55*
400	15	0.16*	0.29*	0.43*	0.56*	0.69*	0.82*	1.02*	1.19*	1.36*	2.07*	2.86*
	20	0.17*	0.32*	0.46*	0.61*	0.75*	0.90*	1.12*	1.31*	1.50*	2.34*	3.35*
	25	0.18*	0.33*	0.49*	0.65*	0.81*	0.97*	1.21*	1.43*	1.64*	2.62*	3.89*
500	15	0.16*	0.31*	0.45*	0.59*	0.73*	0.87*	1.09*	1.27*	1.45*	2.22*	3.08*
	20	0.18*	0.33*	0.49*	0.65*	0.80*	0.96*	1.20*	1.41*	1.62*	2.53*	3.61*
	25	0.19*	0.36*	0.52*	0.69*	0.87*	1.04*	1.31*	1.54*	1.78*	2.84*	4.20*
600	15	0.17*	0.32*	0.47*	0.62*	0.77*	0.92*	1.15*	1.34*	1.54*	2.36*	3.28*
	20	0.18*	0.35*	0.52*	0.68*	0.85*	1.02*	1.28*	1.50*	1.72*	2.70*	3.86*
	25	0.19*	0.37*	0.55*	0.74*	0.92*	1.11*	1.40*	1.64*	1.90*	3.04*	4.49*
700	15	0.18*	0.34*	0.50*	0.65*	0.81*	0.97*	1.21*	1.41*	1.62*	2.50*	3.47*
	20	0.19*	0.37*	0.54*	0.72*	0.89*	1.07*	1.35*	1.58*	1.82*	2.86*	4.09*
	25	0.20*	0.39*	0.58*	0.78*	0.97*	1.17*	1.48*	1.74*	2.01*	3.23*	4.76*
800	15	0.18*	0.35*	0.52*	0.68*	0.85*	1.01*	1.27*	1.48*	1.70*	2.62*	3.65*
	20	0.20*	0.38*	0.57*	0.75*	0.94*	1.13*	1.41*	1.66*	1.92*	3.01*	4.30*
	25	0.21*	0.41*	0.61*	0.81*	1.02*	1.23*	1.55*	1.83*	2.12*	3.40*	5.01*
900	15	0.19*	0.36*	0.53*	0.71*	0.88*	1.05*	1.32*	1.54*	1.77*	2.74*	3.81*
	20	0.20*	0.40*	0.59*	0.78*	0.98*	1.17*	1.48*	1.74*	2.00*	3.16*	4.51*
	25	0.22*	0.43*	0.64*	0.85*	1.07*	1.29*	1.63*	1.92*	2.22*	3.57*	5.25*
1000	15	0.19*	0.37*	0.55*	0.73*	0.91*	1.09*	1.37*	1.60*	1.84*	2.85*	3.97*
	20	0.21*	0.41*	0.61*	0.81*	1.01*	1.22*	1.54*	1.81*	2.09*	3.29*	4.70*
	25	0.23*	0.44*	0.66*	0.88*	1.11*	1.34*	1.70*	2.00*	2.32*	3.73*	5.47*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.20*	0.38*	0.57*	0.76*	0.94*	1.13*	1.42*	1.66*	1.91*	2.96*	4.13*
	20	0.22*	0.42*	0.63*	0.84*	1.05*	1.27*	1.60*	1.88*	2.17*	3.42*	4.89*
	25	0.23*	0.46*	0.68*	0.92*	1.15*	1.39*	1.76*	2.08*	2.41*	3.88*	5.69*
1200	15	0.20*	0.40*	0.59*	0.78*	0.97*	1.17*	1.46*	1.72*	1.97*	3.06*	4.28*
	20	0.22*	0.44*	0.65*	0.87*	1.09*	1.31*	1.65*	1.95*	2.25*	3.55*	5.07*
	25	0.24*	0.47*	0.71*	0.95*	1.19*	1.44*	1.83*	2.16*	2.50*	4.03*	5.90*
1300	15	0.21*	0.41*	0.60*	0.80*	1.00*	1.20*	1.51*	1.77*	2.04*	3.16*	4.42*
	20	0.23*	0.45*	0.67*	0.89*	1.12*	1.35*	1.71*	2.01*	2.32*	3.67*	5.24*
	25	0.25*	0.49*	0.73*	0.98*	1.23*	1.49*	1.89*	2.23*	2.59*	4.17*	6.10*
1400	15	0.21*	0.42*	0.62*	0.82*	1.03*	1.24*	1.55*	1.82*	2.10*	3.26*	4.56*
	20	0.23*	0.46*	0.69*	0.92*	1.15*	1.39*	1.76*	2.07*	2.40*	3.79*	5.41*
	25	0.25*	0.50*	0.75*	1.01*	1.27*	1.54*	1.95*	2.31*	2.67*	4.31*	6.30*
1500	15	0.22*	0.43*	0.63*	0.84*	1.05*	1.27*	1.60*	1.87*	2.16*	3.36*	4.69*
	20	0.24*	0.47*	0.71*	0.94*	1.19*	1.43*	1.81*	2.13*	2.47*	3.90*	5.57*
	25	0.26*	0.51*	0.77*	1.04*	1.31*	1.58*	2.01*	2.38*	2.76*	4.44*	6.49*
1600	15	0.22*	0.44*	0.65*	0.86*	1.08*	1.30*	1.64*	1.92*	2.21*	3.45*	4.82*
	20	0.24*	0.48*	0.72*	0.97*	1.22*	1.47*	1.86*	2.19*	2.54*	4.02*	5.73*
	25	0.26*	0.53*	0.79*	1.06*	1.34*	1.63*	2.06*	2.44*	2.84*	4.57*	6.68*
1700	15	0.23*	0.44*	0.66*	0.88*	1.11*	1.33*	1.68*	1.97*	2.27*	3.54*	4.95*
	20	0.25*	0.49*	0.74*	0.99*	1.25*	1.51*	1.91*	2.25*	2.60*	4.12*	5.89*
	25	0.27*	0.54*	0.81*	1.09*	1.38*	1.67*	2.12*	2.51*	2.91*	4.69*	6.86*
1800	15	0.23*	0.45*	0.68*	0.90*	1.13*	1.36*	1.72*	2.02*	2.33*	3.63*	5.07*
	20	0.25*	0.50*	0.76*	1.02*	1.28*	1.54*	1.95*	2.31*	2.67*	4.23*	6.04*
	25	0.28*	0.55*	0.83*	1.12*	1.41*	1.71*	2.17*	2.58*	2.99*	4.82*	7.03*
1900	15	0.24*	0.46*	0.69*	0.92*	1.16*	1.39*	1.76*	2.06*	2.38*	3.71*	5.19*
	20	0.26*	0.51*	0.77*	1.04*	1.31*	1.58*	2.00*	2.36*	2.73*	4.33*	6.19*
	25	0.28*	0.56*	0.85*	1.14*	1.44*	1.75*	2.23*	2.64*	3.06*	4.94*	7.20*
2000	15	0.24*	0.47*	0.70*	0.94*	1.18*	1.42*	1.79*	2.11*	2.43*	3.80*	5.31*
	20	0.26*	0.53*	0.79*	1.06*	1.33*	1.62*	2.05*	2.42*	2.80*	4.43*	6.33*
	25	0.29*	0.57*	0.87*	1.17*	1.48*	1.79*	2.28*	2.70*	3.14*	5.05*	7.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.18*	0.34*	0.49*	0.64*	0.79*	0.94*	1.17*	1.37*	1.59*	2.70*	5.85*
	20	0.19*	0.36*	0.52*	0.68*	0.85*	1.02*	1.29*	1.53*	1.80*	3.74*	11.74*
	25	0.20*	0.38*	0.55*	0.73*	0.91*	1.10*	1.41*	1.70*	2.04*	5.95*	21.47*
200	15	0.21*	0.39*	0.57*	0.75*	0.93*	1.11*	1.40*	1.65*	1.91*	3.22*	5.99*
	20	0.22*	0.42*	0.61*	0.81*	1.02*	1.23*	1.56*	1.86*	2.19*	4.19*	11.74*
	25	0.23*	0.44*	0.66*	0.88*	1.10*	1.34*	1.73*	2.09*	2.50*	6.03*	21.47*
300	15	0.23*	0.43*	0.63*	0.83*	1.04*	1.25*	1.58*	1.86*	2.17*	3.64*	6.35*
	20	0.24*	0.47*	0.69*	0.92*	1.15*	1.40*	1.78*	2.13*	2.50*	4.65*	11.75*
	25	0.26*	0.50*	0.74*	1.00*	1.26*	1.53*	1.98*	2.40*	2.86*	6.30*	21.47*
400	15	0.24*	0.46*	0.69*	0.91*	1.14*	1.37*	1.74*	2.05*	2.39*	4.01*	6.76*
	20	0.26*	0.51*	0.76*	1.01*	1.27*	1.54*	1.97*	2.36*	2.77*	5.08*	11.78*
	25	0.28*	0.55*	0.82*	1.10*	1.39*	1.70*	2.20*	2.66*	3.18*	6.67*	21.47*
500	15	0.26*	0.50*	0.74*	0.98*	1.23*	1.48*	1.88*	2.22*	2.59*	4.34*	7.17*
	20	0.28*	0.54*	0.81*	1.09*	1.38*	1.67*	2.14*	2.56*	3.02*	5.47*	11.87*
	25	0.30*	0.59*	0.89*	1.19*	1.52*	1.85*	2.40*	2.90*	3.47*	7.05*	21.47*
600	15	0.27*	0.52*	0.78*	1.04*	1.31*	1.58*	2.01*	2.38*	2.77*	4.64*	7.57*
	20	0.29*	0.58*	0.87*	1.17*	1.47*	1.79*	2.30*	2.75*	3.24*	5.83*	12.03*
	25	0.32*	0.63*	0.95*	1.28*	1.63*	1.99*	2.58*	3.13*	3.73*	7.43*	21.47*
700	15	0.28*	0.55*	0.82*	1.10*	1.38*	1.67*	2.13*	2.53*	2.94*	4.93*	7.95*
	20	0.31*	0.61*	0.92*	1.24*	1.56*	1.91*	2.45*	2.93*	3.45*	6.17*	12.25*
	25	0.33*	0.67*	1.01*	1.36*	1.73*	2.12*	2.75*	3.33*	3.97*	7.80*	21.47*
800	15	0.29*	0.58*	0.86*	1.16*	1.46*	1.76*	2.24*	2.66*	3.11*	5.19*	8.31*
	20	0.32*	0.64*	0.97*	1.30*	1.65*	2.01*	2.58*	3.10*	3.65*	6.50*	12.51*
	25	0.35*	0.70*	1.06*	1.44*	1.83*	2.25*	2.92*	3.53*	4.20*	8.15*	21.48*
900	15	0.31*	0.60*	0.90*	1.21*	1.52*	1.85*	2.35*	2.79*	3.26*	5.45*	8.66*
	20	0.34*	0.67*	1.01*	1.37*	1.73*	2.11*	2.72*	3.26*	3.83*	6.80*	12.79*
	25	0.37*	0.73*	1.11*	1.51*	1.93*	2.36*	3.07*	3.71*	4.42*	8.49*	21.50*
1000	15	0.32*	0.62*	0.94*	1.26*	1.59*	1.93*	2.46*	2.92*	3.41*	5.69*	9.00*
	20	0.35*	0.70*	1.06*	1.43*	1.81*	2.21*	2.84*	3.41*	4.01*	7.10*	13.09*
	25	0.38*	0.76*	1.16*	1.58*	2.02*	2.47*	3.21*	3.89*	4.62*	8.82*	21.54*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.33*	0.65*	0.97*	1.31*	1.65*	2.00*	2.56*	3.04*	3.55*	5.92*	9.32*
	20	0.36*	0.72*	1.10*	1.48*	1.88*	2.30*	2.96*	3.55*	4.18*	7.38*	13.40*
	25	0.39*	0.80*	1.21*	1.65*	2.10*	2.58*	3.35*	4.05*	4.82*	9.14*	21.60*
1200	15	0.34*	0.67*	1.01*	1.35*	1.71*	2.08*	2.65*	3.15*	3.68*	6.14*	9.64*
	20	0.37*	0.75*	1.14*	1.54*	1.96*	2.39*	3.08*	3.69*	4.35*	7.65*	13.71*
	25	0.41*	0.82*	1.26*	1.71*	2.19*	2.68*	3.49*	4.22*	5.01*	9.45*	21.69*
1300	15	0.35*	0.69*	1.04*	1.40*	1.77*	2.15*	2.74*	3.27*	3.81*	6.36*	9.94*
	20	0.39*	0.77*	1.18*	1.59*	2.03*	2.48*	3.19*	3.82*	4.50*	7.91*	14.02*
	25	0.42*	0.85*	1.30*	1.77*	2.27*	2.78*	3.62*	4.37*	5.20*	9.75*	21.80*
1400	15	0.36*	0.71*	1.07*	1.44*	1.82*	2.22*	2.83*	3.37*	3.94*	6.57*	10.23*
	20	0.40*	0.80*	1.21*	1.65*	2.09*	2.56*	3.30*	3.96*	4.66*	8.17*	14.33*
	25	0.43*	0.88*	1.35*	1.83*	2.34*	2.88*	3.74*	4.52*	5.38*	10.04*	21.93*
1500	15	0.36*	0.73*	1.10*	1.49*	1.88*	2.29*	2.92*	3.48*	4.06*	6.77*	10.52*
	20	0.41*	0.82*	1.25*	1.70*	2.16*	2.64*	3.40*	4.08*	4.81*	8.41*	14.64*
	25	0.45*	0.91*	1.39*	1.89*	2.42*	2.97*	3.86*	4.67*	5.55*	10.32*	22.08*
1600	15	0.37*	0.75*	1.13*	1.53*	1.93*	2.35*	3.01*	3.58*	4.18*	6.96*	10.80*
	20	0.42*	0.84*	1.29*	1.75*	2.22*	2.72*	3.51*	4.20*	4.95*	8.65*	14.95*
	25	0.46*	0.93*	1.43*	1.95*	2.49*	3.06*	3.98*	4.81*	5.72*	10.60*	22.25*
1700	15	0.38*	0.77*	1.16*	1.57*	1.98*	2.42*	3.09*	3.68*	4.30*	7.16*	11.07*
	20	0.43*	0.87*	1.32*	1.79*	2.28*	2.80*	3.61*	4.32*	5.09*	8.88*	15.25*
	25	0.47*	0.96*	1.47*	2.00*	2.56*	3.15*	4.10*	4.95*	5.88*	10.87*	22.44*
1800	15	0.39*	0.78*	1.19*	1.61*	2.04*	2.48*	3.17*	3.78*	4.41*	7.34*	11.34*
	20	0.44*	0.89*	1.36*	1.84*	2.35*	2.87*	3.70*	4.44*	5.23*	9.11*	15.55*
	25	0.48*	0.98*	1.51*	2.06*	2.63*	3.24*	4.21*	5.09*	6.04*	11.13*	22.64*
1900	15	0.40*	0.80*	1.22*	1.64*	2.09*	2.54*	3.25*	3.87*	4.52*	7.52*	11.60*
	20	0.45*	0.91*	1.39*	1.89*	2.40*	2.94*	3.80*	4.56*	5.36*	9.33*	15.84*
	25	0.49*	1.01*	1.55*	2.11*	2.70*	3.32*	4.32*	5.22*	6.20*	11.39*	22.85*
2000	15	0.41*	0.82*	1.24*	1.68*	2.13*	2.60*	3.33*	3.96*	4.63*	7.70*	11.85*
	20	0.46*	0.93*	1.42*	1.93*	2.46*	3.02*	3.89*	4.67*	5.50*	9.55*	16.13*
	25	0.50*	1.03*	1.58*	2.16*	2.77*	3.41*	4.43*	5.35*	6.35*	11.64*	23.07*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.27*	0.52*	0.77*	1.02*	1.29*	1.58*	2.10*	2.67*	3.54*	17.96*	70.90*
	20	0.29*	0.56*	0.84*	1.13*	1.45*	1.83*	2.60*	3.78*	6.27*	40.35*	165.27*
	25	0.31*	0.60*	0.90*	1.24*	1.63*	2.13*	3.44*	6.16*	11.13*	77.27*	320.85*
200	15	0.32*	0.62*	0.93*	1.24*	1.58*	1.95*	2.59*	3.24*	4.11*	17.96*	70.90*
	20	0.35*	0.68*	1.03*	1.40*	1.81*	2.28*	3.17*	4.29*	6.38*	40.35*	165.27*
	25	0.37*	0.74*	1.13*	1.56*	2.05*	2.64*	3.97*	6.26*	11.13*	77.27*	320.85*
300	15	0.36*	0.70*	1.05*	1.42*	1.82*	2.25*	2.97*	3.71*	4.64*	17.96*	70.90*
	20	0.39*	0.78*	1.18*	1.62*	2.10*	2.64*	3.64*	4.81*	6.72*	40.35*	165.27*
	25	0.42*	0.85*	1.30*	1.81*	2.38*	3.06*	4.48*	6.58*	11.14*	77.27*	320.85*
400	15	0.39*	0.77*	1.17*	1.58*	2.02*	2.50*	3.31*	4.11*	5.11*	17.96*	70.90*
	20	0.43*	0.86*	1.32*	1.81*	2.35*	2.95*	4.05*	5.28*	7.15*	40.35*	165.27*
	25	0.47*	0.94*	1.46*	2.03*	2.67*	3.42*	4.94*	7.00*	11.21*	77.27*	320.85*
500	15	0.42*	0.83*	1.27*	1.72*	2.21*	2.73*	3.61*	4.48*	5.53*	17.97*	70.90*
	20	0.46*	0.94*	1.44*	1.98*	2.57*	3.23*	4.42*	5.71*	7.59*	40.35*	165.27*
	25	0.51*	1.03*	1.60*	2.22*	2.93*	3.75*	5.36*	7.43*	11.37*	77.27*	320.85*
600	15	0.45*	0.89*	1.36*	1.85*	2.38*	2.94*	3.89*	4.82*	5.93*	18.00*	70.90*
	20	0.50*	1.01*	1.55*	2.13*	2.77*	3.48*	4.75*	6.12*	8.02*	40.35*	165.27*
	25	0.54*	1.11*	1.73*	2.40*	3.17*	4.05*	5.75*	7.85*	11.61*	77.27*	320.85*
700	15	0.47*	0.95*	1.45*	1.97*	2.53*	3.14*	4.15*	5.13*	6.30*	18.07*	70.90*
	20	0.53*	1.07*	1.65*	2.28*	2.96*	3.72*	5.07*	6.49*	8.43*	40.35*	165.27*
	25	0.58*	1.19*	1.85*	2.57*	3.39*	4.33*	6.11*	8.26*	11.91*	77.27*	320.85*
800	15	0.49*	1.00*	1.53*	2.09*	2.68*	3.32*	4.39*	5.42*	6.64*	18.18*	70.90*
	20	0.55*	1.13*	1.75*	2.42*	3.14*	3.95*	5.37*	6.85*	8.83*	40.35*	165.27*
	25	0.61*	1.26*	1.96*	2.73*	3.60*	4.59*	6.45*	8.65*	12.23*	77.27*	320.85*
900	15	0.52*	1.05*	1.60*	2.19*	2.82*	3.50*	4.62*	5.70*	6.97*	18.35*	70.90*
	20	0.58*	1.19*	1.84*	2.55*	3.31*	4.16*	5.65*	7.19*	9.22*	40.35*	165.27*
	25	0.64*	1.32*	2.07*	2.88*	3.80*	4.84*	6.78*	9.03*	12.58*	77.27*	320.85*
1000	15	0.54*	1.09*	1.68*	2.30*	2.96*	3.66*	4.84*	5.97*	7.29*	18.55*	70.90*
	20	0.61*	1.25*	1.93*	2.67*	3.48*	4.36*	5.92*	7.51*	9.59*	40.35*	165.27*
	25	0.67*	1.39*	2.17*	3.03*	3.99*	5.08*	7.09*	9.40*	12.93*	77.27*	320.85*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.56*	1.14*	1.75*	2.40*	3.09*	3.82*	5.05*	6.23*	7.59*	18.79*	70.90*
	20	0.63*	1.30*	2.02*	2.79*	3.63*	4.56*	6.17*	7.83*	9.95*	40.35*	165.27*
	25	0.70*	1.45*	2.27*	3.17*	4.17*	5.30*	7.39*	9.75*	13.28*	77.27*	320.85*
1200	15	0.58*	1.18*	1.82*	2.49*	3.21*	3.98*	5.26*	6.47*	7.88*	19.05*	70.90*
	20	0.66*	1.35*	2.10*	2.91*	3.78*	4.75*	6.42*	8.13*	10.29*	40.35*	165.27*
	25	0.72*	1.51*	2.36*	3.30*	4.34*	5.52*	7.68*	10.09*	13.63*	77.27*	320.85*
1300	15	0.60*	1.22*	1.88*	2.58*	3.33*	4.13*	5.45*	6.71*	8.16*	19.33*	70.90*
	20	0.68*	1.40*	2.18*	3.02*	3.93*	4.93*	6.66*	8.41*	10.63*	40.36*	165.27*
	25	0.75*	1.57*	2.45*	3.43*	4.51*	5.73*	7.96*	10.42*	13.98*	77.27*	320.85*
1400	15	0.62*	1.27*	1.95*	2.67*	3.45*	4.27*	5.64*	6.94*	8.43*	19.63*	70.90*
	20	0.70*	1.45*	2.26*	3.12*	4.07*	5.10*	6.89*	8.70*	10.95*	40.36*	165.27*
	25	0.78*	1.62*	2.54*	3.55*	4.67*	5.94*	8.23*	10.74*	14.32*	77.27*	320.85*
1500	15	0.64*	1.30*	2.01*	2.76*	3.56*	4.41*	5.83*	7.16*	8.70*	19.93*	70.90*
	20	0.72*	1.50*	2.33*	3.23*	4.20*	5.27*	7.12*	8.97*	11.27*	40.37*	165.27*
	25	0.80*	1.68*	2.63*	3.67*	4.83*	6.14*	8.49*	11.05*	14.66*	77.27*	320.85*
1600	15	0.65*	1.34*	2.07*	2.85*	3.67*	4.55*	6.01*	7.38*	8.95*	20.24*	70.90*
	20	0.74*	1.54*	2.40*	3.33*	4.34*	5.44*	7.34*	9.23*	11.58*	40.38*	165.27*
	25	0.83*	1.73*	2.71*	3.79*	4.98*	6.33*	8.75*	11.36*	15.00*	77.27*	320.85*
1700	15	0.67*	1.38*	2.13*	2.93*	3.78*	4.68*	6.18*	7.59*	9.20*	20.56*	70.90*
	20	0.76*	1.59*	2.48*	3.43*	4.47*	5.60*	7.55*	9.49*	11.88*	40.40*	165.27*
	25	0.85*	1.78*	2.80*	3.91*	5.13*	6.52*	9.00*	11.66*	15.33*	77.27*	320.85*
1800	15	0.69*	1.42*	2.19*	3.01*	3.88*	4.81*	6.35*	7.80*	9.45*	20.88*	70.90*
	20	0.78*	1.63*	2.54*	3.53*	4.59*	5.76*	7.76*	9.74*	12.18*	40.42*	165.27*
	25	0.87*	1.83*	2.88*	4.02*	5.28*	6.70*	9.24*	11.95*	15.65*	77.27*	320.85*
1900	15	0.70*	1.45*	2.25*	3.09*	3.98*	4.94*	6.52*	8.00*	9.68*	21.20*	70.90*
	20	0.80*	1.68*	2.61*	3.62*	4.72*	5.91*	7.96*	9.99*	12.46*	40.45*	165.27*
	25	0.89*	1.88*	2.95*	4.13*	5.42*	6.88*	9.47*	12.23*	15.97*	77.27*	320.85*
2000	15	0.72*	1.49*	2.30*	3.16*	4.08*	5.06*	6.68*	8.20*	9.92*	21.52*	70.90*
	20	0.82*	1.72*	2.68*	3.71*	4.84*	6.06*	8.16*	10.23*	12.74*	40.49*	165.27*
	25	0.92*	1.93*	3.03*	4.23*	5.56*	7.05*	9.71*	12.51*	16.28*	77.27*	320.85*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.43*	0.84*	1.30*	1.84*	2.58*	3.88*	9.40*	19.05*	35.97*	263.60*	1104.5*
	20	0.46*	0.94*	1.49*	2.24*	3.63*	7.37*	20.59*	43.25*	83.16*	621.91*	2614.4*
	25	0.50*	1.03*	1.70*	2.79*	5.87*	13.42*	39.05*	83.15*	160.95*	1212.6*	5103.8*
200	15	0.52*	1.05*	1.64*	2.32*	3.20*	4.50*	9.41*	19.05*	35.97*	263.60*	1104.5*
	20	0.57*	1.19*	1.90*	2.82*	4.24*	7.44*	20.59*	43.25*	83.16*	621.91*	2614.4*
	25	0.63*	1.32*	2.17*	3.42*	6.06*	13.42*	39.05*	83.15*	160.95*	1212.6*	5103.8*
300	15	0.59*	1.21*	1.90*	2.71*	3.70*	5.09*	9.54*	19.05*	35.97*	263.60*	1104.5*
	20	0.66*	1.38*	2.23*	3.29*	4.81*	7.74*	20.59*	43.25*	83.16*	621.91*	2614.4*
	25	0.73*	1.55*	2.56*	3.96*	6.50*	13.42*	39.05*	83.15*	160.95*	1212.6*	5103.8*
400	15	0.66*	1.36*	2.14*	3.04*	4.14*	5.62*	9.85*	19.05*	35.97*	263.60*	1104.5*
	20	0.74*	1.56*	2.51*	3.69*	5.33*	8.17*	20.59*	43.25*	83.16*	621.91*	2614.4*
	25	0.82*	1.75*	2.89*	4.42*	7.00*	13.46*	39.05*	83.15*	160.95*	1212.6*	5103.8*
500	15	0.72*	1.49*	2.35*	3.34*	4.54*	6.10*	10.25*	19.06*	35.97*	263.60*	1104.5*
	20	0.81*	1.71*	2.76*	4.06*	5.80*	8.64*	20.60*	43.25*	83.16*	621.91*	2614.4*
	25	0.90*	1.93*	3.18*	4.85*	7.49*	13.57*	39.05*	83.15*	160.95*	1212.6*	5103.8*
600	15	0.77*	1.61*	2.54*	3.61*	4.90*	6.55*	10.69*	19.10*	35.97*	263.60*	1104.5*
	20	0.88*	1.86*	3.00*	4.39*	6.24*	9.11*	20.61*	43.25*	83.16*	621.91*	2614.4*
	25	0.97*	2.10*	3.46*	5.24*	7.96*	13.77*	39.05*	83.15*	160.95*	1212.6*	5103.8*
700	15	0.82*	1.72*	2.72*	3.87*	5.24*	6.97*	11.14*	19.19*	35.97*	263.60*	1104.5*
	20	0.94*	1.99*	3.22*	4.70*	6.65*	9.57*	20.66*	43.25*	83.16*	621.91*	2614.4*
	25	1.04*	2.25*	3.71*	5.60*	8.41*	14.04*	39.05*	83.15*	160.95*	1212.6*	5103.8*
800	15	0.87*	1.82*	2.89*	4.11*	5.55*	7.37*	11.59*	19.34*	35.97*	263.60*	1104.5*
	20	0.99*	2.12*	3.42*	4.99*	7.03*	10.02*	20.74*	43.25*	83.16*	621.91*	2614.4*
	25	1.11*	2.40*	3.95*	5.94*	8.84*	14.35*	39.05*	83.15*	160.95*	1212.6*	5103.8*
900	15	0.92*	1.92*	3.05*	4.34*	5.85*	7.75*	12.04*	19.54*	35.98*	263.60*	1104.5*
	20	1.05*	2.24*	3.62*	5.27*	7.40*	10.45*	20.87*	43.25*	83.16*	621.91*	2614.4*
	25	1.17*	2.54*	4.17*	6.27*	9.26*	14.70*	39.05*	83.15*	160.95*	1212.6*	5103.8*
1000	15	0.96*	2.02*	3.20*	4.55*	6.14*	8.10*	12.47*	19.78*	35.98*	263.60*	1104.5*
	20	1.10*	2.35*	3.80*	5.54*	7.75*	10.87*	21.04*	43.25*	83.16*	621.91*	2614.4*
	25	1.23*	2.67*	4.39*	6.57*	9.66*	15.07*	39.05*	83.15*	160.95*	1212.6*	5103.8*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 0.0 Ft (RADIUS = 0.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.00*	2.11*	3.35*	4.76*	6.42*	8.45*	12.89*	20.06*	35.99*	263.60*	1104.5*
	20	1.15*	2.46*	3.98*	5.79*	8.08*	11.28*	21.25*	43.25*	83.16*	621.91*	2614.4*
	25	1.29*	2.80*	4.60*	6.87*	10.04*	15.44*	39.06*	83.15*	160.95*	1212.6*	5103.8*
1200	15	1.04*	2.20*	3.49*	4.96*	6.68*	8.78*	13.30*	20.36*	36.00*	263.60*	1104.5*
	20	1.20*	2.57*	4.15*	6.04*	8.40*	11.67*	21.50*	43.25*	83.16*	621.91*	2614.4*
	25	1.34*	2.92*	4.80*	7.16*	10.41*	15.82*	39.06*	83.15*	160.95*	1212.6*	5103.8*
1300	15	1.08*	2.29*	3.63*	5.16*	6.94*	9.10*	13.71*	20.69*	36.03*	263.60*	1104.5*
	20	1.25*	2.67*	4.32*	6.27*	8.72*	12.05*	21.77*	43.25*	83.16*	621.91*	2614.4*
	25	1.40*	3.04*	4.99*	7.43*	10.77*	16.20*	39.07*	83.15*	160.95*	1212.6*	5103.8*
1400	15	1.12*	2.37*	3.76*	5.34*	7.19*	9.41*	14.10*	21.03*	36.07*	263.60*	1104.5*
	20	1.29*	2.77*	4.48*	6.50*	9.02*	12.42*	22.06*	43.26*	83.16*	621.91*	2614.4*
	25	1.45*	3.15*	5.18*	7.70*	11.12*	16.58*	39.08*	83.15*	160.95*	1212.6*	5103.8*
1500	15	1.16*	2.45*	3.89*	5.53*	7.43*	9.72*	14.48*	21.37*	36.13*	263.60*	1104.5*
	20	1.33*	2.87*	4.63*	6.72*	9.31*	12.78*	22.37*	43.27*	83.16*	621.91*	2614.4*
	25	1.50*	3.26*	5.36*	7.96*	11.46*	16.95*	39.10*	83.15*	160.95*	1212.6*	5103.8*
1600	15	1.19*	2.53*	4.02*	5.70*	7.66*	10.01*	14.86*	21.73*	36.20*	263.60*	1104.5*
	20	1.38*	2.96*	4.79*	6.94*	9.60*	13.13*	22.69*	43.29*	83.16*	621.91*	2614.4*
	25	1.55*	3.37*	5.53*	8.21*	11.79*	17.32*	39.13*	83.15*	160.95*	1212.6*	5103.8*
1700	15	1.23*	2.60*	4.14*	5.88*	7.89*	10.29*	15.22*	22.08*	36.29*	263.60*	1104.5*
	20	1.42*	3.05*	4.93*	7.15*	9.87*	13.48*	23.01*	43.31*	83.16*	621.91*	2614.4*
	25	1.59*	3.48*	5.71*	8.45*	12.11*	17.69*	39.18*	83.15*	160.95*	1212.6*	5103.8*
1800	15	1.26*	2.68*	4.26*	6.04*	8.11*	10.57*	15.58*	22.44*	36.40*	263.60*	1104.5*
	20	1.46*	3.14*	5.08*	7.35*	10.14*	13.81*	23.34*	43.34*	83.16*	621.91*	2614.4*
	25	1.64*	3.58*	5.87*	8.69*	12.42*	18.05*	39.23*	83.15*	160.95*	1212.6*	5103.8*
1900	15	1.29*	2.75*	4.38*	6.21*	8.32*	10.84*	15.93*	22.80*	36.54*	263.60*	1104.5*
	20	1.50*	3.23*	5.22*	7.55*	10.41*	14.14*	23.68*	43.39*	83.16*	621.91*	2614.4*
	25	1.69*	3.68*	6.04*	8.93*	12.73*	18.41*	39.30*	83.15*	160.95*	1212.6*	5103.8*
2000	15	1.33*	2.82*	4.49*	6.37*	8.54*	11.11*	16.28*	23.16*	36.68*	263.60*	1104.5*
	20	1.54*	3.32*	5.36*	7.75*	10.67*	14.46*	24.02*	43.44*	83.16*	621.91*	2614.4*
	25	1.73*	3.78*	6.20*	9.16*	13.03*	18.76*	39.38*	83.15*	160.95*	1212.6*	5103.8*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.18	0.28*	0.38*	0.47*	0.56*	0.66*	0.79*	0.91*	1.02*	1.50*	2.04*
	20	0.19	0.29*	0.39*	0.49*	0.59*	0.69*	0.84*	0.97*	1.10*	1.65*	2.36*
	25	0.19	0.30*	0.41*	0.52*	0.62*	0.73*	0.89*	1.03*	1.17*	1.82*	2.83*
200	15	0.20	0.31*	0.42*	0.53*	0.64*	0.75*	0.91*	1.05*	1.18*	1.76*	2.40*
	20	0.21	0.33*	0.45*	0.57*	0.69*	0.80*	0.98*	1.14*	1.29*	1.97*	2.80*
	25	0.22	0.35*	0.47*	0.60*	0.73*	0.86*	1.05*	1.22*	1.40*	2.18*	3.29*
300	15	0.21	0.34*	0.46*	0.58*	0.70*	0.82*	1.00*	1.16*	1.31*	1.96*	2.69*
	20	0.23	0.36*	0.49*	0.63*	0.76*	0.89*	1.10*	1.27*	1.45*	2.22*	3.15*
	25	0.24	0.38*	0.52*	0.67*	0.81*	0.96*	1.18*	1.38*	1.58*	2.48*	3.69*
400	15	0.23	0.36*	0.49*	0.62*	0.75*	0.89*	1.09*	1.25*	1.42*	2.14*	2.95*
	20	0.24	0.39*	0.53*	0.68*	0.82*	0.97*	1.19*	1.39*	1.58*	2.43*	3.46*
	25	0.26	0.41*	0.57*	0.73*	0.89*	1.05*	1.30*	1.51*	1.73*	2.73*	4.05*
500	15	0.24	0.38*	0.52*	0.66*	0.80*	0.94*	1.16*	1.34*	1.53*	2.30*	3.17*
	20	0.26	0.41*	0.57*	0.72*	0.88*	1.04*	1.28*	1.49*	1.70*	2.63*	3.74*
	25	0.27	0.44*	0.61*	0.78*	0.95*	1.13*	1.40*	1.63*	1.88*	2.96*	4.37*
600	15	0.25	0.40*	0.55*	0.70*	0.85*	1.00*	1.23*	1.42*	1.62*	2.45*	3.38*
	20	0.27	0.43*	0.60*	0.77*	0.93*	1.10*	1.37*	1.59*	1.82*	2.81*	3.99*
	25	0.29	0.46*	0.65*	0.83*	1.01*	1.20*	1.49*	1.75*	2.01*	3.17*	4.66*
700	15	0.26	0.42*	0.57*	0.73*	0.89*	1.05*	1.29*	1.50*	1.71*	2.59*	3.58*
	20	0.28	0.45*	0.63*	0.81*	0.98*	1.16*	1.44*	1.68*	1.92*	2.97*	4.23*
	25	0.30	0.49*	0.68*	0.87*	1.07*	1.27*	1.58*	1.85*	2.13*	3.36*	4.94*
800	15	0.27	0.43*	0.60*	0.76*	0.93*	1.10*	1.35*	1.57*	1.79*	2.72*	3.76*
	20	0.29	0.47*	0.66*	0.84*	1.03*	1.22*	1.51*	1.76*	2.02*	3.13*	4.45*
	25	0.32	0.51*	0.71*	0.92*	1.13*	1.34*	1.66*	1.95*	2.24*	3.55*	5.20*
900	15	0.28	0.45*	0.62*	0.79*	0.97*	1.14*	1.41*	1.64*	1.87*	2.84*	3.93*
	20	0.31	0.49*	0.68*	0.88*	1.08*	1.28*	1.58*	1.84*	2.11*	3.28*	4.66*
	25	0.33	0.53*	0.74*	0.96*	1.18*	1.40*	1.74*	2.04*	2.35*	3.72*	5.44*
1000	15	0.29	0.46*	0.64*	0.82*	1.00*	1.19*	1.46*	1.70*	1.94*	2.96*	4.10*
	20	0.32	0.51*	0.71*	0.91*	1.12*	1.33*	1.65*	1.92*	2.20*	3.42*	4.86*
	25	0.34	0.55*	0.77*	1.00*	1.23*	1.46*	1.82*	2.13*	2.45*	3.89*	5.68*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.30	0.48*	0.66*	0.85*	1.04*	1.23*	1.52*	1.76*	2.01*	3.07*	4.25*
	20	0.33	0.53*	0.73*	0.95*	1.16*	1.38*	1.71*	2.00*	2.29*	3.56*	5.05*
	25	0.35	0.57*	0.80*	1.03*	1.27*	1.52*	1.89*	2.22*	2.55*	4.04*	5.90*
1200	15	0.31	0.49*	0.68*	0.88*	1.07*	1.27*	1.57*	1.82*	2.08*	3.18*	4.41*
	20	0.34	0.54*	0.76*	0.98*	1.20*	1.42*	1.77*	2.07*	2.37*	3.69*	5.24*
	25	0.36	0.59*	0.83*	1.07*	1.32*	1.57*	1.96*	2.30*	2.65*	4.20*	6.12*
1300	15	0.31	0.50*	0.70*	0.90*	1.10*	1.31*	1.61*	1.88*	2.15*	3.28*	4.55*
	20	0.35	0.56*	0.78*	1.01*	1.24*	1.47*	1.83*	2.14*	2.45*	3.82*	5.42*
	25	0.37	0.61*	0.85*	1.11*	1.36*	1.62*	2.03*	2.38*	2.74*	4.34*	6.33*
1400	15	0.32	0.52*	0.72*	0.93*	1.13*	1.34*	1.66*	1.93*	2.21*	3.39*	4.70*
	20	0.35	0.57*	0.80*	1.04*	1.27*	1.52*	1.89*	2.20*	2.53*	3.94*	5.59*
	25	0.38	0.63*	0.88*	1.14*	1.40*	1.68*	2.09*	2.45*	2.83*	4.49*	6.53*
1500	15	0.33	0.53*	0.74*	0.95*	1.16*	1.38*	1.71*	1.99*	2.27*	3.49*	4.83*
	20	0.36	0.59*	0.83*	1.07*	1.31*	1.56*	1.94*	2.27*	2.60*	4.06*	5.76*
	25	0.39	0.64*	0.91*	1.17*	1.45*	1.73*	2.16*	2.53*	2.92*	4.63*	6.73*
1600	15	0.34	0.54*	0.76*	0.97*	1.19*	1.41*	1.75*	2.04*	2.34*	3.58*	4.97*
	20	0.37	0.60*	0.85*	1.09*	1.35*	1.60*	1.99*	2.33*	2.68*	4.18*	5.92*
	25	0.40	0.66*	0.93*	1.20*	1.49*	1.77*	2.22*	2.60*	3.00*	4.76*	6.92*
1700	15	0.34	0.55*	0.77*	1.00*	1.22*	1.45*	1.80*	2.09*	2.39*	3.67*	5.10*
	20	0.38	0.62*	0.87*	1.12*	1.38*	1.64*	2.05*	2.39*	2.75*	4.29*	6.08*
	25	0.41	0.68*	0.95*	1.24*	1.53*	1.82*	2.28*	2.67*	3.08*	4.89*	7.10*
1800	15	0.35	0.57*	0.79*	1.02*	1.25*	1.48*	1.84*	2.14*	2.45*	3.77*	5.23*
	20	0.39	0.63*	0.89*	1.15*	1.41*	1.68*	2.10*	2.45*	2.82*	4.40*	6.24*
	25	0.42	0.69*	0.98*	1.27*	1.56*	1.87*	2.34*	2.74*	3.16*	5.02*	7.29*
1900	15	0.36	0.58*	0.81*	1.04*	1.28*	1.52*	1.88*	2.19*	2.51*	3.86*	5.35*
	20	0.40	0.65*	0.91*	1.17*	1.45*	1.72*	2.15*	2.51*	2.89*	4.51*	6.39*
	25	0.43	0.71*	1.00*	1.30*	1.60*	1.91*	2.39*	2.81*	3.24*	5.15*	7.46*
2000	15	0.36	0.59*	0.82*	1.06*	1.30*	1.55*	1.92*	2.24*	2.57*	3.94*	5.47*
	20	0.40	0.66*	0.93*	1.20*	1.48*	1.76*	2.20*	2.57*	2.95*	4.61*	6.54*
	25	0.44	0.72*	1.02*	1.33*	1.64*	1.96*	2.45*	2.88*	3.32*	5.27*	7.64*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.26	0.41*	0.56*	0.71*	0.86*	1.01*	1.25*	1.45*	1.67*	2.85*	6.40*
	20	0.28	0.44*	0.60*	0.76*	0.93*	1.10*	1.38*	1.63*	1.91*	4.13*	13.03*
	25	0.29	0.46*	0.64*	0.81*	1.00*	1.19*	1.52*	1.82*	2.20*	6.77*	23.95*
200	15	0.30	0.48*	0.66*	0.84*	1.02*	1.20*	1.49*	1.75*	2.02*	3.38*	6.49*
	20	0.32	0.51*	0.71*	0.91*	1.12*	1.33*	1.68*	1.99*	2.33*	4.51*	13.03*
	25	0.34	0.55*	0.76*	0.99*	1.22*	1.46*	1.86*	2.24*	2.68*	6.80*	23.95*
300	15	0.33	0.53*	0.73*	0.94*	1.14*	1.36*	1.69*	1.98*	2.29*	3.82*	6.79*
	20	0.36	0.58*	0.80*	1.03*	1.27*	1.52*	1.92*	2.27*	2.66*	4.97*	13.03*
	25	0.38	0.62*	0.87*	1.13*	1.39*	1.68*	2.14*	2.57*	3.07*	6.99*	23.95*
400	15	0.36	0.57*	0.80*	1.02*	1.25*	1.49*	1.86*	2.18*	2.53*	4.20*	7.18*
	20	0.39	0.63*	0.88*	1.14*	1.40*	1.68*	2.12*	2.52*	2.95*	5.40*	13.04*
	25	0.42	0.68*	0.96*	1.25*	1.55*	1.86*	2.38*	2.86*	3.41*	7.30*	23.95*
500	15	0.38	0.61*	0.86*	1.10*	1.35*	1.61*	2.01*	2.37*	2.74*	4.55*	7.58*
	20	0.42	0.68*	0.95*	1.23*	1.52*	1.83*	2.31*	2.74*	3.21*	5.80*	13.09*
	25	0.45	0.74*	1.04*	1.35*	1.68*	2.03*	2.60*	3.12*	3.71*	7.66*	23.95*
600	15	0.40	0.65*	0.91*	1.17*	1.44*	1.72*	2.16*	2.54*	2.94*	4.87*	7.98*
	20	0.45	0.72*	1.02*	1.32*	1.63*	1.96*	2.48*	2.95*	3.45*	6.18*	13.19*
	25	0.48	0.79*	1.11*	1.45*	1.81*	2.19*	2.80*	3.36*	3.99*	8.03*	23.95*
700	15	0.42	0.69*	0.96*	1.24*	1.53*	1.82*	2.29*	2.69*	3.12*	5.16*	8.36*
	20	0.47	0.76*	1.08*	1.40*	1.74*	2.08*	2.64*	3.14*	3.67*	6.53*	13.36*
	25	0.51	0.84*	1.19*	1.55*	1.93*	2.33*	2.98*	3.58*	4.25*	8.39*	23.95*
800	15	0.44	0.72*	1.01*	1.31*	1.61*	1.92*	2.41*	2.84*	3.29*	5.44*	8.73*
	20	0.49	0.80*	1.14*	1.48*	1.83*	2.20*	2.79*	3.31*	3.88*	6.87*	13.57*
	25	0.54	0.88*	1.25*	1.64*	2.04*	2.47*	3.16*	3.79*	4.49*	8.75*	23.95*
900	15	0.46	0.75*	1.06*	1.37*	1.69*	2.01*	2.53*	2.98*	3.46*	5.71*	9.09*
	20	0.51	0.84*	1.19*	1.55*	1.92*	2.31*	2.93*	3.48*	4.08*	7.19*	13.82*
	25	0.56	0.92*	1.31*	1.72*	2.15*	2.60*	3.32*	3.99*	4.72*	9.10*	23.96*
1000	15	0.48	0.78*	1.10*	1.42*	1.76*	2.10*	2.64*	3.11*	3.61*	5.96*	9.43*
	20	0.54	0.88*	1.24*	1.62*	2.01*	2.42*	3.07*	3.65*	4.27*	7.49*	14.09*
	25	0.59	0.97*	1.37*	1.80*	2.25*	2.72*	3.48*	4.18*	4.94*	9.43*	23.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.50	0.81*	1.14*	1.48*	1.83*	2.19*	2.75*	3.24*	3.76*	6.20*	9.76*
	20	0.56	0.91*	1.29*	1.69*	2.09*	2.52*	3.20*	3.80*	4.45*	7.79*	14.38*
	25	0.61	1.01*	1.43*	1.88*	2.34*	2.84*	3.63*	4.36*	5.16*	9.76*	24.01*
1200	15	0.51	0.84*	1.18*	1.53*	1.90*	2.27*	2.85*	3.37*	3.90*	6.43*	10.08*
	20	0.58	0.95*	1.34*	1.75*	2.18*	2.62*	3.32*	3.95*	4.63*	8.07*	14.67*
	25	0.63	1.04*	1.49*	1.95*	2.44*	2.95*	3.78*	4.53*	5.36*	10.08*	24.06*
1300	15	0.53	0.87*	1.22*	1.59*	1.96*	2.35*	2.95*	3.48*	4.04*	6.66*	10.39*
	20	0.59	0.98*	1.39*	1.81*	2.25*	2.71*	3.44*	4.10*	4.80*	8.34*	14.97*
	25	0.65	1.08*	1.54*	2.02*	2.53*	3.06*	3.92*	4.70*	5.56*	10.39*	24.12*
1400	15	0.55	0.89*	1.26*	1.64*	2.02*	2.43*	3.05*	3.60*	4.18*	6.87*	10.70*
	20	0.61	1.01*	1.43*	1.87*	2.33*	2.81*	3.56*	4.24*	4.96*	8.61*	15.28*
	25	0.67	1.12*	1.59*	2.09*	2.62*	3.17*	4.05*	4.86*	5.75*	10.69*	24.21*
1500	15	0.56	0.92*	1.30*	1.69*	2.09*	2.50*	3.15*	3.71*	4.31*	7.08*	10.99*
	20	0.63	1.04*	1.48*	1.93*	2.40*	2.89*	3.68*	4.37*	5.12*	8.86*	15.58*
	25	0.70	1.15*	1.64*	2.16*	2.70*	3.27*	4.19*	5.02*	5.93*	10.98*	24.31*
1600	15	0.57	0.94*	1.33*	1.73*	2.15*	2.57*	3.24*	3.82*	4.44*	7.29*	11.28*
	20	0.65	1.07*	1.52*	1.99*	2.47*	2.98*	3.79*	4.50*	5.27*	9.11*	15.88*
	25	0.72	1.18*	1.69*	2.22*	2.78*	3.37*	4.31*	5.17*	6.11*	11.27*	24.44*
1700	15	0.59	0.97*	1.37*	1.78*	2.20*	2.64*	3.33*	3.93*	4.56*	7.49*	11.56*
	20	0.67	1.10*	1.56*	2.04*	2.54*	3.07*	3.89*	4.63*	5.42*	9.36*	16.18*
	25	0.73	1.22*	1.74*	2.29*	2.86*	3.47*	4.44*	5.32*	6.29*	11.54*	24.58*
1800	15	0.60	0.99*	1.40*	1.82*	2.26*	2.71*	3.42*	4.03*	4.68*	7.68*	11.83*
	20	0.68	1.13*	1.60*	2.10*	2.61*	3.15*	4.00*	4.76*	5.57*	9.59*	16.48*
	25	0.75	1.25*	1.79*	2.35*	2.94*	3.56*	4.56*	5.47*	6.46*	11.82*	24.74*
1900	15	0.62	1.01*	1.43*	1.87*	2.32*	2.78*	3.50*	4.13*	4.80*	7.87*	12.10*
	20	0.70	1.15*	1.64*	2.15*	2.68*	3.23*	4.10*	4.88*	5.71*	9.83*	16.77*
	25	0.77	1.28*	1.83*	2.41*	3.02*	3.66*	4.68*	5.61*	6.62*	12.08*	24.91*
2000	15	0.63	1.03*	1.47*	1.91*	2.37*	2.84*	3.58*	4.23*	4.91*	8.06*	12.36*
	20	0.71	1.18*	1.68*	2.20*	2.74*	3.31*	4.20*	5.00*	5.85*	10.05*	17.06*
	25	0.79	1.31*	1.88*	2.47*	3.09*	3.75*	4.80*	5.75*	6.79*	12.34*	25.10*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.40	0.64*	0.89*	1.15*	1.43*	1.74*	2.30*	2.95*	4.03*	20.72*	79.41*
	20	0.43	0.69*	0.98*	1.28*	1.63*	2.04*	2.95*	4.52*	7.62*	46.84*	185.39*
	25	0.46	0.75*	1.06*	1.42*	1.85*	2.44*	4.22*	7.72*	13.73*	89.90*	360.11*
200	15	0.48	0.77*	1.08*	1.41*	1.76*	2.15*	2.82*	3.54*	4.56*	20.72*	79.41*
	20	0.52	0.85*	1.21*	1.60*	2.04*	2.54*	3.54*	4.91*	7.65*	46.84*	185.39*
	25	0.56	0.93*	1.33*	1.79*	2.33*	3.00*	4.62*	7.74*	13.73*	89.90*	360.11*
300	15	0.54	0.87*	1.24*	1.62*	2.03*	2.47*	3.25*	4.04*	5.09*	20.72*	79.41*
	20	0.59	0.98*	1.40*	1.85*	2.36*	2.94*	4.04*	5.41*	7.85*	46.84*	185.39*
	25	0.64	1.07*	1.55*	2.08*	2.70*	3.46*	5.12*	7.91*	13.73*	89.90*	360.11*
400	15	0.59	0.97*	1.37*	1.80*	2.26*	2.76*	3.61*	4.48*	5.58*	20.72*	79.41*
	20	0.66	1.09*	1.56*	2.07*	2.64*	3.28*	4.49*	5.89*	8.19*	46.84*	185.39*
	25	0.72	1.20*	1.74*	2.34*	3.03*	3.86*	5.60*	8.22*	13.75*	89.90*	360.11*
500	15	0.64	1.05*	1.49*	1.96*	2.46*	3.01*	3.94*	4.87*	6.02*	20.72*	79.41*
	20	0.71	1.18*	1.70*	2.27*	2.89*	3.59*	4.88*	6.35*	8.59*	46.84*	185.39*
	25	0.78	1.31*	1.91*	2.57*	3.32*	4.22*	6.04*	8.59*	13.80*	89.90*	360.11*
600	15	0.68	1.12*	1.60*	2.11*	2.65*	3.24*	4.24*	5.23*	6.44*	20.73*	79.41*
	20	0.77	1.28*	1.84*	2.45*	3.12*	3.88*	5.25*	6.77*	9.01*	46.84*	185.39*
	25	0.85	1.42*	2.06*	2.78*	3.59*	4.55*	6.46*	8.99*	13.92*	89.90*	360.11*
700	15	0.72	1.20*	1.71*	2.25*	2.83*	3.46*	4.52*	5.57*	6.83*	20.75*	79.41*
	20	0.82	1.36*	1.96*	2.62*	3.34*	4.14*	5.59*	7.17*	9.42*	46.84*	185.39*
	25	0.90	1.51*	2.21*	2.97*	3.84*	4.86*	6.85*	9.40*	14.11*	89.90*	360.11*
800	15	0.76	1.26*	1.81*	2.38*	3.00*	3.67*	4.79*	5.88*	7.20*	20.81*	79.41*
	20	0.86	1.44*	2.08*	2.78*	3.54*	4.39*	5.92*	7.55*	9.82*	46.84*	185.39*
	25	0.96	1.61*	2.34*	3.16*	4.08*	5.15*	7.22*	9.79*	14.34*	89.90*	360.11*
900	15	0.80	1.33*	1.90*	2.51*	3.16*	3.86*	5.04*	6.19*	7.55*	20.89*	79.41*
	20	0.91	1.52*	2.19*	2.93*	3.73*	4.63*	6.22*	7.91*	10.22*	46.84*	185.39*
	25	1.01	1.69*	2.47*	3.33*	4.30*	5.43*	7.57*	10.18*	14.62*	89.90*	360.11*
1000	15	0.84	1.39*	1.99*	2.63*	3.31*	4.05*	5.28*	6.47*	7.88*	21.02*	79.41*
	20	0.95	1.59*	2.30*	3.07*	3.92*	4.85*	6.51*	8.26*	10.60*	46.84*	185.39*
	25	1.06	1.78*	2.60*	3.50*	4.52*	5.69*	7.91*	10.56*	14.92*	89.90*	360.11*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.87	1.45*	2.08*	2.74*	3.45*	4.22*	5.51*	6.75*	8.20*	21.18*	79.41*
	20	0.99	1.66*	2.41*	3.21*	4.09*	5.07*	6.79*	8.59*	10.97*	46.84*	185.39*
	25	1.10	1.86*	2.72*	3.66*	4.72*	5.94*	8.24*	10.93*	15.23*	89.90*	360.11*
1200	15	0.90	1.50*	2.16*	2.85*	3.59*	4.39*	5.73*	7.01*	8.51*	21.38*	79.41*
	20	1.03	1.73*	2.50*	3.34*	4.26*	5.28*	7.06*	8.91*	11.33*	46.84*	185.39*
	25	1.15	1.94*	2.83*	3.82*	4.92*	6.19*	8.55*	11.28*	15.56*	89.90*	360.11*
1300	15	0.94	1.56*	2.24*	2.96*	3.73*	4.56*	5.94*	7.27*	8.81*	21.60*	79.41*
	20	1.07	1.79*	2.60*	3.47*	4.42*	5.48*	7.32*	9.22*	11.69*	46.84*	185.39*
	25	1.19	2.01*	2.94*	3.97*	5.11*	6.42*	8.85*	11.63*	15.89*	89.90*	360.11*
1400	15	0.97	1.61*	2.32*	3.06*	3.86*	4.72*	6.15*	7.51*	9.10*	21.85*	79.41*
	20	1.11	1.86*	2.69*	3.60*	4.58*	5.67*	7.58*	9.53*	12.03*	46.84*	185.39*
	25	1.23	2.08*	3.05*	4.11*	5.29*	6.65*	9.14*	11.97*	16.22*	89.90*	360.11*
1500	15	1.00	1.66*	2.39*	3.16*	3.99*	4.87*	6.35*	7.75*	9.38*	22.11*	79.41*
	20	1.14	1.92*	2.78*	3.72*	4.74*	5.86*	7.82*	9.82*	12.36*	46.84*	185.39*
	25	1.28	2.16*	3.15*	4.25*	5.47*	6.87*	9.43*	12.30*	16.56*	89.90*	360.11*
1600	15	1.03	1.71*	2.46*	3.26*	4.11*	5.03*	6.54*	7.99*	9.66*	22.39*	79.41*
	20	1.18	1.98*	2.87*	3.84*	4.89*	6.05*	8.06*	10.10*	12.69*	46.84*	185.39*
	25	1.32	2.22*	3.25*	4.39*	5.65*	7.08*	9.71*	12.63*	16.89*	89.90*	360.11*
1700	15	1.06	1.76*	2.53*	3.36*	4.23*	5.17*	6.73*	8.21*	9.92*	22.67*	79.41*
	20	1.21	2.04*	2.96*	3.95*	5.03*	6.22*	8.29*	10.38*	13.00*	46.85*	185.39*
	25	1.35	2.29*	3.35*	4.52*	5.82*	7.29*	9.98*	12.94*	17.22*	89.90*	360.11*
1800	15	1.08	1.81*	2.60*	3.45*	4.35*	5.32*	6.92*	8.44*	10.18*	22.97*	79.41*
	20	1.24	2.09*	3.04*	4.06*	5.17*	6.40*	8.51*	10.65*	13.32*	46.85*	185.39*
	25	1.39	2.36*	3.45*	4.65*	5.98*	7.49*	10.24*	13.25*	17.54*	89.90*	360.11*
1900	15	1.11	1.85*	2.67*	3.54*	4.46*	5.46*	7.10*	8.65*	10.43*	23.26*	79.41*
	20	1.28	2.15*	3.12*	4.17*	5.31*	6.57*	8.74*	10.91*	13.62*	46.86*	185.39*
	25	1.43	2.42*	3.54*	4.78*	6.14*	7.69*	10.49*	13.55*	17.87*	89.90*	360.11*
2000	15	1.14	1.90*	2.74*	3.63*	4.58*	5.59*	7.28*	8.86*	10.68*	23.57*	79.41*
	20	1.31	2.20*	3.20*	4.28*	5.45*	6.74*	8.95*	11.17*	13.92*	46.88*	185.39*
	25	1.47	2.48*	3.64*	4.90*	6.30*	7.88*	10.75*	13.85*	18.19*	89.90*	360.11*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.64	1.06*	1.55*	2.16*	3.08*	5.02*	12.34*	24.36*	44.88*	307.17*	1240.1*
	20	0.70	1.19*	1.82*	2.76*	4.96*	10.31*	27.48*	55.76*	104.19*	725.12*	2935.8*
	25	0.76	1.33*	2.13*	3.78*	8.72*	19.11*	52.46*	107.53*	201.98*	1414.2*	5731.4*
200	15	0.79	1.33*	1.96*	2.72*	3.75*	5.46*	12.34*	24.36*	44.88*	307.17*	1240.1*
	20	0.89	1.52*	2.32*	3.41*	5.36*	10.32*	27.48*	55.76*	104.19*	725.12*	2935.8*
	25	0.98	1.71*	2.71*	4.36*	8.74*	19.11*	52.46*	107.53*	201.98*	1414.2*	5731.4*
300	15	0.92	1.55*	2.29*	3.17*	4.31*	6.03*	12.36*	24.36*	44.88*	307.17*	1240.1*
	20	1.04	1.79*	2.72*	3.95*	5.91*	10.38*	27.48*	55.76*	104.19*	725.12*	2935.8*
	25	1.15	2.02*	3.18*	4.94*	8.89*	19.11*	52.46*	107.53*	201.98*	1414.2*	5731.4*
400	15	1.03	1.74*	2.57*	3.56*	4.80*	6.58*	12.47*	24.36*	44.88*	307.17*	1240.1*
	20	1.17	2.02*	3.06*	4.42*	6.45*	10.59*	27.48*	55.76*	104.19*	725.12*	2935.8*
	25	1.30	2.29*	3.58*	5.46*	9.21*	19.11*	52.46*	107.53*	201.98*	1414.2*	5731.4*
500	15	1.13	1.91*	2.83*	3.90*	5.25*	7.10*	12.69*	24.36*	44.88*	307.17*	1240.1*
	20	1.29	2.22*	3.37*	4.84*	6.96*	10.92*	27.48*	55.76*	104.19*	725.12*	2935.8*
	25	1.44	2.53*	3.94*	5.94*	9.61*	19.12*	52.46*	107.53*	201.98*	1414.2*	5731.4*
600	15	1.22	2.07*	3.06*	4.22*	5.66*	7.58*	13.01*	24.36*	44.88*	307.17*	1240.1*
	20	1.39	2.41*	3.66*	5.23*	7.44*	11.31*	27.49*	55.76*	104.19*	725.12*	2935.8*
	25	1.56	2.75*	4.27*	6.39*	10.05*	19.15*	52.46*	107.53*	201.98*	1414.2*	5731.4*
700	15	1.30	2.21*	3.28*	4.52*	6.04*	8.04*	13.38*	24.38*	44.88*	307.17*	1240.1*
	20	1.50	2.59*	3.92*	5.59*	7.89*	11.74*	27.49*	55.76*	104.19*	725.12*	2935.8*
	25	1.68	2.95*	4.58*	6.81*	10.50*	19.22*	52.46*	107.53*	201.98*	1414.2*	5731.4*
800	15	1.38	2.35*	3.48*	4.80*	6.40*	8.48*	13.78*	24.41*	44.88*	307.17*	1240.1*
	20	1.59	2.75*	4.17*	5.93*	8.32*	12.17*	27.50*	55.76*	104.19*	725.12*	2935.8*
	25	1.79	3.14*	4.88*	7.21*	10.94*	19.33*	52.46*	107.53*	201.98*	1414.2*	5731.4*
900	15	1.46	2.48*	3.68*	5.07*	6.74*	8.89*	14.19*	24.48*	44.88*	307.17*	1240.1*
	20	1.68	2.91*	4.41*	6.26*	8.73*	12.60*	27.52*	55.76*	104.19*	725.12*	2935.8*
	25	1.89	3.33*	5.15*	7.58*	11.37*	19.50*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1000	15	1.53	2.61*	3.87*	5.32*	7.07*	9.29*	14.61*	24.58*	44.88*	307.17*	1240.1*
	20	1.77	3.06*	4.64*	6.57*	9.12*	13.02*	27.56*	55.76*	104.19*	725.12*	2935.8*
	25	1.99	3.50*	5.42*	7.94*	11.80*	19.71*	52.46*	107.53*	201.98*	1414.2*	5731.4*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 2.0 Ft (RADIUS = 1.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.60	2.73*	4.04*	5.56*	7.38*	9.67*	15.03*	24.72*	44.88*	307.17*	1240.1*
	20	1.85	3.21*	4.85*	6.86*	9.50*	13.44*	27.63*	55.76*	104.19*	725.12*	2935.8*
	25	2.09	3.67*	5.67*	8.29*	12.21*	19.96*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1200	15	1.66	2.84*	4.22*	5.80*	7.68*	10.03*	15.45*	24.90*	44.88*	307.17*	1240.1*
	20	1.93	3.35*	5.06*	7.15*	9.86*	13.85*	27.72*	55.76*	104.19*	725.12*	2935.8*
	25	2.18	3.83*	5.91*	8.62*	12.61*	20.24*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1300	15	1.73	2.95*	4.38*	6.02*	7.97*	10.39*	15.86*	25.11*	44.89*	307.17*	1240.1*
	20	2.01	3.48*	5.26*	7.42*	10.21*	14.26*	27.84*	55.76*	104.19*	725.12*	2935.8*
	25	2.27	3.99*	6.15*	8.94*	13.00*	20.54*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1400	15	1.79	3.06*	4.54*	6.24*	8.25*	10.73*	16.26*	25.35*	44.89*	307.17*	1240.1*
	20	2.08	3.61*	5.46*	7.69*	10.55*	14.65*	27.99*	55.76*	104.19*	725.12*	2935.8*
	25	2.35	4.14*	6.37*	9.25*	13.39*	20.85*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1500	15	1.85	3.17*	4.70*	6.45*	8.52*	11.07*	16.66*	25.61*	44.90*	307.17*	1240.1*
	20	2.16	3.74*	5.65*	7.95*	10.88*	15.04*	28.17*	55.76*	104.19*	725.12*	2935.8*
	25	2.44	4.28*	6.59*	9.55*	13.76*	21.18*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1600	15	1.91	3.27*	4.85*	6.66*	8.78*	11.39*	17.05*	25.89*	44.92*	307.17*	1240.1*
	20	2.23	3.86*	5.83*	8.20*	11.21*	15.42*	28.37*	55.76*	104.19*	725.12*	2935.8*
	25	2.52	4.43*	6.81*	9.84*	14.12*	21.52*	52.46*	107.53*	201.98*	1414.2*	5731.4*
1700	15	1.97	3.37*	5.00*	6.86*	9.04*	11.71*	17.43*	26.18*	44.94*	307.17*	1240.1*
	20	2.30	3.98*	6.01*	8.44*	11.52*	15.79*	28.59*	55.76*	104.19*	725.12*	2935.8*
	25	2.60	4.57*	7.02*	10.13*	14.48*	21.86*	52.47*	107.53*	201.98*	1414.2*	5731.4*
1800	15	2.03	3.47*	5.14*	7.05*	9.29*	12.02*	17.81*	26.49*	44.98*	307.17*	1240.1*
	20	2.36	4.10*	6.19*	8.68*	11.83*	16.15*	28.83*	55.76*	104.19*	725.12*	2935.8*
	25	2.68	4.70*	7.22*	10.41*	14.83*	22.20*	52.47*	107.53*	201.98*	1414.2*	5731.4*
1900	15	2.08	3.56*	5.29*	7.25*	9.54*	12.32*	18.18*	26.80*	45.02*	307.17*	1240.1*
	20	2.43	4.21*	6.36*	8.92*	12.12*	16.51*	29.09*	55.77*	104.19*	725.12*	2935.8*
	25	2.75	4.83*	7.42*	10.68*	15.17*	22.54*	52.48*	107.53*	201.98*	1414.2*	5731.4*
2000	15	2.14	3.66*	5.42*	7.43*	9.78*	12.61*	18.55*	27.12*	45.07*	307.17*	1240.1*
	20	2.49	4.33*	6.53*	9.14*	12.42*	16.86*	29.35*	55.78*	104.19*	725.12*	2935.8*
	25	2.83	4.96*	7.62*	10.95*	15.51*	22.89*	52.49*	107.53*	201.98*	1414.2*	5731.4*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.24	0.33	0.42*	0.51*	0.61*	0.70*	0.84*	0.95*	1.07*	1.55*	2.10*
	20	0.25	0.34	0.44*	0.54*	0.64*	0.74*	0.89*	1.02*	1.15*	1.71*	2.44*
	25	0.26	0.36	0.46*	0.57*	0.67*	0.78*	0.94*	1.08*	1.23*	1.89*	2.98*
200	15	0.27	0.37	0.48*	0.58*	0.69*	0.80*	0.96*	1.10*	1.24*	1.82*	2.47*
	20	0.28	0.39	0.51*	0.62*	0.74*	0.86*	1.04*	1.20*	1.35*	2.04*	2.89*
	25	0.30	0.41	0.54*	0.66*	0.79*	0.92*	1.12*	1.29*	1.47*	2.27*	3.43*
300	15	0.29	0.40	0.52*	0.64*	0.76*	0.88*	1.06*	1.22*	1.37*	2.03*	2.77*
	20	0.31	0.43	0.56*	0.69*	0.82*	0.96*	1.16*	1.34*	1.52*	2.30*	3.26*
	25	0.33	0.46	0.59*	0.74*	0.88*	1.03*	1.26*	1.46*	1.66*	2.58*	3.84*
400	15	0.31	0.43	0.56*	0.69*	0.82*	0.95*	1.15*	1.32*	1.49*	2.22*	3.03*
	20	0.34	0.47	0.60*	0.75*	0.90*	1.04*	1.27*	1.46*	1.66*	2.53*	3.57*
	25	0.36	0.50	0.65*	0.81*	0.97*	1.13*	1.38*	1.60*	1.82*	2.84*	4.21*
500	15	0.33	0.46	0.59*	0.73*	0.87*	1.02*	1.23*	1.41*	1.60*	2.38*	3.27*
	20	0.36	0.50	0.64*	0.80*	0.96*	1.12*	1.37*	1.58*	1.79*	2.73*	3.86*
	25	0.39	0.53	0.69*	0.87*	1.04*	1.22*	1.49*	1.73*	1.97*	3.08*	4.53*
600	15	0.35	0.48	0.62*	0.77*	0.92*	1.07*	1.30*	1.50*	1.70*	2.54*	3.48*
	20	0.38	0.52	0.68*	0.85*	1.02*	1.19*	1.45*	1.68*	1.91*	2.92*	4.12*
	25	0.41	0.57	0.74*	0.92*	1.11*	1.30*	1.59*	1.85*	2.11*	3.30*	4.84*
700	15	0.36	0.50	0.65*	0.81*	0.97*	1.13*	1.37*	1.58*	1.79*	2.68*	3.68*
	20	0.40	0.55	0.72*	0.89*	1.07*	1.26*	1.54*	1.78*	2.02*	3.09*	4.37*
	25	0.43	0.60	0.78*	0.97*	1.17*	1.37*	1.69*	1.96*	2.24*	3.50*	5.12*
800	15	0.38	0.52	0.68*	0.85*	1.01*	1.18*	1.44*	1.66*	1.88*	2.82*	3.87*
	20	0.42	0.58	0.75*	0.94*	1.13*	1.32*	1.61*	1.87*	2.13*	3.25*	4.60*
	25	0.45	0.62	0.81*	1.02*	1.23*	1.45*	1.78*	2.06*	2.36*	3.69*	5.39*
900	15	0.39	0.54	0.71*	0.88*	1.05*	1.23*	1.50*	1.73*	1.96*	2.94*	4.05*
	20	0.43	0.60	0.78*	0.98*	1.18*	1.38*	1.69*	1.95*	2.22*	3.41*	4.81*
	25	0.47	0.65	0.85*	1.07*	1.29*	1.51*	1.86*	2.16*	2.48*	3.87*	5.64*
1000	15	0.41	0.56	0.73*	0.91*	1.09*	1.28*	1.56*	1.80*	2.04*	3.07*	4.22*
	20	0.45	0.62	0.81*	1.02*	1.22*	1.43*	1.76*	2.03*	2.32*	3.56*	5.02*
	25	0.49	0.68	0.88*	1.11*	1.34*	1.58*	1.94*	2.26*	2.59*	4.05*	5.88*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.42	0.58	0.76*	0.94*	1.13*	1.32*	1.61*	1.86*	2.11*	3.18*	4.38*
	20	0.47	0.64	0.84*	1.05*	1.27*	1.49*	1.82*	2.11*	2.41*	3.70*	5.22*
	25	0.51	0.70	0.92*	1.15*	1.39*	1.64*	2.02*	2.35*	2.69*	4.21*	6.12*
1200	15	0.43	0.60	0.78*	0.97*	1.17*	1.37*	1.67*	1.93*	2.19*	3.30*	4.54*
	20	0.48	0.67	0.87*	1.09*	1.31*	1.54*	1.89*	2.19*	2.50*	3.84*	5.41*
	25	0.53	0.73	0.95*	1.19*	1.45*	1.70*	2.10*	2.44*	2.79*	4.37*	6.34*
1300	15	0.45	0.62	0.80*	1.00*	1.20*	1.41*	1.72*	1.99*	2.26*	3.41*	4.69*
	20	0.50	0.69	0.90*	1.12*	1.35*	1.59*	1.95*	2.26*	2.58*	3.97*	5.60*
	25	0.54	0.75	0.98*	1.23*	1.49*	1.76*	2.17*	2.52*	2.89*	4.52*	6.56*
1400	15	0.46	0.63	0.82*	1.03*	1.24*	1.45*	1.77*	2.05*	2.33*	3.51*	4.84*
	20	0.51	0.71	0.92*	1.16*	1.40*	1.64*	2.01*	2.33*	2.66*	4.10*	5.78*
	25	0.56	0.77	1.01*	1.27*	1.54*	1.81*	2.24*	2.61*	2.99*	4.67*	6.77*
1500	15	0.47	0.65	0.84*	1.06*	1.27*	1.49*	1.82*	2.10*	2.39*	3.61*	4.98*
	20	0.52	0.72	0.95*	1.19*	1.44*	1.69*	2.07*	2.40*	2.74*	4.22*	5.95*
	25	0.57	0.79	1.04*	1.31*	1.59*	1.87*	2.31*	2.69*	3.08*	4.82*	6.97*
1600	15	0.48	0.66	0.87*	1.08*	1.30*	1.53*	1.87*	2.16*	2.46*	3.71*	5.12*
	20	0.54	0.74	0.97*	1.22*	1.47*	1.73*	2.13*	2.47*	2.82*	4.34*	6.12*
	25	0.59	0.82	1.07*	1.35*	1.63*	1.92*	2.37*	2.76*	3.17*	4.96*	7.17*
1700	15	0.49	0.68	0.89*	1.11*	1.34*	1.57*	1.92*	2.21*	2.52*	3.81*	5.25*
	20	0.55	0.76	1.00*	1.25*	1.51*	1.78*	2.19*	2.54*	2.90*	4.46*	6.28*
	25	0.61	0.84	1.10*	1.38*	1.67*	1.97*	2.44*	2.84*	3.25*	5.10*	7.36*
1800	15	0.50	0.69	0.91*	1.13*	1.37*	1.60*	1.96*	2.27*	2.58*	3.91*	5.39*
	20	0.56	0.78	1.02*	1.28*	1.55*	1.82*	2.24*	2.60*	2.97*	4.57*	6.44*
	25	0.62	0.86	1.12*	1.42*	1.72*	2.02*	2.50*	2.91*	3.34*	5.23*	7.54*
1900	15	0.51	0.71	0.92*	1.16*	1.40*	1.64*	2.01*	2.32*	2.64*	4.00*	5.52*
	20	0.58	0.80	1.04*	1.31*	1.59*	1.86*	2.29*	2.66*	3.04*	4.69*	6.60*
	25	0.63	0.88	1.15*	1.45*	1.76*	2.07*	2.56*	2.99*	3.42*	5.36*	7.73*
2000	15	0.52	0.72	0.94*	1.18*	1.43*	1.67*	2.05*	2.37*	2.70*	4.09*	5.64*
	20	0.59	0.81	1.06*	1.34*	1.62*	1.91*	2.35*	2.73*	3.11*	4.80*	6.75*
	25	0.65	0.90	1.17*	1.48*	1.80*	2.12*	2.62*	3.06*	3.50*	5.49*	7.91*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.35	0.49	0.63*	0.78*	0.93*	1.09*	1.33*	1.54*	1.76*	3.02*	7.01*
	20	0.38	0.52	0.68*	0.84*	1.01*	1.19*	1.47*	1.73*	2.03*	4.58*	14.42*
	25	0.40	0.55	0.72*	0.90*	1.09*	1.29*	1.63*	1.96*	2.37*	7.68*	26.64*
200	15	0.41	0.57	0.74*	0.92*	1.11*	1.30*	1.59*	1.85*	2.13*	3.56*	7.06*
	20	0.45	0.62	0.81*	1.01*	1.22*	1.44*	1.80*	2.12*	2.47*	4.88*	14.42*
	25	0.48	0.67	0.87*	1.10*	1.34*	1.59*	2.01*	2.40*	2.87*	7.69*	26.64*
300	15	0.46	0.64	0.83*	1.04*	1.25*	1.47*	1.80*	2.10*	2.42*	4.01*	7.29*
	20	0.50	0.70	0.92*	1.15*	1.39*	1.65*	2.05*	2.42*	2.83*	5.32*	14.42*
	25	0.54	0.76	0.99*	1.26*	1.53*	1.83*	2.31*	2.76*	3.29*	7.80*	26.64*
400	15	0.50	0.70	0.91*	1.14*	1.37*	1.61*	1.99*	2.32*	2.67*	4.41*	7.64*
	20	0.55	0.77	1.01*	1.27*	1.54*	1.82*	2.28*	2.69*	3.14*	5.76*	14.43*
	25	0.60	0.84	1.10*	1.39*	1.70*	2.03*	2.57*	3.07*	3.64*	8.04*	26.64*
500	15	0.54	0.75	0.98*	1.23*	1.48*	1.74*	2.15*	2.51*	2.90*	4.77*	8.03*
	20	0.60	0.83	1.09*	1.38*	1.67*	1.98*	2.48*	2.92*	3.41*	6.17*	14.45*
	25	0.65	0.91	1.20*	1.52*	1.86*	2.21*	2.80*	3.35*	3.96*	8.36*	26.64*
600	15	0.58	0.80	1.04*	1.31*	1.58*	1.86*	2.31*	2.69*	3.10*	5.10*	8.42*
	20	0.64	0.89	1.17*	1.48*	1.79*	2.13*	2.66*	3.14*	3.67*	6.55*	14.51*
	25	0.70	0.97	1.28*	1.63*	2.00*	2.38*	3.01*	3.60*	4.26*	8.71*	26.64*
700	15	0.61	0.84	1.10*	1.38*	1.68*	1.98*	2.45*	2.86*	3.30*	5.41*	8.80*
	20	0.68	0.94	1.24*	1.57*	1.91*	2.27*	2.83*	3.35*	3.90*	6.92*	14.62*
	25	0.74	1.03	1.37*	1.74*	2.13*	2.54*	3.21*	3.84*	4.54*	9.06*	26.64*
800	15	0.64	0.88	1.16*	1.46*	1.77*	2.08*	2.58*	3.02*	3.48*	5.70*	9.18*
	20	0.71	0.99	1.31*	1.65*	2.02*	2.39*	3.00*	3.54*	4.12*	7.27*	14.78*
	25	0.78	1.09	1.44*	1.84*	2.25*	2.69*	3.40*	4.06*	4.80*	9.41*	26.65*
900	15	0.67	0.92	1.21*	1.53*	1.85*	2.18*	2.71*	3.17*	3.65*	5.97*	9.54*
	20	0.75	1.04	1.37*	1.74*	2.12*	2.52*	3.15*	3.72*	4.34*	7.60*	14.98*
	25	0.82	1.15	1.52*	1.93*	2.37*	2.83*	3.58*	4.27*	5.04*	9.76*	26.65*
1000	15	0.69	0.96	1.26*	1.59*	1.93*	2.28*	2.83*	3.31*	3.82*	6.24*	9.89*
	20	0.78	1.09	1.43*	1.82*	2.21*	2.63*	3.30*	3.89*	4.54*	7.91*	15.22*
	25	0.86	1.20	1.59*	2.02*	2.48*	2.97*	3.75*	4.47*	5.28*	10.10*	26.66*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.72	1.00	1.31*	1.65*	2.01*	2.37*	2.95*	3.45*	3.98*	6.49*	10.23*
	20	0.81	1.13	1.49*	1.89*	2.31*	2.74*	3.44*	4.06*	4.73*	8.22*	15.48*
	25	0.90	1.25	1.65*	2.11*	2.59*	3.10*	3.92*	4.67*	5.50*	10.43*	26.67*
1200	15	0.75	1.03	1.36*	1.72*	2.08*	2.46*	3.06*	3.58*	4.13*	6.73*	10.55*
	20	0.84	1.17	1.55*	1.96*	2.40*	2.85*	3.57*	4.22*	4.91*	8.51*	15.75*
	25	0.93	1.30	1.72*	2.19*	2.69*	3.22*	4.07*	4.85*	5.72*	10.76*	26.69*
1300	15	0.77	1.07	1.40*	1.77*	2.16*	2.55*	3.17*	3.71*	4.28*	6.96*	10.87*
	20	0.87	1.21	1.60*	2.03*	2.48*	2.95*	3.70*	4.37*	5.09*	8.79*	16.03*
	25	0.97	1.35	1.78*	2.28*	2.79*	3.34*	4.22*	5.03*	5.93*	11.07*	26.73*
1400	15	0.80	1.10	1.45*	1.83*	2.23*	2.63*	3.27*	3.83*	4.42*	7.19*	11.18*
	20	0.90	1.25	1.65*	2.10*	2.57*	3.06*	3.83*	4.52*	5.27*	9.07*	16.32*
	25	1.00	1.39	1.84*	2.35*	2.89*	3.46*	4.37*	5.21*	6.13*	11.38*	26.78*
1500	15	0.82	1.13	1.49*	1.89*	2.29*	2.71*	3.37*	3.95*	4.56*	7.41*	11.48*
	20	0.93	1.29	1.70*	2.17*	2.65*	3.15*	3.95*	4.67*	5.44*	9.34*	16.61*
	25	1.03	1.44	1.90*	2.43*	2.99*	3.57*	4.51*	5.38*	6.33*	11.68*	26.84*
1600	15	0.84	1.17	1.53*	1.94*	2.36*	2.79*	3.47*	4.07*	4.69*	7.62*	11.78*
	20	0.96	1.33	1.76*	2.23*	2.73*	3.25*	4.07*	4.81*	5.60*	9.60*	16.90*
	25	1.06	1.48	1.96*	2.50*	3.08*	3.68*	4.65*	5.54*	6.52*	11.98*	26.93*
1700	15	0.86	1.20	1.57*	1.99*	2.43*	2.87*	3.57*	4.18*	4.82*	7.83*	12.07*
	20	0.98	1.37	1.80*	2.30*	2.81*	3.34*	4.19*	4.95*	5.76*	9.85*	17.20*
	25	1.09	1.52	2.02*	2.58*	3.17*	3.79*	4.79*	5.70*	6.70*	12.27*	27.03*
1800	15	0.89	1.23	1.61*	2.04*	2.49*	2.95*	3.66*	4.29*	4.95*	8.03*	12.35*
	20	1.01	1.40	1.85*	2.36*	2.88*	3.43*	4.30*	5.08*	5.91*	10.10*	17.49*
	25	1.12	1.56	2.07*	2.65*	3.25*	3.89*	4.92*	5.86*	6.88*	12.55*	27.14*
1900	15	0.91	1.26	1.65*	2.09*	2.55*	3.02*	3.76*	4.40*	5.08*	8.23*	12.62*
	20	1.04	1.44	1.90*	2.42*	2.96*	3.52*	4.41*	5.21*	6.07*	10.34*	17.78*
	25	1.15	1.60	2.12*	2.72*	3.34*	3.99*	5.05*	6.01*	7.06*	12.82*	27.27*
2000	15	0.93	1.29	1.69*	2.14*	2.61*	3.09*	3.85*	4.51*	5.20*	8.43*	12.89*
	20	1.06	1.47	1.94*	2.48*	3.03*	3.61*	4.52*	5.34*	6.21*	10.57*	18.07*
	25	1.18	1.64	2.18*	2.78*	3.42*	4.09*	5.18*	6.16*	7.23*	13.09*	27.42*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.55	0.77	1.01*	1.28*	1.58*	1.90*	2.52*	3.28*	4.66*	23.80*	88.67*
	20	0.60	0.84	1.12*	1.45*	1.82*	2.28*	3.40*	5.48*	9.21*	54.10*	207.30*
	25	0.64	0.91	1.23*	1.62*	2.11*	2.81*	5.26*	9.60*	16.80*	104.05*	402.88*
200	15	0.67	0.94	1.24*	1.58*	1.95*	2.35*	3.08*	3.88*	5.08*	23.80*	88.67*
	20	0.74	1.05	1.40*	1.81*	2.27*	2.82*	3.97*	5.70*	9.22*	54.10*	207.30*
	25	0.81	1.15	1.55*	2.04*	2.63*	3.40*	5.49*	9.60*	16.80*	104.05*	402.88*
300	15	0.77	1.07	1.42*	1.82*	2.24*	2.71*	3.54*	4.41*	5.60*	23.80*	88.67*
	20	0.86	1.21	1.62*	2.10*	2.63*	3.26*	4.50*	6.14*	9.30*	54.10*	207.30*
	25	0.94	1.33	1.81*	2.38*	3.05*	3.90*	5.92*	9.65*	16.80*	104.05*	402.88*
400	15	0.85	1.19	1.58*	2.02*	2.50*	3.02*	3.93*	4.87*	6.10*	23.80*	88.67*
	20	0.96	1.35	1.81*	2.35*	2.95*	3.64*	4.97*	6.61*	9.51*	54.10*	207.30*
	25	1.05	1.50	2.03*	2.67*	3.42*	4.34*	6.39*	9.82*	16.80*	104.05*	402.88*
500	15	0.93	1.30	1.72*	2.21*	2.73*	3.30*	4.29*	5.29*	6.56*	23.80*	88.67*
	20	1.05	1.48	1.98*	2.57*	3.23*	3.98*	5.40*	7.08*	9.83*	54.10*	207.30*
	25	1.16	1.64	2.23*	2.93*	3.74*	4.73*	6.85*	10.09*	16.81*	104.05*	402.88*
600	15	1.00	1.39	1.85*	2.38*	2.94*	3.56*	4.61*	5.67*	7.00*	23.80*	88.67*
	20	1.13	1.59	2.14*	2.78*	3.49*	4.29*	5.79*	7.51*	10.20*	54.10*	207.30*
	25	1.25	1.78	2.41*	3.17*	4.05*	5.10*	7.28*	10.43*	16.85*	104.05*	402.88*
700	15	1.06	1.49	1.98*	2.54*	3.14*	3.80*	4.92*	6.03*	7.41*	23.81*	88.67*
	20	1.21	1.70	2.28*	2.97*	3.73*	4.58*	6.16*	7.93*	10.59*	54.10*	207.30*
	25	1.34	1.90	2.58*	3.39*	4.33*	5.44*	7.69*	10.79*	16.93*	104.05*	402.88*
800	15	1.12	1.57	2.09*	2.69*	3.33*	4.02*	5.20*	6.37*	7.80*	23.83*	88.67*
	20	1.28	1.80	2.42*	3.15*	3.95*	4.86*	6.51*	8.33*	10.99*	54.10*	207.30*
	25	1.43	2.02	2.74*	3.60*	4.59*	5.76*	8.08*	11.17*	17.06*	104.05*	402.88*
900	15	1.18	1.65	2.20*	2.83*	3.50*	4.24*	5.48*	6.69*	8.17*	23.87*	88.67*
	20	1.35	1.90	2.56*	3.32*	4.17*	5.12*	6.84*	8.71*	11.38*	54.10*	207.30*
	25	1.51	2.13	2.89*	3.80*	4.84*	6.06*	8.46*	11.55*	17.23*	104.05*	402.88*
1000	15	1.24	1.73	2.31*	2.97*	3.67*	4.44*	5.73*	7.00*	8.52*	23.93*	88.67*
	20	1.42	2.00	2.68*	3.49*	4.37*	5.37*	7.15*	9.08*	11.76*	54.10*	207.30*
	25	1.59	2.24	3.04*	3.99*	5.08*	6.35*	8.82*	11.93*	17.44*	104.05*	402.88*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.29	1.81	2.41*	3.10*	3.83*	4.63*	5.98*	7.29*	8.86*	24.02*	88.67*
	20	1.48	2.09	2.80*	3.64*	4.57*	5.61*	7.46*	9.43*	12.14*	54.10*	207.30*
	25	1.66	2.35	3.18*	4.18*	5.31*	6.63*	9.17*	12.30*	17.69*	104.05*	402.88*
1200	15	1.34	1.88	2.50*	3.22*	3.99*	4.82*	6.22*	7.58*	9.19*	24.15*	88.67*
	20	1.55	2.17	2.92*	3.80*	4.76*	5.83*	7.75*	9.77*	12.51*	54.10*	207.30*
	25	1.73	2.45	3.31*	4.35*	5.53*	6.89*	9.50*	12.66*	17.95*	104.05*	402.88*
1300	15	1.39	1.95	2.60*	3.34*	4.14*	5.00*	6.45*	7.85*	9.50*	24.30*	88.67*
	20	1.61	2.26	3.03*	3.94*	4.94*	6.05*	8.03*	10.10*	12.87*	54.10*	207.30*
	25	1.80	2.54	3.44*	4.52*	5.74*	7.15*	9.83*	13.02*	18.24*	104.05*	402.88*
1400	15	1.44	2.02	2.69*	3.46*	4.29*	5.18*	6.68*	8.12*	9.81*	24.48*	88.67*
	20	1.66	2.34	3.14*	4.08*	5.12*	6.27*	8.30*	10.42*	13.23*	54.10*	207.30*
	25	1.87	2.64	3.57*	4.69*	5.95*	7.40*	10.14*	13.37*	18.54*	104.05*	402.88*
1500	15	1.49	2.08	2.78*	3.57*	4.43*	5.35*	6.89*	8.37*	10.11*	24.69*	88.67*
	20	1.72	2.42	3.25*	4.22*	5.29*	6.48*	8.56*	10.74*	13.57*	54.10*	207.30*
	25	1.93	2.73	3.69*	4.85*	6.15*	7.64*	10.45*	13.72*	18.84*	104.05*	402.88*
1600	15	1.54	2.15	2.86*	3.69*	4.57*	5.52*	7.10*	8.62*	10.40*	24.91*	88.67*
	20	1.77	2.49	3.35*	4.36*	5.46*	6.68*	8.82*	11.04*	13.91*	54.10*	207.30*
	25	1.99	2.81	3.81*	5.00*	6.34*	7.88*	10.75*	14.05*	19.15*	104.05*	402.88*
1700	15	1.58	2.21	2.94*	3.79*	4.70*	5.68*	7.31*	8.87*	10.68*	25.15*	88.67*
	20	1.83	2.57	3.45*	4.49*	5.62*	6.87*	9.07*	11.33*	14.25*	54.10*	207.30*
	25	2.05	2.90	3.93*	5.16*	6.53*	8.11*	11.04*	14.38*	19.47*	104.05*	402.88*
1800	15	1.62	2.27	3.03*	3.90*	4.83*	5.83*	7.51*	9.10*	10.96*	25.40*	88.67*
	20	1.88	2.64	3.55*	4.61*	5.78*	7.07*	9.32*	11.62*	14.57*	54.10*	207.30*
	25	2.11	2.98	4.04*	5.30*	6.72*	8.33*	11.32*	14.71*	19.78*	104.05*	402.88*
1900	15	1.67	2.33	3.11*	4.00*	4.96*	5.99*	7.70*	9.33*	11.22*	25.67*	88.67*
	20	1.93	2.71	3.64*	4.74*	5.93*	7.25*	9.55*	11.90*	14.89*	54.10*	207.30*
	25	2.17	3.07	4.15*	5.45*	6.90*	8.55*	11.60*	15.03*	20.10*	104.05*	402.88*
2000	15	1.71	2.39	3.18*	4.10*	5.08*	6.14*	7.89*	9.56*	11.49*	25.94*	88.67*
	20	1.98	2.78	3.74*	4.86*	6.08*	7.44*	9.79*	12.18*	15.20*	54.11*	207.30*
	25	2.23	3.15	4.26*	5.59*	7.07*	8.76*	11.87*	15.34*	20.41*	104.05*	402.88*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.91	1.31	1.83*	2.54*	3.76*	6.63*	15.98*	30.76*	55.39*	355.96*	1387.9*
	20	1.02	1.50	2.20*	3.49*	6.95*	14.14*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	1.12	1.71	2.70*	5.46*	12.62*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
200	15	1.15	1.66	2.31*	3.17*	4.42*	6.81*	15.98*	30.76*	55.39*	355.96*	1387.9*
	20	1.31	1.93	2.79*	4.14*	7.07*	14.14*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	1.46	2.21	3.36*	5.76*	12.62*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
300	15	1.35	1.95	2.70*	3.68*	5.02*	7.27*	15.98*	30.76*	55.39*	355.96*	1387.9*
	20	1.55	2.27	3.26*	4.74*	7.45*	14.14*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	1.73	2.60	3.90*	6.27*	12.63*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
400	15	1.52	2.19	3.03*	4.12*	5.56*	7.79*	16.00*	30.76*	55.39*	355.96*	1387.9*
	20	1.75	2.57	3.67*	5.26*	7.94*	14.18*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	1.97	2.95	4.37*	6.81*	12.70*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
500	15	1.68	2.41	3.33*	4.52*	6.06*	8.31*	16.07*	30.76*	55.39*	355.96*	1387.9*
	20	1.94	2.84	4.04*	5.74*	8.44*	14.30*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	2.19	3.26	4.80*	7.32*	12.88*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
600	15	1.82	2.61	3.61*	4.89*	6.51*	8.82*	16.21*	30.76*	55.39*	355.96*	1387.9*
	20	2.11	3.08	4.38*	6.19*	8.94*	14.50*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	2.38	3.54	5.20*	7.81*	13.14*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
700	15	1.95	2.80	3.87*	5.23*	6.93*	9.30*	16.42*	30.76*	55.39*	355.96*	1387.9*
	20	2.27	3.31	4.69*	6.60*	9.41*	14.78*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	2.57	3.81	5.56*	8.27*	13.48*	26.53*	69.12*	136.97*	250.45*	1639.9*	6415.2*
800	15	2.08	2.98	4.11*	5.55*	7.33*	9.77*	16.70*	30.76*	55.39*	355.96*	1387.9*
	20	2.42	3.52	4.99*	6.99*	9.87*	15.11*	36.04*	70.86*	129.04*	840.71*	3285.9*
	25	2.74	4.06	5.91*	8.72*	13.85*	26.54*	69.12*	136.97*	250.45*	1639.9*	6415.2*
900	15	2.20	3.15	4.34*	5.85*	7.71*	10.21*	17.03*	30.78*	55.39*	355.96*	1387.9*
	20	2.56	3.73	5.27*	7.36*	10.32*	15.47*	36.05*	70.86*	129.04*	840.71*	3285.9*
	25	2.91	4.30	6.24*	9.14*	14.24*	26.57*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1000	15	2.31	3.31	4.56*	6.14*	8.08*	10.64*	17.38*	30.80*	55.39*	355.96*	1387.9*
	20	2.70	3.92	5.54*	7.71*	10.74*	15.85*	36.05*	70.86*	129.04*	840.71*	3285.9*
	25	3.06	4.52	6.55*	9.54*	14.64*	26.62*	69.12*	136.97*	250.45*	1639.9*	6415.2*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 4.0 Ft (RADIUS = 2.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.42	3.46	4.77*	6.42*	8.43*	11.05*	17.75*	30.84*	55.39*	355.96*	1387.9*
	20	2.83	4.11	5.79*	8.05*	11.16*	16.25*	36.06*	70.86*	129.04*	840.71*	3285.9*
	25	3.22	4.74	6.85*	9.93*	15.04*	26.70*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1200	15	2.53	3.61	4.98*	6.69*	8.76*	11.45*	18.13*	30.90*	55.39*	355.96*	1387.9*
	20	2.96	4.29	6.04*	8.38*	11.56*	16.64*	36.07*	70.86*	129.04*	840.71*	3285.9*
	25	3.36	4.95	7.14*	10.31*	15.44*	26.81*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1300	15	2.63	3.76	5.17*	6.94*	9.08*	11.83*	18.52*	30.99*	55.39*	355.96*	1387.9*
	20	3.08	4.46	6.28*	8.69*	11.94*	17.04*	36.10*	70.86*	129.04*	840.71*	3285.9*
	25	3.50	5.15	7.41*	10.67*	15.84*	26.94*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1400	15	2.73	3.90	5.36*	7.19*	9.40*	12.21*	18.91*	31.10*	55.39*	355.96*	1387.9*
	20	3.20	4.63	6.51*	8.99*	12.32*	17.43*	36.14*	70.86*	129.04*	840.71*	3285.9*
	25	3.64	5.35	7.68*	11.03*	16.24*	27.11*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1500	15	2.82	4.03	5.55*	7.44*	9.70*	12.57*	19.30*	31.24*	55.39*	355.96*	1387.9*
	20	3.31	4.80	6.73*	9.29*	12.68*	17.82*	36.19*	70.86*	129.04*	840.71*	3285.9*
	25	3.77	5.54	7.95*	11.37*	16.63*	27.30*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1600	15	2.92	4.16	5.73*	7.67*	10.00*	12.93*	19.69*	31.40*	55.40*	355.96*	1387.9*
	20	3.43	4.95	6.95*	9.58*	13.04*	18.21*	36.26*	70.86*	129.04*	840.71*	3285.9*
	25	3.90	5.72	8.20*	11.70*	17.01*	27.52*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1700	15	3.01	4.29	5.90*	7.90*	10.28*	13.27*	20.08*	31.59*	55.40*	355.96*	1387.9*
	20	3.53	5.11	7.16*	9.86*	13.39*	18.59*	36.35*	70.86*	129.04*	840.71*	3285.9*
	25	4.03	5.90	8.45*	12.03*	17.39*	27.75*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1800	15	3.10	4.42	6.07*	8.12*	10.57*	13.61*	20.46*	31.79*	55.40*	355.96*	1387.9*
	20	3.64	5.26	7.37*	10.13*	13.73*	18.97*	36.46*	70.86*	129.04*	840.71*	3285.9*
	25	4.15	6.07	8.69*	12.35*	17.76*	28.01*	69.12*	136.97*	250.45*	1639.9*	6415.2*
1900	15	3.18	4.54	6.24*	8.34*	10.84*	13.94*	20.84*	32.02*	55.41*	355.96*	1387.9*
	20	3.74	5.41	7.57*	10.40*	14.06*	19.35*	36.58*	70.86*	129.04*	840.71*	3285.9*
	25	4.27	6.25	8.92*	12.66*	18.13*	28.28*	69.12*	136.97*	250.45*	1639.9*	6415.2*
2000	15	3.27	4.66	6.40*	8.56*	11.11*	14.27*	21.22*	32.26*	55.43*	355.96*	1387.9*
	20	3.85	5.55	7.77*	10.66*	14.38*	19.71*	36.73*	70.86*	129.04*	840.71*	3285.9*
	25	4.38	6.41	9.15*	12.96*	18.49*	28.55*	69.12*	136.97*	250.45*	1639.9*	6415.2*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.30	0.38	0.47	0.56*	0.65*	0.74*	0.88*	0.99*	1.11*	1.60*	2.15*
	20	0.31	0.40	0.50	0.59*	0.69*	0.79*	0.94*	1.07*	1.20*	1.77*	2.53*
	25	0.33	0.42	0.52	0.62*	0.72*	0.83*	1.00*	1.14*	1.28*	1.97*	3.14*
200	15	0.34	0.44	0.54	0.64*	0.74*	0.85*	1.01*	1.15*	1.29*	1.88*	2.54*
	20	0.36	0.47	0.57	0.68*	0.80*	0.92*	1.10*	1.26*	1.42*	2.11*	2.99*
	25	0.38	0.49	0.61	0.72*	0.85*	0.98*	1.18*	1.36*	1.54*	2.36*	3.59*
300	15	0.37	0.48	0.59	0.70*	0.82*	0.94*	1.12*	1.28*	1.44*	2.10*	2.85*
	20	0.40	0.52	0.63	0.76*	0.89*	1.03*	1.23*	1.41*	1.59*	2.38*	3.37*
	25	0.43	0.55	0.68	0.81*	0.96*	1.11*	1.34*	1.53*	1.74*	2.68*	4.00*
400	15	0.40	0.51	0.63	0.75*	0.88*	1.02*	1.22*	1.39*	1.56*	2.29*	3.12*
	20	0.43	0.56	0.69	0.82*	0.97*	1.12*	1.35*	1.54*	1.74*	2.62*	3.69*
	25	0.46	0.60	0.74	0.88*	1.05*	1.21*	1.47*	1.69*	1.92*	2.96*	4.37*
500	15	0.42	0.55	0.67	0.80*	0.94*	1.09*	1.30*	1.49*	1.67*	2.47*	3.36*
	20	0.46	0.60	0.74	0.88*	1.04*	1.20*	1.45*	1.66*	1.88*	2.83*	3.99*
	25	0.50	0.65	0.79	0.95*	1.13*	1.31*	1.59*	1.83*	2.07*	3.20*	4.71*
600	15	0.45	0.58	0.71	0.85*	1.00*	1.15*	1.38*	1.58*	1.78*	2.63*	3.58*
	20	0.49	0.64	0.78	0.93*	1.10*	1.28*	1.54*	1.77*	2.00*	3.02*	4.26*
	25	0.53	0.69	0.84	1.01*	1.20*	1.40*	1.69*	1.95*	2.22*	3.43*	5.02*
700	15	0.47	0.61	0.74	0.89*	1.05*	1.21*	1.45*	1.66*	1.88*	2.77*	3.79*
	20	0.52	0.67	0.82	0.98*	1.16*	1.35*	1.63*	1.87*	2.12*	3.21*	4.51*
	25	0.56	0.73	0.89	1.07*	1.27*	1.48*	1.80*	2.07*	2.36*	3.64*	5.31*
800	15	0.49	0.63	0.78	0.93*	1.10*	1.27*	1.52*	1.74*	1.97*	2.92*	3.98*
	20	0.54	0.70	0.86	1.03*	1.22*	1.42*	1.71*	1.97*	2.23*	3.38*	4.75*
	25	0.59	0.76	0.94	1.13*	1.34*	1.56*	1.89*	2.18*	2.48*	3.84*	5.59*
900	15	0.51	0.66	0.81	0.97*	1.14*	1.32*	1.59*	1.82*	2.05*	3.05*	4.17*
	20	0.57	0.73	0.90	1.08*	1.28*	1.48*	1.79*	2.06*	2.34*	3.54*	4.97*
	25	0.62	0.80	0.98	1.18*	1.40*	1.63*	1.98*	2.29*	2.61*	4.03*	5.85*
1000	15	0.53	0.68	0.84	1.00*	1.19*	1.37*	1.65*	1.89*	2.14*	3.18*	4.34*
	20	0.59	0.76	0.93	1.12*	1.33*	1.54*	1.87*	2.15*	2.44*	3.69*	5.18*
	25	0.64	0.83	1.02	1.23*	1.46*	1.70*	2.07*	2.39*	2.72*	4.21*	6.10*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.55	0.71	0.87	1.04*	1.23*	1.42*	1.71*	1.96*	2.22*	3.30*	4.51*
	20	0.61	0.79	0.97	1.16*	1.38*	1.60*	1.94*	2.23*	2.53*	3.84*	5.39*
	25	0.67	0.86	1.06	1.27*	1.52*	1.77*	2.15*	2.49*	2.83*	4.38*	6.34*
1200	15	0.57	0.73	0.89	1.07*	1.27*	1.47*	1.77*	2.03*	2.29*	3.42*	4.67*
	20	0.63	0.82	1.00	1.20*	1.43*	1.66*	2.01*	2.31*	2.63*	3.98*	5.59*
	25	0.69	0.89	1.10	1.32*	1.57*	1.83*	2.23*	2.58*	2.94*	4.55*	6.57*
1300	15	0.58	0.75	0.92	1.10*	1.31*	1.51*	1.83*	2.10*	2.37*	3.53*	4.83*
	20	0.65	0.84	1.03	1.24*	1.47*	1.71*	2.08*	2.39*	2.71*	4.12*	5.78*
	25	0.71	0.92	1.14	1.36*	1.63*	1.90*	2.31*	2.67*	3.04*	4.71*	6.79*
1400	15	0.60	0.77	0.95	1.13*	1.34*	1.56*	1.88*	2.16*	2.44*	3.64*	4.98*
	20	0.67	0.87	1.06	1.28*	1.52*	1.76*	2.14*	2.47*	2.80*	4.25*	5.96*
	25	0.74	0.95	1.17	1.41*	1.68*	1.96*	2.39*	2.76*	3.14*	4.86*	7.01*
1500	15	0.62	0.79	0.97	1.16*	1.38*	1.60*	1.93*	2.22*	2.51*	3.75*	5.13*
	20	0.69	0.89	1.09	1.31*	1.56*	1.82*	2.21*	2.54*	2.89*	4.38*	6.14*
	25	0.76	0.98	1.21	1.45*	1.73*	2.02*	2.46*	2.84*	3.24*	5.01*	7.22*
1600	15	0.63	0.81	1.00	1.19*	1.42*	1.64*	1.99*	2.28*	2.58*	3.85*	5.27*
	20	0.71	0.91	1.12	1.35*	1.60*	1.87*	2.27*	2.61*	2.97*	4.51*	6.32*
	25	0.78	1.01	1.24	1.49*	1.78*	2.07*	2.53*	2.93*	3.33*	5.16*	7.42*
1700	15	0.65	0.83	1.02	1.22*	1.45*	1.68*	2.04*	2.34*	2.64*	3.95*	5.41*
	20	0.73	0.94	1.15	1.38*	1.65*	1.91*	2.33*	2.68*	3.05*	4.63*	6.49*
	25	0.80	1.03	1.27	1.53*	1.83*	2.13*	2.60*	3.01*	3.43*	5.30*	7.62*
1800	15	0.66	0.85	1.04	1.25*	1.48*	1.72*	2.09*	2.39*	2.71*	4.05*	5.55*
	20	0.75	0.96	1.18	1.42*	1.69*	1.96*	2.39*	2.75*	3.12*	4.75*	6.65*
	25	0.82	1.06	1.30	1.57*	1.87*	2.18*	2.67*	3.08*	3.52*	5.44*	7.81*
1900	15	0.68	0.87	1.07	1.28*	1.52*	1.76*	2.13*	2.45*	2.77*	4.15*	5.68*
	20	0.76	0.98	1.21	1.45*	1.73*	2.01*	2.44*	2.82*	3.20*	4.87*	6.81*
	25	0.84	1.09	1.33	1.61*	1.92*	2.24*	2.73*	3.16*	3.61*	5.58*	8.00*
2000	15	0.69	0.89	1.09	1.31*	1.55*	1.80*	2.18*	2.50*	2.83*	4.24*	5.81*
	20	0.78	1.00	1.23	1.48*	1.76*	2.05*	2.50*	2.88*	3.28*	4.98*	6.97*
	25	0.86	1.11	1.37	1.64*	1.96*	2.29*	2.80*	3.24*	3.69*	5.71*	8.18*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.45	0.58	0.72	0.86*	1.01*	1.16*	1.41*	1.62*	1.86*	3.20*	7.66*
	20	0.48	0.62	0.77	0.93*	1.10*	1.28*	1.57*	1.84*	2.16*	5.10*	15.93*
	25	0.51	0.66	0.82	0.99*	1.19*	1.40*	1.75*	2.10*	2.56*	8.69*	29.57*
200	15	0.53	0.69	0.85	1.01*	1.20*	1.39*	1.69*	1.96*	2.24*	3.74*	7.69*
	20	0.58	0.75	0.93	1.12*	1.33*	1.56*	1.92*	2.25*	2.63*	5.32*	15.93*
	25	0.62	0.81	1.00	1.21*	1.46*	1.72*	2.15*	2.57*	3.08*	8.69*	29.57*
300	15	0.59	0.77	0.95	1.14*	1.35*	1.57*	1.92*	2.22*	2.55*	4.21*	7.85*
	20	0.65	0.85	1.05	1.27*	1.52*	1.78*	2.19*	2.58*	3.00*	5.72*	15.93*
	25	0.71	0.92	1.15	1.39*	1.67*	1.98*	2.48*	2.95*	3.52*	8.75*	29.57*
400	15	0.65	0.84	1.04	1.25*	1.49*	1.73*	2.12*	2.46*	2.82*	4.62*	8.16*
	20	0.72	0.94	1.16	1.40*	1.68*	1.97*	2.43*	2.86*	3.33*	6.15*	15.94*
	25	0.79	1.02	1.27	1.55*	1.86*	2.20*	2.76*	3.28*	3.89*	8.91*	29.57*
500	15	0.70	0.91	1.12	1.35*	1.61*	1.88*	2.29*	2.66*	3.06*	5.00*	8.52*
	20	0.78	1.02	1.26	1.52*	1.83*	2.14*	2.65*	3.11*	3.62*	6.56*	15.95*
	25	0.86	1.12	1.39	1.68*	2.03*	2.40*	3.01*	3.58*	4.23*	9.17*	29.57*
600	15	0.75	0.97	1.20	1.44*	1.72*	2.01*	2.46*	2.85*	3.28*	5.34*	8.90*
	20	0.84	1.09	1.35	1.63*	1.96*	2.30*	2.85*	3.34*	3.89*	6.96*	15.98*
	25	0.92	1.20	1.49	1.81*	2.19*	2.59*	3.24*	3.85*	4.55*	9.48*	29.57*
700	15	0.80	1.03	1.27	1.53*	1.83*	2.13*	2.61*	3.03*	3.48*	5.66*	9.28*
	20	0.89	1.16	1.43	1.74*	2.08*	2.45*	3.03*	3.56*	4.14*	7.33*	16.04*
	25	0.98	1.28	1.59	1.93*	2.33*	2.76*	3.45*	4.10*	4.84*	9.82*	29.57*
800	15	0.84	1.08	1.34	1.61*	1.92*	2.25*	2.75*	3.20*	3.67*	5.96*	9.66*
	20	0.94	1.22	1.51	1.83*	2.20*	2.59*	3.21*	3.77*	4.37*	7.69*	16.15*
	25	1.04	1.35	1.68	2.04*	2.47*	2.92*	3.66*	4.34*	5.11*	10.16*	29.57*
900	15	0.88	1.14	1.40	1.69*	2.02*	2.36*	2.89*	3.36*	3.86*	6.25*	10.02*
	20	0.99	1.29	1.59	1.93*	2.31*	2.72*	3.37*	3.96*	4.60*	8.03*	16.31*
	25	1.09	1.42	1.77	2.15*	2.60*	3.07*	3.85*	4.57*	5.37*	10.50*	29.58*
1000	15	0.92	1.19	1.46	1.76*	2.11*	2.46*	3.02*	3.51*	4.03*	6.52*	10.37*
	20	1.04	1.35	1.66	2.01*	2.42*	2.85*	3.53*	4.14*	4.81*	8.35*	16.50*
	25	1.15	1.49	1.85	2.25*	2.72*	3.22*	4.03*	4.78*	5.62*	10.84*	29.58*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.95	1.23	1.52	1.83*	2.19*	2.56*	3.15*	3.66*	4.20*	6.78*	10.72*
	20	1.08	1.40	1.73	2.10*	2.52*	2.97*	3.68*	4.32*	5.01*	8.67*	16.71*
	25	1.20	1.56	1.93	2.35*	2.84*	3.36*	4.21*	4.99*	5.86*	11.17*	29.58*
1200	15	0.99	1.28	1.58	1.90*	2.27*	2.66*	3.27*	3.80*	4.36*	7.04*	11.05*
	20	1.12	1.46	1.80	2.18*	2.62*	3.09*	3.83*	4.49*	5.21*	8.97*	16.95*
	25	1.25	1.62	2.01	2.44*	2.95*	3.50*	4.38*	5.19*	6.09*	11.50*	29.59*
1300	15	1.02	1.32	1.63	1.96*	2.35*	2.75*	3.38*	3.93*	4.52*	7.28*	11.38*
	20	1.16	1.51	1.87	2.26*	2.72*	3.20*	3.97*	4.66*	5.40*	9.27*	17.21*
	25	1.29	1.68	2.08	2.53*	3.07*	3.63*	4.54*	5.38*	6.31*	11.82*	29.61*
1400	15	1.05	1.36	1.68	2.03*	2.43*	2.84*	3.49*	4.06*	4.67*	7.52*	11.69*
	20	1.20	1.56	1.93	2.33*	2.81*	3.31*	4.10*	4.82*	5.58*	9.55*	17.48*
	25	1.34	1.74	2.16	2.62*	3.17*	3.75*	4.70*	5.57*	6.52*	12.14*	29.63*
1500	15	1.09	1.41	1.73	2.09*	2.50*	2.93*	3.60*	4.19*	4.81*	7.74*	12.00*
	20	1.24	1.61	1.99	2.41*	2.90*	3.42*	4.24*	4.97*	5.76*	9.83*	17.75*
	25	1.38	1.80	2.23	2.71*	3.28*	3.88*	4.85*	5.75*	6.73*	12.44*	29.67*
1600	15	1.12	1.45	1.78	2.15*	2.58*	3.02*	3.71*	4.32*	4.96*	7.97*	12.30*
	20	1.28	1.66	2.05	2.48*	2.99*	3.52*	4.36*	5.12*	5.93*	10.10*	18.04*
	25	1.42	1.85	2.29	2.79*	3.38*	4.00*	5.00*	5.92*	6.93*	12.75*	29.72*
1700	15	1.15	1.49	1.83	2.21*	2.65*	3.10*	3.81*	4.44*	5.09*	8.18*	12.60*
	20	1.31	1.70	2.11	2.55*	3.07*	3.62*	4.49*	5.27*	6.10*	10.36*	18.32*
	25	1.47	1.90	2.36	2.87*	3.48*	4.11*	5.15*	6.09*	7.13*	13.04*	29.78*
1800	15	1.18	1.52	1.88	2.27*	2.72*	3.18*	3.91*	4.56*	5.23*	8.39*	12.89*
	20	1.35	1.75	2.16	2.62*	3.16*	3.72*	4.61*	5.41*	6.27*	10.62*	18.61*
	25	1.51	1.96	2.43	2.95*	3.57*	4.23*	5.29*	6.26*	7.32*	13.33*	29.86*
1900	15	1.21	1.56	1.93	2.32*	2.79*	3.26*	4.01*	4.67*	5.36*	8.60*	13.17*
	20	1.38	1.80	2.22	2.69*	3.24*	3.81*	4.73*	5.55*	6.43*	10.87*	18.89*
	25	1.55	2.01	2.49	3.03*	3.67*	4.34*	5.43*	6.42*	7.51*	13.61*	29.95*
2000	15	1.24	1.60	1.97	2.38*	2.85*	3.34*	4.11*	4.78*	5.49*	8.80*	13.45*
	20	1.42	1.84	2.27	2.75*	3.32*	3.91*	4.85*	5.69*	6.59*	11.11*	19.18*
	25	1.59	2.06	2.55	3.10*	3.76*	4.45*	5.56*	6.58*	7.69*	13.89*	30.05*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.71	0.93	1.16	1.42*	1.73*	2.08*	2.77*	3.68*	5.43*	27.24*	98.74*
	20	0.77	1.02	1.30	1.62*	2.02*	2.55*	3.98*	6.64*	11.07*	62.19*	231.12*
	25	0.84	1.12	1.44	1.83*	2.40*	3.30*	6.57*	11.84*	20.39*	119.81*	449.37*
200	15	0.87	1.14	1.43	1.76*	2.14*	2.57*	3.36*	4.27*	5.72*	27.24*	98.74*
	20	0.97	1.28	1.63	2.02*	2.52*	3.13*	4.49*	6.73*	11.07*	62.19*	231.12*
	25	1.06	1.42	1.82	2.31*	2.97*	3.88*	6.65*	11.84*	20.39*	119.81*	449.37*
300	15	1.01	1.32	1.65	2.02*	2.47*	2.96*	3.85*	4.81*	6.20*	27.24*	98.74*
	20	1.13	1.49	1.89	2.35*	2.92*	3.61*	5.02*	7.05*	11.09*	62.19*	231.12*
	25	1.25	1.66	2.12	2.69*	3.43*	4.40*	6.96*	11.85*	20.39*	119.81*	449.37*
400	15	1.12	1.47	1.84	2.25*	2.75*	3.30*	4.27*	5.30*	6.69*	27.24*	98.74*
	20	1.27	1.68	2.12	2.63*	3.27*	4.02*	5.51*	7.48*	11.19*	62.19*	231.12*
	25	1.41	1.87	2.39	3.02*	3.83*	4.87*	7.37*	11.90*	20.39*	119.81*	449.37*
500	15	1.23	1.61	2.01	2.46*	3.01*	3.61*	4.65*	5.74*	7.17*	27.24*	98.74*
	20	1.39	1.84	2.32	2.88*	3.58*	4.39*	5.96*	7.93*	11.39*	62.19*	231.12*
	25	1.55	2.06	2.63	3.31*	4.20*	5.30*	7.81*	12.04*	20.39*	119.81*	449.37*
600	15	1.32	1.73	2.16	2.65*	3.24*	3.89*	5.00*	6.15*	7.62*	27.24*	98.74*
	20	1.51	1.99	2.51	3.12*	3.87*	4.74*	6.38*	8.37*	11.68*	62.19*	231.12*
	25	1.68	2.23	2.85	3.58*	4.53*	5.69*	8.24*	12.27*	20.39*	119.81*	449.37*
700	15	1.41	1.85	2.31	2.83*	3.46*	4.15*	5.33*	6.53*	8.04*	27.24*	98.74*
	20	1.62	2.13	2.69	3.33*	4.13*	5.05*	6.78*	8.80*	12.01*	62.19*	231.12*
	25	1.81	2.40	3.05	3.83*	4.84*	6.06*	8.66*	12.55*	20.42*	119.81*	449.37*
800	15	1.50	1.96	2.45	3.00*	3.67*	4.39*	5.64*	6.89*	8.45*	27.24*	98.74*
	20	1.72	2.26	2.85	3.54*	4.39*	5.35*	7.15*	9.21*	12.37*	62.19*	231.12*
	25	1.92	2.55	3.24	4.07*	5.13*	6.41*	9.07*	12.88*	20.46*	119.81*	449.37*
900	15	1.58	2.06	2.58	3.16*	3.86*	4.63*	5.93*	7.23*	8.84*	27.26*	98.74*
	20	1.81	2.39	3.01	3.73*	4.62*	5.64*	7.50*	9.61*	12.74*	62.19*	231.12*
	25	2.03	2.70	3.42	4.30*	5.41*	6.74*	9.47*	13.22*	20.54*	119.81*	449.37*
1000	15	1.65	2.16	2.70	3.31*	4.05*	4.85*	6.21*	7.56*	9.21*	27.28*	98.74*
	20	1.91	2.51	3.16	3.91*	4.85*	5.91*	7.84*	9.99*	13.12*	62.19*	231.12*
	25	2.14	2.83	3.60	4.51*	5.67*	7.06*	9.84*	13.57*	20.65*	119.81*	449.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.73	2.26	2.82	3.46*	4.23*	5.06*	6.48*	7.87*	9.56*	27.33*	98.74*
	20	2.00	2.63	3.30	4.09*	5.07*	6.17*	8.17*	10.36*	13.49*	62.19*	231.12*
	25	2.24	2.97	3.77	4.72*	5.93*	7.36*	10.21*	13.93*	20.80*	119.81*	449.37*
1200	15	1.80	2.35	2.94	3.60*	4.40*	5.27*	6.73*	8.17*	9.91*	27.39*	98.74*
	20	2.08	2.74	3.44	4.26*	5.28*	6.42*	8.48*	10.72*	13.86*	62.19*	231.12*
	25	2.34	3.10	3.93	4.92*	6.17*	7.65*	10.57*	14.29*	20.98*	119.81*	449.37*
1300	15	1.87	2.44	3.05	3.73*	4.56*	5.46*	6.98*	8.47*	10.24*	27.48*	98.74*
	20	2.16	2.84	3.58	4.43*	5.48*	6.66*	8.78*	11.07*	14.23*	62.19*	231.12*
	25	2.43	3.22	4.08	5.11*	6.41*	7.93*	10.91*	14.65*	21.19*	119.81*	449.37*
1400	15	1.94	2.53	3.16	3.87*	4.72*	5.65*	7.22*	8.75*	10.57*	27.59*	98.74*
	20	2.24	2.95	3.71	4.59*	5.67*	6.89*	9.07*	11.40*	14.59*	62.19*	231.12*
	25	2.53	3.34	4.23	5.29*	6.64*	8.21*	11.25*	15.00*	21.42*	119.81*	449.37*
1500	15	2.00	2.61	3.26	3.99*	4.88*	5.84*	7.46*	9.02*	10.88*	27.73*	98.74*
	20	2.32	3.05	3.83	4.74*	5.86*	7.12*	9.36*	11.73*	14.94*	62.19*	231.12*
	25	2.62	3.46	4.38	5.47*	6.86*	8.47*	11.57*	15.35*	21.67*	119.81*	449.37*
1600	15	2.06	2.70	3.36	4.12*	5.03*	6.02*	7.68*	9.29*	11.19*	27.89*	98.74*
	20	2.40	3.15	3.95	4.89*	6.05*	7.34*	9.63*	12.05*	15.29*	62.19*	231.12*
	25	2.70	3.57	4.52	5.65*	7.07*	8.73*	11.89*	15.69*	21.93*	119.81*	449.37*
1700	15	2.13	2.78	3.46	4.24*	5.18*	6.20*	7.90*	9.55*	11.48*	28.07*	98.74*
	20	2.47	3.24	4.07	5.04*	6.23*	7.55*	9.90*	12.37*	15.63*	62.19*	231.12*
	25	2.79	3.68	4.66	5.82*	7.28*	8.98*	12.20*	16.03*	22.21*	119.81*	449.37*
1800	15	2.19	2.85	3.56	4.36*	5.33*	6.37*	8.12*	9.80*	11.78*	28.27*	98.74*
	20	2.54	3.34	4.19	5.18*	6.40*	7.76*	10.16*	12.67*	15.97*	62.19*	231.12*
	25	2.87	3.79	4.79	5.98*	7.49*	9.22*	12.50*	16.36*	22.49*	119.81*	449.37*
1900	15	2.24	2.93	3.65	4.47*	5.47*	6.54*	8.33*	10.05*	12.06*	28.49*	98.74*
	20	2.61	3.43	4.31	5.32*	6.57*	7.97*	10.42*	12.97*	16.30*	62.19*	231.12*
	25	2.95	3.89	4.93	6.15*	7.69*	9.46*	12.80*	16.69*	22.78*	119.81*	449.37*
2000	15	2.30	3.01	3.75	4.59*	5.60*	6.70*	8.53*	10.29*	12.34*	28.72*	98.74*
	20	2.68	3.52	4.42	5.46*	6.74*	8.17*	10.67*	13.26*	16.62*	62.19*	231.12*
	25	3.03	4.00	5.05	6.30*	7.88*	9.69*	13.09*	17.02*	23.07*	119.81*	449.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.19	1.63	2.17	3.00*	4.75*	8.72*	20.43*	38.40*	67.69*	410.38*	1548.4*
	20	1.35	1.90	2.72	4.61*	9.62*	19.02*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	1.50	2.20	3.56	7.98*	17.78*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
200	15	1.53	2.08	2.75	3.69*	5.28*	8.76*	20.43*	38.40*	67.69*	410.38*	1548.4*
	20	1.76	2.46	3.41	5.13*	9.64*	19.02*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	1.98	2.85	4.26	8.03*	17.78*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
300	15	1.81	2.45	3.22	4.25*	5.89*	8.99*	20.43*	38.40*	67.69*	410.38*	1548.4*
	20	2.09	2.90	3.97	5.73*	9.76*	19.02*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	2.36	3.37	4.89	8.29*	17.78*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
400	15	2.04	2.76	3.62	4.75*	6.46*	9.39*	20.43*	38.40*	67.69*	410.38*	1548.4*
	20	2.38	3.29	4.46	6.29*	10.06*	19.02*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	2.69	3.82	5.44	8.71*	17.78*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
500	15	2.26	3.05	3.98	5.20*	6.99*	9.86*	20.44*	38.40*	67.69*	410.38*	1548.4*
	20	2.63	3.63	4.90	6.81*	10.46*	19.03*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	2.99	4.22	5.95	9.18*	17.80*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
600	15	2.46	3.31	4.31	5.61*	7.48*	10.35*	20.48*	38.40*	67.69*	410.38*	1548.4*
	20	2.87	3.95	5.31	7.30*	10.91*	19.08*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	3.27	4.59	6.42	9.66*	17.87*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
700	15	2.64	3.55	4.62	5.99*	7.95*	10.83*	20.55*	38.40*	67.69*	410.38*	1548.4*
	20	3.09	4.24	5.68	7.76*	11.37*	19.18*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	3.52	4.94	6.86	10.14*	17.99*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
800	15	2.81	3.78	4.91	6.35*	8.38*	11.31*	20.67*	38.40*	67.69*	410.38*	1548.4*
	20	3.30	4.52	6.04	8.19*	11.82*	19.33*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	3.76	5.26	7.27	10.60*	18.17*	35.99*	89.53*	172.12*	307.20*	1891.6*	7158.4*
900	15	2.98	4.00	5.19	6.70*	8.80*	11.77*	20.85*	38.40*	67.69*	410.38*	1548.4*
	20	3.50	4.79	6.38	8.61*	12.28*	19.54*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	3.99	5.57	7.66	11.06*	18.41*	36.00*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1000	15	3.14	4.21	5.45	7.02*	9.20*	12.22*	21.08*	38.40*	67.69*	410.38*	1548.4*
	20	3.69	5.04	6.70	9.00*	12.72*	19.79*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	4.21	5.86	8.04	11.49*	18.69*	36.00*	89.53*	172.12*	307.20*	1891.6*	7158.4*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 6.0 Ft (RADIUS = 4.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.29	4.41	5.70	7.34*	9.59*	12.65*	21.34*	38.41*	67.69*	410.38*	1548.4*
	20	3.87	5.28	7.00	9.38*	13.15*	20.08*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	4.42	6.15	8.40	11.92*	19.00*	36.01*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1200	15	3.43	4.60	5.95	7.64*	9.95*	13.08*	21.64*	38.42*	67.69*	410.38*	1548.4*
	20	4.05	5.52	7.30	9.75*	13.58*	20.39*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	4.62	6.42	8.74	12.33*	19.34*	36.02*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1300	15	3.57	4.79	6.18	7.93*	10.31*	13.49*	21.96*	38.44*	67.69*	410.38*	1548.4*
	20	4.21	5.74	7.59	10.10*	13.99*	20.73*	46.52*	88.89*	158.12*	969.62*	3666.5*
	25	4.82	6.68	9.08	12.73*	19.68*	36.05*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1400	15	3.71	4.97	6.41	8.21*	10.66*	13.89*	22.29*	38.47*	67.69*	410.38*	1548.4*
	20	4.38	5.96	7.86	10.45*	14.39*	21.07*	46.53*	88.89*	158.12*	969.62*	3666.5*
	25	5.01	6.93	9.40	13.12*	20.04*	36.08*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1500	15	3.84	5.14	6.63	8.48*	10.99*	14.28*	22.64*	38.51*	67.69*	410.38*	1548.4*
	20	4.54	6.17	8.13	10.78*	14.79*	21.43*	46.54*	88.89*	158.12*	969.62*	3666.5*
	25	5.19	7.18	9.71	13.50*	20.41*	36.14*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1600	15	3.97	5.31	6.84	8.75*	11.32*	14.66*	23.00*	38.57*	67.69*	410.38*	1548.4*
	20	4.69	6.38	8.39	11.10*	15.17*	21.79*	46.55*	88.89*	158.12*	969.62*	3666.5*
	25	5.37	7.42	10.02	13.87*	20.77*	36.21*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1700	15	4.10	5.48	7.05	9.01*	11.64*	15.04*	23.36*	38.65*	67.69*	410.38*	1548.4*
	20	4.84	6.58	8.65	11.42*	15.55*	22.15*	46.56*	88.89*	158.12*	969.62*	3666.5*
	25	5.55	7.65	10.32	14.23*	21.14*	36.29*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1800	15	4.22	5.64	7.26	9.26*	11.95*	15.40*	23.72*	38.75*	67.69*	410.38*	1548.4*
	20	4.99	6.77	8.90	11.72*	15.92*	22.52*	46.59*	88.89*	158.12*	969.62*	3666.5*
	25	5.72	7.88	10.60	14.58*	21.51*	36.40*	89.53*	172.12*	307.20*	1891.6*	7158.4*
1900	15	4.34	5.80	7.45	9.51*	12.25*	15.76*	24.09*	38.86*	67.70*	410.38*	1548.4*
	20	5.14	6.96	9.14	12.03*	16.28*	22.89*	46.62*	88.89*	158.12*	969.62*	3666.5*
	25	5.88	8.10	10.89	14.93*	21.88*	36.53*	89.53*	172.12*	307.20*	1891.6*	7158.4*
2000	15	4.46	5.95	7.65	9.75*	12.55*	16.11*	24.45*	39.00*	67.70*	410.38*	1548.4*
	20	5.28	7.15	9.37	12.32*	16.63*	23.25*	46.66*	88.89*	158.12*	969.62*	3666.5*
	25	6.04	8.32	11.16	15.27*	22.24*	36.67*	89.53*	172.12*	307.20*	1891.6*	7158.4*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.36	0.44	0.53	0.61	0.70*	0.79*	0.92*	1.04*	1.16*	1.65*	2.21*
	20	0.38	0.46	0.56	0.65	0.74*	0.84*	0.99*	1.12*	1.25*	1.83*	2.63*
	25	0.39	0.49	0.58	0.68	0.78*	0.88*	1.05*	1.19*	1.34*	2.05*	3.32*
200	15	0.41	0.50	0.60	0.70	0.80*	0.90*	1.07*	1.21*	1.35*	1.94*	2.61*
	20	0.44	0.54	0.65	0.75	0.86*	0.98*	1.16*	1.32*	1.48*	2.19*	3.09*
	25	0.46	0.57	0.69	0.80	0.92*	1.05*	1.25*	1.43*	1.61*	2.46*	3.75*
300	15	0.45	0.55	0.66	0.77	0.88*	1.00*	1.18*	1.34*	1.50*	2.17*	2.93*
	20	0.49	0.60	0.72	0.84	0.96*	1.09*	1.30*	1.48*	1.66*	2.47*	3.48*
	25	0.52	0.64	0.77	0.90	1.03*	1.18*	1.41*	1.61*	1.82*	2.79*	4.17*
400	15	0.49	0.60	0.72	0.83	0.95*	1.08*	1.28*	1.46*	1.63*	2.37*	3.21*
	20	0.53	0.65	0.78	0.91	1.04*	1.19*	1.42*	1.62*	1.82*	2.71*	3.82*
	25	0.57	0.70	0.84	0.98	1.13*	1.30*	1.55*	1.78*	2.01*	3.07*	4.54*
500	15	0.52	0.64	0.76	0.89	1.01*	1.16*	1.38*	1.56*	1.75*	2.55*	3.46*
	20	0.57	0.70	0.84	0.98	1.12*	1.28*	1.53*	1.75*	1.97*	2.93*	4.12*
	25	0.62	0.76	0.91	1.06	1.22*	1.40*	1.68*	1.92*	2.18*	3.33*	4.89*
600	15	0.55	0.68	0.81	0.94	1.07*	1.23*	1.46*	1.66*	1.86*	2.72*	3.69*
	20	0.61	0.75	0.89	1.04	1.19*	1.36*	1.63*	1.86*	2.10*	3.14*	4.40*
	25	0.66	0.81	0.97	1.13	1.30*	1.49*	1.80*	2.06*	2.33*	3.57*	5.21*
700	15	0.58	0.71	0.85	0.99	1.13*	1.29*	1.54*	1.75*	1.96*	2.87*	3.90*
	20	0.64	0.79	0.94	1.10	1.26*	1.44*	1.73*	1.97*	2.22*	3.32*	4.66*
	25	0.70	0.86	1.03	1.20	1.37*	1.58*	1.90*	2.18*	2.47*	3.79*	5.51*
800	15	0.61	0.74	0.89	1.03	1.18*	1.35*	1.61*	1.83*	2.06*	3.02*	4.10*
	20	0.67	0.83	0.99	1.15	1.32*	1.51*	1.81*	2.07*	2.34*	3.50*	4.90*
	25	0.73	0.90	1.08	1.26	1.45*	1.67*	2.01*	2.30*	2.61*	3.99*	5.79*
900	15	0.63	0.78	0.93	1.08	1.23*	1.41*	1.68*	1.91*	2.15*	3.15*	4.29*
	20	0.70	0.86	1.03	1.20	1.38*	1.58*	1.90*	2.17*	2.45*	3.67*	5.13*
	25	0.77	0.95	1.13	1.32	1.51*	1.75*	2.10*	2.41*	2.74*	4.19*	6.06*
1000	15	0.66	0.81	0.96	1.12	1.28*	1.46*	1.75*	1.99*	2.24*	3.29*	4.47*
	20	0.73	0.90	1.08	1.25	1.43*	1.65*	1.98*	2.26*	2.55*	3.83*	5.35*
	25	0.80	0.99	1.18	1.38	1.58*	1.82*	2.20*	2.52*	2.86*	4.37*	6.32*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.68	0.83	1.00	1.16	1.32*	1.52*	1.81*	2.06*	2.32*	3.41*	4.64*
	20	0.76	0.93	1.12	1.30	1.49*	1.71*	2.06*	2.35*	2.66*	3.98*	5.56*
	25	0.83	1.03	1.23	1.43	1.64*	1.89*	2.29*	2.62*	2.98*	4.55*	6.57*
1200	15	0.70	0.86	1.03	1.20	1.37*	1.57*	1.87*	2.14*	2.40*	3.53*	4.81*
	20	0.79	0.97	1.16	1.34	1.54*	1.77*	2.13*	2.44*	2.75*	4.13*	5.77*
	25	0.86	1.06	1.27	1.48	1.70*	1.96*	2.37*	2.72*	3.09*	4.73*	6.80*
1300	15	0.72	0.89	1.06	1.23	1.41*	1.62*	1.93*	2.20*	2.48*	3.65*	4.97*
	20	0.81	1.00	1.19	1.39	1.59*	1.83*	2.20*	2.52*	2.85*	4.27*	5.96*
	25	0.89	1.10	1.32	1.53	1.76*	2.03*	2.45*	2.82*	3.20*	4.89*	7.03*
1400	15	0.74	0.91	1.09	1.27	1.45*	1.66*	1.99*	2.27*	2.56*	3.77*	5.13*
	20	0.84	1.03	1.23	1.43	1.64*	1.89*	2.27*	2.60*	2.94*	4.41*	6.15*
	25	0.92	1.13	1.36	1.58	1.82*	2.10*	2.53*	2.91*	3.30*	5.05*	7.25*
1500	15	0.76	0.94	1.12	1.30	1.49*	1.71*	2.05*	2.34*	2.63*	3.88*	5.28*
	20	0.86	1.06	1.27	1.47	1.69*	1.94*	2.34*	2.68*	3.03*	4.55*	6.34*
	25	0.95	1.17	1.40	1.63	1.87*	2.16*	2.61*	3.00*	3.41*	5.21*	7.47*
1600	15	0.78	0.96	1.15	1.34	1.53*	1.76*	2.10*	2.40*	2.70*	3.99*	5.42*
	20	0.89	1.09	1.30	1.51	1.73*	2.00*	2.41*	2.75*	3.11*	4.68*	6.52*
	25	0.98	1.20	1.44	1.68	1.93*	2.22*	2.69*	3.09*	3.50*	5.36*	7.68*
1700	15	0.80	0.99	1.18	1.37	1.57*	1.80*	2.16*	2.46*	2.77*	4.09*	5.57*
	20	0.91	1.12	1.33	1.55	1.78*	2.05*	2.47*	2.83*	3.20*	4.80*	6.69*
	25	1.00	1.24	1.48	1.72	1.98*	2.28*	2.76*	3.17*	3.60*	5.51*	7.88*
1800	15	0.82	1.01	1.21	1.40	1.60*	1.84*	2.21*	2.52*	2.84*	4.19*	5.71*
	20	0.93	1.15	1.37	1.59	1.82*	2.10*	2.53*	2.90*	3.28*	4.93*	6.86*
	25	1.03	1.27	1.52	1.77	2.03*	2.34*	2.83*	3.26*	3.70*	5.65*	8.08*
1900	15	0.84	1.03	1.23	1.43	1.64*	1.89*	2.26*	2.58*	2.91*	4.29*	5.84*
	20	0.95	1.17	1.40	1.63	1.87*	2.15*	2.59*	2.97*	3.36*	5.05*	7.03*
	25	1.05	1.30	1.55	1.81	2.08*	2.40*	2.90*	3.34*	3.79*	5.79*	8.28*
2000	15	0.86	1.06	1.26	1.46	1.68*	1.93*	2.31*	2.64*	2.97*	4.39*	5.98*
	20	0.98	1.20	1.43	1.67	1.91*	2.20*	2.65*	3.04*	3.44*	5.17*	7.19*
	25	1.08	1.33	1.59	1.85	2.13*	2.46*	2.97*	3.42*	3.88*	5.93*	8.47*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.54	0.67	0.81	0.94	1.08*	1.24*	1.49*	1.71*	1.95*	3.41*	8.37*
	20	0.58	0.72	0.87	1.02	1.19*	1.37*	1.67*	1.96*	2.29*	5.68*	17.57*
	25	0.62	0.77	0.93	1.10	1.29*	1.50*	1.88*	2.26*	2.78*	9.81*	32.75*
200	15	0.65	0.80	0.96	1.12	1.29*	1.49*	1.79*	2.06*	2.36*	3.95*	8.38*
	20	0.71	0.88	1.06	1.24	1.44*	1.67*	2.04*	2.39*	2.79*	5.82*	17.57*
	25	0.76	0.95	1.15	1.36	1.58*	1.85*	2.31*	2.76*	3.31*	9.81*	32.75*
300	15	0.73	0.90	1.09	1.27	1.46*	1.69*	2.04*	2.35*	2.68*	4.42*	8.49*
	20	0.81	1.00	1.21	1.42	1.64*	1.91*	2.34*	2.74*	3.18*	6.17*	17.57*
	25	0.88	1.09	1.32	1.56	1.82*	2.13*	2.65*	3.16*	3.76*	9.83*	32.75*
400	15	0.80	0.99	1.19	1.40	1.61*	1.86*	2.25*	2.59*	2.96*	4.85*	8.74*
	20	0.90	1.11	1.34	1.57	1.82*	2.12*	2.60*	3.04*	3.52*	6.58*	17.57*
	25	0.98	1.22	1.47	1.74	2.03*	2.38*	2.95*	3.51*	4.16*	9.93*	32.75*
500	15	0.87	1.08	1.29	1.51	1.74*	2.01*	2.44*	2.82*	3.22*	5.23*	9.07*
	20	0.97	1.21	1.46	1.71	1.98*	2.30*	2.83*	3.31*	3.83*	6.99*	17.58*
	25	1.07	1.33	1.61	1.90	2.21*	2.59*	3.22*	3.82*	4.52*	10.12*	32.75*
600	15	0.93	1.15	1.38	1.62	1.86*	2.15*	2.61*	3.02*	3.45*	5.59*	9.43*
	20	1.05	1.30	1.56	1.84	2.13*	2.48*	3.04*	3.55*	4.12*	7.39*	17.59*
	25	1.15	1.43	1.73	2.04	2.38*	2.79*	3.47*	4.11*	4.85*	10.38*	32.75*
700	15	0.99	1.22	1.47	1.71	1.98*	2.29*	2.78*	3.21*	3.67*	5.92*	9.80*
	20	1.12	1.38	1.66	1.95	2.26*	2.64*	3.24*	3.78*	4.38*	7.77*	17.63*
	25	1.23	1.53	1.85	2.18	2.54*	2.98*	3.70*	4.38*	5.15*	10.68*	32.75*
800	15	1.04	1.29	1.55	1.81	2.08*	2.41*	2.93*	3.39*	3.87*	6.24*	10.17*
	20	1.18	1.46	1.76	2.07	2.39*	2.79*	3.42*	4.00*	4.63*	8.14*	17.70*
	25	1.31	1.62	1.96	2.31	2.69*	3.15*	3.92*	4.63*	5.44*	11.00*	32.75*
900	15	1.09	1.35	1.62	1.90	2.18*	2.53*	3.07*	3.55*	4.06*	6.53*	10.54*
	20	1.24	1.54	1.85	2.17	2.51*	2.93*	3.60*	4.21*	4.87*	8.49*	17.80*
	25	1.38	1.71	2.06	2.43	2.83*	3.32*	4.12*	4.87*	5.72*	11.33*	32.75*
1000	15	1.14	1.41	1.69	1.98	2.28*	2.64*	3.21*	3.72*	4.25*	6.82*	10.89*
	20	1.30	1.61	1.94	2.27	2.63*	3.07*	3.77*	4.40*	5.09*	8.82*	17.94*
	25	1.44	1.79	2.16	2.55	2.97*	3.48*	4.32*	5.10*	5.98*	11.66*	32.75*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.19	1.47	1.76	2.06	2.37*	2.75*	3.35*	3.87*	4.42*	7.09*	11.24*
	20	1.36	1.68	2.02	2.37	2.74*	3.20*	3.93*	4.59*	5.31*	9.15*	18.12*
	25	1.51	1.87	2.26	2.66	3.10*	3.63*	4.51*	5.32*	6.23*	11.99*	32.75*
1200	15	1.24	1.53	1.83	2.14	2.46*	2.86*	3.48*	4.02*	4.59*	7.35*	11.58*
	20	1.41	1.74	2.10	2.46	2.85*	3.33*	4.09*	4.77*	5.51*	9.46*	18.32*
	25	1.57	1.95	2.35	2.77	3.22*	3.78*	4.69*	5.53*	6.47*	12.32*	32.76*
1300	15	1.28	1.58	1.89	2.21	2.55*	2.96*	3.60*	4.16*	4.76*	7.61*	11.91*
	20	1.46	1.81	2.18	2.55	2.96*	3.45*	4.24*	4.95*	5.71*	9.77*	18.54*
	25	1.63	2.02	2.44	2.87	3.34*	3.92*	4.86*	5.74*	6.71*	12.64*	32.76*
1400	15	1.32	1.63	1.96	2.29	2.64*	3.06*	3.72*	4.30*	4.92*	7.85*	12.23*
	20	1.51	1.87	2.25	2.64	3.06*	3.57*	4.38*	5.11*	5.91*	10.06*	18.78*
	25	1.69	2.09	2.52	2.97	3.46*	4.06*	5.03*	5.93*	6.93*	12.96*	32.77*
1500	15	1.36	1.68	2.02	2.36	2.72*	3.15*	3.84*	4.44*	5.07*	8.09*	12.55*
	20	1.56	1.93	2.32	2.73	3.16*	3.68*	4.52*	5.28*	6.09*	10.35*	19.03*
	25	1.74	2.16	2.61	3.07	3.57*	4.19*	5.20*	6.12*	7.15*	13.27*	32.79*
1600	15	1.40	1.73	2.08	2.43	2.80*	3.25*	3.95*	4.57*	5.22*	8.32*	12.86*
	20	1.61	1.99	2.39	2.81	3.25*	3.79*	4.66*	5.44*	6.28*	10.63*	19.29*
	25	1.80	2.23	2.69	3.17	3.68*	4.32*	5.36*	6.31*	7.37*	13.58*	32.82*
1700	15	1.44	1.78	2.13	2.49	2.87*	3.34*	4.06*	4.70*	5.37*	8.54*	13.16*
	20	1.66	2.05	2.46	2.89	3.34*	3.90*	4.79*	5.59*	6.46*	10.90*	19.56*
	25	1.85	2.30	2.77	3.26	3.79*	4.45*	5.51*	6.49*	7.57*	13.88*	32.85*
1800	15	1.48	1.83	2.19	2.56	2.95*	3.42*	4.17*	4.82*	5.51*	8.76*	13.45*
	20	1.70	2.10	2.53	2.97	3.44*	4.01*	4.92*	5.75*	6.63*	11.16*	19.83*
	25	1.90	2.36	2.85	3.35	3.89*	4.57*	5.66*	6.67*	7.78*	14.17*	32.90*
1900	15	1.52	1.87	2.24	2.62	3.02*	3.51*	4.27*	4.94*	5.65*	8.98*	13.74*
	20	1.75	2.16	2.60	3.05	3.52*	4.11*	5.05*	5.89*	6.80*	11.43*	20.11*
	25	1.96	2.42	2.92	3.44	4.00*	4.69*	5.81*	6.84*	7.98*	14.46*	32.95*
2000	15	1.56	1.92	2.30	2.69	3.10*	3.59*	4.38*	5.06*	5.79*	9.19*	14.02*
	20	1.79	2.21	2.66	3.12	3.61*	4.22*	5.18*	6.04*	6.96*	11.68*	20.39*
	25	2.01	2.49	3.00	3.53	4.10*	4.81*	5.96*	7.01*	8.17*	14.75*	33.02*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.87	1.09	1.33	1.59	1.89*	2.27*	3.05*	4.19*	6.35*	31.05*	109.66*
	20	0.96	1.21	1.50	1.83	2.25*	2.87*	4.74*	8.01*	13.22*	71.17*	256.95*
	25	1.04	1.33	1.68	2.11	2.74*	3.96*	8.15*	14.48*	24.54*	137.33*	499.78*
200	15	1.08	1.35	1.65	1.98	2.34*	2.80*	3.67*	4.72*	6.51*	31.05*	109.66*
	20	1.21	1.53	1.89	2.30	2.80*	3.48*	5.12*	8.03*	13.22*	71.17*	256.95*
	25	1.33	1.70	2.14	2.65	3.35*	4.46*	8.17*	14.48*	24.54*	137.33*	499.78*
300	15	1.25	1.57	1.91	2.28	2.70*	3.22*	4.18*	5.27*	6.91*	31.05*	109.66*
	20	1.42	1.79	2.21	2.68	3.24*	3.99*	5.63*	8.21*	13.22*	71.17*	256.95*
	25	1.57	2.00	2.50	3.09	3.85*	4.99*	8.32*	14.48*	24.54*	137.33*	499.78*
400	15	1.40	1.75	2.14	2.55	3.01*	3.59*	4.64*	5.77*	7.38*	31.05*	109.66*
	20	1.59	2.01	2.48	3.00	3.62*	4.44*	6.13*	8.55*	13.25*	71.17*	256.95*
	25	1.78	2.26	2.82	3.47	4.29*	5.48*	8.62*	14.49*	24.54*	137.33*	499.78*
500	15	1.54	1.92	2.34	2.79	3.29*	3.92*	5.04*	6.23*	7.85*	31.05*	109.66*
	20	1.76	2.21	2.73	3.29	3.96*	4.84*	6.60*	8.95*	13.35*	71.17*	256.95*
	25	1.96	2.49	3.10	3.81	4.69*	5.94*	9.00*	14.53*	24.54*	137.33*	499.78*
600	15	1.66	2.07	2.53	3.01	3.55*	4.23*	5.42*	6.66*	8.31*	31.05*	109.66*
	20	1.90	2.40	2.95	3.56	4.27*	5.21*	7.04*	9.37*	13.53*	71.17*	256.95*
	25	2.13	2.71	3.37	4.12	5.05*	6.36*	9.41*	14.64*	24.55*	137.33*	499.78*
700	15	1.77	2.22	2.70	3.22	3.79*	4.51*	5.77*	7.06*	8.74*	31.05*	109.66*
	20	2.04	2.57	3.16	3.81	4.56*	5.55*	7.46*	9.80*	13.77*	71.17*	256.95*
	25	2.29	2.91	3.61	4.41	5.39*	6.75*	9.82*	14.81*	24.55*	137.33*	499.78*
800	15	1.88	2.35	2.86	3.41	4.01*	4.78*	6.10*	7.45*	9.16*	31.05*	109.66*
	20	2.17	2.74	3.36	4.05	4.84*	5.88*	7.85*	10.21*	14.07*	71.17*	256.95*
	25	2.44	3.10	3.84	4.69	5.71*	7.13*	10.23*	15.04*	24.56*	137.33*	499.78*
900	15	1.99	2.48	3.02	3.59	4.23*	5.03*	6.41*	7.81*	9.57*	31.05*	109.66*
	20	2.30	2.89	3.55	4.27	5.10*	6.19*	8.23*	10.62*	14.39*	71.17*	256.95*
	25	2.58	3.28	4.06	4.95	6.02*	7.49*	10.63*	15.31*	24.58*	137.33*	499.78*
1000	15	2.09	2.61	3.17	3.77	4.43*	5.27*	6.71*	8.15*	9.95*	31.06*	109.66*
	20	2.42	3.04	3.73	4.48	5.35*	6.48*	8.59*	11.01*	14.73*	71.17*	256.95*
	25	2.72	3.45	4.27	5.20	6.31*	7.83*	11.02*	15.61*	24.62*	137.33*	499.78*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.18	2.72	3.31	3.94	4.63*	5.50*	7.00*	8.49*	10.33*	31.08*	109.66*
	20	2.53	3.18	3.90	4.69	5.59*	6.76*	8.93*	11.40*	15.08*	71.17*	256.95*
	25	2.85	3.61	4.47	5.43	6.59*	8.15*	11.40*	15.93*	24.69*	137.33*	499.78*
1200	15	2.27	2.84	3.45	4.10	4.82*	5.72*	7.27*	8.81*	10.69*	31.11*	109.66*
	20	2.64	3.32	4.07	4.88	5.82*	7.03*	9.27*	11.77*	15.44*	71.17*	256.95*
	25	2.98	3.77	4.66	5.66	6.85*	8.47*	11.77*	16.25*	24.78*	137.33*	499.78*
1300	15	2.36	2.95	3.58	4.26	5.00*	5.94*	7.54*	9.12*	11.04*	31.15*	109.66*
	20	2.75	3.45	4.23	5.07	6.04*	7.29*	9.59*	12.13*	15.79*	71.17*	256.95*
	25	3.10	3.92	4.85	5.88	7.11*	8.77*	12.13*	16.59*	24.90*	137.33*	499.78*
1400	15	2.45	3.05	3.71	4.41	5.17*	6.14*	7.79*	9.42*	11.38*	31.21*	109.66*
	20	2.85	3.58	4.38	5.26	6.25*	7.55*	9.90*	12.48*	16.15*	71.17*	256.95*
	25	3.22	4.07	5.03	6.10	7.36*	9.07*	12.48*	16.93*	25.04*	137.33*	499.78*
1500	15	2.53	3.16	3.84	4.55	5.35*	6.35*	8.04*	9.71*	11.71*	31.29*	109.66*
	20	2.95	3.70	4.53	5.43	6.46*	7.79*	10.21*	12.83*	16.50*	71.17*	256.95*
	25	3.33	4.21	5.20	6.30	7.61*	9.36*	12.82*	17.27*	25.21*	137.33*	499.78*
1600	15	2.61	3.26	3.96	4.70	5.51*	6.54*	8.29*	9.99*	12.03*	31.39*	109.66*
	20	3.05	3.82	4.68	5.61	6.66*	8.03*	10.50*	13.17*	16.85*	71.17*	256.95*
	25	3.44	4.35	5.37	6.51	7.84*	9.63*	13.16*	17.61*	25.40*	137.33*	499.78*
1700	15	2.69	3.36	4.08	4.84	5.67*	6.73*	8.52*	10.26*	12.34*	31.50*	109.66*
	20	3.14	3.94	4.82	5.78	6.86*	8.26*	10.79*	13.49*	17.20*	71.17*	256.95*
	25	3.55	4.49	5.54	6.70	8.07*	9.91*	13.49*	17.94*	25.61*	137.33*	499.78*
1800	15	2.77	3.45	4.19	4.97	5.83*	6.92*	8.75*	10.53*	12.65*	31.64*	109.66*
	20	3.23	4.06	4.96	5.94	7.05*	8.49*	11.07*	13.82*	17.54*	71.17*	256.95*
	25	3.66	4.62	5.70	6.89	8.30*	10.17*	13.81*	18.28*	25.83*	137.33*	499.78*
1900	15	2.85	3.55	4.30	5.11	5.99*	7.10*	8.98*	10.80*	12.95*	31.80*	109.66*
	20	3.32	4.17	5.10	6.10	7.24*	8.71*	11.34*	14.13*	17.88*	71.17*	256.95*
	25	3.76	4.75	5.85	7.08	8.51*	10.43*	14.12*	18.61*	26.07*	137.33*	499.78*
2000	15	2.92	3.64	4.41	5.24	6.14*	7.28*	9.20*	11.05*	13.24*	31.97*	109.66*
	20	3.41	4.28	5.23	6.26	7.42*	8.93*	11.61*	14.44*	18.21*	71.18*	256.95*
	25	3.87	4.88	6.01	7.26	8.73*	10.68*	14.43*	18.94*	26.32*	137.33*	499.78*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.49	1.96	2.59	3.64	6.18*	11.33*	25.81*	47.42*	81.98*	470.83*	1722.6*
	20	1.71	2.34	3.40	6.33	13.07*	25.12*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	1.93	2.78	4.89	11.40	24.45*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
200	15	1.93	2.53	3.29	4.38	6.46*	11.33*	25.81*	47.42*	81.98*	470.83*	1722.6*
	20	2.24	3.03	4.19	6.61	13.07*	25.12*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	2.55	3.58	5.51	11.40	24.45*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
300	15	2.29	2.98	3.84	5.02	6.99*	11.39*	25.81*	47.42*	81.98*	470.83*	1722.6*
	20	2.67	3.58	4.86	7.15	13.09*	25.12*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	3.04	4.22	6.20	11.46	24.45*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
400	15	2.60	3.37	4.33	5.59	7.56*	11.59*	25.81*	47.42*	81.98*	470.83*	1722.6*
	20	3.04	4.05	5.44	7.73	13.17*	25.12*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	3.47	4.78	6.84	11.66	24.45*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
500	15	2.87	3.72	4.76	6.10	8.10*	11.92*	25.81*	47.42*	81.98*	470.83*	1722.6*
	20	3.38	4.48	5.97	8.30	13.37*	25.12*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	3.86	5.28	7.44	12.00	24.45*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
600	15	3.13	4.04	5.16	6.57	8.62*	12.33*	25.81*	47.42*	81.98*	470.83*	1722.6*
	20	3.68	4.88	6.46	8.83	13.66*	25.13*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	4.22	5.73	7.99	12.41	24.46*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
700	15	3.37	4.35	5.53	7.02	9.12*	12.76*	25.83*	47.42*	81.98*	470.83*	1722.6*
	20	3.97	5.24	6.91	9.35	14.01*	25.14*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	4.55	6.16	8.51	12.86	24.47*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
800	15	3.59	4.63	5.88	7.43	9.59*	13.22*	25.86*	47.42*	81.98*	470.83*	1722.6*
	20	4.24	5.59	7.33	9.84	14.41*	25.17*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	4.86	6.56	9.00	13.32	24.51*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
900	15	3.80	4.90	6.21	7.83	10.04*	13.67*	25.91*	47.42*	81.98*	470.83*	1722.6*
	20	4.50	5.91	7.74	10.31	14.82*	25.23*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	5.16	6.95	9.47	13.79	24.57*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1000	15	4.01	5.16	6.53	8.20	10.47*	14.12*	26.00*	47.42*	81.98*	470.83*	1722.6*
	20	4.74	6.23	8.12	10.76	15.24*	25.32*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	5.44	7.31	9.91	14.25	24.67*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 8.0 Ft (RADIUS = 5.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.20	5.40	6.83	8.56	10.89*	14.56*	26.13*	47.42*	81.98*	470.83*	1722.6*
	20	4.98	6.53	8.49	11.19	15.66*	25.46*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	5.72	7.66	10.34	14.71	24.81*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1200	15	4.39	5.64	7.12	8.91	11.29*	15.00*	26.30*	47.42*	81.98*	470.83*	1722.6*
	20	5.20	6.81	8.85	11.61	16.09*	25.62*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	5.98	8.00	10.75	15.16	24.98*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1300	15	4.57	5.87	7.40	9.25	11.68*	15.43*	26.50*	47.42*	81.98*	470.83*	1722.6*
	20	5.42	7.09	9.19	12.01	16.50*	25.82*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	6.23	8.32	11.15	15.59	25.19*	47.86*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1400	15	4.75	6.09	7.67	9.57	12.05*	15.85*	26.73*	47.43*	81.98*	470.83*	1722.6*
	20	5.63	7.36	9.52	12.41	16.92*	26.05*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	6.48	8.63	11.54	16.03	25.43*	47.87*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1500	15	4.92	6.31	7.94	9.89	12.42*	16.26*	26.98*	47.44*	81.98*	470.83*	1722.6*
	20	5.84	7.62	9.85	12.79	17.33*	26.31*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	6.72	8.94	11.92	16.45	25.69*	47.87*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1600	15	5.08	6.52	8.19	10.19	12.78*	16.66*	27.26*	47.45*	81.98*	470.83*	1722.6*
	20	6.04	7.88	10.16	13.16	17.73*	26.59*	59.18*	110.20*	191.91*	1112.8*	4079.2*
	25	6.95	9.23	12.28	16.86	25.97*	47.88*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1700	15	5.25	6.72	8.44	10.49	13.13*	17.05*	27.55*	47.47*	81.98*	470.83*	1722.6*
	20	6.24	8.12	10.46	13.52	18.12*	26.88*	59.19*	110.20*	191.91*	1112.8*	4079.2*
	25	7.17	9.52	12.64	17.27	26.26*	47.89*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1800	15	5.41	6.92	8.69	10.78	13.47*	17.44*	27.86*	47.50*	81.98*	470.83*	1722.6*
	20	6.43	8.37	10.76	13.88	18.51*	27.18*	59.19*	110.20*	191.91*	1112.8*	4079.2*
	25	7.39	9.80	12.98	17.67	26.57*	47.91*	114.20*	213.70*	373.14*	2171.3*	7964.5*
1900	15	5.56	7.11	8.93	11.07	13.80*	17.82*	28.17*	47.53*	81.98*	470.83*	1722.6*
	20	6.61	8.60	11.05	14.22	18.89*	27.50*	59.19*	110.20*	191.91*	1112.8*	4079.2*
	25	7.61	10.08	13.32	18.06	26.88*	47.94*	114.20*	213.70*	373.14*	2171.3*	7964.5*
2000	15	5.71	7.30	9.16	11.35	14.12*	18.19*	28.50*	47.58*	81.98*	470.83*	1722.6*
	20	6.79	8.83	11.34	14.56	19.27*	27.82*	59.20*	110.20*	191.91*	1112.8*	4079.2*
	25	7.82	10.35	13.65	18.44	27.21*	47.98*	114.20*	213.70*	373.14*	2171.3*	7964.5*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.42	0.50	0.58	0.66	0.75	0.83*	0.97*	1.08*	1.20*	1.70*	2.28*
	20	0.44	0.53	0.61	0.70	0.80	0.89*	1.04*	1.17*	1.30*	1.90*	2.73*
	25	0.46	0.55	0.65	0.74	0.84	0.94*	1.11*	1.25*	1.40*	2.13*	3.52*
200	15	0.48	0.57	0.67	0.76	0.86	0.96*	1.12*	1.26*	1.40*	2.00*	2.69*
	20	0.52	0.61	0.72	0.83	0.93	1.04*	1.22*	1.38*	1.54*	2.26*	3.20*
	25	0.55	0.65	0.77	0.88	1.00	1.11*	1.32*	1.50*	1.68*	2.55*	3.92*
300	15	0.53	0.63	0.74	0.85	0.95	1.06*	1.24*	1.40*	1.56*	2.24*	3.02*
	20	0.58	0.69	0.80	0.92	1.04	1.16*	1.37*	1.55*	1.74*	2.56*	3.60*
	25	0.62	0.74	0.86	0.99	1.12	1.26*	1.49*	1.70*	1.91*	2.90*	4.34*
400	15	0.58	0.69	0.80	0.92	1.03	1.15*	1.35*	1.52*	1.70*	2.45*	3.30*
	20	0.63	0.75	0.88	1.01	1.14	1.27*	1.50*	1.70*	1.90*	2.81*	3.94*
	25	0.68	0.81	0.95	1.09	1.23	1.38*	1.64*	1.87*	2.10*	3.19*	4.73*
500	15	0.62	0.73	0.86	0.98	1.11	1.23*	1.45*	1.63*	1.82*	2.63*	3.56*
	20	0.68	0.81	0.94	1.08	1.22	1.36*	1.62*	1.83*	2.06*	3.04*	4.25*
	25	0.74	0.88	1.03	1.18	1.33	1.49*	1.78*	2.02*	2.28*	3.46*	5.08*
600	15	0.65	0.78	0.91	1.04	1.17	1.30*	1.54*	1.74*	1.94*	2.81*	3.79*
	20	0.72	0.86	1.01	1.15	1.30	1.45*	1.72*	1.96*	2.19*	3.25*	4.54*
	25	0.79	0.94	1.10	1.26	1.43	1.59*	1.90*	2.16*	2.44*	3.70*	5.41*
700	15	0.69	0.82	0.96	1.09	1.23	1.37*	1.62*	1.83*	2.05*	2.97*	4.01*
	20	0.77	0.91	1.06	1.22	1.38	1.53*	1.82*	2.07*	2.32*	3.44*	4.80*
	25	0.83	0.99	1.16	1.34	1.51	1.69*	2.01*	2.30*	2.59*	3.93*	5.72*
800	15	0.72	0.86	1.00	1.15	1.29	1.44*	1.70*	1.92*	2.15*	3.12*	4.21*
	20	0.80	0.96	1.12	1.28	1.45	1.61*	1.92*	2.18*	2.45*	3.63*	5.06*
	25	0.88	1.05	1.22	1.41	1.59	1.78*	2.12*	2.42*	2.73*	4.15*	6.01*
900	15	0.75	0.89	1.04	1.20	1.35	1.50*	1.77*	2.01*	2.25*	3.26*	4.41*
	20	0.84	1.00	1.17	1.34	1.51	1.69*	2.01*	2.28*	2.56*	3.80*	5.29*
	25	0.92	1.10	1.28	1.47	1.67	1.86*	2.23*	2.54*	2.87*	4.35*	6.28*
1000	15	0.78	0.93	1.08	1.24	1.40	1.56*	1.84*	2.09*	2.34*	3.40*	4.60*
	20	0.88	1.04	1.22	1.40	1.58	1.76*	2.09*	2.38*	2.67*	3.97*	5.52*
	25	0.96	1.14	1.34	1.54	1.74	1.94*	2.32*	2.65*	3.00*	4.54*	6.55*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.81	0.96	1.12	1.29	1.45	1.61*	1.91*	2.17*	2.43*	3.53*	4.77*
	20	0.91	1.08	1.27	1.45	1.64	1.83*	2.17*	2.47*	2.78*	4.13*	5.74*
	25	1.00	1.19	1.39	1.60	1.81	2.02*	2.42*	2.76*	3.12*	4.73*	6.80*
1200	15	0.84	1.00	1.16	1.33	1.50	1.67*	1.98*	2.24*	2.51*	3.66*	4.95*
	20	0.94	1.12	1.31	1.50	1.70	1.89*	2.25*	2.56*	2.88*	4.28*	5.95*
	25	1.04	1.24	1.45	1.66	1.88	2.10*	2.51*	2.87*	3.24*	4.91*	7.04*
1300	15	0.87	1.03	1.20	1.37	1.55	1.72*	2.04*	2.31*	2.59*	3.78*	5.11*
	20	0.98	1.16	1.35	1.55	1.75	1.95*	2.33*	2.65*	2.98*	4.43*	6.15*
	25	1.08	1.28	1.50	1.72	1.94	2.17*	2.60*	2.97*	3.35*	5.08*	7.28*
1400	15	0.89	1.06	1.24	1.41	1.59	1.77*	2.10*	2.38*	2.67*	3.90*	5.27*
	20	1.01	1.20	1.40	1.60	1.81	2.02*	2.40*	2.73*	3.08*	4.57*	6.35*
	25	1.11	1.32	1.55	1.78	2.01	2.24*	2.68*	3.07*	3.46*	5.25*	7.51*
1500	15	0.92	1.09	1.27	1.45	1.64	1.82*	2.16*	2.45*	2.75*	4.01*	5.43*
	20	1.04	1.23	1.44	1.65	1.86	2.08*	2.47*	2.82*	3.17*	4.71*	6.54*
	25	1.15	1.36	1.59	1.83	2.07	2.31*	2.77*	3.16*	3.57*	5.41*	7.73*
1600	15	0.94	1.12	1.30	1.49	1.68	1.87*	2.22*	2.52*	2.82*	4.12*	5.58*
	20	1.07	1.27	1.48	1.70	1.92	2.13*	2.54*	2.90*	3.26*	4.85*	6.72*
	25	1.18	1.40	1.64	1.88	2.13	2.38*	2.85*	3.25*	3.68*	5.57*	7.94*
1700	15	0.97	1.15	1.34	1.53	1.73	1.92*	2.28*	2.58*	2.90*	4.23*	5.73*
	20	1.10	1.30	1.52	1.74	1.97	2.19*	2.61*	2.98*	3.35*	4.98*	6.90*
	25	1.21	1.44	1.68	1.93	2.19	2.44*	2.93*	3.34*	3.78*	5.72*	8.15*
1800	15	0.99	1.17	1.37	1.57	1.77	1.96*	2.33*	2.65*	2.97*	4.34*	5.87*
	20	1.12	1.33	1.56	1.78	2.02	2.24*	2.68*	3.05*	3.44*	5.11*	7.08*
	25	1.24	1.48	1.73	1.99	2.25	2.51*	3.00*	3.43*	3.88*	5.87*	8.36*
1900	15	1.01	1.20	1.40	1.60	1.81	2.01*	2.39*	2.71*	3.04*	4.44*	6.01*
	20	1.15	1.36	1.59	1.83	2.06	2.30*	2.74*	3.13*	3.52*	5.23*	7.25*
	25	1.27	1.51	1.77	2.03	2.30	2.57*	3.08*	3.52*	3.98*	6.02*	8.56*
2000	15	1.04	1.23	1.43	1.64	1.85	2.05*	2.44*	2.77*	3.11*	4.54*	6.15*
	20	1.18	1.40	1.63	1.87	2.11	2.35*	2.81*	3.20*	3.60*	5.36*	7.42*
	25	1.31	1.55	1.81	2.08	2.36	2.63*	3.15*	3.60*	4.07*	6.16*	8.75*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.64	0.76	0.90	1.04	1.18	1.32*	1.57*	1.80*	2.05*	3.64*	9.13*
	20	0.69	0.83	0.98	1.13	1.29	1.46*	1.78*	2.08*	2.44*	6.33*	19.35*
	25	0.74	0.89	1.05	1.23	1.41	1.61*	2.01*	2.43*	3.03*	11.05*	36.19*
200	15	0.77	0.92	1.08	1.24	1.41	1.58*	1.90*	2.18*	2.48*	4.16*	9.14*
	20	0.84	1.01	1.19	1.38	1.58	1.79*	2.17*	2.54*	2.95*	6.41*	19.35*
	25	0.91	1.10	1.30	1.52	1.75	1.99*	2.47*	2.95*	3.56*	11.05*	36.19*
300	15	0.87	1.04	1.22	1.41	1.60	1.80*	2.16*	2.48*	2.82*	4.65*	9.20*
	20	0.97	1.16	1.37	1.58	1.81	2.05*	2.49*	2.90*	3.37*	6.69*	19.35*
	25	1.05	1.27	1.50	1.75	2.01	2.29*	2.84*	3.38*	4.03*	11.06*	36.19*
400	15	0.96	1.15	1.35	1.55	1.77	1.98*	2.38*	2.74*	3.12*	5.09*	9.39*
	20	1.07	1.29	1.52	1.76	2.01	2.27*	2.76*	3.22*	3.73*	7.07*	19.35*
	25	1.18	1.42	1.68	1.95	2.25	2.55*	3.16*	3.75*	4.44*	11.10*	36.19*
500	15	1.04	1.24	1.46	1.69	1.92	2.15*	2.58*	2.97*	3.38*	5.48*	9.68*
	20	1.17	1.40	1.65	1.92	2.19	2.47*	3.01*	3.50*	4.06*	7.47*	19.35*
	25	1.29	1.55	1.83	2.13	2.45	2.79*	3.45*	4.08*	4.82*	11.23*	36.19*
600	15	1.12	1.33	1.57	1.81	2.05	2.30*	2.77*	3.19*	3.63*	5.85*	10.02*
	20	1.26	1.51	1.78	2.06	2.35	2.66*	3.24*	3.77*	4.35*	7.87*	19.35*
	25	1.39	1.67	1.98	2.30	2.64	3.01*	3.71*	4.38*	5.16*	11.42*	36.19*
700	15	1.19	1.42	1.66	1.92	2.18	2.44*	2.94*	3.39*	3.86*	6.20*	10.37*
	20	1.34	1.61	1.90	2.20	2.51	2.83*	3.45*	4.01*	4.63*	8.25*	19.37*
	25	1.49	1.79	2.11	2.46	2.82	3.21*	3.96*	4.67*	5.49*	11.67*	36.19*
800	15	1.25	1.50	1.76	2.02	2.30	2.58*	3.11*	3.57*	4.07*	6.52*	10.74*
	20	1.42	1.70	2.01	2.32	2.65	2.99*	3.65*	4.24*	4.89*	8.62*	19.41*
	25	1.58	1.89	2.24	2.61	2.99	3.40*	4.19*	4.94*	5.79*	11.96*	36.19*
900	15	1.32	1.57	1.84	2.13	2.41	2.71*	3.26*	3.75*	4.27*	6.83*	11.10*
	20	1.50	1.79	2.11	2.44	2.79	3.15*	3.83*	4.46*	5.14*	8.98*	19.47*
	25	1.67	2.00	2.36	2.75	3.15	3.57*	4.41*	5.19*	6.08*	12.26*	36.19*
1000	15	1.38	1.64	1.93	2.22	2.52	2.83*	3.41*	3.92*	4.47*	7.12*	11.45*
	20	1.57	1.88	2.21	2.56	2.92	3.29*	4.01*	4.67*	5.38*	9.32*	19.57*
	25	1.75	2.10	2.48	2.88	3.30	3.75*	4.62*	5.43*	6.36*	12.58*	36.19*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.44	1.71	2.01	2.31	2.63	2.95*	3.55*	4.09*	4.65*	7.41*	11.80*
	20	1.64	1.96	2.31	2.67	3.05	3.43*	4.19*	4.86*	5.61*	9.66*	19.70*
	25	1.83	2.19	2.59	3.01	3.45	3.91*	4.82*	5.66*	6.62*	12.90*	36.19*
1200	15	1.49	1.78	2.09	2.40	2.73	3.06*	3.69*	4.24*	4.83*	7.68*	12.14*
	20	1.71	2.04	2.40	2.78	3.17	3.57*	4.35*	5.06*	5.82*	9.98*	19.85*
	25	1.90	2.28	2.70	3.13	3.59	4.07*	5.01*	5.89*	6.88*	13.22*	36.19*
1300	15	1.55	1.84	2.16	2.49	2.83	3.17*	3.82*	4.40*	5.01*	7.94*	12.48*
	20	1.77	2.12	2.49	2.88	3.29	3.70*	4.51*	5.24*	6.04*	10.29*	20.04*
	25	1.98	2.37	2.80	3.25	3.73	4.22*	5.20*	6.10*	7.12*	13.54*	36.19*
1400	15	1.60	1.90	2.23	2.57	2.92	3.27*	3.95*	4.54*	5.17*	8.19*	12.80*
	20	1.83	2.19	2.58	2.98	3.40	3.83*	4.67*	5.42*	6.24*	10.60*	20.24*
	25	2.05	2.45	2.90	3.37	3.86	4.37*	5.38*	6.31*	7.36*	13.86*	36.19*
1500	15	1.65	1.96	2.30	2.65	3.01	3.38*	4.07*	4.69*	5.34*	8.44*	13.12*
	20	1.89	2.26	2.66	3.08	3.51	3.95*	4.82*	5.59*	6.44*	10.89*	20.46*
	25	2.12	2.54	3.00	3.48	3.99	4.51*	5.55*	6.52*	7.59*	14.17*	36.20*
1600	15	1.70	2.02	2.37	2.73	3.10	3.48*	4.19*	4.83*	5.49*	8.68*	13.44*
	20	1.95	2.33	2.74	3.17	3.62	4.07*	4.96*	5.76*	6.63*	11.18*	20.70*
	25	2.18	2.62	3.09	3.59	4.11	4.65*	5.72*	6.71*	7.82*	14.48*	36.21*
1700	15	1.75	2.08	2.44	2.81	3.19	3.57*	4.31*	4.96*	5.65*	8.91*	13.75*
	20	2.01	2.40	2.82	3.27	3.72	4.19*	5.11*	5.93*	6.82*	11.46*	20.94*
	25	2.25	2.70	3.18	3.70	4.23	4.79*	5.89*	6.90*	8.03*	14.78*	36.23*
1800	15	1.79	2.14	2.50	2.88	3.27	3.67*	4.43*	5.09*	5.80*	9.14*	14.05*
	20	2.07	2.47	2.90	3.36	3.83	4.31*	5.24*	6.09*	7.00*	11.74*	21.20*
	25	2.32	2.77	3.27	3.80	4.35	4.92*	6.05*	7.09*	8.25*	15.08*	36.25*
1900	15	1.84	2.19	2.57	2.96	3.36	3.76*	4.54*	5.22*	5.95*	9.36*	14.34*
	20	2.12	2.53	2.98	3.44	3.93	4.42*	5.38*	6.24*	7.18*	12.01*	21.46*
	25	2.38	2.85	3.36	3.90	4.46	5.05*	6.21*	7.27*	8.46*	15.38*	36.28*
2000	15	1.88	2.24	2.63	3.03	3.44	3.85*	4.65*	5.35*	6.09*	9.58*	14.63*
	20	2.17	2.60	3.05	3.53	4.02	4.53*	5.51*	6.40*	7.35*	12.27*	21.72*
	25	2.44	2.92	3.45	4.00	4.58	5.18*	6.36*	7.45*	8.66*	15.67*	36.32*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.03	1.25	1.50	1.78	2.10	2.48*	3.38*	4.82*	7.41*	35.27*	121.47*
	20	1.15	1.41	1.71	2.08	2.55	3.26*	5.70*	9.61*	15.69*	81.12*	284.90*
	25	1.25	1.56	1.93	2.43	3.21	4.85*	10.03*	17.56*	29.34*	156.72*	554.34*
200	15	1.30	1.57	1.88	2.22	2.60	3.04*	4.01*	5.25*	7.48*	35.27*	121.47*
	20	1.46	1.79	2.17	2.62	3.16	3.87*	5.92*	9.61*	15.69*	81.12*	284.90*
	25	1.61	2.00	2.47	3.05	3.85	5.19*	10.04*	17.56*	29.34*	156.72*	554.34*
300	15	1.51	1.83	2.18	2.58	3.01	3.50*	4.55*	5.78*	7.77*	35.27*	121.47*
	20	1.71	2.10	2.54	3.05	3.65	4.41*	6.37*	9.68*	15.69*	81.12*	284.90*
	25	1.91	2.36	2.90	3.55	4.41	5.69*	10.08*	17.56*	29.34*	156.72*	554.34*
400	15	1.69	2.05	2.45	2.88	3.36	3.90*	5.03*	6.29*	8.19*	35.27*	121.47*
	20	1.93	2.36	2.86	3.42	4.08	4.89*	6.86*	9.89*	15.70*	81.12*	284.90*
	25	2.16	2.67	3.27	3.99	4.90	6.19*	10.24*	17.56*	29.34*	156.72*	554.34*
500	15	1.86	2.25	2.68	3.16	3.68	4.26*	5.46*	6.77*	8.64*	35.27*	121.47*
	20	2.13	2.60	3.14	3.76	4.46	5.32*	7.33*	10.21*	15.73*	81.12*	284.90*
	25	2.39	2.95	3.60	4.38	5.35	6.66*	10.51*	17.57*	29.34*	156.72*	554.34*
600	15	2.01	2.43	2.90	3.41	3.97	4.58*	5.86*	7.22*	9.09*	35.27*	121.47*
	20	2.32	2.82	3.41	4.06	4.82	5.72*	7.78*	10.58*	15.81*	81.12*	284.90*
	25	2.60	3.20	3.91	4.74	5.76	7.11*	10.85*	17.60*	29.34*	156.72*	554.34*
700	15	2.15	2.60	3.10	3.65	4.24	4.89*	6.23*	7.64*	9.53*	35.27*	121.47*
	20	2.49	3.03	3.65	4.35	5.15	6.09*	8.22*	10.98*	15.95*	81.12*	284.90*
	25	2.80	3.44	4.20	5.08	6.14	7.53*	11.22*	17.68*	29.34*	156.72*	554.34*
800	15	2.29	2.76	3.29	3.87	4.49	5.18*	6.58*	8.04*	9.96*	35.27*	121.47*
	20	2.65	3.22	3.88	4.62	5.46	6.44*	8.63*	11.38*	16.16*	81.12*	284.90*
	25	2.98	3.67	4.46	5.39	6.51	7.93*	11.61*	17.80*	29.34*	156.72*	554.34*
900	15	2.41	2.92	3.47	4.08	4.73	5.45*	6.92*	8.43*	10.37*	35.27*	121.47*
	20	2.80	3.41	4.10	4.88	5.75	6.77*	9.03*	11.78*	16.40*	81.12*	284.90*
	25	3.16	3.88	4.72	5.69	6.85	8.31*	12.00*	17.96*	29.34*	156.72*	554.34*
1000	15	2.54	3.06	3.65	4.28	4.96	5.71*	7.23*	8.79*	10.77*	35.27*	121.47*
	20	2.95	3.59	4.31	5.12	6.03	7.09*	9.40*	12.18*	16.68*	81.12*	284.90*
	25	3.33	4.08	4.96	5.97	7.18	8.67*	12.39*	18.17*	29.35*	156.72*	554.34*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.65	3.20	3.81	4.47	5.18	5.96*	7.54*	9.14*	11.16*	35.27*	121.47*
	20	3.09	3.75	4.51	5.35	6.30	7.39*	9.77*	12.57*	16.99*	81.12*	284.90*
	25	3.49	4.28	5.20	6.25	7.49	9.02*	12.77*	18.41*	29.37*	156.72*	554.34*
1200	15	2.77	3.34	3.97	4.66	5.40	6.20*	7.83*	9.48*	11.53*	35.28*	121.47*
	20	3.22	3.92	4.71	5.58	6.56	7.68*	10.12*	12.95*	17.31*	81.12*	284.90*
	25	3.64	4.47	5.42	6.51	7.79	9.36*	13.15*	18.68*	29.40*	156.72*	554.34*
1300	15	2.88	3.47	4.13	4.84	5.60	6.43*	8.12*	9.81*	11.90*	35.30*	121.47*
	20	3.35	4.08	4.89	5.80	6.81	7.96*	10.46*	13.32*	17.64*	81.12*	284.90*
	25	3.80	4.65	5.64	6.76	8.08	9.69*	13.52*	18.97*	29.45*	156.72*	554.34*
1400	15	2.98	3.60	4.28	5.01	5.80	6.65*	8.39*	10.12*	12.25*	35.33*	121.47*
	20	3.48	4.23	5.07	6.01	7.05	8.24*	10.80*	13.69*	17.98*	81.12*	284.90*
	25	3.94	4.83	5.85	7.01	8.37	10.01*	13.88*	19.27*	29.52*	156.72*	554.34*
1500	15	3.08	3.72	4.42	5.18	5.99	6.87*	8.66*	10.43*	12.59*	35.36*	121.47*
	20	3.60	4.38	5.25	6.21	7.29	8.50*	11.12*	14.04*	18.31*	81.12*	284.90*
	25	4.08	5.00	6.05	7.25	8.64	10.31*	14.24*	19.58*	29.61*	156.72*	554.34*
1600	15	3.18	3.84	4.56	5.34	6.18	7.08*	8.92*	10.73*	12.93*	35.41*	121.47*
	20	3.72	4.52	5.42	6.41	7.52	8.76*	11.43*	14.39*	18.65*	81.12*	284.90*
	25	4.22	5.16	6.25	7.48	8.91	10.61*	14.58*	19.89*	29.71*	156.72*	554.34*
1700	15	3.28	3.96	4.70	5.50	6.36	7.29*	9.17*	11.02*	13.26*	35.48*	121.47*
	20	3.84	4.66	5.59	6.61	7.74	9.01*	11.74*	14.73*	18.99*	81.12*	284.90*
	25	4.35	5.33	6.44	7.70	9.17	10.91*	14.93*	20.21*	29.84*	156.72*	554.34*
1800	15	3.38	4.07	4.84	5.66	6.54	7.49*	9.41*	11.30*	13.58*	35.56*	121.47*
	20	3.95	4.80	5.75	6.79	7.96	9.26*	12.04*	15.07*	19.33*	81.12*	284.90*
	25	4.49	5.48	6.63	7.92	9.42	11.19*	15.26*	20.53*	29.99*	156.72*	554.34*
1900	15	3.47	4.18	4.97	5.81	6.72	7.68*	9.65*	11.58*	13.89*	35.66*	121.47*
	20	4.06	4.93	5.91	6.98	8.17	9.50*	12.33*	15.40*	19.67*	81.12*	284.90*
	25	4.61	5.64	6.81	8.14	9.67	11.47*	15.59*	20.86*	30.15*	156.72*	554.34*
2000	15	3.56	4.29	5.10	5.96	6.89	7.88*	9.89*	11.85*	14.20*	35.78*	121.47*
	20	4.17	5.06	6.06	7.16	8.37	9.73*	12.61*	15.72*	20.00*	81.12*	284.90*
	25	4.74	5.79	6.99	8.35	9.91	11.74*	15.91*	21.18*	30.33*	156.72*	554.34*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.81	2.33	3.07	4.49	8.05	14.54*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	2.10	2.84	4.31	8.66	17.44	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	2.39	3.49	6.91	15.89	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
200	15	2.36	3.00	3.88	5.24	8.16	14.54*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	2.76	3.66	5.14	8.74	17.44	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	3.16	4.42	7.26	15.89	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
300	15	2.80	3.54	4.53	5.94	8.56	14.55*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	3.29	4.32	5.89	9.11	17.44	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	3.78	5.19	7.89	15.89	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
400	15	3.18	4.01	5.09	6.58	9.09	14.60*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	3.75	4.89	6.56	9.63	17.46	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	4.32	5.85	8.57	15.94	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
500	15	3.52	4.43	5.60	7.16	9.64	14.75*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	4.17	5.40	7.17	10.20	17.52	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	4.80	6.45	9.22	16.08	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
600	15	3.84	4.82	6.06	7.70	10.19	14.99*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	4.55	5.88	7.73	10.77	17.65	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	5.24	7.00	9.84	16.32	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
700	15	4.13	5.18	6.50	8.21	10.72	15.31*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	4.90	6.32	8.26	11.32	17.86	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	5.66	7.51	10.43	16.65	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
800	15	4.41	5.52	6.91	8.69	11.23	15.68*	32.23*	57.99*	98.45*	537.75*	1911.1*
	20	5.24	6.73	8.76	11.86	18.14	32.65*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	6.05	8.00	10.99	17.03	32.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
900	15	4.67	5.84	7.29	9.14	11.73	16.08*	32.24*	57.99*	98.45*	537.75*	1911.1*
	20	5.56	7.12	9.23	12.38	18.47	32.66*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	6.41	8.45	11.53	17.45	32.94	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1000	15	4.92	6.15	7.66	9.57	12.21	16.49*	32.26*	57.99*	98.45*	537.75*	1911.1*
	20	5.86	7.50	9.68	12.88	18.84	32.68*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	6.77	8.89	12.04	17.90	32.96	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 10.0 Ft (RADIUS = 7.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	5.16	6.45	8.02	9.98	12.67	16.91*	32.30*	57.99*	98.45*	537.75*	1911.1*
	20	6.15	7.85	10.11	13.37	19.23	32.71*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	7.10	9.31	12.54	18.35	33.00	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1200	15	5.40	6.73	8.36	10.38	13.11	17.34*	32.36*	57.99*	98.45*	537.75*	1911.1*
	20	6.43	8.20	10.52	13.84	19.63	32.75*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	7.43	9.71	13.02	18.81	33.06	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1300	15	5.62	7.00	8.69	10.77	13.55	17.76*	32.44*	57.99*	98.45*	537.75*	1911.1*
	20	6.70	8.53	10.93	14.30	20.04	32.82*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	7.74	10.10	13.48	19.26	33.14	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1400	15	5.84	7.27	9.00	11.14	13.97	18.18*	32.55*	57.99*	98.45*	537.75*	1911.1*
	20	6.97	8.86	11.31	14.75	20.46	32.91*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	8.05	10.48	13.93	19.72	33.24	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1500	15	6.05	7.53	9.31	11.50	14.38	18.60*	32.68*	57.99*	98.45*	537.75*	1911.1*
	20	7.22	9.17	11.69	15.18	20.88	33.03*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	8.34	10.84	14.37	20.17	33.38	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1600	15	6.26	7.78	9.61	11.86	14.78	19.01*	32.84*	57.99*	98.45*	537.75*	1911.1*
	20	7.47	9.47	12.06	15.60	21.29	33.17*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	8.63	11.20	14.79	20.62	33.54	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1700	15	6.46	8.02	9.91	12.20	15.17	19.41*	33.02*	58.00*	98.45*	537.75*	1911.1*
	20	7.71	9.77	12.41	16.01	21.71	33.33*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	8.91	11.54	15.20	21.06	33.73	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1800	15	6.65	8.26	10.19	12.53	15.55	19.81*	33.23*	58.00*	98.45*	537.75*	1911.1*
	20	7.94	10.06	12.76	16.42	22.12	33.52*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	9.18	11.88	15.61	21.49	33.93	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
1900	15	6.84	8.49	10.47	12.86	15.92	20.21*	33.45*	58.01*	98.45*	537.75*	1911.1*
	20	8.18	10.34	13.10	16.81	22.52	33.72*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	9.45	12.21	16.00	21.92	34.16	62.51*	143.71*	262.43*	449.19*	2480.9*	8836.8*
2000	15	7.03	8.72	10.74	13.18	16.28	20.60*	33.70*	58.02*	98.45*	537.75*	1911.1*
	20	8.40	10.62	13.44	17.20	22.93	33.95*	74.32*	135.18*	230.87*	1271.4*	4525.9*
	25	9.71	12.53	16.39	22.34	34.41	62.52*	143.71*	262.43*	449.19*	2480.9*	8836.8*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.48	0.55	0.63	0.72	0.80	0.89	1.01*	1.13*	1.25*	1.75*	2.34*
	20	0.51	0.59	0.67	0.76	0.86	0.95	1.09*	1.22*	1.35*	1.96*	2.83*
	25	0.53	0.62	0.71	0.81	0.91	1.01	1.16*	1.31*	1.46*	2.22*	3.74*
200	15	0.55	0.64	0.73	0.83	0.93	1.03	1.18*	1.31*	1.46*	2.06*	2.76*
	20	0.60	0.69	0.79	0.90	1.01	1.12	1.28*	1.44*	1.61*	2.34*	3.31*
	25	0.64	0.74	0.85	0.96	1.08	1.20	1.39*	1.57*	1.76*	2.66*	4.11*
300	15	0.62	0.71	0.82	0.92	1.03	1.14	1.31*	1.46*	1.62*	2.31*	3.10*
	20	0.67	0.77	0.89	1.01	1.13	1.25	1.44*	1.62*	1.81*	2.64*	3.72*
	25	0.72	0.83	0.96	1.09	1.22	1.36	1.57*	1.78*	2.00*	3.01*	4.53*
400	15	0.67	0.77	0.89	1.00	1.12	1.24	1.42*	1.59*	1.77*	2.52*	3.39*
	20	0.73	0.85	0.97	1.10	1.24	1.37	1.58*	1.78*	1.99*	2.91*	4.07*
	25	0.79	0.92	1.06	1.20	1.35	1.49	1.73*	1.96*	2.20*	3.32*	4.92*
500	15	0.72	0.83	0.95	1.07	1.20	1.33	1.52*	1.71*	1.90*	2.72*	3.65*
	20	0.79	0.91	1.05	1.19	1.33	1.48	1.70*	1.92*	2.15*	3.14*	4.39*
	25	0.86	0.99	1.14	1.30	1.46	1.62	1.87*	2.12*	2.38*	3.59*	5.28*
600	15	0.76	0.88	1.01	1.14	1.27	1.41	1.62*	1.82*	2.02*	2.90*	3.90*
	20	0.84	0.98	1.12	1.27	1.42	1.57	1.81*	2.05*	2.29*	3.36*	4.68*
	25	0.92	1.06	1.22	1.39	1.56	1.73	2.00*	2.27*	2.55*	3.85*	5.61*
700	15	0.80	0.93	1.06	1.20	1.34	1.48	1.70*	1.92*	2.13*	3.06*	4.12*
	20	0.89	1.03	1.19	1.34	1.50	1.67	1.92*	2.17*	2.43*	3.56*	4.96*
	25	0.98	1.13	1.30	1.47	1.65	1.84	2.12*	2.41*	2.71*	4.08*	5.93*
800	15	0.84	0.97	1.11	1.26	1.41	1.56	1.79*	2.01*	2.24*	3.22*	4.33*
	20	0.94	1.09	1.25	1.41	1.58	1.75	2.02*	2.28*	2.56*	3.75*	5.22*
	25	1.03	1.19	1.37	1.56	1.74	1.94	2.24*	2.54*	2.86*	4.30*	6.23*
900	15	0.88	1.01	1.16	1.32	1.47	1.62	1.87*	2.10*	2.34*	3.37*	4.53*
	20	0.98	1.14	1.31	1.48	1.66	1.83	2.11*	2.39*	2.68*	3.94*	5.46*
	25	1.08	1.25	1.44	1.63	1.83	2.03	2.35*	2.67*	3.00*	4.51*	6.51*
1000	15	0.91	1.06	1.21	1.37	1.53	1.69	1.94*	2.19*	2.44*	3.51*	4.73*
	20	1.03	1.19	1.36	1.54	1.73	1.91	2.20*	2.49*	2.79*	4.11*	5.69*
	25	1.13	1.31	1.50	1.70	1.91	2.12	2.45*	2.79*	3.14*	4.72*	6.78*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	0.95	1.09	1.26	1.42	1.59	1.75	2.01*	2.27*	2.53*	3.65*	4.91*
	20	1.07	1.23	1.42	1.60	1.79	1.99	2.29*	2.59*	2.91*	4.27*	5.92*
	25	1.18	1.36	1.56	1.77	1.99	2.21	2.55*	2.90*	3.27*	4.91*	7.04*
1200	15	0.98	1.13	1.30	1.47	1.64	1.81	2.08*	2.35*	2.62*	3.78*	5.09*
	20	1.11	1.28	1.47	1.66	1.86	2.06	2.38*	2.69*	3.01*	4.43*	6.13*
	25	1.22	1.41	1.62	1.84	2.06	2.29	2.65*	3.01*	3.39*	5.09*	7.29*
1300	15	1.01	1.17	1.34	1.52	1.69	1.87	2.15*	2.42*	2.71*	3.90*	5.26*
	20	1.14	1.32	1.52	1.72	1.92	2.13	2.46*	2.78*	3.12*	4.59*	6.34*
	25	1.26	1.46	1.68	1.91	2.14	2.37	2.74*	3.12*	3.51*	5.27*	7.53*
1400	15	1.04	1.20	1.38	1.56	1.74	1.93	2.21*	2.50*	2.79*	4.03*	5.42*
	20	1.18	1.36	1.57	1.77	1.98	2.20	2.53*	2.87*	3.22*	4.73*	6.54*
	25	1.31	1.51	1.74	1.97	2.21	2.45	2.83*	3.22*	3.63*	5.45*	7.77*
1500	15	1.07	1.24	1.42	1.61	1.79	1.98	2.28*	2.57*	2.87*	4.14*	5.58*
	20	1.22	1.41	1.61	1.83	2.04	2.26	2.61*	2.96*	3.31*	4.88*	6.74*
	25	1.35	1.56	1.79	2.03	2.28	2.53	2.92*	3.32*	3.74*	5.61*	8.00*
1600	15	1.10	1.27	1.46	1.65	1.84	2.04	2.34*	2.64*	2.95*	4.26*	5.74*
	20	1.25	1.45	1.66	1.88	2.10	2.33	2.68*	3.04*	3.41*	5.02*	6.93*
	25	1.39	1.60	1.84	2.09	2.34	2.60	3.01*	3.42*	3.85*	5.78*	8.22*
1700	15	1.13	1.31	1.50	1.69	1.89	2.09	2.40*	2.71*	3.03*	4.37*	5.89*
	20	1.29	1.49	1.70	1.93	2.16	2.39	2.76*	3.12*	3.50*	5.16*	7.11*
	25	1.43	1.65	1.89	2.15	2.41	2.67	3.09*	3.52*	3.96*	5.94*	8.43*
1800	15	1.16	1.34	1.53	1.73	1.94	2.14	2.46*	2.78*	3.10*	4.48*	6.04*
	20	1.32	1.52	1.75	1.98	2.21	2.45	2.83*	3.20*	3.59*	5.29*	7.29*
	25	1.46	1.69	1.95	2.21	2.47	2.74	3.17*	3.61*	4.06*	6.09*	8.64*
1900	15	1.19	1.37	1.57	1.77	1.98	2.19	2.52*	2.84*	3.17*	4.59*	6.18*
	20	1.35	1.56	1.79	2.03	2.27	2.51	2.90*	3.28*	3.68*	5.42*	7.47*
	25	1.50	1.74	1.99	2.26	2.53	2.81	3.25*	3.70*	4.16*	6.24*	8.85*
2000	15	1.21	1.40	1.60	1.81	2.03	2.24	2.57*	2.91*	3.25*	4.70*	6.32*
	20	1.38	1.60	1.83	2.08	2.32	2.57	2.96*	3.36*	3.77*	5.55*	7.64*
	25	1.54	1.78	2.04	2.32	2.59	2.88	3.33*	3.79*	4.26*	6.39*	9.05*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.74	0.86	0.99	1.13	1.27	1.42	1.66*	1.89*	2.15*	3.90*	9.95*
	20	0.80	0.93	1.08	1.24	1.41	1.58	1.89*	2.21*	2.60*	7.04*	21.26*
	25	0.86	1.00	1.17	1.35	1.54	1.76	2.16*	2.63*	3.33*	12.41*	39.89*
200	15	0.89	1.03	1.20	1.36	1.54	1.71	2.00*	2.29*	2.60*	4.40*	9.95*
	20	0.98	1.14	1.33	1.52	1.73	1.94	2.31*	2.69*	3.13*	7.08*	21.26*
	25	1.07	1.25	1.45	1.68	1.92	2.18	2.64*	3.16*	3.84*	12.41*	39.89*
300	15	1.02	1.18	1.36	1.55	1.75	1.95	2.28*	2.61*	2.96*	4.89*	9.99*
	20	1.13	1.32	1.53	1.75	1.98	2.23	2.64*	3.07*	3.57*	7.29*	21.26*
	25	1.24	1.45	1.68	1.94	2.22	2.52	3.03*	3.61*	4.32*	12.42*	39.89*
400	15	1.12	1.30	1.50	1.71	1.93	2.16	2.52*	2.88*	3.27*	5.34*	10.13*
	20	1.26	1.47	1.70	1.95	2.21	2.48	2.93*	3.41*	3.95*	7.62*	21.26*
	25	1.38	1.62	1.88	2.17	2.48	2.81	3.37*	3.99*	4.74*	12.43*	39.89*
500	15	1.22	1.42	1.63	1.86	2.10	2.34	2.73*	3.13*	3.55*	5.75*	10.36*
	20	1.37	1.60	1.86	2.12	2.41	2.70	3.20*	3.71*	4.29*	8.00*	21.26*
	25	1.52	1.77	2.06	2.38	2.71	3.07	3.68*	4.35*	5.14*	12.50*	39.89*
600	15	1.31	1.52	1.75	2.00	2.25	2.51	2.93*	3.36*	3.81*	6.13*	10.66*
	20	1.48	1.73	2.00	2.29	2.59	2.91	3.44*	3.99*	4.60*	8.39*	21.26*
	25	1.64	1.92	2.23	2.57	2.92	3.31	3.96*	4.67*	5.50*	12.63*	39.89*
700	15	1.39	1.62	1.87	2.12	2.39	2.67	3.11*	3.57*	4.05*	6.48*	11.00*
	20	1.58	1.84	2.13	2.44	2.76	3.10	3.66*	4.24*	4.89*	8.77*	21.27*
	25	1.75	2.05	2.38	2.74	3.12	3.53	4.22*	4.97*	5.84*	12.83*	39.89*
800	15	1.47	1.71	1.97	2.24	2.53	2.82	3.29*	3.77*	4.28*	6.82*	11.35*
	20	1.67	1.95	2.26	2.58	2.93	3.28	3.87*	4.49*	5.17*	9.15*	21.28*
	25	1.86	2.18	2.53	2.91	3.31	3.74	4.47*	5.25*	6.16*	13.06*	39.89*
900	15	1.55	1.79	2.07	2.36	2.65	2.96	3.45*	3.95*	4.49*	7.14*	11.70*
	20	1.76	2.05	2.38	2.72	3.08	3.45	4.07*	4.72*	5.43*	9.51*	21.32*
	25	1.96	2.30	2.67	3.07	3.49	3.94	4.70*	5.52*	6.46*	13.33*	39.89*
1000	15	1.62	1.88	2.17	2.47	2.78	3.09	3.61*	4.13*	4.69*	7.44*	12.05*
	20	1.85	2.15	2.49	2.85	3.23	3.62	4.26*	4.94*	5.68*	9.86*	21.38*
	25	2.06	2.41	2.80	3.22	3.66	4.13	4.92*	5.78*	6.75*	13.62*	39.89*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.69	1.96	2.26	2.57	2.89	3.22	3.76*	4.31*	4.89*	7.73*	12.40*
	20	1.93	2.25	2.60	2.98	3.37	3.77	4.45*	5.15*	5.92*	10.20*	21.47*
	25	2.16	2.52	2.93	3.36	3.82	4.31	5.14*	6.02*	7.03*	13.92*	39.89*
1200	15	1.75	2.03	2.35	2.67	3.01	3.35	3.90*	4.47*	5.08*	8.01*	12.74*
	20	2.01	2.34	2.71	3.10	3.50	3.93	4.62*	5.35*	6.15*	10.53*	21.58*
	25	2.25	2.63	3.05	3.50	3.98	4.49	5.34*	6.26*	7.29*	14.23*	39.89*
1300	15	1.82	2.11	2.43	2.77	3.11	3.47	4.05*	4.63*	5.26*	8.29*	13.08*
	20	2.09	2.43	2.81	3.21	3.63	4.07	4.79*	5.54*	6.37*	10.85*	21.72*
	25	2.34	2.73	3.17	3.64	4.13	4.66	5.54*	6.48*	7.55*	14.54*	39.89*
1400	15	1.88	2.18	2.51	2.86	3.22	3.59	4.18*	4.79*	5.43*	8.55*	13.41*
	20	2.16	2.52	2.91	3.33	3.76	4.21	4.96*	5.73*	6.58*	11.16*	21.88*
	25	2.42	2.83	3.28	3.77	4.28	4.82	5.73*	6.71*	7.80*	14.85*	39.89*
1500	15	1.94	2.25	2.59	2.95	3.32	3.70	4.31*	4.94*	5.61*	8.81*	13.73*
	20	2.23	2.60	3.01	3.44	3.88	4.35	5.12*	5.92*	6.79*	11.47*	22.07*
	25	2.50	2.92	3.39	3.89	4.42	4.98	5.92*	6.92*	8.05*	15.16*	39.90*
1600	15	2.00	2.32	2.67	3.04	3.42	3.81	4.44*	5.09*	5.77*	9.05*	14.05*
	20	2.30	2.68	3.10	3.54	4.00	4.48	5.27*	6.10*	6.99*	11.77*	22.27*
	25	2.58	3.02	3.50	4.02	4.56	5.13	6.10*	7.13*	8.28*	15.47*	39.90*
1700	15	2.06	2.39	2.75	3.13	3.52	3.92	4.57*	5.23*	5.93*	9.30*	14.36*
	20	2.37	2.76	3.19	3.65	4.12	4.61	5.42*	6.27*	7.19*	12.06*	22.49*
	25	2.66	3.11	3.61	4.14	4.69	5.29	6.27*	7.33*	8.51*	15.77*	39.91*
1800	15	2.11	2.45	2.82	3.21	3.61	4.02	4.69*	5.37*	6.09*	9.53*	14.67*
	20	2.44	2.84	3.28	3.75	4.23	4.74	5.57*	6.44*	7.38*	12.34*	22.71*
	25	2.74	3.20	3.71	4.25	4.83	5.43	6.45*	7.53*	8.74*	16.07*	39.92*
1900	15	2.17	2.51	2.90	3.30	3.71	4.13	4.81*	5.51*	6.24*	9.76*	14.97*
	20	2.51	2.91	3.37	3.85	4.35	4.86	5.71*	6.60*	7.57*	12.62*	22.95*
	25	2.81	3.28	3.81	4.37	4.96	5.58	6.61*	7.72*	8.96*	16.37*	39.94*
2000	15	2.22	2.58	2.97	3.38	3.80	4.23	4.92*	5.64*	6.40*	9.99*	15.27*
	20	2.57	2.99	3.46	3.94	4.45	4.99	5.86*	6.77*	7.75*	12.89*	23.20*
	25	2.89	3.37	3.91	4.48	5.08	5.72	6.78*	7.91*	9.17*	16.67*	39.96*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.21	1.43	1.68	1.98	2.32	2.75	3.79*	5.60*	8.63*	39.92*	134.23*
	20	1.34	1.61	1.93	2.34	2.88	3.78	6.86*	11.46*	18.52*	92.09*	315.08*
	25	1.47	1.79	2.21	2.79	3.80	5.99	12.26*	21.14*	34.82*	178.10*	613.25*
200	15	1.52	1.79	2.12	2.48	2.89	3.37	4.39*	5.89*	8.65*	39.92*	134.23*
	20	1.72	2.06	2.46	2.95	3.55	4.40	6.95*	11.46*	18.52*	92.09*	315.08*
	25	1.91	2.31	2.83	3.49	4.45	6.20	12.26*	21.14*	34.82*	178.10*	613.25*
300	15	1.77	2.09	2.46	2.88	3.34	3.88	4.95*	6.38*	8.82*	39.92*	134.23*
	20	2.02	2.41	2.88	3.43	4.10	4.98	7.28*	11.48*	18.52*	92.09*	315.08*
	25	2.26	2.73	3.32	4.05	5.05	6.65	12.27*	21.14*	34.82*	178.10*	613.25*
400	15	1.99	2.35	2.76	3.22	3.73	4.32	5.45*	6.89*	9.15*	39.92*	134.23*
	20	2.29	2.73	3.25	3.86	4.58	5.50	7.72*	11.58*	18.52*	92.09*	315.08*
	25	2.56	3.09	3.74	4.54	5.59	7.16	12.32*	21.14*	34.82*	178.10*	613.25*
500	15	2.19	2.58	3.03	3.53	4.09	4.72	5.91*	7.37*	9.55*	39.92*	134.23*
	20	2.52	3.01	3.58	4.24	5.01	5.98	8.18*	11.78*	18.53*	92.09*	315.08*
	25	2.84	3.42	4.13	4.99	6.09	7.66	12.46*	21.14*	34.82*	178.10*	613.25*
600	15	2.37	2.79	3.28	3.82	4.41	5.08	6.33*	7.84*	9.99*	39.92*	134.23*
	20	2.74	3.26	3.88	4.59	5.41	6.42	8.63*	12.07*	18.55*	92.09*	315.08*
	25	3.09	3.72	4.48	5.39	6.54	8.13	12.69*	21.15*	34.82*	178.10*	613.25*
700	15	2.54	2.99	3.51	4.09	4.72	5.42	6.73*	8.28*	10.42*	39.92*	134.23*
	20	2.95	3.51	4.16	4.91	5.78	6.83	9.08*	12.41*	18.62*	92.09*	315.08*
	25	3.33	4.00	4.81	5.77	6.97	8.59	12.98*	21.17*	34.82*	178.10*	613.25*
800	15	2.70	3.18	3.73	4.34	5.00	5.74	7.10*	8.69*	10.85*	39.92*	134.23*
	20	3.14	3.73	4.43	5.22	6.13	7.22	9.50*	12.77*	18.72*	92.09*	315.08*
	25	3.55	4.26	5.11	6.13	7.38	9.02	13.31*	21.21*	34.82*	178.10*	613.25*
900	15	2.85	3.36	3.94	4.57	5.27	6.04	7.45*	9.09*	11.26*	39.92*	134.23*
	20	3.32	3.95	4.68	5.50	6.46	7.59	9.91*	13.15*	18.88*	92.09*	315.08*
	25	3.76	4.51	5.41	6.47	7.76	9.44	13.67*	21.29*	34.82*	178.10*	613.25*
1000	15	3.00	3.53	4.14	4.80	5.53	6.33	7.79*	9.47*	11.67*	39.92*	134.23*
	20	3.50	4.15	4.92	5.78	6.77	7.94	10.31*	13.53*	19.08*	92.09*	315.08*
	25	3.96	4.75	5.69	6.79	8.12	9.84	14.03*	21.40*	34.82*	178.10*	613.25*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.14	3.70	4.33	5.02	5.77	6.61	8.11*	9.84*	12.07*	39.92*	134.23*
	20	3.66	4.35	5.15	6.05	7.07	8.28	10.69*	13.92*	19.31*	92.09*	315.08*
	25	4.15	4.98	5.95	7.10	8.48	10.23	14.40*	21.54*	34.83*	178.10*	613.25*
1200	15	3.27	3.85	4.51	5.23	6.01	6.88	8.42*	10.20*	12.45*	39.92*	134.23*
	20	3.83	4.54	5.37	6.30	7.36	8.60	11.06*	14.30*	19.57*	92.09*	315.08*
	25	4.34	5.20	6.21	7.40	8.81	10.60	14.77*	21.72*	34.84*	178.10*	613.25*
1300	15	3.41	4.01	4.69	5.43	6.24	7.13	8.73*	10.54*	12.83*	39.93*	134.23*
	20	3.98	4.72	5.58	6.55	7.64	8.91	11.42*	14.67*	19.85*	92.09*	315.08*
	25	4.52	5.41	6.46	7.68	9.14	10.96	15.13*	21.93*	34.85*	178.10*	613.25*
1400	15	3.53	4.15	4.86	5.63	6.46	7.38	9.02*	10.87*	13.20*	39.93*	134.23*
	20	4.13	4.90	5.79	6.79	7.91	9.22	11.77*	15.04*	20.15*	92.09*	315.08*
	25	4.69	5.61	6.70	7.96	9.46	11.31	15.50*	22.17*	34.87*	178.10*	613.25*
1500	15	3.65	4.30	5.03	5.82	6.68	7.62	9.30*	11.20*	13.55*	39.95*	134.23*
	20	4.28	5.07	5.99	7.02	8.17	9.51	12.11*	15.41*	20.46*	92.09*	315.08*
	25	4.86	5.81	6.93	8.23	9.76	11.66	15.86*	22.42*	34.90*	178.10*	613.25*
1600	15	3.77	4.44	5.19	6.00	6.89	7.86	9.58*	11.51*	13.90*	39.97*	134.23*
	20	4.42	5.24	6.19	7.24	8.43	9.80	12.44*	15.76*	20.77*	92.09*	315.08*
	25	5.03	6.01	7.16	8.49	10.06	11.99	16.21*	22.68*	34.95*	178.10*	613.25*
1700	15	3.89	4.57	5.35	6.18	7.09	8.09	9.84*	11.82*	14.24*	40.00*	134.23*
	20	4.56	5.40	6.38	7.46	8.68	10.08	12.76*	16.12*	21.09*	92.09*	315.08*
	25	5.19	6.20	7.38	8.75	10.35	12.31	16.56*	22.96*	35.01*	178.10*	613.25*
1800	15	4.00	4.70	5.50	6.36	7.29	8.31	10.10*	12.12*	14.58*	40.04*	134.23*
	20	4.70	5.56	6.56	7.67	8.92	10.35	13.08*	16.46*	21.41*	92.09*	315.08*
	25	5.35	6.38	7.60	9.00	10.63	12.63	16.90*	23.25*	35.08*	178.10*	613.25*
1900	15	4.12	4.83	5.65	6.53	7.49	8.53	10.36*	12.41*	14.91*	40.10*	134.23*
	20	4.83	5.72	6.74	7.88	9.16	10.62	13.39*	16.80*	21.74*	92.09*	315.08*
	25	5.50	6.56	7.81	9.24	10.91	12.94	17.24*	23.54*	35.17*	178.10*	613.25*
2000	15	4.22	4.96	5.80	6.70	7.68	8.74	10.61*	12.70*	15.23*	40.16*	134.23*
	20	4.96	5.87	6.92	8.09	9.39	10.88	13.69*	17.14*	22.07*	92.09*	315.08*
	25	5.65	6.74	8.02	9.48	11.18	13.24	17.58*	23.84*	35.27*	178.10*	613.25*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.15	2.72	3.63	5.65	10.38	18.44	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	2.52	3.41	5.58	11.64	22.88	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	2.91	4.41	9.71	21.65	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
200	15	2.81	3.52	4.53	6.29	10.41	18.44	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	3.32	4.37	6.32	11.65	22.88	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	3.84	5.43	9.80	21.65	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
300	15	3.33	4.15	5.28	7.02	10.62	18.44	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	3.96	5.14	7.11	11.80	22.88	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	4.59	6.30	10.21	21.65	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
400	15	3.79	4.70	5.92	7.72	11.03	18.45	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	4.51	5.81	7.86	12.15	22.88	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	5.23	7.07	10.81	21.66	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
500	15	4.20	5.19	6.50	8.36	11.55	18.50	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	5.01	6.41	8.54	12.63	22.89	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	5.82	7.77	11.45	21.68	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
600	15	4.58	5.65	7.04	8.96	12.09	18.62	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	5.47	6.96	9.18	13.17	22.93	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	6.35	8.41	12.10	21.76	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
700	15	4.94	6.07	7.54	9.53	12.63	18.82	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	5.90	7.48	9.78	13.72	23.01	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	6.85	9.01	12.74	21.90	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
800	15	5.27	6.47	8.00	10.06	13.17	19.09	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	6.30	7.96	10.34	14.28	23.14	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	7.32	9.58	13.35	22.12	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
900	15	5.58	6.84	8.45	10.57	13.70	19.41	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	6.68	8.42	10.88	14.83	23.33	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	7.76	10.11	13.94	22.40	43.49	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1000	15	5.89	7.20	8.87	11.06	14.22	19.77	39.82*	70.27*	117.32*	611.58*	2114.6*
	20	7.05	8.86	11.39	15.37	23.58	41.81	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	8.18	10.63	14.52	22.73	43.50	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 12.0 Ft (RADIUS = 8.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	6.17	7.55	9.28	11.52	14.72	20.16	39.83*	70.27*	117.32*	611.58*	2114.6*
	20	7.40	9.28	11.89	15.90	23.88	41.82	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	8.59	11.12	15.07	23.10	43.50	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1200	15	6.45	7.88	9.67	11.97	15.21	20.57	39.84*	70.27*	117.32*	611.58*	2114.6*
	20	7.73	9.69	12.36	16.41	24.20	41.83	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	8.98	11.59	15.61	23.50	43.51	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1300	15	6.72	8.20	10.05	12.41	15.68	20.98	39.86*	70.27*	117.32*	611.58*	2114.6*
	20	8.06	10.08	12.82	16.92	24.56	41.84	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	9.36	12.04	16.14	23.92	43.53	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1400	15	6.98	8.51	10.42	12.83	16.14	21.40	39.89*	70.27*	117.32*	611.58*	2114.6*
	20	8.37	10.45	13.27	17.41	24.93	41.87	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	9.73	12.49	16.64	24.36	43.55	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1500	15	7.24	8.81	10.77	13.24	16.59	21.82	39.93*	70.27*	117.32*	611.58*	2114.6*
	20	8.68	10.82	13.70	17.89	25.32	41.91	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	10.08	12.91	17.14	24.80	43.59	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1600	15	7.48	9.10	11.12	13.64	17.03	22.24	39.99*	70.27*	117.32*	611.58*	2114.6*
	20	8.98	11.18	14.12	18.36	25.72	41.97	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	10.43	13.33	17.62	25.24	43.65	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1700	15	7.72	9.39	11.45	14.03	17.47	22.67	40.07*	70.27*	117.32*	611.58*	2114.6*
	20	9.27	11.52	14.53	18.81	26.12	42.04	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	10.76	13.73	18.09	25.69	43.72	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1800	15	7.96	9.67	11.78	14.40	17.89	23.08	40.17*	70.27*	117.32*	611.58*	2114.6*
	20	9.55	11.86	14.93	19.26	26.53	42.13	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	11.09	14.13	18.55	26.13	43.82	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
1900	15	8.19	9.94	12.10	14.77	18.30	23.50	40.28*	70.27*	117.32*	611.58*	2114.6*
	20	9.83	12.19	15.32	19.70	26.94	42.24	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	11.41	14.52	19.00	26.58	43.93	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*
2000	15	8.41	10.20	12.41	15.14	18.70	23.91	40.42*	70.28*	117.32*	611.58*	2114.6*
	20	10.10	12.52	15.70	20.14	27.35	42.37	92.23*	164.21*	275.52*	1446.3*	5008.3*
	25	11.72	14.89	19.45	27.02	44.06	80.34	178.64*	319.09*	536.35*	2822.6*	9778.9*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.54	0.61	0.69	0.77	0.86	0.94	1.07	1.17*	1.29*	1.80*	2.40*
	20	0.58	0.65	0.73	0.82	0.91	1.01	1.15	1.27*	1.41*	2.03*	2.94*
	25	0.61	0.68	0.78	0.87	0.97	1.07	1.23	1.37*	1.52*	2.31*	3.98*
200	15	0.63	0.71	0.80	0.90	1.00	1.09	1.24	1.37*	1.51*	2.12*	2.84*
	20	0.68	0.77	0.87	0.98	1.08	1.19	1.36	1.51*	1.67*	2.42*	3.43*
	25	0.73	0.82	0.93	1.05	1.17	1.29	1.47	1.64*	1.83*	2.76*	4.32*
300	15	0.70	0.79	0.89	1.00	1.11	1.22	1.38	1.53*	1.69*	2.38*	3.18*
	20	0.76	0.86	0.98	1.10	1.22	1.34	1.53	1.70*	1.89*	2.73*	3.84*
	25	0.82	0.93	1.06	1.19	1.32	1.46	1.67	1.86*	2.08*	3.12*	4.73*
400	15	0.76	0.86	0.97	1.09	1.21	1.32	1.50	1.66*	1.84*	2.60*	3.48*
	20	0.84	0.95	1.07	1.20	1.34	1.47	1.68	1.86*	2.07*	3.01*	4.20*
	25	0.91	1.03	1.17	1.31	1.46	1.61	1.84	2.05*	2.30*	3.44*	5.12*
500	15	0.82	0.92	1.04	1.17	1.29	1.42	1.62	1.78*	1.98*	2.80*	3.76*
	20	0.91	1.02	1.16	1.30	1.44	1.59	1.81	2.01*	2.24*	3.25*	4.53*
	25	0.98	1.11	1.26	1.42	1.58	1.74	2.00	2.22*	2.49*	3.73*	5.49*
600	15	0.87	0.98	1.11	1.24	1.38	1.51	1.72	1.90*	2.10*	2.99*	4.00*
	20	0.97	1.09	1.24	1.39	1.54	1.70	1.93	2.14*	2.39*	3.48*	4.83*
	25	1.05	1.19	1.35	1.52	1.69	1.87	2.14	2.38*	2.67*	3.99*	5.83*
700	15	0.92	1.04	1.17	1.31	1.45	1.60	1.81	2.00*	2.22*	3.16*	4.23*
	20	1.02	1.16	1.31	1.47	1.63	1.80	2.05	2.27*	2.53*	3.69*	5.11*
	25	1.12	1.27	1.44	1.62	1.80	1.98	2.27	2.53*	2.83*	4.24*	6.15*
800	15	0.96	1.09	1.23	1.38	1.52	1.67	1.90	2.10*	2.33*	3.32*	4.45*
	20	1.08	1.22	1.38	1.55	1.72	1.89	2.16	2.39*	2.67*	3.88*	5.38*
	25	1.18	1.34	1.52	1.70	1.90	2.09	2.40	2.67*	2.99*	4.47*	6.45*
900	15	1.01	1.14	1.28	1.44	1.59	1.75	1.99	2.20*	2.44*	3.48*	4.66*
	20	1.13	1.28	1.45	1.62	1.80	1.98	2.26	2.50*	2.79*	4.07*	5.63*
	25	1.24	1.41	1.59	1.79	1.99	2.20	2.51	2.80*	3.14*	4.68*	6.74*
1000	15	1.05	1.18	1.34	1.50	1.66	1.82	2.07	2.29*	2.54*	3.62*	4.86*
	20	1.18	1.33	1.51	1.69	1.88	2.07	2.36	2.61*	2.92*	4.25*	5.87*
	25	1.30	1.47	1.67	1.87	2.08	2.30	2.63	2.92*	3.28*	4.89*	7.02*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.09	1.23	1.39	1.55	1.72	1.89	2.15	2.37*	2.64*	3.76*	5.04*
	20	1.23	1.39	1.57	1.76	1.95	2.15	2.45	2.72*	3.03*	4.42*	6.10*
	25	1.35	1.53	1.74	1.95	2.17	2.39	2.74	3.05*	3.41*	5.09*	7.29*
1200	15	1.13	1.27	1.44	1.61	1.78	1.96	2.22	2.46*	2.73*	3.90*	5.23*
	20	1.27	1.44	1.63	1.82	2.02	2.23	2.54	2.82*	3.14*	4.59*	6.32*
	25	1.41	1.59	1.80	2.02	2.25	2.48	2.84	3.16*	3.54*	5.28*	7.55*
1300	15	1.16	1.31	1.48	1.66	1.84	2.02	2.29	2.54*	2.82*	4.03*	5.40*
	20	1.32	1.49	1.68	1.89	2.09	2.30	2.63	2.91*	3.25*	4.74*	6.54*
	25	1.46	1.65	1.87	2.10	2.33	2.57	2.94	3.27*	3.67*	5.47*	7.79*
1400	15	1.20	1.35	1.53	1.71	1.90	2.08	2.36	2.61*	2.91*	4.16*	5.57*
	20	1.36	1.54	1.74	1.95	2.16	2.38	2.71	3.01*	3.36*	4.90*	6.74*
	25	1.50	1.70	1.93	2.17	2.41	2.66	3.04	3.38*	3.79*	5.65*	8.04*
1500	15	1.23	1.39	1.57	1.76	1.95	2.14	2.43	2.69*	2.99*	4.28*	5.74*
	20	1.40	1.58	1.79	2.01	2.23	2.45	2.79	3.10*	3.46*	5.05*	6.95*
	25	1.55	1.76	1.99	2.23	2.48	2.74	3.13	3.49*	3.91*	5.82*	8.27*
1600	15	1.27	1.43	1.62	1.81	2.00	2.20	2.50	2.76*	3.07*	4.40*	5.90*
	20	1.44	1.63	1.84	2.06	2.29	2.52	2.87	3.19*	3.56*	5.19*	7.14*
	25	1.60	1.81	2.05	2.30	2.56	2.82	3.23	3.59*	4.03*	5.99*	8.50*
1700	15	1.30	1.47	1.66	1.86	2.06	2.26	2.56	2.83*	3.15*	4.52*	6.05*
	20	1.48	1.67	1.89	2.12	2.35	2.59	2.95	3.27*	3.66*	5.33*	7.33*
	25	1.64	1.86	2.11	2.37	2.63	2.90	3.32	3.69*	4.14*	6.16*	8.72*
1800	15	1.33	1.51	1.70	1.90	2.11	2.31	2.63	2.90*	3.23*	4.63*	6.20*
	20	1.52	1.72	1.94	2.18	2.41	2.66	3.03	3.36*	3.75*	5.47*	7.52*
	25	1.69	1.91	2.16	2.43	2.70	2.98	3.40	3.79*	4.25*	6.32*	8.93*
1900	15	1.37	1.54	1.74	1.95	2.16	2.37	2.69	2.97*	3.31*	4.74*	6.35*
	20	1.56	1.76	1.99	2.23	2.47	2.72	3.10	3.44*	3.84*	5.61*	7.70*
	25	1.73	1.96	2.22	2.49	2.77	3.05	3.49	3.88*	4.35*	6.47*	9.15*
2000	15	1.40	1.58	1.78	1.99	2.21	2.42	2.75	3.04*	3.38*	4.85*	6.50*
	20	1.59	1.80	2.04	2.28	2.53	2.79	3.17	3.52*	3.93*	5.74*	7.88*
	25	1.77	2.01	2.27	2.55	2.84	3.13	3.57	3.98*	4.46*	6.63*	9.35*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.84	0.95	1.08	1.22	1.37	1.52	1.76	1.99*	2.26*	4.20*	10.84*
	20	0.91	1.04	1.19	1.35	1.52	1.71	2.02	2.34*	2.77*	7.82*	23.31*
	25	0.98	1.12	1.29	1.48	1.68	1.91	2.33	2.84*	3.68*	13.91*	43.89*
200	15	1.02	1.16	1.32	1.48	1.66	1.84	2.14	2.41*	2.73*	4.66*	10.84*
	20	1.12	1.28	1.47	1.67	1.88	2.10	2.48	2.85*	3.32*	7.83*	23.31*
	25	1.22	1.40	1.61	1.84	2.09	2.37	2.86	3.39*	4.15*	13.91*	43.89*
300	15	1.16	1.32	1.50	1.69	1.90	2.10	2.43	2.74*	3.11*	5.15*	10.86*
	20	1.30	1.48	1.69	1.92	2.16	2.42	2.84	3.25*	3.77*	7.97*	23.31*
	25	1.42	1.63	1.87	2.14	2.43	2.74	3.28	3.85*	4.63*	13.91*	43.89*
400	15	1.29	1.46	1.66	1.88	2.10	2.33	2.69	3.03*	3.43*	5.60*	10.94*
	20	1.45	1.65	1.89	2.14	2.41	2.69	3.16	3.61*	4.17*	8.25*	23.31*
	25	1.59	1.83	2.10	2.39	2.71	3.06	3.65	4.26*	5.07*	13.92*	43.89*
500	15	1.40	1.59	1.81	2.04	2.28	2.53	2.93	3.29*	3.73*	6.02*	11.13*
	20	1.58	1.80	2.06	2.34	2.63	2.94	3.44	3.92*	4.53*	8.60*	23.32*
	25	1.75	2.00	2.30	2.62	2.97	3.35	3.98	4.63*	5.48*	13.95*	43.89*
600	15	1.50	1.71	1.94	2.19	2.45	2.72	3.14	3.53*	4.00*	6.41*	11.39*
	20	1.71	1.95	2.22	2.52	2.83	3.16	3.70	4.21*	4.86*	8.97*	23.32*
	25	1.89	2.17	2.49	2.83	3.21	3.61	4.29	4.97*	5.85*	14.02*	43.89*
700	15	1.60	1.82	2.07	2.33	2.61	2.89	3.34	3.75*	4.25*	6.78*	11.69*
	20	1.82	2.08	2.37	2.69	3.02	3.37	3.94	4.49*	5.16*	9.34*	23.32*
	25	2.03	2.32	2.66	3.03	3.43	3.85	4.57	5.28*	6.21*	14.16*	43.89*
800	15	1.69	1.92	2.19	2.47	2.76	3.06	3.53	3.96*	4.48*	7.13*	12.02*
	20	1.93	2.20	2.52	2.85	3.20	3.57	4.17	4.74*	5.45*	9.72*	23.33*
	25	2.15	2.46	2.83	3.22	3.64	4.09	4.84	5.58*	6.54*	14.34*	43.89*
900	15	1.78	2.02	2.30	2.59	2.90	3.21	3.71	4.16*	4.71*	7.46*	12.36*
	20	2.04	2.32	2.65	3.00	3.37	3.76	4.39	4.98*	5.72*	10.08*	23.34*
	25	2.27	2.60	2.98	3.39	3.83	4.30	5.09	5.86*	6.86*	14.56*	43.89*
1000	15	1.86	2.12	2.41	2.71	3.03	3.36	3.88	4.35*	4.92*	7.77*	12.70*
	20	2.14	2.44	2.78	3.15	3.53	3.94	4.60	5.22*	5.98*	10.43*	23.38*
	25	2.39	2.73	3.13	3.56	4.02	4.51	5.33	6.13*	7.16*	14.81*	43.89*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.95	2.21	2.51	2.83	3.16	3.50	4.04	4.53*	5.13*	8.07*	13.05*
	20	2.23	2.55	2.90	3.29	3.69	4.11	4.79	5.44*	6.24*	10.78*	23.43*
	25	2.50	2.86	3.27	3.72	4.20	4.71	5.56	6.39*	7.45*	15.08*	43.89*
1200	15	2.02	2.30	2.61	2.94	3.28	3.64	4.20	4.71*	5.32*	8.36*	13.39*
	20	2.32	2.65	3.02	3.42	3.84	4.28	4.98	5.65*	6.48*	11.12*	23.50*
	25	2.60	2.98	3.41	3.88	4.38	4.91	5.78	6.64*	7.73*	15.37*	43.89*
1300	15	2.10	2.38	2.71	3.05	3.40	3.77	4.35	4.87*	5.52*	8.64*	13.72*
	20	2.41	2.75	3.14	3.55	3.98	4.44	5.17	5.86*	6.71*	11.45*	23.60*
	25	2.70	3.10	3.55	4.03	4.54	5.09	6.00	6.88*	8.00*	15.66*	43.89*
1400	15	2.17	2.46	2.80	3.15	3.52	3.90	4.49	5.04*	5.70*	8.92*	14.06*
	20	2.50	2.85	3.25	3.68	4.12	4.59	5.35	6.05*	6.93*	11.77*	23.73*
	25	2.80	3.21	3.67	4.17	4.71	5.27	6.21	7.11*	8.27*	15.96*	43.89*
1500	15	2.24	2.54	2.89	3.26	3.63	4.02	4.64	5.20*	5.88*	9.18*	14.38*
	20	2.58	2.95	3.36	3.80	4.26	4.74	5.52	6.25*	7.15*	12.08*	23.87*
	25	2.90	3.32	3.80	4.32	4.86	5.45	6.41	7.34*	8.52*	16.26*	43.89*
1600	15	2.31	2.62	2.98	3.35	3.74	4.15	4.77	5.35*	6.05*	9.44*	14.70*
	20	2.67	3.04	3.47	3.92	4.39	4.89	5.69	6.44*	7.36*	12.38*	24.03*
	25	2.99	3.43	3.92	4.45	5.02	5.62	6.60	7.56*	8.77*	16.56*	43.89*
1700	15	2.38	2.70	3.06	3.45	3.85	4.26	4.91	5.50*	6.22*	9.69*	15.02*
	20	2.75	3.13	3.57	4.03	4.52	5.03	5.85	6.62*	7.57*	12.68*	24.22*
	25	3.09	3.53	4.04	4.59	5.17	5.78	6.79	7.77*	9.01*	16.86*	43.89*
1800	15	2.44	2.77	3.15	3.54	3.96	4.38	5.04	5.65*	6.39*	9.93*	15.33*
	20	2.82	3.22	3.67	4.15	4.65	5.17	6.01	6.80*	7.77*	12.97*	24.41*
	25	3.18	3.63	4.16	4.72	5.31	5.95	6.98	7.98*	9.24*	17.16*	43.90*
1900	15	2.51	2.84	3.23	3.64	4.06	4.49	5.17	5.79*	6.55*	10.17*	15.64*
	20	2.90	3.31	3.77	4.26	4.77	5.31	6.17	6.97*	7.97*	13.26*	24.62*
	25	3.26	3.73	4.27	4.84	5.46	6.10	7.16	8.18*	9.47*	17.46*	43.90*
2000	15	2.57	2.92	3.31	3.73	4.16	4.60	5.30	5.93*	6.71*	10.41*	15.94*
	20	2.98	3.39	3.86	4.37	4.89	5.44	6.32	7.14*	8.16*	13.54*	24.84*
	25	3.35	3.83	4.38	4.97	5.59	6.26	7.34	8.38*	9.70*	17.75*	43.91*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.38	1.60	1.87	2.18	2.55	3.04	4.31	6.52*	10.01*	45.03*	147.97*
	20	1.55	1.82	2.17	2.62	3.27	4.42	8.21	13.59*	21.74*	104.15*	347.61*
	25	1.70	2.04	2.51	3.21	4.56	7.37	14.86	25.27*	41.07*	201.62*	676.75*
200	15	1.75	2.03	2.36	2.74	3.18	3.72	4.88	6.68*	10.02*	45.03*	147.97*
	20	1.99	2.33	2.77	3.30	3.99	5.00	8.25	13.59*	21.74*	104.15*	347.61*
	25	2.22	2.64	3.21	3.96	5.14	7.46	14.86	25.27*	41.07*	201.62*	676.75*
300	15	2.04	2.37	2.75	3.19	3.69	4.27	5.46	7.09*	10.09*	45.03*	147.97*
	20	2.34	2.75	3.25	3.84	4.59	5.61	8.46	13.60*	21.74*	104.15*	347.61*
	25	2.63	3.12	3.76	4.59	5.77	7.81	14.86	25.27*	41.07*	201.62*	676.75*
400	15	2.30	2.66	3.09	3.57	4.12	4.76	6.00	7.57*	10.32*	45.03*	147.97*
	20	2.65	3.10	3.66	4.32	5.12	6.17	8.84	13.63*	21.74*	104.15*	347.61*
	25	2.98	3.54	4.25	5.14	6.36	8.29	14.88	25.27*	41.07*	201.62*	676.75*
500	15	2.53	2.93	3.40	3.92	4.51	5.19	6.49	8.05*	10.65*	45.03*	147.97*
	20	2.93	3.43	4.03	4.74	5.60	6.69	9.28	13.73*	21.74*	104.15*	347.61*
	25	3.30	3.91	4.68	5.63	6.90	8.79	14.94	25.27*	41.07*	201.62*	676.75*
600	15	2.74	3.17	3.68	4.24	4.87	5.59	6.94	8.52*	11.03*	45.03*	147.97*
	20	3.18	3.72	4.37	5.13	6.03	7.17	9.73	13.91*	21.74*	104.15*	347.61*
	25	3.60	4.26	5.08	6.09	7.40	9.28	15.07	25.27*	41.07*	201.62*	676.75*
700	15	2.94	3.40	3.94	4.54	5.21	5.97	7.36	8.97*	11.44*	45.03*	147.97*
	20	3.42	4.00	4.69	5.49	6.44	7.61	10.18	14.16*	21.76*	104.15*	347.61*
	25	3.88	4.58	5.45	6.51	7.87	9.76	15.27	25.27*	41.07*	201.62*	676.75*
800	15	3.13	3.62	4.19	4.82	5.52	6.32	7.77	9.40*	11.86*	45.03*	147.97*
	20	3.65	4.26	4.99	5.84	6.83	8.04	10.63	14.46*	21.81*	104.15*	347.61*
	25	4.14	4.88	5.80	6.91	8.31	10.23	15.53	25.28*	41.07*	201.62*	676.75*
900	15	3.31	3.82	4.42	5.09	5.82	6.65	8.15	9.82*	12.27*	45.03*	147.97*
	20	3.86	4.50	5.27	6.16	7.19	8.44	11.06	14.79*	21.88*	104.15*	347.61*
	25	4.38	5.17	6.13	7.29	8.73	10.68	15.84	25.31*	41.07*	201.62*	676.75*
1000	15	3.48	4.02	4.64	5.34	6.11	6.97	8.51	10.21*	12.68*	45.03*	147.97*
	20	4.07	4.74	5.55	6.47	7.54	8.83	11.47	15.14*	21.99*	104.15*	347.61*
	25	4.62	5.44	6.45	7.65	9.14	11.11	16.17	25.35*	41.07*	201.62*	676.75*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.64	4.20	4.86	5.58	6.38	7.27	8.86	10.60*	13.08*	45.03*	147.97*
	20	4.26	4.97	5.81	6.77	7.87	9.20	11.88	15.50*	22.14*	104.15*	347.61*
	25	4.84	5.70	6.75	7.99	9.53	11.53	16.51	25.41*	41.07*	201.62*	676.75*
1200	15	3.80	4.38	5.07	5.82	6.65	7.57	9.20	10.97*	13.47*	45.03*	147.97*
	20	4.45	5.18	6.06	7.05	8.20	9.56	12.27	15.86*	22.32*	104.15*	347.61*
	25	5.06	5.95	7.04	8.33	9.90	11.93	16.87	25.50*	41.07*	201.62*	676.75*
1300	15	3.95	4.56	5.26	6.04	6.90	7.85	9.53	11.33*	13.86*	45.03*	147.97*
	20	4.63	5.39	6.30	7.33	8.51	9.90	12.66	16.23*	22.53*	104.15*	347.61*
	25	5.27	6.20	7.32	8.65	10.26	12.33	17.23	25.62*	41.07*	201.62*	676.75*
1400	15	4.10	4.73	5.46	6.26	7.15	8.12	9.84	11.68*	14.23*	45.03*	147.97*
	20	4.81	5.60	6.53	7.59	8.81	10.23	13.03	16.59*	22.77*	104.15*	347.61*
	25	5.48	6.43	7.59	8.96	10.61	12.71	17.59	25.77*	41.08*	201.62*	676.75*
1500	15	4.24	4.89	5.65	6.48	7.38	8.39	10.15	12.02*	14.60*	45.04*	147.97*
	20	4.98	5.80	6.76	7.85	9.10	10.56	13.40	16.96*	23.02*	104.15*	347.61*
	25	5.67	6.66	7.86	9.26	10.95	13.08	17.96	25.94*	41.08*	201.62*	676.75*
1600	15	4.38	5.05	5.83	6.68	7.62	8.65	10.45	12.35*	14.96*	45.04*	147.97*
	20	5.15	5.99	6.98	8.10	9.38	10.87	13.75	17.31*	23.29*	104.15*	347.61*
	25	5.87	6.88	8.11	9.55	11.28	13.44	18.32	26.14*	41.10*	201.62*	676.75*
1700	15	4.52	5.21	6.01	6.88	7.84	8.90	10.74	12.67*	15.31*	45.06*	147.97*
	20	5.31	6.18	7.19	8.35	9.66	11.18	14.10	17.67*	23.57*	104.15*	347.61*
	25	6.06	7.10	8.36	9.84	11.60	13.80	18.68	26.35*	41.12*	201.62*	676.75*
1800	15	4.65	5.36	6.18	7.08	8.06	9.14	11.02	12.98*	15.66*	45.07*	147.97*
	20	5.47	6.36	7.40	8.59	9.92	11.48	14.44	18.02*	23.87*	104.15*	347.61*
	25	6.24	7.31	8.61	10.12	11.91	14.14	19.04	26.58*	41.14*	201.62*	676.75*
1900	15	4.78	5.51	6.35	7.27	8.28	9.38	11.30	13.29*	16.00*	45.10*	147.97*
	20	5.63	6.54	7.61	8.82	10.19	11.77	14.77	18.37*	24.16*	104.15*	347.61*
	25	6.42	7.52	8.85	10.39	12.22	14.48	19.39	26.82*	41.18*	201.62*	676.75*
2000	15	4.91	5.65	6.52	7.46	8.49	9.62	11.57	13.59*	16.33*	45.13*	147.97*
	20	5.78	6.71	7.81	9.05	10.44	12.06	15.09	18.71*	24.47*	104.15*	347.61*
	25	6.59	7.72	9.08	10.66	12.52	14.81	19.74	27.07*	41.23*	201.62*	676.75*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.51	3.16	4.31	7.21	13.24	23.12	48.72	84.45*	138.81*	692.79*	2334.0*
	20	2.97	4.10	7.39	15.39	29.56	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	3.48	5.69	13.37	28.92	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
200	15	3.28	4.07	5.29	7.62	13.24	23.12	48.72	84.45*	138.81*	692.79*	2334.0*
	20	3.91	5.17	7.87	15.40	29.56	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	4.58	6.68	13.38	28.92	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
300	15	3.90	4.80	6.11	8.32	13.31	23.12	48.72	84.45*	138.81*	692.79*	2334.0*
	20	4.67	6.05	8.63	15.42	29.56	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	5.47	7.63	13.52	28.92	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
400	15	4.44	5.43	6.84	9.04	13.55	23.12	48.72	84.45*	138.81*	692.79*	2334.0*
	20	5.32	6.82	9.40	15.57	29.56	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	6.23	8.50	13.88	28.92	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
500	15	4.92	6.00	7.49	9.73	13.94	23.13	48.72	84.45*	138.81*	692.79*	2334.0*
	20	5.91	7.51	10.14	15.87	29.56	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	6.91	9.29	14.41	28.93	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
600	15	5.37	6.52	8.10	10.38	14.42	23.17	48.72	84.45*	138.81*	692.79*	2334.0*
	20	6.45	8.15	10.84	16.28	29.57	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	7.54	10.02	15.00	28.94	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
700	15	5.78	7.01	8.66	11.00	14.94	23.25	48.72	84.45*	138.81*	692.79*	2334.0*
	20	6.95	8.74	11.50	16.77	29.58	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	8.13	10.70	15.62	28.97	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
800	15	6.17	7.47	9.19	11.59	15.47	23.40	48.72	84.45*	138.81*	692.79*	2334.0*
	20	7.43	9.30	12.13	17.29	29.62	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	8.68	11.35	16.25	29.03	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
900	15	6.54	7.90	9.69	12.15	16.01	23.60	48.72	84.45*	138.81*	692.79*	2334.0*
	20	7.87	9.83	12.73	17.82	29.69	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	9.20	11.96	16.87	29.15	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1000	15	6.89	8.31	10.17	12.69	16.54	23.86	48.72	84.45*	138.81*	692.79*	2334.0*
	20	8.30	10.33	13.31	18.37	29.80	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	9.70	12.55	17.48	29.31	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 14.0 Ft (RADIUS = 9.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	7.23	8.71	10.63	13.21	17.07	24.16	48.72	84.45*	138.81*	692.79*	2334.0*
	20	8.71	10.82	13.87	18.91	29.96	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	10.18	13.11	18.08	29.53	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1200	15	7.56	9.09	11.08	13.71	17.59	24.50	48.72	84.45*	138.81*	692.79*	2334.0*
	20	9.11	11.28	14.40	19.45	30.16	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	10.64	13.66	18.66	29.79	56.47	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1300	15	7.88	9.46	11.50	14.19	18.09	24.87	48.72	84.45*	138.81*	692.79*	2334.0*
	20	9.49	11.73	14.92	19.98	30.39	52.82	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	11.08	14.18	19.23	30.09	56.48	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1400	15	8.18	9.82	11.92	14.66	18.59	25.25	48.73	84.45*	138.81*	692.79*	2334.0*
	20	9.86	12.17	15.42	20.50	30.67	52.83	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	11.51	14.69	19.79	30.43	56.48	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1500	15	8.48	10.16	12.32	15.12	19.08	25.65	48.74	84.45*	138.81*	692.79*	2334.0*
	20	10.22	12.59	15.91	21.01	30.97	52.84	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	11.93	15.18	20.34	30.79	56.49	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1600	15	8.77	10.50	12.71	15.56	19.55	26.05	48.76	84.45*	138.81*	692.79*	2334.0*
	20	10.57	13.00	16.38	21.52	31.30	52.85	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	12.34	15.66	20.87	31.17	56.50	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1700	15	9.05	10.83	13.09	16.00	20.02	26.47	48.79	84.45*	138.81*	692.79*	2334.0*
	20	10.91	13.40	16.84	22.02	31.64	52.87	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	12.73	16.13	21.40	31.57	56.51	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1800	15	9.32	11.15	13.46	16.42	20.48	26.88	48.83	84.45*	138.81*	692.79*	2334.0*
	20	11.24	13.79	17.29	22.50	32.01	52.90	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	13.12	16.58	21.91	31.98	56.53	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
1900	15	9.59	11.46	13.82	16.83	20.93	27.30	48.87	84.45*	138.81*	692.79*	2334.0*
	20	11.57	14.17	17.74	22.98	32.38	52.94	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	13.50	17.02	22.41	32.40	56.57	101.78	219.63	384.51*	635.65*	3198.4*	10794.*
2000	15	9.85	11.76	14.18	17.23	21.37	27.72	48.94	84.45*	138.81*	692.79*	2334.0*
	20	11.88	14.54	18.17	23.46	32.76	52.99	113.24	197.73*	326.39*	1638.8*	5528.2*
	25	13.87	17.46	22.90	32.82	56.61	101.78	219.63	384.51*	635.65*	3198.4*	10794.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.60	0.67	0.75	0.83	0.91	0.99	1.12	1.23	1.34*	1.85*	2.47*
	20	0.64	0.71	0.80	0.88	0.98	1.07	1.21	1.33	1.46*	2.10*	3.07*
	25	0.68	0.75	0.84	0.94	1.04	1.14	1.30	1.44	1.59*	2.40*	4.26*
200	15	0.70	0.78	0.87	0.97	1.06	1.16	1.31	1.44	1.57*	2.18*	2.91*
	20	0.76	0.85	0.95	1.05	1.16	1.27	1.44	1.58	1.74*	2.50*	3.55*
	25	0.82	0.91	1.02	1.13	1.25	1.37	1.56	1.73	1.91*	2.87*	4.54*
300	15	0.79	0.87	0.97	1.08	1.19	1.30	1.46	1.60	1.75*	2.45*	3.27*
	20	0.86	0.95	1.07	1.19	1.31	1.43	1.62	1.79	1.96*	2.83*	3.97*
	25	0.93	1.03	1.15	1.29	1.42	1.56	1.78	1.97	2.17*	3.24*	4.94*
400	15	0.86	0.95	1.06	1.17	1.29	1.41	1.59	1.75	1.91*	2.68*	3.58*
	20	0.94	1.05	1.17	1.30	1.44	1.57	1.78	1.96	2.16*	3.11*	4.34*
	25	1.02	1.14	1.28	1.42	1.57	1.72	1.96	2.17	2.40*	3.57*	5.33*
500	15	0.92	1.02	1.14	1.26	1.39	1.52	1.71	1.88	2.05*	2.89*	3.86*
	20	1.02	1.13	1.27	1.41	1.55	1.70	1.93	2.12	2.33*	3.36*	4.68*
	25	1.11	1.24	1.39	1.54	1.70	1.87	2.13	2.35	2.60*	3.87*	5.70*
600	15	0.98	1.09	1.21	1.34	1.48	1.62	1.82	2.00	2.19*	3.08*	4.11*
	20	1.09	1.21	1.35	1.50	1.66	1.82	2.06	2.27	2.49*	3.60*	4.99*
	25	1.19	1.33	1.49	1.65	1.83	2.01	2.28	2.52	2.78*	4.14*	6.05*
700	15	1.04	1.15	1.28	1.42	1.56	1.71	1.93	2.11	2.31*	3.26*	4.35*
	20	1.16	1.28	1.44	1.60	1.76	1.93	2.18	2.40	2.64*	3.81*	5.28*
	25	1.27	1.41	1.58	1.76	1.94	2.13	2.43	2.68	2.96*	4.39*	6.38*
800	15	1.09	1.21	1.34	1.49	1.64	1.79	2.02	2.22	2.43*	3.43*	4.57*
	20	1.22	1.35	1.51	1.68	1.85	2.03	2.30	2.53	2.78*	4.02*	5.55*
	25	1.34	1.49	1.67	1.86	2.05	2.25	2.56	2.83	3.12*	4.63*	6.69*
900	15	1.14	1.26	1.41	1.56	1.72	1.87	2.12	2.32	2.54*	3.59*	4.79*
	20	1.28	1.42	1.59	1.76	1.94	2.13	2.41	2.65	2.91*	4.21*	5.81*
	25	1.41	1.57	1.75	1.95	2.15	2.36	2.69	2.97	3.28*	4.86*	6.99*
1000	15	1.18	1.31	1.46	1.62	1.79	1.95	2.20	2.42	2.64*	3.74*	4.99*
	20	1.33	1.48	1.66	1.84	2.03	2.22	2.52	2.77	3.04*	4.39*	6.05*
	25	1.47	1.64	1.83	2.04	2.25	2.47	2.81	3.10	3.42*	5.07*	7.27*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.23	1.36	1.52	1.69	1.86	2.03	2.29	2.51	2.74*	3.88*	5.18*
	20	1.39	1.54	1.72	1.91	2.11	2.31	2.62	2.88	3.16*	4.57*	6.29*
	25	1.53	1.71	1.91	2.13	2.35	2.58	2.93	3.23	3.56*	5.28*	7.55*
1200	15	1.27	1.41	1.58	1.75	1.92	2.10	2.37	2.60	2.84*	4.02*	5.37*
	20	1.44	1.60	1.79	1.99	2.19	2.40	2.71	2.99	3.28*	4.74*	6.52*
	25	1.59	1.77	1.98	2.21	2.44	2.67	3.04	3.36	3.70*	5.48*	7.81*
1300	15	1.32	1.46	1.63	1.80	1.99	2.17	2.45	2.68	2.93*	4.16*	5.55*
	20	1.49	1.66	1.85	2.06	2.27	2.48	2.81	3.09	3.39*	4.91*	6.74*
	25	1.65	1.84	2.06	2.29	2.53	2.77	3.15	3.48	3.83*	5.67*	8.06*
1400	15	1.36	1.51	1.68	1.86	2.05	2.24	2.52	2.77	3.03*	4.29*	5.72*
	20	1.54	1.71	1.91	2.12	2.34	2.56	2.90	3.19	3.50*	5.06*	6.95*
	25	1.71	1.90	2.13	2.37	2.61	2.86	3.26	3.59	3.96*	5.85*	8.31*
1500	15	1.40	1.55	1.73	1.92	2.11	2.30	2.60	2.85	3.11*	4.42*	5.89*
	20	1.59	1.76	1.97	2.19	2.41	2.64	2.99	3.29	3.61*	5.22*	7.16*
	25	1.76	1.96	2.19	2.44	2.69	2.96	3.36	3.71	4.08*	6.03*	8.55*
1600	15	1.44	1.59	1.78	1.97	2.17	2.36	2.67	2.93	3.20*	4.54*	6.06*
	20	1.64	1.82	2.03	2.25	2.48	2.72	3.07	3.38	3.71*	5.37*	7.36*
	25	1.82	2.02	2.26	2.51	2.78	3.04	3.46	3.81	4.20*	6.21*	8.78*
1700	15	1.47	1.63	1.82	2.02	2.22	2.43	2.74	3.00	3.28*	4.66*	6.22*
	20	1.68	1.87	2.08	2.31	2.55	2.79	3.16	3.47	3.81*	5.52*	7.55*
	25	1.87	2.08	2.32	2.59	2.85	3.13	3.55	3.92	4.32*	6.38*	9.01*
1800	15	1.51	1.68	1.87	2.07	2.28	2.49	2.81	3.08	3.37*	4.78*	6.37*
	20	1.72	1.92	2.14	2.37	2.62	2.86	3.24	3.56	3.91*	5.66*	7.74*
	25	1.92	2.13	2.39	2.65	2.93	3.21	3.65	4.03	4.44*	6.55*	9.23*
1900	15	1.55	1.72	1.91	2.12	2.33	2.55	2.87	3.15	3.45*	4.89*	6.53*
	20	1.77	1.96	2.19	2.43	2.68	2.93	3.32	3.65	4.01*	5.80*	7.93*
	25	1.97	2.19	2.45	2.72	3.01	3.29	3.74	4.13	4.55*	6.71*	9.45*
2000	15	1.58	1.76	1.96	2.17	2.39	2.61	2.94	3.22	3.52*	5.00*	6.67*
	20	1.81	2.01	2.25	2.49	2.75	3.00	3.40	3.74	4.10*	5.93*	8.11*
	25	2.02	2.24	2.51	2.79	3.08	3.38	3.83	4.23	4.66*	6.87*	9.66*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.94	1.05	1.18	1.32	1.47	1.62	1.87	2.10	2.37*	4.55*	11.79*
	20	1.02	1.15	1.30	1.46	1.64	1.83	2.17	2.51	2.97*	8.67*	25.53*
	25	1.10	1.24	1.41	1.61	1.82	2.07	2.53	3.11	4.10*	15.55*	48.18*
200	15	1.15	1.28	1.44	1.61	1.79	1.98	2.28	2.55	2.86*	4.95*	11.79*
	20	1.27	1.42	1.61	1.81	2.03	2.26	2.66	3.04	3.52*	8.68*	25.53*
	25	1.38	1.56	1.78	2.01	2.28	2.57	3.09	3.67	4.50*	15.55*	48.18*
300	15	1.31	1.46	1.65	1.84	2.05	2.26	2.60	2.91	3.26*	5.43*	11.79*
	20	1.47	1.64	1.86	2.09	2.34	2.61	3.05	3.48	3.99*	8.76*	25.53*
	25	1.61	1.82	2.07	2.34	2.64	2.97	3.55	4.16	4.98*	15.55*	48.18*
400	15	1.45	1.62	1.83	2.04	2.27	2.50	2.88	3.22	3.60*	5.89*	11.85*
	20	1.64	1.84	2.08	2.34	2.61	2.91	3.39	3.86	4.41*	8.97*	25.53*
	25	1.81	2.04	2.32	2.62	2.95	3.32	3.95	4.59	5.43*	15.55*	48.18*
500	15	1.58	1.77	1.99	2.22	2.47	2.73	3.13	3.50	3.91*	6.32*	11.98*
	20	1.79	2.01	2.27	2.56	2.86	3.18	3.70	4.20	4.78*	9.27*	25.53*
	25	1.99	2.24	2.54	2.88	3.24	3.63	4.31	4.98	5.85*	15.56*	48.18*
600	15	1.70	1.90	2.14	2.39	2.65	2.93	3.36	3.75	4.19*	6.72*	12.19*
	20	1.94	2.17	2.45	2.76	3.08	3.42	3.98	4.51	5.12*	9.61*	25.53*
	25	2.15	2.42	2.75	3.11	3.50	3.92	4.64	5.35	6.24*	15.60*	48.18*
700	15	1.82	2.03	2.28	2.55	2.83	3.12	3.58	3.99	4.45*	7.09*	12.46*
	20	2.07	2.32	2.62	2.94	3.29	3.65	4.25	4.80	5.44*	9.98*	25.53*
	25	2.30	2.60	2.95	3.33	3.74	4.19	4.94	5.68	6.60*	15.68*	48.18*
800	15	1.92	2.14	2.41	2.69	2.99	3.30	3.78	4.22	4.70*	7.45*	12.76*
	20	2.20	2.46	2.78	3.12	3.48	3.87	4.49	5.07	5.74*	10.34*	25.53*
	25	2.45	2.76	3.13	3.53	3.97	4.44	5.23	6.00	6.95*	15.80*	48.18*
900	15	2.02	2.26	2.54	2.83	3.14	3.47	3.98	4.43	4.93*	7.79*	13.08*
	20	2.32	2.60	2.93	3.29	3.67	4.07	4.73	5.33	6.03*	10.70*	25.54*
	25	2.59	2.91	3.30	3.73	4.18	4.68	5.51	6.31	7.28*	15.97*	48.18*
1000	15	2.12	2.36	2.66	2.97	3.29	3.63	4.16	4.63	5.16*	8.11*	13.41*
	20	2.43	2.72	3.07	3.45	3.85	4.27	4.95	5.58	6.30*	11.06*	25.56*
	25	2.72	3.06	3.47	3.91	4.39	4.91	5.77	6.59	7.60*	16.18*	48.18*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.21	2.47	2.77	3.09	3.43	3.78	4.34	4.83	5.37*	8.42*	13.75*
	20	2.54	2.85	3.21	3.60	4.02	4.46	5.17	5.82	6.57*	11.41*	25.58*
	25	2.84	3.20	3.63	4.09	4.59	5.13	6.02	6.87	7.90*	16.41*	48.18*
1200	15	2.30	2.57	2.88	3.22	3.57	3.93	4.51	5.01	5.58*	8.72*	14.08*
	20	2.65	2.97	3.35	3.75	4.18	4.64	5.37	6.04	6.82*	11.75*	25.63*
	25	2.97	3.34	3.78	4.26	4.78	5.34	6.26	7.14	8.19*	16.66*	48.18*
1300	15	2.38	2.66	2.99	3.34	3.70	4.08	4.67	5.19	5.78*	9.02*	14.42*
	20	2.75	3.08	3.47	3.90	4.34	4.81	5.57	6.26	7.06*	12.08*	25.69*
	25	3.08	3.47	3.93	4.43	4.96	5.54	6.49	7.39	8.47*	16.93*	48.18*
1400	15	2.47	2.75	3.09	3.45	3.83	4.22	4.83	5.37	5.97*	9.30*	14.75*
	20	2.85	3.19	3.60	4.03	4.50	4.98	5.76	6.48	7.30*	12.41*	25.78*
	25	3.20	3.60	4.07	4.59	5.14	5.74	6.72	7.64	8.75*	17.21*	48.18*
1500	15	2.55	2.84	3.19	3.56	3.95	4.35	4.98	5.54	6.16*	9.57*	15.08*
	20	2.94	3.30	3.72	4.17	4.64	5.15	5.95	6.69	7.52*	12.73*	25.88*
	25	3.31	3.72	4.21	4.75	5.32	5.93	6.93	7.88	9.01*	17.49*	48.18*
1600	15	2.63	2.93	3.29	3.67	4.07	4.48	5.13	5.70	6.34*	9.84*	15.40*
	20	3.04	3.40	3.84	4.30	4.79	5.31	6.13	6.89	7.75*	13.04*	26.01*
	25	3.42	3.84	4.35	4.90	5.48	6.11	7.15	8.12	9.27*	17.78*	48.18*
1700	15	2.70	3.02	3.39	3.78	4.19	4.61	5.28	5.87	6.52*	10.09*	15.72*
	20	3.13	3.51	3.95	4.43	4.93	5.46	6.31	7.08	7.96*	13.34*	26.15*
	25	3.52	3.96	4.48	5.05	5.65	6.29	7.35	8.35	9.52*	18.07*	48.18*
1800	15	2.78	3.10	3.48	3.88	4.30	4.74	5.42	6.02	6.69*	10.35*	16.03*
	20	3.22	3.61	4.06	4.55	5.07	5.61	6.48	7.27	8.17*	13.64*	26.31*
	25	3.62	4.08	4.61	5.19	5.81	6.47	7.55	8.57	9.77*	18.36*	48.18*
1900	15	2.85	3.18	3.57	3.98	4.41	4.86	5.56	6.18	6.86*	10.59*	16.34*
	20	3.31	3.70	4.17	4.68	5.20	5.76	6.65	7.46	8.38*	13.94*	26.49*
	25	3.72	4.19	4.74	5.33	5.96	6.64	7.75	8.79	10.01*	18.65*	48.19*
2000	15	2.92	3.26	3.66	4.08	4.52	4.98	5.70	6.33	7.02*	10.84*	16.64*
	20	3.39	3.80	4.28	4.79	5.34	5.91	6.82	7.64	8.58*	14.22*	26.68*
	25	3.82	4.30	4.86	5.47	6.12	6.81	7.94	9.00	10.25*	18.95*	48.19*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.56	1.78	2.06	2.40	2.81	3.37	4.93	7.57	11.57*	50.63*	162.76*
	20	1.76	2.04	2.42	2.93	3.71	5.22	9.78	16.04	25.38*	117.38*	382.61*
	25	1.94	2.31	2.84	3.70	5.51	9.00	17.88	30.00	48.14*	227.42*	745.08*
200	15	1.98	2.26	2.61	3.02	3.49	4.09	5.45	7.65	11.57*	50.63*	162.76*
	20	2.26	2.62	3.09	3.68	4.47	5.71	9.79	16.04	25.38*	117.38*	382.61*
	25	2.53	2.99	3.62	4.50	5.98	9.04	17.88	30.00	48.14*	227.42*	745.08*
300	15	2.32	2.65	3.05	3.51	4.05	4.69	6.04	7.98	11.60*	50.63*	162.76*
	20	2.67	3.09	3.63	4.28	5.12	6.32	9.91	16.04	25.38*	117.38*	382.61*
	25	3.01	3.54	4.24	5.18	6.61	9.25	17.88	30.00	48.14*	227.42*	745.08*
400	15	2.62	2.98	3.43	3.94	4.53	5.22	6.60	8.43	11.72*	50.63*	162.76*
	20	3.03	3.50	4.09	4.80	5.70	6.91	10.19	16.05	25.38*	117.38*	382.61*
	25	3.42	4.01	4.78	5.78	7.22	9.64	17.88	30.00	48.14*	227.42*	745.08*
500	15	2.88	3.28	3.77	4.33	4.96	5.69	7.13	8.91	11.95*	50.63*	162.76*
	20	3.35	3.86	4.50	5.27	6.22	7.46	10.58	16.09	25.38*	117.38*	382.61*
	25	3.79	4.43	5.26	6.33	7.79	10.11	17.90	30.00	48.14*	227.42*	745.08*
600	15	3.13	3.56	4.09	4.68	5.35	6.13	7.61	9.38	12.27*	50.63*	162.76*
	20	3.64	4.20	4.89	5.70	6.70	7.97	11.02	16.19	25.38*	117.38*	382.61*
	25	4.13	4.82	5.71	6.83	8.33	10.61	17.96	30.00	48.14*	227.42*	745.08*
700	15	3.36	3.82	4.38	5.01	5.72	6.54	8.07	9.85	12.64*	50.63*	162.76*
	20	3.92	4.51	5.24	6.11	7.15	8.46	11.47	16.35	25.38*	117.38*	382.61*
	25	4.45	5.18	6.13	7.30	8.84	11.10	18.08	30.00	48.14*	227.42*	745.08*
800	15	3.57	4.06	4.65	5.32	6.07	6.92	8.50	10.30	13.02*	50.63*	162.76*
	20	4.17	4.80	5.58	6.48	7.57	8.92	11.92	16.58	25.40*	117.38*	382.61*
	25	4.74	5.53	6.52	7.74	9.33	11.58	18.26	30.00	48.14*	227.42*	745.08*
900	15	3.78	4.29	4.92	5.61	6.40	7.28	8.91	10.73	13.42*	50.63*	162.76*
	20	4.42	5.08	5.89	6.84	7.97	9.36	12.36	16.86	25.42*	117.38*	382.61*
	25	5.03	5.85	6.89	8.16	9.79	12.05	18.48	30.00	48.14*	227.42*	745.08*
1000	15	3.97	4.51	5.17	5.89	6.71	7.63	9.31	11.15	13.82*	50.63*	162.76*
	20	4.66	5.35	6.20	7.19	8.35	9.77	12.80	17.17	25.47*	117.38*	382.61*
	25	5.30	6.16	7.24	8.56	10.23	12.51	18.75	30.02	48.14*	227.42*	745.08*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.16	4.73	5.40	6.16	7.01	7.96	9.69	11.56	14.22*	50.63*	162.76*
	20	4.88	5.60	6.49	7.51	8.72	10.18	13.23	17.50	25.54*	117.38*	382.61*
	25	5.56	6.46	7.58	8.94	10.65	12.96	19.06	30.04	48.14*	227.42*	745.08*
1200	15	4.34	4.93	5.64	6.42	7.30	8.28	10.05	11.95	14.61*	50.63*	162.76*
	20	5.10	5.85	6.77	7.83	9.07	10.56	13.64	17.84	25.65*	117.38*	382.61*
	25	5.81	6.74	7.91	9.31	11.06	13.39	19.38	30.09	48.14*	227.42*	745.08*
1300	15	4.51	5.13	5.86	6.67	7.58	8.59	10.40	12.33	15.00*	50.63*	162.76*
	20	5.31	6.09	7.04	8.13	9.41	10.94	14.05	18.20	25.78*	117.38*	382.61*
	25	6.05	7.02	8.22	9.67	11.46	13.81	19.72	30.15	48.14*	227.42*	745.08*
1400	15	4.68	5.32	6.07	6.92	7.85	8.89	10.74	12.70	15.38*	50.63*	162.76*
	20	5.51	6.32	7.30	8.43	9.74	11.30	14.45	18.56	25.94*	117.38*	382.61*
	25	6.29	7.29	8.53	10.01	11.84	14.22	20.07	30.23	48.14*	227.42*	745.08*
1500	15	4.85	5.50	6.28	7.15	8.11	9.18	11.07	13.06	15.75*	50.63*	162.76*
	20	5.71	6.54	7.55	8.72	10.06	11.66	14.83	18.92	26.12*	117.38*	382.61*
	25	6.52	7.55	8.82	10.34	12.21	14.63	20.42	30.33	48.14*	227.42*	745.08*
1600	15	5.01	5.68	6.49	7.38	8.36	9.46	11.40	13.41	16.12*	50.63*	162.76*
	20	5.90	6.76	7.80	8.99	10.37	12.00	15.21	19.28	26.33*	117.38*	382.61*
	25	6.74	7.80	9.11	10.67	12.57	15.02	20.78	30.46	48.14*	227.42*	745.08*
1700	15	5.16	5.86	6.69	7.60	8.61	9.74	11.71	13.76	16.48*	50.64*	162.76*
	20	6.09	6.97	8.04	9.27	10.67	12.33	15.59	19.64	26.55*	117.38*	382.61*
	25	6.95	8.04	9.39	10.98	12.92	15.40	21.15	30.60	48.15*	227.42*	745.08*
1800	15	5.32	6.03	6.88	7.82	8.85	10.00	12.02	14.09	16.84*	50.64*	162.76*
	20	6.27	7.18	8.28	9.53	10.97	12.66	15.95	20.00	26.79*	117.38*	382.61*
	25	7.16	8.28	9.66	11.29	13.27	15.77	21.51	30.77	48.15*	227.42*	745.08*
1900	15	5.47	6.20	7.07	8.03	9.09	10.26	12.32	14.42	17.18*	50.65*	162.76*
	20	6.45	7.38	8.51	9.79	11.26	12.98	16.30	20.35	27.04*	117.38*	382.61*
	25	7.37	8.52	9.93	11.59	13.60	16.14	21.87	30.96	48.16*	227.42*	745.08*
2000	15	5.61	6.36	7.25	8.24	9.32	10.52	12.61	14.74	17.53*	50.66*	162.76*
	20	6.62	7.58	8.73	10.04	11.54	13.29	16.65	20.70	27.31*	117.38*	382.61*
	25	7.57	8.75	10.19	11.89	13.93	16.50	22.23	31.16	48.18*	227.42*	745.08*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.89	3.65	5.17	9.19	16.68	28.68	59.07	100.70	163.15*	781.86*	2570.0*
	20	3.47	4.97	9.79	20.05	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	4.15	7.56	18.03	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
200	15	3.78	4.67	6.16	9.38	16.68	28.68	59.07	100.70	163.15*	781.86*	2570.0*
	20	4.56	6.11	9.99	20.05	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	5.41	8.30	18.03	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
300	15	4.50	5.50	7.05	9.94	16.70	28.68	59.07	100.70	163.15*	781.86*	2570.0*
	20	5.43	7.09	10.58	20.05	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	6.43	9.26	18.06	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
400	15	5.12	6.22	7.86	10.63	16.79	28.68	59.07	100.70	163.15*	781.86*	2570.0*
	20	6.19	7.95	11.31	20.08	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	7.31	10.19	18.18	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
500	15	5.68	6.86	8.58	11.33	17.01	28.68	59.07	100.70	163.15*	781.86*	2570.0*
	20	6.87	8.73	12.06	20.19	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	8.10	11.05	18.46	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
600	15	6.19	7.46	9.25	12.02	17.36	28.69	59.07	100.70	163.15*	781.86*	2570.0*
	20	7.49	9.45	12.80	20.42	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	8.83	11.86	18.88	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
700	15	6.67	8.01	9.88	12.68	17.79	28.71	59.07	100.70	163.15*	781.86*	2570.0*
	20	8.07	10.12	13.51	20.74	37.65	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	9.51	12.63	19.39	37.95	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
800	15	7.12	8.53	10.47	13.31	18.27	28.76	59.07	100.70	163.15*	781.86*	2570.0*
	20	8.62	10.76	14.19	21.15	37.66	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	10.15	13.35	19.95	37.96	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
900	15	7.54	9.02	11.04	13.92	18.78	28.86	59.07	100.70	163.15*	781.86*	2570.0*
	20	9.14	11.36	14.85	21.61	37.67	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	10.75	14.05	20.54	37.98	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1000	15	7.95	9.49	11.57	14.51	19.30	29.00	59.07	100.70	163.15*	781.86*	2570.0*
	20	9.63	11.93	15.48	22.10	37.70	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	11.33	14.71	21.14	38.03	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 16.0 Ft (RADIUS = 11.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	8.34	9.94	12.09	15.08	19.83	29.18	59.07	100.70	163.15*	781.86*	2570.0*
	20	10.11	12.48	16.09	22.61	37.75	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	11.88	15.34	21.75	38.10	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1200	15	8.72	10.37	12.58	15.62	20.36	29.42	59.07	100.70	163.15*	781.86*	2570.0*
	20	10.56	13.01	16.68	23.13	37.83	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	12.41	15.96	22.35	38.21	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1300	15	9.08	10.79	13.06	16.15	20.88	29.69	59.07	100.70	163.15*	781.86*	2570.0*
	20	11.00	13.52	17.26	23.66	37.94	65.91	137.70	236.17	384.03*	1849.8*	6087.7*
	25	12.93	16.55	22.94	38.35	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1400	15	9.43	11.19	13.53	16.67	21.39	29.99	59.07	100.70	163.15*	781.86*	2570.0*
	20	11.43	14.01	17.81	24.19	38.09	65.92	137.70	236.17	384.03*	1849.8*	6087.7*
	25	13.42	17.12	23.53	38.53	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1500	15	9.78	11.59	13.98	17.17	21.90	30.32	59.07	100.70	163.15*	781.86*	2570.0*
	20	11.85	14.49	18.35	24.72	38.26	65.92	137.70	236.17	384.03*	1849.8*	6087.7*
	25	13.91	17.68	24.11	38.75	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1600	15	10.11	11.97	14.41	17.66	22.41	30.68	59.07	100.70	163.15*	781.86*	2570.0*
	20	12.25	14.96	18.88	25.24	38.47	65.92	137.70	236.17	384.03*	1849.8*	6087.7*
	25	14.38	18.22	24.68	39.00	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1700	15	10.43	12.34	14.84	18.14	22.90	31.04	59.08	100.70	163.15*	781.86*	2570.0*
	20	12.64	15.41	19.39	25.76	38.71	65.92	137.70	236.17	384.03*	1849.8*	6087.7*
	25	14.83	18.75	25.25	39.28	72.21	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1800	15	10.75	12.70	15.25	18.60	23.39	31.43	59.09	100.70	163.15*	781.86*	2570.0*
	20	13.02	15.85	19.90	26.27	38.97	65.93	137.70	236.17	384.03*	1849.8*	6087.7*
	25	15.28	19.27	25.80	39.59	72.22	127.30	267.33	459.53	748.17*	3610.5*	11887.*
1900	15	11.06	13.06	15.66	19.06	23.87	31.82	59.11	100.70	163.15*	781.86*	2570.0*
	20	13.40	16.28	20.39	26.78	39.26	65.94	137.70	236.17	384.03*	1849.8*	6087.7*
	25	15.71	19.77	26.34	39.92	72.22	127.30	267.33	459.53	748.17*	3610.5*	11887.*
2000	15	11.36	13.40	16.06	19.50	24.34	32.22	59.13	100.70	163.15*	781.86*	2570.0*
	20	13.76	16.71	20.87	27.28	39.57	65.95	137.70	236.17	384.03*	1849.8*	6087.7*
	25	16.14	20.26	26.88	40.26	72.23	127.30	267.33	459.53	748.17*	3610.5*	11887.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.67	0.73	0.80	0.88	0.96	1.05	1.18	1.28	1.39	1.90*	2.54*
	20	0.71	0.78	0.86	0.95	1.04	1.13	1.27	1.40	1.52	2.17*	3.20*
	25	0.75	0.82	0.91	1.01	1.11	1.21	1.37	1.51	1.66	2.51*	4.55*
200	15	0.78	0.85	0.94	1.03	1.13	1.23	1.38	1.51	1.64	2.25*	2.99*
	20	0.85	0.92	1.02	1.13	1.24	1.35	1.52	1.67	1.82	2.58*	3.68*
	25	0.91	0.99	1.10	1.22	1.34	1.46	1.66	1.83	2.01	2.98*	4.79*
300	15	0.87	0.95	1.05	1.16	1.26	1.37	1.54	1.69	1.83	2.52*	3.36*
	20	0.96	1.05	1.16	1.27	1.40	1.52	1.72	1.88	2.06	2.92*	4.10*
	25	1.03	1.13	1.25	1.39	1.52	1.67	1.89	2.08	2.28	3.37*	5.17*
400	15	0.95	1.04	1.15	1.26	1.38	1.50	1.69	1.84	2.00	2.76*	3.68*
	20	1.05	1.15	1.27	1.40	1.54	1.68	1.89	2.07	2.26	3.21*	4.48*
	25	1.14	1.25	1.39	1.53	1.69	1.84	2.09	2.30	2.52	3.71*	5.56*
500	15	1.03	1.12	1.24	1.36	1.49	1.62	1.81	1.98	2.15	2.98*	3.96*
	20	1.14	1.24	1.38	1.52	1.66	1.81	2.04	2.24	2.45	3.47*	4.83*
	25	1.24	1.36	1.51	1.67	1.83	2.00	2.26	2.50	2.74	4.01*	5.93*
600	15	1.09	1.19	1.32	1.45	1.58	1.72	1.93	2.11	2.29	3.18*	4.22*
	20	1.22	1.33	1.47	1.62	1.78	1.94	2.19	2.40	2.62	3.72*	5.14*
	25	1.33	1.46	1.62	1.79	1.96	2.15	2.43	2.68	2.93	4.29*	6.29*
700	15	1.15	1.26	1.39	1.53	1.67	1.82	2.04	2.23	2.42	3.36*	4.47*
	20	1.29	1.41	1.56	1.72	1.89	2.06	2.32	2.54	2.77	3.94*	5.44*
	25	1.42	1.56	1.72	1.90	2.09	2.28	2.58	2.84	3.12	4.55*	6.62*
800	15	1.21	1.32	1.46	1.61	1.76	1.91	2.15	2.34	2.55	3.53*	4.70*
	20	1.36	1.49	1.65	1.82	1.99	2.17	2.44	2.68	2.92	4.15*	5.72*
	25	1.50	1.64	1.82	2.01	2.21	2.41	2.73	3.00	3.29	4.80*	6.94*
900	15	1.27	1.39	1.53	1.68	1.84	2.00	2.24	2.45	2.66	3.70*	4.91*
	20	1.43	1.56	1.73	1.91	2.09	2.27	2.56	2.81	3.06	4.35*	5.98*
	25	1.58	1.73	1.91	2.11	2.32	2.53	2.87	3.15	3.45	5.03*	7.24*
1000	15	1.32	1.44	1.59	1.75	1.92	2.08	2.34	2.55	2.77	3.85*	5.12*
	20	1.49	1.63	1.81	1.99	2.18	2.38	2.68	2.93	3.20	4.54*	6.24*
	25	1.65	1.81	2.00	2.21	2.43	2.65	3.00	3.30	3.61	5.25*	7.53*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.37	1.50	1.66	1.82	1.99	2.16	2.43	2.65	2.88	4.00*	5.32*
	20	1.55	1.70	1.88	2.07	2.27	2.47	2.78	3.05	3.33	4.72*	6.48*
	25	1.72	1.88	2.09	2.30	2.53	2.76	3.12	3.43	3.76	5.47*	7.81*
1200	15	1.42	1.56	1.72	1.89	2.06	2.24	2.52	2.75	2.98	4.15*	5.51*
	20	1.61	1.77	1.95	2.15	2.36	2.57	2.89	3.17	3.45	4.90*	6.71*
	25	1.79	1.96	2.17	2.40	2.63	2.87	3.24	3.57	3.90	5.67*	8.08*
1300	15	1.47	1.61	1.77	1.95	2.13	2.32	2.60	2.84	3.08	4.29*	5.70*
	20	1.67	1.83	2.02	2.23	2.44	2.66	2.99	3.28	3.57	5.07*	6.94*
	25	1.85	2.03	2.25	2.48	2.72	2.97	3.36	3.70	4.04	5.87*	8.34*
1400	15	1.52	1.66	1.83	2.01	2.20	2.39	2.68	2.93	3.18	4.42*	5.88*
	20	1.73	1.89	2.09	2.30	2.52	2.74	3.09	3.38	3.69	5.23*	7.16*
	25	1.92	2.10	2.33	2.57	2.82	3.07	3.47	3.82	4.18	6.06*	8.60*
1500	15	1.56	1.71	1.88	2.07	2.27	2.46	2.76	3.02	3.27	4.55*	6.05*
	20	1.78	1.95	2.15	2.37	2.60	2.83	3.18	3.49	3.80	5.39*	7.37*
	25	1.98	2.17	2.40	2.65	2.91	3.17	3.58	3.94	4.31	6.25*	8.84*
1600	15	1.61	1.76	1.94	2.13	2.33	2.53	2.84	3.10	3.37	4.68*	6.22*
	20	1.83	2.01	2.22	2.44	2.67	2.91	3.28	3.59	3.91	5.55*	7.58*
	25	2.04	2.23	2.47	2.73	2.99	3.27	3.69	4.06	4.44	6.43*	9.08*
1700	15	1.65	1.80	1.99	2.19	2.39	2.60	2.91	3.18	3.45	4.81*	6.38*
	20	1.88	2.06	2.28	2.51	2.75	2.99	3.37	3.69	4.02	5.70*	7.78*
	25	2.10	2.30	2.54	2.81	3.08	3.36	3.80	4.17	4.56	6.61*	9.31*
1800	15	1.69	1.85	2.04	2.24	2.45	2.66	2.99	3.26	3.54	4.93*	6.54*
	20	1.93	2.12	2.34	2.58	2.82	3.07	3.46	3.78	4.12	5.85*	7.97*
	25	2.15	2.36	2.61	2.88	3.16	3.45	3.90	4.28	4.68	6.78*	9.54*
1900	15	1.73	1.89	2.09	2.30	2.51	2.73	3.06	3.34	3.63	5.05*	6.70*
	20	1.98	2.17	2.40	2.64	2.89	3.15	3.54	3.88	4.23	5.99*	8.16*
	25	2.21	2.42	2.68	2.96	3.24	3.54	4.00	4.39	4.80	6.95*	9.76*
2000	15	1.77	1.94	2.14	2.35	2.57	2.79	3.13	3.42	3.71	5.16*	6.85*
	20	2.03	2.22	2.46	2.70	2.96	3.22	3.63	3.97	4.33	6.13*	8.35*
	25	2.26	2.48	2.75	3.03	3.32	3.63	4.09	4.50	4.92	7.11*	9.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.04	1.15	1.28	1.42	1.57	1.73	1.99	2.23	2.50	4.93*	12.80*
	20	1.14	1.26	1.41	1.58	1.76	1.96	2.32	2.69	3.20	9.60*	27.90*
	25	1.23	1.37	1.54	1.74	1.97	2.23	2.75	3.42	4.60	17.34*	52.79*
200	15	1.28	1.40	1.56	1.73	1.92	2.11	2.42	2.71	3.02	5.27*	12.80*
	20	1.42	1.57	1.75	1.96	2.19	2.43	2.85	3.26	3.77	9.60*	27.90*
	25	1.55	1.72	1.94	2.19	2.46	2.77	3.34	3.98	4.94	17.34*	52.79*
300	15	1.46	1.61	1.79	1.99	2.20	2.42	2.77	3.09	3.44	5.73*	12.81*
	20	1.64	1.81	2.03	2.27	2.53	2.81	3.27	3.72	4.26	9.64*	27.90*
	25	1.80	2.01	2.26	2.55	2.86	3.21	3.83	4.50	5.41	17.34*	52.79*
400	15	1.63	1.79	1.99	2.21	2.44	2.68	3.07	3.42	3.81	6.19*	12.83*
	20	1.83	2.03	2.27	2.54	2.82	3.13	3.64	4.13	4.70	9.79*	27.90*
	25	2.03	2.26	2.54	2.86	3.20	3.59	4.26	4.96	5.87	17.34*	52.79*
500	15	1.77	1.95	2.17	2.41	2.66	2.92	3.34	3.72	4.13	6.63*	12.92*
	20	2.01	2.22	2.49	2.78	3.09	3.42	3.97	4.49	5.09	10.03*	27.90*
	25	2.23	2.48	2.79	3.14	3.51	3.93	4.65	5.38	6.30	17.34*	52.79*
600	15	1.91	2.10	2.34	2.59	2.86	3.14	3.59	3.99	4.43	7.03*	13.08*
	20	2.17	2.40	2.69	3.00	3.33	3.69	4.27	4.82	5.46	10.34*	27.90*
	25	2.42	2.69	3.02	3.39	3.80	4.24	5.00	5.76	6.71	17.36*	52.79*
700	15	2.03	2.24	2.49	2.76	3.05	3.35	3.82	4.25	4.71	7.42*	13.31*
	20	2.32	2.57	2.87	3.20	3.56	3.94	4.56	5.14	5.80	10.68*	27.90*
	25	2.59	2.88	3.24	3.63	4.06	4.53	5.33	6.12	7.09	17.40*	52.79*
800	15	2.15	2.37	2.64	2.92	3.22	3.54	4.04	4.49	4.97	7.79*	13.57*
	20	2.46	2.73	3.05	3.40	3.77	4.17	4.82	5.43	6.12	11.03*	27.90*
	25	2.75	3.06	3.44	3.86	4.31	4.80	5.64	6.46	7.46	17.47*	52.79*
900	15	2.27	2.49	2.77	3.08	3.39	3.72	4.25	4.72	5.22	8.14*	13.87*
	20	2.60	2.88	3.21	3.58	3.97	4.39	5.07	5.71	6.42	11.38*	27.91*
	25	2.91	3.23	3.63	4.07	4.55	5.06	5.94	6.79	7.81	17.59*	52.79*
1000	15	2.37	2.61	2.91	3.22	3.55	3.90	4.45	4.94	5.46	8.47*	14.18*
	20	2.73	3.02	3.37	3.76	4.17	4.60	5.32	5.97	6.71	11.74*	27.91*
	25	3.06	3.40	3.82	4.27	4.77	5.31	6.22	7.10	8.14	17.74*	52.79*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.48	2.73	3.03	3.36	3.71	4.07	4.64	5.14	5.69	8.79*	14.51*
	20	2.85	3.16	3.53	3.93	4.35	4.81	5.55	6.23	6.99	12.09*	27.93*
	25	3.20	3.56	3.99	4.47	4.99	5.55	6.49	7.39	8.46	17.92*	52.79*
1200	15	2.58	2.84	3.16	3.50	3.85	4.23	4.82	5.34	5.91	9.10*	14.83*
	20	2.97	3.29	3.67	4.09	4.53	5.00	5.77	6.47	7.25	12.43*	27.95*
	25	3.34	3.71	4.16	4.66	5.19	5.77	6.75	7.68	8.77	18.13*	52.79*
1300	15	2.67	2.94	3.27	3.63	4.00	4.38	5.00	5.54	6.12	9.40*	15.16*
	20	3.09	3.42	3.81	4.25	4.71	5.19	5.98	6.71	7.51	12.76*	27.99*
	25	3.47	3.86	4.33	4.84	5.40	5.99	7.00	7.95	9.07	18.37*	52.79*
1400	15	2.77	3.05	3.39	3.75	4.14	4.54	5.17	5.73	6.32	9.69*	15.49*
	20	3.20	3.54	3.95	4.40	4.87	5.38	6.19	6.94	7.76	13.09*	28.04*
	25	3.60	4.00	4.48	5.02	5.59	6.21	7.24	8.22	9.36	18.61*	52.79*
1500	15	2.86	3.15	3.50	3.88	4.27	4.68	5.33	5.91	6.52	9.97*	15.82*
	20	3.31	3.66	4.09	4.55	5.04	5.55	6.39	7.16	8.01	13.42*	28.11*
	25	3.73	4.14	4.64	5.19	5.78	6.41	7.47	8.48	9.64	18.87*	52.79*
1600	15	2.95	3.25	3.61	3.99	4.40	4.82	5.49	6.08	6.71	10.25*	16.14*
	20	3.42	3.78	4.22	4.69	5.19	5.73	6.59	7.37	8.24	13.74*	28.20*
	25	3.85	4.27	4.79	5.35	5.96	6.62	7.70	8.73	9.92	19.14*	52.79*
1700	15	3.04	3.34	3.71	4.11	4.53	4.96	5.65	6.26	6.90	10.51*	16.46*
	20	3.52	3.89	4.34	4.83	5.35	5.90	6.78	7.58	8.47	14.05*	28.31*
	25	3.97	4.40	4.93	5.52	6.14	6.81	7.92	8.98	10.19	19.42*	52.79*
1800	15	3.12	3.43	3.82	4.22	4.65	5.10	5.80	6.43	7.09	10.77*	16.77*
	20	3.62	4.00	4.47	4.97	5.50	6.06	6.96	7.79	8.69	14.35*	28.43*
	25	4.08	4.53	5.08	5.67	6.31	7.00	8.14	9.22	10.45	19.70*	52.79*
1900	15	3.20	3.53	3.92	4.34	4.77	5.23	5.95	6.59	7.26	11.03*	17.08*
	20	3.72	4.11	4.59	5.10	5.64	6.22	7.15	7.99	8.91	14.65*	28.57*
	25	4.20	4.66	5.22	5.83	6.48	7.19	8.35	9.45	10.70	19.98*	52.79*
2000	15	3.28	3.61	4.01	4.44	4.89	5.36	6.10	6.75	7.44	11.28*	17.39*
	20	3.82	4.22	4.70	5.23	5.79	6.38	7.32	8.18	9.13	14.95*	28.72*
	25	4.31	4.78	5.35	5.98	6.65	7.37	8.56	9.68	10.95	20.26*	52.80*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.75	1.97	2.27	2.62	3.08	3.74	5.68	8.76	13.33	56.75*	178.64*
	20	1.97	2.27	2.69	3.28	4.25	6.19	11.58	18.81	29.48	131.84*	420.20*
	25	2.19	2.59	3.21	4.30	6.71	10.93	21.37	35.38	56.10	255.63*	818.46*
200	15	2.23	2.51	2.87	3.30	3.83	4.49	6.10	8.80	13.33	56.75*	178.64*
	20	2.55	2.93	3.43	4.08	5.01	6.55	11.59	18.81	29.48	131.84*	420.20*
	25	2.87	3.36	4.06	5.10	7.01	10.93	21.37	35.38	56.10	255.63*	818.46*
300	15	2.61	2.94	3.36	3.85	4.43	5.14	6.69	9.03	13.33	56.75*	178.64*
	20	3.01	3.45	4.02	4.74	5.70	7.13	11.64	18.81	29.48	131.84*	420.20*
	25	3.40	3.97	4.75	5.83	7.59	11.03	21.37	35.38	56.10	255.63*	818.46*
400	15	2.94	3.31	3.78	4.32	4.95	5.71	7.27	9.43	13.39	56.75*	178.64*
	20	3.42	3.91	4.54	5.32	6.32	7.73	11.82	18.82	29.48	131.84*	420.20*
	25	3.87	4.50	5.35	6.49	8.20	11.31	21.37	35.38	56.10	255.63*	818.46*
500	15	3.25	3.65	4.16	4.74	5.42	6.22	7.82	9.89	13.55	56.75*	178.64*
	20	3.78	4.31	5.00	5.83	6.88	8.31	12.13	18.83	29.48	131.84*	420.20*
	25	4.29	4.98	5.88	7.08	8.80	11.70	21.37	35.38	56.10	255.63*	818.46*
600	15	3.52	3.96	4.51	5.13	5.85	6.69	8.33	10.37	13.80	56.75*	178.64*
	20	4.11	4.69	5.42	6.31	7.41	8.86	12.51	18.88	29.48	131.84*	420.20*
	25	4.68	5.41	6.38	7.63	9.37	12.16	21.39	35.38	56.10	255.63*	818.46*
700	15	3.78	4.25	4.83	5.49	6.25	7.13	8.82	10.84	14.11	56.75*	178.64*
	20	4.42	5.04	5.82	6.75	7.89	9.37	12.94	18.97	29.48	131.84*	420.20*
	25	5.04	5.82	6.84	8.14	9.92	12.64	21.44	35.38	56.10	255.63*	818.46*
800	15	4.03	4.52	5.14	5.84	6.63	7.55	9.28	11.31	14.46	56.75*	178.64*
	20	4.72	5.37	6.19	7.17	8.35	9.87	13.38	19.12	29.48	131.84*	420.20*
	25	5.38	6.20	7.27	8.63	10.44	13.13	21.54	35.38	56.10	255.63*	818.46*
900	15	4.26	4.78	5.43	6.16	6.99	7.94	9.72	11.76	14.84	56.75*	178.64*
	20	5.00	5.68	6.54	7.56	8.79	10.34	13.83	19.33	29.49	131.84*	420.20*
	25	5.70	6.57	7.68	9.09	10.93	13.61	21.68	35.38	56.10	255.63*	818.46*
1000	15	4.48	5.03	5.70	6.47	7.33	8.32	10.14	12.20	15.23	56.75*	178.64*
	20	5.26	5.98	6.88	7.94	9.21	10.79	14.28	19.58	29.51	131.84*	420.20*
	25	6.01	6.91	8.08	9.53	11.41	14.09	21.87	35.39	56.10	255.63*	818.46*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.69	5.26	5.97	6.76	7.66	8.68	10.55	12.63	15.62	56.75*	178.64*
	20	5.52	6.27	7.20	8.30	9.60	11.22	14.71	19.87	29.54	131.84*	420.20*
	25	6.30	7.24	8.45	9.95	11.87	14.55	22.10	35.39	56.10	255.63*	818.46*
1200	15	4.90	5.49	6.22	7.05	7.97	9.03	10.94	13.04	16.02	56.75*	178.64*
	20	5.76	6.54	7.51	8.64	9.99	11.64	15.15	20.18	29.60	131.84*	420.20*
	25	6.59	7.56	8.81	10.35	12.31	15.01	22.37	35.41	56.10	255.63*	818.46*
1300	15	5.09	5.71	6.47	7.32	8.28	9.36	11.32	13.45	16.41	56.75*	178.64*
	20	6.00	6.81	7.81	8.98	10.36	12.04	15.57	20.50	29.67	131.84*	420.20*
	25	6.86	7.87	9.16	10.74	12.74	15.45	22.66	35.43	56.10	255.63*	818.46*
1400	15	5.29	5.92	6.71	7.59	8.57	9.68	11.69	13.84	16.80	56.75*	178.64*
	20	6.23	7.06	8.10	9.30	10.72	12.44	15.99	20.85	29.77	131.84*	420.20*
	25	7.13	8.17	9.50	11.12	13.15	15.89	22.97	35.47	56.10	255.63*	818.46*
1500	15	5.47	6.13	6.94	7.85	8.86	10.00	12.04	14.22	17.18	56.75*	178.64*
	20	6.46	7.31	8.38	9.62	11.07	12.82	16.40	21.20	29.89	131.84*	420.20*
	25	7.39	8.46	9.83	11.49	13.56	16.31	23.30	35.52	56.10	255.63*	818.46*
1600	15	5.65	6.33	7.16	8.10	9.14	10.30	12.39	14.60	17.56	56.75*	178.64*
	20	6.67	7.56	8.65	9.92	11.41	13.19	16.80	21.55	30.04	131.84*	420.20*
	25	7.64	8.75	10.15	11.84	13.95	16.73	23.64	35.59	56.10	255.63*	818.46*
1700	15	5.83	6.53	7.38	8.34	9.41	10.60	12.73	14.96	17.94	56.75*	178.64*
	20	6.89	7.79	8.92	10.22	11.74	13.55	17.19	21.91	30.20	131.84*	420.20*
	25	7.88	9.02	10.46	12.19	14.34	17.14	23.98	35.68	56.10	255.63*	818.46*
1800	15	6.00	6.72	7.60	8.58	9.67	10.89	13.05	15.32	18.30	56.75*	178.64*
	20	7.09	8.03	9.18	10.51	12.06	13.90	17.58	22.27	30.39	131.84*	420.20*
	25	8.12	9.29	10.76	12.53	14.71	17.54	24.33	35.79	56.11	255.63*	818.46*
1900	15	6.17	6.91	7.81	8.81	9.93	11.18	13.38	15.67	18.67	56.76*	178.64*
	20	7.30	8.25	9.43	10.80	12.38	14.25	17.96	22.63	30.60	131.84*	420.20*
	25	8.36	9.55	11.06	12.86	15.08	17.93	24.69	35.91	56.11	255.63*	818.46*
2000	15	6.34	7.09	8.01	9.04	10.18	11.45	13.69	16.01	19.02	56.76*	178.64*
	20	7.49	8.47	9.68	11.07	12.68	14.59	18.33	22.99	30.82	131.84*	420.20*
	25	8.58	9.81	11.35	13.19	15.43	18.32	25.05	36.06	56.11	255.63*	818.46*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.29	4.20	6.29	11.62	20.81	35.22	71.01	119.21	190.60	879.26*	2823.5*
	20	4.02	6.10	12.82	25.73	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	4.92	10.15	23.88	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
200	15	4.31	5.34	7.20	11.68	20.81	35.22	71.01	119.21	190.60	879.26*	2823.5*
	20	5.26	7.23	12.86	25.73	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	6.34	10.52	23.88	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
300	15	5.13	6.27	8.14	12.02	20.81	35.22	71.01	119.21	190.60	879.26*	2823.5*
	20	6.25	8.28	13.18	25.73	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	7.49	11.34	23.88	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
400	15	5.83	7.07	9.00	12.60	20.83	35.22	71.01	119.21	190.60	879.26*	2823.5*
	20	7.12	9.23	13.76	25.73	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	8.50	12.26	23.90	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
500	15	6.47	7.79	9.80	13.26	20.92	35.22	71.01	119.21	190.60	879.26*	2823.5*
	20	7.89	10.10	14.45	25.75	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	9.40	13.17	23.99	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
600	15	7.05	8.46	10.53	13.95	21.10	35.23	71.01	119.21	190.60	879.26*	2823.5*
	20	8.60	10.90	15.17	25.83	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	10.23	14.04	24.17	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
700	15	7.59	9.08	11.22	14.63	21.39	35.23	71.01	119.21	190.60	879.26*	2823.5*
	20	9.26	11.65	15.90	25.97	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	11.00	14.87	24.47	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
800	15	8.11	9.66	11.88	15.29	21.76	35.24	71.01	119.21	190.60	879.26*	2823.5*
	20	9.88	12.36	16.61	26.20	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	11.73	15.66	24.86	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
900	15	8.59	10.21	12.50	15.93	22.18	35.27	71.01	119.21	190.60	879.26*	2823.5*
	20	10.48	13.03	17.31	26.51	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	12.42	16.42	25.33	48.98	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1000	15	9.05	10.74	13.09	16.56	22.65	35.32	71.01	119.21	190.60	879.26*	2823.5*
	20	11.04	13.67	17.98	26.88	47.34	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	13.08	17.15	25.84	48.99	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 18.0 Ft (RADIUS = 12.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	9.50	11.24	13.66	17.17	23.14	35.41	71.01	119.21	190.60	879.26*	2823.5*
	20	11.58	14.28	18.64	27.29	47.36	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	13.71	17.86	26.38	49.00	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1200	15	9.93	11.73	14.21	17.76	23.64	35.53	71.01	119.21	190.60	879.26*	2823.5*
	20	12.10	14.88	19.28	27.74	47.37	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	14.31	18.54	26.95	49.03	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1300	15	10.34	12.20	14.74	18.33	24.16	35.69	71.01	119.21	190.60	879.26*	2823.5*
	20	12.60	15.45	19.90	28.22	47.41	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	14.90	19.19	27.52	49.07	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1400	15	10.74	12.65	15.25	18.89	24.67	35.88	71.01	119.21	190.60	879.26*	2823.5*
	20	13.09	16.00	20.51	28.71	47.46	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	15.46	19.83	28.10	49.13	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1500	15	11.13	13.09	15.75	19.43	25.19	36.11	71.01	119.21	190.60	879.26*	2823.5*
	20	13.56	16.54	21.10	29.21	47.53	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	16.01	20.46	28.69	49.21	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1600	15	11.51	13.52	16.24	19.96	25.70	36.37	71.02	119.21	190.60	879.26*	2823.5*
	20	14.02	17.06	21.67	29.72	47.62	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	16.55	21.06	29.27	49.31	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1700	15	11.87	13.94	16.71	20.48	26.21	36.66	71.02	119.21	190.60	879.26*	2823.5*
	20	14.46	17.57	22.24	30.23	47.74	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	17.07	21.65	29.85	49.45	91.07	157.39	322.44	545.06	875.03	4061.3*	13061.*
1800	15	12.23	14.34	17.17	20.99	26.72	36.97	71.02	119.21	190.60	879.26*	2823.5*
	20	14.90	18.07	22.79	30.74	47.88	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	17.58	22.23	30.42	49.61	91.08	157.39	322.44	545.06	875.03	4061.3*	13061.*
1900	15	12.58	14.74	17.62	21.49	27.22	37.30	71.02	119.21	190.60	879.26*	2823.5*
	20	15.33	18.55	23.33	31.26	48.04	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	18.07	22.79	30.99	49.80	91.08	157.39	322.44	545.06	875.03	4061.3*	13061.*
2000	15	12.93	15.13	18.06	21.97	27.71	37.65	71.03	119.21	190.60	879.26*	2823.5*
	20	15.74	19.03	23.86	31.77	48.23	81.35	165.94	279.99	449.00	2080.6*	6688.6*
	25	18.56	23.34	31.55	50.01	91.08	157.39	322.44	545.06	875.03	4061.3*	13061.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.73	0.78	0.86	0.94	1.02	1.10	1.23	1.34	1.45	1.96*	2.61*
	20	0.78	0.84	0.92	1.01	1.10	1.19	1.34	1.46	1.59	2.24*	3.34*
	25	0.83	0.89	0.98	1.07	1.17	1.28	1.44	1.59	1.74	2.61*	4.88*
200	15	0.86	0.92	1.01	1.10	1.20	1.30	1.45	1.58	1.71	2.31*	3.08*
	20	0.93	1.00	1.10	1.21	1.31	1.43	1.60	1.75	1.91	2.67*	3.81*
	25	1.00	1.08	1.19	1.30	1.42	1.55	1.75	1.92	2.11	3.10*	5.06*
300	15	0.96	1.03	1.13	1.24	1.34	1.45	1.62	1.77	1.92	2.60*	3.45*
	20	1.05	1.14	1.25	1.37	1.49	1.62	1.81	1.98	2.16	3.02*	4.24*
	25	1.14	1.23	1.36	1.49	1.63	1.77	2.00	2.19	2.40	3.49*	5.42*
400	15	1.05	1.13	1.24	1.35	1.47	1.59	1.78	1.93	2.10	2.85*	3.78*
	20	1.16	1.25	1.37	1.50	1.64	1.78	2.00	2.18	2.38	3.32*	4.63*
	25	1.26	1.37	1.50	1.65	1.80	1.96	2.21	2.43	2.66	3.84*	5.80*
500	15	1.13	1.22	1.33	1.46	1.58	1.71	1.91	2.08	2.26	3.07*	4.07*
	20	1.26	1.36	1.49	1.63	1.78	1.93	2.16	2.36	2.57	3.59*	4.98*
	25	1.37	1.49	1.63	1.79	1.96	2.13	2.40	2.64	2.88	4.16*	6.18*
600	15	1.21	1.30	1.42	1.55	1.69	1.83	2.04	2.22	2.41	3.27*	4.34*
	20	1.35	1.45	1.59	1.75	1.90	2.06	2.31	2.53	2.75	3.84*	5.31*
	25	1.48	1.60	1.76	1.93	2.10	2.29	2.58	2.83	3.09	4.45*	6.53*
700	15	1.28	1.37	1.50	1.64	1.79	1.93	2.16	2.35	2.54	3.46*	4.59*
	20	1.43	1.54	1.69	1.85	2.02	2.19	2.46	2.68	2.92	4.07*	5.61*
	25	1.57	1.70	1.87	2.05	2.24	2.44	2.74	3.01	3.29	4.72*	6.87*
800	15	1.34	1.45	1.58	1.73	1.88	2.03	2.27	2.47	2.67	3.64*	4.82*
	20	1.51	1.63	1.79	1.95	2.13	2.31	2.59	2.83	3.08	4.29*	5.90*
	25	1.66	1.80	1.98	2.17	2.37	2.57	2.90	3.18	3.47	4.97*	7.19*
900	15	1.40	1.51	1.66	1.81	1.97	2.13	2.37	2.58	2.80	3.81*	5.05*
	20	1.58	1.71	1.87	2.05	2.24	2.42	2.72	2.97	3.23	4.49*	6.17*
	25	1.75	1.89	2.08	2.28	2.49	2.70	3.04	3.34	3.65	5.21*	7.50*
1000	15	1.46	1.58	1.73	1.88	2.05	2.22	2.47	2.69	2.92	3.97*	5.26*
	20	1.65	1.79	1.96	2.14	2.34	2.53	2.84	3.10	3.37	4.69*	6.43*
	25	1.83	1.98	2.17	2.38	2.60	2.83	3.18	3.49	3.81	5.44*	7.80*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.52	1.64	1.79	1.96	2.13	2.30	2.57	2.80	3.03	4.12*	5.46*
	20	1.72	1.86	2.04	2.23	2.43	2.64	2.95	3.23	3.51	4.88*	6.68*
	25	1.91	2.07	2.27	2.49	2.71	2.95	3.32	3.64	3.97	5.66*	8.09*
1200	15	1.58	1.70	1.86	2.03	2.21	2.39	2.66	2.90	3.14	4.27*	5.66*
	20	1.79	1.93	2.12	2.32	2.52	2.74	3.07	3.35	3.64	5.06*	6.92*
	25	1.98	2.15	2.36	2.58	2.82	3.07	3.45	3.78	4.13	5.87*	8.36*
1300	15	1.63	1.76	1.92	2.10	2.28	2.47	2.75	3.00	3.25	4.42*	5.85*
	20	1.85	2.00	2.19	2.40	2.61	2.83	3.17	3.47	3.77	5.23*	7.15*
	25	2.06	2.23	2.44	2.68	2.92	3.18	3.57	3.92	4.27	6.08*	8.63*
1400	15	1.68	1.81	1.98	2.17	2.35	2.55	2.84	3.09	3.35	4.56*	6.03*
	20	1.91	2.07	2.27	2.48	2.70	2.93	3.28	3.58	3.89	5.40*	7.37*
	25	2.13	2.30	2.53	2.77	3.03	3.29	3.69	4.05	4.42	6.28*	8.89*
1500	15	1.73	1.87	2.04	2.23	2.42	2.62	2.93	3.18	3.45	4.69*	6.21*
	20	1.97	2.13	2.34	2.56	2.79	3.02	3.38	3.69	4.01	5.57*	7.59*
	25	2.19	2.38	2.61	2.86	3.12	3.39	3.81	4.18	4.56	6.47*	9.14*
1600	15	1.78	1.92	2.10	2.29	2.49	2.70	3.01	3.27	3.54	4.82*	6.38*
	20	2.03	2.20	2.41	2.63	2.87	3.11	3.48	3.80	4.13	5.73*	7.80*
	25	2.26	2.45	2.69	2.95	3.22	3.49	3.93	4.30	4.69	6.66*	9.39*
1700	15	1.83	1.97	2.16	2.36	2.56	2.77	3.09	3.36	3.64	4.95*	6.55*
	20	2.09	2.26	2.48	2.71	2.95	3.20	3.58	3.90	4.24	5.89*	8.00*
	25	2.33	2.52	2.77	3.03	3.31	3.59	4.04	4.42	4.83	6.84*	9.62*
1800	15	1.88	2.02	2.21	2.42	2.63	2.84	3.17	3.45	3.73	5.08*	6.72*
	20	2.15	2.32	2.54	2.78	3.03	3.28	3.67	4.01	4.35	6.04*	8.21*
	25	2.39	2.59	2.84	3.12	3.40	3.69	4.15	4.54	4.95	7.01*	9.86*
1900	15	1.92	2.07	2.27	2.47	2.69	2.91	3.24	3.53	3.82	5.20*	6.88*
	20	2.20	2.38	2.61	2.85	3.10	3.36	3.76	4.11	4.46	6.19*	8.40*
	25	2.45	2.66	2.92	3.20	3.49	3.79	4.25	4.66	5.08	7.19*	10.09*
2000	15	1.97	2.12	2.32	2.53	2.75	2.98	3.32	3.61	3.91	5.32*	7.03*
	20	2.25	2.44	2.67	2.92	3.18	3.44	3.85	4.21	4.57	6.33*	8.59*
	25	2.51	2.73	2.99	3.28	3.57	3.88	4.36	4.77	5.20	7.36*	10.31*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.15	1.25	1.38	1.52	1.67	1.83	2.10	2.35	2.65	5.36*	13.89*
	20	1.26	1.37	1.52	1.70	1.89	2.10	2.47	2.88	3.47	10.61*	30.45*
	25	1.36	1.49	1.67	1.88	2.12	2.40	2.98	3.77	5.18	19.29*	57.74*
200	15	1.41	1.53	1.69	1.86	2.05	2.25	2.57	2.87	3.20	5.62*	13.89*
	20	1.57	1.71	1.90	2.12	2.35	2.60	3.04	3.48	4.04	10.61*	30.45*
	25	1.72	1.89	2.11	2.37	2.66	2.99	3.61	4.32	5.44	19.29*	57.74*
300	15	1.62	1.76	1.94	2.14	2.35	2.58	2.94	3.27	3.64	6.06*	13.89*
	20	1.82	1.99	2.21	2.45	2.72	3.01	3.50	3.98	4.56	10.63*	30.45*
	25	2.00	2.21	2.47	2.76	3.09	3.46	4.13	4.86	5.89	19.29*	57.74*
400	15	1.80	1.96	2.16	2.38	2.62	2.86	3.26	3.63	4.03	6.52*	13.91*
	20	2.03	2.23	2.47	2.74	3.04	3.36	3.89	4.41	5.02	10.72*	30.45*
	25	2.25	2.48	2.77	3.10	3.46	3.87	4.59	5.34	6.36	19.29*	57.74*
500	15	1.96	2.13	2.36	2.60	2.85	3.12	3.56	3.95	4.38	6.96*	13.96*
	20	2.23	2.44	2.71	3.00	3.32	3.67	4.24	4.79	5.44	10.90*	30.45*
	25	2.48	2.73	3.05	3.40	3.80	4.23	5.00	5.79	6.81	19.29*	57.74*
600	15	2.11	2.30	2.54	2.80	3.07	3.36	3.82	4.24	4.70	7.37*	14.07*
	20	2.41	2.64	2.93	3.24	3.59	3.96	4.57	5.15	5.82	11.16*	30.45*
	25	2.69	2.96	3.30	3.68	4.10	4.57	5.38	6.20	7.24	19.30*	57.74*
700	15	2.25	2.45	2.71	2.98	3.27	3.58	4.07	4.51	4.99	7.77*	14.25*
	20	2.58	2.82	3.13	3.47	3.83	4.23	4.87	5.48	6.18	11.47*	30.45*
	25	2.88	3.17	3.54	3.94	4.39	4.88	5.73	6.58	7.64	19.31*	57.74*
800	15	2.39	2.60	2.87	3.16	3.46	3.79	4.30	4.77	5.27	8.14*	14.48*
	20	2.74	3.00	3.32	3.68	4.07	4.48	5.16	5.80	6.52	11.80*	30.45*
	25	3.07	3.37	3.76	4.19	4.66	5.18	6.06	6.94	8.02	19.35*	57.74*
900	15	2.51	2.74	3.02	3.32	3.65	3.99	4.53	5.01	5.54	8.50*	14.74*
	20	2.89	3.16	3.50	3.88	4.29	4.72	5.43	6.09	6.85	12.14*	30.45*
	25	3.24	3.56	3.97	4.42	4.92	5.46	6.38	7.29	8.39	19.42*	57.74*
1000	15	2.64	2.87	3.16	3.48	3.82	4.17	4.74	5.24	5.79	8.84*	15.03*
	20	3.04	3.32	3.68	4.07	4.50	4.95	5.69	6.38	7.15	12.48*	30.45*
	25	3.41	3.74	4.17	4.64	5.16	5.72	6.68	7.62	8.75	19.52*	57.74*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.75	2.99	3.30	3.63	3.99	4.35	4.94	5.47	6.03	9.17*	15.34*
	20	3.17	3.47	3.85	4.26	4.70	5.17	5.93	6.65	7.45	12.82*	30.46*
	25	3.57	3.92	4.36	4.86	5.39	5.98	6.97	7.93	9.09	19.65*	57.74*
1200	15	2.86	3.12	3.43	3.78	4.15	4.53	5.14	5.68	6.26	9.49*	15.65*
	20	3.31	3.62	4.01	4.43	4.89	5.38	6.17	6.91	7.73	13.17*	30.47*
	25	3.72	4.09	4.55	5.06	5.62	6.23	7.25	8.24	9.41	19.82*	57.74*
1300	15	2.97	3.23	3.56	3.92	4.30	4.70	5.33	5.89	6.49	9.80*	15.97*
	20	3.44	3.76	4.16	4.60	5.08	5.58	6.40	7.16	8.01	13.50*	30.49*
	25	3.87	4.25	4.73	5.26	5.84	6.46	7.52	8.53	9.73	20.01*	57.74*
1400	15	3.08	3.35	3.69	4.06	4.45	4.86	5.51	6.09	6.71	10.10*	16.29*
	20	3.56	3.90	4.31	4.77	5.26	5.78	6.62	7.40	8.27	13.83*	30.52*
	25	4.01	4.41	4.90	5.45	6.05	6.69	7.78	8.82	10.04	20.21*	57.74*
1500	15	3.18	3.46	3.81	4.19	4.60	5.02	5.69	6.28	6.92	10.39*	16.61*
	20	3.69	4.03	4.46	4.93	5.43	5.97	6.84	7.64	8.53	14.16*	30.56*
	25	4.15	4.56	5.07	5.64	6.25	6.92	8.03	9.09	10.34	20.44*	57.74*
1600	15	3.28	3.57	3.93	4.32	4.74	5.17	5.86	6.47	7.12	10.67*	16.93*
	20	3.80	4.16	4.60	5.09	5.61	6.16	7.05	7.87	8.78	14.48*	30.62*
	25	4.29	4.71	5.24	5.82	6.45	7.13	8.27	9.36	10.63	20.68*	57.74*
1700	15	3.37	3.67	4.04	4.45	4.88	5.32	6.03	6.65	7.32	10.95*	17.25*
	20	3.92	4.29	4.74	5.24	5.77	6.34	7.25	8.10	9.03	14.80*	30.69*
	25	4.42	4.86	5.40	6.00	6.64	7.34	8.51	9.62	10.91	20.93*	57.74*
1800	15	3.47	3.78	4.16	4.57	5.01	5.47	6.19	6.83	7.52	11.21*	17.56*
	20	4.03	4.41	4.88	5.39	5.93	6.51	7.45	8.31	9.26	15.11*	30.78*
	25	4.55	5.00	5.55	6.17	6.83	7.55	8.74	9.88	11.19	21.19*	57.74*
1900	15	3.56	3.88	4.27	4.69	5.14	5.61	6.35	7.01	7.71	11.48*	17.88*
	20	4.14	4.53	5.01	5.53	6.09	6.69	7.65	8.53	9.50	15.41*	30.88*
	25	4.68	5.14	5.71	6.34	7.02	7.75	8.97	10.13	11.46	21.45*	57.74*
2000	15	3.65	3.97	4.38	4.81	5.27	5.75	6.51	7.18	7.89	11.73*	18.18*
	20	4.25	4.65	5.14	5.68	6.25	6.86	7.84	8.74	9.72	15.71*	31.00*
	25	4.80	5.27	5.86	6.50	7.20	7.95	9.19	10.37	11.72	21.72*	57.74*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.94	2.17	2.48	2.87	3.38	4.16	6.56	10.12	15.29	63.43*	195.66*
	20	2.20	2.52	2.98	3.66	4.90	7.35	13.65	21.96	34.07	147.61*	460.50*
	25	2.46	2.90	3.62	5.04	8.14	13.17	25.36	41.48	65.04	286.40*	897.14*
200	15	2.47	2.76	3.15	3.61	4.18	4.94	6.86	10.13	15.29	63.43*	195.66*
	20	2.85	3.24	3.79	4.53	5.62	7.56	13.65	21.96	34.07	147.61*	460.50*
	25	3.21	3.75	4.54	5.80	8.30	13.17	25.36	41.48	65.04	286.40*	897.14*
300	15	2.91	3.24	3.68	4.20	4.83	5.62	7.42	10.27	15.29	63.43*	195.66*
	20	3.37	3.83	4.44	5.24	6.34	8.08	13.67	21.96	34.07	147.61*	460.50*
	25	3.82	4.43	5.30	6.57	8.76	13.20	25.36	41.48	65.04	286.40*	897.14*
400	15	3.28	3.66	4.14	4.72	5.40	6.23	8.00	10.59	15.32	63.43*	195.66*
	20	3.82	4.33	5.01	5.87	7.00	8.67	13.76	21.96	34.07	147.61*	460.50*
	25	4.34	5.02	5.95	7.27	9.35	13.35	25.36	41.48	65.04	286.40*	897.14*
500	15	3.62	4.03	4.56	5.18	5.90	6.78	8.57	11.01	15.41	63.43*	195.66*
	20	4.23	4.78	5.52	6.43	7.61	9.26	13.97	21.96	34.07	147.61*	460.50*
	25	4.81	5.54	6.55	7.91	9.95	13.64	25.36	41.48	65.04	286.40*	897.14*
600	15	3.93	4.37	4.94	5.60	6.37	7.29	9.11	11.47	15.58	63.43*	195.66*
	20	4.60	5.20	5.98	6.95	8.17	9.83	14.28	21.98	34.07	147.61*	460.50*
	25	5.25	6.03	7.09	8.50	10.54	14.02	25.37	41.48	65.04	286.40*	897.14*
700	15	4.22	4.69	5.30	6.00	6.81	7.76	9.63	11.94	15.83	63.43*	195.66*
	20	4.95	5.59	6.42	7.43	8.69	10.38	14.66	22.02	34.07	147.61*	460.50*
	25	5.65	6.48	7.60	9.06	11.11	14.46	25.38	41.48	65.04	286.40*	897.14*
800	15	4.49	4.99	5.63	6.37	7.22	8.21	10.11	12.42	16.14	63.43*	195.66*
	20	5.28	5.95	6.83	7.88	9.19	10.90	15.07	22.11	34.07	147.61*	460.50*
	25	6.03	6.91	8.07	9.58	11.66	14.92	25.42	41.48	65.04	286.40*	897.14*
900	15	4.75	5.28	5.95	6.72	7.61	8.63	10.58	12.88	16.48	63.43*	195.66*
	20	5.59	6.30	7.21	8.31	9.66	11.40	15.50	22.24	34.08	147.61*	460.50*
	25	6.39	7.31	8.52	10.08	12.19	15.40	25.49	41.48	65.04	286.40*	897.14*
1000	15	5.00	5.55	6.26	7.06	7.98	9.04	11.03	13.34	16.85	63.43*	195.66*
	20	5.89	6.63	7.58	8.72	10.11	11.88	15.94	22.42	34.08	147.61*	460.50*
	25	6.74	7.70	8.96	10.56	12.70	15.87	25.60	41.48	65.04	286.40*	897.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	5.24	5.82	6.55	7.38	8.33	9.43	11.46	13.78	17.24	63.43*	195.66*
	20	6.18	6.95	7.94	9.12	10.54	12.34	16.38	22.64	34.10	147.61*	460.50*
	25	7.07	8.07	9.37	11.02	13.19	16.35	25.75	41.48	65.04	286.40*	897.14*
1200	15	5.47	6.07	6.83	7.69	8.67	9.80	11.88	14.22	17.63	63.43*	195.66*
	20	6.45	7.25	8.28	9.50	10.96	12.79	16.82	22.89	34.12	147.61*	460.50*
	25	7.39	8.42	9.77	11.46	13.67	16.82	25.94	41.49	65.04	286.40*	897.14*
1300	15	5.69	6.31	7.10	7.99	9.00	10.16	12.28	14.64	18.02	63.43*	195.66*
	20	6.72	7.55	8.61	9.86	11.36	13.22	17.26	23.18	34.16	147.61*	460.50*
	25	7.70	8.76	10.15	11.88	14.13	17.28	26.16	41.50	65.04	286.40*	897.14*
1400	15	5.90	6.55	7.36	8.28	9.32	10.51	12.68	15.06	18.41	63.43*	195.66*
	20	6.98	7.84	8.93	10.21	11.75	13.64	17.69	23.48	34.21	147.61*	460.50*
	25	8.00	9.10	10.52	12.30	14.57	17.73	26.41	41.51	65.04	286.40*	897.14*
1500	15	6.11	6.78	7.61	8.56	9.63	10.85	13.06	15.46	18.80	63.43*	195.66*
	20	7.23	8.11	9.24	10.56	12.13	14.05	18.11	23.80	34.28	147.61*	460.50*
	25	8.29	9.42	10.88	12.70	15.01	18.18	26.69	41.53	65.04	286.40*	897.14*
1600	15	6.31	7.00	7.86	8.84	9.94	11.18	13.43	15.85	19.19	63.43*	195.66*
	20	7.47	8.38	9.54	10.89	12.50	14.45	18.53	24.14	34.37	147.61*	460.50*
	25	8.57	9.73	11.24	13.09	15.43	18.62	26.98	41.56	65.04	286.40*	897.14*
1700	15	6.51	7.22	8.10	9.11	10.23	11.50	13.79	16.24	19.57	63.43*	195.66*
	20	7.71	8.65	9.83	11.22	12.85	14.84	18.94	24.48	34.49	147.61*	460.50*
	25	8.84	10.04	11.58	13.46	15.85	19.05	27.29	41.61	65.04	286.40*	897.14*
1800	15	6.70	7.43	8.34	9.37	10.52	11.81	14.14	16.62	19.95	63.43*	195.66*
	20	7.94	8.90	10.11	11.53	13.20	15.22	19.35	24.83	34.62	147.61*	460.50*
	25	9.11	10.34	11.91	13.83	16.25	19.47	27.62	41.66	65.04	286.40*	897.14*
1900	15	6.89	7.64	8.57	9.62	10.79	12.12	14.48	16.99	20.33	63.43*	195.66*
	20	8.17	9.15	10.39	11.84	13.55	15.59	19.74	25.18	34.77	147.61*	460.50*
	25	9.37	10.63	12.24	14.20	16.65	19.89	27.95	41.73	65.04	286.40*	897.14*
2000	15	7.08	7.84	8.79	9.87	11.07	12.42	14.82	17.35	20.70	63.43*	195.66*
	20	8.39	9.40	10.67	12.15	13.88	15.96	20.13	25.54	34.94	147.61*	460.50*
	25	9.63	10.91	12.55	14.55	17.03	20.30	28.29	41.82	65.04	286.40*	897.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.72	4.84	7.78	14.55	25.69	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	4.63	7.64	16.55	32.58	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	5.84	13.51	31.10	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
200	15	4.87	6.08	8.48	14.56	25.69	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	6.02	8.60	16.56	32.58	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	7.39	13.61	31.10	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
300	15	5.79	7.10	9.41	14.71	25.69	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	7.14	9.69	16.66	32.58	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	8.68	14.13	31.10	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
400	15	6.58	7.99	10.32	15.09	25.69	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	8.11	10.70	16.98	32.58	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	9.80	14.91	31.10	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
500	15	7.30	8.79	11.17	15.64	25.72	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	8.98	11.64	17.51	32.59	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	10.82	15.78	31.12	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
600	15	7.95	9.53	11.96	16.27	25.78	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	9.78	12.52	18.14	32.60	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	11.75	16.66	31.16	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
700	15	8.57	10.22	12.71	16.93	25.92	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	10.53	13.34	18.82	32.64	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	12.62	17.52	31.26	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
800	15	9.14	10.86	13.42	17.60	26.14	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	11.23	14.12	19.52	32.72	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	13.44	18.36	31.44	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
900	15	9.69	11.48	14.10	18.26	26.44	42.87	84.72	140.21	221.40	985.51*	3095.4*
	20	11.89	14.87	20.22	32.86	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	14.21	19.18	31.70	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1000	15	10.21	12.06	14.75	18.91	26.79	42.89	84.72	140.21	221.40	985.51*	3095.4*
	20	12.53	15.58	20.92	33.06	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	14.96	19.96	32.04	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 20.0 Ft (RADIUS = 14.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	10.71	12.62	15.37	19.54	27.20	42.92	84.72	140.21	221.40	985.51*	3095.4*
	20	13.14	16.26	21.60	33.32	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	15.67	20.73	32.43	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1200	15	11.19	13.16	15.97	20.17	27.63	42.96	84.72	140.21	221.40	985.51*	3095.4*
	20	13.72	16.91	22.28	33.64	58.83	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	16.35	21.47	32.88	62.31	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1300	15	11.65	13.69	16.55	20.78	28.10	43.03	84.72	140.21	221.40	985.51*	3095.4*
	20	14.29	17.55	22.93	33.99	58.84	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	17.01	22.19	33.36	62.32	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1400	15	12.10	14.19	17.12	21.37	28.58	43.12	84.72	140.21	221.40	985.51*	3095.4*
	20	14.84	18.16	23.58	34.39	58.85	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	17.65	22.89	33.87	62.33	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1500	15	12.54	14.68	17.66	21.95	29.07	43.24	84.72	140.21	221.40	985.51*	3095.4*
	20	15.37	18.76	24.21	34.81	58.87	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	18.27	23.57	34.40	62.35	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1600	15	12.96	15.16	18.19	22.52	29.57	43.40	84.72	140.21	221.40	985.51*	3095.4*
	20	15.88	19.34	24.83	35.26	58.89	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	18.87	24.24	34.94	62.37	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1700	15	13.38	15.62	18.71	23.08	30.07	43.58	84.72	140.21	221.40	985.51*	3095.4*
	20	16.38	19.90	25.44	35.72	58.93	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	19.45	24.88	35.49	62.41	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1800	15	13.78	16.07	19.22	23.62	30.58	43.79	84.72	140.21	221.40	985.51*	3095.4*
	20	16.87	20.45	26.03	36.20	58.98	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	20.03	25.52	36.05	62.47	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
1900	15	14.17	16.51	19.71	24.16	31.08	44.02	84.72	140.21	221.40	985.51*	3095.4*
	20	17.35	20.99	26.61	36.68	59.05	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	20.58	26.14	36.61	62.54	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*
2000	15	14.56	16.94	20.20	24.68	31.58	44.28	84.73	140.21	221.40	985.51*	3095.4*
	20	17.82	21.52	27.19	37.17	59.14	99.38	198.36	329.67	521.93	2332.4*	7333.0*
	25	21.13	26.75	37.17	62.62	113.46	192.55	385.70	642.04	1017.4	4553.0*	14319.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.80	0.84	0.91	0.99	1.07	1.16	1.29	1.40	1.51	2.01*	2.69*
	20	0.85	0.90	0.98	1.07	1.16	1.25	1.40	1.53	1.66	2.31*	3.49*
	25	0.90	0.96	1.05	1.14	1.24	1.35	1.52	1.66	1.83	2.73*	5.22*
200	15	0.94	0.99	1.08	1.17	1.27	1.37	1.52	1.65	1.78	2.38*	3.16*
	20	1.02	1.09	1.18	1.28	1.39	1.51	1.68	1.84	1.99	2.76*	3.95*
	25	1.09	1.17	1.27	1.39	1.51	1.64	1.84	2.02	2.21	3.22*	5.36*
300	15	1.05	1.12	1.21	1.32	1.42	1.54	1.71	1.85	2.00	2.67*	3.54*
	20	1.15	1.23	1.34	1.46	1.58	1.71	1.91	2.08	2.26	3.12*	4.39*
	25	1.25	1.34	1.46	1.59	1.73	1.88	2.11	2.31	2.52	3.63*	5.69*
400	15	1.15	1.22	1.33	1.44	1.56	1.68	1.87	2.03	2.19	2.93*	3.88*
	20	1.27	1.36	1.48	1.61	1.74	1.89	2.10	2.29	2.49	3.43*	4.78*
	25	1.39	1.48	1.62	1.76	1.92	2.08	2.33	2.56	2.79	3.99*	6.06*
500	15	1.24	1.32	1.43	1.55	1.68	1.81	2.01	2.19	2.36	3.16*	4.18*
	20	1.38	1.47	1.60	1.74	1.89	2.04	2.28	2.49	2.70	3.71*	5.14*
	25	1.51	1.62	1.76	1.92	2.09	2.26	2.54	2.78	3.03	4.31*	6.43*
600	15	1.32	1.41	1.53	1.66	1.79	1.93	2.15	2.33	2.52	3.37*	4.45*
	20	1.48	1.58	1.72	1.87	2.03	2.19	2.44	2.66	2.89	3.96*	5.47*
	25	1.62	1.74	1.89	2.06	2.24	2.43	2.73	2.98	3.26	4.61*	6.79*
700	15	1.40	1.49	1.62	1.76	1.90	2.05	2.27	2.47	2.67	3.56*	4.71*
	20	1.57	1.68	1.82	1.98	2.15	2.33	2.59	2.83	3.07	4.20*	5.78*
	25	1.73	1.85	2.02	2.20	2.39	2.59	2.90	3.18	3.46	4.89*	7.14*
800	15	1.47	1.57	1.70	1.85	2.00	2.15	2.39	2.60	2.80	3.75*	4.95*
	20	1.66	1.77	1.93	2.09	2.27	2.45	2.74	2.98	3.23	4.42*	6.08*
	25	1.83	1.96	2.13	2.32	2.53	2.74	3.07	3.36	3.66	5.15*	7.46*
900	15	1.54	1.64	1.78	1.93	2.09	2.25	2.50	2.72	2.94	3.92*	5.18*
	20	1.74	1.86	2.02	2.20	2.38	2.58	2.87	3.13	3.39	4.64*	6.35*
	25	1.92	2.06	2.24	2.45	2.66	2.88	3.22	3.53	3.84	5.40*	7.78*
1000	15	1.61	1.71	1.86	2.02	2.18	2.35	2.61	2.83	3.06	4.09*	5.40*
	20	1.82	1.94	2.11	2.30	2.49	2.69	3.00	3.27	3.54	4.84*	6.62*
	25	2.01	2.16	2.35	2.56	2.78	3.01	3.37	3.69	4.02	5.63*	8.08*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.67	1.78	1.93	2.10	2.27	2.44	2.71	2.95	3.18	4.25*	5.61*
	20	1.89	2.03	2.20	2.39	2.60	2.80	3.13	3.40	3.69	5.03*	6.88*
	25	2.10	2.25	2.45	2.67	2.90	3.14	3.52	3.84	4.19	5.86*	8.37*
1200	15	1.73	1.85	2.00	2.17	2.35	2.53	2.81	3.05	3.30	4.40*	5.81*
	20	1.97	2.10	2.29	2.49	2.70	2.91	3.24	3.53	3.83	5.22*	7.12*
	25	2.18	2.34	2.55	2.78	3.02	3.27	3.66	3.99	4.35	6.08*	8.65*
1300	15	1.79	1.91	2.07	2.25	2.43	2.62	2.91	3.16	3.41	4.55*	6.00*
	20	2.04	2.18	2.37	2.58	2.79	3.01	3.36	3.66	3.97	5.40*	7.36*
	25	2.26	2.43	2.64	2.88	3.13	3.39	3.79	4.14	4.51	6.29*	8.93*
1400	15	1.85	1.97	2.14	2.32	2.51	2.70	3.00	3.26	3.52	4.69*	6.19*
	20	2.10	2.25	2.45	2.66	2.89	3.12	3.47	3.78	4.10	5.58*	7.59*
	25	2.34	2.51	2.73	2.98	3.24	3.50	3.92	4.28	4.66	6.49*	9.19*
1500	15	1.90	2.03	2.20	2.39	2.59	2.79	3.09	3.35	3.62	4.83*	6.37*
	20	2.17	2.32	2.53	2.75	2.98	3.21	3.58	3.90	4.22	5.75*	7.81*
	25	2.42	2.59	2.82	3.08	3.34	3.61	4.04	4.42	4.81	6.69*	9.45*
1600	15	1.96	2.09	2.27	2.46	2.66	2.87	3.18	3.45	3.72	4.97*	6.55*
	20	2.24	2.39	2.60	2.83	3.06	3.31	3.69	4.01	4.35	5.91*	8.03*
	25	2.49	2.67	2.91	3.17	3.44	3.72	4.17	4.55	4.95	6.88*	9.70*
1700	15	2.01	2.15	2.33	2.53	2.73	2.94	3.27	3.54	3.82	5.10*	6.72*
	20	2.30	2.46	2.68	2.91	3.15	3.40	3.79	4.12	4.47	6.07*	8.24*
	25	2.56	2.75	2.99	3.26	3.54	3.83	4.28	4.68	5.09	7.07*	9.94*
1800	15	2.06	2.20	2.39	2.59	2.80	3.02	3.35	3.63	3.92	5.23*	6.89*
	20	2.36	2.53	2.75	2.99	3.23	3.49	3.89	4.23	4.58	6.23*	8.44*
	25	2.63	2.83	3.08	3.35	3.64	3.94	4.40	4.80	5.23	7.26*	10.18*
1900	15	2.11	2.26	2.45	2.65	2.87	3.09	3.43	3.72	4.02	5.36*	7.06*
	20	2.42	2.59	2.82	3.06	3.32	3.58	3.99	4.34	4.70	6.38*	8.65*
	25	2.70	2.90	3.16	3.44	3.73	4.04	4.51	4.93	5.36	7.43*	10.42*
2000	15	2.16	2.31	2.50	2.72	2.94	3.16	3.51	3.81	4.11	5.48*	7.22*
	20	2.48	2.66	2.89	3.14	3.40	3.67	4.08	4.44	4.81	6.53*	8.84*
	25	2.77	2.97	3.24	3.52	3.83	4.14	4.63	5.05	5.49	7.61*	10.64*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.26	1.35	1.48	1.62	1.78	1.94	2.22	2.49	2.80	5.84*	15.06*
	20	1.38	1.49	1.64	1.82	2.02	2.24	2.64	3.09	3.77	11.71*	33.17*
	25	1.49	1.62	1.81	2.03	2.28	2.59	3.24	4.18	5.82	21.41*	63.03*
200	15	1.54	1.66	1.82	1.99	2.18	2.39	2.72	3.03	3.38	6.03*	15.06*
	20	1.72	1.86	2.05	2.27	2.51	2.78	3.24	3.72	4.34	11.71*	33.17*
	25	1.89	2.06	2.29	2.56	2.86	3.21	3.89	4.70	6.01	21.41*	63.03*
300	15	1.77	1.91	2.09	2.29	2.51	2.74	3.12	3.46	3.85	6.43*	15.06*
	20	2.00	2.16	2.39	2.64	2.91	3.21	3.73	4.24	4.88	11.72*	33.17*
	25	2.21	2.41	2.67	2.98	3.32	3.72	4.44	5.25	6.43	21.41*	63.03*
400	15	1.98	2.13	2.33	2.55	2.79	3.05	3.46	3.84	4.26	6.88*	15.06*
	20	2.24	2.43	2.67	2.95	3.26	3.59	4.15	4.70	5.36	11.77*	33.17*
	25	2.48	2.71	3.01	3.35	3.73	4.16	4.93	5.76	6.90	21.41*	63.03*
500	15	2.16	2.32	2.54	2.79	3.05	3.33	3.77	4.18	4.63	7.31*	15.09*
	20	2.46	2.66	2.93	3.24	3.57	3.92	4.53	5.11	5.80	11.89*	33.17*
	25	2.73	2.98	3.31	3.68	4.09	4.55	5.37	6.22	7.35	21.41*	63.03*
600	15	2.32	2.50	2.74	3.00	3.28	3.58	4.06	4.49	4.96	7.73*	15.17*
	20	2.66	2.88	3.17	3.50	3.85	4.23	4.87	5.49	6.21	12.09*	33.17*
	25	2.97	3.23	3.58	3.98	4.42	4.91	5.77	6.66	7.80	21.41*	63.03*
700	15	2.48	2.67	2.93	3.20	3.50	3.82	4.32	4.78	5.28	8.13*	15.30*
	20	2.84	3.08	3.39	3.74	4.12	4.52	5.20	5.84	6.59	12.36*	33.17*
	25	3.18	3.47	3.84	4.26	4.73	5.25	6.15	7.06	8.22	21.42*	63.03*
800	15	2.63	2.83	3.10	3.39	3.71	4.04	4.57	5.05	5.57	8.51*	15.48*
	20	3.02	3.27	3.60	3.97	4.37	4.79	5.50	6.17	6.95	12.65*	33.17*
	25	3.38	3.69	4.08	4.53	5.02	5.56	6.50	7.45	8.62	21.43*	63.03*
900	15	2.77	2.98	3.26	3.57	3.90	4.25	4.81	5.31	5.86	8.88*	15.71*
	20	3.19	3.45	3.80	4.19	4.60	5.05	5.79	6.49	7.29	12.97*	33.17*
	25	3.58	3.90	4.31	4.78	5.30	5.86	6.84	7.81	9.01	21.47*	63.03*
1000	15	2.90	3.13	3.42	3.75	4.09	4.45	5.04	5.56	6.12	9.23*	15.97*
	20	3.35	3.63	3.99	4.39	4.83	5.30	6.07	6.79	7.61	13.30*	33.17*
	25	3.76	4.10	4.53	5.02	5.56	6.15	7.16	8.16	9.38	21.53*	63.03*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.03	3.27	3.57	3.91	4.27	4.65	5.25	5.79	6.38	9.57*	16.25*
	20	3.50	3.79	4.17	4.59	5.05	5.53	6.33	7.08	7.92	13.63*	33.17*
	25	3.94	4.29	4.74	5.25	5.81	6.42	7.47	8.50	9.74	21.62*	63.03*
1200	15	3.15	3.40	3.72	4.07	4.44	4.83	5.46	6.02	6.63	9.90*	16.55*
	20	3.65	3.95	4.35	4.78	5.25	5.76	6.59	7.36	8.23	13.97*	33.18*
	25	4.11	4.48	4.95	5.48	6.05	6.69	7.76	8.82	10.08	21.73*	63.03*
1300	15	3.27	3.53	3.86	4.22	4.61	5.01	5.66	6.24	6.86	10.21*	16.85*
	20	3.79	4.11	4.52	4.97	5.46	5.98	6.83	7.62	8.52	14.30*	33.19*
	25	4.27	4.65	5.14	5.69	6.29	6.94	8.05	9.13	10.42	21.87*	63.03*
1400	15	3.39	3.65	4.00	4.37	4.77	5.19	5.86	6.45	7.10	10.52*	17.16*
	20	3.93	4.26	4.68	5.15	5.65	6.19	7.07	7.88	8.80	14.63*	33.20*
	25	4.43	4.83	5.33	5.90	6.52	7.19	8.33	9.43	10.74	22.03*	63.03*
1500	15	3.50	3.78	4.13	4.52	4.93	5.36	6.05	6.66	7.32	10.82*	17.47*
	20	4.07	4.41	4.84	5.32	5.84	6.39	7.30	8.14	9.07	14.96*	33.23*
	25	4.59	5.00	5.52	6.10	6.74	7.43	8.60	9.73	11.06	22.22*	63.03*
1600	15	3.61	3.89	4.26	4.66	5.08	5.52	6.23	6.86	7.54	11.11*	17.79*
	20	4.20	4.55	5.00	5.49	6.02	6.59	7.52	8.38	9.34	15.28*	33.26*
	25	4.74	5.16	5.70	6.30	6.95	7.66	8.86	10.01	11.37	22.42*	63.03*
1700	15	3.72	4.01	4.38	4.79	5.23	5.68	6.41	7.06	7.75	11.39*	18.10*
	20	4.33	4.69	5.15	5.66	6.20	6.79	7.74	8.62	9.59	15.60*	33.31*
	25	4.89	5.32	5.87	6.49	7.16	7.89	9.11	10.29	11.66	22.64*	63.03*
1800	15	3.83	4.12	4.51	4.93	5.37	5.84	6.58	7.25	7.95	11.67*	18.41*
	20	4.45	4.82	5.29	5.82	6.38	6.98	7.95	8.85	9.85	15.92*	33.36*
	25	5.03	5.48	6.04	6.67	7.36	8.11	9.36	10.56	11.96	22.87*	63.03*
1900	15	3.93	4.23	4.63	5.06	5.51	5.99	6.76	7.43	8.16	11.94*	18.72*
	20	4.57	4.95	5.44	5.98	6.55	7.16	8.16	9.08	10.09	16.23*	33.43*
	25	5.17	5.63	6.21	6.86	7.56	8.33	9.60	10.83	12.24	23.11*	63.03*
2000	15	4.03	4.34	4.74	5.18	5.65	6.14	6.92	7.62	8.35	12.21*	19.03*
	20	4.69	5.08	5.58	6.13	6.72	7.35	8.36	9.30	10.33	16.53*	33.52*
	25	5.31	5.78	6.37	7.03	7.76	8.54	9.84	11.08	12.52	23.36*	63.03*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.13	2.37	2.70	3.13	3.72	4.66	7.57	11.63	17.48	70.69*	213.88*
	20	2.43	2.77	3.29	4.11	5.70	8.69	16.00	25.50	39.20	164.77*	503.65*
	25	2.73	3.23	4.10	5.98	9.83	15.76	29.91	48.36	75.02	319.88*	981.38*
200	15	2.73	3.03	3.43	3.93	4.56	5.42	7.76	11.64	17.48	70.69*	213.88*
	20	3.15	3.57	4.18	5.01	6.33	8.80	16.00	25.50	39.20	164.77*	503.65*
	25	3.57	4.16	5.08	6.63	9.89	15.76	29.91	48.36	75.02	319.88*	981.38*
300	15	3.21	3.55	4.01	4.57	5.26	6.14	8.25	11.71	17.48	70.69*	213.88*
	20	3.73	4.22	4.89	5.78	7.06	9.20	16.01	25.50	39.20	164.77*	503.65*
	25	4.24	4.91	5.89	7.40	10.20	15.77	29.91	48.36	75.02	319.88*	981.38*
400	15	3.62	4.01	4.52	5.13	5.86	6.78	8.82	11.94	17.49	70.69*	213.88*
	20	4.23	4.77	5.50	6.45	7.75	9.75	16.04	25.50	39.20	164.77*	503.65*
	25	4.83	5.56	6.61	8.13	10.71	15.83	29.91	48.36	75.02	319.88*	981.38*
500	15	4.00	4.42	4.97	5.63	6.41	7.37	9.40	12.29	17.53	70.69*	213.88*
	20	4.69	5.27	6.06	7.06	8.39	10.34	16.16	25.50	39.20	164.77*	503.65*
	25	5.35	6.14	7.25	8.81	11.29	15.99	29.91	48.36	75.02	319.88*	981.38*
600	15	4.34	4.80	5.39	6.09	6.92	7.91	9.96	12.72	17.64	70.69*	213.88*
	20	5.10	5.73	6.57	7.62	8.99	10.92	16.38	25.50	39.20	164.77*	503.65*
	25	5.84	6.68	7.84	9.45	11.88	16.27	29.91	48.36	75.02	319.88*	981.38*
700	15	4.66	5.15	5.78	6.52	7.39	8.42	10.50	13.18	17.82	70.69*	213.88*
	20	5.49	6.16	7.04	8.14	9.55	11.48	16.67	25.52	39.20	164.77*	503.65*
	25	6.29	7.18	8.40	10.04	12.47	16.63	29.92	48.36	75.02	319.88*	981.38*
800	15	4.97	5.48	6.15	6.93	7.83	8.90	11.01	13.65	18.06	70.69*	213.88*
	20	5.86	6.56	7.49	8.64	10.08	12.03	17.03	25.56	39.20	164.77*	503.65*
	25	6.71	7.65	8.92	10.61	13.03	17.04	29.93	48.36	75.02	319.88*	981.38*
900	15	5.26	5.80	6.49	7.31	8.25	9.35	11.50	14.12	18.36	70.69*	213.88*
	20	6.20	6.94	7.91	9.10	10.59	12.55	17.43	25.63	39.20	164.77*	503.65*
	25	7.11	8.09	9.41	11.15	13.59	17.48	29.96	48.36	75.02	319.88*	981.38*
1000	15	5.53	6.10	6.83	7.67	8.65	9.79	11.98	14.58	18.69	70.69*	213.88*
	20	6.53	7.31	8.32	9.55	11.07	13.06	17.84	25.74	39.21	164.77*	503.65*
	25	7.50	8.51	9.88	11.67	14.12	17.94	30.01	48.36	75.02	319.88*	981.38*

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	5.79	6.38	7.14	8.02	9.03	10.21	12.43	15.04	19.05	70.69*	213.88*
	20	6.85	7.66	8.71	9.98	11.54	13.55	18.27	25.89	39.21	164.77*	503.65*
	25	7.86	8.92	10.34	12.16	14.64	18.41	30.08	48.36	75.02	319.88*	981.38*
1200	15	6.05	6.66	7.45	8.36	9.40	10.61	12.88	15.49	19.42	70.69*	213.88*
	20	7.16	7.99	9.08	10.39	11.99	14.03	18.71	26.08	39.22	164.77*	503.65*
	25	8.22	9.31	10.77	12.64	15.15	18.87	30.19	48.36	75.02	319.88*	981.38*
1300	15	6.30	6.93	7.75	8.69	9.76	10.99	13.30	15.93	19.80	70.69*	213.88*
	20	7.45	8.32	9.44	10.78	12.42	14.49	19.14	26.30	39.23	164.77*	503.65*
	25	8.56	9.69	11.19	13.10	15.64	19.34	30.34	48.36	75.02	319.88*	981.38*
1400	15	6.53	7.19	8.03	9.00	10.10	11.37	13.72	16.36	20.19	70.69*	213.88*
	20	7.74	8.63	9.79	11.17	12.84	14.94	19.58	26.55	39.26	164.77*	503.65*
	25	8.89	10.06	11.60	13.55	16.11	19.81	30.51	48.36	75.02	319.88*	981.38*
1500	15	6.76	7.44	8.31	9.31	10.44	11.73	14.12	16.78	20.58	70.69*	213.88*
	20	8.02	8.94	10.12	11.54	13.25	15.37	20.01	26.82	39.29	164.77*	503.65*
	25	9.22	10.41	11.99	13.98	16.58	20.27	30.72	48.37	75.02	319.88*	981.38*
1600	15	6.99	7.69	8.58	9.60	10.76	12.09	14.52	17.20	20.97	70.69*	213.88*
	20	8.29	9.23	10.45	11.90	13.64	15.80	20.44	27.12	39.34	164.77*	503.65*
	25	9.53	10.76	12.38	14.40	17.03	20.72	30.95	48.38	75.02	319.88*	981.38*
1700	15	7.21	7.93	8.84	9.89	11.08	12.43	14.90	17.60	21.36	70.69*	213.88*
	20	8.55	9.52	10.77	12.26	14.03	16.22	20.86	27.43	39.41	164.77*	503.65*
	25	9.83	11.09	12.75	14.81	17.48	21.17	31.20	48.40	75.02	319.88*	981.38*
1800	15	7.42	8.16	9.10	10.17	11.39	12.77	15.28	18.00	21.75	70.69*	213.88*
	20	8.81	9.81	11.08	12.60	14.41	16.62	21.28	27.75	39.49	164.77*	503.65*
	25	10.13	11.42	13.11	15.21	17.91	21.61	31.47	48.42	75.02	319.88*	981.38*
1900	15	7.63	8.39	9.35	10.45	11.69	13.10	15.64	18.39	22.13	70.69*	213.88*
	20	9.06	10.08	11.39	12.94	14.77	17.02	21.69	28.08	39.59	164.77*	503.65*
	25	10.42	11.74	13.47	15.61	18.33	22.04	31.76	48.46	75.02	319.88*	981.38*
2000	15	7.84	8.61	9.60	10.72	11.98	13.42	16.00	18.77	22.51	70.69*	213.88*
	20	9.31	10.35	11.69	13.26	15.13	17.41	22.10	28.42	39.71	164.77*	503.65*
	25	10.71	12.06	13.82	15.99	18.75	22.47	32.06	48.50	75.02	319.88*	981.38*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	4.19	5.60	9.69	18.04	31.42	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	5.32	9.71	21.08	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	6.99	17.70	39.89	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
200	15	5.47	6.91	10.11	18.04	31.42	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	6.86	10.35	21.08	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	8.61	17.71	39.89	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
300	15	6.49	8.02	10.95	18.08	31.42	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	8.10	11.38	21.10	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	10.02	17.91	39.89	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
400	15	7.38	8.99	11.85	18.27	31.42	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	9.18	12.43	21.22	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	11.26	18.41	39.89	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
500	15	8.17	9.87	12.73	18.64	31.43	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	10.15	13.42	21.51	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	12.38	19.12	39.89	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
600	15	8.90	10.68	13.57	19.14	31.44	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	11.05	14.36	21.95	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	13.42	19.92	39.90	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
700	15	9.58	11.44	14.37	19.73	31.49	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	11.88	15.25	22.51	40.77	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	14.38	20.76	39.92	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
800	15	10.23	12.15	15.13	20.35	31.59	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	12.66	16.10	23.13	40.79	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	15.30	21.61	39.97	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
900	15	10.83	12.83	15.86	21.00	31.74	51.72	100.36	163.88	255.81	1101.1*	3386.4*
	20	13.40	16.91	23.78	40.83	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	16.16	22.44	40.06	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1000	15	11.41	13.48	16.57	21.64	31.95	51.73	100.36	163.88	255.81	1101.1*	3386.4*
	20	14.11	17.68	24.45	40.91	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	16.99	23.27	40.20	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 22.0 Ft (RADIUS = 15.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	11.97	14.09	17.24	22.29	32.23	51.73	100.36	163.88	255.81	1101.1*	3386.4*
	20	14.79	18.43	25.13	41.02	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	17.78	24.07	40.40	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1200	15	12.51	14.69	17.89	22.93	32.56	51.74	100.36	163.88	255.81	1101.1*	3386.4*
	20	15.44	19.15	25.81	41.18	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	18.54	24.86	40.66	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1300	15	13.02	15.26	18.52	23.56	32.92	51.76	100.36	163.88	255.81	1101.1*	3386.4*
	20	16.07	19.84	26.48	41.38	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	19.27	25.63	40.97	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1400	15	13.52	15.82	19.14	24.18	33.33	51.80	100.36	163.88	255.81	1101.1*	3386.4*
	20	16.68	20.52	27.15	41.63	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	19.99	26.38	41.33	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1500	15	14.01	16.36	19.73	24.79	33.75	51.85	100.36	163.88	255.81	1101.1*	3386.4*
	20	17.27	21.17	27.81	41.92	72.33	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	20.68	27.11	41.73	78.23	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1600	15	14.48	16.88	20.31	25.39	34.20	51.91	100.36	163.88	255.81	1101.1*	3386.4*
	20	17.85	21.81	28.45	42.24	72.34	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	21.35	27.83	42.17	78.24	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1700	15	14.94	17.40	20.87	25.97	34.67	52.00	100.36	163.88	255.81	1101.1*	3386.4*
	20	18.41	22.43	29.09	42.60	72.35	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	22.00	28.53	42.63	78.24	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1800	15	15.39	17.89	21.43	26.55	35.14	52.11	100.36	163.88	255.81	1101.1*	3386.4*
	20	18.95	23.04	29.72	42.99	72.36	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	22.64	29.22	43.11	78.25	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
1900	15	15.83	18.38	21.96	27.12	35.62	52.25	100.36	163.88	255.81	1101.1*	3386.4*
	20	19.49	23.63	30.34	43.39	72.38	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	23.26	29.89	43.61	78.27	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*
2000	15	16.26	18.86	22.49	27.68	36.11	52.41	100.36	163.88	255.81	1101.1*	3386.4*
	20	20.01	24.21	30.95	43.82	72.40	120.29	235.33	385.72	603.42	2606.4*	8022.7*
	25	23.87	30.56	44.12	78.29	139.76	233.33	457.86	751.45	1176.5	5088.1*	15666.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.86	0.90	0.97	1.05	1.13	1.21	1.34	1.45	1.57	2.07*	2.76*
	20	0.92	0.97	1.05	1.13	1.22	1.32	1.47	1.60	1.73	2.39*	3.66*
	25	0.98	1.03	1.12	1.21	1.31	1.42	1.59	1.74	1.91	2.86*	5.59*
200	15	1.02	1.07	1.15	1.24	1.34	1.44	1.59	1.72	1.86	2.45*	3.24*
	20	1.11	1.17	1.26	1.36	1.47	1.59	1.77	1.92	2.08	2.85*	4.10*
	25	1.19	1.26	1.36	1.48	1.60	1.73	1.94	2.12	2.32	3.35*	5.69*
300	15	1.14	1.20	1.29	1.40	1.50	1.62	1.79	1.94	2.09	2.75*	3.64*
	20	1.25	1.33	1.43	1.55	1.67	1.80	2.01	2.18	2.36	3.22*	4.54*
	25	1.36	1.44	1.56	1.69	1.84	1.98	2.22	2.43	2.65	3.76*	5.98*
400	15	1.25	1.32	1.42	1.53	1.65	1.77	1.96	2.12	2.29	3.01*	3.98*
	20	1.38	1.46	1.58	1.71	1.85	1.99	2.21	2.41	2.61	3.54*	4.94*
	25	1.51	1.60	1.73	1.88	2.04	2.20	2.46	2.69	2.93	4.13*	6.34*
500	15	1.35	1.42	1.53	1.65	1.78	1.91	2.12	2.29	2.47	3.25*	4.28*
	20	1.50	1.59	1.72	1.86	2.01	2.16	2.40	2.61	2.83	3.82*	5.31*
	25	1.64	1.75	1.89	2.05	2.22	2.40	2.68	2.93	3.19	4.47*	6.71*
600	15	1.44	1.52	1.63	1.76	1.90	2.04	2.26	2.44	2.63	3.46*	4.57*
	20	1.61	1.70	1.84	1.99	2.15	2.32	2.57	2.80	3.03	4.09*	5.64*
	25	1.77	1.88	2.03	2.20	2.39	2.58	2.88	3.14	3.42	4.77*	7.07*
700	15	1.52	1.61	1.73	1.87	2.01	2.16	2.39	2.59	2.79	3.67*	4.83*
	20	1.71	1.81	1.96	2.12	2.29	2.46	2.73	2.97	3.22	4.33*	5.96*
	25	1.88	2.00	2.17	2.35	2.54	2.75	3.06	3.34	3.64	5.06*	7.41*
800	15	1.60	1.69	1.82	1.97	2.12	2.28	2.52	2.72	2.93	3.85*	5.08*
	20	1.81	1.91	2.07	2.24	2.41	2.60	2.89	3.13	3.39	4.57*	6.26*
	25	1.99	2.12	2.29	2.49	2.69	2.90	3.24	3.53	3.85	5.33*	7.74*
900	15	1.68	1.77	1.91	2.06	2.22	2.38	2.64	2.85	3.07	4.03*	5.31*
	20	1.90	2.01	2.17	2.35	2.53	2.73	3.03	3.29	3.56	4.78*	6.55*
	25	2.10	2.23	2.41	2.61	2.83	3.05	3.41	3.72	4.04	5.58*	8.06*
1000	15	1.75	1.85	1.99	2.15	2.32	2.49	2.75	2.98	3.21	4.21*	5.54*
	20	1.98	2.10	2.27	2.46	2.65	2.85	3.17	3.44	3.72	4.99*	6.82*
	25	2.20	2.33	2.53	2.74	2.96	3.20	3.57	3.89	4.23	5.83*	8.37*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.82	1.92	2.07	2.24	2.41	2.59	2.86	3.09	3.33	4.37*	5.75*
	20	2.07	2.19	2.37	2.56	2.76	2.97	3.30	3.58	3.87	5.19*	7.08*
	25	2.29	2.44	2.64	2.86	3.09	3.33	3.72	4.05	4.40	6.06*	8.67*
1200	15	1.89	2.00	2.15	2.32	2.50	2.68	2.96	3.21	3.45	4.53*	5.96*
	20	2.15	2.28	2.46	2.66	2.87	3.09	3.42	3.72	4.02	5.39*	7.33*
	25	2.38	2.53	2.74	2.97	3.21	3.47	3.86	4.21	4.58	6.29*	8.96*
1300	15	1.95	2.06	2.22	2.40	2.58	2.77	3.07	3.32	3.57	4.68*	6.16*
	20	2.22	2.36	2.55	2.75	2.97	3.20	3.55	3.85	4.16	5.57*	7.57*
	25	2.47	2.63	2.84	3.08	3.33	3.60	4.01	4.37	4.74	6.51*	9.23*
1400	15	2.02	2.13	2.30	2.48	2.67	2.86	3.17	3.42	3.69	4.83*	6.35*
	20	2.30	2.44	2.63	2.85	3.07	3.30	3.67	3.98	4.30	5.75*	7.81*
	25	2.56	2.72	2.94	3.19	3.45	3.72	4.14	4.51	4.90	6.72*	9.50*
1500	15	2.08	2.20	2.37	2.55	2.75	2.95	3.26	3.53	3.80	4.97*	6.54*
	20	2.37	2.52	2.72	2.94	3.17	3.41	3.78	4.10	4.44	5.93*	8.04*
	25	2.64	2.81	3.04	3.29	3.56	3.84	4.28	4.66	5.06	6.92*	9.77*
1600	15	2.14	2.26	2.43	2.63	2.83	3.03	3.35	3.63	3.91	5.11*	6.72*
	20	2.44	2.59	2.80	3.02	3.26	3.51	3.89	4.22	4.57	6.10*	8.26*
	25	2.72	2.90	3.13	3.39	3.67	3.96	4.41	4.80	5.21	7.12*	10.02*
1700	15	2.19	2.32	2.50	2.70	2.90	3.12	3.44	3.72	4.01	5.25*	6.90*
	20	2.51	2.67	2.88	3.11	3.36	3.61	4.00	4.34	4.69	6.26*	8.48*
	25	2.80	2.98	3.22	3.49	3.78	4.07	4.53	4.94	5.36	7.31*	10.27*
1800	15	2.25	2.38	2.57	2.77	2.98	3.20	3.53	3.82	4.11	5.38*	7.07*
	20	2.58	2.74	2.95	3.19	3.45	3.71	4.11	4.46	4.82	6.43*	8.69*
	25	2.88	3.06	3.31	3.59	3.88	4.18	4.66	5.07	5.50	7.50*	10.52*
1900	15	2.31	2.44	2.63	2.84	3.05	3.28	3.62	3.91	4.21	5.51*	7.24*
	20	2.65	2.81	3.03	3.28	3.53	3.80	4.21	4.57	4.94	6.58*	8.89*
	25	2.96	3.14	3.40	3.68	3.98	4.29	4.78	5.20	5.64	7.69*	10.76*
2000	15	2.36	2.50	2.69	2.90	3.13	3.35	3.70	4.01	4.31	5.64*	7.40*
	20	2.71	2.88	3.10	3.36	3.62	3.89	4.32	4.68	5.06	6.74*	9.09*
	25	3.03	3.22	3.49	3.78	4.08	4.40	4.89	5.33	5.78	7.87*	10.99*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.36	1.45	1.58	1.72	1.88	2.05	2.34	2.62	2.96	6.35*	16.30*
	20	1.50	1.61	1.76	1.94	2.15	2.38	2.82	3.32	4.10	12.90*	36.07*
	25	1.62	1.76	1.95	2.18	2.45	2.78	3.53	4.65	6.54	23.71*	68.68*
200	15	1.68	1.79	1.95	2.13	2.32	2.53	2.87	3.20	3.57	6.48*	16.30*
	20	1.88	2.01	2.21	2.43	2.68	2.96	3.45	3.97	4.66	12.90*	36.07*
	25	2.06	2.23	2.47	2.75	3.07	3.45	4.19	5.12	6.67	23.71*	68.68*
300	15	1.93	2.06	2.24	2.45	2.67	2.91	3.30	3.66	4.07	6.84*	16.30*
	20	2.18	2.34	2.57	2.83	3.11	3.43	3.97	4.52	5.21	12.91*	36.07*
	25	2.41	2.61	2.89	3.21	3.57	3.99	4.77	5.67	7.03	23.71*	68.68*
400	15	2.15	2.30	2.50	2.73	2.98	3.24	3.66	4.06	4.50	7.26*	16.30*
	20	2.45	2.63	2.88	3.17	3.48	3.83	4.42	5.00	5.71	12.93*	36.07*
	25	2.72	2.94	3.25	3.60	4.00	4.46	5.28	6.20	7.48	23.71*	68.68*
500	15	2.35	2.51	2.73	2.98	3.25	3.53	3.99	4.42	4.88	7.69*	16.32*
	20	2.69	2.89	3.16	3.47	3.81	4.19	4.82	5.44	6.17	13.00*	36.07*
	25	2.99	3.24	3.58	3.96	4.39	4.88	5.75	6.68	7.95	23.71*	68.68*
600	15	2.54	2.71	2.95	3.21	3.50	3.80	4.30	4.75	5.24	8.12*	16.36*
	20	2.91	3.12	3.42	3.75	4.12	4.52	5.19	5.84	6.60	13.15*	36.07*
	25	3.25	3.52	3.87	4.29	4.75	5.26	6.18	7.14	8.40	23.71*	68.68*
700	15	2.71	2.89	3.15	3.43	3.74	4.06	4.58	5.05	5.57	8.52*	16.45*
	20	3.11	3.35	3.66	4.02	4.40	4.83	5.53	6.21	7.00	13.36*	36.07*
	25	3.49	3.77	4.15	4.59	5.08	5.62	6.58	7.57	8.84	23.71*	68.68*
800	15	2.87	3.07	3.34	3.64	3.96	4.30	4.84	5.34	5.89	8.91*	16.59*
	20	3.31	3.55	3.89	4.26	4.67	5.12	5.86	6.56	7.38	13.62*	36.07*
	25	3.71	4.01	4.42	4.88	5.39	5.96	6.96	7.97	9.26	23.71*	68.68*
900	15	3.03	3.23	3.52	3.83	4.17	4.52	5.10	5.62	6.18	9.28*	16.78*
	20	3.49	3.75	4.10	4.50	4.93	5.39	6.16	6.90	7.74	13.90*	36.07*
	25	3.92	4.24	4.67	5.15	5.69	6.28	7.31	8.36	9.66	23.73*	68.68*
1000	15	3.17	3.39	3.69	4.01	4.37	4.74	5.34	5.88	6.46	9.64*	17.00*
	20	3.67	3.94	4.31	4.72	5.17	5.65	6.46	7.22	8.09	14.21*	36.08*
	25	4.12	4.46	4.90	5.41	5.97	6.59	7.66	8.73	10.05	23.76*	68.68*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.31	3.54	3.85	4.19	4.56	4.95	5.57	6.13	6.74	9.99*	17.25*
	20	3.84	4.12	4.51	4.94	5.40	5.91	6.74	7.52	8.41	14.53*	36.08*
	25	4.32	4.67	5.13	5.66	6.24	6.88	7.98	9.08	10.42	23.81*	68.68*
1200	15	3.45	3.69	4.01	4.36	4.74	5.14	5.79	6.37	7.00	10.32*	17.52*
	20	4.00	4.30	4.70	5.14	5.63	6.15	7.01	7.82	8.73	14.85*	36.08*
	25	4.51	4.87	5.35	5.90	6.50	7.16	8.30	9.42	10.78	23.88*	68.68*
1300	15	3.58	3.83	4.16	4.53	4.92	5.34	6.00	6.60	7.25	10.65*	17.81*
	20	4.16	4.47	4.88	5.34	5.84	6.38	7.27	8.10	9.04	15.18*	36.08*
	25	4.69	5.07	5.57	6.13	6.75	7.44	8.60	9.75	11.14	23.98*	68.68*
1400	15	3.71	3.96	4.31	4.69	5.09	5.52	6.21	6.83	7.49	10.96*	18.10*
	20	4.31	4.63	5.06	5.53	6.05	6.61	7.52	8.38	9.34	15.50*	36.09*
	25	4.86	5.26	5.77	6.35	7.00	7.70	8.90	10.07	11.48	24.10*	68.68*
1500	15	3.83	4.10	4.45	4.84	5.26	5.70	6.41	7.05	7.73	11.27*	18.40*
	20	4.46	4.79	5.23	5.72	6.26	6.83	7.77	8.64	9.62	15.83*	36.10*
	25	5.03	5.44	5.97	6.57	7.23	7.96	9.18	10.38	11.81	24.24*	68.68*
1600	15	3.95	4.23	4.59	4.99	5.43	5.88	6.61	7.26	7.96	11.57*	18.71*
	20	4.60	4.94	5.40	5.90	6.45	7.04	8.01	8.90	9.90	16.15*	36.12*
	25	5.20	5.62	6.17	6.78	7.46	8.20	9.46	10.68	12.13	24.40*	68.68*
1700	15	4.07	4.35	4.73	5.14	5.59	6.05	6.80	7.47	8.18	11.86*	19.02*
	20	4.74	5.10	5.56	6.08	6.65	7.25	8.24	9.15	10.18	16.47*	36.15*
	25	5.36	5.79	6.36	6.99	7.69	8.45	9.73	10.98	12.45	24.58*	68.68*
1800	15	4.19	4.47	4.86	5.29	5.74	6.22	6.98	7.67	8.40	12.14*	19.32*
	20	4.88	5.24	5.72	6.26	6.83	7.45	8.46	9.40	10.44	16.78*	36.18*
	25	5.52	5.96	6.54	7.19	7.90	8.68	10.00	11.27	12.76	24.77*	68.68*
1900	15	4.30	4.59	4.99	5.43	5.89	6.38	7.17	7.86	8.61	12.42*	19.63*
	20	5.01	5.39	5.88	6.43	7.02	7.65	8.68	9.64	10.70	17.10*	36.23*
	25	5.67	6.13	6.72	7.39	8.12	8.91	10.26	11.55	13.06	24.98*	68.68*
2000	15	4.41	4.71	5.12	5.56	6.04	6.54	7.34	8.06	8.82	12.69*	19.93*
	20	5.14	5.53	6.03	6.59	7.20	7.84	8.90	9.88	10.96	17.40*	36.28*
	25	5.83	6.29	6.90	7.58	8.33	9.14	10.51	11.82	13.35	25.20*	68.68*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.33	2.58	2.93	3.40	4.09	5.24	8.71	13.33	19.91	78.57*	233.36*
	20	2.67	3.04	3.63	4.63	6.67	10.24	18.66	29.47	44.91	183.40*	549.78*
	25	3.01	3.58	4.66	7.15	11.79	18.73	35.07	56.07	86.13	356.22*	1071.4*
200	15	2.99	3.30	3.72	4.26	4.97	5.97	8.82	13.34	19.91	78.57*	233.36*
	20	3.47	3.92	4.59	5.55	7.16	10.28	18.66	29.47	44.91	183.40*	549.78*
	25	3.95	4.60	5.67	7.62	11.81	18.73	35.07	56.07	86.13	356.22*	1071.4*
300	15	3.52	3.87	4.36	4.96	5.71	6.71	9.21	13.37	19.91	78.57*	233.36*
	20	4.11	4.62	5.36	6.36	7.87	10.55	18.66	29.47	44.91	183.40*	549.78*
	25	4.69	5.42	6.54	8.36	11.97	18.74	35.07	56.07	86.13	356.22*	1071.4*
400	15	3.98	4.37	4.91	5.56	6.36	7.38	9.75	13.51	19.91	78.57*	233.36*
	20	4.66	5.23	6.03	7.08	8.58	11.02	18.68	29.47	44.91	183.40*	549.78*
	25	5.33	6.13	7.31	9.11	12.36	18.76	35.07	56.07	86.13	356.22*	1071.4*
500	15	4.39	4.82	5.40	6.10	6.95	8.00	10.32	13.78	19.93	78.57*	233.36*
	20	5.16	5.78	6.63	7.74	9.25	11.57	18.73	29.47	44.91	183.40*	549.78*
	25	5.91	6.77	8.01	9.82	12.87	18.83	35.07	56.07	86.13	356.22*	1071.4*
600	15	4.77	5.23	5.86	6.60	7.49	8.58	10.89	14.15	19.99	78.57*	233.36*
	20	5.62	6.28	7.18	8.34	9.88	12.15	18.85	29.47	44.91	183.40*	549.78*
	25	6.45	7.36	8.65	10.49	13.43	18.99	35.07	56.07	86.13	356.22*	1071.4*
700	15	5.12	5.62	6.28	7.06	7.99	9.12	11.44	14.57	20.10	78.57*	233.36*
	20	6.05	6.75	7.70	8.90	10.48	12.72	19.06	29.48	44.91	183.40*	549.78*
	25	6.94	7.90	9.25	11.12	14.01	19.24	35.07	56.07	86.13	356.22*	1071.4*
800	15	5.46	5.98	6.68	7.50	8.47	9.63	11.98	15.02	20.28	78.57*	233.36*
	20	6.45	7.19	8.19	9.43	11.04	13.28	19.34	29.49	44.91	183.40*	549.78*
	25	7.41	8.42	9.82	11.73	14.59	19.57	35.07	56.07	86.13	356.22*	1071.4*
900	15	5.77	6.33	7.05	7.91	8.92	10.12	12.49	15.49	20.51	78.57*	233.36*
	20	6.83	7.61	8.65	9.94	11.58	13.82	19.67	29.52	44.91	183.40*	549.78*
	25	7.85	8.90	10.35	12.31	15.15	19.95	35.08	56.07	86.13	356.22*	1071.4*
1000	15	6.08	6.65	7.41	8.31	9.35	10.58	12.99	15.95	20.79	78.57*	233.36*
	20	7.20	8.01	9.08	10.42	12.10	14.35	20.04	29.58	44.91	183.40*	549.78*
	25	8.28	9.37	10.87	12.86	15.71	20.36	35.10	56.07	86.13	356.22*	1071.4*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	6.37	6.97	7.76	8.69	9.76	11.02	13.47	16.42	21.11	78.57*	233.36*
	20	7.55	8.39	9.51	10.88	12.60	14.87	20.44	29.66	44.91	183.40*	549.78*
	25	8.68	9.81	11.36	13.39	16.25	20.79	35.13	56.07	86.13	356.22*	1071.4*
1200	15	6.65	7.27	8.09	9.05	10.16	11.45	13.94	16.87	21.45	78.57*	233.36*
	20	7.89	8.76	9.91	11.32	13.08	15.37	20.85	29.78	44.91	183.40*	549.78*
	25	9.08	10.24	11.83	13.90	16.78	21.24	35.18	56.07	86.13	356.22*	1071.4*
1300	15	6.92	7.57	8.41	9.40	10.54	11.87	14.39	17.33	21.81	78.57*	233.36*
	20	8.21	9.11	10.30	11.75	13.54	15.86	21.28	29.94	44.92	183.40*	549.78*
	25	9.45	10.66	12.28	14.40	17.29	21.70	35.26	56.08	86.13	356.22*	1071.4*
1400	15	7.18	7.85	8.72	9.74	10.91	12.27	14.83	17.77	22.18	78.57*	233.36*
	20	8.53	9.46	10.68	12.17	13.99	16.33	21.70	30.12	44.93	183.40*	549.78*
	25	9.82	11.06	12.73	14.88	17.80	22.16	35.36	56.08	86.13	356.22*	1071.4*
1500	15	7.43	8.12	9.03	10.07	11.27	12.66	15.25	18.21	22.56	78.57*	233.36*
	20	8.83	9.79	11.05	12.57	14.43	16.79	22.13	30.33	44.94	183.40*	549.78*
	25	10.17	11.45	13.15	15.35	18.29	22.62	35.49	56.08	86.13	356.22*	1071.4*
1600	15	7.68	8.39	9.32	10.39	11.62	13.03	15.67	18.64	22.94	78.57*	233.36*
	20	9.13	10.11	11.40	12.96	14.85	17.24	22.56	30.57	44.97	183.40*	549.78*
	25	10.52	11.82	13.57	15.80	18.77	23.08	35.64	56.08	86.13	356.22*	1071.4*
1700	15	7.92	8.65	9.60	10.70	11.96	13.40	16.08	19.06	23.33	78.57*	233.36*
	20	9.42	10.43	11.75	13.34	15.27	17.68	22.99	30.83	45.00	183.40*	549.78*
	25	10.86	12.19	13.98	16.25	19.24	23.54	35.83	56.09	86.13	356.22*	1071.4*
1800	15	8.16	8.91	9.88	11.01	12.29	13.76	16.47	19.47	23.72	78.57*	233.36*
	20	9.71	10.74	12.09	13.71	15.67	18.11	23.42	31.11	45.04	183.40*	549.78*
	25	11.18	12.55	14.37	16.68	19.70	23.99	36.03	56.09	86.13	356.22*	1071.4*
1900	15	8.39	9.16	10.15	11.31	12.61	14.11	16.86	19.88	24.10	78.57*	233.36*
	20	9.98	11.04	12.42	14.08	16.07	18.54	23.84	31.41	45.10	183.40*	549.78*
	25	11.51	12.90	14.76	17.10	20.15	24.43	36.26	56.11	86.13	356.22*	1071.4*
2000	15	8.61	9.40	10.42	11.60	12.93	14.46	17.24	20.28	24.49	78.57*	233.36*
	20	10.26	11.33	12.74	14.43	16.45	18.95	24.26	31.72	45.17	183.40*	549.78*
	25	11.82	13.24	15.14	17.51	20.59	24.88	36.50	56.12	86.13	356.22*	1071.4*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	4.69	6.53	12.02	22.16	38.10	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	6.12	12.35	26.53	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	8.49	22.84	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
200	15	6.10	7.85	12.20	22.16	38.10	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	7.78	12.66	26.53	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	10.06	22.84	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
300	15	7.23	9.04	12.85	22.17	38.10	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	9.15	13.50	26.54	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	11.55	22.88	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
400	15	8.21	10.09	13.68	22.23	38.10	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	10.34	14.49	26.56	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	12.89	23.09	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
500	15	9.09	11.05	14.56	22.41	38.10	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	11.41	15.50	26.66	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	14.12	23.52	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
600	15	9.90	11.93	15.42	22.74	38.10	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	12.40	16.48	26.88	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	15.26	24.13	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
700	15	10.65	12.76	16.25	23.18	38.11	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	13.32	17.42	27.24	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	16.32	24.85	50.47	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
800	15	11.36	13.54	17.06	23.71	38.14	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	14.18	18.33	27.69	50.44	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	17.32	25.62	50.48	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
900	15	12.03	14.28	17.83	24.29	38.20	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	15.00	19.19	28.23	50.45	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	18.28	26.42	50.50	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1000	15	12.67	14.98	18.58	24.90	38.30	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	15.79	20.03	28.81	50.47	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	19.19	27.23	50.53	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 24.0 Ft (RADIUS = 17.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	13.29	15.66	19.30	25.52	38.44	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	16.54	20.84	29.43	50.50	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	20.06	28.04	50.60	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1200	15	13.88	16.31	20.00	26.15	38.63	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	17.26	21.61	30.07	50.55	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	20.90	28.85	50.70	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1300	15	14.45	16.94	20.68	26.78	38.87	61.92	118.09	190.46	294.10	1226.7*	3697.6*
	20	17.95	22.37	30.72	50.63	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	21.71	29.64	50.83	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1400	15	15.00	17.55	21.34	27.40	39.16	61.93	118.09	190.46	294.10	1226.7*	3697.6*
	20	18.63	23.10	31.38	50.74	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	22.50	30.43	51.01	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1500	15	15.54	18.14	21.98	28.03	39.48	61.95	118.09	190.46	294.10	1226.7*	3697.6*
	20	19.28	23.81	32.03	50.89	88.06	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	23.26	31.20	51.24	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1600	15	16.06	18.72	22.61	28.64	39.84	61.97	118.09	190.46	294.10	1226.7*	3697.6*
	20	19.92	24.51	32.69	51.07	88.07	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	24.01	31.95	51.51	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1700	15	16.57	19.28	23.22	29.25	40.22	62.00	118.09	190.46	294.10	1226.7*	3697.6*
	20	20.54	25.18	33.34	51.29	88.07	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	24.73	32.70	51.81	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1800	15	17.07	19.82	23.81	29.85	40.63	62.05	118.09	190.46	294.10	1226.7*	3697.6*
	20	21.14	25.85	33.99	51.54	88.07	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	25.43	33.43	52.15	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
1900	15	17.55	20.35	24.40	30.45	41.06	62.10	118.09	190.46	294.10	1226.7*	3697.6*
	20	21.73	26.49	34.63	51.82	88.07	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	26.12	34.15	52.52	97.06	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*
2000	15	18.02	20.88	24.97	31.03	41.50	62.18	118.09	190.46	294.10	1226.7*	3697.6*
	20	22.31	27.12	35.26	52.13	88.08	144.37	277.28	448.65	694.12	2903.9*	8760.1*
	25	26.79	34.86	52.92	97.07	170.44	280.30	539.74	874.30	1353.6	5669.0*	17107.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.93	0.96	1.03	1.11	1.19	1.27	1.40	1.51	1.63	2.13	2.84*
	20	0.99	1.04	1.11	1.20	1.29	1.38	1.53	1.66	1.80	2.48	3.85*
	25	1.05	1.10	1.19	1.28	1.38	1.49	1.67	1.82	1.99	3.00	5.99*
200	15	1.09	1.14	1.22	1.31	1.41	1.51	1.66	1.79	1.93	2.53	3.33*
	20	1.19	1.25	1.34	1.44	1.55	1.67	1.85	2.01	2.17	2.95	4.26*
	25	1.29	1.35	1.45	1.57	1.69	1.83	2.04	2.22	2.43	3.49	6.05*
300	15	1.23	1.29	1.38	1.48	1.59	1.70	1.87	2.02	2.17	2.84	3.73*
	20	1.36	1.42	1.53	1.64	1.77	1.90	2.10	2.28	2.47	3.34	4.70*
	25	1.47	1.55	1.67	1.80	1.94	2.09	2.33	2.55	2.77	3.93	6.30*
400	15	1.35	1.41	1.51	1.62	1.74	1.86	2.05	2.22	2.39	3.11	4.08*
	20	1.50	1.57	1.69	1.82	1.96	2.10	2.32	2.52	2.73	3.67	5.11*
	25	1.63	1.72	1.85	2.00	2.16	2.32	2.59	2.82	3.07	4.31	6.64*
500	15	1.46	1.52	1.63	1.75	1.88	2.01	2.22	2.39	2.57	3.36	4.40*
	20	1.63	1.71	1.83	1.97	2.12	2.28	2.52	2.74	2.96	3.97	5.48*
	25	1.78	1.88	2.02	2.18	2.35	2.53	2.82	3.07	3.34	4.65	7.00*
600	15	1.56	1.63	1.74	1.87	2.01	2.15	2.37	2.56	2.75	3.58	4.69*
	20	1.74	1.83	1.97	2.12	2.28	2.44	2.71	2.93	3.17	4.24	5.82*
	25	1.92	2.02	2.17	2.35	2.53	2.72	3.03	3.30	3.59	4.97	7.36*
700	15	1.65	1.73	1.85	1.98	2.13	2.28	2.51	2.71	2.91	3.79	4.95*
	20	1.85	1.95	2.09	2.25	2.42	2.60	2.88	3.12	3.37	4.50	6.15*
	25	2.04	2.15	2.32	2.50	2.70	2.90	3.23	3.52	3.82	5.27	7.70*
800	15	1.73	1.82	1.95	2.09	2.24	2.40	2.64	2.85	3.07	3.99	5.21*
	20	1.96	2.06	2.21	2.38	2.56	2.74	3.04	3.29	3.55	4.74	6.45*
	25	2.16	2.28	2.45	2.65	2.85	3.07	3.41	3.72	4.03	5.55	8.04*
900	15	1.82	1.91	2.04	2.19	2.35	2.51	2.77	2.99	3.21	4.17	5.45*
	20	2.06	2.16	2.32	2.50	2.69	2.88	3.19	3.45	3.73	4.96	6.74*
	25	2.28	2.40	2.58	2.79	3.00	3.23	3.59	3.91	4.24	5.81	8.36*
1000	15	1.90	1.99	2.13	2.29	2.45	2.62	2.89	3.12	3.35	4.35	5.68*
	20	2.15	2.26	2.43	2.61	2.81	3.01	3.33	3.61	3.90	5.18	7.02*
	25	2.38	2.52	2.71	2.92	3.15	3.38	3.76	4.09	4.44	6.07	8.68*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	1.97	2.07	2.22	2.38	2.55	2.73	3.01	3.24	3.48	4.52	5.90*
	20	2.24	2.36	2.53	2.72	2.93	3.14	3.47	3.76	4.06	5.39	7.29*
	25	2.49	2.63	2.82	3.05	3.28	3.53	3.92	4.26	4.62	6.31	8.98*
1200	15	2.05	2.15	2.30	2.47	2.65	2.83	3.12	3.36	3.61	4.69	6.11*
	20	2.33	2.45	2.63	2.83	3.04	3.26	3.61	3.90	4.21	5.59	7.55*
	25	2.59	2.73	2.94	3.17	3.41	3.67	4.08	4.43	4.81	6.54	9.27*
1300	15	2.12	2.22	2.38	2.55	2.74	2.93	3.22	3.48	3.74	4.85	6.31*
	20	2.41	2.54	2.73	2.93	3.15	3.38	3.74	4.04	4.36	5.78	7.80*
	25	2.68	2.83	3.05	3.29	3.54	3.81	4.23	4.59	4.98	6.77	9.55*
1400	15	2.19	2.29	2.46	2.64	2.83	3.02	3.33	3.59	3.86	5.00	6.51*
	20	2.49	2.63	2.82	3.03	3.26	3.49	3.86	4.18	4.51	5.97	8.04*
	25	2.78	2.93	3.16	3.40	3.67	3.94	4.37	4.75	5.15	6.99	9.83*
1500	15	2.25	2.36	2.53	2.72	2.91	3.12	3.43	3.70	3.97	5.15	6.70*
	20	2.57	2.71	2.91	3.13	3.36	3.61	3.98	4.31	4.65	6.15	8.27*
	25	2.87	3.03	3.26	3.51	3.78	4.07	4.51	4.90	5.31	7.20	10.10*
1600	15	2.32	2.43	2.60	2.80	3.00	3.21	3.53	3.80	4.09	5.30	6.89*
	20	2.65	2.79	3.00	3.22	3.46	3.71	4.10	4.44	4.79	6.33	8.50*
	25	2.96	3.12	3.36	3.62	3.90	4.19	4.65	5.05	5.47	7.41	10.36*
1700	15	2.38	2.50	2.68	2.87	3.08	3.29	3.62	3.91	4.20	5.44	7.07*
	20	2.73	2.87	3.08	3.32	3.56	3.82	4.22	4.56	4.92	6.50	8.72*
	25	3.05	3.22	3.46	3.73	4.01	4.31	4.78	5.20	5.63	7.61	10.61*
1800	15	2.44	2.56	2.75	2.95	3.16	3.38	3.72	4.01	4.31	5.58	7.25*
	20	2.80	2.95	3.17	3.41	3.66	3.92	4.33	4.69	5.05	6.67	8.93*
	25	3.13	3.31	3.55	3.83	4.13	4.43	4.92	5.34	5.78	7.80	10.86*
1900	15	2.50	2.63	2.81	3.02	3.24	3.46	3.81	4.11	4.41	5.71	7.42*
	20	2.87	3.03	3.25	3.49	3.75	4.02	4.44	4.80	5.18	6.83	9.15*
	25	3.21	3.39	3.65	3.93	4.23	4.55	5.04	5.48	5.93	8.00	11.11*
2000	15	2.56	2.69	2.88	3.09	3.31	3.54	3.90	4.20	4.52	5.84	7.59*
	20	2.94	3.10	3.33	3.58	3.84	4.12	4.55	4.92	5.31	7.00	9.35*
	25	3.29	3.48	3.74	4.03	4.34	4.66	5.17	5.61	6.07	8.18	11.35*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.47	1.55	1.68	1.83	1.99	2.17	2.47	2.77	3.13	6.91	17.62*
	20	1.62	1.73	1.88	2.07	2.29	2.54	3.01	3.57	4.48	14.19	39.18*
	25	1.76	1.89	2.09	2.33	2.62	2.99	3.85	5.19	7.34	26.19	74.71*
200	15	1.82	1.92	2.08	2.26	2.46	2.67	3.03	3.37	3.77	7.00	17.62*
	20	2.03	2.17	2.37	2.60	2.86	3.15	3.68	4.24	5.00	14.19	39.18*
	25	2.24	2.41	2.65	2.95	3.29	3.70	4.52	5.58	7.41	26.19	74.71*
300	15	2.10	2.22	2.40	2.61	2.84	3.08	3.48	3.86	4.29	7.30	17.62*
	20	2.37	2.53	2.76	3.02	3.32	3.64	4.22	4.81	5.57	14.19	39.18*
	25	2.62	2.82	3.11	3.44	3.82	4.27	5.12	6.13	7.71	26.19	74.71*
400	15	2.34	2.48	2.68	2.91	3.16	3.43	3.87	4.28	4.74	7.71	17.62*
	20	2.66	2.84	3.09	3.39	3.71	4.07	4.69	5.32	6.09	14.20	39.18*
	25	2.96	3.18	3.50	3.87	4.28	4.77	5.66	6.67	8.14	26.19	74.71*
500	15	2.55	2.71	2.93	3.18	3.45	3.74	4.22	4.66	5.15	8.14	17.63*
	20	2.92	3.12	3.40	3.71	4.07	4.46	5.12	5.78	6.57	14.25	39.18*
	25	3.26	3.51	3.85	4.25	4.70	5.21	6.15	7.17	8.59	26.19	74.71*
600	15	2.76	2.92	3.16	3.43	3.72	4.03	4.54	5.01	5.52	8.57	17.66*
	20	3.16	3.37	3.67	4.02	4.39	4.81	5.51	6.20	7.02	14.35	39.18*
	25	3.54	3.80	4.17	4.60	5.08	5.63	6.61	7.65	9.05	26.19	74.71*
700	15	2.94	3.12	3.38	3.66	3.97	4.30	4.84	5.33	5.87	8.98	17.72*
	20	3.38	3.61	3.93	4.30	4.70	5.14	5.88	6.59	7.44	14.51	39.18*
	25	3.80	4.08	4.47	4.93	5.44	6.01	7.03	8.10	9.50	26.19	74.71*
800	15	3.12	3.31	3.58	3.88	4.21	4.56	5.12	5.64	6.20	9.37	17.82*
	20	3.60	3.84	4.18	4.56	4.99	5.45	6.22	6.96	7.84	14.73	39.18*
	25	4.04	4.34	4.76	5.24	5.77	6.37	7.43	8.52	9.93	26.20	74.71*
900	15	3.29	3.49	3.77	4.09	4.43	4.80	5.39	5.93	6.52	9.76	17.96*
	20	3.80	4.06	4.41	4.81	5.26	5.74	6.55	7.32	8.21	14.99	39.18*
	25	4.27	4.59	5.03	5.53	6.09	6.71	7.81	8.93	10.35	26.20	74.71*
1000	15	3.45	3.66	3.95	4.29	4.65	5.03	5.64	6.20	6.81	10.13	18.14*
	20	3.99	4.26	4.63	5.06	5.52	6.02	6.86	7.65	8.57	15.27	39.18*
	25	4.49	4.83	5.28	5.81	6.39	7.04	8.17	9.32	10.75	26.22	74.71*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.60	3.82	4.13	4.48	4.85	5.25	5.89	6.47	7.10	10.48	18.36*
	20	4.17	4.46	4.85	5.29	5.77	6.29	7.16	7.98	8.92	15.57	39.18*
	25	4.71	5.06	5.53	6.07	6.68	7.35	8.52	9.69	11.14	26.25	74.71*
1200	15	3.75	3.98	4.30	4.66	5.05	5.46	6.12	6.72	7.37	10.83	18.60*
	20	4.35	4.65	5.05	5.51	6.01	6.55	7.44	8.29	9.26	15.88	39.18*
	25	4.91	5.28	5.77	6.33	6.96	7.65	8.85	10.05	11.52	26.29	74.71*
1300	15	3.90	4.13	4.47	4.84	5.24	5.67	6.35	6.97	7.64	11.17	18.86*
	20	4.52	4.83	5.25	5.72	6.24	6.79	7.72	8.59	9.58	16.20	39.18*
	25	5.11	5.49	6.00	6.58	7.23	7.94	9.17	10.40	11.89	26.35	74.71*
1400	15	4.03	4.28	4.62	5.01	5.42	5.86	6.57	7.21	7.90	11.49	19.13*
	20	4.69	5.01	5.44	5.93	6.46	7.04	7.99	8.88	9.89	16.52	39.18*
	25	5.30	5.69	6.22	6.82	7.49	8.22	9.49	10.74	12.25	26.44	74.71*
1500	15	4.17	4.42	4.78	5.18	5.60	6.06	6.78	7.44	8.14	11.81	19.42*
	20	4.85	5.18	5.63	6.13	6.68	7.27	8.25	9.16	10.19	16.85	39.19*
	25	5.49	5.89	6.44	7.06	7.74	8.50	9.79	11.06	12.60	26.54	74.71*
1600	15	4.30	4.56	4.93	5.34	5.78	6.24	6.99	7.66	8.39	12.12	19.71*
	20	5.01	5.35	5.81	6.33	6.89	7.50	8.50	9.44	10.49	17.17	39.20*
	25	5.67	6.09	6.65	7.28	7.99	8.76	10.09	11.38	12.93	26.66	74.71*
1700	15	4.43	4.70	5.08	5.50	5.95	6.43	7.19	7.88	8.62	12.42	20.01*
	20	5.16	5.51	5.98	6.52	7.10	7.72	8.75	9.70	10.78	17.49	39.21*
	25	5.85	6.27	6.85	7.50	8.23	9.02	10.37	11.69	13.27	26.81	74.71*
1800	15	4.55	4.83	5.22	5.65	6.11	6.60	7.39	8.09	8.85	12.72	20.30*
	20	5.31	5.67	6.16	6.70	7.30	7.93	8.99	9.96	11.06	17.81	39.23*
	25	6.02	6.46	7.05	7.72	8.46	9.27	10.65	12.00	13.59	26.97	74.71*
1900	15	4.68	4.96	5.36	5.80	6.28	6.78	7.58	8.30	9.08	13.00	20.60*
	20	5.46	5.83	6.32	6.88	7.49	8.15	9.22	10.22	11.33	18.12	39.26*
	25	6.19	6.64	7.24	7.93	8.69	9.52	10.93	12.29	13.91	27.15	74.71*
2000	15	4.80	5.09	5.50	5.95	6.44	6.95	7.77	8.51	9.30	13.29	20.91*
	20	5.60	5.98	6.49	7.06	7.68	8.35	9.45	10.47	11.60	18.43	39.29*
	25	6.35	6.81	7.43	8.14	8.91	9.76	11.19	12.58	14.22	27.34	74.71*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.54	2.79	3.18	3.70	4.51	5.94	10.00	15.23	22.60	87.10	254.15*
	20	2.92	3.33	4.01	5.25	7.83	12.00	21.66	33.91	51.23	203.57	599.00*
	25	3.31	3.98	5.34	8.56	14.05	22.14	40.88	64.70	98.44	395.59	1167.5*
200	15	3.26	3.58	4.03	4.62	5.41	6.58	10.05	15.23	22.60	87.10	254.15*
	20	3.79	4.28	5.03	6.15	8.16	12.02	21.66	33.91	51.23	203.57	599.00*
	25	4.34	5.08	6.34	8.84	14.06	22.14	40.88	64.70	98.44	395.59	1167.5*
300	15	3.84	4.20	4.72	5.37	6.20	7.33	10.33	15.24	22.60	87.10	254.15*
	20	4.50	5.05	5.86	7.00	8.81	12.16	21.66	33.91	51.23	203.57	599.00*
	25	5.15	5.97	7.26	9.49	14.12	22.14	40.88	64.70	98.44	395.59	1167.5*
400	15	4.34	4.75	5.31	6.01	6.89	8.03	10.81	15.32	22.60	87.10	254.15*
	20	5.10	5.71	6.58	7.76	9.52	12.52	21.67	33.91	51.23	203.57	599.00*
	25	5.86	6.74	8.08	10.22	14.36	22.14	40.88	64.70	98.44	395.59	1167.5*
500	15	4.79	5.24	5.85	6.60	7.51	8.68	11.36	15.50	22.61	87.10	254.15*
	20	5.65	6.31	7.23	8.46	10.20	13.01	21.69	33.91	51.23	203.57	599.00*
	25	6.50	7.43	8.83	10.95	14.76	22.17	40.88	64.70	98.44	395.59	1167.5*
600	15	5.21	5.68	6.34	7.13	8.09	9.29	11.92	15.79	22.63	87.10	254.15*
	20	6.15	6.85	7.83	9.11	10.86	13.55	21.75	33.91	51.23	203.57	599.00*
	25	7.08	8.07	9.52	11.65	15.26	22.24	40.88	64.70	98.44	395.59	1167.5*
700	15	5.59	6.10	6.80	7.63	8.63	9.86	12.48	16.16	22.70	87.10	254.15*
	20	6.62	7.36	8.39	9.71	11.49	14.11	21.87	33.91	51.23	203.57	599.00*
	25	7.62	8.67	10.16	12.31	15.80	22.39	40.88	64.70	98.44	395.59	1167.5*
800	15	5.96	6.50	7.23	8.10	9.14	10.40	13.03	16.58	22.81	87.10	254.15*
	20	7.06	7.84	8.91	10.28	12.08	14.68	22.05	33.91	51.23	203.57	599.00*
	25	8.14	9.22	10.77	12.95	16.36	22.60	40.88	64.70	98.44	395.59	1167.5*
900	15	6.30	6.87	7.63	8.54	9.62	10.92	13.56	17.02	22.97	87.10	254.15*
	20	7.48	8.30	9.41	10.82	12.65	15.23	22.31	33.92	51.23	203.57	599.00*
	25	8.62	9.76	11.35	13.56	16.93	22.89	40.89	64.70	98.44	395.59	1167.5*
1000	15	6.64	7.23	8.02	8.97	10.08	11.41	14.08	17.48	23.19	87.10	254.15*
	20	7.88	8.73	9.88	11.33	13.20	15.78	22.61	33.95	51.23	203.57	599.00*
	25	9.09	10.26	11.90	14.15	17.49	23.23	40.89	64.70	98.44	395.59	1167.5*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	6.95	7.57	8.40	9.37	10.52	11.88	14.58	17.94	23.45	87.10	254.15*
	20	8.26	9.15	10.34	11.83	13.73	16.31	22.95	33.99	51.23	203.57	599.00*
	25	9.53	10.75	12.43	14.72	18.05	23.60	40.90	64.70	98.44	395.59	1167.5*
1200	15	7.26	7.90	8.75	9.76	10.94	12.34	15.07	18.40	23.75	87.10	254.15*
	20	8.63	9.55	10.78	12.31	14.24	16.83	23.32	34.05	51.23	203.57	599.00*
	25	9.96	11.21	12.95	15.27	18.59	24.01	40.92	64.70	98.44	395.59	1167.5*
1300	15	7.56	8.22	9.10	10.14	11.35	12.78	15.54	18.85	24.07	87.10	254.15*
	20	8.99	9.93	11.20	12.77	14.74	17.34	23.71	34.14	51.24	203.57	599.00*
	25	10.37	11.66	13.44	15.80	19.13	24.43	40.95	64.70	98.44	395.59	1167.5*
1400	15	7.84	8.52	9.44	10.51	11.75	13.21	16.00	19.31	24.41	87.10	254.15*
	20	9.34	10.31	11.61	13.21	15.21	17.84	24.12	34.26	51.24	203.57	599.00*
	25	10.77	12.10	13.92	16.31	19.65	24.87	41.00	64.70	98.44	395.59	1167.5*
1500	15	8.12	8.82	9.76	10.86	12.13	13.62	16.45	19.75	24.77	87.10	254.15*
	20	9.67	10.67	12.01	13.64	15.68	18.32	24.53	34.41	51.24	203.57	599.00*
	25	11.16	12.52	14.38	16.81	20.16	25.31	41.07	64.70	98.44	395.59	1167.5*
1600	15	8.39	9.11	10.08	11.21	12.51	14.02	16.89	20.20	25.14	87.10	254.15*
	20	10.00	11.02	12.39	14.07	16.13	18.80	24.95	34.58	51.25	203.57	599.00*
	25	11.54	12.93	14.83	17.30	20.67	25.76	41.16	64.70	98.44	395.59	1167.5*
1700	15	8.65	9.40	10.39	11.54	12.87	14.42	17.32	20.63	25.51	87.10	254.15*
	20	10.32	11.37	12.77	14.47	16.57	19.26	25.38	34.78	51.27	203.57	599.00*
	25	11.91	13.33	15.27	17.77	21.16	26.22	41.27	64.70	98.44	395.59	1167.5*
1800	15	8.91	9.67	10.69	11.87	13.23	14.80	17.74	21.06	25.89	87.10	254.15*
	20	10.63	11.70	13.13	14.87	17.01	19.71	25.80	35.01	51.29	203.57	599.00*
	25	12.27	13.72	15.69	18.23	21.65	26.67	41.40	64.70	98.44	395.59	1167.5*
1900	15	9.16	9.94	10.98	12.19	13.57	15.17	18.15	21.48	26.27	87.10	254.15*
	20	10.93	12.03	13.49	15.26	17.43	20.16	26.22	35.25	51.31	203.57	599.00*
	25	12.62	14.10	16.11	18.69	22.12	27.12	41.56	64.71	98.44	395.59	1167.5*
2000	15	9.41	10.21	11.27	12.50	13.91	15.54	18.55	21.90	26.66	87.10	254.15*
	20	11.23	12.35	13.84	15.65	17.84	20.60	26.65	35.51	51.35	203.57	599.00*
	25	12.97	14.48	16.52	19.13	22.59	27.57	41.73	64.71	98.44	395.59	1167.5*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	5.23	7.70	14.79	26.98	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	7.07	15.57	33.01	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	10.49	29.07	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
200	15	6.78	8.95	14.85	26.98	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	8.82	15.67	33.01	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	11.82	29.07	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
300	15	8.02	10.19	15.23	26.98	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	10.30	16.20	33.01	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	13.34	29.08	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
400	15	9.09	11.31	15.92	27.00	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	11.60	17.05	33.02	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	14.76	29.13	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
500	15	10.06	12.34	16.73	27.06	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	12.78	18.00	33.04	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	16.08	29.30	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
600	15	10.95	13.29	17.58	27.22	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	13.86	18.98	33.11	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	17.31	29.63	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
700	15	11.77	14.19	18.42	27.49	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	14.86	19.94	33.27	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	18.46	30.12	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
800	15	12.55	15.03	19.25	27.86	45.82	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	15.81	20.88	33.52	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	19.55	30.72	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
900	15	13.29	15.84	20.06	28.31	45.84	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	16.71	21.79	33.87	61.77	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	20.59	31.40	63.06	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1000	15	13.99	16.60	20.84	28.83	45.87	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	17.57	22.68	34.30	61.78	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	21.59	32.13	63.07	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 26.0 Ft (RADIUS = 18.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	14.67	17.34	21.60	29.38	45.93	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	18.39	23.53	34.79	61.78	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	22.54	32.89	63.08	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1200	15	15.31	18.05	22.34	29.97	46.01	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	19.19	24.37	35.33	61.80	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	23.46	33.66	63.11	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1300	15	15.94	18.73	23.06	30.56	46.14	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	19.95	25.17	35.90	61.82	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	24.35	34.44	63.14	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1400	15	16.55	19.39	23.77	31.17	46.30	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	20.69	25.96	36.50	61.85	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	25.22	35.23	63.20	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1500	15	17.14	20.03	24.45	31.78	46.50	73.58	138.10	220.18	336.57	1362.6	4029.7*
	20	21.41	26.73	37.11	61.90	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	26.05	36.01	63.29	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1600	15	17.71	20.66	25.12	32.40	46.73	73.59	138.10	220.18	336.57	1362.6	4029.7*
	20	22.11	27.47	37.74	61.97	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	26.86	36.78	63.40	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1700	15	18.27	21.27	25.77	33.01	47.00	73.60	138.10	220.18	336.57	1362.6	4029.7*
	20	22.79	28.20	38.37	62.07	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	27.66	37.55	63.54	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1800	15	18.81	21.86	26.41	33.62	47.31	73.61	138.10	220.18	336.57	1362.6	4029.7*
	20	23.45	28.92	39.01	62.19	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	28.43	38.30	63.72	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
1900	15	19.34	22.44	27.03	34.23	47.64	73.63	138.10	220.18	336.57	1362.6	4029.7*
	20	24.10	29.62	39.64	62.34	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	29.19	39.05	63.93	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*
2000	15	19.86	23.01	27.65	34.83	48.00	73.66	138.10	220.18	336.57	1362.6	4029.7*
	20	24.73	30.30	40.28	62.51	106.27	171.92	324.63	519.00	794.70	3226.2	9547.3*
	25	29.92	39.80	64.17	119.14	205.94	334.06	632.16	1011.7	1550.0	6298.4	18644.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	0.99	1.02	1.09	1.16	1.24	1.33	1.46	1.57	1.69	2.20	2.93*
	20	1.06	1.10	1.18	1.26	1.35	1.45	1.60	1.73	1.87	2.58	4.05*
	25	1.13	1.18	1.26	1.35	1.46	1.57	1.74	1.91	2.08	3.16	6.41*
200	15	1.17	1.22	1.29	1.38	1.48	1.58	1.73	1.87	2.01	2.61	3.42*
	20	1.28	1.33	1.42	1.53	1.64	1.75	1.93	2.10	2.26	3.07	4.44*
	25	1.38	1.44	1.54	1.66	1.79	1.92	2.14	2.33	2.54	3.66	6.45*
300	15	1.32	1.37	1.46	1.56	1.67	1.78	1.96	2.11	2.26	2.94	3.83*
	20	1.46	1.52	1.62	1.74	1.86	2.00	2.20	2.39	2.58	3.47	4.87*
	25	1.59	1.66	1.77	1.91	2.05	2.20	2.45	2.67	2.90	4.11	6.65*
400	15	1.45	1.51	1.60	1.71	1.83	1.96	2.15	2.31	2.48	3.22	4.19*
	20	1.61	1.68	1.79	1.92	2.06	2.21	2.44	2.64	2.85	3.81	5.28*
	25	1.76	1.84	1.97	2.12	2.28	2.45	2.72	2.96	3.22	4.50	6.97*
500	15	1.57	1.63	1.73	1.85	1.98	2.11	2.32	2.50	2.68	3.48	4.51*
	20	1.75	1.83	1.95	2.09	2.24	2.40	2.65	2.86	3.09	4.13	5.66*
	25	1.92	2.01	2.15	2.31	2.49	2.67	2.96	3.22	3.50	4.86	7.31*
600	15	1.67	1.74	1.85	1.98	2.12	2.26	2.48	2.67	2.87	3.71	4.81*
	20	1.88	1.96	2.09	2.24	2.41	2.57	2.84	3.07	3.31	4.41	6.01*
	25	2.07	2.17	2.32	2.49	2.68	2.87	3.19	3.46	3.76	5.19	7.67*
700	15	1.77	1.85	1.97	2.10	2.25	2.40	2.63	2.83	3.04	3.93	5.08*
	20	2.00	2.09	2.23	2.39	2.56	2.74	3.02	3.26	3.52	4.68	6.34*
	25	2.20	2.31	2.47	2.66	2.85	3.06	3.40	3.69	4.00	5.50	8.01*
800	15	1.87	1.95	2.07	2.21	2.37	2.52	2.77	2.98	3.20	4.14	5.34*
	20	2.11	2.21	2.35	2.52	2.70	2.89	3.19	3.45	3.71	4.93	6.65*
	25	2.33	2.45	2.62	2.81	3.02	3.24	3.59	3.90	4.23	5.79	8.35*
900	15	1.96	2.04	2.17	2.32	2.48	2.65	2.90	3.12	3.35	4.33	5.59*
	20	2.22	2.32	2.47	2.65	2.84	3.04	3.35	3.62	3.90	5.17	6.95*
	25	2.46	2.58	2.76	2.96	3.18	3.41	3.78	4.10	4.44	6.07	8.68*
1000	15	2.04	2.13	2.27	2.42	2.59	2.76	3.03	3.26	3.50	4.52	5.82*
	20	2.32	2.43	2.59	2.77	2.97	3.18	3.50	3.78	4.08	5.39	7.23*
	25	2.57	2.70	2.89	3.10	3.33	3.57	3.96	4.29	4.65	6.33	8.99*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.13	2.22	2.36	2.52	2.69	2.87	3.15	3.39	3.64	4.70	6.05*
	20	2.42	2.53	2.70	2.89	3.10	3.31	3.65	3.94	4.25	5.61	7.50*
	25	2.69	2.82	3.01	3.24	3.48	3.73	4.13	4.48	4.85	6.59	9.30*
1200	15	2.21	2.30	2.45	2.62	2.80	2.98	3.27	3.52	3.77	4.87	6.26*
	20	2.51	2.63	2.81	3.01	3.22	3.44	3.79	4.09	4.41	5.82	7.77*
	25	2.80	2.93	3.14	3.37	3.62	3.88	4.29	4.65	5.04	6.83	9.60*
1300	15	2.28	2.38	2.53	2.71	2.89	3.09	3.38	3.64	3.90	5.03	6.47*
	20	2.61	2.72	2.91	3.12	3.34	3.57	3.93	4.24	4.57	6.02	8.02*
	25	2.90	3.04	3.26	3.50	3.75	4.02	4.45	4.83	5.22	7.07	9.88*
1400	15	2.36	2.46	2.62	2.80	2.99	3.19	3.49	3.76	4.03	5.19	6.68*
	20	2.69	2.82	3.01	3.22	3.45	3.69	4.06	4.38	4.72	6.22	8.27*
	25	3.00	3.15	3.37	3.62	3.88	4.16	4.60	4.99	5.40	7.30	10.16*
1500	15	2.43	2.53	2.70	2.88	3.08	3.28	3.60	3.87	4.15	5.35	6.87*
	20	2.78	2.91	3.10	3.32	3.56	3.81	4.19	4.52	4.87	6.41	8.51*
	25	3.10	3.25	3.48	3.74	4.01	4.30	4.75	5.15	5.57	7.52	10.44*
1600	15	2.50	2.61	2.78	2.97	3.17	3.38	3.70	3.98	4.27	5.50	7.06*
	20	2.86	3.00	3.20	3.43	3.67	3.92	4.31	4.66	5.01	6.59	8.74*
	25	3.20	3.36	3.59	3.85	4.14	4.43	4.90	5.31	5.74	7.73	10.70*
1700	15	2.57	2.68	2.85	3.05	3.26	3.47	3.81	4.09	4.39	5.65	7.25*
	20	2.95	3.08	3.29	3.52	3.77	4.03	4.44	4.79	5.15	6.77	8.97*
	25	3.29	3.45	3.69	3.97	4.26	4.56	5.04	5.46	5.90	7.94	10.96*
1800	15	2.64	2.75	2.93	3.13	3.34	3.56	3.90	4.20	4.50	5.79	7.43*
	20	3.03	3.17	3.38	3.62	3.87	4.14	4.56	4.92	5.29	6.95	9.19*
	25	3.38	3.55	3.80	4.08	4.37	4.69	5.18	5.61	6.06	8.15	11.22*
1900	15	2.70	2.82	3.00	3.21	3.42	3.65	4.00	4.30	4.61	5.93	7.61*
	20	3.10	3.25	3.47	3.71	3.97	4.25	4.67	5.04	5.42	7.12	9.40*
	25	3.47	3.64	3.90	4.18	4.49	4.81	5.31	5.75	6.22	8.35	11.47*
2000	15	2.77	2.89	3.07	3.28	3.51	3.74	4.10	4.40	4.72	6.07	7.78*
	20	3.18	3.33	3.55	3.80	4.07	4.35	4.79	5.16	5.56	7.28	9.61*
	25	3.56	3.74	4.00	4.29	4.60	4.93	5.44	5.90	6.37	8.54	11.71*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.58	1.66	1.79	1.94	2.10	2.29	2.60	2.92	3.31	7.51	19.03*
	20	1.75	1.85	2.01	2.20	2.43	2.69	3.21	3.85	4.91	15.58	42.48*
	25	1.90	2.03	2.24	2.49	2.81	3.22	4.22	5.80	8.22	28.88	81.14*
200	15	1.96	2.06	2.22	2.40	2.60	2.82	3.19	3.55	3.97	7.57	19.03*
	20	2.20	2.33	2.53	2.77	3.04	3.35	3.91	4.52	5.38	15.58	42.48*
	25	2.42	2.59	2.85	3.15	3.52	3.96	4.87	6.11	8.26	28.88	81.14*
300	15	2.26	2.38	2.56	2.77	3.00	3.25	3.67	4.06	4.51	7.83	19.03*
	20	2.56	2.71	2.95	3.22	3.53	3.87	4.48	5.12	5.95	15.58	42.48*
	25	2.84	3.04	3.33	3.68	4.09	4.56	5.50	6.64	8.48	28.88	81.14*
400	15	2.52	2.66	2.86	3.09	3.35	3.63	4.08	4.51	4.99	8.22	19.03*
	20	2.87	3.05	3.31	3.61	3.95	4.33	4.98	5.65	6.49	15.59	42.48*
	25	3.20	3.43	3.75	4.14	4.58	5.09	6.06	7.18	8.86	28.88	81.14*
500	15	2.76	2.91	3.13	3.38	3.66	3.96	4.45	4.91	5.42	8.64	19.04*
	20	3.16	3.35	3.63	3.96	4.33	4.73	5.43	6.13	6.99	15.61	42.48*
	25	3.53	3.78	4.13	4.55	5.02	5.57	6.58	7.70	9.30	28.88	81.14*
600	15	2.98	3.14	3.38	3.65	3.95	4.27	4.79	5.28	5.81	9.07	19.05*
	20	3.42	3.63	3.93	4.29	4.68	5.11	5.85	6.57	7.45	15.68	42.48*
	25	3.83	4.10	4.48	4.92	5.43	6.00	7.05	8.19	9.76	28.88	81.14*
700	15	3.18	3.35	3.61	3.90	4.21	4.55	5.11	5.62	6.18	9.49	19.08*
	20	3.66	3.89	4.21	4.59	5.00	5.46	6.23	6.99	7.89	15.80	42.48*
	25	4.11	4.40	4.80	5.27	5.81	6.41	7.50	8.66	10.21	28.88	81.14*
800	15	3.37	3.55	3.82	4.13	4.47	4.82	5.41	5.94	6.53	9.89	19.15*
	20	3.89	4.13	4.48	4.87	5.31	5.79	6.60	7.38	8.31	15.98	42.48*
	25	4.38	4.68	5.11	5.60	6.16	6.79	7.92	9.10	10.66	28.88	81.14*
900	15	3.55	3.75	4.03	4.35	4.70	5.08	5.69	6.24	6.86	10.29	19.26*
	20	4.11	4.36	4.73	5.14	5.60	6.10	6.94	7.75	8.70	16.21	42.48*
	25	4.63	4.95	5.40	5.92	6.50	7.16	8.32	9.53	11.09	28.88	81.14*
1000	15	3.73	3.93	4.23	4.57	4.93	5.32	5.96	6.54	7.17	10.67	19.40*
	20	4.32	4.59	4.96	5.40	5.87	6.39	7.27	8.11	9.08	16.46	42.48*
	25	4.87	5.21	5.67	6.21	6.82	7.50	8.70	9.94	11.50	28.89	81.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.90	4.11	4.42	4.77	5.15	5.56	6.22	6.81	7.47	11.04	19.58*
	20	4.52	4.80	5.19	5.64	6.14	6.68	7.58	8.45	9.45	16.74	42.48*
	25	5.10	5.45	5.94	6.50	7.13	7.84	9.07	10.33	11.91	28.91	81.14*
1200	15	4.06	4.28	4.60	4.97	5.36	5.78	6.46	7.08	7.76	11.40	19.78*
	20	4.71	5.00	5.41	5.88	6.39	6.95	7.89	8.78	9.80	17.04	42.48*
	25	5.32	5.69	6.19	6.78	7.43	8.16	9.42	10.71	12.30	28.93	81.14*
1300	15	4.21	4.44	4.78	5.15	5.56	6.00	6.70	7.34	8.04	11.74	20.01*
	20	4.90	5.20	5.62	6.11	6.64	7.22	8.18	9.09	10.14	17.35	42.48*
	25	5.54	5.92	6.44	7.04	7.72	8.47	9.77	11.07	12.68	28.97	81.14*
1400	15	4.36	4.60	4.95	5.34	5.76	6.21	6.94	7.59	8.31	12.08	20.26*
	20	5.08	5.39	5.83	6.33	6.88	7.47	8.46	9.40	10.46	17.67	42.48*
	25	5.75	6.14	6.68	7.30	7.99	8.76	10.10	11.43	13.06	29.03	81.14*
1500	15	4.51	4.76	5.11	5.52	5.95	6.41	7.16	7.84	8.57	12.41	20.53*
	20	5.26	5.58	6.03	6.55	7.11	7.72	8.74	9.69	10.78	17.99	42.49*
	25	5.95	6.35	6.91	7.55	8.26	9.05	10.42	11.77	13.42	29.10	81.14*
1600	15	4.65	4.91	5.27	5.69	6.14	6.61	7.38	8.07	8.82	12.73	20.80*
	20	5.43	5.76	6.22	6.76	7.34	7.96	9.00	9.98	11.09	18.31	42.49*
	25	6.15	6.56	7.14	7.79	8.53	9.34	10.73	12.11	13.77	29.19	81.14*
1700	15	4.79	5.05	5.43	5.86	6.32	6.81	7.59	8.30	9.07	13.05	21.08*
	20	5.59	5.94	6.41	6.96	7.55	8.20	9.27	10.26	11.40	18.63	42.50*
	25	6.34	6.77	7.36	8.03	8.78	9.61	11.03	12.43	14.12	29.30	81.14*
1800	15	4.93	5.20	5.58	6.02	6.49	7.00	7.80	8.53	9.31	13.35	21.37*
	20	5.76	6.11	6.60	7.16	7.77	8.43	9.52	10.54	11.69	18.95	42.51*
	25	6.53	6.97	7.57	8.26	9.03	9.88	11.33	12.75	14.46	29.43	81.14*
1900	15	5.06	5.34	5.73	6.18	6.67	7.18	8.01	8.75	9.55	13.65	21.66*
	20	5.92	6.28	6.78	7.35	7.98	8.65	9.77	10.81	11.98	19.27	42.52*
	25	6.71	7.16	7.78	8.49	9.27	10.14	11.62	13.06	14.79	29.58	81.14*
2000	15	5.19	5.47	5.88	6.34	6.84	7.36	8.21	8.96	9.78	13.95	21.95*
	20	6.07	6.44	6.96	7.54	8.18	8.87	10.01	11.07	12.26	19.59	42.54*
	25	6.89	7.35	7.98	8.71	9.51	10.40	11.90	13.37	15.12	29.74	81.14*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.75	3.02	3.43	4.03	5.00	6.77	11.45	17.34	25.57	96.32	276.31*
	20	3.18	3.63	4.43	6.00	9.18	14.00	25.03	38.84	58.22	225.38	651.47*
	25	3.63	4.41	6.17	10.20	16.65	26.00	47.41	74.30	112.05	438.15	1270.0*
200	15	3.53	3.87	4.36	5.00	5.90	7.29	11.47	17.34	25.57	96.32	276.31*
	20	4.13	4.67	5.50	6.84	9.36	14.01	25.03	38.84	58.22	225.38	651.47*
	25	4.74	5.59	7.10	10.34	16.65	26.00	47.41	74.30	112.05	438.15	1270.0*
300	15	4.16	4.55	5.10	5.80	6.72	8.02	11.64	17.34	25.57	96.32	276.31*
	20	4.90	5.50	6.39	7.71	9.91	14.07	25.03	38.84	58.22	225.38	651.47*
	25	5.63	6.55	8.05	10.85	16.67	26.00	47.41	74.30	112.05	438.15	1270.0*
400	15	4.71	5.13	5.73	6.49	7.45	8.74	12.03	17.37	25.57	96.32	276.31*
	20	5.56	6.21	7.17	8.51	10.58	14.30	25.03	38.84	58.22	225.38	651.47*
	25	6.41	7.38	8.92	11.52	16.79	26.00	47.41	74.30	112.05	438.15	1270.0*
500	15	5.20	5.66	6.31	7.11	8.11	9.42	12.53	17.48	25.57	96.32	276.31*
	20	6.15	6.86	7.87	9.24	11.27	14.69	25.03	38.84	58.22	225.38	651.47*
	25	7.10	8.13	9.71	12.24	17.05	26.01	47.41	74.30	112.05	438.15	1270.0*
600	15	5.65	6.15	6.84	7.68	8.73	10.05	13.07	17.69	25.58	96.32	276.31*
	20	6.70	7.45	8.51	9.93	11.94	15.18	25.06	38.84	58.22	225.38	651.47*
	25	7.73	8.82	10.45	12.95	17.44	26.04	47.41	74.30	112.05	438.15	1270.0*
700	15	6.07	6.60	7.33	8.22	9.30	10.65	13.63	17.99	25.61	96.32	276.31*
	20	7.21	8.00	9.11	10.57	12.59	15.71	25.12	38.84	58.22	225.38	651.47*
	25	8.33	9.47	11.14	13.64	17.91	26.10	47.41	74.30	112.05	438.15	1270.0*
800	15	6.47	7.03	7.79	8.72	9.84	11.22	14.19	18.35	25.68	96.32	276.31*
	20	7.69	8.52	9.67	11.18	13.22	16.25	25.22	38.84	58.22	225.38	651.47*
	25	8.89	10.07	11.79	14.30	18.43	26.22	47.41	74.30	112.05	438.15	1270.0*
900	15	6.85	7.43	8.23	9.20	10.35	11.77	14.73	18.75	25.78	96.32	276.31*
	20	8.15	9.01	10.21	11.75	13.81	16.81	25.39	38.85	58.22	225.38	651.47*
	25	9.42	10.65	12.42	14.94	18.97	26.41	47.41	74.30	112.05	438.15	1270.0*
1000	15	7.21	7.82	8.65	9.65	10.84	12.29	15.26	19.18	25.93	96.32	276.31*
	20	8.58	9.48	10.72	12.30	14.39	17.36	25.61	38.86	58.22	225.38	651.47*
	25	9.92	11.19	13.01	15.56	19.52	26.65	47.42	74.30	112.05	438.15	1270.0*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	7.55	8.19	9.05	10.08	11.31	12.79	15.78	19.63	26.13	96.32	276.31*
	20	9.00	9.93	11.21	12.83	14.95	17.90	25.88	38.87	58.22	225.38	651.47*
	25	10.41	11.72	13.58	16.16	20.08	26.94	47.42	74.30	112.05	438.15	1270.0*
1200	15	7.89	8.54	9.44	10.50	11.76	13.27	16.29	20.08	26.37	96.32	276.31*
	20	9.40	10.36	11.68	13.34	15.49	18.44	26.19	38.90	58.22	225.38	651.47*
	25	10.87	12.22	14.13	16.74	20.63	27.27	47.42	74.30	112.05	438.15	1270.0*
1300	15	8.21	8.89	9.81	10.91	12.20	13.74	16.78	20.53	26.64	96.32	276.31*
	20	9.79	10.78	12.14	13.84	16.01	18.96	26.53	38.95	58.22	225.38	651.47*
	25	11.32	12.71	14.66	17.30	21.17	27.64	47.44	74.30	112.05	438.15	1270.0*
1400	15	8.52	9.22	10.17	11.30	12.62	14.19	17.26	20.99	26.94	96.32	276.31*
	20	10.17	11.19	12.58	14.31	16.52	19.48	26.89	39.01	58.22	225.38	651.47*
	25	11.76	13.18	15.17	17.85	21.71	28.03	47.45	74.30	112.05	438.15	1270.0*
1500	15	8.82	9.54	10.52	11.68	13.03	14.63	17.73	21.44	27.26	96.32	276.31*
	20	10.53	11.58	13.00	14.78	17.01	19.98	27.27	39.10	58.22	225.38	651.47*
	25	12.18	13.64	15.67	18.38	22.24	28.43	47.48	74.30	112.05	438.15	1270.0*
1600	15	9.11	9.86	10.86	12.05	13.43	15.06	18.19	21.89	27.60	96.32	276.31*
	20	10.89	11.96	13.42	15.23	17.49	20.48	27.67	39.21	58.22	225.38	651.47*
	25	12.60	14.09	16.15	18.90	22.76	28.85	47.52	74.30	112.05	438.15	1270.0*
1700	15	9.40	10.16	11.19	12.41	13.82	15.47	18.64	22.34	27.95	96.32	276.31*
	20	11.23	12.33	13.82	15.66	17.96	20.96	28.07	39.35	58.23	225.38	651.47*
	25	13.00	14.52	16.62	19.40	23.28	29.29	47.58	74.30	112.05	438.15	1270.0*
1800	15	9.68	10.46	11.52	12.76	14.20	15.88	19.08	22.77	28.31	96.32	276.31*
	20	11.57	12.69	14.22	16.09	18.42	21.44	28.48	39.51	58.24	225.38	651.47*
	25	13.39	14.94	17.08	19.90	23.78	29.72	47.65	74.30	112.05	438.15	1270.0*
1900	15	9.96	10.75	11.83	13.10	14.57	16.28	19.51	23.21	28.68	96.32	276.31*
	20	11.90	13.05	14.60	16.51	18.87	21.91	28.90	39.69	58.25	225.38	651.47*
	25	13.77	15.36	17.53	20.38	24.28	30.16	47.74	74.30	112.05	438.15	1270.0*
2000	15	10.22	11.04	12.14	13.44	14.93	16.67	19.93	23.64	29.05	96.32	276.31*
	20	12.22	13.40	14.98	16.92	19.31	22.37	29.31	39.89	58.27	225.38	651.47*
	25	14.15	15.76	17.97	20.85	24.77	30.60	47.85	74.30	112.05	438.15	1270.0*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	5.83	9.19	18.05	32.58	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	8.21	19.43	40.65	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	13.13	36.54	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
200	15	7.50	10.25	18.06	32.58	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	10.00	19.45	40.65	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	14.04	36.54	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
300	15	8.85	11.50	18.23	32.58	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	11.58	19.69	40.65	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	15.48	36.54	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
400	15	10.03	12.68	18.69	32.58	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	12.99	20.27	40.65	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	16.93	36.55	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
500	15	11.08	13.77	19.37	32.60	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	14.26	21.08	40.65	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	18.31	36.59	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
600	15	12.05	14.79	20.14	32.65	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	15.43	21.98	40.67	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	19.61	36.71	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
700	15	12.95	15.75	20.95	32.77	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	16.53	22.92	40.72	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	20.85	36.94	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
800	15	13.80	16.65	21.78	32.98	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	17.56	23.86	40.81	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	22.03	37.30	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
900	15	14.60	17.52	22.60	33.28	54.68	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	18.54	24.79	40.98	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	23.15	37.76	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1000	15	15.37	18.34	23.40	33.65	54.69	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	19.47	25.71	41.21	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	24.23	38.32	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 28.0 Ft (RADIUS = 19.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	16.11	19.14	24.19	34.09	54.71	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	20.37	26.60	41.53	74.95	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	25.26	38.94	77.91	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1200	15	16.81	19.90	24.96	34.57	54.74	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	21.23	27.47	41.90	74.96	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	26.26	39.61	77.92	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1300	15	17.50	20.64	25.72	35.10	54.78	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	22.07	28.32	42.34	74.96	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	27.22	40.32	77.92	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1400	15	18.16	21.36	26.45	35.65	54.85	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	22.88	29.16	42.82	74.97	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	28.16	41.05	77.94	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1500	15	18.80	22.05	27.18	36.21	54.95	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	23.66	29.97	43.33	74.98	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	29.07	41.79	77.96	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1600	15	19.42	22.73	27.88	36.80	55.07	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	24.42	30.77	43.88	75.00	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	29.95	42.54	77.99	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1700	15	20.03	23.39	28.57	37.39	55.23	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	25.16	31.54	44.45	75.03	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	30.81	43.29	78.03	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1800	15	20.62	24.03	29.25	37.98	55.41	86.84	160.57	253.26	383.49	1509.7	4383.6*
	20	25.88	32.31	45.03	75.07	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	31.66	44.05	78.09	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
1900	15	21.20	24.66	29.92	38.58	55.63	86.85	160.57	253.26	383.49	1509.7	4383.6*
	20	26.59	33.05	45.63	75.13	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	32.48	44.80	78.17	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*
2000	15	21.77	25.27	30.57	39.18	55.88	86.86	160.57	253.26	383.49	1509.7	4383.6*
	20	27.28	33.79	46.23	75.20	127.19	203.27	377.83	597.35	905.86	3574.5	10386.*
	25	33.28	45.55	78.28	144.81	246.75	395.24	736.00	1164.6	1767.1	6978.8	20282.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.06	1.09	1.15	1.22	1.30	1.38	1.52	1.63	1.75	2.27	3.01*
	20	1.14	1.17	1.24	1.33	1.42	1.51	1.67	1.80	1.95	2.68	4.27*
	25	1.21	1.25	1.33	1.43	1.53	1.64	1.82	1.99	2.17	3.33	6.85*
200	15	1.26	1.29	1.37	1.46	1.55	1.65	1.81	1.94	2.08	2.70	3.52*
	20	1.37	1.42	1.51	1.61	1.72	1.84	2.02	2.18	2.36	3.19	4.62*
	25	1.48	1.54	1.64	1.75	1.88	2.02	2.24	2.43	2.65	3.83	6.88*
300	15	1.42	1.46	1.54	1.64	1.75	1.86	2.04	2.19	2.35	3.04	3.93*
	20	1.56	1.62	1.72	1.83	1.96	2.09	2.30	2.49	2.68	3.60	5.05*
	25	1.70	1.77	1.88	2.02	2.16	2.32	2.57	2.79	3.03	4.29	7.04*
400	15	1.55	1.60	1.70	1.81	1.93	2.05	2.24	2.41	2.58	3.34	4.30*
	20	1.73	1.79	1.90	2.03	2.17	2.32	2.55	2.75	2.97	3.96	5.46*
	25	1.89	1.97	2.09	2.24	2.41	2.58	2.85	3.10	3.36	4.70	7.32*
500	15	1.68	1.73	1.84	1.96	2.08	2.22	2.43	2.61	2.79	3.60	4.63*
	20	1.88	1.95	2.07	2.21	2.36	2.52	2.77	2.99	3.22	4.29	5.84*
	25	2.06	2.15	2.29	2.45	2.62	2.81	3.11	3.37	3.66	5.07	7.65*
600	15	1.79	1.85	1.96	2.09	2.23	2.37	2.59	2.79	2.98	3.85	4.93*
	20	2.02	2.09	2.22	2.37	2.53	2.71	2.97	3.21	3.45	4.58	6.20*
	25	2.22	2.31	2.46	2.64	2.83	3.03	3.34	3.63	3.93	5.42	8.00*
700	15	1.90	1.97	2.08	2.22	2.36	2.51	2.75	2.95	3.16	4.07	5.21*
	20	2.14	2.23	2.37	2.53	2.70	2.88	3.16	3.41	3.67	4.86	6.53*
	25	2.37	2.47	2.63	2.81	3.01	3.23	3.56	3.86	4.18	5.74	8.34*
800	15	2.00	2.07	2.20	2.34	2.49	2.65	2.90	3.11	3.33	4.29	5.48*
	20	2.27	2.35	2.50	2.67	2.85	3.04	3.34	3.60	3.88	5.12	6.85*
	25	2.51	2.61	2.78	2.98	3.19	3.42	3.77	4.09	4.42	6.04	8.68*
900	15	2.10	2.17	2.30	2.45	2.61	2.78	3.04	3.26	3.49	4.49	5.73*
	20	2.38	2.47	2.63	2.81	3.00	3.20	3.51	3.79	4.07	5.37	7.16*
	25	2.64	2.75	2.93	3.14	3.36	3.59	3.97	4.30	4.65	6.33	9.01*
1000	15	2.19	2.27	2.41	2.56	2.73	2.90	3.17	3.41	3.65	4.68	5.97*
	20	2.49	2.59	2.75	2.94	3.14	3.34	3.67	3.96	4.26	5.61	7.45*
	25	2.77	2.88	3.07	3.29	3.52	3.77	4.16	4.50	4.87	6.61	9.33*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.28	2.36	2.50	2.67	2.84	3.02	3.30	3.54	3.79	4.87	6.20*
	20	2.60	2.70	2.87	3.06	3.27	3.49	3.83	4.12	4.44	5.83	7.73*
	25	2.89	3.01	3.21	3.43	3.67	3.93	4.34	4.69	5.07	6.87	9.63*
1200	15	2.37	2.45	2.60	2.77	2.95	3.13	3.42	3.68	3.93	5.05	6.42*
	20	2.70	2.81	2.98	3.18	3.40	3.62	3.98	4.29	4.61	6.05	7.99*
	25	3.01	3.13	3.34	3.57	3.82	4.09	4.51	4.88	5.27	7.12	9.94*
1300	15	2.45	2.54	2.69	2.86	3.05	3.24	3.54	3.80	4.07	5.22	6.63*
	20	2.80	2.91	3.09	3.30	3.52	3.75	4.12	4.44	4.77	6.26	8.25*
	25	3.12	3.25	3.46	3.71	3.97	4.24	4.68	5.06	5.46	7.37	10.23*
1400	15	2.53	2.62	2.78	2.96	3.15	3.35	3.66	3.93	4.20	5.39	6.84*
	20	2.90	3.01	3.20	3.41	3.64	3.88	4.26	4.59	4.93	6.46	8.51*
	25	3.23	3.37	3.59	3.84	4.11	4.39	4.84	5.23	5.65	7.61	10.51*
1500	15	2.61	2.70	2.87	3.05	3.25	3.45	3.77	4.05	4.33	5.55	7.04*
	20	2.99	3.11	3.30	3.52	3.76	4.01	4.40	4.74	5.09	6.66	8.75*
	25	3.34	3.48	3.71	3.96	4.24	4.53	4.99	5.40	5.83	7.84	10.79*
1600	15	2.68	2.78	2.95	3.14	3.34	3.55	3.88	4.16	4.46	5.71	7.24*
	20	3.08	3.20	3.40	3.63	3.87	4.13	4.53	4.88	5.24	6.85	8.99*
	25	3.44	3.59	3.82	4.09	4.37	4.67	5.15	5.57	6.01	8.06	11.06*
1700	15	2.76	2.86	3.03	3.23	3.43	3.65	3.99	4.28	4.58	5.86	7.43*
	20	3.17	3.29	3.50	3.73	3.98	4.25	4.66	5.01	5.39	7.04	9.22*
	25	3.54	3.69	3.93	4.21	4.50	4.81	5.30	5.73	6.18	8.28	11.33*
1800	15	2.83	2.94	3.11	3.31	3.52	3.75	4.09	4.39	4.70	6.01	7.61*
	20	3.25	3.38	3.59	3.84	4.09	4.36	4.78	5.15	5.53	7.22	9.45*
	25	3.64	3.80	4.04	4.32	4.63	4.94	5.44	5.88	6.35	8.49	11.59*
1900	15	2.90	3.01	3.19	3.39	3.61	3.84	4.19	4.50	4.81	6.16	7.79*
	20	3.34	3.47	3.69	3.93	4.20	4.47	4.90	5.28	5.67	7.40	9.67*
	25	3.74	3.90	4.15	4.44	4.75	5.07	5.58	6.04	6.51	8.70	11.84*
2000	15	2.97	3.08	3.27	3.48	3.70	3.93	4.29	4.61	4.93	6.30	7.97*
	20	3.42	3.56	3.78	4.03	4.30	4.58	5.02	5.41	5.81	7.58	9.88*
	25	3.83	4.00	4.26	4.55	4.87	5.20	5.72	6.18	6.67	8.90	12.09*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.70	1.77	1.89	2.05	2.22	2.41	2.74	3.07	3.50	8.16	20.53*
	20	1.87	1.97	2.14	2.34	2.58	2.86	3.43	4.16	5.39	17.08	46.00*
	25	2.04	2.18	2.39	2.66	3.01	3.47	4.65	6.49	9.18	31.77	87.98*
200	15	2.10	2.19	2.35	2.54	2.75	2.98	3.36	3.74	4.18	8.20	20.53*
	20	2.36	2.49	2.70	2.94	3.22	3.55	4.15	4.82	5.80	17.08	46.00*
	25	2.61	2.78	3.04	3.37	3.76	4.24	5.26	6.71	9.20	31.77	87.98*
300	15	2.43	2.54	2.72	2.94	3.17	3.43	3.86	4.28	4.75	8.41	20.53*
	20	2.75	2.91	3.14	3.42	3.74	4.11	4.75	5.44	6.36	17.08	46.00*
	25	3.06	3.26	3.56	3.93	4.36	4.87	5.90	7.20	9.35	31.77	87.98*
400	15	2.71	2.84	3.04	3.28	3.54	3.83	4.30	4.74	5.25	8.76	20.53*
	20	3.09	3.27	3.53	3.84	4.19	4.59	5.28	5.99	6.91	17.08	46.00*
	25	3.45	3.68	4.01	4.42	4.88	5.43	6.49	7.74	9.68	31.77	87.98*
500	15	2.96	3.11	3.33	3.59	3.87	4.18	4.69	5.16	5.70	9.17	20.53*
	20	3.40	3.59	3.88	4.22	4.60	5.02	5.75	6.50	7.43	17.09	46.00*
	25	3.81	4.06	4.42	4.85	5.35	5.93	7.02	8.27	10.09	31.77	87.98*
600	15	3.20	3.35	3.59	3.87	4.18	4.51	5.05	5.55	6.11	9.60	20.54*
	20	3.68	3.89	4.20	4.56	4.97	5.42	6.19	6.96	7.91	17.14	46.00*
	25	4.13	4.40	4.79	5.25	5.78	6.40	7.52	8.77	10.54	31.77	87.98*
700	15	3.42	3.58	3.84	4.14	4.46	4.81	5.38	5.91	6.50	10.02	20.56*
	20	3.94	4.17	4.50	4.88	5.31	5.78	6.60	7.40	8.37	17.22	46.00*
	25	4.44	4.72	5.14	5.63	6.19	6.83	7.99	9.26	10.99	31.77	87.98*
800	15	3.63	3.80	4.07	4.39	4.73	5.09	5.69	6.25	6.86	10.44	20.60*
	20	4.19	4.43	4.78	5.18	5.64	6.13	6.98	7.81	8.80	17.36	46.00*
	25	4.72	5.03	5.47	5.98	6.57	7.23	8.44	9.72	11.44	31.78	87.98*
900	15	3.82	4.01	4.29	4.62	4.98	5.36	5.99	6.57	7.21	10.84	20.67*
	20	4.43	4.68	5.05	5.47	5.94	6.46	7.34	8.20	9.21	17.55	46.00*
	25	4.99	5.32	5.78	6.31	6.93	7.62	8.86	10.16	11.87	31.78	87.98*
1000	15	4.01	4.21	4.51	4.85	5.22	5.62	6.28	6.88	7.53	11.24	20.78*
	20	4.65	4.92	5.30	5.74	6.24	6.78	7.69	8.57	9.61	17.77	46.00*
	25	5.25	5.59	6.07	6.63	7.27	7.99	9.26	10.59	12.30	31.78	87.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.19	4.40	4.71	5.07	5.45	5.87	6.55	7.17	7.85	11.62	20.92*
	20	4.87	5.14	5.54	6.01	6.52	7.08	8.02	8.93	9.99	18.03	46.00*
	25	5.50	5.86	6.36	6.94	7.60	8.34	9.65	11.00	12.72	31.79	87.98*
1200	15	4.37	4.58	4.90	5.27	5.68	6.11	6.81	7.45	8.15	11.99	21.09*
	20	5.08	5.36	5.78	6.26	6.79	7.37	8.34	9.28	10.36	18.31	46.00*
	25	5.74	6.11	6.63	7.23	7.91	8.68	10.02	11.39	13.13	31.80	87.98*
1300	15	4.53	4.76	5.09	5.48	5.89	6.34	7.06	7.72	8.44	12.35	21.28*
	20	5.28	5.58	6.01	6.50	7.05	7.65	8.65	9.61	10.71	18.60	46.00*
	25	5.98	6.36	6.89	7.52	8.22	9.00	10.38	11.78	13.52	31.82	87.98*
1400	15	4.70	4.93	5.27	5.67	6.10	6.56	7.31	7.99	8.73	12.70	21.50*
	20	5.48	5.78	6.23	6.74	7.31	7.92	8.95	9.93	11.06	18.91	46.00*
	25	6.20	6.59	7.15	7.79	8.51	9.32	10.73	12.15	13.91	31.86	87.98*
1500	15	4.86	5.09	5.45	5.86	6.30	6.78	7.55	8.24	9.00	13.04	21.74*
	20	5.67	5.98	6.44	6.97	7.55	8.18	9.24	10.24	11.39	19.22	46.00*
	25	6.42	6.83	7.40	8.06	8.80	9.63	11.07	12.51	14.29	31.91	87.98*
1600	15	5.01	5.26	5.62	6.04	6.50	6.99	7.78	8.49	9.27	13.37	21.99*
	20	5.85	6.18	6.65	7.19	7.79	8.44	9.52	10.55	11.72	19.54	46.00*
	25	6.63	7.05	7.64	8.32	9.08	9.93	11.39	12.86	14.66	31.97	87.98*
1700	15	5.16	5.41	5.79	6.22	6.69	7.19	8.00	8.74	9.53	13.69	22.25*
	20	6.03	6.37	6.85	7.41	8.02	8.69	9.80	10.84	12.03	19.86	46.00*
	25	6.84	7.27	7.87	8.57	9.35	10.22	11.71	13.20	15.02	32.05	87.98*
1800	15	5.31	5.57	5.96	6.40	6.88	7.39	8.22	8.97	9.78	14.01	22.52*
	20	6.21	6.55	7.05	7.62	8.25	8.93	10.07	11.13	12.34	20.18	46.01*
	25	7.04	7.48	8.10	8.82	9.61	10.50	12.03	13.54	15.37	32.15	87.98*
1900	15	5.45	5.72	6.12	6.57	7.06	7.59	8.44	9.20	10.03	14.32	22.80*
	20	6.38	6.73	7.24	7.83	8.47	9.17	10.33	11.41	12.64	20.50	46.01*
	25	7.24	7.69	8.32	9.06	9.87	10.78	12.33	13.87	15.72	32.26	87.98*
2000	15	5.59	5.87	6.27	6.74	7.24	7.78	8.65	9.43	10.27	14.63	23.08*
	20	6.55	6.91	7.43	8.03	8.69	9.40	10.58	11.69	12.94	20.82	46.03*
	25	7.44	7.90	8.54	9.29	10.13	11.05	12.63	14.19	16.06	32.39	87.98*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.97	3.25	3.71	4.40	5.56	7.72	13.06	19.67	28.84	106.27	299.89*
	20	3.44	3.96	4.91	6.91	10.71	16.26	28.79	44.31	65.91	248.91	707.33*
	25	3.96	4.89	7.19	12.10	19.60	30.37	54.71	84.94	127.03	484.07	1379.0*
200	15	3.82	4.17	4.69	5.41	6.44	8.11	13.07	19.67	28.84	106.27	299.89*
	20	4.48	5.07	6.02	7.63	10.80	16.26	28.79	44.31	65.91	248.91	707.33*
	25	5.17	6.14	7.99	12.15	19.60	30.37	54.71	84.94	127.03	484.07	1379.0*
300	15	4.50	4.90	5.49	6.25	7.28	8.80	13.16	19.67	28.84	106.27	299.89*
	20	5.31	5.96	6.96	8.49	11.20	16.29	28.79	44.31	65.91	248.91	707.33*
	25	6.13	7.17	8.94	12.48	19.61	30.37	54.71	84.94	127.03	484.07	1379.0*
400	15	5.09	5.53	6.17	6.99	8.05	9.52	13.44	19.68	28.84	106.27	299.89*
	20	6.03	6.74	7.79	9.32	11.81	16.41	28.79	44.31	65.91	248.91	707.33*
	25	6.97	8.06	9.84	13.06	19.65	30.37	54.71	84.94	127.03	484.07	1379.0*
500	15	5.62	6.10	6.79	7.65	8.75	10.22	13.87	19.74	28.84	106.27	299.89*
	20	6.67	7.43	8.54	10.09	12.48	16.68	28.79	44.31	65.91	248.91	707.33*
	25	7.72	8.87	10.68	13.73	19.80	30.37	54.71	84.94	127.03	484.07	1379.0*
600	15	6.11	6.62	7.35	8.26	9.40	10.88	14.38	19.87	28.84	106.27	299.89*
	20	7.26	8.07	9.23	10.81	13.15	17.08	28.80	44.31	65.91	248.91	707.33*
	25	8.41	9.62	11.46	14.43	20.06	30.38	54.71	84.94	127.03	484.07	1379.0*
700	15	6.56	7.11	7.88	8.83	10.00	11.50	14.91	20.09	28.86	106.27	299.89*
	20	7.82	8.66	9.87	11.49	13.81	17.55	28.82	44.31	65.91	248.91	707.33*
	25	9.06	10.31	12.20	15.12	20.42	30.40	54.71	84.94	127.03	484.07	1379.0*
800	15	6.99	7.57	8.38	9.37	10.58	12.10	15.46	20.38	28.89	106.27	299.89*
	20	8.34	9.22	10.47	12.14	14.46	18.06	28.87	44.31	65.91	248.91	707.33*
	25	9.66	10.96	12.89	15.80	20.87	30.46	54.71	84.94	127.03	484.07	1379.0*
900	15	7.40	8.00	8.85	9.87	11.12	12.67	16.01	20.72	28.94	106.27	299.89*
	20	8.83	9.75	11.05	12.75	15.08	18.59	28.96	44.31	65.91	248.91	707.33*
	25	10.24	11.58	13.55	16.47	21.35	30.55	54.71	84.94	127.03	484.07	1379.0*
1000	15	7.79	8.42	9.30	10.36	11.64	13.22	16.55	21.11	29.04	106.27	299.89*
	20	9.30	10.26	11.59	13.33	15.68	19.14	29.10	44.32	65.91	248.91	707.33*
	25	10.78	12.17	14.19	17.11	21.87	30.70	54.71	84.94	127.03	484.07	1379.0*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	8.17	8.82	9.73	10.82	12.14	13.75	17.08	21.53	29.17	106.27	299.89*
	20	9.75	10.74	12.12	13.90	16.26	19.68	29.29	44.32	65.91	248.91	707.33*
	25	11.31	12.74	14.80	17.74	22.40	30.89	54.71	84.94	127.03	484.07	1379.0*
1200	15	8.53	9.20	10.14	11.27	12.62	14.26	17.60	21.96	29.35	106.27	299.89*
	20	10.19	11.21	12.62	14.44	16.83	20.22	29.52	44.33	65.91	248.91	707.33*
	25	11.82	13.28	15.38	18.34	22.94	31.13	54.72	84.94	127.03	484.07	1379.0*
1300	15	8.87	9.57	10.54	11.70	13.08	14.75	18.11	22.40	29.56	106.27	299.89*
	20	10.61	11.66	13.11	14.96	17.38	20.75	29.79	44.35	65.91	248.91	707.33*
	25	12.30	13.80	15.95	18.94	23.48	31.42	54.72	84.94	127.03	484.07	1379.0*
1400	15	9.21	9.93	10.93	12.12	13.53	15.23	18.61	22.85	29.80	106.27	299.89*
	20	11.02	12.09	13.58	15.47	17.91	21.28	30.09	44.38	65.91	248.91	707.33*
	25	12.78	14.31	16.50	19.51	24.02	31.74	54.73	84.94	127.03	484.07	1379.0*
1500	15	9.54	10.28	11.30	12.52	13.97	15.69	19.10	23.30	30.08	106.27	299.89*
	20	11.41	12.52	14.04	15.96	18.44	21.80	30.43	44.43	65.91	248.91	707.33*
	25	13.24	14.81	17.03	20.07	24.56	32.08	54.74	84.94	127.03	484.07	1379.0*
1600	15	9.85	10.62	11.67	12.92	14.39	16.14	19.57	23.75	30.37	106.27	299.89*
	20	11.80	12.93	14.49	16.44	18.94	22.31	30.78	44.49	65.91	248.91	707.33*
	25	13.68	15.29	17.55	20.62	25.09	32.45	54.75	84.94	127.03	484.07	1379.0*
1700	15	10.17	10.95	12.02	13.30	14.80	16.58	20.04	24.19	30.69	106.27	299.89*
	20	12.17	13.33	14.92	16.91	19.44	22.81	31.15	44.57	65.91	248.91	707.33*
	25	14.12	15.75	18.05	21.15	25.61	32.84	54.77	84.94	127.03	484.07	1379.0*
1800	15	10.47	11.27	12.37	13.68	15.20	17.01	20.50	24.64	31.02	106.27	299.89*
	20	12.54	13.72	15.34	17.37	19.92	23.31	31.53	44.67	65.92	248.91	707.33*
	25	14.54	16.21	18.55	21.68	26.13	33.24	54.81	84.94	127.03	484.07	1379.0*
1900	15	10.76	11.58	12.71	14.04	15.60	17.43	20.95	25.08	31.36	106.27	299.89*
	20	12.89	14.10	15.76	17.81	20.40	23.79	31.92	44.79	65.92	248.91	707.33*
	25	14.95	16.65	19.03	22.19	26.65	33.65	54.85	84.94	127.03	484.07	1379.0*
2000	15	11.05	11.89	13.04	14.40	15.98	17.84	21.39	25.52	31.72	106.27	299.89*
	20	13.24	14.47	16.16	18.25	20.86	24.27	32.32	44.93	65.93	248.91	707.33*
	25	15.36	17.09	19.50	22.69	27.15	34.08	54.91	84.94	127.03	484.07	1379.0*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	6.49	11.07	21.86	39.04	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	9.65	24.00	49.57	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	16.43	45.40	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
200	15	8.28	11.84	21.86	39.04	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	11.37	24.01	49.57	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	16.90	45.40	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
300	15	9.75	13.03	21.91	39.04	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	13.02	24.08	49.57	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	18.10	45.40	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
400	15	11.02	14.23	22.15	39.04	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	14.51	24.37	49.57	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	19.49	45.40	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
500	15	12.16	15.36	22.62	39.04	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	15.88	24.93	49.58	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	20.90	45.41	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
600	15	13.21	16.44	23.25	39.05	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	17.14	25.68	49.58	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	22.25	45.43	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
700	15	14.19	17.45	23.98	39.09	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	18.32	26.52	49.59	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	23.55	45.51	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
800	15	15.11	18.42	24.75	39.18	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	19.44	27.41	49.61	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	24.80	45.65	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
900	15	15.98	19.34	25.54	39.33	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	20.50	28.32	49.66	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	25.99	45.88	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1000	15	16.81	20.23	26.34	39.54	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	21.51	29.23	49.76	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	27.14	46.21	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 30.0 Ft (RADIUS = 21.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	17.61	21.08	27.14	39.83	64.80	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	22.48	30.13	49.91	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	28.25	46.62	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1200	15	18.38	21.90	27.93	40.18	64.81	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	23.42	31.02	50.11	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	29.32	47.11	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1300	15	19.12	22.69	28.70	40.58	64.82	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	24.32	31.90	50.37	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	30.36	47.66	95.27	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1400	15	19.84	23.46	29.47	41.03	64.85	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	25.20	32.77	50.68	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	31.37	48.26	95.28	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1500	15	20.53	24.21	30.22	41.52	64.88	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	26.05	33.62	51.05	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	32.35	48.89	95.28	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1600	15	21.21	24.93	30.95	42.03	64.93	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	26.87	34.45	51.46	90.17	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	33.30	49.56	95.29	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1700	15	21.87	25.64	31.68	42.56	65.00	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	27.68	35.27	51.91	90.18	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	34.24	50.25	95.29	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1800	15	22.51	26.33	32.39	43.11	65.09	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	28.46	36.07	52.39	90.19	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	35.14	50.95	95.31	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
1900	15	23.14	27.01	33.09	43.67	65.20	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	29.23	36.86	52.89	90.21	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	36.03	51.67	95.33	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*
2000	15	23.75	27.67	33.77	44.24	65.34	101.84	185.71	289.96	435.19	1668.3	4760.5*
	20	29.98	37.64	53.42	90.23	151.09	238.76	437.33	684.26	1028.3	3950.4	11279.*
	25	36.90	52.39	95.36	174.47	293.36	464.48	852.16	1334.3	2006.2	7712.9	22027.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.13	1.15	1.21	1.28	1.36	1.44	1.57	1.69	1.81	2.34	3.10*
	20	1.21	1.24	1.31	1.39	1.48	1.58	1.74	1.87	2.02	2.79	4.51*
	25	1.29	1.33	1.40	1.50	1.60	1.72	1.90	2.08	2.27	3.51	7.33*
200	15	1.34	1.37	1.44	1.53	1.62	1.72	1.88	2.02	2.16	2.79	3.61*
	20	1.46	1.50	1.59	1.69	1.80	1.92	2.11	2.27	2.45	3.31	4.82*
	25	1.58	1.63	1.73	1.85	1.98	2.11	2.34	2.54	2.76	4.01	7.34*
300	15	1.51	1.55	1.63	1.73	1.84	1.95	2.13	2.28	2.44	3.14	4.04*
	20	1.67	1.72	1.82	1.93	2.06	2.19	2.41	2.59	2.79	3.74	5.24*
	25	1.82	1.88	1.99	2.13	2.27	2.43	2.69	2.92	3.16	4.48	7.46*
400	15	1.66	1.70	1.79	1.90	2.02	2.14	2.34	2.51	2.68	3.45	4.41*
	20	1.85	1.90	2.01	2.14	2.28	2.43	2.66	2.87	3.09	4.11	5.65*
	25	2.02	2.09	2.22	2.37	2.53	2.71	2.99	3.24	3.51	4.91	7.71*
500	15	1.79	1.84	1.94	2.06	2.19	2.32	2.53	2.71	2.90	3.73	4.75*
	20	2.01	2.07	2.19	2.33	2.48	2.64	2.90	3.12	3.36	4.45	6.03*
	25	2.20	2.28	2.42	2.59	2.76	2.95	3.26	3.53	3.82	5.29	8.02*
600	15	1.92	1.97	2.08	2.20	2.34	2.48	2.71	2.90	3.10	3.98	5.05*
	20	2.15	2.22	2.35	2.50	2.67	2.84	3.11	3.35	3.60	4.76	6.39*
	25	2.37	2.46	2.61	2.79	2.98	3.18	3.50	3.80	4.11	5.65	8.35*
700	15	2.03	2.09	2.20	2.34	2.48	2.63	2.87	3.08	3.29	4.22	5.34*
	20	2.29	2.37	2.50	2.66	2.84	3.02	3.31	3.56	3.83	5.05	6.74*
	25	2.53	2.63	2.79	2.97	3.18	3.39	3.74	4.04	4.37	5.98	8.69*
800	15	2.14	2.20	2.32	2.46	2.62	2.78	3.03	3.24	3.47	4.44	5.61*
	20	2.42	2.50	2.65	2.82	3.00	3.19	3.50	3.76	4.04	5.32	7.06*
	25	2.68	2.78	2.95	3.15	3.36	3.59	3.95	4.28	4.62	6.30	9.02*
900	15	2.24	2.31	2.44	2.59	2.75	2.91	3.17	3.40	3.63	4.65	5.87*
	20	2.55	2.63	2.78	2.96	3.15	3.36	3.67	3.95	4.25	5.58	7.37*
	25	2.83	2.93	3.11	3.32	3.54	3.78	4.16	4.50	4.86	6.60	9.35*
1000	15	2.34	2.41	2.55	2.70	2.87	3.04	3.32	3.55	3.79	4.85	6.12*
	20	2.67	2.76	2.92	3.10	3.30	3.51	3.84	4.14	4.44	5.82	7.67*
	25	2.96	3.07	3.26	3.48	3.71	3.96	4.36	4.71	5.08	6.88	9.67*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.44	2.51	2.65	2.81	2.99	3.17	3.45	3.70	3.95	5.04	6.35*
	20	2.78	2.87	3.04	3.23	3.44	3.66	4.01	4.31	4.63	6.06	7.95*
	25	3.09	3.21	3.40	3.63	3.87	4.13	4.55	4.91	5.30	7.16	9.99*
1200	15	2.53	2.61	2.75	2.92	3.10	3.29	3.58	3.83	4.10	5.23	6.58*
	20	2.89	2.99	3.16	3.36	3.58	3.81	4.16	4.48	4.81	6.28	8.23*
	25	3.22	3.34	3.54	3.78	4.03	4.30	4.73	5.11	5.51	7.42	10.29*
1300	15	2.62	2.70	2.85	3.02	3.21	3.40	3.71	3.97	4.24	5.41	6.80*
	20	3.00	3.10	3.28	3.49	3.71	3.95	4.32	4.64	4.98	6.50	8.49*
	25	3.34	3.47	3.68	3.92	4.18	4.46	4.90	5.30	5.71	7.68	10.59*
1400	15	2.71	2.79	2.94	3.12	3.31	3.51	3.83	4.10	4.38	5.58	7.01*
	20	3.10	3.21	3.39	3.61	3.84	4.08	4.46	4.80	5.15	6.71	8.75*
	25	3.46	3.59	3.81	4.06	4.33	4.62	5.08	5.48	5.91	7.92	10.88*
1500	15	2.79	2.88	3.04	3.22	3.42	3.62	3.95	4.22	4.51	5.75	7.22*
	20	3.20	3.31	3.50	3.72	3.96	4.21	4.61	4.95	5.31	6.92	9.00*
	25	3.57	3.71	3.93	4.19	4.47	4.77	5.24	5.66	6.10	8.16	11.16*
1600	15	2.87	2.96	3.12	3.31	3.52	3.73	4.06	4.35	4.64	5.91	7.42*
	20	3.30	3.41	3.61	3.84	4.08	4.34	4.74	5.10	5.47	7.12	9.24*
	25	3.69	3.83	4.06	4.32	4.61	4.92	5.40	5.83	6.28	8.40	11.44*
1700	15	2.95	3.04	3.21	3.41	3.61	3.83	4.17	4.47	4.77	6.07	7.61*
	20	3.39	3.51	3.71	3.95	4.20	4.46	4.88	5.24	5.62	7.31	9.48*
	25	3.79	3.94	4.18	4.45	4.75	5.06	5.56	6.00	6.46	8.62	11.71*
1800	15	3.03	3.12	3.30	3.50	3.71	3.93	4.28	4.58	4.89	6.23	7.80*
	20	3.48	3.61	3.81	4.05	4.31	4.58	5.01	5.38	5.77	7.50	9.71*
	25	3.90	4.05	4.29	4.58	4.88	5.20	5.71	6.16	6.63	8.84	11.97*
1900	15	3.11	3.20	3.38	3.58	3.80	4.03	4.39	4.70	5.02	6.38	7.98*
	20	3.57	3.70	3.91	4.16	4.42	4.70	5.14	5.52	5.92	7.69	9.94*
	25	4.00	4.16	4.41	4.70	5.01	5.34	5.86	6.32	6.81	9.06	12.23*
2000	15	3.18	3.28	3.46	3.67	3.89	4.13	4.49	4.81	5.13	6.53	8.17*
	20	3.66	3.79	4.01	4.26	4.53	4.82	5.27	5.66	6.06	7.87	10.16*
	25	4.11	4.26	4.52	4.82	5.14	5.47	6.01	6.48	6.97	9.27	12.48*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.81	1.88	2.00	2.16	2.33	2.53	2.88	3.24	3.71	8.86	22.12*
	20	2.00	2.10	2.27	2.48	2.73	3.04	3.66	4.51	5.93	18.69	49.73*
	25	2.19	2.32	2.55	2.84	3.22	3.74	5.14	7.25	10.24	34.89	95.25*
200	15	2.24	2.33	2.49	2.68	2.90	3.13	3.53	3.93	4.41	8.88	22.12*
	20	2.53	2.65	2.87	3.12	3.42	3.76	4.41	5.15	6.27	18.69	49.73*
	25	2.79	2.97	3.25	3.59	4.00	4.53	5.69	7.40	10.25	34.89	95.25*
300	15	2.59	2.70	2.89	3.10	3.35	3.61	4.06	4.49	5.00	9.04	22.12*
	20	2.95	3.10	3.34	3.63	3.97	4.35	5.04	5.79	6.81	18.69	49.73*
	25	3.28	3.49	3.80	4.19	4.64	5.20	6.34	7.83	10.34	34.89	95.25*
400	15	2.90	3.02	3.23	3.47	3.74	4.03	4.52	4.98	5.52	9.35	22.12*
	20	3.31	3.49	3.76	4.08	4.44	4.86	5.59	6.36	7.36	18.69	49.73*
	25	3.70	3.94	4.28	4.70	5.20	5.79	6.94	8.35	10.60	34.89	95.25*
500	15	3.17	3.31	3.53	3.80	4.09	4.40	4.93	5.43	5.99	9.75	22.12*
	20	3.64	3.83	4.13	4.48	4.87	5.31	6.09	6.88	7.89	18.69	49.73*
	25	4.09	4.34	4.72	5.17	5.70	6.32	7.50	8.88	10.97	34.89	95.25*
600	15	3.43	3.57	3.82	4.10	4.41	4.75	5.31	5.83	6.42	10.17	22.13*
	20	3.95	4.15	4.47	4.84	5.26	5.73	6.55	7.37	8.39	18.72	49.73*
	25	4.44	4.71	5.11	5.60	6.15	6.80	8.02	9.40	11.39	34.89	95.25*
700	15	3.66	3.82	4.08	4.38	4.71	5.07	5.66	6.21	6.82	10.60	22.14*
	20	4.23	4.45	4.79	5.18	5.63	6.12	6.98	7.83	8.87	18.78	49.73*
	25	4.76	5.06	5.48	5.99	6.58	7.26	8.51	9.89	11.83	34.89	95.25*
800	15	3.89	4.05	4.33	4.64	4.99	5.37	5.99	6.56	7.20	11.02	22.16*
	20	4.50	4.73	5.09	5.50	5.97	6.49	7.38	8.26	9.32	18.88	49.73*
	25	5.07	5.38	5.83	6.37	6.98	7.69	8.98	10.37	12.28	34.89	95.25*
900	15	4.10	4.28	4.56	4.90	5.26	5.66	6.30	6.90	7.56	11.43	22.21*
	20	4.75	5.00	5.37	5.81	6.30	6.84	7.76	8.67	9.75	19.02	49.73*
	25	5.37	5.69	6.16	6.72	7.36	8.09	9.42	10.83	12.72	34.89	95.25*
1000	15	4.30	4.49	4.79	5.14	5.52	5.93	6.60	7.22	7.91	11.83	22.28*
	20	4.99	5.25	5.64	6.10	6.61	7.17	8.13	9.06	10.16	19.21	49.73*
	25	5.65	5.98	6.48	7.06	7.73	8.48	9.84	11.27	13.16	34.89	95.25*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.49	4.69	5.00	5.37	5.76	6.19	6.89	7.53	8.24	12.22	22.38*
	20	5.23	5.50	5.90	6.38	6.91	7.49	8.48	9.43	10.56	19.44	49.73*
	25	5.91	6.27	6.78	7.39	8.08	8.85	10.25	11.70	13.59	34.90	95.25*
1200	15	4.68	4.89	5.21	5.59	6.00	6.44	7.16	7.83	8.55	12.60	22.51*
	20	5.45	5.73	6.16	6.65	7.20	7.80	8.81	9.79	10.94	19.69	49.73*
	25	6.17	6.54	7.07	7.70	8.41	9.21	10.64	12.11	14.01	34.90	95.25*
1300	15	4.86	5.08	5.41	5.80	6.23	6.69	7.43	8.11	8.86	12.97	22.68*
	20	5.67	5.96	6.40	6.91	7.47	8.09	9.14	10.14	11.31	19.96	49.73*
	25	6.42	6.80	7.35	8.00	8.73	9.56	11.02	12.51	14.42	34.92	95.25*
1400	15	5.04	5.26	5.61	6.01	6.45	6.92	7.69	8.39	9.16	13.33	22.86*
	20	5.88	6.18	6.63	7.16	7.74	8.38	9.45	10.48	11.67	20.25	49.73*
	25	6.67	7.06	7.63	8.29	9.05	9.89	11.38	12.90	14.81	34.94	95.25*
1500	15	5.21	5.44	5.80	6.21	6.66	7.15	7.94	8.66	9.45	13.68	23.07*
	20	6.08	6.40	6.86	7.40	8.00	8.66	9.76	10.81	12.02	20.55	49.73*
	25	6.90	7.31	7.89	8.58	9.35	10.22	11.74	13.28	15.21	34.97	95.25*
1600	15	5.37	5.61	5.98	6.41	6.87	7.37	8.18	8.92	9.73	14.03	23.29*
	20	6.28	6.60	7.08	7.64	8.25	8.93	10.05	11.13	12.36	20.86	49.73*
	25	7.13	7.55	8.15	8.85	9.65	10.53	12.08	13.65	15.59	35.01	95.25*
1700	15	5.53	5.78	6.16	6.60	7.08	7.59	8.42	9.17	10.00	14.36	23.53*
	20	6.48	6.81	7.30	7.87	8.50	9.19	10.34	11.44	12.69	21.17	49.74*
	25	7.35	7.78	8.40	9.12	9.93	10.84	12.42	14.01	15.96	35.06	95.25*
1800	15	5.69	5.94	6.33	6.78	7.27	7.80	8.65	9.42	10.26	14.69	23.78*
	20	6.66	7.00	7.51	8.10	8.74	9.45	10.63	11.74	13.01	21.49	49.74*
	25	7.57	8.01	8.64	9.38	10.21	11.14	12.75	14.36	16.33	35.13	95.25*
1900	15	5.85	6.10	6.50	6.97	7.47	8.01	8.88	9.67	10.52	15.02	24.04*
	20	6.85	7.20	7.72	8.32	8.98	9.70	10.90	12.04	13.33	21.81	49.74*
	25	7.78	8.23	8.88	9.64	10.49	11.43	13.07	14.70	16.69	35.21	95.25*
2000	15	6.00	6.26	6.67	7.14	7.66	8.21	9.10	9.90	10.78	15.33	24.30*
	20	7.03	7.39	7.92	8.53	9.21	9.94	11.17	12.33	13.64	22.13	49.75*
	25	7.99	8.45	9.12	9.89	10.76	11.72	13.38	15.04	17.04	35.31	95.25*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.19	3.49	4.00	4.80	6.23	8.81	14.85	22.24	32.43	116.98	324.96*
	20	3.72	4.31	5.46	8.00	12.45	18.80	32.97	50.36	74.35	274.24	766.71*
	25	4.31	5.45	8.43	14.27	22.96	35.29	62.84	96.71	143.48	533.51	1495.0*
200	15	4.10	4.48	5.05	5.85	7.04	9.07	14.85	22.24	32.43	116.98	324.96*
	20	4.84	5.50	6.59	8.55	12.48	18.80	32.97	50.36	74.35	274.24	766.71*
	25	5.61	6.74	9.04	14.29	22.96	35.29	62.84	96.71	143.48	533.51	1495.0*
300	15	4.84	5.26	5.90	6.74	7.90	9.68	14.90	22.24	32.43	116.98	324.96*
	20	5.73	6.45	7.58	9.38	12.74	18.81	32.97	50.36	74.35	274.24	766.71*
	25	6.66	7.83	9.96	14.46	22.96	35.29	62.84	96.71	143.48	533.51	1495.0*
400	15	5.48	5.94	6.63	7.52	8.70	10.39	15.08	22.25	32.43	116.98	324.96*
	20	6.51	7.28	8.46	10.22	13.24	18.86	32.97	50.36	74.35	274.24	766.71*
	25	7.56	8.79	10.88	14.89	22.97	35.29	62.84	96.71	143.48	533.51	1495.0*
500	15	6.05	6.55	7.29	8.22	9.43	11.09	15.41	22.27	32.43	116.98	324.96*
	20	7.21	8.03	9.25	11.02	13.86	19.03	32.97	50.36	74.35	274.24	766.71*
	25	8.37	9.66	11.74	15.48	23.03	35.29	62.84	96.71	143.48	533.51	1495.0*
600	15	6.58	7.11	7.89	8.87	10.11	11.77	15.86	22.34	32.43	116.98	324.96*
	20	7.84	8.71	9.98	11.77	14.51	19.31	32.97	50.36	74.35	274.24	766.71*
	25	9.12	10.45	12.56	16.13	23.18	35.29	62.84	96.71	143.48	533.51	1495.0*
700	15	7.07	7.64	8.45	9.47	10.75	12.42	16.36	22.48	32.43	116.98	324.96*
	20	8.44	9.35	10.67	12.49	15.18	19.69	32.98	50.36	74.35	274.24	766.71*
	25	9.81	11.20	13.34	16.81	23.42	35.30	62.84	96.71	143.48	533.51	1495.0*
800	15	7.53	8.13	8.98	10.04	11.35	13.04	16.89	22.70	32.44	116.98	324.96*
	20	9.00	9.95	11.31	13.16	15.83	20.14	33.00	50.36	74.35	274.24	766.71*
	25	10.46	11.90	14.07	17.49	23.75	35.32	62.84	96.71	143.48	533.51	1495.0*
900	15	7.97	8.60	9.48	10.58	11.93	13.64	17.42	22.97	32.47	116.98	324.96*
	20	9.53	10.52	11.93	13.81	16.47	20.63	33.04	50.36	74.35	274.24	766.71*
	25	11.08	12.56	14.77	18.17	24.16	35.36	62.84	96.71	143.48	533.51	1495.0*
1000	15	8.39	9.04	9.96	11.10	12.48	14.21	17.96	23.30	32.52	116.98	324.96*
	20	10.04	11.06	12.51	14.43	17.09	21.15	33.12	50.36	74.35	274.24	766.71*
	25	11.67	13.19	15.45	18.83	24.61	35.43	62.84	96.71	143.48	533.51	1495.0*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	8.79	9.47	10.42	11.59	13.01	14.76	18.50	23.67	32.61	116.98	324.96*
	20	10.53	11.58	13.07	15.03	17.69	21.68	33.23	50.36	74.35	274.24	766.71*
	25	12.24	13.80	16.09	19.47	25.09	35.54	62.84	96.71	143.48	533.51	1495.0*
1200	15	9.18	9.88	10.87	12.07	13.51	15.30	19.03	24.07	32.72	116.98	324.96*
	20	11.00	12.08	13.61	15.60	18.28	22.21	33.38	50.36	74.35	274.24	766.71*
	25	12.79	14.38	16.72	20.10	25.60	35.69	62.84	96.71	143.48	533.51	1495.0*
1300	15	9.55	10.28	11.29	12.52	14.00	15.81	19.55	24.49	32.87	116.98	324.96*
	20	11.45	12.57	14.13	16.16	18.86	22.74	33.58	50.37	74.35	274.24	766.71*
	25	13.31	14.95	17.32	20.72	26.12	35.88	62.84	96.71	143.48	533.51	1495.0*
1400	15	9.92	10.66	11.70	12.97	14.48	16.32	20.06	24.91	33.06	116.98	324.96*
	20	11.89	13.03	14.63	16.69	19.42	23.27	33.81	50.38	74.35	274.24	766.71*
	25	13.82	15.49	17.91	21.32	26.64	36.11	62.85	96.71	143.48	533.51	1495.0*
1500	15	10.27	11.03	12.11	13.40	14.94	16.81	20.57	25.35	33.27	116.98	324.96*
	20	12.32	13.49	15.12	17.22	19.96	23.80	34.07	50.40	74.35	274.24	766.71*
	25	14.32	16.02	18.47	21.91	27.17	36.37	62.85	96.71	143.48	533.51	1495.0*
1600	15	10.61	11.40	12.49	13.82	15.39	17.28	21.06	25.79	33.52	116.98	324.96*
	20	12.73	13.93	15.60	17.73	20.49	24.32	34.36	50.43	74.35	274.24	766.71*
	25	14.80	16.54	19.03	22.48	27.70	36.67	62.85	96.71	143.48	533.51	1495.0*
1700	15	10.94	11.75	12.87	14.23	15.83	17.74	21.54	26.24	33.78	116.98	324.96*
	20	13.13	14.36	16.06	18.22	21.01	24.84	34.68	50.47	74.35	274.24	766.71*
	25	15.27	17.04	19.56	23.05	28.23	36.99	62.86	96.71	143.48	533.51	1495.0*
1800	15	11.27	12.09	13.24	14.63	16.25	18.20	22.02	26.68	34.07	116.98	324.96*
	20	13.53	14.78	16.51	18.71	21.52	25.35	35.01	50.53	74.36	274.24	766.71*
	25	15.73	17.53	20.09	23.60	28.75	37.34	62.87	96.71	143.48	533.51	1495.0*
1900	15	11.59	12.43	13.61	15.01	16.67	18.64	22.49	27.12	34.38	116.98	324.96*
	20	13.91	15.19	16.95	19.18	22.02	25.85	35.37	50.60	74.36	274.24	766.71*
	25	16.17	18.01	20.60	24.14	29.28	37.70	62.89	96.71	143.48	533.51	1495.0*
2000	15	11.90	12.76	13.96	15.39	17.08	19.07	22.95	27.57	34.70	116.98	324.96*
	20	14.29	15.59	17.39	19.64	22.51	26.34	35.73	50.69	74.36	274.24	766.71*
	25	16.61	18.47	21.11	24.67	29.79	38.08	62.92	96.71	143.48	533.51	1495.0*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	7.23	13.34	26.26	46.43	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	11.47	29.37	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	20.41	55.82	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
200	15	9.13	13.80	26.26	46.43	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	12.98	29.37	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	20.58	55.82	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
300	15	10.70	14.84	26.27	46.43	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	14.65	29.39	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	21.39	55.82	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
400	15	12.07	16.01	26.36	46.43	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	16.21	29.49	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	22.61	55.82	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
500	15	13.30	17.17	26.62	46.43	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	17.66	29.79	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	23.95	55.82	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
600	15	14.43	18.28	27.05	46.44	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	19.01	30.28	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	25.31	55.82	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
700	15	15.49	19.35	27.63	46.45	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	20.27	30.94	59.92	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	26.64	55.84	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
800	15	16.48	20.36	28.30	46.47	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	21.47	31.71	59.93	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	27.94	55.87	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
900	15	17.43	21.34	29.02	46.53	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	22.61	32.53	59.94	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	29.19	55.95	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1000	15	18.32	22.28	29.78	46.63	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	23.70	33.39	59.97	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	30.40	56.09	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 32.0 Ft (RADIUS = 22.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	19.19	23.18	30.55	46.78	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	24.75	34.27	60.02	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	31.57	56.29	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1200	15	20.02	24.05	31.33	46.98	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	25.75	35.15	60.10	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	32.71	56.56	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1300	15	20.82	24.90	32.11	47.24	76.29	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	26.73	36.03	60.21	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	33.82	56.90	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1400	15	21.59	25.72	32.88	47.55	76.30	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	27.67	36.91	60.37	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	34.89	57.30	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1500	15	22.34	26.52	33.64	47.91	76.31	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	28.59	37.77	60.57	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	35.94	57.77	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1600	15	23.07	27.29	34.40	48.31	76.32	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	29.48	38.63	60.82	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	36.96	58.28	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1700	15	23.78	28.05	35.14	48.75	76.34	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	30.34	39.47	61.11	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	37.96	58.83	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1800	15	24.48	28.79	35.88	49.21	76.38	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	31.19	40.31	61.45	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	38.93	59.42	115.42	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
1900	15	25.16	29.51	36.60	49.70	76.43	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	32.02	41.13	61.81	107.62	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	39.89	60.04	115.43	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*
2000	15	25.82	30.22	37.32	50.21	76.49	118.73	213.71	330.53	491.96	1839.0	5161.1*
	20	32.83	41.94	62.22	107.63	178.24	278.72	503.62	780.36	1162.8	4355.2	12229.*
	25	40.82	60.68	115.43	208.48	346.32	542.47	981.58	1522.0	2268.8	8503.5	23881.*

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.19	1.21	1.27	1.34	1.42	1.50	1.63	1.75	1.87	2.42	3.20
	20	1.28	1.31	1.37	1.46	1.55	1.65	1.81	1.95	2.10	2.90	4.77
	25	1.37	1.40	1.48	1.57	1.68	1.80	1.99	2.16	2.36	3.71	7.83
200	15	1.42	1.44	1.51	1.60	1.70	1.80	1.95	2.09	2.24	2.88	3.72
	20	1.56	1.59	1.67	1.77	1.89	2.01	2.20	2.37	2.55	3.44	5.04
	25	1.68	1.73	1.82	1.94	2.07	2.21	2.44	2.65	2.88	4.20	7.84
300	15	1.60	1.63	1.71	1.81	1.92	2.03	2.21	2.37	2.53	3.25	4.15
	20	1.77	1.82	1.91	2.03	2.16	2.29	2.51	2.70	2.90	3.88	5.45
	25	1.93	1.99	2.10	2.24	2.39	2.55	2.81	3.04	3.30	4.68	7.92
400	15	1.76	1.80	1.89	2.00	2.12	2.24	2.44	2.61	2.78	3.56	4.54
	20	1.96	2.01	2.12	2.25	2.39	2.54	2.78	2.99	3.21	4.27	5.86
	25	2.15	2.22	2.34	2.49	2.66	2.84	3.12	3.38	3.66	5.12	8.14
500	15	1.91	1.95	2.05	2.16	2.29	2.43	2.64	2.82	3.01	3.85	4.88
	20	2.14	2.19	2.31	2.45	2.60	2.77	3.02	3.25	3.49	4.62	6.25
	25	2.35	2.42	2.56	2.72	2.90	3.10	3.41	3.69	3.99	5.52	8.43
600	15	2.04	2.08	2.19	2.32	2.45	2.60	2.82	3.02	3.22	4.12	5.20
	20	2.29	2.36	2.48	2.63	2.80	2.97	3.25	3.49	3.75	4.94	6.62
	25	2.53	2.61	2.76	2.94	3.13	3.34	3.67	3.96	4.28	5.89	8.75
700	15	2.16	2.21	2.32	2.46	2.60	2.76	2.99	3.20	3.42	4.36	5.49
	20	2.44	2.51	2.65	2.81	2.98	3.16	3.46	3.71	3.99	5.24	6.97
	25	2.70	2.79	2.95	3.13	3.34	3.56	3.91	4.22	4.56	6.23	9.08
800	15	2.28	2.33	2.45	2.59	2.75	2.91	3.16	3.38	3.60	4.59	5.77
	20	2.58	2.66	2.80	2.97	3.15	3.35	3.65	3.93	4.21	5.52	7.30
	25	2.86	2.95	3.12	3.32	3.54	3.77	4.14	4.47	4.82	6.56	9.42
900	15	2.39	2.45	2.57	2.72	2.88	3.05	3.31	3.54	3.78	4.81	6.04
	20	2.72	2.79	2.94	3.12	3.31	3.52	3.84	4.12	4.42	5.79	7.62
	25	3.01	3.11	3.29	3.50	3.73	3.97	4.36	4.70	5.07	6.87	9.75
1000	15	2.50	2.56	2.69	2.84	3.01	3.18	3.46	3.70	3.94	5.02	6.29
	20	2.84	2.92	3.08	3.27	3.47	3.68	4.02	4.32	4.63	6.04	7.92
	25	3.16	3.26	3.45	3.67	3.90	4.16	4.56	4.92	5.31	7.17	10.07

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.60	2.66	2.80	2.96	3.13	3.32	3.60	3.85	4.11	5.22	6.53
	20	2.96	3.05	3.21	3.41	3.62	3.84	4.19	4.50	4.82	6.29	8.21
	25	3.30	3.41	3.60	3.83	4.08	4.34	4.76	5.14	5.53	7.45	10.39
1200	15	2.70	2.77	2.91	3.07	3.25	3.44	3.74	3.99	4.26	5.41	6.77
	20	3.08	3.17	3.34	3.54	3.76	3.99	4.35	4.67	5.01	6.52	8.50
	25	3.43	3.55	3.75	3.99	4.24	4.52	4.95	5.34	5.75	7.73	10.70
1300	15	2.79	2.86	3.01	3.18	3.37	3.56	3.87	4.13	4.41	5.60	6.99
	20	3.20	3.29	3.47	3.67	3.90	4.14	4.51	4.84	5.19	6.75	8.77
	25	3.57	3.68	3.89	4.14	4.40	4.69	5.14	5.54	5.96	7.99	11.00
1400	15	2.88	2.96	3.11	3.29	3.48	3.68	4.00	4.27	4.55	5.78	7.21
	20	3.31	3.40	3.59	3.80	4.03	4.28	4.67	5.01	5.36	6.97	9.03
	25	3.69	3.81	4.03	4.28	4.56	4.85	5.32	5.73	6.17	8.25	11.29
1500	15	2.97	3.05	3.21	3.39	3.59	3.80	4.12	4.40	4.69	5.95	7.42
	20	3.41	3.51	3.70	3.92	4.16	4.42	4.82	5.17	5.53	7.18	9.29
	25	3.81	3.94	4.16	4.43	4.71	5.01	5.49	5.91	6.36	8.49	11.58
1600	15	3.06	3.14	3.30	3.49	3.69	3.91	4.24	4.53	4.83	6.12	7.62
	20	3.52	3.62	3.82	4.04	4.29	4.55	4.96	5.32	5.70	7.39	9.54
	25	3.93	4.07	4.30	4.56	4.86	5.17	5.66	6.09	6.56	8.74	11.86
1700	15	3.15	3.23	3.39	3.59	3.80	4.02	4.36	4.66	4.96	6.29	7.82
	20	3.62	3.73	3.93	4.16	4.42	4.68	5.10	5.47	5.86	7.59	9.78
	25	4.05	4.19	4.42	4.70	5.00	5.32	5.82	6.27	6.74	8.97	12.14
1800	15	3.23	3.32	3.48	3.68	3.90	4.12	4.47	4.78	5.09	6.45	8.02
	20	3.72	3.83	4.03	4.28	4.54	4.81	5.24	5.62	6.02	7.79	10.02
	25	4.16	4.30	4.55	4.83	5.14	5.46	5.98	6.44	6.93	9.20	12.41
1900	15	3.31	3.40	3.57	3.78	4.00	4.23	4.59	4.90	5.22	6.61	8.21
	20	3.81	3.93	4.14	4.39	4.65	4.93	5.38	5.77	6.17	7.98	10.25
	25	4.28	4.42	4.67	4.96	5.27	5.61	6.14	6.61	7.11	9.43	12.67
2000	15	3.39	3.48	3.66	3.87	4.09	4.33	4.70	5.01	5.34	6.76	8.40
	20	3.91	4.03	4.24	4.50	4.77	5.06	5.51	5.91	6.32	8.17	10.48
	25	4.38	4.53	4.79	5.08	5.41	5.75	6.29	6.77	7.28	9.64	12.93

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.92	1.99	2.11	2.27	2.45	2.66	3.03	3.41	3.94	9.60	23.81
	20	2.13	2.23	2.40	2.62	2.89	3.22	3.92	4.91	6.53	20.42	53.70
	25	2.33	2.48	2.71	3.03	3.44	4.04	5.70	8.09	11.39	38.24	102.97
200	15	2.39	2.48	2.64	2.83	3.05	3.29	3.71	4.13	4.64	9.61	23.81
	20	2.69	2.82	3.04	3.30	3.62	3.98	4.68	5.51	6.79	20.42	53.70
	25	2.99	3.17	3.45	3.82	4.27	4.85	6.18	8.18	11.40	38.24	102.97
300	15	2.77	2.87	3.05	3.28	3.53	3.80	4.27	4.72	5.25	9.73	23.81
	20	3.15	3.30	3.55	3.85	4.20	4.60	5.34	6.15	7.30	20.42	53.70
	25	3.51	3.72	4.05	4.45	4.94	5.54	6.81	8.53	11.45	38.24	102.97
400	15	3.09	3.21	3.42	3.66	3.94	4.24	4.75	5.23	5.80	10.00	23.81
	20	3.54	3.71	3.99	4.32	4.70	5.13	5.91	6.74	7.85	20.42	53.70
	25	3.96	4.20	4.56	5.00	5.53	6.16	7.43	9.02	11.64	38.24	102.97
500	15	3.39	3.52	3.74	4.01	4.31	4.63	5.18	5.69	6.29	10.37	23.81
	20	3.89	4.08	4.38	4.74	5.15	5.61	6.44	7.29	8.39	20.42	53.70
	25	4.37	4.63	5.02	5.49	6.05	6.72	8.00	9.55	11.95	38.24	102.97
600	15	3.66	3.80	4.04	4.33	4.65	5.00	5.57	6.12	6.74	10.78	23.81
	20	4.22	4.42	4.75	5.13	5.57	6.06	6.92	7.80	8.90	20.43	53.70
	25	4.75	5.02	5.44	5.95	6.54	7.23	8.55	10.07	12.34	38.24	102.97
700	15	3.91	4.06	4.32	4.63	4.97	5.33	5.94	6.51	7.16	11.20	23.82
	20	4.52	4.74	5.08	5.49	5.95	6.47	7.37	8.27	9.39	20.47	53.70
	25	5.10	5.39	5.84	6.37	6.99	7.71	9.06	10.58	12.76	38.24	102.97
800	15	4.15	4.31	4.58	4.91	5.26	5.65	6.29	6.89	7.55	11.63	23.83
	20	4.81	5.04	5.40	5.83	6.32	6.86	7.79	8.72	9.86	20.54	53.70
	25	5.43	5.74	6.21	6.77	7.41	8.16	9.54	11.07	13.20	38.24	102.97
900	15	4.37	4.55	4.83	5.17	5.55	5.95	6.62	7.24	7.93	12.04	23.86
	20	5.08	5.32	5.71	6.16	6.66	7.22	8.19	9.15	10.31	20.65	53.70
	25	5.74	6.07	6.56	7.14	7.82	8.59	10.00	11.54	13.65	38.24	102.97
1000	15	4.59	4.77	5.07	5.43	5.82	6.24	6.93	7.58	8.29	12.45	23.91
	20	5.34	5.60	5.99	6.46	6.99	7.57	8.57	9.56	10.73	20.80	53.70
	25	6.04	6.39	6.90	7.50	8.20	9.00	10.45	12.00	14.09	38.24	102.97

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.80	4.99	5.30	5.67	6.08	6.52	7.24	7.90	8.64	12.85	23.99
	20	5.59	5.86	6.27	6.76	7.31	7.91	8.94	9.95	11.15	20.98	53.70
	25	6.33	6.69	7.22	7.85	8.57	9.39	10.87	12.44	14.52	38.24	102.97
1200	15	5.00	5.20	5.52	5.91	6.33	6.78	7.53	8.21	8.97	13.24	24.09
	20	5.83	6.11	6.54	7.04	7.61	8.23	9.30	10.33	11.55	21.20	53.70
	25	6.61	6.98	7.53	8.18	8.92	9.77	11.28	12.87	14.95	38.25	102.97
1300	15	5.19	5.40	5.74	6.13	6.57	7.04	7.81	8.51	9.29	13.62	24.22
	20	6.06	6.35	6.80	7.32	7.90	8.55	9.64	10.69	11.93	21.45	53.70
	25	6.88	7.26	7.83	8.50	9.26	10.13	11.68	13.29	15.36	38.25	102.97
1400	15	5.38	5.59	5.94	6.35	6.80	7.29	8.08	8.80	9.60	13.99	24.37
	20	6.29	6.59	7.05	7.59	8.19	8.85	9.97	11.05	12.31	21.72	53.70
	25	7.14	7.53	8.12	8.81	9.59	10.48	12.06	13.69	15.77	38.26	102.97
1500	15	5.56	5.78	6.14	6.57	7.03	7.53	8.34	9.08	9.90	14.36	24.55
	20	6.51	6.81	7.29	7.84	8.46	9.14	10.29	11.39	12.67	22.00	53.70
	25	7.39	7.80	8.40	9.11	9.92	10.83	12.43	14.09	16.18	38.28	102.97
1600	15	5.74	5.97	6.34	6.77	7.25	7.76	8.59	9.36	10.19	14.71	24.75
	20	6.72	7.04	7.52	8.09	8.73	9.43	10.60	11.72	13.03	22.29	53.70
	25	7.63	8.05	8.67	9.40	10.23	11.16	12.80	14.47	16.57	38.30	102.97
1700	15	5.91	6.15	6.53	6.98	7.46	7.99	8.84	9.62	10.47	15.06	24.96
	20	6.93	7.25	7.75	8.34	8.99	9.70	10.90	12.05	13.37	22.60	53.70
	25	7.87	8.30	8.94	9.69	10.53	11.48	13.15	14.84	16.96	38.34	102.97
1800	15	6.08	6.32	6.72	7.17	7.67	8.21	9.09	9.88	10.75	15.40	25.19
	20	7.13	7.46	7.98	8.58	9.24	9.97	11.20	12.37	13.71	22.90	53.70
	25	8.11	8.55	9.20	9.96	10.83	11.80	13.49	15.21	17.34	38.38	102.97
1900	15	6.25	6.50	6.90	7.37	7.88	8.43	9.32	10.14	11.02	15.73	25.43
	20	7.33	7.67	8.20	8.81	9.49	10.24	11.49	12.68	14.04	23.22	53.70
	25	8.33	8.79	9.45	10.24	11.12	12.11	13.83	15.57	17.71	38.44	102.97
2000	15	6.41	6.66	7.07	7.55	8.08	8.64	9.55	10.38	11.29	16.06	25.68
	20	7.52	7.87	8.41	9.04	9.74	10.50	11.77	12.98	14.36	23.53	53.70
	25	8.56	9.02	9.70	10.50	11.40	12.41	14.16	15.92	18.07	38.51	102.97

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.41	3.75	4.32	5.25	7.01	10.03	16.83	25.08	36.35	128.49	351.59
	20	4.01	4.69	6.11	9.27	14.41	21.65	37.61	57.02	83.60	301.48	829.76
	25	4.68	6.08	9.90	16.74	26.74	40.80	71.86	109.67	161.49	586.66	1618.1
200	15	4.40	4.80	5.43	6.32	7.72	10.18	16.83	25.08	36.35	128.49	351.59
	20	5.21	5.95	7.22	9.64	14.42	21.65	37.61	57.02	83.60	301.48	829.76
	25	6.08	7.40	10.31	16.75	26.74	40.80	71.86	109.67	161.49	586.66	1618.1
300	15	5.19	5.64	6.32	7.25	8.58	10.69	16.85	25.08	36.35	128.49	351.59
	20	6.17	6.97	8.25	10.40	14.56	21.65	37.61	57.02	83.60	301.48	829.76
	25	7.20	8.55	11.14	16.82	26.74	40.80	71.86	109.67	161.49	586.66	1618.1
400	15	5.87	6.37	7.10	8.07	9.40	11.36	16.95	25.08	36.35	128.49	351.59
	20	7.01	7.85	9.17	11.23	14.93	21.67	37.61	57.02	83.60	301.48	829.76
	25	8.17	9.57	12.04	17.09	26.74	40.80	71.86	109.67	161.49	586.66	1618.1
500	15	6.49	7.02	7.80	8.82	10.16	12.05	17.19	25.09	36.35	128.49	351.59
	20	7.75	8.65	10.01	12.04	15.46	21.75	37.61	57.02	83.60	301.48	829.76
	25	9.04	10.49	12.93	17.55	26.77	40.80	71.86	109.67	161.49	586.66	1618.1
600	15	7.05	7.62	8.45	9.50	10.87	12.74	17.55	25.12	36.35	128.49	351.59
	20	8.44	9.38	10.79	12.82	16.07	21.92	37.61	57.02	83.60	301.48	829.76
	25	9.85	11.34	13.77	18.12	26.83	40.80	71.86	109.67	161.49	586.66	1618.1
700	15	7.58	8.18	9.05	10.14	11.54	13.41	17.99	25.20	36.35	128.49	351.59
	20	9.08	10.06	11.52	13.56	16.71	22.20	37.61	57.02	83.60	301.48	829.76
	25	10.59	12.13	14.58	18.76	26.96	40.80	71.86	109.67	161.49	586.66	1618.1
800	15	8.08	8.70	9.61	10.75	12.18	14.05	18.48	25.34	36.36	128.49	351.59
	20	9.68	10.71	12.20	14.27	17.36	22.56	37.62	57.02	83.60	301.48	829.76
	25	11.29	12.88	15.35	19.42	27.18	40.80	71.86	109.67	161.49	586.66	1618.1
900	15	8.55	9.20	10.14	11.32	12.78	14.67	19.00	25.54	36.37	128.49	351.59
	20	10.26	11.32	12.85	14.95	18.00	22.99	37.64	57.02	83.60	301.48	829.76
	25	11.96	13.59	16.09	20.08	27.47	40.82	71.86	109.67	161.49	586.66	1618.1
1000	15	9.00	9.68	10.65	11.86	13.36	15.27	19.53	25.80	36.39	128.49	351.59
	20	10.80	11.90	13.47	15.60	18.63	23.45	37.67	57.02	83.60	301.48	829.76
	25	12.59	14.27	16.80	20.75	27.83	40.85	71.86	109.67	161.49	586.66	1618.1

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	9.43	10.14	11.14	12.39	13.92	15.84	20.06	26.11	36.44	128.49	351.59
	20	11.32	12.45	14.07	16.23	19.26	23.95	37.73	57.02	83.60	301.48	829.76
	25	13.20	14.91	17.48	21.40	28.24	40.90	71.86	109.67	161.49	586.66	1618.1
1200	15	9.85	10.57	11.61	12.89	14.45	16.40	20.59	26.46	36.51	128.49	351.59
	20	11.83	12.99	14.64	16.83	19.86	24.46	37.82	57.02	83.60	301.48	829.76
	25	13.79	15.54	18.14	22.05	28.69	40.97	71.86	109.67	161.49	586.66	1618.1
1300	15	10.25	11.00	12.07	13.38	14.97	16.94	21.12	26.83	36.60	128.49	351.59
	20	12.31	13.50	15.20	17.42	20.46	24.98	37.94	57.02	83.60	301.48	829.76
	25	14.36	16.14	18.78	22.68	29.16	41.08	71.86	109.67	161.49	586.66	1618.1
1400	15	10.64	11.41	12.51	13.85	15.47	17.47	21.64	27.23	36.73	128.49	351.59
	20	12.79	14.00	15.73	17.99	21.04	25.50	38.09	57.02	83.60	301.48	829.76
	25	14.90	16.73	19.40	23.30	29.65	41.22	71.86	109.67	161.49	586.66	1618.1
1500	15	11.01	11.81	12.93	14.31	15.96	17.98	22.16	27.64	36.88	128.49	351.59
	20	13.24	14.49	16.25	18.54	21.61	26.02	38.28	57.03	83.60	301.48	829.76
	25	15.44	17.29	20.01	23.91	30.15	41.40	71.86	109.67	161.49	586.66	1618.1
1600	15	11.38	12.19	13.35	14.75	16.43	18.48	22.66	28.06	37.07	128.49	351.59
	20	13.69	14.96	16.76	19.08	22.16	26.55	38.50	57.04	83.60	301.48	829.76
	25	15.95	17.84	20.59	24.51	30.66	41.61	71.86	109.67	161.49	586.66	1618.1
1700	15	11.74	12.57	13.75	15.18	16.89	18.97	23.16	28.49	37.28	128.49	351.59
	20	14.12	15.42	17.25	19.61	22.71	27.07	38.75	57.06	83.60	301.48	829.76
	25	16.46	18.38	21.16	25.10	31.18	41.85	71.87	109.67	161.49	586.66	1618.1
1800	15	12.09	12.94	14.15	15.61	17.34	19.44	23.65	28.93	37.52	128.49	351.59
	20	14.54	15.87	17.73	20.12	23.24	27.58	39.02	57.09	83.60	301.48	829.76
	25	16.95	18.90	21.72	25.67	31.70	42.13	71.87	109.67	161.49	586.66	1618.1
1900	15	12.43	13.30	14.53	16.02	17.78	19.91	24.13	29.37	37.78	128.49	351.59
	20	14.96	16.31	18.20	20.62	23.76	28.09	39.32	57.12	83.60	301.48	829.76
	25	17.43	19.41	22.27	26.24	32.22	42.42	71.88	109.67	161.49	586.66	1618.1
2000	15	12.76	13.65	14.91	16.42	18.22	20.36	24.61	29.81	38.06	128.49	351.59
	20	15.36	16.74	18.66	21.11	24.27	28.60	39.63	57.17	83.60	301.48	829.76
	25	17.90	19.91	22.80	26.79	32.74	42.74	71.88	109.67	161.49	586.66	1618.1

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	8.08	16.02	31.33	54.86	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	13.77	35.63	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	25.11	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
200	15	10.06	16.23	31.33	54.86	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	14.92	35.63	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	25.15	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
300	15	11.73	17.02	31.33	54.86	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	16.54	35.63	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	25.56	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
400	15	13.20	18.10	31.36	54.86	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	18.14	35.65	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	26.47	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
500	15	14.52	19.24	31.46	54.86	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	19.65	35.76	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	27.65	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
600	15	15.73	20.36	31.70	54.86	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	21.07	36.02	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	28.93	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
700	15	16.87	21.46	32.08	54.87	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	22.41	36.44	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	30.24	67.96	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
800	15	17.93	22.52	32.59	54.87	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	23.68	37.00	71.84	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	31.55	67.97	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
900	15	18.95	23.54	33.19	54.89	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	24.90	37.67	71.85	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	32.83	67.99	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1000	15	19.91	24.52	33.86	54.92	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	26.06	38.41	71.85	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	34.08	68.03	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 34.0 Ft (RADIUS = 24.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	20.84	25.48	34.56	54.98	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	27.18	39.20	71.86	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	35.31	68.09	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1200	15	21.73	26.40	35.29	55.08	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	28.26	40.02	71.88	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	36.50	68.20	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1300	15	22.59	27.29	36.04	55.21	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	29.30	40.87	71.92	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	37.66	68.36	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1400	15	23.42	28.16	36.79	55.39	89.26	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	30.31	41.72	71.98	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	38.80	68.56	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1500	15	24.23	29.01	37.55	55.61	89.27	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	31.30	42.57	72.07	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	39.90	68.83	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1600	15	25.02	29.83	38.31	55.88	89.27	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	32.25	43.43	72.18	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	40.99	69.14	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1700	15	25.78	30.64	39.06	56.19	89.28	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	33.18	44.28	72.33	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	42.04	69.51	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1800	15	26.53	31.43	39.80	56.53	89.29	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	34.09	45.12	72.51	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	43.08	69.92	138.63	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
1900	15	27.26	32.20	40.54	56.91	89.30	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	34.98	45.96	72.73	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	44.09	70.38	138.64	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.
2000	15	27.97	32.95	41.28	57.32	89.32	137.67	244.78	375.24	554.12	2022.6	5586.5
	20	35.85	46.79	72.98	127.51	208.91	323.52	577.19	886.26	1310.1	4790.3	13237.
	25	45.09	70.88	138.64	247.28	406.17	629.92	1125.2	1728.7	2556.4	9353.3	25851.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.26	1.27	1.33	1.40	1.48	1.56	1.69	1.81	1.93	2.49	3.32
	20	1.36	1.38	1.44	1.52	1.62	1.72	1.88	2.02	2.18	3.01	5.04
	25	1.45	1.48	1.55	1.65	1.76	1.87	2.07	2.25	2.46	3.93	8.36
200	15	1.50	1.52	1.59	1.68	1.77	1.87	2.03	2.17	2.31	2.97	3.84
	20	1.65	1.68	1.76	1.86	1.97	2.09	2.29	2.46	2.64	3.57	5.28
	25	1.78	1.82	1.92	2.04	2.17	2.31	2.55	2.76	3.00	4.40	8.36
300	15	1.70	1.72	1.80	1.90	2.01	2.12	2.30	2.46	2.62	3.35	4.29
	20	1.88	1.92	2.01	2.13	2.26	2.39	2.61	2.81	3.02	4.03	5.68
	25	2.05	2.10	2.21	2.35	2.50	2.66	2.93	3.17	3.44	4.89	8.43
400	15	1.87	1.90	1.99	2.09	2.21	2.34	2.53	2.71	2.88	3.68	4.68
	20	2.08	2.13	2.23	2.36	2.50	2.66	2.90	3.11	3.34	4.43	6.10
	25	2.28	2.34	2.47	2.62	2.79	2.97	3.26	3.53	3.82	5.34	8.61
500	15	2.02	2.06	2.15	2.27	2.40	2.53	2.74	2.93	3.12	3.98	5.04
	20	2.27	2.32	2.43	2.57	2.73	2.89	3.15	3.39	3.63	4.79	6.50
	25	2.50	2.56	2.70	2.86	3.05	3.24	3.56	3.85	4.15	5.75	8.88
600	15	2.16	2.20	2.30	2.43	2.57	2.71	2.94	3.14	3.34	4.25	5.36
	20	2.44	2.49	2.62	2.77	2.93	3.11	3.39	3.64	3.90	5.12	6.87
	25	2.69	2.76	2.91	3.09	3.28	3.49	3.83	4.14	4.47	6.13	9.19
700	15	2.29	2.34	2.45	2.58	2.72	2.88	3.12	3.33	3.55	4.51	5.67
	20	2.59	2.66	2.79	2.95	3.12	3.31	3.61	3.87	4.15	5.43	7.23
	25	2.87	2.95	3.11	3.30	3.51	3.73	4.09	4.41	4.76	6.49	9.52
800	15	2.42	2.47	2.58	2.72	2.87	3.04	3.29	3.51	3.74	4.75	5.96
	20	2.74	2.81	2.95	3.12	3.30	3.50	3.81	4.09	4.38	5.72	7.57
	25	3.04	3.13	3.29	3.49	3.71	3.95	4.33	4.67	5.03	6.83	9.86
900	15	2.54	2.59	2.71	2.86	3.02	3.18	3.45	3.68	3.92	4.97	6.23
	20	2.88	2.96	3.10	3.28	3.47	3.68	4.01	4.30	4.60	6.00	7.90
	25	3.20	3.30	3.47	3.68	3.91	4.16	4.55	4.91	5.29	7.15	10.19
1000	15	2.65	2.70	2.83	2.98	3.15	3.33	3.61	3.85	4.10	5.19	6.49
	20	3.02	3.09	3.25	3.44	3.64	3.85	4.20	4.50	4.81	6.27	8.21
	25	3.36	3.46	3.64	3.86	4.10	4.36	4.77	5.14	5.53	7.46	10.52

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.76	2.82	2.95	3.11	3.28	3.47	3.75	4.00	4.26	5.40	6.74
	20	3.15	3.23	3.39	3.58	3.79	4.02	4.37	4.69	5.02	6.52	8.51
	25	3.51	3.61	3.80	4.03	4.28	4.55	4.98	5.36	5.77	7.75	10.84
1200	15	2.86	2.92	3.06	3.23	3.41	3.60	3.90	4.16	4.42	5.60	6.98
	20	3.28	3.36	3.53	3.73	3.95	4.18	4.55	4.87	5.21	6.76	8.80
	25	3.65	3.76	3.96	4.20	4.46	4.73	5.18	5.58	6.00	8.04	11.15
1300	15	2.97	3.03	3.17	3.34	3.53	3.73	4.03	4.30	4.58	5.79	7.21
	20	3.40	3.48	3.66	3.86	4.09	4.33	4.71	5.05	5.40	7.00	9.08
	25	3.79	3.90	4.11	4.36	4.63	4.91	5.37	5.78	6.22	8.31	11.46
1400	15	3.06	3.13	3.28	3.45	3.65	3.85	4.17	4.44	4.73	5.98	7.44
	20	3.51	3.60	3.78	4.00	4.23	4.48	4.88	5.22	5.58	7.23	9.36
	25	3.93	4.04	4.26	4.51	4.79	5.09	5.56	5.98	6.43	8.57	11.77
1500	15	3.16	3.23	3.38	3.56	3.76	3.97	4.30	4.58	4.88	6.16	7.66
	20	3.63	3.72	3.91	4.13	4.37	4.63	5.03	5.39	5.76	7.45	9.62
	25	4.06	4.18	4.40	4.66	4.95	5.25	5.74	6.18	6.64	8.83	12.06
1600	15	3.25	3.32	3.48	3.67	3.87	4.09	4.42	4.72	5.02	6.33	7.87
	20	3.74	3.84	4.03	4.26	4.50	4.77	5.18	5.55	5.93	7.66	9.88
	25	4.19	4.31	4.54	4.81	5.10	5.42	5.92	6.36	6.84	9.08	12.35
1700	15	3.34	3.42	3.58	3.77	3.98	4.20	4.55	4.85	5.16	6.51	8.07
	20	3.85	3.95	4.14	4.38	4.63	4.90	5.33	5.71	6.10	7.87	10.13
	25	4.31	4.44	4.67	4.95	5.25	5.58	6.09	6.55	7.03	9.33	12.63
1800	15	3.43	3.51	3.67	3.87	4.09	4.31	4.67	4.98	5.29	6.67	8.28
	20	3.95	4.06	4.26	4.50	4.76	5.04	5.48	5.86	6.26	8.07	10.37
	25	4.43	4.56	4.80	5.09	5.40	5.73	6.26	6.73	7.22	9.57	12.91
1900	15	3.52	3.60	3.77	3.97	4.19	4.42	4.78	5.10	5.43	6.84	8.47
	20	4.06	4.16	4.37	4.62	4.89	5.17	5.62	6.01	6.42	8.27	10.61
	25	4.55	4.68	4.93	5.22	5.54	5.88	6.42	6.90	7.41	9.80	13.18
2000	15	3.60	3.68	3.86	4.06	4.29	4.53	4.90	5.22	5.55	7.00	8.66
	20	4.16	4.27	4.48	4.73	5.01	5.30	5.76	6.16	6.58	8.47	10.85
	25	4.67	4.80	5.06	5.36	5.68	6.03	6.58	7.07	7.59	10.03	13.45

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.04	2.10	2.23	2.39	2.58	2.79	3.18	3.60	4.18	10.40	25.60
	20	2.27	2.36	2.54	2.77	3.06	3.42	4.21	5.35	7.19	22.27	57.90
	25	2.48	2.63	2.88	3.22	3.69	4.38	6.33	9.01	12.65	41.83	111.16
200	15	2.54	2.62	2.78	2.98	3.20	3.46	3.90	4.34	4.89	10.41	25.60
	20	2.87	2.99	3.22	3.49	3.82	4.21	4.97	5.90	7.37	22.27	57.90
	25	3.18	3.37	3.67	4.06	4.54	5.19	6.72	9.05	12.65	41.83	111.16
300	15	2.94	3.04	3.22	3.45	3.71	3.99	4.48	4.95	5.52	10.49	25.60
	20	3.35	3.50	3.76	4.07	4.43	4.86	5.65	6.55	7.84	22.27	57.90
	25	3.74	3.96	4.30	4.73	5.25	5.91	7.33	9.33	12.68	41.83	111.16
400	15	3.29	3.40	3.61	3.86	4.14	4.45	4.98	5.49	6.08	10.71	25.60
	20	3.77	3.94	4.22	4.57	4.96	5.42	6.25	7.15	8.38	22.27	57.90
	25	4.23	4.47	4.84	5.31	5.87	6.55	7.95	9.77	12.80	41.83	111.16
500	15	3.60	3.73	3.95	4.23	4.53	4.87	5.43	5.97	6.59	11.05	25.60
	20	4.15	4.33	4.64	5.01	5.44	5.93	6.80	7.72	8.92	22.27	57.90
	25	4.66	4.92	5.33	5.83	6.42	7.13	8.54	10.28	13.05	41.83	111.16
600	15	3.89	4.03	4.27	4.56	4.89	5.25	5.85	6.42	7.06	11.44	25.60
	20	4.49	4.70	5.03	5.42	5.88	6.39	7.30	8.24	9.44	22.28	57.90
	25	5.06	5.35	5.78	6.31	6.93	7.67	9.10	10.80	13.40	41.83	111.16
700	15	4.16	4.31	4.57	4.88	5.23	5.60	6.23	6.83	7.50	11.85	25.61
	20	4.82	5.03	5.39	5.81	6.29	6.82	7.77	8.74	9.95	22.30	57.90
	25	5.44	5.74	6.20	6.76	7.41	8.18	9.63	11.31	13.79	41.83	111.16
800	15	4.41	4.57	4.85	5.17	5.54	5.94	6.60	7.22	7.92	12.27	25.61
	20	5.12	5.35	5.72	6.17	6.67	7.23	8.21	9.21	10.43	22.34	57.90
	25	5.79	6.11	6.59	7.18	7.86	8.65	10.14	11.81	14.21	41.83	111.16
900	15	4.66	4.82	5.11	5.46	5.84	6.25	6.94	7.59	8.31	12.69	25.63
	20	5.41	5.66	6.05	6.51	7.03	7.62	8.64	9.65	10.89	22.42	57.90
	25	6.13	6.46	6.97	7.57	8.28	9.10	10.62	12.30	14.65	41.83	111.16
1000	15	4.89	5.06	5.36	5.72	6.12	6.56	7.27	7.94	8.68	13.11	25.67
	20	5.69	5.95	6.35	6.83	7.38	7.99	9.04	10.08	11.33	22.53	57.90
	25	6.45	6.80	7.32	7.95	8.69	9.53	11.08	12.77	15.09	41.83	111.16

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	5.11	5.29	5.61	5.98	6.40	6.85	7.59	8.28	9.04	13.51	25.72
	20	5.96	6.22	6.65	7.15	7.71	8.34	9.42	10.49	11.76	22.68	57.90
	25	6.76	7.12	7.66	8.32	9.07	9.94	11.52	13.23	15.52	41.83	111.16
1200	15	5.32	5.51	5.84	6.23	6.66	7.13	7.89	8.60	9.39	13.91	25.80
	20	6.21	6.49	6.93	7.45	8.03	8.68	9.79	10.88	12.18	22.86	57.90
	25	7.05	7.43	7.99	8.67	9.45	10.34	11.95	13.67	15.95	41.83	111.16
1300	15	5.53	5.73	6.07	6.47	6.91	7.40	8.19	8.92	9.72	14.30	25.90
	20	6.46	6.75	7.20	7.74	8.34	9.01	10.15	11.26	12.58	23.08	57.90
	25	7.34	7.73	8.31	9.01	9.81	10.72	12.37	14.10	16.38	41.84	111.16
1400	15	5.73	5.93	6.29	6.70	7.16	7.66	8.47	9.22	10.05	14.68	26.03
	20	6.70	7.00	7.47	8.02	8.64	9.33	10.50	11.63	12.97	23.32	57.90
	25	7.61	8.01	8.62	9.34	10.16	11.09	12.77	14.52	16.80	41.84	111.16
1500	15	5.92	6.14	6.50	6.93	7.40	7.91	8.75	9.51	10.36	15.06	26.18
	20	6.94	7.24	7.72	8.29	8.93	9.64	10.83	11.99	13.35	23.58	57.90
	25	7.88	8.30	8.92	9.65	10.50	11.45	13.16	14.93	17.21	41.85	111.16
1600	15	6.11	6.33	6.71	7.15	7.63	8.16	9.01	9.80	10.67	15.42	26.36
	20	7.16	7.48	7.97	8.56	9.21	9.94	11.16	12.34	13.72	23.85	57.90
	25	8.15	8.57	9.21	9.96	10.83	11.80	13.54	15.33	17.61	41.86	111.16
1700	15	6.30	6.52	6.91	7.36	7.86	8.40	9.27	10.08	10.96	15.78	26.55
	20	7.38	7.71	8.22	8.82	9.49	10.23	11.48	12.68	14.08	24.14	57.90
	25	8.40	8.84	9.49	10.26	11.15	12.14	13.91	15.72	18.01	41.88	111.16
1800	15	6.48	6.71	7.10	7.57	8.08	8.63	9.53	10.35	11.25	16.13	26.76
	20	7.60	7.93	8.45	9.07	9.76	10.51	11.79	13.01	14.43	24.43	57.90
	25	8.65	9.10	9.76	10.56	11.46	12.48	14.27	16.10	18.40	41.91	111.16
1900	15	6.65	6.89	7.30	7.77	8.29	8.86	9.78	10.62	11.54	16.47	26.98
	20	7.81	8.15	8.69	9.32	10.02	10.79	12.09	13.34	14.77	24.73	57.90
	25	8.89	9.35	10.03	10.84	11.76	12.80	14.62	16.47	18.78	41.95	111.16
2000	15	6.83	7.07	7.48	7.97	8.51	9.08	10.02	10.88	11.81	16.81	27.22
	20	8.02	8.37	8.91	9.56	10.28	11.06	12.39	13.65	15.11	25.04	57.91
	25	9.13	9.60	10.30	11.13	12.06	13.12	14.97	16.84	19.16	41.99	111.16

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.65	4.02	4.66	5.77	7.93	11.39	19.02	28.19	40.63	140.84	379.81
	20	4.31	5.10	6.87	10.72	16.61	24.81	42.73	64.33	93.69	330.70	896.63
	25	5.07	6.83	11.60	19.54	30.99	46.94	81.83	123.91	181.17	643.70	1748.7
200	15	4.70	5.13	5.82	6.84	8.49	11.47	19.02	28.19	40.63	140.84	379.81
	20	5.60	6.43	7.92	10.93	16.61	24.81	42.73	64.33	93.69	330.70	896.63
	25	6.57	8.14	11.83	19.54	30.99	46.94	81.83	123.91	181.17	643.70	1748.7
300	15	5.55	6.03	6.77	7.80	9.33	11.85	19.03	28.19	40.63	140.84	379.81
	20	6.63	7.51	8.98	11.57	16.67	24.81	42.73	64.33	93.69	330.70	896.63
	25	7.77	9.33	12.51	19.56	30.99	46.94	81.83	123.91	181.17	643.70	1748.7
400	15	6.28	6.80	7.60	8.67	10.16	12.45	19.07	28.19	40.63	140.84	379.81
	20	7.52	8.45	9.94	12.37	16.91	24.82	42.73	64.33	93.69	330.70	896.63
	25	8.81	10.41	13.37	19.70	30.99	46.94	81.83	123.91	181.17	643.70	1748.7
500	15	6.94	7.50	8.34	9.45	10.94	13.13	19.22	28.19	40.63	140.84	379.81
	20	8.32	9.30	10.83	13.18	17.32	24.85	42.73	64.33	93.69	330.70	896.63
	25	9.74	11.38	14.25	20.01	31.00	46.94	81.83	123.91	181.17	643.70	1748.7
600	15	7.54	8.14	9.02	10.17	11.68	13.81	19.49	28.20	40.63	140.84	379.81
	20	9.06	10.08	11.64	13.97	17.86	24.95	42.73	64.33	93.69	330.70	896.63
	25	10.60	12.28	15.11	20.47	31.02	46.94	81.83	123.91	181.17	643.70	1748.7
700	15	8.11	8.73	9.66	10.85	12.38	14.49	19.86	28.24	40.63	140.84	379.81
	20	9.74	10.81	12.41	14.73	18.45	25.12	42.74	64.33	93.69	330.70	896.63
	25	11.40	13.12	15.95	21.02	31.08	46.94	81.83	123.91	181.17	643.70	1748.7
800	15	8.64	9.30	10.26	11.48	13.05	15.14	20.29	28.32	40.63	140.84	379.81
	20	10.39	11.49	13.14	15.47	19.08	25.38	42.74	64.33	93.69	330.70	896.63
	25	12.15	13.92	16.75	21.63	31.20	46.94	81.83	123.91	181.17	643.70	1748.7
900	15	9.14	9.83	10.83	12.09	13.68	15.78	20.77	28.46	40.64	140.84	379.81
	20	11.00	12.14	13.83	16.18	19.71	25.72	42.74	64.33	93.69	330.70	896.63
	25	12.87	14.67	17.52	22.27	31.38	46.95	81.83	123.91	181.17	643.70	1748.7
1000	15	9.62	10.33	11.37	12.67	14.29	16.40	21.28	28.64	40.65	140.84	379.81
	20	11.58	12.76	14.48	16.86	20.35	26.11	42.76	64.33	93.69	330.70	896.63
	25	13.55	15.39	18.26	22.92	31.63	46.96	81.83	123.91	181.17	643.70	1748.7

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	10.08	10.82	11.89	13.22	14.87	17.00	21.79	28.88	40.67	140.84	379.81
	20	12.14	13.35	15.12	17.51	20.98	26.55	42.78	64.33	93.69	330.70	896.63
	25	14.20	16.09	18.98	23.57	31.94	46.97	81.83	123.91	181.17	643.70	1748.7
1200	15	10.53	11.29	12.39	13.75	15.44	17.58	22.32	29.16	40.71	140.84	379.81
	20	12.68	13.93	15.72	18.15	21.60	27.01	42.82	64.33	93.69	330.70	896.63
	25	14.82	16.75	19.68	24.22	32.30	47.01	81.83	123.91	181.17	643.70	1748.7
1300	15	10.96	11.74	12.87	14.27	15.98	18.14	22.84	29.48	40.76	140.84	379.81
	20	13.20	14.48	16.31	18.77	22.20	27.50	42.89	64.33	93.69	330.70	896.63
	25	15.43	17.39	20.35	24.86	32.70	47.06	81.83	123.91	181.17	643.70	1748.7
1400	15	11.37	12.18	13.34	14.76	16.51	18.69	23.36	29.84	40.84	140.84	379.81
	20	13.70	15.01	16.88	19.36	22.80	28.00	42.98	64.33	93.69	330.70	896.63
	25	16.02	18.02	21.00	25.49	33.13	47.13	81.83	123.91	181.17	643.70	1748.7
1500	15	11.78	12.60	13.79	15.25	17.02	19.23	23.88	30.21	40.94	140.84	379.81
	20	14.19	15.53	17.43	19.95	23.39	28.51	43.10	64.33	93.69	330.70	896.63
	25	16.59	18.62	21.64	26.12	33.59	47.24	81.83	123.91	181.17	643.70	1748.7
1600	15	12.17	13.01	14.23	15.72	17.52	19.75	24.40	30.60	41.07	140.84	379.81
	20	14.67	16.03	17.97	20.51	23.96	29.02	43.25	64.34	93.69	330.70	896.63
	25	17.14	19.21	22.26	26.73	34.06	47.36	81.83	123.91	181.17	643.70	1748.7
1700	15	12.55	13.42	14.66	16.18	18.01	20.26	24.90	31.01	41.23	140.84	379.81
	20	15.13	16.52	18.49	21.07	24.53	29.54	43.42	64.34	93.69	330.70	896.63
	25	17.68	19.78	22.86	27.34	34.55	47.52	81.83	123.91	181.17	643.70	1748.7
1800	15	12.92	13.81	15.08	16.62	18.48	20.75	25.41	31.42	41.41	140.84	379.81
	20	15.58	17.00	19.00	21.61	25.08	30.05	43.63	64.35	93.69	330.70	896.63
	25	18.20	20.34	23.45	27.93	35.04	47.71	81.83	123.91	181.17	643.70	1748.7
1900	15	13.29	14.19	15.48	17.06	18.95	21.24	25.90	31.85	41.61	140.84	379.81
	20	16.02	17.46	19.50	22.13	25.62	30.57	43.86	64.37	93.69	330.70	896.63
	25	18.72	20.88	24.03	28.52	35.54	47.92	81.83	123.91	181.17	643.70	1748.7
2000	15	13.65	14.57	15.88	17.49	19.40	21.72	26.39	32.27	41.84	140.84	379.81
	20	16.46	17.92	19.99	22.65	26.16	31.08	44.11	64.39	93.69	330.70	896.63
	25	19.22	21.41	24.59	29.10	36.05	48.16	81.84	123.91	181.17	643.70	1748.7

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	9.06	19.11	37.13	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	16.57	42.86	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	30.62	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
200	15	11.09	19.19	37.13	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	17.30	42.86	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	30.62	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
300	15	12.85	19.69	37.13	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	18.76	42.86	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	30.77	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
400	15	14.40	20.58	37.13	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	20.34	42.86	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	31.30	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
500	15	15.81	21.64	37.16	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	21.88	42.89	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	32.19	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
600	15	17.11	22.75	37.26	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	23.36	42.99	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	33.30	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
700	15	18.32	23.85	37.47	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	24.76	43.19	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	34.51	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
800	15	19.46	24.93	37.79	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	26.11	43.52	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	35.77	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
900	15	20.55	25.98	38.22	64.42	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	27.39	43.97	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	37.04	82.02	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1000	15	21.58	27.00	38.74	64.43	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	28.63	44.53	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	38.30	82.03	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 36.0 Ft (RADIUS = 25.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	22.57	28.00	39.33	64.45	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	29.81	45.17	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	39.55	82.04	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1200	15	23.53	28.96	39.97	64.48	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	30.96	45.88	85.49	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	40.77	82.07	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1300	15	24.45	29.90	40.65	64.54	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	32.07	46.63	85.50	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	41.98	82.12	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1400	15	25.34	30.82	41.35	64.62	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	33.15	47.41	85.52	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	43.15	82.20	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1500	15	26.21	31.71	42.07	64.73	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	34.20	48.21	85.54	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	44.31	82.31	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1600	15	27.05	32.58	42.80	64.88	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	35.22	49.02	85.58	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	45.44	82.46	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1700	15	27.87	33.43	43.53	65.06	103.85	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	36.21	49.85	85.64	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	46.55	82.64	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1800	15	28.66	34.26	44.27	65.27	103.86	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	37.18	50.68	85.72	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	47.64	82.87	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
1900	15	29.45	35.08	45.01	65.53	103.86	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	38.13	51.51	85.81	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	48.71	83.15	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.
2000	15	30.21	35.87	45.74	65.82	103.86	158.81	279.14	424.36	622.02	2219.7	6037.7
	20	39.06	52.34	85.94	150.07	243.41	373.54	658.57	1002.6	1471.0	5257.3	14307.
	25	49.77	83.46	165.21	291.27	473.49	727.56	1284.1	1955.9	2870.6	10265.	27939.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.33	1.33	1.39	1.46	1.54	1.62	1.75	1.87	1.99	2.57	3.43
	20	1.43	1.45	1.51	1.59	1.69	1.79	1.95	2.10	2.26	3.13	5.34
	25	1.53	1.55	1.63	1.73	1.83	1.96	2.16	2.35	2.56	4.16	8.92
200	15	1.59	1.60	1.67	1.75	1.84	1.94	2.10	2.25	2.39	3.06	3.96
	20	1.74	1.76	1.84	1.95	2.06	2.18	2.38	2.55	2.74	3.70	5.54
	25	1.88	1.92	2.02	2.14	2.27	2.42	2.66	2.88	3.13	4.62	8.92
300	15	1.79	1.81	1.89	1.99	2.09	2.21	2.39	2.55	2.71	3.46	4.42
	20	1.99	2.02	2.11	2.23	2.36	2.50	2.72	2.92	3.13	4.17	5.93
	25	2.17	2.22	2.33	2.46	2.62	2.78	3.06	3.31	3.58	5.11	8.97
400	15	1.97	2.00	2.08	2.19	2.31	2.43	2.63	2.81	2.99	3.80	4.83
	20	2.20	2.24	2.35	2.48	2.62	2.77	3.02	3.24	3.47	4.59	6.35
	25	2.42	2.47	2.60	2.75	2.92	3.10	3.40	3.68	3.97	5.57	9.12
500	15	2.14	2.17	2.26	2.37	2.50	2.64	2.85	3.04	3.24	4.11	5.19
	20	2.40	2.44	2.56	2.70	2.85	3.02	3.28	3.52	3.77	4.96	6.75
	25	2.64	2.70	2.84	3.01	3.19	3.39	3.71	4.01	4.33	5.99	9.36
600	15	2.29	2.32	2.42	2.54	2.68	2.83	3.06	3.26	3.46	4.39	5.53
	20	2.58	2.63	2.75	2.90	3.07	3.25	3.53	3.78	4.05	5.31	7.14
	25	2.85	2.92	3.06	3.24	3.44	3.65	4.00	4.31	4.65	6.39	9.66
700	15	2.43	2.46	2.57	2.70	2.85	3.00	3.24	3.46	3.68	4.65	5.85
	20	2.75	2.80	2.93	3.09	3.27	3.46	3.76	4.03	4.31	5.63	7.50
	25	3.04	3.12	3.27	3.46	3.67	3.90	4.27	4.60	4.95	6.75	9.99
800	15	2.56	2.60	2.71	2.85	3.00	3.17	3.42	3.65	3.88	4.90	6.14
	20	2.91	2.96	3.10	3.27	3.46	3.66	3.97	4.26	4.55	5.93	7.85
	25	3.22	3.30	3.47	3.67	3.89	4.13	4.52	4.86	5.24	7.10	10.32
900	15	2.69	2.73	2.85	2.99	3.15	3.32	3.59	3.83	4.07	5.14	6.42
	20	3.06	3.12	3.26	3.44	3.64	3.85	4.18	4.47	4.78	6.22	8.19
	25	3.40	3.48	3.66	3.87	4.10	4.35	4.75	5.12	5.51	7.44	10.65
1000	15	2.81	2.85	2.98	3.13	3.30	3.47	3.75	4.00	4.25	5.36	6.69
	20	3.20	3.27	3.42	3.61	3.81	4.03	4.37	4.68	5.00	6.49	8.51
	25	3.56	3.65	3.83	4.06	4.30	4.56	4.98	5.36	5.76	7.75	10.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	2.92	2.97	3.10	3.26	3.43	3.62	3.91	4.16	4.42	5.58	6.95
	20	3.34	3.41	3.57	3.76	3.97	4.20	4.56	4.88	5.21	6.75	8.82
	25	3.72	3.82	4.01	4.24	4.49	4.76	5.20	5.59	6.01	8.06	11.31
1200	15	3.03	3.09	3.22	3.38	3.56	3.76	4.06	4.32	4.59	5.78	7.20
	20	3.47	3.55	3.71	3.91	4.13	4.37	4.74	5.07	5.42	7.01	9.12
	25	3.87	3.97	4.17	4.41	4.67	4.96	5.41	5.81	6.25	8.35	11.63
1300	15	3.14	3.20	3.33	3.50	3.69	3.89	4.20	4.47	4.75	5.98	7.44
	20	3.60	3.68	3.85	4.06	4.29	4.53	4.92	5.26	5.61	7.25	9.40
	25	4.02	4.12	4.33	4.58	4.85	5.14	5.61	6.03	6.48	8.64	11.94
1400	15	3.25	3.30	3.45	3.62	3.82	4.02	4.34	4.62	4.91	6.18	7.67
	20	3.72	3.81	3.98	4.20	4.43	4.69	5.08	5.44	5.80	7.49	9.68
	25	4.16	4.27	4.49	4.74	5.02	5.32	5.81	6.24	6.70	8.91	12.25
1500	15	3.35	3.41	3.56	3.74	3.94	4.15	4.48	4.76	5.06	6.36	7.90
	20	3.85	3.93	4.11	4.34	4.58	4.84	5.25	5.61	5.99	7.72	9.96
	25	4.30	4.42	4.64	4.90	5.19	5.50	6.00	6.44	6.91	9.18	12.55
1600	15	3.45	3.51	3.66	3.85	4.05	4.27	4.61	4.90	5.21	6.55	8.11
	20	3.96	4.05	4.24	4.47	4.72	4.99	5.41	5.78	6.17	7.94	10.22
	25	4.44	4.55	4.78	5.05	5.35	5.67	6.18	6.64	7.12	9.44	12.85
1700	15	3.54	3.61	3.76	3.96	4.17	4.39	4.74	5.04	5.36	6.72	8.33
	20	4.08	4.17	4.36	4.60	4.86	5.13	5.56	5.94	6.34	8.15	10.48
	25	4.57	4.69	4.92	5.20	5.51	5.84	6.36	6.83	7.33	9.69	13.14
1800	15	3.64	3.70	3.86	4.06	4.28	4.50	4.86	5.17	5.50	6.90	8.53
	20	4.19	4.28	4.48	4.73	4.99	5.27	5.71	6.11	6.51	8.37	10.73
	25	4.70	4.82	5.06	5.35	5.66	6.00	6.54	7.02	7.52	9.94	13.42
1900	15	3.73	3.80	3.96	4.16	4.38	4.62	4.98	5.30	5.63	7.07	8.74
	20	4.30	4.40	4.60	4.85	5.12	5.41	5.86	6.26	6.68	8.57	10.98
	25	4.83	4.95	5.20	5.49	5.81	6.16	6.71	7.20	7.72	10.18	13.70
2000	15	3.82	3.89	4.06	4.27	4.49	4.73	5.10	5.43	5.77	7.23	8.94
	20	4.41	4.51	4.72	4.97	5.25	5.54	6.01	6.42	6.84	8.77	11.22
	25	4.95	5.08	5.33	5.63	5.96	6.31	6.88	7.38	7.91	10.41	13.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.16	2.21	2.34	2.51	2.70	2.93	3.34	3.80	4.45	11.26	27.50
	20	2.40	2.50	2.68	2.93	3.23	3.62	4.52	5.85	7.90	24.25	62.36
	25	2.64	2.79	3.06	3.43	3.95	4.76	7.03	10.01	14.02	45.68	119.83
200	15	2.69	2.76	2.93	3.13	3.36	3.63	4.09	4.56	5.15	11.26	27.50
	20	3.04	3.17	3.40	3.69	4.03	4.45	5.28	6.33	8.03	24.25	62.36
	25	3.38	3.57	3.89	4.31	4.84	5.55	7.33	10.03	14.02	45.68	119.83
300	15	3.11	3.21	3.40	3.63	3.89	4.19	4.69	5.20	5.80	11.31	27.50
	20	3.55	3.71	3.97	4.29	4.68	5.13	5.98	6.97	8.43	24.25	62.36
	25	3.98	4.20	4.56	5.01	5.58	6.30	7.90	10.23	14.03	45.68	119.83
400	15	3.48	3.59	3.80	4.06	4.35	4.67	5.22	5.75	6.38	11.49	27.50
	20	4.00	4.17	4.46	4.82	5.24	5.72	6.61	7.59	8.95	24.25	62.36
	25	4.49	4.74	5.13	5.63	6.22	6.96	8.52	10.61	14.11	45.68	119.83
500	15	3.82	3.94	4.17	4.45	4.76	5.11	5.69	6.26	6.91	11.78	27.50
	20	4.40	4.59	4.91	5.29	5.74	6.25	7.18	8.17	9.49	24.25	62.36
	25	4.96	5.23	5.65	6.18	6.81	7.57	9.12	11.09	14.29	45.68	119.83
600	15	4.12	4.26	4.50	4.80	5.14	5.51	6.13	6.72	7.40	12.15	27.50
	20	4.77	4.97	5.31	5.73	6.20	6.74	7.70	8.71	10.02	24.26	62.36
	25	5.39	5.67	6.13	6.68	7.34	8.14	9.69	11.59	14.58	45.68	119.83
700	15	4.41	4.55	4.82	5.13	5.49	5.88	6.53	7.15	7.86	12.55	27.50
	20	5.12	5.33	5.69	6.13	6.63	7.19	8.19	9.22	10.53	24.27	62.36
	25	5.78	6.09	6.57	7.15	7.84	8.66	10.24	12.11	14.93	45.68	119.83
800	15	4.68	4.83	5.11	5.45	5.82	6.23	6.91	7.56	8.29	12.97	27.50
	20	5.44	5.67	6.05	6.51	7.03	7.62	8.65	9.71	11.03	24.29	62.36
	25	6.16	6.48	6.99	7.60	8.31	9.16	10.76	12.61	15.33	45.68	119.83
900	15	4.94	5.10	5.39	5.74	6.14	6.56	7.28	7.94	8.70	13.39	27.51
	20	5.75	5.99	6.39	6.87	7.41	8.03	9.09	10.17	11.50	24.34	62.36
	25	6.52	6.86	7.38	8.02	8.76	9.63	11.26	13.11	15.74	45.68	119.83
1000	15	5.19	5.35	5.66	6.03	6.43	6.88	7.62	8.31	9.09	13.80	27.54
	20	6.05	6.30	6.72	7.21	7.78	8.41	9.51	10.62	11.96	24.42	62.36
	25	6.86	7.21	7.76	8.42	9.19	10.08	11.74	13.59	16.17	45.68	119.83

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	5.42	5.60	5.92	6.30	6.72	7.18	7.95	8.66	9.46	14.21	27.57
	20	6.33	6.59	7.03	7.54	8.13	8.78	9.92	11.04	12.41	24.54	62.36
	25	7.19	7.55	8.12	8.80	9.60	10.51	12.21	14.06	16.61	45.68	119.83
1200	15	5.65	5.83	6.16	6.56	7.00	7.48	8.27	9.00	9.82	14.62	27.63
	20	6.60	6.88	7.33	7.86	8.47	9.14	10.30	11.45	12.84	24.68	62.36
	25	7.50	7.88	8.47	9.17	9.99	10.93	12.65	14.52	17.04	45.68	119.83
1300	15	5.87	6.06	6.40	6.81	7.27	7.76	8.58	9.33	10.17	15.01	27.71
	20	6.87	7.15	7.61	8.17	8.79	9.49	10.68	11.85	13.25	24.86	62.36
	25	7.81	8.20	8.80	9.53	10.37	11.33	13.09	14.96	17.47	45.68	119.83
1400	15	6.08	6.28	6.63	7.06	7.53	8.03	8.87	9.65	10.51	15.40	27.81
	20	7.12	7.42	7.89	8.46	9.11	9.82	11.04	12.24	13.66	25.07	62.36
	25	8.10	8.51	9.13	9.88	10.74	11.72	13.50	15.40	17.89	45.68	119.83
1500	15	6.29	6.49	6.86	7.29	7.78	8.30	9.16	9.96	10.83	15.79	27.94
	20	7.37	7.67	8.17	8.75	9.41	10.14	11.39	12.61	14.05	25.30	62.36
	25	8.39	8.81	9.45	10.21	11.09	12.10	13.91	15.82	18.31	45.68	119.83
1600	15	6.49	6.70	7.08	7.52	8.02	8.56	9.44	10.25	11.15	16.16	28.09
	20	7.61	7.92	8.43	9.03	9.71	10.46	11.73	12.98	14.43	25.55	62.36
	25	8.67	9.10	9.75	10.54	11.44	12.47	14.31	16.23	18.72	45.69	119.83
1700	15	6.69	6.90	7.29	7.75	8.26	8.81	9.71	10.55	11.46	16.53	28.25
	20	7.85	8.17	8.69	9.30	10.00	10.76	12.07	13.33	14.81	25.81	62.36
	25	8.94	9.38	10.05	10.86	11.78	12.82	14.69	16.64	19.13	45.70	119.83
1800	15	6.88	7.10	7.50	7.97	8.49	9.05	9.98	10.83	11.76	16.89	28.44
	20	8.08	8.41	8.94	9.57	10.28	11.06	12.39	13.68	15.17	26.09	62.36
	25	9.20	9.65	10.34	11.17	12.11	13.17	15.07	17.03	19.53	45.72	119.83
1900	15	7.06	7.30	7.70	8.18	8.72	9.29	10.24	11.11	12.06	17.24	28.64
	20	8.30	8.64	9.18	9.83	10.56	11.36	12.71	14.01	15.53	26.38	62.36
	25	9.46	9.92	10.63	11.47	12.43	13.51	15.44	17.42	19.92	45.74	119.83
2000	15	7.25	7.48	7.90	8.39	8.94	9.53	10.49	11.38	12.35	17.59	28.86
	20	8.52	8.87	9.42	10.09	10.83	11.64	13.02	14.34	15.88	26.67	62.36
	25	9.72	10.19	10.91	11.76	12.74	13.85	15.80	17.80	20.31	45.77	119.83

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.89	4.30	5.03	6.37	8.97	12.90	21.43	31.59	45.29	154.07	409.72
	20	4.63	5.56	7.78	12.35	19.07	28.33	48.38	72.33	104.68	362.00	967.47
	25	5.49	7.73	13.54	22.69	35.75	53.77	92.82	139.51	202.60	704.80	1887.0
200	15	5.01	5.48	6.24	7.41	9.39	12.94	21.43	31.59	45.29	154.07	409.72
	20	6.00	6.94	8.72	12.46	19.07	28.33	48.38	72.33	104.68	362.00	967.47
	25	7.08	8.96	13.64	22.69	35.75	53.77	92.82	139.51	202.60	704.80	1887.0
300	15	5.92	6.43	7.24	8.40	10.17	13.19	21.43	31.59	45.29	154.07	409.72
	20	7.10	8.09	9.78	12.94	19.09	28.33	48.38	72.33	104.68	362.00	967.47
	25	8.36	10.19	14.14	22.69	35.75	53.77	92.82	139.51	202.60	704.80	1887.0
400	15	6.70	7.26	8.12	9.30	10.99	13.70	21.45	31.59	45.29	154.07	409.72
	20	8.05	9.09	10.78	13.66	19.22	28.33	48.38	72.33	104.68	362.00	967.47
	25	9.47	11.31	14.91	22.75	35.75	53.77	92.82	139.51	202.60	704.80	1887.0
500	15	7.40	8.00	8.90	10.12	11.79	14.33	21.53	31.59	45.29	154.07	409.72
	20	8.90	9.99	11.70	14.45	19.50	28.35	48.38	72.33	104.68	362.00	967.47
	25	10.47	12.34	15.75	22.92	35.75	53.77	92.82	139.51	202.60	704.80	1887.0
600	15	8.04	8.68	9.62	10.87	12.56	15.00	21.71	31.59	45.29	154.07	409.72
	20	9.69	10.82	12.56	15.24	19.93	28.39	48.38	72.33	104.68	362.00	967.47
	25	11.39	13.29	16.61	23.24	35.75	53.77	92.82	139.51	202.60	704.80	1887.0
700	15	8.64	9.31	10.30	11.58	13.28	15.67	21.99	31.61	45.29	154.07	409.72
	20	10.42	11.59	13.36	16.02	20.46	28.48	48.38	72.33	104.68	362.00	967.47
	25	12.24	14.18	17.46	23.68	35.78	53.77	92.82	139.51	202.60	704.80	1887.0
800	15	9.21	9.90	10.93	12.26	13.98	16.33	22.35	31.65	45.29	154.07	409.72
	20	11.11	12.31	14.13	16.78	21.04	28.65	48.38	72.33	104.68	362.00	967.47
	25	13.04	15.02	18.28	24.21	35.83	53.77	92.82	139.51	202.60	704.80	1887.0
900	15	9.75	10.47	11.53	12.89	14.64	16.98	22.77	31.73	45.29	154.07	409.72
	20	11.76	13.00	14.85	17.51	21.64	28.88	48.38	72.33	104.68	362.00	967.47
	25	13.80	15.82	19.08	24.79	35.92	53.77	92.82	139.51	202.60	704.80	1887.0
1000	15	10.26	11.01	12.11	13.50	15.27	17.62	23.23	31.85	45.30	154.07	409.72
	20	12.38	13.66	15.55	18.21	22.26	29.19	48.39	72.33	104.68	362.00	967.47
	25	14.53	16.58	19.85	25.40	36.07	53.77	92.82	139.51	202.60	704.80	1887.0

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	10.75	11.52	12.66	14.08	15.88	18.23	23.72	32.02	45.31	154.07	409.72
	20	12.98	14.29	16.22	18.90	22.89	29.54	48.40	72.33	104.68	362.00	967.47
	25	15.22	17.32	20.60	26.02	36.28	53.78	92.82	139.51	202.60	704.80	1887.0
1200	15	11.22	12.02	13.19	14.65	16.47	18.84	24.23	32.23	45.32	154.07	409.72
	20	13.55	14.90	16.86	19.56	23.51	29.95	48.42	72.33	104.68	362.00	967.47
	25	15.89	18.02	21.33	26.66	36.53	53.79	92.82	139.51	202.60	704.80	1887.0
1300	15	11.68	12.50	13.70	15.19	17.04	19.42	24.74	32.49	45.35	154.07	409.72
	20	14.11	15.48	17.48	20.20	24.12	30.38	48.45	72.33	104.68	362.00	967.47
	25	16.54	18.71	22.03	27.29	36.84	53.81	92.82	139.51	202.60	704.80	1887.0
1400	15	12.12	12.97	14.19	15.72	17.60	19.99	25.25	32.78	45.39	154.07	409.72
	20	14.65	16.05	18.08	20.83	24.73	30.84	48.49	72.33	104.68	362.00	967.47
	25	17.17	19.37	22.72	27.93	37.19	53.84	92.82	139.51	202.60	704.80	1887.0
1500	15	12.55	13.42	14.67	16.23	18.14	20.55	25.77	33.10	45.46	154.07	409.72
	20	15.17	16.60	18.67	21.44	25.33	31.32	48.56	72.33	104.68	362.00	967.47
	25	17.77	20.01	23.38	28.56	37.57	53.89	92.82	139.51	202.60	704.80	1887.0
1600	15	12.97	13.85	15.14	16.72	18.66	21.09	26.29	33.45	45.54	154.07	409.72
	20	15.67	17.13	19.23	22.03	25.92	31.81	48.65	72.34	104.68	362.00	967.47
	25	18.36	20.63	24.03	29.18	37.98	53.96	92.82	139.51	202.60	704.80	1887.0
1700	15	13.38	14.28	15.59	17.20	19.17	21.62	26.80	33.82	45.64	154.07	409.72
	20	16.17	17.65	19.79	22.61	26.50	32.30	48.76	72.34	104.68	362.00	967.47
	25	18.94	21.24	24.67	29.80	38.42	54.05	92.82	139.51	202.60	704.80	1887.0
1800	15	13.78	14.70	16.03	17.68	19.67	22.14	27.31	34.20	45.77	154.07	409.72
	20	16.65	18.16	20.33	23.18	27.07	32.81	48.89	72.34	104.68	362.00	967.47
	25	19.50	21.83	25.29	30.41	38.87	54.16	92.82	139.51	202.60	704.80	1887.0
1900	15	14.17	15.10	16.46	18.14	20.16	22.65	27.81	34.60	45.92	154.07	409.72
	20	17.12	18.66	20.85	23.74	27.63	33.31	49.05	72.35	104.68	362.00	967.47
	25	20.05	22.41	25.90	31.01	39.34	54.30	92.82	139.51	202.60	704.80	1887.0
2000	15	14.55	15.50	16.89	18.59	20.63	23.15	28.31	35.01	46.09	154.07	409.72
	20	17.58	19.14	21.37	24.28	28.19	33.82	49.24	72.36	104.68	362.00	967.47
	25	20.58	22.97	26.49	31.61	39.81	54.46	92.82	139.51	202.60	704.80	1887.0

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	10.22	22.66	43.71	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	19.87	51.17	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	37.01	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
200	15	12.23	22.68	43.71	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	20.24	51.17	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	37.01	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
300	15	14.07	22.93	43.71	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	21.41	51.17	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	37.05	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
400	15	15.71	23.58	43.72	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	22.90	51.17	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	37.28	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
500	15	17.20	24.49	43.72	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	24.43	51.18	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	37.82	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
600	15	18.58	25.51	43.76	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	25.93	51.20	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	38.65	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
700	15	19.87	26.58	43.84	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	27.38	51.27	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	39.67	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
800	15	21.08	27.65	44.00	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	28.78	51.42	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	40.80	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
900	15	22.24	28.72	44.26	75.19	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	30.13	51.67	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	41.99	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1000	15	23.34	29.76	44.61	75.20	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	31.42	52.01	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	43.21	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 38.0 Ft (RADIUS = 26.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	24.40	30.79	45.04	75.20	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	32.68	52.45	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	44.44	98.18	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1200	15	25.41	31.78	45.54	75.21	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	33.89	52.98	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	45.66	98.19	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1300	15	26.40	32.76	46.11	75.23	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	35.06	53.57	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	46.88	98.20	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1400	15	27.35	33.72	46.71	75.26	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	36.20	54.22	101.01	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	48.08	98.22	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1500	15	28.27	34.65	47.36	75.30	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	37.31	54.92	101.02	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	49.26	98.25	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1600	15	29.17	35.56	48.03	75.36	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	38.40	55.65	101.03	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	50.43	98.30	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1700	15	30.04	36.45	48.71	75.45	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	39.45	56.40	101.05	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	51.58	98.37	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1800	15	30.90	37.33	49.41	75.56	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	40.48	57.17	101.07	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	52.72	98.47	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
1900	15	31.73	38.18	50.12	75.70	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	41.49	57.96	101.11	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	53.83	98.59	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.
2000	15	32.54	39.02	50.83	75.87	120.18	182.31	317.03	478.16	695.99	2430.8	6515.7
	20	42.48	58.76	101.15	175.52	282.03	429.17	748.29	1130.1	1646.2	5757.7	15440.
	25	54.93	98.74	195.47	340.92	548.86	836.15	1459.3	2204.8	3212.8	11242.	30152.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.40	1.40	1.45	1.52	1.60	1.68	1.81	1.93	2.06	2.64	3.55
	20	1.51	1.52	1.58	1.66	1.75	1.86	2.02	2.17	2.34	3.26	5.65
	25	1.61	1.63	1.71	1.80	1.91	2.04	2.24	2.44	2.67	4.42	9.51
200	15	1.67	1.68	1.74	1.83	1.92	2.02	2.18	2.32	2.47	3.15	4.09
	20	1.83	1.85	1.93	2.03	2.15	2.27	2.47	2.65	2.84	3.84	5.82
	25	1.99	2.02	2.11	2.23	2.37	2.52	2.77	3.00	3.25	4.85	9.51
300	15	1.89	1.90	1.98	2.07	2.18	2.29	2.48	2.64	2.80	3.56	4.56
	20	2.10	2.12	2.22	2.33	2.46	2.60	2.83	3.03	3.25	4.32	6.19
	25	2.29	2.33	2.44	2.58	2.74	2.91	3.18	3.44	3.73	5.34	9.55
400	15	2.08	2.10	2.18	2.29	2.40	2.53	2.73	2.91	3.09	3.92	4.98
	20	2.33	2.36	2.46	2.59	2.73	2.89	3.14	3.36	3.60	4.75	6.60
	25	2.55	2.60	2.73	2.88	3.05	3.24	3.55	3.83	4.13	5.81	9.67
500	15	2.25	2.28	2.37	2.48	2.61	2.74	2.96	3.15	3.35	4.24	5.35
	20	2.53	2.57	2.68	2.82	2.98	3.15	3.42	3.66	3.91	5.14	7.01
	25	2.79	2.85	2.98	3.15	3.34	3.54	3.87	4.17	4.50	6.24	9.88
600	15	2.41	2.44	2.54	2.66	2.80	2.94	3.17	3.38	3.59	4.53	5.70
	20	2.72	2.77	2.89	3.04	3.21	3.38	3.67	3.93	4.20	5.50	7.41
	25	3.01	3.07	3.22	3.40	3.60	3.82	4.17	4.49	4.84	6.65	10.16
700	15	2.56	2.59	2.69	2.83	2.97	3.13	3.37	3.59	3.81	4.80	6.02
	20	2.90	2.95	3.08	3.24	3.42	3.61	3.91	4.18	4.47	5.83	7.78
	25	3.22	3.28	3.44	3.63	3.84	4.07	4.45	4.79	5.15	7.03	10.48
800	15	2.70	2.73	2.84	2.98	3.14	3.30	3.56	3.78	4.02	5.06	6.33
	20	3.07	3.12	3.26	3.43	3.61	3.82	4.14	4.42	4.73	6.14	8.14
	25	3.41	3.48	3.65	3.85	4.07	4.32	4.71	5.07	5.45	7.39	10.80
900	15	2.84	2.87	2.99	3.13	3.29	3.46	3.73	3.97	4.22	5.30	6.62
	20	3.23	3.28	3.43	3.61	3.80	4.01	4.35	4.65	4.97	6.44	8.48
	25	3.59	3.67	3.84	4.06	4.29	4.55	4.96	5.33	5.73	7.73	11.14
1000	15	2.96	3.00	3.12	3.27	3.44	3.62	3.90	4.15	4.40	5.54	6.90
	20	3.38	3.44	3.59	3.78	3.98	4.20	4.55	4.87	5.20	6.72	8.81
	25	3.77	3.85	4.03	4.25	4.50	4.77	5.20	5.58	6.00	8.06	11.47

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.09	3.13	3.25	3.41	3.58	3.77	4.06	4.32	4.59	5.76	7.16
	20	3.53	3.59	3.75	3.94	4.16	4.38	4.75	5.07	5.42	6.99	9.13
	25	3.94	4.02	4.21	4.44	4.70	4.98	5.42	5.82	6.25	8.37	11.80
1200	15	3.20	3.25	3.38	3.54	3.72	3.91	4.22	4.48	4.76	5.97	7.42
	20	3.67	3.73	3.90	4.10	4.32	4.56	4.94	5.27	5.63	7.25	9.44
	25	4.10	4.19	4.39	4.63	4.89	5.18	5.64	6.06	6.50	8.68	12.12
1300	15	3.32	3.36	3.50	3.67	3.86	4.05	4.37	4.64	4.93	6.18	7.67
	20	3.80	3.87	4.04	4.25	4.48	4.73	5.12	5.47	5.83	7.51	9.73
	25	4.25	4.35	4.55	4.80	5.08	5.38	5.85	6.28	6.74	8.97	12.44
1400	15	3.43	3.48	3.62	3.79	3.99	4.19	4.51	4.80	5.09	6.38	7.90
	20	3.94	4.01	4.19	4.40	4.64	4.89	5.30	5.65	6.03	7.75	10.02
	25	4.41	4.50	4.72	4.97	5.26	5.57	6.06	6.50	6.97	9.25	12.76
1500	15	3.54	3.59	3.73	3.91	4.11	4.32	4.66	4.95	5.25	6.57	8.14
	20	4.07	4.14	4.32	4.54	4.79	5.05	5.47	5.84	6.22	7.99	10.30
	25	4.55	4.66	4.87	5.14	5.43	5.75	6.26	6.71	7.19	9.53	13.07
1600	15	3.64	3.69	3.84	4.03	4.23	4.45	4.79	5.09	5.40	6.76	8.36
	20	4.19	4.27	4.46	4.68	4.94	5.21	5.63	6.01	6.41	8.22	10.57
	25	4.70	4.80	5.03	5.30	5.60	5.93	6.45	6.92	7.41	9.80	13.37
1700	15	3.74	3.80	3.95	4.14	4.35	4.58	4.93	5.24	5.55	6.95	8.58
	20	4.31	4.39	4.59	4.82	5.08	5.36	5.80	6.18	6.59	8.44	10.84
	25	4.84	4.95	5.18	5.46	5.77	6.10	6.64	7.11	7.62	10.06	13.66
1800	15	3.84	3.90	4.06	4.25	4.47	4.70	5.06	5.37	5.70	7.12	8.80
	20	4.43	4.52	4.71	4.95	5.22	5.50	5.95	6.35	6.77	8.66	11.10
	25	4.97	5.09	5.33	5.61	5.93	6.27	6.82	7.31	7.83	10.31	13.95
1900	15	3.94	4.00	4.16	4.36	4.58	4.82	5.19	5.51	5.84	7.30	9.00
	20	4.55	4.63	4.84	5.08	5.36	5.65	6.11	6.51	6.94	8.87	11.35
	25	5.11	5.22	5.47	5.76	6.09	6.44	7.00	7.50	8.03	10.56	14.24
2000	15	4.03	4.10	4.26	4.47	4.69	4.93	5.31	5.64	5.98	7.47	9.21
	20	4.66	4.75	4.96	5.21	5.49	5.79	6.26	6.68	7.11	9.08	11.60
	25	5.24	5.36	5.61	5.91	6.24	6.60	7.18	7.69	8.23	10.81	14.52

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.28	2.33	2.46	2.63	2.83	3.07	3.51	4.01	4.74	12.17	29.50
	20	2.54	2.63	2.83	3.09	3.42	3.85	4.88	6.41	8.68	26.37	67.07
	25	2.79	2.95	3.24	3.65	4.24	5.19	7.81	11.10	15.50	49.79	129.00
200	15	2.84	2.91	3.08	3.28	3.53	3.80	4.28	4.79	5.43	12.17	29.50
	20	3.22	3.35	3.58	3.89	4.25	4.70	5.62	6.81	8.75	26.37	67.07
	25	3.58	3.78	4.12	4.57	5.15	5.95	8.02	11.11	15.50	49.79	129.00
300	15	3.29	3.38	3.57	3.81	4.08	4.39	4.92	5.45	6.10	12.20	29.50
	20	3.76	3.91	4.19	4.53	4.93	5.41	6.33	7.43	9.09	26.37	67.07
	25	4.22	4.45	4.82	5.31	5.92	6.71	8.53	11.24	15.51	49.79	129.00
400	15	3.68	3.79	4.00	4.26	4.56	4.89	5.47	6.03	6.70	12.33	29.50
	20	4.24	4.41	4.71	5.08	5.52	6.03	6.98	8.05	9.58	26.37	67.07
	25	4.76	5.02	5.43	5.95	6.60	7.40	9.14	11.55	15.55	49.79	129.00
500	15	4.04	4.15	4.39	4.67	4.99	5.35	5.96	6.55	7.24	12.58	29.50
	20	4.66	4.85	5.18	5.58	6.04	6.58	7.57	8.64	10.11	26.37	67.07
	25	5.26	5.54	5.98	6.53	7.21	8.03	9.74	11.98	15.68	49.79	129.00
600	15	4.36	4.49	4.74	5.05	5.39	5.77	6.41	7.03	7.75	12.92	29.50
	20	5.05	5.26	5.61	6.03	6.53	7.09	8.12	9.20	10.64	26.37	67.07
	25	5.71	6.01	6.48	7.07	7.77	8.62	10.33	12.47	15.90	49.79	129.00
700	15	4.67	4.81	5.07	5.39	5.76	6.16	6.84	7.48	8.22	13.30	29.50
	20	5.42	5.64	6.01	6.46	6.98	7.57	8.63	9.73	11.16	26.38	67.07
	25	6.14	6.45	6.95	7.56	8.29	9.17	10.89	12.97	16.20	49.79	129.00
800	15	4.96	5.10	5.38	5.72	6.11	6.53	7.24	7.91	8.67	13.71	29.50
	20	5.77	6.00	6.39	6.86	7.40	8.02	9.11	10.24	11.67	26.39	67.07
	25	6.54	6.87	7.39	8.03	8.79	9.69	11.43	13.48	16.56	49.79	129.00
900	15	5.23	5.38	5.68	6.04	6.44	6.88	7.61	8.31	9.10	14.12	29.51
	20	6.09	6.34	6.74	7.24	7.80	8.44	9.57	10.72	12.15	26.42	67.07
	25	6.91	7.26	7.81	8.47	9.26	10.18	11.95	13.98	16.95	49.79	129.00
1000	15	5.49	5.65	5.96	6.33	6.75	7.21	7.97	8.69	9.50	14.54	29.52
	20	6.41	6.66	7.09	7.60	8.19	8.85	10.01	11.18	12.63	26.48	67.07
	25	7.28	7.64	8.21	8.90	9.71	10.66	12.44	14.47	17.36	49.79	129.00

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	5.74	5.91	6.23	6.62	7.05	7.53	8.32	9.06	9.89	14.95	29.55
	20	6.71	6.97	7.41	7.95	8.56	9.24	10.43	11.62	13.08	26.56	67.07
	25	7.62	8.00	8.59	9.30	10.14	11.11	12.92	14.95	17.79	49.79	129.00
1200	15	5.98	6.16	6.49	6.89	7.34	7.84	8.65	9.41	10.27	15.36	29.59
	20	7.00	7.27	7.73	8.28	8.91	9.61	10.83	12.05	13.53	26.67	67.07
	25	7.96	8.35	8.95	9.69	10.55	11.54	13.39	15.41	18.21	49.79	129.00
1300	15	6.21	6.40	6.74	7.16	7.62	8.13	8.97	9.75	10.63	15.76	29.65
	20	7.28	7.56	8.04	8.60	9.25	9.97	11.22	12.46	13.96	26.81	67.07
	25	8.28	8.68	9.31	10.07	10.95	11.97	13.84	15.87	18.64	49.79	129.00
1400	15	6.44	6.63	6.99	7.42	7.90	8.42	9.28	10.09	10.98	16.16	29.72
	20	7.55	7.84	8.33	8.92	9.58	10.32	11.60	12.86	14.37	26.98	67.07
	25	8.60	9.01	9.65	10.43	11.33	12.37	14.27	16.32	19.07	49.79	129.00
1500	15	6.66	6.86	7.22	7.67	8.16	8.70	9.58	10.41	11.32	16.55	29.83
	20	7.81	8.11	8.62	9.22	9.90	10.66	11.97	13.25	14.78	27.18	67.07
	25	8.90	9.32	9.99	10.78	11.71	12.77	14.70	16.76	19.49	49.79	129.00
1600	15	6.87	7.08	7.45	7.91	8.42	8.97	9.88	10.72	11.65	16.93	29.95
	20	8.07	8.38	8.90	9.51	10.21	10.99	12.33	13.63	15.18	27.40	67.07
	25	9.20	9.63	10.31	11.13	12.07	13.15	15.11	17.18	19.91	49.80	129.00
1700	15	7.08	7.29	7.68	8.15	8.67	9.23	10.16	11.02	11.97	17.31	30.09
	20	8.32	8.64	9.17	9.80	10.52	11.31	12.67	14.00	15.56	27.64	67.07
	25	9.48	9.93	10.63	11.46	12.43	13.53	15.51	17.60	20.32	49.80	129.00
1800	15	7.28	7.50	7.90	8.38	8.91	9.49	10.44	11.32	12.29	17.67	30.25
	20	8.56	8.89	9.43	10.08	10.81	11.63	13.01	14.36	15.94	27.89	67.07
	25	9.76	10.22	10.93	11.79	12.77	13.89	15.91	18.01	20.73	49.81	129.00
1900	15	7.48	7.70	8.11	8.60	9.15	9.74	10.71	11.61	12.59	18.04	30.43
	20	8.80	9.14	9.69	10.36	11.10	11.93	13.35	14.71	16.31	28.16	67.07
	25	10.04	10.51	11.23	12.11	13.11	14.25	16.29	18.41	21.13	49.82	129.00
2000	15	7.68	7.90	8.32	8.82	9.38	9.98	10.98	11.89	12.89	18.39	30.63
	20	9.03	9.38	9.94	10.62	11.39	12.23	13.67	15.06	16.68	28.44	67.07
	25	10.31	10.79	11.53	12.42	13.44	14.60	16.67	18.81	21.53	49.84	129.00

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	4.14	4.59	5.44	7.07	10.14	14.57	24.07	35.30	50.35	168.22	441.37
	20	4.96	6.07	8.85	14.18	21.80	32.23	54.58	81.08	116.62	395.49	1042.4
	25	5.95	8.80	15.73	26.22	41.04	61.33	104.89	156.54	225.88	770.17	2033.4
200	15	5.33	5.84	6.69	8.03	10.42	14.59	24.07	35.30	50.35	168.22	441.37
	20	6.42	7.49	9.63	14.23	21.81	32.23	54.58	81.08	116.62	395.49	1042.4
	25	7.63	9.90	15.77	26.22	41.04	61.33	104.89	156.54	225.88	770.17	2033.4
300	15	6.29	6.85	7.74	9.04	11.11	14.74	24.07	35.30	50.35	168.22	441.37
	20	7.58	8.70	10.67	14.55	21.81	32.23	54.58	81.08	116.62	395.49	1042.4
	25	8.99	11.14	16.08	26.22	41.04	61.33	104.89	156.54	225.88	770.17	2033.4
400	15	7.12	7.72	8.66	9.97	11.92	15.13	24.08	35.30	50.35	168.22	441.37
	20	8.60	9.75	11.69	15.16	21.87	32.23	54.58	81.08	116.62	395.49	1042.4
	25	10.17	12.29	16.70	26.24	41.04	61.33	104.89	156.54	225.88	770.17	2033.4
500	15	7.87	8.51	9.49	10.82	12.72	15.69	24.12	35.30	50.35	168.22	441.37
	20	9.51	10.70	12.64	15.89	22.04	32.23	54.58	81.08	116.62	395.49	1042.4
	25	11.23	13.37	17.48	26.32	41.04	61.33	104.89	156.54	225.88	770.17	2033.4
600	15	8.55	9.23	10.25	11.62	13.50	16.32	24.22	35.30	50.35	168.22	441.37
	20	10.34	11.58	13.54	16.67	22.35	32.25	54.58	81.08	116.62	395.49	1042.4
	25	12.20	14.36	18.31	26.51	41.05	61.33	104.89	156.54	225.88	770.17	2033.4
700	15	9.19	9.90	10.96	12.36	14.25	16.98	24.41	35.31	50.35	168.22	441.37
	20	11.12	12.40	14.38	17.44	22.77	32.29	54.58	81.08	116.62	395.49	1042.4
	25	13.11	15.30	19.15	26.81	41.05	61.33	104.89	156.54	225.88	770.17	2033.4
800	15	9.79	10.53	11.63	13.07	14.97	17.64	24.69	35.33	50.35	168.22	441.37
	20	11.85	13.17	15.18	18.21	23.28	32.38	54.58	81.08	116.62	395.49	1042.4
	25	13.96	16.19	19.98	27.22	41.07	61.33	104.89	156.54	225.88	770.17	2033.4
900	15	10.36	11.13	12.27	13.74	15.65	18.29	25.04	35.37	50.35	168.22	441.37
	20	12.54	13.90	15.94	18.95	23.84	32.53	54.58	81.08	116.62	395.49	1042.4
	25	14.77	17.03	20.79	27.71	41.11	61.33	104.89	156.54	225.88	770.17	2033.4
1000	15	10.91	11.70	12.87	14.37	16.31	18.94	25.44	35.44	50.36	168.22	441.37
	20	13.21	14.59	16.68	19.68	24.42	32.73	54.59	81.08	116.62	395.49	1042.4
	25	15.54	17.84	21.59	28.25	41.19	61.33	104.89	156.54	225.88	770.17	2033.4

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	11.43	12.25	13.45	14.99	16.95	19.57	25.89	35.54	50.36	168.22	441.37
	20	13.84	15.26	17.38	20.39	25.02	33.00	54.59	81.08	116.62	395.49	1042.4
	25	16.28	18.62	22.36	28.83	41.30	61.33	104.89	156.54	225.88	770.17	2033.4
1200	15	11.93	12.77	14.01	15.58	17.57	20.18	26.36	35.69	50.37	168.22	441.37
	20	14.45	15.91	18.05	21.07	25.63	33.32	54.60	81.08	116.62	395.49	1042.4
	25	17.00	19.36	23.11	29.43	41.46	61.34	104.89	156.54	225.88	770.17	2033.4
1300	15	12.42	13.28	14.55	16.15	18.16	20.79	26.84	35.88	50.38	168.22	441.37
	20	15.04	16.53	18.71	21.74	26.24	33.69	54.61	81.08	116.62	395.49	1042.4
	25	17.68	20.08	23.85	30.04	41.67	61.34	104.89	156.54	225.88	770.17	2033.4
1400	15	12.89	13.77	15.07	16.70	18.74	21.38	27.34	36.11	50.40	168.22	441.37
	20	15.61	17.13	19.34	22.39	26.85	34.09	54.63	81.08	116.62	395.49	1042.4
	25	18.35	20.78	24.56	30.67	41.92	61.36	104.89	156.54	225.88	770.17	2033.4
1500	15	13.35	14.25	15.58	17.24	19.31	21.95	27.85	36.37	50.43	168.22	441.37
	20	16.17	17.71	19.96	23.03	27.46	34.51	54.66	81.08	116.62	395.49	1042.4
	25	19.00	21.46	25.26	31.29	42.21	61.38	104.89	156.54	225.88	770.17	2033.4
1600	15	13.79	14.72	16.07	17.76	19.86	22.51	28.36	36.66	50.48	168.22	441.37
	20	16.70	18.28	20.56	23.65	28.06	34.96	54.71	81.08	116.62	395.49	1042.4
	25	19.62	22.12	25.94	31.91	42.54	61.41	104.89	156.54	225.88	770.17	2033.4
1700	15	14.22	15.17	16.55	18.27	20.39	23.06	28.87	36.98	50.54	168.22	441.37
	20	17.23	18.83	21.14	24.26	28.65	35.42	54.77	81.08	116.62	395.49	1042.4
	25	20.23	22.77	26.60	32.53	42.90	61.45	104.89	156.54	225.88	770.17	2033.4
1800	15	14.65	15.61	17.02	18.77	20.91	23.60	29.37	37.32	50.62	168.22	441.37
	20	17.74	19.36	21.71	24.85	29.23	35.90	54.85	81.08	116.62	395.49	1042.4
	25	20.83	23.39	27.25	33.15	43.29	61.51	104.89	156.54	225.88	770.17	2033.4
1900	15	15.06	16.04	17.47	19.25	21.42	24.13	29.88	37.68	50.72	168.22	441.37
	20	18.24	19.89	22.27	25.43	29.81	36.38	54.95	81.08	116.62	395.49	1042.4
	25	21.41	24.01	27.89	33.76	43.70	61.58	104.89	156.54	225.88	770.17	2033.4
2000	15	15.46	16.46	17.92	19.73	21.92	24.65	30.38	38.05	50.84	168.22	441.37
	20	18.73	20.40	22.81	26.00	30.38	36.87	55.07	81.08	116.62	395.49	1042.4
	25	21.98	24.60	28.52	34.36	44.13	61.67	104.89	156.54	225.88	770.17	2033.4

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	11.61	26.71	51.17	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	23.69	60.66	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	44.40	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
200	15	13.51	26.71	51.17	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	23.84	60.66	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	44.40	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
300	15	15.40	26.81	51.17	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	24.63	60.66	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	44.40	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
400	15	17.12	27.20	51.17	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	25.92	60.66	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	44.47	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
500	15	18.69	27.88	51.17	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	27.37	60.66	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	44.72	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
600	15	20.15	28.77	51.18	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	28.86	60.67	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	45.22	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
700	15	21.51	29.75	51.21	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	30.33	60.69	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	45.96	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
800	15	22.80	30.78	51.27	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	31.76	60.74	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	46.87	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
900	15	24.03	31.83	51.39	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	33.15	60.84	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	47.90	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1000	15	25.20	32.87	51.58	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	34.50	61.00	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	49.00	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 40.0 Ft (RADIUS = 28.3 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	26.32	33.90	51.85	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	35.81	61.25	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	50.16	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1200	15	27.40	34.92	52.19	87.29	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	37.08	61.57	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	51.33	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1300	15	28.44	35.92	52.61	87.30	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	38.31	61.97	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	52.52	116.64	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1400	15	29.46	36.91	53.08	87.30	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	39.51	62.45	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	53.71	116.65	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1500	15	30.44	37.87	53.60	87.32	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	40.68	62.98	118.58	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	54.90	116.65	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1600	15	31.39	38.82	54.17	87.34	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	41.82	63.57	118.59	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	56.08	116.67	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1700	15	32.32	39.75	54.77	87.37	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	42.93	64.20	118.59	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	57.25	116.69	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1800	15	33.23	40.66	55.40	87.42	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	44.02	64.87	118.60	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	58.41	116.71	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
1900	15	34.11	41.55	56.05	87.48	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	45.09	65.57	118.60	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	59.55	116.76	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.
2000	15	34.98	42.43	56.71	87.56	138.39	208.35	358.65	536.95	776.39	2656.6	7021.5
	20	46.14	66.29	118.62	204.10	325.10	490.81	846.89	1269.3	1836.7	6292.9	16639.
	25	60.68	116.81	229.73	396.67	632.92	956.48	1651.8	2476.8	3584.8	12288.	32494.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.47	1.46	1.51	1.58	1.66	1.74	1.88	2.00	2.12	2.72	3.68
	20	1.58	1.59	1.65	1.73	1.82	1.93	2.10	2.25	2.42	3.39	5.97
	25	1.69	1.71	1.78	1.88	1.99	2.12	2.33	2.54	2.78	4.70	10.14
200	15	1.75	1.76	1.82	1.90	1.99	2.10	2.26	2.40	2.55	3.25	4.22
	20	1.93	1.94	2.02	2.12	2.24	2.36	2.56	2.75	2.95	3.98	6.11
	25	2.09	2.12	2.21	2.33	2.47	2.63	2.88	3.12	3.38	5.09	10.14
300	15	1.99	1.99	2.07	2.16	2.27	2.38	2.57	2.73	2.90	3.67	4.70
	20	2.21	2.23	2.32	2.43	2.56	2.71	2.94	3.14	3.37	4.48	6.47
	25	2.41	2.45	2.56	2.70	2.86	3.03	3.32	3.58	3.87	5.58	10.16
400	15	2.19	2.20	2.28	2.39	2.50	2.63	2.83	3.01	3.20	4.04	5.13
	20	2.45	2.48	2.58	2.71	2.85	3.01	3.26	3.49	3.73	4.92	6.88
	25	2.69	2.74	2.86	3.01	3.19	3.38	3.69	3.98	4.30	6.06	10.25
500	15	2.37	2.39	2.47	2.59	2.72	2.85	3.07	3.26	3.47	4.37	5.52
	20	2.67	2.70	2.81	2.95	3.11	3.28	3.55	3.80	4.06	5.32	7.29
	25	2.94	2.99	3.13	3.30	3.49	3.69	4.03	4.34	4.68	6.50	10.44
600	15	2.54	2.56	2.65	2.78	2.91	3.06	3.29	3.50	3.71	4.67	5.87
	20	2.87	2.91	3.02	3.18	3.34	3.53	3.82	4.08	4.36	5.69	7.69
	25	3.17	3.23	3.38	3.56	3.76	3.98	4.34	4.67	5.03	6.91	10.70
700	15	2.70	2.72	2.82	2.95	3.10	3.25	3.50	3.72	3.94	4.95	6.21
	20	3.06	3.10	3.23	3.39	3.56	3.76	4.07	4.34	4.64	6.03	8.07
	25	3.39	3.45	3.61	3.80	4.02	4.25	4.63	4.98	5.36	7.31	11.00
800	15	2.85	2.87	2.98	3.11	3.27	3.43	3.69	3.92	4.16	5.22	6.52
	20	3.23	3.28	3.41	3.58	3.77	3.98	4.30	4.59	4.90	6.36	8.43
	25	3.59	3.66	3.83	4.03	4.26	4.50	4.91	5.27	5.67	7.68	11.32
900	15	2.99	3.01	3.13	3.27	3.43	3.60	3.88	4.12	4.36	5.47	6.82
	20	3.40	3.45	3.59	3.77	3.97	4.18	4.53	4.83	5.15	6.66	8.79
	25	3.79	3.86	4.03	4.25	4.49	4.75	5.17	5.55	5.96	8.03	11.65
1000	15	3.12	3.15	3.27	3.42	3.59	3.77	4.05	4.30	4.56	5.71	7.11
	20	3.56	3.62	3.76	3.95	4.16	4.38	4.74	5.05	5.39	6.96	9.12
	25	3.97	4.05	4.23	4.45	4.70	4.98	5.41	5.81	6.24	8.37	11.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.25	3.28	3.41	3.56	3.74	3.92	4.22	4.48	4.75	5.94	7.38
	20	3.72	3.77	3.93	4.12	4.34	4.57	4.94	5.27	5.62	7.24	9.45
	25	4.15	4.23	4.42	4.65	4.91	5.20	5.65	6.06	6.50	8.69	12.31
1200	15	3.38	3.41	3.54	3.70	3.88	4.08	4.38	4.65	4.93	6.16	7.64
	20	3.87	3.93	4.09	4.29	4.51	4.75	5.14	5.48	5.84	7.51	9.76
	25	4.32	4.41	4.60	4.85	5.12	5.41	5.88	6.30	6.76	9.01	12.64
1300	15	3.50	3.53	3.67	3.83	4.02	4.22	4.54	4.82	5.10	6.38	7.90
	20	4.01	4.07	4.24	4.45	4.68	4.93	5.33	5.68	6.05	7.77	10.07
	25	4.49	4.58	4.78	5.03	5.31	5.61	6.10	6.54	7.01	9.31	12.96
1400	15	3.61	3.65	3.79	3.96	4.16	4.36	4.69	4.98	5.27	6.58	8.14
	20	4.15	4.22	4.39	4.60	4.84	5.10	5.51	5.87	6.26	8.02	10.37
	25	4.65	4.74	4.95	5.21	5.50	5.81	6.31	6.76	7.25	9.60	13.28
1500	15	3.73	3.77	3.91	4.09	4.29	4.50	4.84	5.13	5.44	6.78	8.38
	20	4.29	4.35	4.53	4.76	5.00	5.27	5.69	6.06	6.46	8.26	10.65
	25	4.80	4.90	5.12	5.39	5.68	6.00	6.52	6.98	7.48	9.89	13.60
1600	15	3.84	3.88	4.03	4.21	4.42	4.64	4.98	5.28	5.60	6.98	8.61
	20	4.42	4.49	4.67	4.90	5.16	5.43	5.86	6.25	6.65	8.50	10.93
	25	4.96	5.05	5.28	5.55	5.86	6.19	6.72	7.20	7.70	10.17	13.90
1700	15	3.94	3.99	4.14	4.33	4.54	4.77	5.12	5.43	5.75	7.17	8.84
	20	4.55	4.62	4.81	5.05	5.31	5.59	6.03	6.43	6.84	8.73	11.21
	25	5.10	5.21	5.44	5.72	6.03	6.37	6.92	7.40	7.93	10.44	14.20
1800	15	4.05	4.10	4.25	4.45	4.66	4.89	5.26	5.58	5.91	7.35	9.06
	20	4.67	4.75	4.94	5.19	5.45	5.74	6.20	6.60	7.02	8.96	11.47
	25	5.25	5.35	5.59	5.88	6.20	6.55	7.11	7.61	8.14	10.70	14.50
1900	15	4.15	4.20	4.36	4.56	4.78	5.02	5.39	5.72	6.05	7.53	9.27
	20	4.80	4.87	5.07	5.32	5.60	5.89	6.36	6.77	7.20	9.18	11.74
	25	5.39	5.50	5.74	6.04	6.37	6.72	7.29	7.81	8.35	10.96	14.79
2000	15	4.25	4.31	4.47	4.67	4.90	5.14	5.52	5.85	6.20	7.71	9.49
	20	4.92	5.00	5.20	5.46	5.74	6.04	6.51	6.94	7.38	9.40	11.99
	25	5.53	5.64	5.89	6.19	6.53	6.89	7.48	8.00	8.55	11.21	15.08

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.40	2.44	2.58	2.75	2.96	3.21	3.69	4.24	5.06	13.14	31.62
	20	2.68	2.78	2.98	3.25	3.61	4.09	5.27	7.02	9.51	28.63	72.04
	25	2.95	3.12	3.44	3.88	4.56	5.68	8.67	12.29	17.11	54.18	138.70
200	15	2.99	3.06	3.23	3.44	3.69	3.98	4.49	5.03	5.73	13.14	31.62
	20	3.40	3.53	3.77	4.09	4.48	4.97	5.98	7.34	9.56	28.63	72.04
	25	3.79	4.00	4.36	4.84	5.48	6.39	8.80	12.30	17.11	54.18	138.70
300	15	3.47	3.56	3.75	3.99	4.27	4.59	5.15	5.71	6.41	13.16	31.62
	20	3.97	4.13	4.41	4.76	5.19	5.70	6.71	7.92	9.82	28.63	72.04
	25	4.46	4.70	5.10	5.62	6.28	7.15	9.24	12.37	17.11	54.18	138.70
400	15	3.89	3.99	4.20	4.47	4.78	5.12	5.72	6.31	7.02	13.25	31.62
	20	4.48	4.65	4.96	5.35	5.80	6.35	7.37	8.55	10.26	28.63	72.04
	25	5.04	5.31	5.74	6.30	6.98	7.86	9.82	12.61	17.13	54.18	138.70
500	15	4.26	4.37	4.61	4.90	5.23	5.60	6.24	6.85	7.59	13.45	31.62
	20	4.93	5.12	5.45	5.87	6.36	6.93	7.98	9.15	10.78	28.63	72.04
	25	5.56	5.85	6.32	6.90	7.62	8.52	10.42	12.98	17.21	54.18	138.70
600	15	4.61	4.73	4.98	5.29	5.65	6.04	6.71	7.36	8.11	13.75	31.62
	20	5.34	5.55	5.91	6.35	6.86	7.46	8.55	9.72	11.30	28.63	72.04
	25	6.05	6.35	6.85	7.46	8.21	9.13	11.01	13.43	17.37	54.18	138.70
700	15	4.93	5.06	5.33	5.66	6.03	6.45	7.15	7.82	8.60	14.11	31.62
	20	5.73	5.95	6.33	6.80	7.34	7.96	9.08	10.27	11.83	28.64	72.04
	25	6.49	6.82	7.34	7.99	8.76	9.70	11.58	13.92	17.62	54.18	138.70
800	15	5.23	5.37	5.66	6.00	6.40	6.83	7.57	8.26	9.07	14.50	31.62
	20	6.10	6.33	6.73	7.22	7.78	8.43	9.58	10.79	12.34	28.64	72.04
	25	6.92	7.26	7.80	8.48	9.28	10.24	12.14	14.41	17.93	54.18	138.70
900	15	5.52	5.67	5.97	6.33	6.74	7.20	7.96	8.68	9.51	14.91	31.62
	20	6.44	6.69	7.10	7.62	8.20	8.87	10.06	11.29	12.84	28.66	72.04
	25	7.32	7.68	8.24	8.94	9.77	10.76	12.67	14.91	18.28	54.18	138.70
1000	15	5.80	5.95	6.26	6.65	7.07	7.55	8.34	9.08	9.93	15.32	31.63
	20	6.77	7.03	7.46	8.00	8.61	9.30	10.52	11.76	13.32	28.69	72.04
	25	7.70	8.07	8.66	9.39	10.24	11.25	13.18	15.41	18.67	54.18	138.70

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	6.06	6.23	6.55	6.95	7.39	7.88	8.70	9.46	10.33	15.73	31.64
	20	7.09	7.36	7.81	8.36	8.99	9.70	10.96	12.22	13.79	28.75	72.04
	25	8.07	8.45	9.07	9.81	10.69	11.72	13.68	15.89	19.07	54.18	138.70
1200	15	6.32	6.49	6.82	7.23	7.69	8.20	9.04	9.83	10.72	16.14	31.67
	20	7.40	7.67	8.14	8.71	9.36	10.10	11.38	12.67	14.25	28.83	72.04
	25	8.42	8.82	9.45	10.22	11.12	12.18	14.16	16.37	19.49	54.18	138.70
1300	15	6.56	6.74	7.09	7.51	7.99	8.51	9.38	10.19	11.10	16.55	31.71
	20	7.69	7.98	8.46	9.05	9.72	10.47	11.78	13.10	14.69	28.94	72.04
	25	8.77	9.18	9.83	10.62	11.54	12.62	14.62	16.84	19.91	54.18	138.70
1400	15	6.80	6.99	7.35	7.78	8.27	8.81	9.70	10.53	11.46	16.95	31.77
	20	7.98	8.27	8.77	9.38	10.07	10.84	12.18	13.51	15.12	29.07	72.04
	25	9.10	9.52	10.19	11.00	11.95	13.05	15.08	17.30	20.33	54.18	138.70
1500	15	7.03	7.22	7.59	8.04	8.55	9.10	10.02	10.87	11.82	17.35	31.85
	20	8.26	8.56	9.08	9.70	10.40	11.19	12.56	13.92	15.54	29.23	72.04
	25	9.42	9.85	10.54	11.37	12.34	13.46	15.52	17.75	20.76	54.18	138.70
1600	15	7.26	7.46	7.84	8.30	8.82	9.38	10.32	11.19	12.16	17.74	31.94
	20	8.53	8.84	9.37	10.01	10.73	11.54	12.94	14.31	15.95	29.42	72.04
	25	9.73	10.18	10.88	11.73	12.72	13.86	15.95	18.19	21.18	54.18	138.70
1700	15	7.48	7.68	8.07	8.55	9.08	9.66	10.62	11.51	12.50	18.12	32.06
	20	8.80	9.11	9.66	10.31	11.05	11.88	13.30	14.69	16.35	29.63	72.04
	25	10.04	10.49	11.21	12.08	13.09	14.25	16.37	18.62	21.59	54.18	138.70
1800	15	7.69	7.90	8.30	8.79	9.33	9.93	10.91	11.82	12.82	18.50	32.20
	20	9.05	9.38	9.93	10.60	11.36	12.20	13.65	15.07	16.75	29.85	72.04
	25	10.34	10.80	11.54	12.43	13.46	14.64	16.77	19.04	22.01	54.19	138.70
1900	15	7.90	8.12	8.53	9.03	9.58	10.19	11.19	12.12	13.14	18.87	32.35
	20	9.31	9.64	10.21	10.89	11.66	12.52	14.00	15.43	17.13	30.10	72.04
	25	10.63	11.10	11.85	12.76	13.81	15.01	17.17	19.45	22.42	54.19	138.70
2000	15	8.11	8.33	8.75	9.26	9.83	10.45	11.47	12.41	13.45	19.23	32.53
	20	9.55	9.89	10.47	11.17	11.96	12.84	14.34	15.79	17.50	30.35	72.04
	25	10.91	11.40	12.16	13.09	14.16	15.38	17.57	19.86	22.82	54.20	138.70

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	4.39	4.90	5.89	7.88	11.44	16.41	26.96	39.34	55.84	183.33	474.83
	20	5.30	6.63	10.10	16.22	24.84	36.52	61.38	90.60	129.57	431.25	1121.7
	25	6.43	10.07	18.19	30.16	46.92	69.68	118.12	175.10	251.14	839.99	2188.1
200	15	5.66	6.22	7.17	8.74	11.61	16.42	26.96	39.34	55.84	183.33	474.83
	20	6.85	8.09	10.69	16.24	24.84	36.52	61.38	90.60	129.57	431.25	1121.7
	25	8.20	10.98	18.20	30.16	46.92	69.68	118.12	175.10	251.14	839.99	2188.1
300	15	6.68	7.29	8.27	9.74	12.18	16.50	26.96	39.34	55.84	183.33	474.83
	20	8.09	9.35	11.67	16.43	24.84	36.52	61.38	90.60	129.57	431.25	1121.7
	25	9.64	12.19	18.36	30.16	46.92	69.68	118.12	175.10	251.14	839.99	2188.1
400	15	7.56	8.21	9.23	10.70	12.94	16.77	26.96	39.34	55.84	183.33	474.83
	20	9.16	10.46	12.69	16.89	24.86	36.52	61.38	90.60	129.57	431.25	1121.7
	25	10.89	13.37	18.81	30.17	46.92	69.68	118.12	175.10	251.14	839.99	2188.1
500	15	8.35	9.04	10.10	11.58	13.74	17.23	26.98	39.34	55.84	183.33	474.83
	20	10.13	11.46	13.67	17.54	24.95	36.52	61.38	90.60	129.57	431.25	1121.7
	25	12.02	14.48	19.48	30.20	46.92	69.68	118.12	175.10	251.14	839.99	2188.1
600	15	9.07	9.80	10.90	12.41	14.53	17.81	27.03	39.34	55.84	183.33	474.83
	20	11.01	12.38	14.59	18.27	25.14	36.53	61.38	90.60	129.57	431.25	1121.7
	25	13.05	15.52	20.25	30.29	46.92	69.68	118.12	175.10	251.14	839.99	2188.1
700	15	9.75	10.51	11.65	13.18	15.29	18.43	27.15	39.35	55.84	183.33	474.83
	20	11.84	13.25	15.47	19.03	25.46	36.55	61.38	90.60	129.57	431.25	1121.7
	25	14.01	16.50	21.06	30.47	46.93	69.68	118.12	175.10	251.14	839.99	2188.1
800	15	10.39	11.17	12.36	13.92	16.03	19.08	27.34	39.35	55.84	183.33	474.83
	20	12.61	14.06	16.31	19.79	25.86	36.59	61.38	90.60	129.57	431.25	1121.7
	25	14.92	17.43	21.88	30.75	46.93	69.68	118.12	175.10	251.14	839.99	2188.1
900	15	10.99	11.81	13.03	14.62	16.74	19.73	27.61	39.37	55.84	183.33	474.83
	20	13.35	14.83	17.10	20.54	26.35	36.67	61.38	90.60	129.57	431.25	1121.7
	25	15.78	18.32	22.69	31.13	46.95	69.68	118.12	175.10	251.14	839.99	2188.1
1000	15	11.57	12.41	13.66	15.29	17.42	20.37	27.94	39.41	55.84	183.33	474.83
	20	14.05	15.57	17.87	21.28	26.88	36.79	61.38	90.60	129.57	431.25	1121.7
	25	16.60	19.17	23.50	31.57	46.98	69.68	118.12	175.10	251.14	839.99	2188.1

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	12.12	12.99	14.28	15.93	18.08	21.01	28.33	39.47	55.84	183.33	474.83
	20	14.72	16.27	18.60	22.00	27.44	36.97	61.38	90.60	129.57	431.25	1121.7
	25	17.38	19.99	24.29	32.07	47.03	69.68	118.12	175.10	251.14	839.99	2188.1
1200	15	12.66	13.55	14.86	16.55	18.72	21.64	28.75	39.56	55.85	183.33	474.83
	20	15.37	16.95	19.32	22.71	28.02	37.20	61.38	90.60	129.57	431.25	1121.7
	25	18.14	20.77	25.06	32.61	47.12	69.68	118.12	175.10	251.14	839.99	2188.1
1300	15	13.17	14.08	15.43	17.15	19.35	22.26	29.20	39.69	55.85	183.33	474.83
	20	16.00	17.61	20.00	23.40	28.61	37.48	61.39	90.60	129.57	431.25	1121.7
	25	18.87	21.54	25.82	33.18	47.24	69.68	118.12	175.10	251.14	839.99	2188.1
1400	15	13.67	14.60	15.98	17.73	19.95	22.86	29.67	39.85	55.86	183.33	474.83
	20	16.60	18.24	20.67	24.08	29.21	37.80	61.39	90.60	129.57	431.25	1121.7
	25	19.57	22.27	26.56	33.77	47.40	69.69	118.12	175.10	251.14	839.99	2188.1
1500	15	14.15	15.11	16.52	18.30	20.54	23.45	30.15	40.04	55.88	183.33	474.83
	20	17.19	18.86	21.32	24.74	29.81	38.16	61.41	90.60	129.57	431.25	1121.7
	25	20.26	22.99	27.28	34.36	47.59	69.69	118.12	175.10	251.14	839.99	2188.1
1600	15	14.62	15.60	17.03	18.84	21.11	24.03	30.64	40.27	55.90	183.33	474.83
	20	17.76	19.46	21.95	25.38	30.41	38.55	61.43	90.60	129.57	431.25	1121.7
	25	20.92	23.69	27.99	34.97	47.83	69.71	118.12	175.10	251.14	839.99	2188.1
1700	15	15.08	16.08	17.54	19.38	21.67	24.60	31.14	40.53	55.93	183.33	474.83
	20	18.32	20.04	22.56	26.01	31.00	38.96	61.46	90.60	129.57	431.25	1121.7
	25	21.57	24.36	28.68	35.58	48.10	69.72	118.12	175.10	251.14	839.99	2188.1
1800	15	15.53	16.54	18.03	19.90	22.21	25.16	31.64	40.82	55.98	183.33	474.83
	20	18.86	20.61	23.16	26.63	31.59	39.39	61.50	90.60	129.57	431.25	1121.7
	25	22.20	25.03	29.36	36.19	48.41	69.75	118.12	175.10	251.14	839.99	2188.1
1900	15	15.97	17.00	18.51	20.41	22.75	25.71	32.14	41.13	56.04	183.33	474.83
	20	19.39	21.16	23.74	27.23	32.18	39.84	61.55	90.60	129.57	431.25	1121.7
	25	22.82	25.67	30.02	36.80	48.74	69.78	118.12	175.10	251.14	839.99	2188.1
2000	15	16.40	17.44	18.99	20.91	23.27	26.24	32.64	41.46	56.12	183.33	474.83
	20	19.91	21.71	24.32	27.83	32.75	40.30	61.62	90.60	129.57	431.25	1121.7
	25	23.43	26.31	30.68	37.41	49.10	69.83	118.12	175.10	251.14	839.99	2188.1

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	13.29	31.30	59.56	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	28.07	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	52.86	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
200	15	14.98	31.30	59.56	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	28.11	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	52.86	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
300	15	16.88	31.33	59.56	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	28.55	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	52.86	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
400	15	18.66	31.51	59.56	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	29.53	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	52.88	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
500	15	20.30	31.96	59.56	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	30.82	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	52.96	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
600	15	21.83	32.63	59.56	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	32.23	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	53.20	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
700	15	23.27	33.47	59.57	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	33.68	71.44	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	53.62	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
800	15	24.63	34.41	59.59	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	35.11	71.46	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	54.25	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
900	15	25.92	35.40	59.63	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	36.53	71.49	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	55.03	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1000	15	27.16	36.41	59.72	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	37.91	71.55	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	55.94	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 42.0 Ft (RADIUS = 29.7 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	28.35	37.43	59.86	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	39.26	71.65	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	56.95	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1200	15	29.49	38.44	60.05	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	40.57	71.81	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	58.01	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1300	15	30.60	39.45	60.31	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	41.86	72.04	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	59.12	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1400	15	31.67	40.45	60.63	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	43.11	72.32	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	60.25	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1500	15	32.71	41.43	61.01	100.81	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	44.33	72.67	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	61.40	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1600	15	33.72	42.41	61.44	100.82	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	45.53	73.08	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	62.55	137.62	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1700	15	34.71	43.36	61.91	100.83	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	46.70	73.55	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	63.71	137.63	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1800	15	35.67	44.30	62.43	100.85	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	47.84	74.07	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	64.86	137.63	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
1900	15	36.61	45.23	62.98	100.87	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	48.96	74.63	138.38	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	66.01	137.64	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.
2000	15	37.53	46.14	63.56	100.90	158.61	237.10	404.27	601.01	863.58	2897.8	7556.2
	20	50.06	75.23	138.39	236.05	372.94	558.88	954.93	1421.1	2043.3	6864.5	17906.
	25	67.15	137.66	268.32	459.03	726.30	1089.4	1862.8	2773.1	3988.3	13404.	34969.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.54	1.53	1.57	1.64	1.72	1.80	1.94	2.06	2.19	2.80	3.82
	20	1.66	1.66	1.72	1.80	1.90	2.00	2.17	2.33	2.50	3.53	6.32
	25	1.78	1.79	1.86	1.96	2.08	2.21	2.43	2.64	2.89	5.00	10.80
200	15	1.84	1.84	1.90	1.98	2.07	2.17	2.34	2.48	2.64	3.35	4.36
	20	2.02	2.03	2.11	2.21	2.33	2.45	2.66	2.85	3.05	4.13	6.43
	25	2.20	2.22	2.31	2.44	2.58	2.73	2.99	3.24	3.52	5.35	10.80
300	15	2.08	2.09	2.16	2.25	2.36	2.47	2.66	2.82	2.99	3.78	4.85
	20	2.32	2.33	2.42	2.54	2.67	2.81	3.05	3.26	3.49	4.64	6.76
	25	2.54	2.57	2.68	2.82	2.98	3.15	3.45	3.72	4.03	5.83	10.81
400	15	2.30	2.30	2.38	2.48	2.60	2.73	2.93	3.11	3.30	4.16	5.28
	20	2.57	2.59	2.69	2.82	2.97	3.13	3.38	3.62	3.86	5.10	7.16
	25	2.83	2.87	2.99	3.15	3.33	3.52	3.84	4.14	4.47	6.31	10.88
500	15	2.49	2.50	2.58	2.70	2.83	2.96	3.18	3.38	3.58	4.50	5.68
	20	2.80	2.83	2.94	3.08	3.24	3.41	3.69	3.94	4.20	5.51	7.57
	25	3.10	3.14	3.27	3.44	3.64	3.85	4.20	4.51	4.86	6.77	11.04
600	15	2.67	2.68	2.77	2.89	3.03	3.18	3.41	3.62	3.84	4.82	6.05
	20	3.02	3.05	3.16	3.31	3.48	3.67	3.97	4.23	4.52	5.89	7.98
	25	3.34	3.39	3.53	3.72	3.92	4.15	4.52	4.86	5.23	7.19	11.27
700	15	2.83	2.85	2.95	3.08	3.22	3.38	3.63	3.85	4.08	5.11	6.39
	20	3.21	3.25	3.37	3.53	3.72	3.91	4.23	4.51	4.81	6.24	8.37
	25	3.57	3.62	3.78	3.97	4.19	4.43	4.82	5.18	5.57	7.60	11.55
800	15	2.99	3.01	3.11	3.25	3.40	3.57	3.83	4.06	4.30	5.38	6.72
	20	3.40	3.44	3.57	3.74	3.93	4.14	4.47	4.77	5.08	6.57	8.74
	25	3.78	3.84	4.01	4.21	4.44	4.70	5.11	5.48	5.89	7.98	11.86
900	15	3.14	3.16	3.27	3.41	3.57	3.74	4.02	4.26	4.51	5.64	7.02
	20	3.58	3.62	3.76	3.94	4.14	4.35	4.70	5.01	5.34	6.89	9.10
	25	3.99	4.05	4.22	4.44	4.68	4.95	5.38	5.77	6.19	8.34	12.19
1000	15	3.28	3.30	3.42	3.57	3.74	3.92	4.20	4.46	4.72	5.89	7.32
	20	3.75	3.79	3.94	4.13	4.34	4.56	4.92	5.25	5.59	7.19	9.44
	25	4.18	4.25	4.43	4.66	4.91	5.19	5.63	6.04	6.48	8.69	12.52

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.42	3.44	3.56	3.72	3.89	4.08	4.38	4.64	4.91	6.13	7.60
	20	3.91	3.96	4.11	4.31	4.52	4.76	5.14	5.47	5.82	7.48	9.78
	25	4.37	4.44	4.63	4.87	5.13	5.42	5.88	6.30	6.75	9.02	12.85
1200	15	3.55	3.58	3.70	3.86	4.04	4.24	4.55	4.82	5.10	6.35	7.87
	20	4.07	4.12	4.28	4.48	4.71	4.95	5.34	5.69	6.05	7.76	10.10
	25	4.55	4.63	4.82	5.07	5.34	5.64	6.12	6.55	7.02	9.35	13.18
1300	15	3.68	3.70	3.83	4.00	4.19	4.39	4.71	4.99	5.28	6.57	8.13
	20	4.22	4.27	4.44	4.65	4.88	5.13	5.54	5.90	6.27	8.03	10.41
	25	4.73	4.81	5.01	5.26	5.54	5.85	6.35	6.80	7.28	9.66	13.51
1400	15	3.80	3.83	3.96	4.14	4.33	4.54	4.87	5.16	5.46	6.79	8.38
	20	4.37	4.42	4.60	4.81	5.05	5.31	5.73	6.10	6.49	8.29	10.72
	25	4.89	4.98	5.19	5.45	5.74	6.06	6.57	7.03	7.53	9.96	13.83
1500	15	3.92	3.95	4.09	4.27	4.47	4.68	5.02	5.32	5.63	7.00	8.63
	20	4.51	4.57	4.75	4.97	5.22	5.49	5.91	6.29	6.69	8.54	11.01
	25	5.06	5.15	5.36	5.63	5.93	6.26	6.79	7.26	7.77	10.26	14.15
1600	15	4.04	4.07	4.21	4.40	4.60	4.82	5.17	5.48	5.80	7.20	8.87
	20	4.65	4.71	4.89	5.12	5.38	5.65	6.09	6.48	6.90	8.79	11.30
	25	5.22	5.31	5.53	5.81	6.12	6.45	7.00	7.48	8.00	10.54	14.46
1700	15	4.15	4.19	4.33	4.52	4.73	4.96	5.32	5.63	5.96	7.39	9.10
	20	4.79	4.85	5.04	5.27	5.54	5.82	6.27	6.67	7.09	9.03	11.58
	25	5.37	5.47	5.70	5.98	6.30	6.64	7.20	7.70	8.23	10.82	14.77
1800	15	4.26	4.30	4.45	4.64	4.86	5.09	5.46	5.78	6.11	7.58	9.33
	20	4.92	4.98	5.18	5.42	5.69	5.98	6.44	6.85	7.28	9.26	11.86
	25	5.53	5.62	5.86	6.15	6.48	6.83	7.40	7.91	8.45	11.09	15.07
1900	15	4.37	4.41	4.56	4.76	4.98	5.22	5.60	5.93	6.27	7.77	9.55
	20	5.05	5.12	5.31	5.56	5.84	6.13	6.61	7.03	7.47	9.49	12.13
	25	5.68	5.78	6.02	6.32	6.65	7.01	7.59	8.12	8.67	11.36	15.37
2000	15	4.47	4.52	4.67	4.88	5.11	5.35	5.73	6.07	6.42	7.95	9.76
	20	5.18	5.25	5.45	5.70	5.98	6.29	6.77	7.20	7.65	9.71	12.39
	25	5.82	5.92	6.17	6.48	6.82	7.19	7.78	8.32	8.89	11.62	15.66

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.52	2.56	2.70	2.88	3.10	3.36	3.87	4.48	5.42	14.17	33.85
	20	2.82	2.92	3.13	3.43	3.81	4.35	5.72	7.69	10.42	31.04	77.30
	25	3.11	3.30	3.64	4.14	4.91	6.24	9.60	13.58	18.85	58.86	148.94
200	15	3.15	3.21	3.38	3.60	3.86	4.16	4.70	5.28	6.05	14.17	33.85
	20	3.58	3.71	3.97	4.31	4.72	5.25	6.37	7.93	10.44	31.04	77.30
	25	4.00	4.22	4.61	5.13	5.84	6.87	9.68	13.59	18.85	58.86	148.94
300	15	3.65	3.73	3.93	4.18	4.47	4.80	5.39	5.98	6.73	14.18	33.85
	20	4.19	4.34	4.64	5.01	5.46	6.01	7.10	8.47	10.63	31.04	77.30
	25	4.71	4.96	5.38	5.94	6.66	7.63	10.03	13.62	18.85	58.86	148.94
400	15	4.09	4.19	4.41	4.68	5.00	5.36	5.98	6.60	7.36	14.24	33.85
	20	4.72	4.89	5.22	5.62	6.10	6.68	7.78	9.08	11.02	31.04	77.30
	25	5.32	5.60	6.06	6.65	7.39	8.36	10.56	13.79	18.86	58.86	148.94
500	15	4.49	4.59	4.83	5.13	5.47	5.86	6.52	7.17	7.95	14.40	33.85
	20	5.19	5.39	5.73	6.17	6.68	7.28	8.41	9.69	11.51	31.04	77.30
	25	5.88	6.17	6.66	7.29	8.06	9.03	11.15	14.09	18.90	58.86	148.94
600	15	4.85	4.97	5.22	5.54	5.91	6.31	7.01	7.69	8.49	14.66	33.85
	20	5.63	5.84	6.21	6.67	7.21	7.84	9.00	10.27	12.02	31.04	77.30
	25	6.38	6.70	7.22	7.87	8.67	9.67	11.74	14.50	19.01	58.86	148.94
700	15	5.19	5.32	5.59	5.93	6.31	6.74	7.47	8.18	9.00	14.98	33.85
	20	6.04	6.26	6.66	7.14	7.71	8.36	9.55	10.83	12.54	31.04	77.30
	25	6.86	7.19	7.74	8.42	9.25	10.26	12.32	14.95	19.19	58.86	148.94
800	15	5.51	5.65	5.93	6.29	6.69	7.14	7.90	8.63	9.48	15.35	33.85
	20	6.43	6.66	7.07	7.58	8.17	8.85	10.07	11.37	13.06	31.05	77.30
	25	7.30	7.66	8.23	8.94	9.79	10.82	12.89	15.44	19.45	58.86	148.94
900	15	5.81	5.96	6.26	6.63	7.06	7.52	8.31	9.07	9.93	15.75	33.85
	20	6.80	7.04	7.47	8.00	8.61	9.31	10.57	11.88	13.57	31.06	77.30
	25	7.73	8.10	8.69	9.43	10.30	11.36	13.43	15.93	19.76	58.86	148.94
1000	15	6.11	6.26	6.57	6.96	7.40	7.89	8.71	9.48	10.37	16.15	33.86
	20	7.15	7.40	7.85	8.40	9.03	9.76	11.05	12.37	14.06	31.08	77.30
	25	8.13	8.52	9.13	9.89	10.79	11.87	13.96	16.42	20.11	58.86	148.94

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	6.39	6.54	6.87	7.28	7.73	8.24	9.08	9.88	10.79	16.56	33.87
	20	7.48	7.75	8.21	8.78	9.44	10.18	11.50	12.85	14.54	31.11	77.30
	25	8.52	8.92	9.55	10.34	11.27	12.37	14.47	16.91	20.49	58.86	148.94
1200	15	6.65	6.82	7.16	7.58	8.05	8.57	9.44	10.26	11.19	16.97	33.88
	20	7.81	8.08	8.56	9.15	9.83	10.59	11.94	13.31	15.01	31.17	77.30
	25	8.90	9.31	9.96	10.77	11.72	12.84	14.97	17.39	20.89	58.86	148.94
1300	15	6.91	7.09	7.44	7.87	8.36	8.89	9.79	10.63	11.58	17.38	33.91
	20	8.12	8.40	8.90	9.51	10.20	10.99	12.36	13.75	15.46	31.24	77.30
	25	9.26	9.68	10.35	11.18	12.16	13.30	15.45	17.87	21.29	58.86	148.94
1400	15	7.17	7.35	7.71	8.15	8.66	9.21	10.13	10.99	11.96	17.79	33.95
	20	8.42	8.71	9.23	9.85	10.56	11.37	12.78	14.19	15.91	31.35	77.30
	25	9.61	10.04	10.73	11.58	12.58	13.74	15.92	18.34	21.71	58.86	148.94
1500	15	7.41	7.60	7.97	8.43	8.95	9.51	10.46	11.34	12.33	18.19	34.01
	20	8.71	9.02	9.54	10.18	10.92	11.74	13.17	14.60	16.34	31.47	77.30
	25	9.95	10.39	11.10	11.97	12.99	14.18	16.38	18.80	22.13	58.86	148.94
1600	15	7.65	7.84	8.22	8.70	9.23	9.81	10.77	11.68	12.68	18.58	34.08
	20	9.00	9.31	9.85	10.51	11.26	12.10	13.56	15.01	16.76	31.62	77.30
	25	10.28	10.73	11.46	12.35	13.39	14.60	16.82	19.25	22.55	58.86	148.94
1700	15	7.88	8.08	8.47	8.96	9.50	10.10	11.08	12.00	13.03	18.97	34.18
	20	9.28	9.60	10.15	10.83	11.59	12.45	13.94	15.41	17.18	31.80	77.30
	25	10.60	11.07	11.81	12.72	13.78	15.00	17.25	19.69	22.96	58.86	148.94
1800	15	8.11	8.31	8.71	9.21	9.77	10.38	11.39	12.32	13.37	19.36	34.29
	20	9.55	9.88	10.45	11.13	11.92	12.79	14.31	15.80	17.58	31.99	77.30
	25	10.91	11.39	12.15	13.08	14.16	15.40	17.68	20.12	23.38	58.86	148.94
1900	15	8.33	8.54	8.95	9.46	10.03	10.65	11.68	12.64	13.70	19.74	34.42
	20	9.82	10.15	10.73	11.44	12.23	13.13	14.67	16.18	17.98	32.21	77.30
	25	11.22	11.71	12.49	13.43	14.53	15.79	18.09	20.55	23.79	58.87	148.94
2000	15	8.55	8.76	9.18	9.70	10.28	10.92	11.97	12.94	14.03	20.11	34.56
	20	10.08	10.42	11.01	11.73	12.55	13.46	15.02	16.55	18.37	32.44	77.30
	25	11.52	12.02	12.81	13.78	14.89	16.17	18.50	20.97	24.20	58.87	148.94

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	4.65	5.23	6.39	8.81	12.89	18.43	30.12	43.74	61.78	199.45	510.15
	20	5.66	7.28	11.51	18.49	28.19	41.25	68.80	100.95	143.59	469.40	1205.4
	25	6.97	11.56	20.95	34.55	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
200	15	6.00	6.62	7.69	9.53	12.97	18.43	30.12	43.74	61.78	199.45	510.15
	20	7.30	8.74	11.91	18.50	28.19	41.25	68.80	100.95	143.59	469.40	1205.4
	25	8.81	12.23	20.95	34.55	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
300	15	7.07	7.74	8.83	10.51	13.41	18.47	30.12	43.74	61.78	199.45	510.15
	20	8.61	10.04	12.80	18.59	28.19	41.25	68.80	100.95	143.59	469.40	1205.4
	25	10.33	13.38	21.02	34.55	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
400	15	8.00	8.71	9.83	11.48	14.10	18.64	30.12	43.74	61.78	199.45	510.15
	20	9.74	11.20	13.80	18.91	28.20	41.25	68.80	100.95	143.59	469.40	1205.4
	25	11.65	14.56	21.30	34.55	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
500	15	8.84	9.58	10.75	12.39	14.87	19.00	30.12	43.74	61.78	199.45	510.15
	20	10.76	12.26	14.79	19.44	28.24	41.25	68.80	100.95	143.59	469.40	1205.4
	25	12.84	15.70	21.81	34.56	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
600	15	9.61	10.39	11.59	13.25	15.65	19.49	30.15	43.74	61.78	199.45	510.15
	20	11.70	13.23	15.74	20.09	28.34	41.25	68.80	100.95	143.59	469.40	1205.4
	25	13.93	16.77	22.48	34.59	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
700	15	10.32	11.13	12.37	14.05	16.42	20.06	30.21	43.74	61.78	199.45	510.15
	20	12.57	14.14	16.64	20.81	28.54	41.26	68.80	100.95	143.59	469.40	1205.4
	25	14.95	17.79	23.23	34.69	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
800	15	11.00	11.84	13.11	14.82	17.17	20.67	30.33	43.74	61.78	199.45	510.15
	20	13.40	14.99	17.51	21.55	28.84	41.27	68.80	100.95	143.59	469.40	1205.4
	25	15.91	18.77	24.02	34.85	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
900	15	11.64	12.51	13.81	15.55	17.90	21.31	30.52	43.75	61.78	199.45	510.15
	20	14.17	15.80	18.34	22.30	29.23	41.31	68.80	100.95	143.59	469.40	1205.4
	25	16.82	19.69	24.82	35.11	53.43	78.87	132.57	195.28	278.46	914.47	2351.6
1000	15	12.25	13.14	14.49	16.25	18.61	21.95	30.77	43.76	61.78	199.45	510.15
	20	14.92	16.58	19.14	23.04	29.68	41.38	68.80	100.95	143.59	469.40	1205.4
	25	17.68	20.58	25.62	35.44	53.45	78.87	132.57	195.28	278.46	914.47	2351.6

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	12.83	13.75	15.13	16.92	19.29	22.59	31.08	43.79	61.78	199.45	510.15
	20	15.63	17.32	19.91	23.77	30.18	41.48	68.80	100.95	143.59	469.40	1205.4
	25	18.51	21.44	26.41	35.83	53.47	78.87	132.57	195.28	278.46	914.47	2351.6
1200	15	13.40	14.34	15.75	17.57	19.95	23.22	31.44	43.85	61.78	199.45	510.15
	20	16.32	18.04	20.65	24.49	30.71	41.63	68.80	100.95	143.59	469.40	1205.4
	25	19.31	22.27	27.20	36.29	53.51	78.87	132.57	195.28	278.46	914.47	2351.6
1300	15	13.94	14.91	16.35	18.20	20.60	23.84	31.84	43.92	61.78	199.45	510.15
	20	16.98	18.73	21.37	25.20	31.27	41.82	68.80	100.95	143.59	469.40	1205.4
	25	20.09	23.07	27.97	36.78	53.57	78.87	132.57	195.28	278.46	914.47	2351.6
1400	15	14.47	15.45	16.92	18.81	21.22	24.46	32.26	44.03	61.78	199.45	510.15
	20	17.62	19.40	22.07	25.89	31.84	42.06	68.80	100.95	143.59	469.40	1205.4
	25	20.83	23.84	28.73	37.31	53.65	78.87	132.57	195.28	278.46	914.47	2351.6
1500	15	14.98	15.99	17.48	19.40	21.83	25.06	32.71	44.16	61.79	199.45	510.15
	20	18.24	20.05	22.74	26.57	32.42	42.34	68.81	100.95	143.59	469.40	1205.4
	25	21.56	24.60	29.47	37.86	53.77	78.87	132.57	195.28	278.46	914.47	2351.6
1600	15	15.48	16.50	18.03	19.97	22.43	25.66	33.17	44.33	61.80	199.45	510.15
	20	18.84	20.68	23.40	27.24	33.01	42.65	68.82	100.95	143.59	469.40	1205.4
	25	22.26	25.33	30.20	38.43	53.92	78.87	132.57	195.28	278.46	914.47	2351.6
1700	15	15.96	17.01	18.56	20.53	23.01	26.24	33.65	44.53	61.82	199.45	510.15
	20	19.43	21.30	24.05	27.89	33.60	42.99	68.83	100.95	143.59	469.40	1205.4
	25	22.95	26.04	30.92	39.01	54.10	78.88	132.57	195.28	278.46	914.47	2351.6
1800	15	16.43	17.50	19.08	21.08	23.58	26.82	34.13	44.75	61.84	199.45	510.15
	20	20.01	21.90	24.68	28.53	34.19	43.37	68.85	100.95	143.59	469.40	1205.4
	25	23.62	26.74	31.62	39.60	54.31	78.89	132.57	195.28	278.46	914.47	2351.6
1900	15	16.90	17.98	19.59	21.61	24.14	27.38	34.62	45.00	61.88	199.45	510.15
	20	20.57	22.48	25.29	29.16	34.77	43.76	68.88	100.95	143.59	469.40	1205.4
	25	24.27	27.42	32.31	40.20	54.56	78.90	132.57	195.28	278.46	914.47	2351.6
2000	15	17.35	18.45	20.08	22.13	24.68	27.93	35.11	45.28	61.92	199.45	510.15
	20	21.12	23.06	25.89	29.77	35.35	44.18	68.91	100.95	143.59	469.40	1205.4
	25	24.91	28.09	32.99	40.79	54.83	78.92	132.57	195.28	278.46	914.47	2351.6

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	15.30	36.48	68.96	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	33.05	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.51	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
200	15	16.68	36.48	68.96	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	33.06	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.51	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
300	15	18.54	36.49	68.96	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	33.25	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.51	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
400	15	20.35	36.56	68.96	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	33.89	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.51	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
500	15	22.05	36.79	68.96	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	34.92	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.53	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
600	15	23.64	37.24	68.96	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	36.17	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.62	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
700	15	25.15	37.88	68.97	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	37.53	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	62.81	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
800	15	26.58	38.66	68.97	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	38.93	83.62	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	63.15	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
900	15	27.94	39.54	68.98	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	40.33	83.63	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	63.66	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1000	15	29.24	40.48	69.02	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	41.72	83.64	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	64.31	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 44.0 Ft (RADIUS = 31.1 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	30.50	41.45	69.07	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	43.10	83.68	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	65.09	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1200	15	31.70	42.43	69.16	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	44.44	83.74	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	65.96	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1300	15	32.87	43.43	69.29	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	45.76	83.84	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	66.92	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1400	15	34.00	44.42	69.48	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	47.06	83.98	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	67.93	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1500	15	35.10	45.41	69.71	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	48.33	84.17	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	68.98	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1600	15	36.17	46.39	69.99	115.86	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	49.57	84.41	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	70.06	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1700	15	37.21	47.36	70.33	115.87	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	50.78	84.70	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	71.16	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1800	15	38.23	48.32	70.71	115.87	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	51.98	85.04	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	72.27	161.33	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
1900	15	39.22	49.26	71.13	115.88	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	53.15	85.43	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	73.39	161.34	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.
2000	15	40.19	50.20	71.59	115.89	180.98	268.75	454.13	670.65	957.91	3155.1	8120.9
	20	54.30	85.87	160.58	271.65	425.90	633.82	1073.0	1586.1	2266.9	7474.4	19245.
	25	74.52	161.34	311.61	528.48	829.68	1235.7	2093.4	3095.4	4424.9	14595.	37583.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.61	1.59	1.64	1.70	1.78	1.86	2.00	2.12	2.25	2.89	3.96
	20	1.74	1.73	1.79	1.87	1.97	2.07	2.25	2.41	2.59	3.68	6.69
	25	1.86	1.87	1.94	2.04	2.16	2.29	2.52	2.74	3.01	5.32	11.49
200	15	1.93	1.92	1.97	2.05	2.15	2.25	2.42	2.56	2.72	3.45	4.50
	20	2.12	2.13	2.20	2.30	2.42	2.54	2.75	2.95	3.16	4.28	6.77
	25	2.30	2.32	2.42	2.54	2.68	2.84	3.11	3.37	3.66	5.62	11.49
300	15	2.18	2.18	2.25	2.34	2.45	2.56	2.75	2.91	3.09	3.90	5.00
	20	2.43	2.44	2.53	2.64	2.78	2.92	3.16	3.37	3.61	4.81	7.07
	25	2.66	2.69	2.80	2.94	3.10	3.28	3.58	3.87	4.18	6.10	11.50
400	15	2.41	2.41	2.48	2.59	2.70	2.83	3.04	3.22	3.41	4.29	5.44
	20	2.70	2.71	2.81	2.94	3.09	3.25	3.51	3.75	4.00	5.27	7.46
	25	2.97	3.00	3.13	3.28	3.46	3.66	3.99	4.30	4.64	6.59	11.55
500	15	2.61	2.61	2.70	2.81	2.94	3.07	3.30	3.49	3.70	4.64	5.85
	20	2.94	2.96	3.07	3.21	3.37	3.54	3.83	4.08	4.35	5.70	7.87
	25	3.25	3.29	3.42	3.59	3.79	4.01	4.36	4.69	5.05	7.05	11.68
600	15	2.80	2.80	2.89	3.01	3.15	3.30	3.53	3.74	3.97	4.96	6.23
	20	3.16	3.19	3.30	3.46	3.63	3.81	4.11	4.39	4.68	6.09	8.28
	25	3.51	3.55	3.70	3.88	4.09	4.32	4.70	5.05	5.43	7.48	11.88
700	15	2.97	2.98	3.07	3.20	3.35	3.51	3.76	3.98	4.21	5.26	6.58
	20	3.37	3.40	3.52	3.69	3.87	4.06	4.38	4.67	4.98	6.45	8.67
	25	3.75	3.80	3.95	4.15	4.37	4.61	5.01	5.38	5.78	7.89	12.15
800	15	3.14	3.15	3.25	3.38	3.54	3.70	3.97	4.20	4.45	5.54	6.91
	20	3.57	3.60	3.73	3.90	4.09	4.30	4.64	4.94	5.26	6.80	9.05
	25	3.97	4.03	4.19	4.40	4.63	4.89	5.31	5.69	6.11	8.29	12.44
900	15	3.29	3.30	3.41	3.55	3.71	3.89	4.17	4.41	4.67	5.81	7.23
	20	3.76	3.79	3.93	4.11	4.31	4.53	4.88	5.20	5.53	7.12	9.42
	25	4.19	4.25	4.42	4.64	4.88	5.15	5.59	5.99	6.42	8.66	12.76
1000	15	3.44	3.46	3.57	3.72	3.89	4.07	4.36	4.61	4.88	6.07	7.53
	20	3.94	3.97	4.12	4.30	4.51	4.74	5.11	5.44	5.79	7.44	9.77
	25	4.39	4.46	4.64	4.86	5.12	5.40	5.86	6.27	6.72	9.02	13.08

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.58	3.60	3.72	3.87	4.05	4.24	4.54	4.80	5.08	6.31	7.82
	20	4.11	4.15	4.30	4.49	4.71	4.95	5.33	5.67	6.03	7.73	10.11
	25	4.59	4.66	4.84	5.08	5.35	5.64	6.11	6.55	7.01	9.36	13.41
1200	15	3.72	3.74	3.86	4.02	4.21	4.40	4.71	4.99	5.27	6.55	8.10
	20	4.27	4.32	4.47	4.67	4.90	5.15	5.54	5.90	6.27	8.02	10.45
	25	4.78	4.85	5.05	5.29	5.57	5.87	6.36	6.81	7.29	9.70	13.74
1300	15	3.86	3.88	4.00	4.17	4.36	4.56	4.88	5.17	5.46	6.78	8.37
	20	4.43	4.48	4.64	4.85	5.09	5.34	5.75	6.11	6.50	8.30	10.77
	25	4.96	5.04	5.24	5.50	5.78	6.09	6.60	7.06	7.55	10.02	14.07
1400	15	3.99	4.01	4.14	4.31	4.51	4.71	5.05	5.34	5.64	7.00	8.63
	20	4.59	4.63	4.80	5.02	5.26	5.53	5.95	6.32	6.72	8.57	11.08
	25	5.14	5.22	5.43	5.69	5.99	6.31	6.83	7.30	7.81	10.33	14.40
1500	15	4.11	4.14	4.27	4.45	4.65	4.86	5.21	5.51	5.82	7.21	8.88
	20	4.74	4.79	4.96	5.19	5.44	5.71	6.14	6.53	6.93	8.83	11.38
	25	5.32	5.39	5.61	5.88	6.19	6.52	7.06	7.54	8.06	10.63	14.72
1600	15	4.24	4.26	4.40	4.58	4.79	5.01	5.36	5.67	5.99	7.42	9.12
	20	4.88	4.94	5.12	5.35	5.60	5.88	6.33	6.72	7.14	9.08	11.68
	25	5.48	5.57	5.79	6.07	6.38	6.72	7.27	7.77	8.31	10.93	15.03
1700	15	4.35	4.38	4.53	4.71	4.92	5.15	5.51	5.83	6.16	7.62	9.36
	20	5.03	5.08	5.27	5.50	5.77	6.05	6.51	6.92	7.35	9.33	11.96
	25	5.65	5.73	5.96	6.25	6.57	6.92	7.49	8.00	8.54	11.21	15.35
1800	15	4.47	4.50	4.65	4.84	5.06	5.29	5.66	5.99	6.32	7.82	9.60
	20	5.17	5.22	5.41	5.66	5.93	6.22	6.69	7.11	7.55	9.57	12.25
	25	5.81	5.90	6.13	6.43	6.76	7.11	7.69	8.22	8.77	11.49	15.65
1900	15	4.59	4.62	4.77	4.96	5.19	5.42	5.80	6.14	6.48	8.01	9.82
	20	5.30	5.36	5.56	5.80	6.08	6.38	6.86	7.29	7.74	9.81	12.52
	25	5.97	.6.06	6.30	6.60	6.94	7.30	7.90	8.43	9.00	11.77	15.96
2000	15	4.70	4.73	4.88	5.09	5.31	5.56	5.95	6.29	6.64	8.20	10.05
	20	5.44	5.50	5.70	5.95	6.24	6.54	7.03	7.47	7.93	10.04	12.79
	25	6.12	6.21	6.46	6.77	7.11	7.49	8.09	8.64	9.22	12.04	16.26

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.64	2.68	2.82	3.01	3.24	3.52	4.07	4.75	5.81	15.27	36.20
	20	2.96	3.07	3.29	3.61	4.03	4.63	6.21	8.42	11.39	33.61	82.84
	25	3.28	3.48	3.85	4.41	5.31	6.87	10.62	14.98	20.72	63.84	159.74
200	15	3.30	3.37	3.54	3.77	4.04	4.35	4.92	5.55	6.40	15.27	36.20
	20	3.76	3.90	4.17	4.53	4.97	5.54	6.80	8.59	11.40	33.61	82.84
	25	4.21	4.45	4.86	5.43	6.22	7.41	10.66	14.98	20.72	63.84	159.74
300	15	3.83	3.92	4.12	4.37	4.67	5.02	5.63	6.27	7.08	15.28	36.20
	20	4.41	4.57	4.87	5.26	5.74	6.33	7.53	9.07	11.54	33.61	82.84
	25	4.96	5.23	5.68	6.28	7.06	8.15	10.92	15.00	20.72	63.84	159.74
400	15	4.30	4.39	4.61	4.90	5.22	5.60	6.25	6.91	7.72	15.31	36.20
	20	4.96	5.14	5.48	5.90	6.41	7.02	8.22	9.66	11.86	33.61	82.84
	25	5.61	5.90	6.39	7.02	7.82	8.89	11.40	15.11	20.72	63.84	159.74
500	15	4.71	4.82	5.06	5.37	5.72	6.12	6.81	7.49	8.32	15.43	36.20
	20	5.47	5.66	6.02	6.48	7.01	7.65	8.87	10.27	12.30	33.61	82.84
	25	6.19	6.50	7.02	7.68	8.51	9.58	11.96	15.34	20.75	63.84	159.74
600	15	5.10	5.21	5.47	5.80	6.17	6.60	7.32	8.03	8.88	15.64	36.20
	20	5.93	6.14	6.52	7.00	7.57	8.23	9.48	10.86	12.80	33.61	82.84
	25	6.73	7.06	7.61	8.30	9.15	10.23	12.54	15.68	20.81	63.84	159.74
700	15	5.46	5.58	5.86	6.20	6.60	7.04	7.80	8.54	9.40	15.93	36.20
	20	6.36	6.58	6.99	7.49	8.09	8.77	10.05	11.43	13.31	33.61	82.84
	25	7.23	7.58	8.15	8.87	9.75	10.85	13.12	16.10	20.94	63.84	159.74
800	15	5.79	5.93	6.22	6.58	7.00	7.46	8.25	9.01	9.90	16.27	36.20
	20	6.77	7.00	7.43	7.96	8.57	9.29	10.59	11.98	13.83	33.61	82.84
	25	7.70	8.07	8.66	9.41	10.32	11.43	13.69	16.56	21.14	63.84	159.74
900	15	6.11	6.25	6.56	6.94	7.38	7.86	8.68	9.46	10.37	16.65	36.20
	20	7.15	7.40	7.84	8.39	9.03	9.77	11.10	12.51	14.34	33.62	82.84
	25	8.15	8.53	9.15	9.92	10.85	11.99	14.25	17.03	21.40	63.84	159.74
1000	15	6.42	6.57	6.89	7.28	7.74	8.24	9.08	9.89	10.82	17.04	36.21
	20	7.52	7.78	8.24	8.81	9.47	10.23	11.59	13.01	14.84	33.63	82.84
	25	8.57	8.97	9.61	10.41	11.37	12.52	14.79	17.52	21.71	63.84	159.74

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	6.71	6.87	7.20	7.61	8.08	8.60	9.47	10.31	11.26	17.45	36.21
	20	7.88	8.14	8.62	9.21	9.90	10.68	12.07	13.50	15.33	33.65	82.84
	25	8.98	9.39	10.05	10.88	11.86	13.03	15.31	18.01	22.05	63.84	159.74
1200	15	7.00	7.16	7.50	7.93	8.41	8.95	9.85	10.70	11.68	17.85	36.22
	20	8.22	8.49	8.99	9.60	10.30	11.10	12.52	13.98	15.81	33.68	82.84
	25	9.38	9.80	10.48	11.33	12.33	13.53	15.82	18.49	22.42	63.84	159.74
1300	15	7.27	7.44	7.79	8.24	8.74	9.29	10.21	11.09	12.08	18.26	36.24
	20	8.55	8.83	9.34	9.97	10.69	11.51	12.96	14.44	16.27	33.74	82.84
	25	9.76	10.19	10.89	11.76	12.79	14.00	16.32	18.97	22.81	63.84	159.74
1400	15	7.54	7.71	8.08	8.53	9.05	9.61	10.56	11.46	12.47	18.67	36.27
	20	8.87	9.16	9.69	10.33	11.07	11.91	13.39	14.88	16.73	33.81	82.84
	25	10.13	10.57	11.29	12.18	13.23	14.47	16.80	19.44	23.21	63.84	159.74
1500	15	7.79	7.97	8.35	8.82	9.35	9.93	10.90	11.82	12.85	19.07	36.31
	20	9.17	9.48	10.02	10.68	11.44	12.30	13.80	15.32	17.17	33.90	82.84
	25	10.48	10.94	11.68	12.59	13.66	14.92	17.27	19.91	23.61	63.84	159.74
1600	15	8.04	8.23	8.62	9.10	9.64	10.24	11.24	12.17	13.22	19.47	36.36
	20	9.48	9.79	10.34	11.02	11.80	12.68	14.21	15.74	17.61	34.02	82.84
	25	10.83	11.30	12.06	12.99	14.08	15.35	17.73	20.37	24.02	63.84	159.74
1700	15	8.29	8.48	8.88	9.37	9.93	10.54	11.56	12.51	13.58	19.87	36.44
	20	9.77	10.09	10.66	11.35	12.15	13.04	14.60	16.15	18.03	34.16	82.84
	25	11.17	11.65	12.42	13.37	14.48	15.78	18.18	20.82	24.44	63.85	159.74
1800	15	8.53	8.72	9.13	9.64	10.21	10.83	11.87	12.85	13.93	20.26	36.52
	20	10.06	10.38	10.96	11.67	12.49	13.40	14.98	16.56	18.45	34.32	82.84
	25	11.50	11.99	12.78	13.75	14.88	16.20	18.62	21.27	24.85	63.85	159.74
1900	15	8.76	8.96	9.38	9.90	10.48	11.12	12.18	13.17	14.28	20.64	36.63
	20	10.34	10.67	11.27	11.99	12.82	13.75	15.36	16.95	18.86	34.50	82.84
	25	11.83	12.32	13.13	14.12	15.27	16.60	19.05	21.70	25.26	63.85	159.74
2000	15	8.99	9.19	9.62	10.15	10.75	11.40	12.48	13.49	14.61	21.02	36.75
	20	10.61	10.95	11.56	12.30	13.14	14.09	15.72	17.34	19.26	34.70	82.84
	25	12.14	12.65	13.47	14.48	15.65	17.00	19.48	22.13	25.67	63.85	159.74

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	4.92	5.58	6.96	9.87	14.47	20.65	33.55	48.50	68.18	216.61	547.43
	20	6.05	8.03	13.11	21.01	31.89	46.43	76.89	112.18	158.71	510.04	1293.7
	25	7.55	13.26	24.02	39.41	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
200	15	6.34	7.03	8.25	10.43	14.51	20.65	33.55	48.50	68.18	216.61	547.43
	20	7.77	9.45	13.34	21.01	31.89	46.43	76.89	112.18	158.71	510.04	1293.7
	25	9.46	13.71	24.02	39.41	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
300	15	7.48	8.21	9.42	11.36	14.81	20.66	33.55	48.50	68.18	216.61	547.43
	20	9.15	10.79	14.09	21.05	31.89	46.43	76.89	112.18	158.71	510.04	1293.7
	25	11.05	14.73	24.04	39.41	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
400	15	8.46	9.23	10.47	12.33	15.40	20.76	33.55	48.50	68.18	216.61	547.43
	20	10.35	12.00	15.04	21.23	31.89	46.43	76.89	112.18	158.71	510.04	1293.7
	25	12.44	15.89	24.19	39.41	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
500	15	9.34	10.15	11.42	13.26	16.12	21.00	33.56	48.50	68.18	216.61	547.43
	20	11.43	13.10	16.02	21.63	31.90	46.43	76.89	112.18	158.71	510.04	1293.7
	25	13.70	17.03	24.54	39.41	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
600	15	10.15	10.99	12.30	14.14	16.89	21.39	33.57	48.50	68.18	216.61	547.43
	20	12.41	14.12	16.98	22.18	31.95	46.43	76.89	112.18	158.71	510.04	1293.7
	25	14.85	18.13	25.07	39.42	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
700	15	10.91	11.78	13.12	14.98	17.66	21.89	33.60	48.50	68.18	216.61	547.43
	20	13.34	15.07	17.91	22.83	32.07	46.43	76.89	112.18	158.71	510.04	1293.7
	25	15.92	19.19	25.72	39.46	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
800	15	11.62	12.52	13.90	15.77	18.41	22.46	33.67	48.50	68.18	216.61	547.43
	20	14.20	15.97	18.80	23.53	32.26	46.44	76.89	112.18	158.71	510.04	1293.7
	25	16.94	20.19	26.45	39.55	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
900	15	12.29	13.22	14.64	16.53	19.15	23.06	33.78	48.50	68.18	216.61	547.43
	20	15.02	16.82	19.66	24.25	32.54	46.45	76.89	112.18	158.71	510.04	1293.7
	25	17.90	21.16	27.21	39.69	60.60	88.95	148.32	217.17	307.97	993.79	2524.0
1000	15	12.94	13.89	15.34	17.26	19.88	23.68	33.96	48.51	68.18	216.61	547.43
	20	15.81	17.64	20.49	24.98	32.89	46.49	76.89	112.18	158.71	510.04	1293.7
	25	18.81	22.09	27.99	39.91	60.60	88.95	148.32	217.17	307.97	993.79	2524.0

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	13.56	14.54	16.01	17.96	20.58	24.31	34.19	48.52	68.18	216.61	547.43
	20	16.56	18.42	21.29	25.71	33.31	46.54	76.89	112.18	158.71	510.04	1293.7
	25	19.69	22.98	28.78	40.19	60.61	88.95	148.32	217.17	307.97	993.79	2524.0
1200	15	14.15	15.15	16.66	18.64	21.26	24.94	34.47	48.55	68.18	216.61	547.43
	20	17.28	19.17	22.06	26.44	33.78	46.62	76.89	112.18	158.71	510.04	1293.7
	25	20.53	23.85	29.56	40.54	60.63	88.95	148.32	217.17	307.97	993.79	2524.0
1300	15	14.72	15.75	17.29	19.29	21.93	25.56	34.80	48.59	68.18	216.61	547.43
	20	17.98	19.90	22.81	27.15	34.28	46.74	76.89	112.18	158.71	510.04	1293.7
	25	21.35	24.69	30.34	40.94	60.65	88.95	148.32	217.17	307.97	993.79	2524.0
1400	15	15.28	16.33	17.90	19.93	22.57	26.18	35.17	48.65	68.18	216.61	547.43
	20	18.66	20.60	23.54	27.86	34.81	46.90	76.89	112.18	158.71	510.04	1293.7
	25	22.14	25.50	31.10	41.39	60.69	88.95	148.32	217.17	307.97	993.79	2524.0
1500	15	15.82	16.89	18.49	20.55	23.21	26.80	35.57	48.74	68.19	216.61	547.43
	20	19.31	21.29	24.25	28.55	35.35	47.09	76.89	112.18	158.71	510.04	1293.7
	25	22.90	26.29	31.86	41.87	60.75	88.95	148.32	217.17	307.97	993.79	2524.0
1600	15	16.34	17.43	19.06	21.15	23.82	27.40	35.99	48.85	68.19	216.61	547.43
	20	19.95	21.95	24.94	29.23	35.91	47.32	76.89	112.18	158.71	510.04	1293.7
	25	23.65	27.06	32.61	42.38	60.83	88.95	148.32	217.17	307.97	993.79	2524.0
1700	15	16.85	17.96	19.62	21.73	24.43	28.00	36.44	48.98	68.20	216.61	547.43
	20	20.57	22.60	25.61	29.90	36.48	47.59	76.90	112.18	158.71	510.04	1293.7
	25	24.37	27.81	33.34	42.91	60.94	88.95	148.32	217.17	307.97	993.79	2524.0
1800	15	17.35	18.48	20.16	22.30	25.02	28.59	36.89	49.15	68.21	216.61	547.43
	20	21.18	23.23	26.27	30.56	37.06	47.89	76.90	112.18	158.71	510.04	1293.7
	25	25.08	28.54	34.06	43.46	61.07	88.95	148.32	217.17	307.97	993.79	2524.0
1900	15	17.84	18.99	20.69	22.86	25.60	29.16	37.36	49.34	68.23	216.61	547.43
	20	21.77	23.85	26.91	31.21	37.63	48.22	76.92	112.18	158.71	510.04	1293.7
	25	25.77	29.26	34.78	44.02	61.23	88.96	148.32	217.17	307.97	993.79	2524.0
2000	15	18.32	19.48	21.21	23.41	26.16	29.73	37.83	49.56	68.25	216.61	547.43
	20	22.35	24.45	27.54	31.85	38.21	48.57	76.93	112.18	158.71	510.04	1293.7
	25	26.44	29.96	35.48	44.60	61.42	88.96	148.32	217.17	307.97	993.79	2524.0

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	17.66	42.30	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	38.69	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.45	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
200	15	18.67	42.30	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	38.70	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.45	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
300	15	20.41	42.30	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	38.76	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.45	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
400	15	22.22	42.32	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	39.10	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.45	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
500	15	23.96	42.42	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	39.81	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.45	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
600	15	25.61	42.67	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	40.83	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.47	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
700	15	27.18	43.09	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	42.03	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.54	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
800	15	28.67	43.68	79.46	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	43.33	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.69	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
900	15	30.10	44.40	79.47	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	44.67	97.31	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	73.95	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1000	15	31.46	45.21	79.48	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	46.04	97.32	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	74.34	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 46.0 Ft (RADIUS = 32.5 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	32.78	46.09	79.49	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	47.40	97.33	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	74.85	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1200	15	34.05	47.00	79.53	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	48.76	97.35	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	75.49	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1300	15	35.27	47.95	79.59	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	50.10	97.38	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	76.22	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1400	15	36.46	48.91	79.67	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	51.42	97.43	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	77.04	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1500	15	37.62	49.88	79.79	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	52.72	97.51	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	77.93	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1600	15	38.75	50.84	79.95	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	53.99	97.63	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	78.88	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1700	15	39.84	51.81	80.15	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	55.25	97.78	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	79.87	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1800	15	40.92	52.78	80.39	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	56.49	97.97	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	80.89	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
1900	15	41.96	53.73	80.68	132.56	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	57.70	98.20	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	81.93	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.
2000	15	42.99	54.68	81.01	132.57	205.67	303.49	508.47	746.20	1059.8	3429.2	8716.8
	20	58.89	98.47	185.37	311.14	484.32	716.08	1201.8	1765.1	2508.3	8124.0	20657.
	25	83.00	188.01	359.96	605.55	943.73	1396.3	2344.8	3444.9	4896.3	15864.	40342.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.68	1.66	1.70	1.76	1.84	1.93	2.06	2.19	2.32	2.97	4.11
	20	1.82	1.81	1.86	1.94	2.04	2.15	2.32	2.49	2.68	3.84	7.07
	25	1.95	1.95	2.02	2.12	2.24	2.38	2.62	2.85	3.14	5.66	12.22
200	15	2.01	2.00	2.05	2.13	2.23	2.33	2.50	2.64	2.80	3.55	4.64
	20	2.22	2.22	2.29	2.39	2.51	2.64	2.85	3.05	3.26	4.44	7.13
	25	2.41	2.43	2.52	2.64	2.79	2.95	3.23	3.50	3.80	5.92	12.22
300	15	2.28	2.27	2.34	2.43	2.54	2.65	2.84	3.01	3.19	4.01	5.15
	20	2.54	2.55	2.63	2.75	2.88	3.03	3.27	3.49	3.73	4.98	7.40
	25	2.79	2.81	2.92	3.06	3.23	3.41	3.72	4.01	4.34	6.39	12.23
400	15	2.52	2.51	2.58	2.69	2.80	2.93	3.14	3.33	3.52	4.41	5.61
	20	2.83	2.83	2.93	3.06	3.21	3.37	3.64	3.88	4.14	5.46	7.78
	25	3.11	3.14	3.26	3.42	3.61	3.81	4.15	4.46	4.82	6.87	12.26
500	15	2.73	2.73	2.81	2.92	3.05	3.19	3.41	3.61	3.82	4.78	6.02
	20	3.08	3.09	3.20	3.34	3.50	3.68	3.96	4.22	4.50	5.89	8.19
	25	3.40	3.44	3.57	3.75	3.95	4.17	4.53	4.87	5.24	7.34	12.36
600	15	2.93	2.93	3.01	3.13	3.27	3.42	3.66	3.87	4.09	5.11	6.41
	20	3.31	3.33	3.45	3.60	3.77	3.96	4.27	4.54	4.84	6.29	8.59
	25	3.67	3.71	3.86	4.05	4.26	4.49	4.88	5.24	5.63	7.78	12.54
700	15	3.11	3.11	3.20	3.33	3.48	3.63	3.89	4.11	4.35	5.42	6.77
	20	3.53	3.55	3.68	3.84	4.02	4.22	4.55	4.84	5.15	6.67	8.99
	25	3.93	3.97	4.12	4.32	4.55	4.80	5.21	5.58	6.00	8.20	12.78
800	15	3.28	3.29	3.38	3.52	3.67	3.84	4.11	4.34	4.59	5.71	7.11
	20	3.74	3.76	3.89	4.06	4.26	4.47	4.81	5.12	5.45	7.02	9.38
	25	4.16	4.21	4.38	4.59	4.82	5.09	5.52	5.91	6.34	8.60	13.06
900	15	3.45	3.45	3.56	3.70	3.86	4.03	4.31	4.56	4.82	5.99	7.44
	20	3.94	3.96	4.10	4.28	4.48	4.70	5.06	5.38	5.72	7.36	9.75
	25	4.39	4.44	4.61	4.83	5.08	5.36	5.81	6.22	6.66	8.99	13.36
1000	15	3.60	3.61	3.72	3.87	4.04	4.22	4.51	4.77	5.04	6.25	7.75
	20	4.12	4.15	4.30	4.48	4.70	4.93	5.30	5.63	5.99	7.68	10.11
	25	4.61	4.66	4.84	5.07	5.33	5.62	6.09	6.51	6.97	9.36	13.68

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.75	3.76	3.88	4.03	4.21	4.40	4.70	4.97	5.25	6.50	8.04
	20	4.30	4.34	4.49	4.68	4.90	5.14	5.53	5.88	6.25	7.99	10.46
	25	4.81	4.87	5.06	5.30	5.57	5.87	6.35	6.79	7.27	9.71	14.01
1200	15	3.90	3.91	4.03	4.19	4.37	4.57	4.88	5.16	5.45	6.75	8.33
	20	4.48	4.51	4.67	4.87	5.10	5.35	5.75	6.11	6.49	8.29	10.80
	25	5.01	5.08	5.27	5.52	5.80	6.11	6.61	7.06	7.56	10.05	14.34
1300	15	4.04	4.05	4.18	4.34	4.53	4.73	5.06	5.34	5.64	6.98	8.61
	20	4.65	4.68	4.84	5.05	5.29	5.55	5.96	6.33	6.73	8.57	11.13
	25	5.21	5.27	5.47	5.73	6.02	6.34	6.86	7.33	7.83	10.38	14.66
1400	15	4.18	4.19	4.32	4.49	4.68	4.89	5.23	5.52	5.83	7.21	8.87
	20	4.81	4.85	5.01	5.23	5.48	5.74	6.17	6.55	6.96	8.85	11.45
	25	5.39	5.46	5.67	5.94	6.24	6.56	7.10	7.58	8.10	10.70	14.99
1500	15	4.31	4.32	4.46	4.63	4.83	5.05	5.39	5.70	6.02	7.43	9.13
	20	4.97	5.01	5.18	5.40	5.66	5.93	6.37	6.76	7.18	9.12	11.76
	25	5.58	5.65	5.86	6.14	6.45	6.78	7.33	7.83	8.36	11.02	15.31
1600	15	4.44	4.45	4.59	4.77	4.98	5.20	5.55	5.87	6.19	7.64	9.38
	20	5.12	5.16	5.34	5.57	5.83	6.11	6.56	6.97	7.39	9.38	12.06
	25	5.75	5.83	6.05	6.33	6.65	6.99	7.56	8.07	8.61	11.32	15.63
1700	15	4.56	4.58	4.72	4.91	5.12	5.35	5.71	6.03	6.37	7.85	9.63
	20	5.27	5.32	5.50	5.73	6.00	6.29	6.75	7.17	7.61	9.64	12.36
	25	5.92	6.00	6.23	6.52	6.85	7.20	7.78	8.30	8.86	11.62	15.95
1800	15	4.68	4.70	4.85	5.04	5.26	5.49	5.86	6.19	6.54	8.05	9.87
	20	5.42	5.46	5.65	5.89	6.17	6.46	6.94	7.36	7.81	9.88	12.64
	25	6.09	6.17	6.41	6.70	7.04	7.40	7.99	8.53	9.10	11.90	16.26
1900	15	4.80	4.82	4.97	5.17	5.39	5.63	6.01	6.35	6.70	8.25	10.10
	20	5.56	5.61	5.80	6.05	6.33	6.63	7.12	7.55	8.01	10.13	12.93
	25	6.26	6.34	6.58	6.88	7.23	7.60	8.20	8.75	9.33	12.19	16.57
2000	15	4.92	4.94	5.09	5.30	5.52	5.77	6.16	6.50	6.86	8.45	10.33
	20	5.70	5.75	5.95	6.20	6.49	6.80	7.30	7.74	8.21	10.36	13.20
	25	6.42	6.50	6.75	7.06	7.41	7.79	8.41	8.96	9.56	12.46	16.87

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.76	2.81	2.95	3.15	3.39	3.68	4.28	5.05	6.24	16.44	38.68
	20	3.10	3.22	3.46	3.80	4.26	4.95	6.77	9.21	12.44	36.34	88.69
	25	3.45	3.66	4.07	4.70	5.76	7.57	11.72	16.49	22.74	69.15	171.12
200	15	3.46	3.52	3.70	3.94	4.22	4.54	5.16	5.83	6.77	16.44	38.68
	20	3.95	4.09	4.38	4.75	5.23	5.85	7.27	9.32	12.44	36.34	88.69
	25	4.43	4.68	5.13	5.75	6.63	8.00	11.74	16.49	22.74	69.15	171.12
300	15	4.02	4.10	4.30	4.57	4.88	5.24	5.89	6.57	7.45	16.44	38.68
	20	4.63	4.79	5.11	5.52	6.03	6.66	7.99	9.73	12.53	36.34	88.69
	25	5.22	5.50	5.98	6.63	7.49	8.72	11.92	16.50	22.74	69.15	171.12
400	15	4.51	4.60	4.83	5.12	5.46	5.84	6.53	7.23	8.10	16.46	38.68
	20	5.21	5.40	5.75	6.19	6.73	7.38	8.69	10.29	12.78	36.34	88.69
	25	5.90	6.21	6.72	7.40	8.27	9.46	12.32	16.56	22.74	69.15	171.12
500	15	4.94	5.05	5.29	5.61	5.97	6.39	7.11	7.83	8.71	16.55	38.68
	20	5.74	5.94	6.32	6.79	7.36	8.04	9.35	10.89	13.18	36.34	88.69
	25	6.51	6.84	7.39	8.10	8.99	10.16	12.84	16.73	22.75	69.15	171.12
600	15	5.35	5.46	5.72	6.06	6.45	6.88	7.64	8.39	9.28	16.72	38.68
	20	6.23	6.44	6.84	7.34	7.94	8.64	9.97	11.48	13.65	36.34	88.69
	25	7.08	7.43	8.00	8.74	9.66	10.83	13.41	17.01	22.79	69.15	171.12
700	15	5.72	5.85	6.13	6.48	6.89	7.35	8.14	8.91	9.82	16.96	38.68
	20	6.68	6.91	7.33	7.86	8.48	9.20	10.56	12.06	14.15	36.34	88.69
	25	7.60	7.97	8.57	9.34	10.28	11.46	13.98	17.37	22.87	69.15	171.12
800	15	6.08	6.21	6.50	6.88	7.30	7.78	8.60	9.40	10.34	17.27	38.68
	20	7.11	7.35	7.79	8.34	8.98	9.74	11.12	12.62	14.66	36.34	88.69
	25	8.10	8.48	9.11	9.90	10.87	12.07	14.55	17.79	23.01	69.15	171.12
900	15	6.42	6.55	6.86	7.25	7.70	8.20	9.05	9.87	10.82	17.62	38.68
	20	7.52	7.77	8.23	8.80	9.47	10.24	11.65	13.16	15.17	36.34	88.69
	25	8.57	8.97	9.62	10.43	11.43	12.64	15.12	18.24	23.22	69.15	171.12
1000	15	6.74	6.88	7.21	7.61	8.08	8.59	9.47	10.32	11.29	18.00	38.69
	20	7.90	8.17	8.64	9.23	9.92	10.72	12.16	13.68	15.67	36.35	88.69
	25	9.02	9.43	10.10	10.94	11.96	13.20	15.67	18.71	23.47	69.15	171.12

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	7.05	7.20	7.53	7.96	8.44	8.97	9.88	10.74	11.74	18.39	38.69
	20	8.28	8.55	9.04	9.65	10.37	11.18	12.65	14.19	16.17	36.36	88.69
	25	9.45	9.87	10.57	11.43	12.47	13.73	16.20	19.19	23.77	69.15	171.12
1200	15	7.34	7.50	7.85	8.29	8.78	9.34	10.27	11.16	12.17	18.79	38.69
	20	8.63	8.91	9.43	10.06	10.79	11.63	13.12	14.68	16.65	36.38	88.69
	25	9.86	10.30	11.01	11.90	12.97	14.24	16.73	19.67	24.11	69.15	171.12
1300	15	7.63	7.79	8.16	8.61	9.12	9.69	10.64	11.55	12.59	19.19	38.71
	20	8.98	9.27	9.80	10.45	11.20	12.06	13.58	15.15	17.13	36.41	88.69
	25	10.26	10.71	11.45	12.36	13.44	14.74	17.24	20.15	24.46	69.15	171.12
1400	15	7.91	8.08	8.45	8.92	9.44	10.03	11.01	11.94	13.00	19.60	38.72
	20	9.32	9.61	10.15	10.82	11.59	12.47	14.02	15.61	17.59	36.46	88.69
	25	10.65	11.11	11.86	12.80	13.90	15.22	17.73	20.63	24.84	69.15	171.12
1500	15	8.18	8.35	8.74	9.22	9.76	10.36	11.36	12.31	13.39	20.00	38.75
	20	9.64	9.95	10.50	11.19	11.98	12.87	14.46	16.06	18.05	36.53	88.69
	25	11.03	11.50	12.27	13.22	14.35	15.69	18.22	21.10	25.23	69.15	171.12
1600	15	8.44	8.62	9.02	9.51	10.06	10.68	11.71	12.68	13.77	20.41	38.79
	20	9.96	10.27	10.84	11.54	12.35	13.27	14.87	16.50	18.49	36.62	88.69
	25	11.39	11.88	12.67	13.64	14.79	16.14	18.69	21.57	25.63	69.15	171.12
1700	15	8.70	8.89	9.29	9.79	10.36	10.99	12.04	13.03	14.14	20.81	38.84
	20	10.27	10.59	11.17	11.89	12.71	13.65	15.28	16.92	18.93	36.72	88.69
	25	11.75	12.24	13.05	14.04	15.21	16.58	19.16	22.03	26.03	69.15	171.12
1800	15	8.95	9.14	9.56	10.07	10.65	11.30	12.37	13.38	14.51	21.20	38.91
	20	10.57	10.90	11.49	12.23	13.07	14.02	15.68	17.34	19.36	36.85	88.69
	25	12.10	12.60	13.42	14.44	15.62	17.02	19.61	22.48	26.44	69.15	171.12
1900	15	9.20	9.39	9.81	10.34	10.94	11.59	12.69	13.71	14.86	21.59	38.99
	20	10.86	11.20	11.81	12.56	13.42	14.38	16.07	17.75	19.78	37.00	88.69
	25	12.44	12.95	13.79	14.82	16.03	17.44	20.06	22.93	26.85	69.15	171.12
2000	15	9.44	9.63	10.07	10.61	11.22	11.89	13.00	14.04	15.21	21.98	39.09
	20	11.15	11.49	12.12	12.88	13.75	14.74	16.45	18.15	20.19	37.17	88.69
	25	12.77	13.29	14.15	15.20	16.42	17.85	20.49	23.37	27.26	69.15	171.12

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	5.20	5.96	7.61	11.05	16.21	23.06	37.29	53.65	75.08	234.87	586.71
	20	6.45	8.89	14.88	23.78	35.95	52.10	85.68	124.33	175.01	553.26	1386.8
	25	8.20	15.17	27.43	44.78	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
200	15	6.70	7.47	8.86	11.45	16.23	23.06	37.29	53.65	75.08	234.87	586.71
	20	8.26	10.23	15.00	23.78	35.95	52.10	85.68	124.33	175.01	553.26	1386.8
	25	10.16	15.43	27.43	44.78	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
300	15	7.89	8.70	10.06	12.31	16.42	23.07	37.29	53.65	75.08	234.87	586.71
	20	9.71	11.60	15.58	23.80	35.95	52.10	85.68	124.33	175.01	553.26	1386.8
	25	11.82	16.28	27.43	44.78	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
400	15	8.93	9.77	11.14	13.26	16.88	23.12	37.29	53.65	75.08	234.87	586.71
	20	10.97	12.85	16.44	23.89	35.95	52.10	85.68	124.33	175.01	553.26	1386.8
	25	13.28	17.37	27.50	44.78	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
500	15	9.86	10.74	12.13	14.20	17.53	23.27	37.29	53.65	75.08	234.87	586.71
	20	12.11	13.99	17.39	24.15	35.95	52.10	85.68	124.33	175.01	553.26	1386.8
	25	14.60	18.51	27.70	44.78	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
600	15	10.71	11.62	13.05	15.10	18.26	23.56	37.29	53.65	75.08	234.87	586.71
	20	13.15	15.05	18.35	24.58	35.97	52.10	85.68	124.33	175.01	553.26	1386.8
	25	15.81	19.62	28.08	44.79	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
700	15	11.51	12.45	13.91	15.96	19.01	23.97	37.31	53.65	75.08	234.87	586.71
	20	14.12	16.05	19.29	25.13	36.03	52.10	85.68	124.33	175.01	553.26	1386.8
	25	16.94	20.70	28.61	44.80	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
800	15	12.26	13.23	14.72	16.78	19.76	24.46	37.34	53.65	75.08	234.87	586.71
	20	15.03	16.99	20.20	25.76	36.14	52.10	85.68	124.33	175.01	553.26	1386.8
	25	18.01	21.74	29.24	44.84	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
900	15	12.97	13.97	15.49	17.57	20.51	25.01	37.41	53.65	75.08	234.87	586.71
	20	15.90	17.89	21.08	26.44	36.32	52.11	85.68	124.33	175.01	553.26	1386.8
	25	19.02	22.74	29.93	44.91	68.48	99.97	165.45	240.85	339.77	1078.2	2705.7
1000	15	13.64	14.67	16.23	18.33	21.24	25.60	37.52	53.65	75.08	234.87	586.71
	20	16.73	18.74	21.94	27.14	36.57	52.12	85.68	124.33	175.01	553.26	1386.8
	25	19.98	23.70	30.67	45.03	68.49	99.97	165.45	240.85	339.77	1078.2	2705.7

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	14.29	15.34	16.93	19.06	21.96	26.21	37.68	53.65	75.08	234.87	586.71
	20	17.52	19.56	22.77	27.86	36.89	52.14	85.68	124.33	175.01	553.26	1386.8
	25	20.90	24.63	31.42	45.21	68.49	99.97	165.45	240.85	339.77	1078.2	2705.7
1200	15	14.92	15.99	17.61	19.76	22.66	26.82	37.89	53.67	75.08	234.87	586.71
	20	18.28	20.35	23.57	28.58	37.27	52.19	85.68	124.33	175.01	553.26	1386.8
	25	21.79	25.53	32.19	45.44	68.49	99.97	165.45	240.85	339.77	1078.2	2705.7
1300	15	15.52	16.62	18.27	20.44	23.34	27.44	38.14	53.69	75.08	234.87	586.71
	20	19.01	21.11	24.35	29.29	37.70	52.25	85.68	124.33	175.01	553.26	1386.8
	25	22.65	26.40	32.96	45.74	68.50	99.97	165.45	240.85	339.77	1078.2	2705.7
1400	15	16.11	17.23	18.91	21.10	24.01	28.06	38.44	53.72	75.08	234.87	586.71
	20	19.73	21.85	25.10	30.00	38.16	52.34	85.68	124.33	175.01	553.26	1386.8
	25	23.48	27.25	33.72	46.08	68.52	99.97	165.45	240.85	339.77	1078.2	2705.7
1500	15	16.68	17.81	19.52	21.75	24.66	28.68	38.78	53.77	75.08	234.87	586.71
	20	20.42	22.57	25.84	30.70	38.66	52.46	85.68	124.33	175.01	553.26	1386.8
	25	24.29	28.08	34.48	46.48	68.54	99.97	165.45	240.85	339.77	1078.2	2705.7
1600	15	17.23	18.39	20.12	22.37	25.30	29.29	39.15	53.84	75.09	234.87	586.71
	20	21.09	23.27	26.56	31.40	39.18	52.62	85.68	124.33	175.01	553.26	1386.8
	25	25.07	28.88	35.24	46.91	68.58	99.97	165.45	240.85	339.77	1078.2	2705.7
1700	15	17.77	18.94	20.71	22.98	25.92	29.89	39.54	53.92	75.09	234.87	586.71
	20	21.74	23.95	27.26	32.08	39.71	52.81	85.68	124.33	175.01	553.26	1386.8
	25	25.84	29.67	35.98	47.37	68.64	99.97	165.45	240.85	339.77	1078.2	2705.7
1800	15	18.29	19.49	21.28	23.58	26.53	30.49	39.96	54.04	75.09	234.87	586.71
	20	22.38	24.61	27.95	32.76	40.26	53.03	85.68	124.33	175.01	553.26	1386.8
	25	26.58	30.43	36.72	47.86	68.71	99.98	165.45	240.85	339.77	1078.2	2705.7
1900	15	18.80	20.02	21.83	24.16	27.13	31.08	40.39	54.17	75.10	234.87	586.71
	20	23.00	25.26	28.62	33.42	40.81	53.28	85.69	124.33	175.01	553.26	1386.8
	25	27.31	31.18	37.45	48.37	68.80	99.98	165.45	240.85	339.77	1078.2	2705.7
2000	15	19.30	20.54	22.38	24.73	27.72	31.66	40.84	54.33	75.11	234.87	586.71
	20	23.61	25.89	29.28	34.08	41.37	53.56	85.69	124.33	175.01	553.26	1386.8
	25	28.02	31.92	38.17	48.89	68.92	99.98	165.45	240.85	339.77	1078.2	2705.7

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	20.36	48.81	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	45.05	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.79	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
200	15	21.01	48.81	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	45.05	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.79	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
300	15	22.56	48.81	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	45.07	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.79	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
400	15	24.32	48.82	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	45.21	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.79	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
500	15	26.07	48.85	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	45.63	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.79	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
600	15	27.76	48.96	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	46.35	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.79	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
700	15	29.38	49.20	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	47.32	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.81	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
800	15	30.92	49.58	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	48.45	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.86	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
900	15	32.41	50.10	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	49.68	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	85.97	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1000	15	33.83	50.75	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	50.97	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	86.15	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 48.0 Ft (RADIUS = 33.9 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	35.21	51.48	91.14	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	52.29	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	86.43	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1200	15	36.53	52.29	91.15	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	53.62	112.65	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	86.82	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1300	15	37.82	53.14	91.17	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	54.95	112.66	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	87.30	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1400	15	39.07	54.04	91.21	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	56.27	112.68	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	87.89	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1500	15	40.28	54.95	91.26	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	57.58	112.71	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	88.56	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1600	15	41.46	55.88	91.33	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	58.88	112.75	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	89.31	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1700	15	42.62	56.82	91.43	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	60.16	112.81	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	90.13	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1800	15	43.74	57.77	91.57	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	61.43	112.90	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	91.00	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
1900	15	44.84	58.72	91.73	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	62.67	113.01	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	91.91	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.
2000	15	45.92	59.66	91.93	151.02	232.81	341.51	567.57	827.96	1169.6	3720.8	9344.8
	20	63.90	113.15	212.94	354.81	548.58	806.10	1341.8	1958.8	2768.5	8815.0	22145.
	25	92.87	217.89	413.75	690.78	1069.2	1572.1	2618.2	3823.3	5404.6	17214.	43249.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.75	1.72	1.76	1.83	1.90	1.99	2.13	2.25	2.39	3.06	4.27
	20	1.89	1.88	1.93	2.02	2.11	2.22	2.40	2.58	2.77	4.01	7.47
	25	2.03	2.03	2.10	2.21	2.33	2.47	2.72	2.96	3.27	6.03	12.99
200	15	2.10	2.08	2.13	2.21	2.30	2.41	2.58	2.73	2.89	3.65	4.79
	20	2.32	2.31	2.38	2.48	2.60	2.73	2.95	3.15	3.37	4.60	7.52
	25	2.52	2.53	2.62	2.75	2.90	3.07	3.35	3.63	3.95	6.25	12.99
300	15	2.38	2.37	2.43	2.52	2.63	2.74	2.93	3.10	3.29	4.13	5.31
	20	2.66	2.66	2.74	2.86	2.99	3.14	3.39	3.61	3.86	5.15	7.75
	25	2.91	2.93	3.04	3.19	3.35	3.54	3.86	4.16	4.51	6.69	12.99
400	15	2.63	2.62	2.69	2.79	2.91	3.04	3.25	3.43	3.63	4.54	5.77
	20	2.95	2.96	3.05	3.18	3.33	3.50	3.77	4.01	4.28	5.64	8.11
	25	3.25	3.28	3.40	3.56	3.75	3.96	4.30	4.63	5.00	7.17	13.02
500	15	2.85	2.84	2.92	3.03	3.16	3.30	3.52	3.73	3.94	4.92	6.20
	20	3.22	3.23	3.33	3.47	3.64	3.81	4.11	4.37	4.66	6.09	8.51
	25	3.56	3.59	3.72	3.90	4.10	4.33	4.70	5.05	5.44	7.64	13.09
600	15	3.06	3.05	3.13	3.25	3.39	3.54	3.78	4.00	4.22	5.26	6.60
	20	3.47	3.48	3.59	3.74	3.92	4.11	4.42	4.70	5.01	6.50	8.92
	25	3.84	3.88	4.02	4.21	4.43	4.67	5.07	5.43	5.84	8.09	13.24
700	15	3.25	3.24	3.33	3.46	3.61	3.77	4.02	4.25	4.49	5.58	6.97
	20	3.69	3.71	3.83	3.99	4.18	4.38	4.71	5.01	5.33	6.89	9.32
	25	4.11	4.15	4.30	4.50	4.73	4.99	5.40	5.79	6.22	8.52	13.45
800	15	3.43	3.43	3.52	3.66	3.81	3.98	4.25	4.49	4.74	5.88	7.32
	20	3.91	3.93	4.06	4.23	4.42	4.64	4.98	5.30	5.63	7.26	9.72
	25	4.36	4.40	4.56	4.78	5.02	5.28	5.72	6.13	6.57	8.93	13.71
900	15	3.60	3.60	3.70	3.84	4.00	4.18	4.46	4.71	4.98	6.16	7.65
	20	4.12	4.14	4.27	4.45	4.66	4.88	5.24	5.57	5.92	7.60	10.10
	25	4.59	4.64	4.81	5.04	5.29	5.57	6.03	6.45	6.91	9.33	14.00
1000	15	3.77	3.77	3.87	4.02	4.19	4.37	4.67	4.93	5.20	6.43	7.97
	20	4.31	4.34	4.48	4.67	4.88	5.11	5.49	5.83	6.20	7.93	10.46
	25	4.82	4.87	5.05	5.28	5.55	5.84	6.32	6.75	7.23	9.71	14.31

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	3.92	3.93	4.04	4.19	4.37	4.56	4.86	5.13	5.42	6.69	8.27
	20	4.50	4.53	4.67	4.87	5.09	5.34	5.73	6.08	6.46	8.25	10.82
	25	5.04	5.09	5.28	5.52	5.80	6.10	6.59	7.05	7.54	10.07	14.63
1200	15	4.08	4.08	4.19	4.35	4.54	4.73	5.05	5.33	5.63	6.94	8.57
	20	4.68	4.71	4.86	5.07	5.30	5.55	5.96	6.32	6.71	8.56	11.16
	25	5.25	5.30	5.50	5.75	6.04	6.35	6.86	7.33	7.83	10.42	14.96
1300	15	4.22	4.23	4.35	4.51	4.70	4.91	5.23	5.52	5.83	7.19	8.85
	20	4.86	4.89	5.05	5.26	5.50	5.76	6.18	6.56	6.96	8.85	11.50
	25	5.45	5.51	5.71	5.97	6.27	6.59	7.12	7.60	8.12	10.76	15.28
1400	15	4.37	4.37	4.50	4.67	4.86	5.07	5.41	5.71	6.02	7.42	9.12
	20	5.03	5.06	5.23	5.44	5.69	5.96	6.39	6.78	7.20	9.14	11.82
	25	5.65	5.71	5.92	6.18	6.49	6.82	7.37	7.86	8.40	11.09	15.61
1500	15	4.50	4.51	4.64	4.82	5.02	5.23	5.58	5.89	6.21	7.65	9.39
	20	5.20	5.23	5.40	5.62	5.88	6.15	6.60	7.00	7.43	9.41	12.14
	25	5.84	5.90	6.12	6.39	6.71	7.05	7.61	8.12	8.66	11.41	15.94
1600	15	4.64	4.65	4.78	4.96	5.17	5.39	5.75	6.07	6.40	7.87	9.65
	20	5.36	5.39	5.57	5.80	6.06	6.34	6.80	7.21	7.65	9.68	12.45
	25	6.02	6.09	6.31	6.59	6.92	7.27	7.84	8.36	8.93	11.72	16.26
1700	15	4.77	4.78	4.92	5.10	5.31	5.54	5.91	6.24	6.58	8.08	9.90
	20	5.52	5.55	5.73	5.97	6.24	6.53	7.00	7.42	7.87	9.95	12.76
	25	6.20	6.27	6.50	6.79	7.12	7.48	8.07	8.60	9.18	12.03	16.58
1800	15	4.90	4.91	5.05	5.24	5.46	5.69	6.07	6.40	6.75	8.29	10.15
	20	5.67	5.71	5.89	6.14	6.41	6.71	7.19	7.62	8.08	10.20	13.05
	25	6.38	6.45	6.68	6.98	7.32	7.69	8.30	8.84	9.43	12.32	16.89
1900	15	5.03	5.04	5.18	5.38	5.60	5.84	6.23	6.57	6.92	8.50	10.39
	20	5.82	5.86	6.05	6.30	6.58	6.89	7.38	7.82	8.29	10.45	13.34
	25	6.55	6.63	6.86	7.17	7.52	7.90	8.51	9.07	9.67	12.62	17.21
2000	15	5.15	5.16	5.31	5.51	5.74	5.98	6.38	6.73	7.09	8.70	10.62
	20	5.97	6.01	6.20	6.46	6.75	7.06	7.56	8.01	8.49	10.70	13.62
	25	6.72	6.80	7.04	7.36	7.71	8.10	8.73	9.30	9.91	12.90	17.52

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.89	2.93	3.08	3.28	3.54	3.85	4.51	5.37	6.72	17.68	41.29
	20	3.25	3.37	3.63	3.99	4.51	5.29	7.38	10.06	13.56	39.23	94.84
	25	3.62	3.85	4.30	5.02	6.26	8.34	12.91	18.12	24.90	74.78	183.11
200	15	3.62	3.68	3.87	4.11	4.40	4.75	5.40	6.13	7.17	17.68	41.29
	20	4.14	4.29	4.59	4.99	5.50	6.19	7.79	10.12	13.57	39.23	94.84
	25	4.65	4.92	5.40	6.08	7.08	8.67	12.92	18.12	24.90	74.78	183.11
300	15	4.21	4.29	4.49	4.77	5.09	5.47	6.15	6.88	7.84	17.68	41.29
	20	4.85	5.02	5.36	5.79	6.33	7.02	8.48	10.46	13.62	39.23	94.84
	25	5.48	5.78	6.29	6.99	7.95	9.34	13.03	18.12	24.90	74.78	183.11
400	15	4.72	4.81	5.04	5.34	5.69	6.10	6.82	7.56	8.50	17.69	41.29
	20	5.47	5.66	6.02	6.49	7.06	7.76	9.18	10.98	13.81	39.23	94.84
	25	6.20	6.52	7.07	7.80	8.75	10.07	13.35	18.16	24.90	74.78	183.11
500	15	5.18	5.28	5.53	5.85	6.23	6.66	7.41	8.18	9.12	17.75	41.29
	20	6.02	6.23	6.62	7.11	7.71	8.44	9.86	11.56	14.14	39.23	94.84
	25	6.84	7.19	7.77	8.52	9.49	10.78	13.82	18.27	24.91	74.78	183.11
600	15	5.60	5.71	5.98	6.32	6.72	7.18	7.97	8.75	9.71	17.87	41.29
	20	6.53	6.75	7.17	7.69	8.32	9.06	10.50	12.15	14.57	39.23	94.84
	25	7.43	7.80	8.41	9.19	10.18	11.46	14.35	18.48	24.93	74.78	183.11
700	15	6.00	6.11	6.40	6.76	7.19	7.66	8.48	9.29	10.26	18.08	41.29
	20	7.01	7.24	7.68	8.23	8.88	9.65	11.10	12.74	15.05	39.23	94.84
	25	7.98	8.37	9.00	9.82	10.83	12.12	14.92	18.78	24.98	74.78	183.11
800	15	6.37	6.49	6.80	7.18	7.62	8.11	8.97	9.80	10.79	18.35	41.29
	20	7.46	7.70	8.16	8.73	9.41	10.20	11.68	13.30	15.55	39.24	94.84
	25	8.50	8.91	9.56	10.40	11.44	12.74	15.49	19.16	25.08	74.78	183.11
900	15	6.72	6.85	7.17	7.57	8.03	8.54	9.43	10.29	11.29	18.67	41.29
	20	7.88	8.14	8.61	9.21	9.91	10.72	12.23	13.86	16.05	39.24	94.84
	25	9.00	9.41	10.10	10.96	12.02	13.33	16.05	19.57	25.22	74.78	183.11
1000	15	7.06	7.20	7.53	7.94	8.42	8.96	9.87	10.75	11.77	19.02	41.29
	20	8.29	8.56	9.05	9.67	10.39	11.22	12.75	14.39	16.56	39.24	94.84
	25	9.47	9.90	10.60	11.49	12.58	13.90	16.61	20.02	25.43	74.78	183.11

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	7.38	7.53	7.87	8.30	8.80	9.35	10.29	11.19	12.24	19.40	41.30
	20	8.68	8.96	9.47	10.10	10.85	11.70	13.26	14.91	17.05	39.24	94.84
	25	9.92	10.36	11.09	12.00	13.11	14.45	17.15	20.48	25.68	74.78	183.11
1200	15	7.69	7.85	8.20	8.65	9.16	9.73	10.69	11.62	12.68	19.79	41.30
	20	9.06	9.34	9.87	10.52	11.29	12.17	13.75	15.41	17.55	39.26	94.84
	25	10.36	10.81	11.56	12.50	13.62	14.98	17.68	20.95	25.97	74.78	183.11
1300	15	8.00	8.15	8.52	8.98	9.51	10.09	11.09	12.03	13.12	20.19	41.31
	20	9.42	9.71	10.26	10.93	11.71	12.61	14.22	15.90	18.03	39.28	94.84
	25	10.78	11.24	12.01	12.97	14.12	15.50	18.20	21.43	26.29	74.78	183.11
1400	15	8.29	8.45	8.83	9.30	9.85	10.45	11.46	12.43	13.53	20.59	41.32
	20	9.77	10.07	10.63	11.32	12.13	13.04	14.68	16.37	18.50	39.31	94.84
	25	11.19	11.66	12.45	13.43	14.60	16.00	18.71	21.90	26.63	74.78	183.11
1500	15	8.57	8.74	9.13	9.62	10.17	10.79	11.83	12.82	13.94	20.99	41.34
	20	10.11	10.42	11.00	11.70	12.53	13.46	15.13	16.83	18.97	39.35	94.84
	25	11.58	12.07	12.87	13.87	15.06	16.48	19.21	22.38	27.00	74.78	183.11
1600	15	8.85	9.02	9.42	9.92	10.49	11.13	12.19	13.20	14.34	21.39	41.36
	20	10.45	10.76	11.35	12.08	12.92	13.87	15.56	17.28	19.42	39.41	94.84
	25	11.97	12.46	13.29	14.31	15.52	16.96	19.70	22.84	27.38	74.78	183.11
1700	15	9.12	9.30	9.71	10.22	10.80	11.45	12.54	13.56	14.72	21.79	41.40
	20	10.77	11.09	11.70	12.44	13.29	14.27	15.98	17.72	19.87	39.49	94.84
	25	12.34	12.85	13.69	14.73	15.96	17.42	20.18	23.31	27.77	74.78	183.11
1800	15	9.38	9.56	9.98	10.51	11.11	11.77	12.88	13.92	15.10	22.19	41.45
	20	11.09	11.42	12.03	12.79	13.66	14.65	16.40	18.15	20.31	39.59	94.84
	25	12.71	13.22	14.08	15.14	16.39	17.87	20.65	23.77	28.16	74.78	183.11
1900	15	9.64	9.83	10.26	10.79	11.40	12.08	13.21	14.27	15.47	22.59	41.51
	20	11.39	11.73	12.36	13.13	14.02	15.03	16.80	18.58	20.74	39.71	94.84
	25	13.06	13.59	14.46	15.54	16.81	18.30	21.10	24.22	28.56	74.78	183.11
2000	15	9.89	10.08	10.52	11.07	11.69	12.38	13.53	14.61	15.83	22.98	41.59
	20	11.70	12.04	12.68	13.47	14.38	15.40	17.19	18.99	21.17	39.84	94.84
	25	13.41	13.95	14.84	15.93	17.22	18.73	21.55	24.67	28.96	74.78	183.11

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	5.49	6.36	8.36	12.37	18.12	25.70	41.34	59.20	82.51	254.27	628.08
	20	6.88	9.89	16.83	26.84	40.39	58.29	95.21	137.44	192.55	599.19	1484.8
	25	8.92	17.30	31.20	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
200	15	7.06	7.92	9.52	12.62	18.12	25.70	41.34	59.20	82.51	254.27	628.08
	20	8.77	11.11	16.89	26.84	40.39	58.29	95.21	137.44	192.55	599.19	1484.8
	25	10.91	17.44	31.20	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
300	15	8.32	9.21	10.74	13.37	18.23	25.70	41.34	59.20	82.51	254.27	628.08
	20	10.29	12.47	17.29	26.84	40.39	58.29	95.21	137.44	192.55	599.19	1484.8
	25	12.64	18.08	31.20	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
400	15	9.41	10.33	11.86	14.29	18.57	25.72	41.34	59.20	82.51	254.27	628.08
	20	11.62	13.75	18.04	26.88	40.39	58.29	95.21	137.44	192.55	599.19	1484.8
	25	14.16	19.06	31.23	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
500	15	10.38	11.34	12.88	15.22	19.12	25.81	41.34	59.20	82.51	254.27	628.08
	20	12.81	14.94	18.93	27.03	40.40	58.29	95.21	137.44	192.55	599.19	1484.8
	25	15.54	20.16	31.33	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
600	15	11.28	12.27	13.84	16.14	19.78	26.00	41.34	59.20	82.51	254.27	628.08
	20	13.91	16.05	19.86	27.33	40.40	58.29	95.21	137.44	192.55	599.19	1484.8
	25	16.81	21.26	31.57	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
700	15	12.12	13.14	14.73	17.02	20.50	26.31	41.34	59.20	82.51	254.27	628.08
	20	14.93	17.08	20.80	27.76	40.43	58.29	95.21	137.44	192.55	599.19	1484.8
	25	18.00	22.35	31.95	50.70	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
800	15	12.90	13.95	15.58	17.86	21.24	26.72	41.36	59.20	82.51	254.27	628.08
	20	15.89	18.07	21.72	28.30	40.48	58.29	95.21	137.44	192.55	599.19	1484.8
	25	19.12	23.41	32.45	50.72	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
900	15	13.65	14.73	16.38	18.67	21.98	27.21	41.39	59.20	82.51	254.27	628.08
	20	16.80	19.00	22.62	28.91	40.59	58.29	95.21	137.44	192.55	599.19	1484.8
	25	20.18	24.44	33.05	50.75	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
1000	15	14.36	15.47	17.15	19.45	22.72	27.74	41.45	59.21	82.51	254.27	628.08
	20	17.67	19.90	23.50	29.57	40.75	58.29	95.21	137.44	192.55	599.19	1484.8
	25	21.19	25.43	33.71	50.81	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	15.05	16.17	17.89	20.21	23.44	28.31	41.55	59.21	82.51	254.27	628.08
	20	18.50	20.75	24.35	30.25	40.97	58.30	95.21	137.44	192.55	599.19	1484.8
	25	22.16	26.39	34.41	50.90	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
1200	15	15.70	16.85	18.60	20.94	24.16	28.90	41.70	59.21	82.51	254.27	628.08
	20	19.30	21.58	25.17	30.95	41.25	58.32	95.21	137.44	192.55	599.19	1484.8
	25	23.10	27.33	35.14	51.05	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
1300	15	16.34	17.51	19.28	21.65	24.85	29.50	41.88	59.22	82.51	254.27	628.08
	20	20.07	22.38	25.98	31.65	41.59	58.35	95.21	137.44	192.55	599.19	1484.8
	25	24.00	28.23	35.88	51.24	77.13	112.01	184.03	266.43	373.98	1167.8	2897.1
1400	15	16.95	18.15	19.95	22.33	25.54	30.11	42.11	59.24	82.51	254.27	628.08
	20	20.82	23.15	26.76	32.36	41.98	58.40	95.21	137.44	192.55	599.19	1484.8
	25	24.88	29.11	36.63	51.48	77.14	112.01	184.03	266.43	373.98	1167.8	2897.1
1500	15	17.55	18.76	20.59	23.00	26.21	30.72	42.38	59.26	82.51	254.27	628.08
	20	21.55	23.91	27.53	33.06	42.40	58.47	95.21	137.44	192.55	599.19	1484.8
	25	25.72	29.97	37.38	51.77	77.15	112.01	184.03	266.43	373.98	1167.8	2897.1
1600	15	18.13	19.36	21.22	23.65	26.86	31.33	42.68	59.30	82.51	254.27	628.08
	20	22.25	24.64	28.27	33.75	42.86	58.56	95.21	137.44	192.55	599.19	1484.8
	25	26.55	30.81	38.13	52.10	77.16	112.01	184.03	266.43	373.98	1167.8	2897.1
1700	15	18.69	19.95	21.83	24.29	27.51	31.94	43.02	59.35	82.51	254.27	628.08
	20	22.94	25.35	29.00	34.45	43.34	58.68	95.21	137.44	192.55	599.19	1484.8
	25	27.35	31.63	38.88	52.47	77.19	112.01	184.03	266.43	373.98	1167.8	2897.1
1800	15	19.24	20.52	22.43	24.91	28.14	32.54	43.38	59.42	82.51	254.27	628.08
	20	23.61	26.04	29.72	35.13	43.84	58.83	95.21	137.44	192.55	599.19	1484.8
	25	28.13	32.43	39.62	52.88	77.22	112.01	184.03	266.43	373.98	1167.8	2897.1
1900	15	19.78	21.07	23.01	25.51	28.76	33.13	43.77	59.51	82.51	254.27	628.08
	20	24.27	26.72	30.41	35.81	44.36	59.00	95.21	137.44	192.55	599.19	1484.8
	25	28.90	33.21	40.36	53.32	77.27	112.01	184.03	266.43	373.98	1167.8	2897.1
2000	15	20.31	21.62	23.58	26.11	29.36	33.72	44.18	59.62	82.52	254.27	628.08
	20	24.91	27.39	31.10	36.47	44.90	59.21	95.22	137.44	192.55	599.19	1484.8
	25	29.64	33.98	41.09	53.78	77.33	112.01	184.03	266.43	373.98	1167.8	2897.1

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	23.41	56.07	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	52.19	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.64	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
200	15	23.78	56.07	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	52.19	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.64	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
300	15	25.04	56.07	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	52.19	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.64	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
400	15	26.69	56.07	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	52.24	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.64	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
500	15	28.42	56.08	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	52.44	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.64	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
600	15	30.12	56.12	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	52.87	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.65	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
700	15	31.77	56.23	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	53.56	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.65	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
800	15	33.36	56.44	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	54.46	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.66	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
900	15	34.90	56.77	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	55.51	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.70	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1000	15	36.38	57.22	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	56.66	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.77	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 50.0 Ft (RADIUS = 35.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	37.80	57.78	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	57.89	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	99.89	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1200	15	39.19	58.43	104.07	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	59.15	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	100.08	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1300	15	40.53	59.16	104.08	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	60.43	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	100.35	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1400	15	41.83	59.94	104.09	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	61.73	129.75	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	100.70	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1500	15	43.10	60.77	104.11	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	63.03	129.76	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	101.14	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1600	15	44.34	61.63	104.14	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	64.32	129.78	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	101.66	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1700	15	45.54	62.51	104.18	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	65.61	129.80	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	102.26	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1800	15	46.72	63.41	104.24	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	66.89	129.83	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	102.93	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
1900	15	47.88	64.33	104.32	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	68.15	129.87	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	103.66	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.
2000	15	49.00	65.25	104.42	171.36	262.58	383.00	631.69	916.29	1287.8	4030.6	10006.
	20	69.40	129.93	243.50	402.94	619.05	904.38	1493.7	2168.1	3048.5	9549.3	23713.
	25	104.45	251.22	473.37	784.72	1206.7	1763.9	2914.8	4232.0	5951.4	18648.	46311.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.82	1.79	1.83	1.89	1.97	2.05	2.19	2.32	2.46	3.15	4.43
	20	1.97	1.95	2.01	2.09	2.19	2.30	2.48	2.66	2.86	4.19	7.90
	25	2.12	2.12	2.19	2.29	2.42	2.56	2.82	3.08	3.40	6.42	13.80
200	15	2.19	2.16	2.21	2.29	2.38	2.49	2.66	2.81	2.97	3.76	4.95
	20	2.41	2.40	2.47	2.58	2.70	2.83	3.05	3.26	3.49	4.78	7.93
	25	2.63	2.64	2.73	2.86	3.01	3.18	3.48	3.76	4.10	6.60	13.80
300	15	2.48	2.46	2.52	2.61	2.72	2.84	3.03	3.20	3.38	4.25	5.47
	20	2.77	2.77	2.85	2.96	3.10	3.25	3.50	3.74	3.99	5.34	8.13
	25	3.04	3.05	3.16	3.31	3.48	3.68	4.01	4.32	4.68	7.01	13.80
400	15	2.74	2.72	2.79	2.89	3.01	3.14	3.35	3.54	3.74	4.67	5.95
	20	3.08	3.08	3.17	3.30	3.45	3.62	3.90	4.15	4.42	5.84	8.47
	25	3.40	3.42	3.54	3.70	3.89	4.11	4.46	4.80	5.18	7.49	13.81
500	15	2.97	2.96	3.03	3.14	3.27	3.41	3.64	3.85	4.06	5.06	6.38
	20	3.36	3.36	3.46	3.61	3.77	3.95	4.25	4.52	4.81	6.30	8.86
	25	3.72	3.74	3.88	4.06	4.26	4.49	4.88	5.23	5.64	7.96	13.87
600	15	3.19	3.17	3.26	3.37	3.51	3.66	3.91	4.13	4.36	5.41	6.79
	20	3.62	3.62	3.73	3.89	4.06	4.26	4.57	4.86	5.17	6.72	9.27
	25	4.02	4.05	4.19	4.38	4.60	4.85	5.25	5.63	6.05	8.42	13.99
700	15	3.39	3.38	3.46	3.59	3.74	3.90	4.16	4.39	4.63	5.74	7.17
	20	3.86	3.87	3.98	4.15	4.33	4.54	4.88	5.18	5.51	7.12	9.67
	25	4.29	4.33	4.48	4.68	4.92	5.18	5.61	6.00	6.44	8.86	14.18
800	15	3.58	3.57	3.66	3.79	3.95	4.12	4.39	4.63	4.89	6.05	7.53
	20	4.08	4.09	4.22	4.39	4.59	4.81	5.16	5.48	5.82	7.49	10.07
	25	4.55	4.59	4.75	4.97	5.21	5.49	5.94	6.35	6.81	9.28	14.41
900	15	3.76	3.75	3.85	3.99	4.15	4.33	4.61	4.87	5.13	6.34	7.87
	20	4.30	4.31	4.45	4.63	4.83	5.06	5.43	5.76	6.12	7.85	10.45
	25	4.80	4.84	5.01	5.24	5.50	5.78	6.25	6.68	7.16	9.68	14.69
1000	15	3.93	3.92	4.03	4.17	4.34	4.53	4.82	5.09	5.37	6.62	8.19
	20	4.51	4.52	4.66	4.85	5.06	5.30	5.69	6.03	6.40	8.19	10.82
	25	5.04	5.08	5.26	5.50	5.77	6.06	6.55	7.00	7.49	10.06	14.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.10	4.09	4.20	4.35	4.53	4.72	5.03	5.30	5.59	6.89	8.50
	20	4.70	4.72	4.87	5.06	5.29	5.53	5.93	6.29	6.68	8.52	11.19
	25	5.27	5.31	5.50	5.74	6.02	6.33	6.84	7.30	7.81	10.44	15.29
1200	15	4.26	4.25	4.36	4.52	4.70	4.90	5.22	5.51	5.80	7.15	8.81
	20	4.89	4.91	5.06	5.27	5.50	5.76	6.17	6.54	6.94	8.83	11.54
	25	5.48	5.53	5.73	5.98	6.27	6.59	7.11	7.59	8.11	10.80	15.61
1300	15	4.41	4.40	4.52	4.69	4.87	5.08	5.41	5.70	6.01	7.39	9.10
	20	5.08	5.10	5.26	5.47	5.71	5.97	6.40	6.78	7.19	9.13	11.88
	25	5.70	5.75	5.95	6.21	6.51	6.84	7.38	7.87	8.41	11.15	15.94
1400	15	4.56	4.55	4.68	4.85	5.04	5.25	5.59	5.90	6.21	7.64	9.38
	20	5.26	5.28	5.44	5.66	5.91	6.18	6.62	7.02	7.44	9.43	12.21
	25	5.90	5.96	6.16	6.44	6.74	7.08	7.64	8.15	8.70	11.49	16.26
1500	15	4.70	4.70	4.83	5.00	5.20	5.42	5.77	6.08	6.41	7.87	9.65
	20	5.43	5.45	5.62	5.85	6.10	6.38	6.84	7.24	7.68	9.71	12.54
	25	6.10	6.16	6.37	6.65	6.97	7.32	7.89	8.41	8.97	11.82	16.59
1600	15	4.84	4.84	4.97	5.15	5.36	5.58	5.95	6.27	6.60	8.10	9.92
	20	5.60	5.62	5.80	6.03	6.29	6.58	7.05	7.46	7.91	9.99	12.85
	25	6.30	6.35	6.58	6.86	7.19	7.55	8.13	8.67	9.24	12.14	16.91
1700	15	4.98	4.98	5.11	5.30	5.51	5.74	6.11	6.44	6.79	8.32	10.18
	20	5.76	5.79	5.97	6.21	6.48	6.77	7.25	7.68	8.13	10.26	13.16
	25	6.48	6.55	6.77	7.07	7.40	7.77	8.37	8.92	9.51	12.45	17.23
1800	15	5.12	5.12	5.25	5.44	5.66	5.90	6.28	6.61	6.97	8.53	10.43
	20	5.92	5.95	6.13	6.38	6.66	6.96	7.45	7.89	8.35	10.52	13.47
	25	6.67	6.73	6.97	7.27	7.61	7.99	8.60	9.16	9.76	12.75	17.55
1900	15	5.25	5.25	5.39	5.58	5.81	6.05	6.44	6.78	7.14	8.74	10.67
	20	6.08	6.11	6.30	6.55	6.83	7.14	7.64	8.09	8.57	10.78	13.76
	25	6.85	6.91	7.15	7.46	7.82	8.20	8.83	9.40	10.01	13.05	17.87
2000	15	5.38	5.38	5.52	5.72	5.95	6.20	6.60	6.95	7.32	8.95	10.92
	20	6.23	6.27	6.46	6.71	7.00	7.32	7.83	8.29	8.78	11.03	14.05
	25	7.03	7.09	7.34	7.65	8.01	8.41	9.05	9.63	10.26	13.35	18.18

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.01	3.06	3.21	3.42	3.69	4.03	4.76	5.72	7.23	18.99	44.04
	20	3.40	3.53	3.80	4.20	4.78	5.67	8.04	10.97	14.77	42.31	101.31
	25	3.79	4.05	4.55	5.37	6.83	9.19	14.20	19.87	27.23	80.75	195.72
200	15	3.78	3.84	4.03	4.28	4.59	4.95	5.65	6.45	7.61	18.99	44.04
	20	4.33	4.49	4.80	5.23	5.79	6.55	8.37	11.01	14.77	42.31	101.31
	25	4.88	5.17	5.69	6.44	7.57	9.42	14.20	19.87	27.23	80.75	195.72
300	15	4.40	4.47	4.69	4.97	5.31	5.70	6.43	7.21	8.26	18.99	44.04
	20	5.08	5.26	5.61	6.07	6.65	7.39	9.02	11.26	14.80	42.31	101.31
	25	5.75	6.07	6.62	7.38	8.44	10.02	14.27	19.87	27.23	80.75	195.72
400	15	4.93	5.02	5.26	5.57	5.93	6.35	7.11	7.90	8.92	19.00	44.04
	20	5.72	5.92	6.30	6.79	7.40	8.16	9.71	11.73	14.93	42.31	101.31
	25	6.50	6.84	7.43	8.21	9.26	10.73	14.51	19.89	27.23	80.75	195.72
500	15	5.41	5.51	5.77	6.10	6.49	6.94	7.73	8.54	9.55	19.03	44.04
	20	6.31	6.52	6.93	7.45	8.08	8.85	10.40	12.29	15.20	42.31	101.31
	25	7.17	7.54	8.16	8.97	10.02	11.45	14.90	19.96	27.23	80.75	195.72
600	15	5.86	5.96	6.24	6.59	7.01	7.48	8.30	9.14	10.15	19.13	44.04
	20	6.84	7.07	7.50	8.05	8.71	9.50	11.05	12.87	15.58	42.31	101.31
	25	7.79	8.18	8.82	9.66	10.73	12.14	15.40	20.11	27.24	80.75	195.72
700	15	6.27	6.39	6.68	7.05	7.49	7.98	8.84	9.69	10.72	19.29	44.04
	20	7.34	7.58	8.03	8.61	9.29	10.11	11.67	13.45	16.03	42.31	101.31
	25	8.37	8.78	9.45	10.31	11.40	12.81	15.94	20.35	27.27	80.75	195.72
800	15	6.66	6.78	7.09	7.48	7.94	8.45	9.34	10.22	11.26	19.52	44.04
	20	7.81	8.06	8.53	9.13	9.84	10.68	12.26	14.03	16.51	42.31	101.31
	25	8.92	9.34	10.03	10.92	12.03	13.44	16.49	20.66	27.33	80.75	195.72
900	15	7.03	7.16	7.48	7.89	8.37	8.90	9.82	10.72	11.78	19.80	44.04
	20	8.26	8.52	9.01	9.63	10.36	11.22	12.82	14.59	17.00	42.31	101.31
	25	9.44	9.87	10.59	11.51	12.64	14.06	17.05	21.04	27.43	80.75	195.72
1000	15	7.38	7.52	7.86	8.28	8.77	9.33	10.27	11.20	12.27	20.13	44.04
	20	8.68	8.96	9.47	10.11	10.86	11.74	13.37	15.13	17.50	42.31	101.31
	25	9.93	10.38	11.12	12.06	13.21	14.64	17.61	21.45	27.58	80.75	195.72

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	7.72	7.87	8.21	8.66	9.17	9.74	10.71	11.65	12.75	20.48	44.04
	20	9.09	9.37	9.90	10.56	11.34	12.24	13.89	15.66	18.00	42.31	101.31
	25	10.40	10.87	11.63	12.59	13.77	15.21	18.16	21.89	27.78	80.75	195.72
1200	15	8.05	8.20	8.56	9.02	9.54	10.13	11.13	12.10	13.21	20.86	44.04
	20	9.48	9.78	10.32	11.00	11.80	12.72	14.40	16.17	18.50	42.32	101.31
	25	10.86	11.33	12.12	13.10	14.30	15.76	18.70	22.34	28.02	80.75	195.72
1300	15	8.37	8.52	8.89	9.36	9.91	10.51	11.54	12.52	13.66	21.25	44.05
	20	9.87	10.17	10.73	11.42	12.24	13.18	14.89	16.68	18.98	42.33	101.31
	25	11.30	11.79	12.59	13.60	14.82	16.29	19.23	22.81	28.30	80.75	195.72
1400	15	8.67	8.83	9.22	9.70	10.26	10.88	11.93	12.94	14.09	21.64	44.05
	20	10.23	10.54	11.12	11.83	12.67	13.63	15.36	17.16	19.46	42.35	101.31
	25	11.73	12.23	13.05	14.08	15.32	16.81	19.75	23.28	28.61	80.75	195.72
1500	15	8.97	9.13	9.53	10.03	10.60	11.23	12.31	13.34	14.51	22.04	44.06
	20	10.59	10.91	11.50	12.23	13.09	14.07	15.82	17.64	19.94	42.38	101.31
	25	12.14	12.65	13.49	14.54	15.80	17.31	20.26	23.75	28.94	80.75	195.72
1600	15	9.26	9.43	9.83	10.34	10.93	11.58	12.68	13.73	14.92	22.44	44.08
	20	10.94	11.26	11.87	12.62	13.49	14.49	16.27	18.10	20.40	42.42	101.31
	25	12.54	13.06	13.92	14.99	16.27	17.80	20.76	24.21	29.29	80.75	195.72
1700	15	9.54	9.71	10.13	10.65	11.25	11.92	13.04	14.11	15.32	22.84	44.11
	20	11.28	11.61	12.23	13.00	13.89	14.90	16.71	18.56	20.86	42.47	101.31
	25	12.94	13.47	14.34	15.43	16.73	18.28	21.25	24.68	29.65	80.75	195.72
1800	15	9.81	9.99	10.42	10.96	11.57	12.25	13.39	14.48	15.70	23.24	44.14
	20	11.61	11.95	12.58	13.36	14.27	15.31	17.14	19.00	21.31	42.54	101.31
	25	13.32	13.86	14.75	15.86	17.18	18.75	21.73	25.14	30.03	80.75	195.72
1900	15	10.08	10.27	10.70	11.25	11.88	12.57	13.74	14.84	16.08	23.63	44.19
	20	11.93	12.28	12.92	13.72	14.65	15.70	17.55	19.43	21.75	42.63	101.31
	25	13.69	14.24	15.15	16.28	17.62	19.20	22.20	25.60	30.42	80.75	195.72
2000	15	10.35	10.53	10.98	11.54	12.18	12.89	14.07	15.19	16.46	24.03	44.24
	20	12.25	12.60	13.26	14.07	15.01	16.08	17.96	19.86	22.18	42.73	101.31
	25	14.06	14.62	15.54	16.69	18.05	19.65	22.67	26.05	30.81	80.75	195.72

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	5.79	6.80	9.21	13.81	20.19	28.56	45.72	65.19	90.47	274.85	671.61
	20	7.34	11.05	18.99	30.19	45.25	65.02	105.53	151.59	211.39	647.93	1587.9
	25	9.74	19.67	35.37	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
200	15	7.44	8.41	10.26	13.96	20.19	28.56	45.72	65.19	90.47	274.85	671.61
	20	9.30	12.09	19.01	30.19	45.25	65.02	105.53	151.59	211.39	647.93	1587.9
	25	11.72	19.73	35.37	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
300	15	8.76	9.75	11.48	14.57	20.25	28.57	45.72	65.19	90.47	274.85	671.61
	20	10.90	13.43	19.26	30.19	45.25	65.02	105.53	151.59	211.39	647.93	1587.9
	25	13.51	20.16	35.37	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
400	15	9.90	10.92	12.62	15.42	20.47	28.57	45.72	65.19	90.47	274.85	671.61
	20	12.29	14.74	19.85	30.20	45.25	65.02	105.53	151.59	211.39	647.93	1587.9
	25	15.09	20.99	35.37	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
500	15	10.92	11.97	13.68	16.34	20.91	28.62	45.72	65.19	90.47	274.85	671.61
	20	13.54	15.96	20.65	30.28	45.25	65.02	105.53	151.59	211.39	647.93	1587.9
	25	16.53	22.01	35.42	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
600	15	11.86	12.95	14.67	17.26	21.49	28.73	45.72	65.19	90.47	274.85	671.61
	20	14.69	17.10	21.55	30.46	45.26	65.02	105.53	151.59	211.39	647.93	1587.9
	25	17.86	23.09	35.54	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
700	15	12.74	13.85	15.60	18.15	22.16	28.95	45.72	65.19	90.47	274.85	671.61
	20	15.76	18.18	22.46	30.77	45.27	65.02	105.53	151.59	211.39	647.93	1587.9
	25	19.11	24.17	35.79	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
800	15	13.57	14.71	16.48	19.01	22.87	29.26	45.72	65.19	90.47	274.85	671.61
	20	16.77	19.20	23.38	31.20	45.29	65.02	105.53	151.59	211.39	647.93	1587.9
	25	20.28	25.24	36.15	57.20	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
900	15	14.35	15.52	17.31	19.84	23.60	29.67	45.74	65.19	90.47	274.85	671.61
	20	17.72	20.17	24.29	31.72	45.34	65.02	105.53	151.59	211.39	647.93	1587.9
	25	21.39	26.28	36.63	57.21	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
1000	15	15.10	16.29	18.11	20.65	24.33	30.14	45.77	65.20	90.47	274.85	671.61
	20	18.64	21.11	25.18	32.31	45.43	65.02	105.53	151.59	211.39	647.93	1587.9
	25	22.45	27.30	37.19	57.24	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	15.81	17.03	18.88	21.43	25.05	30.65	45.83	65.20	90.47	274.85	671.61
	20	19.51	22.00	26.05	32.93	45.57	65.02	105.53	151.59	211.39	647.93	1587.9
	25	23.47	28.29	37.81	57.28	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
1200	15	16.50	17.74	19.62	22.18	25.77	31.20	45.91	65.20	90.47	274.85	671.61
	20	20.35	22.87	26.90	33.59	45.76	65.03	105.53	151.59	211.39	647.93	1587.9
	25	24.45	29.25	38.47	57.36	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
1300	15	17.17	18.43	20.34	22.91	26.48	31.78	46.04	65.20	90.47	274.85	671.61
	20	21.16	23.70	27.72	34.27	46.01	65.04	105.53	151.59	211.39	647.93	1587.9
	25	25.40	30.18	39.17	57.47	86.57	125.11	204.15	294.01	410.73	1263.0	3098.5
1400	15	17.81	19.09	21.03	23.63	27.17	32.36	46.20	65.21	90.47	274.85	671.61
	20	21.95	24.51	28.53	34.95	46.30	65.06	105.53	151.59	211.39	647.93	1587.9
	25	26.32	31.10	39.88	57.62	86.58	125.11	204.15	294.01	410.73	1263.0	3098.5
1500	15	18.44	19.74	21.71	24.32	27.86	32.96	46.40	65.22	90.47	274.85	671.61
	20	22.71	25.30	29.32	35.64	46.64	65.10	105.53	151.59	211.39	647.93	1587.9
	25	27.20	31.99	40.61	57.81	86.58	125.11	204.15	294.01	410.73	1263.0	3098.5
1600	15	19.05	20.37	22.36	24.99	28.53	33.56	46.63	65.24	90.47	274.85	671.61
	20	23.45	26.06	30.09	36.33	47.03	65.15	105.53	151.59	211.39	647.93	1587.9
	25	28.07	32.86	41.35	58.04	86.58	125.11	204.15	294.01	410.73	1263.0	3098.5
1700	15	19.64	20.98	23.00	25.65	29.19	34.16	46.90	65.27	90.48	274.85	671.61
	20	24.17	26.80	30.85	37.02	47.44	65.22	105.53	151.59	211.39	647.93	1587.9
	25	28.91	33.71	42.08	58.32	86.59	125.11	204.15	294.01	410.73	1263.0	3098.5
1800	15	20.22	21.58	23.62	26.30	29.84	34.76	47.21	65.31	90.48	274.85	671.61
	20	24.88	27.53	31.59	37.71	47.88	65.30	105.53	151.59	211.39	647.93	1587.9
	25	29.73	34.54	42.82	58.63	86.61	125.11	204.15	294.01	410.73	1263.0	3098.5
1900	15	20.78	22.16	24.23	26.93	30.47	35.35	47.54	65.36	90.48	274.85	671.61
	20	25.56	28.24	32.31	38.39	48.35	65.42	105.53	151.59	211.39	647.93	1587.9
	25	30.54	35.35	43.55	58.98	86.63	125.11	204.15	294.01	410.73	1263.0	3098.5
2000	15	21.33	22.73	24.82	27.55	31.10	35.95	47.89	65.42	90.48	274.85	671.61
	20	26.23	28.94	33.02	39.07	48.84	65.55	105.53	151.59	211.39	647.93	1587.9
	25	31.32	36.15	44.29	59.36	86.66	125.11	204.15	294.01	410.73	1263.0	3098.5

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX $(Ft*s)^{1/2}$	RATE OF RISE °F/min	CEILING HEIGHT, Ft 4	8	12	16	20	24	30	35	40	60	80
100	15	26.82	64.13	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.17	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
200	15	27.00	64.13	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.17	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
300	15	27.92	64.13	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.17	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
400	15	29.39	64.13	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.18	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
500	15	31.05	64.13	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.26	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
600	15	32.73	64.14	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.47	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
700	15	34.40	64.18	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	60.89	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
800	15	36.02	64.28	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	61.52	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
900	15	37.59	64.46	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	62.33	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.15	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1000	15	39.12	64.73	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	63.29	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.17	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 52.0 Ft (RADIUS = 36.8 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	40.59	65.11	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	64.36	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.22	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1200	15	42.03	65.58	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	65.50	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.29	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1300	15	43.42	66.14	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	66.69	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.41	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1400	15	44.78	66.78	118.35	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	67.92	148.74	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.59	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1500	15	46.10	67.48	118.36	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	69.17	148.75	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	115.83	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1600	15	47.39	68.23	118.37	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	70.43	148.75	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	116.14	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1700	15	48.64	69.02	118.39	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	71.70	148.76	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	116.52	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1800	15	49.87	69.84	118.41	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	72.97	148.76	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	116.97	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
1900	15	51.08	70.69	118.44	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	74.23	148.78	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	117.48	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.
2000	15	52.26	71.56	118.49	193.71	295.12	428.18	701.11	1011.5	1414.7	4359.3	10702.
	20	75.48	148.80	277.26	455.82	696.11	1011.4	1658.2	2393.8	3349.2	10328.	25362.
	25	118.06	288.25	539.24	887.95	1357.2	1972.9	3236.0	4672.6	6538.7	20169.	49532.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.89	1.85	1.89	1.95	2.03	2.12	2.26	2.39	2.53	3.24	4.61
	20	2.05	2.03	2.08	2.16	2.26	2.38	2.57	2.75	2.96	4.39	8.34
	25	2.21	2.20	2.27	2.38	2.51	2.66	2.92	3.20	3.55	6.84	14.64
200	15	2.27	2.24	2.29	2.37	2.46	2.57	2.74	2.89	3.06	3.86	5.11
	20	2.51	2.50	2.57	2.67	2.79	2.93	3.15	3.37	3.60	4.96	8.36
	25	2.74	2.74	2.84	2.97	3.12	3.30	3.61	3.90	4.26	6.97	14.64
300	15	2.58	2.56	2.61	2.70	2.81	2.93	3.12	3.30	3.49	4.37	5.64
	20	2.89	2.88	2.96	3.07	3.21	3.37	3.62	3.86	4.12	5.52	8.53
	25	3.17	3.18	3.29	3.44	3.62	3.81	4.15	4.48	4.85	7.35	14.65
400	15	2.85	2.83	2.89	2.99	3.11	3.24	3.46	3.65	3.85	4.81	6.12
	20	3.21	3.20	3.30	3.43	3.58	3.75	4.03	4.29	4.57	6.04	8.84
	25	3.54	3.56	3.68	3.85	4.04	4.26	4.63	4.98	5.37	7.82	14.65
500	15	3.10	3.07	3.15	3.26	3.39	3.53	3.76	3.97	4.18	5.20	6.57
	20	3.50	3.50	3.60	3.74	3.91	4.09	4.40	4.67	4.97	6.51	9.22
	25	3.88	3.90	4.03	4.21	4.42	4.66	5.05	5.42	5.84	8.29	14.70
600	15	3.32	3.30	3.38	3.50	3.64	3.79	4.03	4.25	4.49	5.56	6.98
	20	3.77	3.77	3.88	4.03	4.21	4.41	4.73	5.03	5.34	6.94	9.63
	25	4.19	4.21	4.36	4.55	4.78	5.03	5.45	5.84	6.27	8.76	14.79
700	15	3.53	3.51	3.60	3.72	3.87	4.03	4.29	4.52	4.77	5.90	7.37
	20	4.02	4.02	4.14	4.30	4.49	4.70	5.04	5.35	5.69	7.35	10.03
	25	4.48	4.51	4.66	4.87	5.10	5.37	5.81	6.22	6.67	9.20	14.95
800	15	3.73	3.71	3.80	3.93	4.09	4.26	4.53	4.78	5.04	6.22	7.74
	20	4.26	4.26	4.39	4.56	4.76	4.98	5.34	5.66	6.01	7.74	10.43
	25	4.75	4.78	4.95	5.16	5.41	5.69	6.15	6.58	7.05	9.63	15.16
900	15	3.92	3.90	4.00	4.13	4.30	4.47	4.76	5.02	5.29	6.52	8.09
	20	4.48	4.49	4.62	4.80	5.01	5.24	5.62	5.96	6.32	8.10	10.82
	25	5.01	5.04	5.22	5.44	5.71	6.00	6.48	6.92	7.41	10.04	15.41
1000	15	4.10	4.08	4.18	4.33	4.50	4.68	4.98	5.25	5.53	6.81	8.42
	20	4.70	4.71	4.84	5.03	5.25	5.49	5.88	6.24	6.62	8.45	11.20
	25	5.26	5.29	5.47	5.71	5.99	6.29	6.79	7.25	7.75	10.44	15.69

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.27	4.25	4.36	4.51	4.69	4.88	5.19	5.47	5.76	7.08	8.74
	20	4.90	4.91	5.06	5.26	5.48	5.73	6.14	6.50	6.90	8.79	11.56
	25	5.49	5.54	5.72	5.97	6.25	6.57	7.09	7.56	8.08	10.82	15.99
1200	15	4.44	4.42	4.53	4.69	4.87	5.07	5.40	5.68	5.98	7.35	9.05
	20	5.10	5.12	5.27	5.47	5.71	5.96	6.38	6.76	7.17	9.11	11.92
	25	5.72	5.77	5.96	6.22	6.51	6.84	7.37	7.86	8.40	11.19	16.30
1300	15	4.60	4.58	4.70	4.86	5.05	5.26	5.59	5.89	6.20	7.61	9.35
	20	5.30	5.31	5.46	5.68	5.92	6.19	6.62	7.01	7.43	9.42	12.27
	25	5.95	5.99	6.19	6.46	6.76	7.10	7.65	8.15	8.70	11.54	16.62
1400	15	4.75	4.74	4.86	5.03	5.22	5.44	5.78	6.09	6.41	7.85	9.64
	20	5.48	5.50	5.66	5.88	6.13	6.40	6.85	7.25	7.68	9.72	12.61
	25	6.16	6.21	6.42	6.69	7.00	7.35	7.92	8.44	9.00	11.89	16.94
1500	15	4.90	4.89	5.01	5.19	5.39	5.61	5.96	6.28	6.61	8.09	9.92
	20	5.66	5.68	5.85	6.07	6.33	6.61	7.07	7.49	7.93	10.02	12.94
	25	6.37	6.42	6.63	6.91	7.24	7.59	8.18	8.71	9.29	12.23	17.27
1600	15	5.05	5.04	5.17	5.35	5.55	5.78	6.14	6.47	6.81	8.33	10.19
	20	5.84	5.86	6.03	6.26	6.53	6.82	7.29	7.72	8.17	10.30	13.27
	25	6.57	6.62	6.84	7.13	7.47	7.83	8.43	8.97	9.57	12.56	17.59
1700	15	5.19	5.18	5.31	5.50	5.71	5.94	6.32	6.65	7.00	8.56	10.45
	20	6.01	6.03	6.21	6.44	6.72	7.02	7.50	7.94	8.40	10.58	13.58
	25	6.77	6.82	7.05	7.35	7.69	8.06	8.67	9.23	9.84	12.88	17.92
1800	15	5.33	5.32	5.46	5.65	5.87	6.10	6.49	6.83	7.18	8.78	10.71
	20	6.18	6.20	6.38	6.62	6.90	7.21	7.71	8.15	8.63	10.85	13.89
	25	6.96	7.02	7.25	7.55	7.90	8.29	8.91	9.48	10.10	13.19	18.24
1900	15	5.47	5.46	5.60	5.79	6.02	6.26	6.65	7.00	7.37	8.99	10.97
	20	6.34	6.36	6.55	6.80	7.09	7.40	7.91	8.36	8.85	11.12	14.20
	25	7.15	7.21	7.45	7.76	8.12	8.51	9.15	9.73	10.36	13.50	18.56
2000	15	5.61	5.60	5.74	5.94	6.17	6.42	6.82	7.17	7.55	9.21	11.21
	20	6.50	6.53	6.72	6.97	7.27	7.59	8.11	8.57	9.07	11.37	14.49
	25	7.33	7.39	7.64	7.96	8.32	8.72	9.38	9.97	10.61	13.80	18.87

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACINC = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.14	3.18	3.34	3.57	3.85	4.22	5.02	6.11	7.79	20.38	46.92
	20	3.55	3.69	3.98	4.42	5.07	6.10	8.76	11.95	16.06	45.56	108.11
	25	3.97	4.26	4.81	5.76	7.47	10.11	15.58	21.76	29.72	87.08	208.98
200	15	3.95	4.01	4.20	4.46	4.78	5.17	5.92	6.80	8.10	20.38	46.92
	20	4.53	4.69	5.03	5.49	6.09	6.93	9.01	11.97	16.06	45.56	108.11
	25	5.11	5.42	5.99	6.82	8.11	10.26	15.59	21.76	29.72	87.08	208.98
300	15	4.59	4.67	4.89	5.18	5.53	5.94	6.71	7.56	8.71	20.38	46.92
	20	5.31	5.50	5.86	6.35	6.98	7.79	9.60	12.15	16.08	45.56	108.11
	25	6.02	6.36	6.96	7.79	8.97	10.78	15.62	21.76	29.72	87.08	208.98
400	15	5.15	5.24	5.48	5.80	6.18	6.62	7.42	8.26	9.36	20.38	46.92
	20	5.98	6.19	6.59	7.11	7.76	8.57	10.28	12.56	16.16	45.56	108.11
	25	6.80	7.17	7.80	8.65	9.80	11.46	15.79	21.76	29.72	87.08	208.98
500	15	5.65	5.75	6.01	6.36	6.76	7.23	8.06	8.92	10.00	20.41	46.92
	20	6.59	6.81	7.24	7.79	8.46	9.29	10.97	13.08	16.37	45.56	108.11
	25	7.51	7.90	8.56	9.43	10.58	12.16	16.11	21.80	29.72	87.08	208.98
600	15	6.12	6.22	6.50	6.87	7.30	7.79	8.65	9.53	10.61	20.47	46.92
	20	7.15	7.39	7.84	8.41	9.11	9.96	11.63	13.64	16.70	45.56	108.11
	25	8.16	8.57	9.25	10.15	11.31	12.86	16.55	21.90	29.72	87.08	208.98
700	15	6.55	6.66	6.96	7.35	7.80	8.31	9.20	10.10	11.20	20.59	46.92
	20	7.67	7.92	8.39	9.00	9.72	10.58	12.26	14.22	17.10	45.56	108.11
	25	8.77	9.19	9.90	10.83	12.00	13.54	17.05	22.08	29.74	87.08	208.98
800	15	6.95	7.08	7.39	7.79	8.26	8.80	9.72	10.65	11.75	20.78	46.92
	20	8.17	8.43	8.92	9.54	10.29	11.18	12.87	14.80	17.55	45.56	108.11
	25	9.34	9.78	10.52	11.46	12.66	14.19	17.59	22.33	29.77	87.08	208.98
900	15	7.34	7.47	7.80	8.22	8.71	9.26	10.22	11.16	12.28	21.03	46.92
	20	8.63	8.90	9.42	10.06	10.83	11.74	13.45	15.36	18.03	45.56	108.11
	25	9.88	10.34	11.10	12.07	13.28	14.82	18.14	22.66	29.84	87.08	208.98
1000	15	7.71	7.85	8.19	8.63	9.13	9.70	10.69	11.65	12.79	21.32	46.92
	20	9.08	9.36	9.89	10.56	11.35	12.28	14.01	15.91	18.52	45.56	108.11
	25	10.40	10.87	11.65	12.65	13.88	15.42	18.69	23.03	29.94	87.08	208.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	8.07	8.21	8.56	9.02	9.54	10.13	11.14	12.13	13.28	21.65	46.92
	20	9.51	9.80	10.34	11.03	11.85	12.80	14.55	16.45	19.01	45.56	108.11
	25	10.89	11.38	12.18	13.20	14.45	16.01	19.24	23.43	30.09	87.08	208.98
1200	15	8.41	8.55	8.92	9.39	9.93	10.54	11.58	12.58	13.76	22.01	46.93
	20	9.92	10.22	10.78	11.49	12.32	13.29	15.07	16.98	19.51	45.57	108.11
	25	11.37	11.87	12.69	13.73	15.01	16.57	19.79	23.86	30.28	87.08	208.98
1300	15	8.74	8.89	9.27	9.75	10.31	10.93	12.00	13.03	14.22	22.38	46.93
	20	10.32	10.62	11.20	11.93	12.78	13.77	15.58	17.49	20.00	45.57	108.11
	25	11.83	12.34	13.18	14.25	15.54	17.12	20.32	24.31	30.51	87.08	208.98
1400	15	9.06	9.21	9.61	10.10	10.67	11.31	12.40	13.45	14.66	22.76	46.93
	20	10.70	11.02	11.61	12.36	13.23	14.24	16.07	17.99	20.48	45.58	108.11
	25	12.28	12.80	13.66	14.74	16.06	17.66	20.85	24.76	30.77	87.08	208.98
1500	15	9.37	9.53	9.93	10.44	11.03	11.68	12.80	13.87	15.09	23.15	46.94
	20	11.08	11.40	12.01	12.77	13.66	14.69	16.54	18.48	20.96	45.60	108.11
	25	12.71	13.24	14.12	15.23	16.56	18.18	21.37	25.22	31.07	87.08	208.98
1600	15	9.67	9.84	10.25	10.77	11.37	12.04	13.18	14.27	15.52	23.55	46.95
	20	11.44	11.77	12.39	13.17	14.08	15.13	17.01	18.96	21.43	45.63	108.11
	25	13.13	13.67	14.57	15.70	17.05	18.68	21.88	25.69	31.38	87.08	208.98
1700	15	9.97	10.14	10.56	11.09	11.71	12.40	13.56	14.66	15.93	23.94	46.97
	20	11.80	12.13	12.77	13.57	14.49	15.56	17.46	19.42	21.90	45.66	108.11
	25	13.54	14.09	15.01	16.16	17.53	19.18	22.38	26.15	31.72	87.08	208.98
1800	15	10.25	10.43	10.86	11.41	12.04	12.74	13.92	15.05	16.33	24.34	46.99
	20	12.14	12.48	13.14	13.95	14.89	15.97	17.90	19.88	22.35	45.71	108.11
	25	13.94	14.50	15.44	16.60	17.99	19.66	22.87	26.61	32.07	87.08	208.98
1900	15	10.53	10.71	11.15	11.72	12.36	13.07	14.28	15.42	16.72	24.74	47.02
	20	12.48	12.83	13.49	14.32	15.28	16.38	18.33	20.33	22.80	45.77	108.11
	25	14.33	14.90	15.85	17.04	18.45	20.13	23.36	27.07	32.44	87.08	208.98
2000	15	10.81	10.99	11.44	12.02	12.67	13.40	14.63	15.79	17.10	25.13	47.06
	20	12.81	13.17	13.84	14.69	15.67	16.78	18.76	20.76	23.25	45.85	108.11
	25	14.72	15.30	16.26	17.46	18.89	20.59	23.83	27.53	32.81	87.08	208.98

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	6.10	7.28	10.17	15.38	22.45	31.67	50.44	71.64	99.02	296.66	717.36
	20	7.83	12.36	21.36	33.85	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	10.67	22.29	39.95	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
200	15	7.82	8.92	11.08	15.46	22.46	31.67	50.44	71.64	99.02	296.66	717.36
	20	9.87	13.19	21.37	33.85	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	12.61	22.31	39.95	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
300	15	9.20	10.31	12.28	15.92	22.48	31.67	50.44	71.64	99.02	296.66	717.36
	20	11.54	14.49	21.51	33.85	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	14.44	22.56	39.95	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
400	15	10.40	11.53	13.44	16.69	22.61	31.68	50.44	71.64	99.02	296.66	717.36
	20	12.99	15.80	21.93	33.86	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	16.08	23.21	39.95	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
500	15	11.47	12.63	14.52	17.57	22.93	31.70	50.44	71.64	99.02	296.66	717.36
	20	14.30	17.04	22.61	33.89	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	17.58	24.11	39.96	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
600	15	12.46	13.64	15.54	18.47	23.42	31.76	50.44	71.64	99.02	296.66	717.36
	20	15.50	18.22	23.43	33.99	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	18.97	25.12	40.02	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
700	15	13.38	14.59	16.51	19.37	24.01	31.90	50.44	71.64	99.02	296.66	717.36
	20	16.62	19.34	24.31	34.19	50.55	72.32	116.68	166.80	231.58	699.58	1696.3
	25	20.26	26.18	40.16	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
800	15	14.24	15.48	17.42	20.24	24.67	32.12	50.45	71.64	99.02	296.66	717.36
	20	17.68	20.40	25.21	34.50	50.56	72.32	116.68	166.80	231.58	699.58	1696.3
	25	21.49	27.24	40.40	64.31	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
900	15	15.07	16.33	18.29	21.09	25.37	32.43	50.45	71.64	99.02	296.66	717.36
	20	18.68	21.41	26.11	34.91	50.59	72.32	116.68	166.80	231.58	699.58	1696.3
	25	22.65	28.29	40.74	64.32	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
1000	15	15.85	17.13	19.12	21.92	26.09	32.82	50.47	71.64	99.02	296.66	717.36
	20	19.63	22.38	27.01	35.40	50.63	72.32	116.68	166.80	231.58	699.58	1696.3
	25	23.76	29.32	41.17	64.32	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	16.60	17.91	19.92	22.72	26.80	33.27	50.50	71.64	99.02	296.66	717.36
	20	20.55	23.31	27.89	35.96	50.71	72.33	116.68	166.80	231.58	699.58	1696.3
	25	24.83	30.33	41.69	64.34	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
1200	15	17.32	18.65	20.69	23.50	27.52	33.77	50.54	71.64	99.02	296.66	717.36
	20	21.43	24.21	28.75	36.56	50.83	72.33	116.68	166.80	231.58	699.58	1696.3
	25	25.86	31.31	42.26	64.38	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
1300	15	18.02	19.37	21.44	24.25	28.23	34.29	50.62	71.64	99.02	296.66	717.36
	20	22.28	25.08	29.59	37.19	50.99	72.33	116.68	166.80	231.58	699.58	1696.3
	25	26.85	32.28	42.89	64.43	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
1400	15	18.69	20.07	22.16	24.99	28.93	34.85	50.72	71.64	99.02	296.66	717.36
	20	23.10	25.92	30.42	37.84	51.19	72.34	116.68	166.80	231.58	699.58	1696.3
	25	27.81	33.22	43.55	64.51	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
1500	15	19.35	20.74	22.86	25.70	29.63	35.41	50.86	71.65	99.02	296.66	717.36
	20	23.90	26.74	31.23	38.50	51.45	72.36	116.68	166.80	231.58	699.58	1696.3
	25	28.74	34.14	44.23	64.62	96.87	139.34	225.88	323.69	450.12	1363.8	3310.2
1600	15	19.98	21.40	23.54	26.40	30.31	35.99	51.03	71.66	99.02	296.66	717.36
	20	24.68	27.54	32.03	39.18	51.74	72.38	116.68	166.80	231.58	699.58	1696.3
	25	29.64	35.04	44.93	64.77	96.88	139.34	225.88	323.69	450.12	1363.8	3310.2
1700	15	20.60	22.04	24.21	27.09	30.98	36.58	51.23	71.67	99.02	296.66	717.36
	20	25.43	28.32	32.81	39.85	52.07	72.42	116.68	166.80	231.58	699.58	1696.3
	25	30.53	35.92	45.64	64.95	96.88	139.34	225.88	323.69	450.12	1363.8	3310.2
1800	15	21.21	22.66	24.85	27.75	31.64	37.17	51.47	71.69	99.02	296.66	717.36
	20	26.17	29.08	33.57	40.53	52.44	72.46	116.68	166.80	231.58	699.58	1696.3
	25	31.39	36.78	46.36	65.17	96.88	139.34	225.88	323.69	450.12	1363.8	3310.2
1900	15	21.80	23.27	25.49	28.41	32.30	37.76	51.74	71.72	99.02	296.66	717.36
	20	26.89	29.82	34.32	41.21	52.84	72.53	116.68	166.80	231.58	699.58	1696.3
	25	32.23	37.62	47.08	65.43	96.89	139.34	225.88	323.69	450.12	1363.8	3310.2
2000	15	22.38	23.87	26.11	29.05	32.94	38.35	52.03	71.76	99.02	296.66	717.36
	20	27.59	30.54	35.05	41.89	53.27	72.61	116.68	166.80	231.58	699.58	1696.3
	25	33.05	38.45	47.80	65.72	96.90	139.34	225.88	323.69	450.12	1363.8	3310.2

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	30.62	73.04	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.04	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
200	15	30.69	73.04	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.04	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
300	15	31.29	73.04	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.04	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
400	15	32.50	73.04	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.05	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
500	15	34.02	73.04	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.07	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
600	15	35.65	73.05	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.16	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
700	15	37.30	73.06	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.37	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.39	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
800	15	38.93	73.10	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	69.75	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.40	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
900	15	40.53	73.18	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	70.31	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.40	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1000	15	42.08	73.32	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	71.02	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.40	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 54.0 Ft (RADIUS = 38.2 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	43.60	73.54	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	71.88	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.41	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1200	15	45.08	73.84	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	72.85	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.44	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1300	15	46.52	74.23	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	73.90	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.49	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1400	15	47.92	74.69	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	75.01	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.56	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1500	15	49.29	75.24	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	76.16	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.67	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1600	15	50.63	75.84	134.07	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	77.35	169.77	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	132.82	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1700	15	51.93	76.51	134.08	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	78.57	169.78	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	133.02	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1800	15	53.21	77.22	134.09	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	79.79	169.78	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	133.28	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
1900	15	54.47	77.97	134.10	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	81.02	169.78	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	133.59	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.
2000	15	55.69	78.75	134.12	218.19	330.62	477.26	776.12	1114.0	1550.7	4707.8	11434.
	20	82.26	169.79	314.43	513.77	780.17	1127.6	1835.9	2636.6	3671.7	11154.	27096.
	25	133.96	329.25	611.77	1001.1	1521.3	2199.9	3583.0	5146.8	7168.4	21783.	52919.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	1.96	1.92	1.96	2.02	2.09	2.18	2.32	2.46	2.60	3.34	4.80
	20	2.13	2.10	2.16	2.24	2.34	2.45	2.65	2.84	3.06	4.59	8.81
	25	2.29	2.28	2.36	2.46	2.60	2.75	3.03	3.32	3.70	7.28	15.53
200	15	2.36	2.33	2.37	2.45	2.54	2.65	2.82	2.98	3.15	3.97	5.28
	20	2.61	2.59	2.66	2.76	2.89	3.03	3.26	3.48	3.72	5.15	8.82
	25	2.85	2.85	2.94	3.08	3.24	3.42	3.74	4.05	4.42	7.38	15.53
300	15	2.69	2.65	2.71	2.80	2.91	3.02	3.22	3.40	3.59	4.49	5.81
	20	3.00	2.99	3.07	3.19	3.33	3.48	3.74	3.99	4.25	5.72	8.95
	25	3.30	3.31	3.42	3.57	3.75	3.95	4.30	4.64	5.03	7.72	15.53
400	15	2.97	2.94	3.00	3.10	3.22	3.35	3.57	3.76	3.97	4.94	6.30
	20	3.34	3.33	3.42	3.55	3.71	3.88	4.16	4.43	4.72	6.24	9.24
	25	3.69	3.70	3.82	3.99	4.19	4.41	4.79	5.15	5.57	8.17	15.54
500	15	3.22	3.19	3.26	3.37	3.50	3.64	3.88	4.09	4.31	5.35	6.76
	20	3.64	3.64	3.74	3.88	4.05	4.23	4.54	4.83	5.13	6.72	9.61
	25	4.04	4.06	4.19	4.37	4.59	4.83	5.23	5.62	6.05	8.64	15.57
600	15	3.46	3.43	3.50	3.62	3.76	3.91	4.16	4.39	4.62	5.72	7.18
	20	3.92	3.92	4.03	4.18	4.36	4.56	4.89	5.19	5.52	7.17	10.00
	25	4.36	4.38	4.53	4.73	4.95	5.21	5.64	6.04	6.49	9.11	15.64
700	15	3.67	3.65	3.73	3.85	4.00	4.16	4.43	4.66	4.91	6.07	7.58
	20	4.19	4.18	4.30	4.46	4.65	4.87	5.21	5.53	5.87	7.59	10.41
	25	4.66	4.69	4.84	5.05	5.29	5.57	6.02	6.44	6.91	9.56	15.77
800	15	3.88	3.85	3.94	4.07	4.23	4.40	4.68	4.93	5.19	6.39	7.95
	20	4.43	4.43	4.56	4.73	4.93	5.15	5.52	5.85	6.21	7.98	10.81
	25	4.95	4.98	5.14	5.36	5.62	5.90	6.37	6.81	7.30	10.00	15.95
900	15	4.08	4.05	4.14	4.28	4.45	4.62	4.92	5.18	5.45	6.70	8.31
	20	4.67	4.67	4.80	4.98	5.19	5.42	5.81	6.15	6.53	8.36	11.20
	25	5.22	5.25	5.42	5.65	5.92	6.22	6.71	7.17	7.67	10.41	16.18
1000	15	4.26	4.24	4.34	4.48	4.65	4.84	5.14	5.41	5.70	7.00	8.65
	20	4.89	4.89	5.03	5.22	5.44	5.68	6.08	6.44	6.83	8.72	11.58
	25	5.48	5.51	5.69	5.93	6.21	6.52	7.03	7.50	8.02	10.82	16.45

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.44	4.42	4.52	4.67	4.85	5.05	5.36	5.64	5.94	7.28	8.98
	20	5.11	5.11	5.25	5.45	5.68	5.93	6.35	6.72	7.12	9.06	11.96
	25	5.73	5.76	5.95	6.20	6.49	6.81	7.34	7.83	8.36	11.21	16.73
1200	15	4.62	4.59	4.70	4.86	5.04	5.24	5.57	5.86	6.17	7.56	9.30
	20	5.32	5.32	5.47	5.67	5.91	6.17	6.60	6.99	7.40	9.39	12.32
	25	5.96	6.00	6.20	6.46	6.76	7.09	7.63	8.14	8.69	11.59	17.03
1300	15	4.78	4.76	4.87	5.04	5.23	5.43	5.77	6.07	6.39	7.82	9.60
	20	5.52	5.52	5.68	5.89	6.13	6.40	6.85	7.24	7.67	9.72	12.68
	25	6.20	6.23	6.44	6.70	7.01	7.36	7.92	8.44	9.01	11.95	17.35
1400	15	4.95	4.93	5.04	5.21	5.41	5.62	5.97	6.28	6.60	8.07	9.90
	20	5.71	5.72	5.88	6.10	6.35	6.63	7.08	7.49	7.93	10.03	13.02
	25	6.42	6.46	6.67	6.95	7.27	7.62	8.20	8.73	9.31	12.31	17.66
1500	15	5.11	5.08	5.20	5.38	5.58	5.80	6.16	6.48	6.81	8.32	10.18
	20	5.90	5.91	6.07	6.30	6.56	6.85	7.31	7.74	8.19	10.33	13.36
	25	6.64	6.68	6.89	7.18	7.51	7.87	8.47	9.01	9.61	12.66	17.98
1600	15	5.26	5.24	5.36	5.54	5.75	5.98	6.34	6.67	7.01	8.56	10.46
	20	6.08	6.09	6.26	6.49	6.76	7.06	7.54	7.97	8.43	10.62	13.69
	25	6.85	6.89	7.11	7.41	7.74	8.12	8.73	9.29	9.89	12.99	18.31
1700	15	5.41	5.39	5.52	5.70	5.91	6.15	6.52	6.86	7.21	8.80	10.74
	20	6.26	6.27	6.45	6.69	6.96	7.26	7.76	8.20	8.67	10.91	14.01
	25	7.05	7.10	7.33	7.63	7.97	8.36	8.98	9.55	10.17	13.32	18.63
1800	15	5.55	5.54	5.67	5.85	6.07	6.31	6.70	7.04	7.40	9.02	11.00
	20	6.44	6.45	6.63	6.87	7.16	7.47	7.97	8.42	8.91	11.18	14.33
	25	7.26	7.30	7.54	7.85	8.20	8.59	9.23	9.81	10.45	13.64	18.95
1900	15	5.70	5.68	5.81	6.01	6.23	6.48	6.87	7.22	7.59	9.25	11.26
	20	6.61	6.62	6.80	7.06	7.35	7.66	8.18	8.64	9.14	11.46	14.64
	25	7.45	7.50	7.74	8.06	8.42	8.82	9.47	10.07	10.71	13.96	19.27
2000	15	5.84	5.82	5.96	6.15	6.38	6.63	7.04	7.40	7.78	9.46	11.51
	20	6.78	6.79	6.98	7.23	7.53	7.85	8.38	8.86	9.36	11.72	14.94
	25	7.65	7.70	7.94	8.26	8.63	9.04	9.71	10.32	10.98	14.27	19.59

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.27	3.31	3.48	3.72	4.02	4.42	5.31	6.54	8.38	21.85	49.95
	20	3.71	3.85	4.17	4.65	5.38	6.57	9.54	13.00	17.44	49.01	115.25
	25	4.15	4.47	5.09	6.19	8.17	11.10	17.08	23.78	32.38	93.78	222.90
200	15	4.11	4.17	4.37	4.65	4.98	5.39	6.20	7.17	8.62	21.85	49.95
	20	4.72	4.90	5.26	5.75	6.41	7.34	9.71	13.01	17.44	49.01	115.25
	25	5.34	5.69	6.30	7.23	8.71	11.20	17.08	23.78	32.38	93.78	222.90
300	15	4.78	4.86	5.09	5.39	5.76	6.19	7.01	7.92	9.19	21.85	49.95
	20	5.54	5.74	6.13	6.65	7.32	8.20	10.24	13.14	17.45	49.01	115.25
	25	6.29	6.66	7.31	8.22	9.54	11.62	17.10	23.78	32.38	93.78	222.90
400	15	5.37	5.46	5.71	6.04	6.43	6.89	7.74	8.64	9.84	21.85	49.95
	20	6.25	6.46	6.88	7.43	8.13	9.00	10.90	13.47	17.50	49.01	115.25
	25	7.11	7.51	8.18	9.10	10.38	12.25	17.20	23.78	32.38	93.78	222.90
500	15	5.89	5.99	6.26	6.62	7.04	7.52	8.40	9.31	10.48	21.86	49.95
	20	6.88	7.12	7.56	8.14	8.86	9.74	11.58	13.94	17.65	49.01	115.25
	25	7.85	8.27	8.97	9.91	11.17	12.94	17.45	23.80	32.38	93.78	222.90
600	15	6.38	6.48	6.77	7.15	7.59	8.10	9.01	9.94	11.10	21.91	49.95
	20	7.47	7.71	8.18	8.79	9.53	10.43	12.25	14.48	17.92	49.01	115.25
	25	8.53	8.97	9.70	10.66	11.92	13.64	17.82	23.86	32.39	93.78	222.90
700	15	6.83	6.94	7.25	7.64	8.11	8.64	9.58	10.53	11.69	22.00	49.95
	20	8.01	8.27	8.76	9.39	10.16	11.08	12.89	15.05	18.27	49.01	115.25
	25	9.17	9.62	10.37	11.36	12.63	14.32	18.28	23.98	32.39	93.78	222.90
800	15	7.25	7.37	7.70	8.11	8.60	9.15	10.12	11.09	12.26	22.15	49.95
	20	8.53	8.80	9.31	9.96	10.75	11.69	13.51	15.62	18.69	49.01	115.25
	25	9.76	10.23	11.01	12.02	13.31	14.98	18.79	24.18	32.41	93.78	222.90
900	15	7.66	7.79	8.12	8.55	9.06	9.63	10.63	11.62	12.81	22.35	49.95
	20	9.02	9.30	9.83	10.50	11.31	12.28	14.11	16.19	19.14	49.01	115.25
	25	10.33	10.81	11.62	12.65	13.95	15.62	19.32	24.44	32.45	93.78	222.90
1000	15	8.04	8.18	8.53	8.98	9.50	10.09	11.12	12.13	13.33	22.61	49.95
	20	9.48	9.77	10.32	11.02	11.85	12.83	14.68	16.74	19.62	49.01	115.25
	25	10.87	11.37	12.19	13.25	14.57	16.24	19.86	24.76	32.52	93.78	222.90

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	8.41	8.55	8.91	9.38	9.92	10.53	11.58	12.62	13.83	22.91	49.95
	20	9.93	10.23	10.79	11.51	12.37	13.37	15.24	17.29	20.10	49.01	115.25
	25	11.39	11.90	12.74	13.82	15.16	16.84	20.41	25.13	32.62	93.78	222.90
1200	15	8.77	8.91	9.29	9.77	10.33	10.95	12.03	13.09	14.32	23.24	49.95
	20	10.36	10.67	11.25	11.99	12.86	13.88	15.77	17.82	20.59	49.01	115.25
	25	11.89	12.41	13.28	14.38	15.74	17.43	20.95	25.52	32.76	93.78	222.90
1300	15	9.11	9.26	9.65	10.15	10.72	11.36	12.47	13.54	14.79	23.59	49.95
	20	10.77	11.09	11.69	12.45	13.34	14.38	16.29	18.35	21.08	49.01	115.25
	25	12.37	12.90	13.79	14.91	16.29	17.99	21.49	25.94	32.94	93.78	222.90
1400	15	9.45	9.60	10.00	10.51	11.10	11.76	12.89	13.98	15.25	23.96	49.96
	20	11.18	11.50	12.12	12.89	13.80	14.86	16.80	18.86	21.56	49.02	115.25
	25	12.83	13.38	14.29	15.43	16.83	18.54	22.02	26.38	33.16	93.78	222.90
1500	15	9.77	9.93	10.34	10.86	11.47	12.14	13.30	14.41	15.70	24.34	49.96
	20	11.57	11.90	12.53	13.32	14.25	15.33	17.29	19.36	22.04	49.03	115.25
	25	13.29	13.84	14.77	15.93	17.35	19.08	22.55	26.82	33.41	93.78	222.90
1600	15	10.09	10.25	10.67	11.21	11.83	12.52	13.70	14.83	16.13	24.72	49.97
	20	11.95	12.28	12.93	13.74	14.69	15.79	17.77	19.85	22.52	49.04	115.25
	25	13.73	14.29	15.24	16.42	17.86	19.60	23.07	27.27	33.68	93.78	222.90
1700	15	10.40	10.56	10.99	11.54	12.17	12.88	14.08	15.23	16.55	25.11	49.98
	20	12.32	12.66	13.32	14.15	15.11	16.23	18.23	20.32	22.99	49.07	115.25
	25	14.16	14.73	15.69	16.90	18.35	20.11	23.58	27.73	33.98	93.78	222.90
1800	15	10.70	10.87	11.31	11.87	12.51	13.24	14.46	15.63	16.97	25.51	49.99
	20	12.68	13.03	13.70	14.55	15.53	16.66	18.69	20.79	23.46	49.10	115.25
	25	14.58	15.16	16.14	17.36	18.83	20.61	24.08	28.19	34.30	93.78	222.90
1900	15	10.99	11.16	11.61	12.19	12.85	13.58	14.83	16.02	17.37	25.90	50.02
	20	13.03	13.39	14.08	14.93	15.94	17.08	19.14	21.25	23.91	49.14	115.25
	25	14.98	15.58	16.57	17.81	19.31	21.10	24.57	28.65	34.64	93.78	222.90
2000	15	11.28	11.45	11.91	12.50	13.17	13.92	15.19	16.39	17.77	26.29	50.04
	20	13.38	13.74	14.44	15.31	16.33	17.50	19.57	21.70	24.37	49.19	115.25
	25	15.38	15.99	17.00	18.26	19.77	21.57	25.06	29.10	34.99	93.78	222.90

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	6.42	7.80	11.26	17.10	24.91	35.04	55.54	78.56	108.16	319.76	765.42
	20	8.37	13.84	23.96	37.86	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	11.74	25.17	44.97	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
200	15	8.22	9.46	12.00	17.14	24.91	35.04	55.54	78.56	108.16	319.76	765.42
	20	10.46	14.45	23.96	37.86	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	13.58	25.17	44.97	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
300	15	9.67	10.90	13.15	17.46	24.92	35.04	55.54	78.56	108.16	319.76	765.42
	20	12.20	15.66	24.03	37.86	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	15.43	25.30	44.97	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
400	15	10.92	12.16	14.32	18.11	24.99	35.04	55.54	78.56	108.16	319.76	765.42
	20	13.71	16.96	24.31	37.86	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	17.13	25.76	44.97	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
500	15	12.04	13.31	15.42	18.93	25.21	35.05	55.54	78.56	108.16	319.76	765.42
	20	15.08	18.22	24.84	37.87	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	18.68	26.50	44.98	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
600	15	13.07	14.37	16.47	19.81	25.58	35.08	55.54	78.56	108.16	319.76	765.42
	20	16.34	19.42	25.56	37.92	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	20.13	27.42	45.00	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
700	15	14.03	15.35	17.46	20.70	26.09	35.16	55.54	78.56	108.16	319.76	765.42
	20	17.51	20.57	26.37	38.03	56.31	80.24	128.70	183.14	253.19	754.27	1810.2
	25	21.48	28.42	45.07	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
800	15	14.94	16.28	18.41	21.58	26.68	35.31	55.54	78.56	108.16	319.76	765.42
	20	18.61	21.66	27.23	38.24	56.32	80.24	128.70	183.14	253.19	754.27	1810.2
	25	22.76	29.46	45.20	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
900	15	15.79	17.17	19.31	22.44	27.33	35.53	55.54	78.56	108.16	319.76	765.42
	20	19.66	22.71	28.12	38.53	56.32	80.24	128.70	183.14	253.19	754.27	1810.2
	25	23.97	30.50	45.42	72.08	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1000	15	16.61	18.01	20.17	23.28	28.02	35.83	55.55	78.56	108.16	319.76	765.42
	20	20.66	23.72	29.00	38.92	56.34	80.24	128.70	183.14	253.19	754.27	1810.2
	25	25.13	31.53	45.73	72.09	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	17.40	18.82	21.00	24.09	28.72	36.20	55.56	78.56	108.16	319.76	765.42
	20	21.62	24.69	29.88	39.38	56.38	80.24	128.70	183.14	253.19	754.27	1810.2
	25	26.24	32.55	46.12	72.09	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1200	15	18.15	19.59	21.80	24.89	29.42	36.63	55.59	78.56	108.16	319.76	765.42
	20	22.54	25.62	30.75	39.90	56.45	80.24	128.70	183.14	253.19	754.27	1810.2
	25	27.32	33.55	46.59	72.11	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1300	15	18.88	20.34	22.58	25.67	30.13	37.09	55.63	78.56	108.16	319.76	765.42
	20	23.43	26.52	31.61	40.46	56.54	80.24	128.70	183.14	253.19	754.27	1810.2
	25	28.35	34.53	47.12	72.13	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1400	15	19.59	21.07	23.33	26.42	30.83	37.60	55.69	78.56	108.16	319.76	765.42
	20	24.29	27.40	32.45	41.06	56.67	80.25	128.70	183.14	253.19	754.27	1810.2
	25	29.35	35.49	47.69	72.17	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1500	15	20.27	21.77	24.06	27.16	31.53	38.13	55.77	78.56	108.16	319.76	765.42
	20	25.12	28.26	33.28	41.68	56.84	80.25	128.70	183.14	253.19	754.27	1810.2
	25	30.33	36.44	48.31	72.23	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1600	15	20.94	22.46	24.76	27.88	32.22	38.68	55.89	78.56	108.16	319.76	765.42
	20	25.93	29.09	34.09	42.33	57.05	80.26	128.70	183.14	253.19	754.27	1810.2
	25	31.27	37.36	48.95	72.31	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1700	15	21.58	23.13	25.46	28.59	32.90	39.24	56.03	78.57	108.16	319.76	765.42
	20	26.72	29.89	34.89	42.98	57.30	80.28	128.70	183.14	253.19	754.27	1810.2
	25	32.20	38.27	49.62	72.42	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1800	15	22.22	23.78	26.13	29.28	33.57	39.81	56.20	78.58	108.16	319.76	765.42
	20	27.49	30.68	35.68	43.64	57.59	80.30	128.70	183.14	253.19	754.27	1810.2
	25	33.10	39.16	50.30	72.55	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
1900	15	22.83	24.41	26.79	29.96	34.24	40.39	56.40	78.59	108.16	319.76	765.42
	20	28.25	31.46	36.45	44.30	57.91	80.34	128.70	183.14	253.19	754.27	1810.2
	25	33.97	40.03	50.99	72.72	108.08	154.76	249.31	355.57	492.30	1470.6	3532.6
2000	15	23.44	25.03	27.44	30.62	34.89	40.97	56.64	78.61	108.16	319.76	765.42
	20	28.98	32.21	37.20	44.97	58.26	80.38	128.70	183.14	253.19	754.27	1810.2
	25	34.83	40.88	51.69	72.92	108.09	154.76	249.31	355.57	492.30	1470.6	3532.6

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	34.82	82.87	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	78.89	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
200	15	34.85	82.87	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	78.89	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
300	15	35.18	82.87	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	78.89	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
400	15	36.10	82.87	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	78.89	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
500	15	37.42	82.87	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	78.90	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
600	15	38.94	82.87	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	78.93	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
700	15	40.53	82.88	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	79.02	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
800	15	42.14	82.89	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	79.21	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
900	15	43.74	82.92	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	79.54	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1000	15	45.32	82.98	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	80.01	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.54	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 56.0 Ft (RADIUS = 39.6 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	46.86	83.09	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	80.63	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.55	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1200	15	48.37	83.26	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	81.37	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.55	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1300	15	49.85	83.49	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	82.23	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.57	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1400	15	51.29	83.80	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	83.17	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.59	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1500	15	52.70	84.18	151.32	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	84.19	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.63	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1600	15	54.09	84.62	151.33	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	85.26	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.70	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1700	15	55.44	85.13	151.33	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	86.37	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.79	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1800	15	56.76	85.70	151.33	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	87.52	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	151.91	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
1900	15	58.06	86.32	151.33	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	88.69	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	152.07	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.
2000	15	59.34	86.98	151.34	244.95	369.25	530.46	857.01	1224.1	1696.4	5076.8	12202.
	20	89.87	192.98	355.23	577.08	871.64	1253.7	2027.5	2897.4	4016.9	12029.	28918.
	25	152.27	374.49	691.39	1124.7	1699.9	2446.0	3957.3	5656.2	7842.6	23491.	56477.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.03	1.99	2.02	2.08	2.16	2.25	2.39	2.53	2.67	3.44	5.00
	20	2.21	2.18	2.23	2.31	2.42	2.53	2.74	2.93	3.16	4.82	9.29
	25	2.38	2.37	2.44	2.55	2.69	2.85	3.14	3.46	3.86	7.74	16.47
200	15	2.45	2.41	2.45	2.53	2.63	2.73	2.91	3.07	3.24	4.09	5.46
	20	2.71	2.69	2.76	2.86	2.98	3.13	3.36	3.59	3.84	5.35	9.30
	25	2.96	2.96	3.05	3.19	3.35	3.54	3.87	4.20	4.59	7.81	16.47
300	15	2.79	2.75	2.80	2.89	3.00	3.12	3.32	3.50	3.69	4.62	5.99
	20	3.12	3.10	3.18	3.30	3.44	3.60	3.87	4.12	4.39	5.92	9.41
	25	3.43	3.43	3.54	3.70	3.88	4.09	4.46	4.81	5.22	8.11	16.47
400	15	3.08	3.04	3.11	3.21	3.32	3.46	3.68	3.87	4.08	5.08	6.49
	20	3.47	3.45	3.54	3.68	3.83	4.01	4.30	4.57	4.87	6.46	9.66
	25	3.84	3.84	3.97	4.14	4.34	4.57	4.96	5.34	5.77	8.55	16.47
500	15	3.35	3.31	3.38	3.49	3.62	3.76	4.00	4.21	4.43	5.50	6.95
	20	3.79	3.77	3.87	4.02	4.19	4.38	4.69	4.98	5.30	6.95	10.01
	25	4.20	4.21	4.35	4.54	4.76	5.00	5.42	5.82	6.26	9.01	16.49
600	15	3.59	3.56	3.63	3.75	3.89	4.04	4.29	4.52	4.76	5.88	7.38
	20	4.08	4.07	4.18	4.33	4.51	4.72	5.05	5.36	5.69	7.40	10.40
	25	4.54	4.55	4.70	4.90	5.13	5.40	5.84	6.25	6.72	9.48	16.54
700	15	3.82	3.78	3.86	3.99	4.14	4.30	4.57	4.81	5.06	6.23	7.79
	20	4.35	4.34	4.46	4.62	4.82	5.03	5.39	5.71	6.06	7.83	10.80
	25	4.85	4.87	5.03	5.24	5.49	5.76	6.23	6.66	7.15	9.94	16.65
800	15	4.03	4.00	4.09	4.22	4.37	4.54	4.82	5.08	5.34	6.57	8.17
	20	4.61	4.60	4.72	4.90	5.10	5.33	5.70	6.04	6.41	8.24	11.20
	25	5.15	5.17	5.34	5.56	5.82	6.11	6.60	7.05	7.55	10.38	16.80
900	15	4.24	4.20	4.30	4.43	4.60	4.78	5.07	5.33	5.61	6.89	8.54
	20	4.86	4.85	4.98	5.16	5.37	5.61	6.00	6.35	6.73	8.62	11.59
	25	5.43	5.46	5.63	5.86	6.14	6.44	6.94	7.41	7.93	10.80	17.01
1000	15	4.43	4.40	4.50	4.64	4.81	5.00	5.30	5.58	5.87	7.19	8.89
	20	5.09	5.08	5.22	5.41	5.63	5.88	6.28	6.65	7.05	8.99	11.98
	25	5.70	5.73	5.91	6.15	6.44	6.75	7.28	7.76	8.30	11.21	17.25

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.62	4.59	4.69	4.84	5.02	5.21	5.53	5.81	6.11	7.48	9.22
	20	5.31	5.31	5.45	5.65	5.88	6.14	6.56	6.94	7.35	9.34	12.36
	25	5.96	5.99	6.18	6.43	6.72	7.05	7.59	8.10	8.65	11.61	17.52
1200	15	4.80	4.77	4.87	5.03	5.21	5.42	5.75	6.04	6.35	7.76	9.55
	20	5.53	5.53	5.67	5.88	6.12	6.38	6.82	7.21	7.64	9.68	12.73
	25	6.21	6.24	6.43	6.70	7.00	7.34	7.90	8.42	8.99	12.00	17.81
1300	15	4.97	4.94	5.05	5.21	5.40	5.61	5.96	6.26	6.58	8.03	9.86
	20	5.74	5.74	5.89	6.10	6.35	6.62	7.07	7.48	7.91	10.01	13.09
	25	6.45	6.48	6.68	6.96	7.27	7.62	8.20	8.73	9.31	12.37	18.11
1400	15	5.14	5.11	5.23	5.39	5.59	5.81	6.16	6.47	6.80	8.30	10.16
	20	5.94	5.94	6.10	6.32	6.57	6.86	7.32	7.74	8.18	10.33	13.44
	25	6.68	6.72	6.93	7.21	7.53	7.89	8.48	9.03	9.63	12.74	18.42
1500	15	5.31	5.28	5.39	5.57	5.77	5.99	6.35	6.68	7.02	8.55	10.46
	20	6.14	6.14	6.30	6.53	6.79	7.08	7.56	7.99	8.45	10.64	13.79
	25	6.91	6.94	7.16	7.45	7.78	8.15	8.76	9.32	9.93	13.09	18.74
1600	15	5.47	5.44	5.56	5.74	5.94	6.17	6.55	6.88	7.22	8.80	10.74
	20	6.33	6.33	6.50	6.73	7.00	7.30	7.79	8.23	8.70	10.94	14.12
	25	7.13	7.17	7.39	7.68	8.03	8.41	9.03	9.60	10.23	13.44	19.06
1700	15	5.62	5.59	5.72	5.90	6.12	6.35	6.73	7.07	7.43	9.04	11.02
	20	6.52	6.52	6.69	6.93	7.21	7.51	8.01	8.47	8.95	11.24	14.45
	25	7.34	7.38	7.61	7.91	8.27	8.65	9.29	9.88	10.52	13.78	19.38
1800	15	5.78	5.75	5.87	6.06	6.28	6.52	6.91	7.26	7.63	9.27	11.29
	20	6.70	6.70	6.88	7.12	7.41	7.72	8.24	8.70	9.19	11.52	14.78
	25	7.55	7.59	7.83	8.14	8.50	8.90	9.55	10.15	10.80	14.11	19.70
1900	15	5.93	5.90	6.03	6.22	6.44	6.69	7.09	7.45	7.82	9.50	11.56
	20	6.88	6.88	7.06	7.31	7.61	7.93	8.45	8.92	9.42	11.80	15.09
	25	7.76	7.80	8.04	8.36	8.73	9.13	9.80	10.41	11.07	14.43	20.02
2000	15	6.07	6.04	6.18	6.37	6.60	6.86	7.26	7.63	8.01	9.73	11.82
	20	7.05	7.05	7.24	7.50	7.80	8.13	8.66	9.14	9.66	12.08	15.40
	25	7.96	8.00	8.25	8.57	8.95	9.36	10.05	10.67	11.34	14.74	20.34

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.40	3.45	3.62	3.87	4.20	4.63	5.62	7.01	9.02	23.40	53.13
	20	3.86	4.02	4.37	4.90	5.73	7.09	10.38	14.13	18.91	52.65	122.74
	25	4.34	4.69	5.39	6.67	8.95	12.18	18.69	25.94	35.23	100.86	237.51
200	15	4.28	4.34	4.55	4.83	5.19	5.62	6.50	7.56	9.20	23.40	53.13
	20	4.93	5.11	5.49	6.02	6.75	7.79	10.49	14.13	18.91	52.65	122.74
	25	5.58	5.96	6.63	7.67	9.38	12.23	18.69	25.94	35.23	100.86	237.51
300	15	4.98	5.06	5.29	5.61	5.99	6.45	7.32	8.31	9.71	23.40	53.13
	20	5.78	5.99	6.40	6.96	7.68	8.65	10.94	14.21	18.92	52.65	122.74
	25	6.57	6.98	7.67	8.67	10.16	12.56	18.69	25.94	35.23	100.86	237.51
400	15	5.59	5.68	5.94	6.28	6.69	7.17	8.07	9.04	10.34	23.40	53.13
	20	6.52	6.74	7.18	7.77	8.51	9.46	11.57	14.47	18.95	52.65	122.74
	25	7.43	7.86	8.58	9.58	10.99	13.12	18.76	25.95	35.23	100.86	237.51
500	15	6.14	6.23	6.51	6.88	7.32	7.83	8.75	9.72	10.98	23.41	53.13
	20	7.18	7.42	7.89	8.50	9.26	10.22	12.24	14.88	19.05	52.65	122.74
	25	8.20	8.65	9.40	10.42	11.80	13.79	18.93	25.95	35.23	100.86	237.51
600	15	6.64	6.75	7.04	7.43	7.89	8.43	9.38	10.37	11.61	23.44	53.13
	20	7.79	8.05	8.54	9.18	9.96	10.93	12.90	15.39	19.26	52.65	122.74
	25	8.91	9.38	10.15	11.19	12.56	14.47	19.23	25.99	35.23	100.86	237.51
700	15	7.11	7.23	7.54	7.95	8.43	8.98	9.97	10.97	12.21	23.50	53.13
	20	8.36	8.63	9.14	9.80	10.61	11.60	13.56	15.94	19.56	52.65	122.74
	25	9.57	10.06	10.86	11.92	13.29	15.16	19.63	26.07	35.23	100.86	237.51
800	15	7.56	7.68	8.00	8.43	8.94	9.51	10.52	11.54	12.79	23.61	53.13
	20	8.89	9.17	9.71	10.40	11.23	12.23	14.19	16.50	19.93	52.65	122.74
	25	10.20	10.69	11.52	12.60	13.99	15.83	20.10	26.21	35.24	100.86	237.51
900	15	7.98	8.10	8.45	8.89	9.41	10.01	11.05	12.09	13.35	23.78	53.13
	20	9.40	9.69	10.25	10.96	11.81	12.83	14.79	17.06	20.35	52.65	122.74
	25	10.79	11.30	12.15	13.25	14.65	16.48	20.60	26.41	35.27	100.86	237.51
1000	15	8.38	8.51	8.87	9.33	9.87	10.48	11.55	12.62	13.89	24.00	53.13
	20	9.89	10.19	10.76	11.49	12.37	13.40	15.38	17.62	20.80	52.65	122.74
	25	11.35	11.88	12.75	13.87	15.29	17.11	21.13	26.68	35.31	100.86	237.51

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	8.76	8.90	9.27	9.75	10.31	10.94	12.04	13.12	14.40	24.26	53.13
	20	10.35	10.66	11.25	12.00	12.90	13.96	15.95	18.18	21.27	52.65	122.74
	25	11.89	12.43	13.32	14.47	15.90	17.72	21.66	26.99	35.37	100.86	237.51
1200	15	9.14	9.28	9.66	10.16	10.73	11.38	12.50	13.60	14.90	24.56	53.13
	20	10.80	11.12	11.73	12.50	13.41	14.49	16.50	18.72	21.75	52.65	122.74
	25	12.41	12.96	13.88	15.04	16.50	18.32	22.20	27.34	35.47	100.86	237.51
1300	15	9.50	9.64	10.04	10.55	11.14	11.80	12.95	14.07	15.39	24.89	53.13
	20	11.24	11.56	12.19	12.97	13.91	15.00	17.04	19.25	22.23	52.65	122.74
	25	12.91	13.48	14.41	15.60	17.07	18.90	22.74	27.73	35.61	100.86	237.51
1400	15	9.84	10.00	10.40	10.92	11.53	12.21	13.39	14.53	15.86	25.24	53.13
	20	11.66	11.99	12.63	13.44	14.39	15.50	17.56	19.77	22.71	52.65	122.74
	25	13.40	13.97	14.93	16.14	17.62	19.47	23.27	28.14	35.77	100.86	237.51
1500	15	10.18	10.34	10.75	11.29	11.91	12.61	13.81	14.97	16.32	25.60	53.13
	20	12.06	12.40	13.06	13.88	14.86	15.99	18.06	20.28	23.20	52.66	122.74
	25	13.87	14.46	15.43	16.66	18.16	20.02	23.80	28.56	35.98	100.86	237.51
1600	15	10.51	10.67	11.10	11.65	12.28	13.00	14.22	15.40	16.76	25.98	53.14
	20	12.46	12.81	13.48	14.32	15.31	16.46	18.56	20.78	23.68	52.67	122.74
	25	14.33	14.93	15.91	17.17	18.69	20.56	24.33	29.00	36.21	100.86	237.51
1700	15	10.83	10.99	11.43	12.00	12.65	13.38	14.62	15.82	17.20	26.36	53.15
	20	12.85	13.20	13.88	14.74	15.75	16.92	19.04	21.27	24.15	52.68	122.74
	25	14.78	15.38	16.39	17.66	19.20	21.08	24.84	29.44	36.46	100.86	237.51
1800	15	11.14	11.31	11.76	12.33	13.00	13.74	15.01	16.23	17.63	26.74	53.15
	20	13.22	13.58	14.28	15.15	16.18	17.37	19.51	21.75	24.62	52.70	122.74
	25	15.22	15.83	16.85	18.14	19.70	21.60	25.35	29.89	36.75	100.86	237.51
1900	15	11.45	11.62	12.08	12.67	13.34	14.10	15.39	16.63	18.04	27.13	53.17
	20	13.59	13.96	14.67	15.56	16.60	17.80	19.97	22.22	25.08	52.73	122.74
	25	15.64	16.27	17.30	18.61	20.19	22.10	25.86	30.34	37.05	100.86	237.51
2000	15	11.75	11.92	12.39	12.99	13.68	14.45	15.76	17.02	18.45	27.52	53.19
	20	13.95	14.32	15.05	15.95	17.01	18.23	20.42	22.68	25.54	52.77	122.74
	25	16.06	16.69	17.75	19.07	20.67	22.59	26.35	30.79	37.37	100.86	237.51

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	6.76	8.38	12.46	18.97	27.58	38.68	61.02	85.97	117.93	344.18	815.87
	20	8.94	15.47	26.80	42.22	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	12.97	28.33	50.47	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
200	15	8.63	10.04	13.03	18.98	27.58	38.68	61.02	85.97	117.93	344.18	815.87
	20	11.09	15.89	26.80	42.22	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	14.65	28.33	50.47	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
300	15	10.14	11.52	14.11	19.19	27.58	38.68	61.02	85.97	117.93	344.18	815.87
	20	12.89	16.97	26.83	42.22	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	16.51	28.39	50.47	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
400	15	11.45	12.83	15.27	19.71	27.61	38.68	61.02	85.97	117.93	344.18	815.87
	20	14.47	18.23	26.99	42.22	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	18.25	28.67	50.47	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
500	15	12.62	14.02	16.39	20.44	27.74	38.68	61.02	85.97	117.93	344.18	815.87
	20	15.90	19.49	27.38	42.22	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	19.85	29.24	50.47	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
600	15	13.70	15.12	17.46	21.27	28.01	38.70	61.02	85.97	117.93	344.18	815.87
	20	17.21	20.71	27.96	42.24	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	21.35	30.03	50.48	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
700	15	14.70	16.15	18.48	22.14	28.41	38.74	61.02	85.97	117.93	344.18	815.87
	20	18.43	21.89	28.69	42.30	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	22.75	30.94	50.51	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
800	15	15.64	17.11	19.45	23.02	28.93	38.82	61.02	85.97	117.93	344.18	815.87
	20	19.58	23.01	29.49	42.42	62.56	88.80	141.63	200.67	276.29	812.12	1929.7
	25	24.08	31.92	50.57	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
900	15	16.54	18.03	20.38	23.88	29.51	38.97	61.02	85.97	117.93	344.18	815.87
	20	20.67	24.09	30.33	42.61	62.57	88.80	141.63	200.67	276.29	812.12	1929.7
	25	25.35	32.93	50.70	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1000	15	17.39	18.91	21.27	24.73	30.15	39.19	61.02	85.97	117.93	344.18	815.87
	20	21.72	25.13	31.20	42.89	62.57	88.80	141.63	200.67	276.29	812.12	1929.7
	25	26.55	33.95	50.89	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	18.21	19.75	22.13	25.56	30.82	39.47	61.03	85.97	117.93	344.18	815.87
	20	22.72	26.13	32.07	43.24	62.59	88.80	141.63	200.67	276.29	812.12	1929.7
	25	27.71	34.97	51.16	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1200	15	19.00	20.56	22.96	26.37	31.50	39.82	61.04	85.97	117.93	344.18	815.87
	20	23.68	27.10	32.93	43.67	62.62	88.80	141.63	200.67	276.29	812.12	1929.7
	25	28.83	35.98	51.51	80.55	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1300	15	19.76	21.34	23.76	27.17	32.19	40.22	61.06	85.97	117.93	344.18	815.87
	20	24.61	28.04	33.79	44.15	62.67	88.80	141.63	200.67	276.29	812.12	1929.7
	25	29.91	36.97	51.93	80.56	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1400	15	20.50	22.10	24.54	27.94	32.89	40.66	61.09	85.98	117.93	344.18	815.87
	20	25.50	28.95	34.64	44.68	62.75	88.80	141.63	200.67	276.29	812.12	1929.7
	25	30.96	37.95	52.40	80.58	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1500	15	21.21	22.83	25.30	28.70	33.58	41.14	61.14	85.98	117.93	344.18	815.87
	20	26.38	29.84	35.48	45.24	62.85	88.81	141.63	200.67	276.29	812.12	1929.7
	25	31.97	38.91	52.93	80.61	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1600	15	21.91	23.55	26.04	29.45	34.28	41.64	61.21	85.98	117.93	344.18	815.87
	20	27.22	30.70	36.31	45.83	62.99	88.81	141.63	200.67	276.29	812.12	1929.7
	25	32.96	39.85	53.49	80.65	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1700	15	22.59	24.24	26.75	30.17	34.96	42.17	61.31	85.98	117.93	344.18	815.87
	20	28.05	31.54	37.13	46.44	63.16	88.82	141.63	200.67	276.29	812.12	1929.7
	25	33.92	40.78	54.09	80.70	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1800	15	23.25	24.92	27.46	30.88	35.64	42.71	61.42	85.98	117.93	344.18	815.87
	20	28.85	32.36	37.93	47.07	63.36	88.83	141.63	200.67	276.29	812.12	1929.7
	25	34.86	41.69	54.72	80.78	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
1900	15	23.89	25.58	28.14	31.58	36.31	43.26	61.56	85.99	117.93	344.18	815.87
	20	29.64	33.16	38.72	47.71	63.60	88.84	141.63	200.67	276.29	812.12	1929.7
	25	35.78	42.59	55.37	80.88	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0
2000	15	24.52	26.23	28.81	32.26	36.98	43.82	61.73	86.00	117.93	344.18	815.87
	20	30.41	33.95	39.49	48.36	63.87	88.86	141.63	200.67	276.29	812.12	1929.7
	25	36.68	43.47	56.03	81.00	120.24	171.44	274.52	389.75	537.38	1583.6	3766.0

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	39.46	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.77	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
200	15	39.47	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.77	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
300	15	39.63	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.77	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
400	15	40.24	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.77	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
500	15	41.31	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.77	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
600	15	42.66	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.78	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
700	15	44.16	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.81	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
800	15	45.71	93.69	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	89.90	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
900	15	47.29	93.70	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	90.06	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1000	15	48.86	93.72	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	90.33	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 58.0 Ft (RADIUS = 41.0 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	50.42	93.77	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	90.72	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1200	15	51.95	93.85	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	91.23	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1300	15	53.45	93.97	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	91.87	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.72	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1400	15	54.93	94.14	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	92.60	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.73	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1500	15	56.37	94.38	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	93.43	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.74	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1600	15	57.79	94.67	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	94.34	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.76	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1700	15	59.18	95.02	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	95.31	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.80	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1800	15	60.55	95.43	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	96.33	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.85	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
1900	15	61.89	95.90	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	97.40	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	172.92	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.
2000	15	63.21	96.42	170.21	274.10	411.17	588.00	944.06	1342.1	1852.1	5467.0	13009.
	20	98.49	218.50	399.89	646.09	970.93	1390.0	2233.8	3177.2	4385.9	12954.	30830.
	25	173.01	424.27	778.56	1259.4	1893.8	2712.2	4360.1	6202.6	8563.3	25297.	60210.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	2.11	2.06	2.09	2.15	2.22	2.31	2.46	2.60	2.75	3.54	5.22
	20	2.29	2.26	2.31	2.39	2.49	2.61	2.82	3.03	3.27	5.06	9.80
	25	2.47	2.45	2.53	2.64	2.79	2.95	3.26	3.59	4.03	8.23	17.44
200	15	2.54	2.49	2.54	2.61	2.71	2.81	2.99	3.15	3.33	4.20	5.65
	20	2.82	2.79	2.85	2.96	3.08	3.23	3.47	3.70	3.96	5.56	9.81
	25	3.08	3.07	3.16	3.30	3.47	3.67	4.01	4.35	4.77	8.28	17.44
300	15	2.89	2.85	2.90	2.99	3.10	3.22	3.42	3.60	3.80	4.74	6.18
	20	3.24	3.21	3.29	3.41	3.55	3.72	3.99	4.25	4.53	6.13	9.89
	25	3.56	3.56	3.67	3.83	4.02	4.24	4.61	4.98	5.41	8.54	17.44
400	15	3.20	3.15	3.21	3.31	3.43	3.57	3.79	3.99	4.20	5.22	6.68
	20	3.60	3.58	3.67	3.80	3.96	4.14	4.44	4.72	5.02	6.67	10.11
	25	3.98	3.99	4.11	4.29	4.50	4.73	5.14	5.52	5.97	8.95	17.44
500	15	3.47	3.43	3.50	3.60	3.73	3.88	4.12	4.33	4.56	5.65	7.15
	20	3.93	3.91	4.01	4.16	4.33	4.52	4.84	5.14	5.47	7.18	10.44
	25	4.37	4.37	4.51	4.70	4.92	5.18	5.61	6.02	6.48	9.40	17.46
600	15	3.73	3.68	3.76	3.87	4.01	4.17	4.42	4.65	4.90	6.04	7.59
	20	4.24	4.22	4.33	4.48	4.67	4.87	5.21	5.53	5.87	7.64	10.81
	25	4.72	4.73	4.88	5.08	5.32	5.59	6.04	6.47	6.96	9.87	17.50
700	15	3.96	3.92	4.00	4.12	4.27	4.44	4.71	4.95	5.21	6.41	8.01
	20	4.52	4.51	4.62	4.79	4.98	5.20	5.56	5.89	6.25	8.08	11.21
	25	5.04	5.06	5.21	5.43	5.68	5.97	6.44	6.89	7.40	10.33	17.58
800	15	4.19	4.15	4.23	4.36	4.52	4.69	4.97	5.23	5.50	6.75	8.40
	20	4.79	4.77	4.90	5.07	5.28	5.51	5.89	6.23	6.61	8.50	11.61
	25	5.35	5.37	5.53	5.76	6.03	6.32	6.82	7.29	7.81	10.77	17.71
900	15	4.40	4.36	4.45	4.58	4.75	4.93	5.23	5.49	5.77	7.08	8.77
	20	5.04	5.03	5.16	5.34	5.56	5.80	6.19	6.55	6.95	8.89	12.01
	25	5.65	5.67	5.84	6.08	6.35	6.66	7.18	7.67	8.20	11.20	17.89
1000	15	4.60	4.56	4.65	4.80	4.97	5.16	5.47	5.75	6.04	7.39	9.13
	20	5.29	5.27	5.41	5.60	5.83	6.08	6.49	6.86	7.27	9.27	12.40
	25	5.93	5.95	6.13	6.38	6.67	6.99	7.53	8.03	8.58	11.62	18.10

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: ULTRAFAST (ALPHA = .178 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	4.80	4.76	4.85	5.00	5.18	5.38	5.70	5.99	6.29	7.69	9.47
	20	5.52	5.51	5.65	5.85	6.08	6.34	6.77	7.16	7.58	9.63	12.78
	25	6.19	6.22	6.41	6.66	6.96	7.30	7.85	8.37	8.94	12.03	18.35
1200	15	4.98	4.94	5.05	5.20	5.39	5.59	5.92	6.22	6.54	7.98	9.80
	20	5.75	5.73	5.88	6.09	6.33	6.60	7.04	7.44	7.87	9.98	13.15
	25	6.45	6.48	6.67	6.94	7.25	7.60	8.17	8.70	9.29	12.42	18.63
1300	15	5.17	5.13	5.23	5.39	5.58	5.80	6.14	6.45	6.77	8.25	10.12
	20	5.96	5.95	6.10	6.32	6.57	6.85	7.30	7.72	8.16	10.32	13.52
	25	6.70	6.73	6.93	7.21	7.53	7.88	8.48	9.02	9.62	12.81	18.92
1400	15	5.34	5.30	5.41	5.58	5.78	5.99	6.35	6.67	7.00	8.52	10.43
	20	6.17	6.16	6.32	6.54	6.80	7.09	7.56	7.98	8.44	10.65	13.88
	25	6.95	6.97	7.18	7.47	7.80	8.16	8.77	9.33	9.95	13.18	19.22
1500	15	5.51	5.47	5.59	5.76	5.96	6.19	6.55	6.88	7.22	8.78	10.73
	20	6.38	6.37	6.53	6.76	7.03	7.32	7.80	8.24	8.71	10.96	14.23
	25	7.18	7.21	7.43	7.72	8.06	8.44	9.06	9.63	10.26	13.54	19.53
1600	15	5.68	5.64	5.76	5.93	6.14	6.37	6.75	7.08	7.44	9.04	11.03
	20	6.58	6.57	6.74	6.97	7.24	7.55	8.04	8.49	8.97	11.27	14.57
	25	7.41	7.44	7.66	7.96	8.31	8.70	9.34	9.93	10.57	13.90	19.84
1700	15	5.84	5.80	5.92	6.10	6.32	6.56	6.94	7.28	7.65	9.28	11.31
	20	6.77	6.76	6.94	7.18	7.46	7.77	8.28	8.73	9.23	11.57	14.91
	25	7.64	7.67	7.89	8.20	8.56	8.96	9.61	10.21	10.87	14.24	20.16
1800	15	6.00	5.96	6.09	6.27	6.49	6.73	7.13	7.48	7.85	9.52	11.59
	20	6.96	6.95	7.13	7.38	7.67	7.98	8.50	8.97	9.47	11.87	15.24
	25	7.85	7.89	8.12	8.44	8.80	9.21	9.87	10.49	11.16	14.58	20.48
1900	15	6.15	6.12	6.24	6.43	6.66	6.91	7.31	7.67	8.05	9.76	11.86
	20	7.15	7.14	7.32	7.57	7.87	8.19	8.73	9.21	9.72	12.15	15.56
	25	8.07	8.10	8.34	8.66	9.04	9.45	10.13	10.76	11.44	14.91	20.80
2000	15	6.31	6.27	6.40	6.59	6.82	7.08	7.49	7.86	8.25	9.99	12.13
	20	7.33	7.32	7.51	7.77	8.07	8.40	8.94	9.43	9.96	12.43	15.87
	25	8.28	8.31	8.56	8.89	9.27	9.69	10.39	11.02	11.72	15.23	21.12

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	3.53	3.58	3.76	4.03	4.38	4.85	5.96	7.51	9.70	25.04	56.46
	20	4.02	4.19	4.57	5.16	6.11	7.67	11.28	15.33	20.48	56.49	130.60
	25	4.53	4.92	5.71	7.20	9.80	13.33	20.41	28.26	38.27	108.35	252.84
200	15	4.45	4.51	4.73	5.03	5.40	5.87	6.81	8.00	9.82	25.04	56.46
	20	5.13	5.33	5.74	6.31	7.11	8.29	11.35	15.33	20.48	56.49	130.60
	25	5.82	6.24	6.98	8.15	10.12	13.36	20.41	28.26	38.27	108.35	252.84
300	15	5.18	5.26	5.50	5.83	6.23	6.72	7.65	8.73	10.28	25.04	56.46
	20	6.02	6.24	6.68	7.27	8.06	9.13	11.71	15.38	20.48	56.49	130.60
	25	6.86	7.30	8.05	9.15	10.84	13.60	20.41	28.26	38.27	108.35	252.84
400	15	5.81	5.90	6.17	6.53	6.96	7.46	8.41	9.46	10.88	25.04	56.46
	20	6.79	7.03	7.49	8.12	8.91	9.95	12.29	15.57	20.50	56.49	130.60
	25	7.75	8.21	8.99	10.08	11.66	14.09	20.45	28.26	38.27	108.35	252.84
500	15	6.38	6.48	6.77	7.15	7.61	8.14	9.11	10.15	11.52	25.05	56.46
	20	7.48	7.73	8.23	8.87	9.69	10.72	12.94	15.92	20.57	56.49	130.60
	25	8.56	9.04	9.84	10.94	12.47	14.71	20.56	28.27	38.27	108.35	252.84
600	15	6.91	7.02	7.32	7.72	8.20	8.76	9.76	10.81	12.15	25.06	56.46
	20	8.11	8.38	8.90	9.57	10.41	11.45	13.61	16.38	20.72	56.49	130.60
	25	9.30	9.80	10.62	11.74	13.25	15.38	20.79	28.28	38.27	108.35	252.84
700	15	7.40	7.51	7.84	8.26	8.76	9.34	10.37	11.43	12.76	25.10	56.46
	20	8.71	8.99	9.53	10.22	11.08	12.13	14.26	16.90	20.96	56.49	130.60
	25	9.99	10.50	11.36	12.49	13.99	16.05	21.13	28.33	38.27	108.35	252.84
800	15	7.86	7.98	8.32	8.76	9.28	9.88	10.94	12.02	13.35	25.19	56.46
	20	9.26	9.56	10.12	10.84	11.72	12.78	14.90	17.45	21.28	56.49	130.60
	25	10.64	11.17	12.04	13.20	14.70	16.72	21.54	28.42	38.27	108.35	252.84
900	15	8.30	8.43	8.78	9.24	9.78	10.40	11.48	12.58	13.92	25.32	56.46
	20	9.79	10.10	10.68	11.42	12.32	13.40	15.52	18.00	21.66	56.49	130.60
	25	11.25	11.80	12.70	13.87	15.39	17.38	22.01	28.57	38.28	108.35	252.84
1000	15	8.72	8.85	9.22	9.69	10.25	10.89	12.00	13.12	14.47	25.50	56.46
	20	10.30	10.61	11.21	11.98	12.90	14.00	16.12	18.56	22.09	56.49	130.60
	25	11.84	12.40	13.32	14.52	16.04	18.03	22.50	28.78	38.31	108.35	252.84

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: FAST (ALPHA = .0444 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	9.12	9.26	9.64	10.13	10.71	11.36	12.50	13.64	15.00	25.73	56.46
	20	10.79	11.11	11.72	12.51	13.45	14.57	16.70	19.12	22.53	56.49	130.60
	25	12.40	12.97	13.92	15.14	16.67	18.65	23.02	29.04	38.35	108.35	252.84
1200	15	9.51	9.65	10.04	10.55	11.14	11.81	12.98	14.14	15.51	25.99	56.46
	20	11.25	11.58	12.21	13.02	13.98	15.12	17.26	19.66	23.00	56.50	130.60
	25	12.94	13.53	14.49	15.73	17.29	19.26	23.55	29.35	38.41	108.35	252.84
1300	15	9.88	10.03	10.43	10.95	11.56	12.25	13.45	14.62	16.01	26.29	56.46
	20	11.70	12.04	12.69	13.51	14.49	15.65	17.81	20.20	23.47	56.50	130.60
	25	13.47	14.06	15.05	16.31	17.88	19.86	24.08	29.69	38.51	108.35	252.84
1400	15	10.24	10.39	10.81	11.35	11.97	12.68	13.90	15.09	16.49	26.61	56.46
	20	12.14	12.49	13.15	13.99	14.99	16.17	18.35	20.73	23.94	56.50	130.60
	25	13.97	14.58	15.58	16.86	18.45	20.44	24.61	30.06	38.63	108.35	252.84
1500	15	10.59	10.75	11.18	11.73	12.37	13.09	14.33	15.54	16.96	26.96	56.46
	20	12.57	12.92	13.60	14.46	15.47	16.67	18.87	21.25	24.42	56.50	130.60
	25	14.47	15.08	16.10	17.41	19.01	21.00	25.14	30.46	38.78	108.35	252.84
1600	15	10.94	11.10	11.53	12.10	12.75	13.49	14.76	15.99	17.42	27.32	56.47
	20	12.98	13.34	14.03	14.91	15.94	17.15	19.37	21.75	24.90	56.51	130.60
	25	14.94	15.57	16.61	17.93	19.55	21.56	25.67	30.87	38.97	108.35	252.84
1700	15	11.27	11.43	11.88	12.46	13.13	13.88	15.17	16.42	17.87	27.68	56.47
	20	13.38	13.75	14.45	15.35	16.40	17.63	19.87	22.25	25.38	56.51	130.60
	25	15.41	16.05	17.10	18.44	20.08	22.10	26.19	31.29	39.18	108.35	252.84
1800	15	11.60	11.76	12.22	12.81	13.49	14.26	15.57	16.84	18.30	28.06	56.48
	20	13.77	14.14	14.87	15.78	16.85	18.09	20.35	22.74	25.85	56.52	130.60
	25	15.87	16.51	17.58	18.94	20.60	22.63	26.70	31.72	39.42	108.35	252.84
1900	15	11.91	12.08	12.55	13.15	13.85	14.63	15.97	17.25	18.73	28.44	56.48
	20	14.16	14.53	15.27	16.19	17.28	18.54	20.83	23.23	26.32	56.54	130.60
	25	16.31	16.96	18.05	19.43	21.11	23.14	27.21	32.16	39.68	108.35	252.84
2000	15	12.23	12.40	12.87	13.49	14.20	14.99	16.35	17.65	19.15	28.83	56.50
	20	14.53	14.91	15.66	16.60	17.71	18.99	21.29	23.70	26.78	56.56	130.60
	25	16.75	17.41	18.51	19.91	21.60	23.65	27.72	32.61	39.97	108.35	252.84

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	7.10	9.03	13.79	20.99	30.46	42.60	66.91	93.91	128.35	369.99	868.77
	20	9.58	17.27	29.90	46.95	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	14.38	31.79	56.46	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
200	15	9.06	10.66	14.19	21.00	30.46	42.60	66.91	93.91	128.35	369.99	868.77
	20	11.75	17.53	29.90	46.95	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	15.84	31.79	56.46	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
300	15	10.63	12.18	15.17	21.12	30.46	42.60	66.91	93.91	128.35	369.99	868.77
	20	13.62	18.44	29.91	46.95	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	17.68	31.82	56.46	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
400	15	11.99	13.53	16.30	21.50	30.47	42.60	66.91	93.91	128.35	369.99	868.77
	20	15.26	19.63	29.99	46.95	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	19.45	31.97	56.46	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
500	15	13.21	14.76	17.43	22.13	30.54	42.60	66.91	93.91	128.35	369.99	868.77
	20	16.74	20.87	30.24	46.95	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	21.10	32.37	56.47	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
600	15	14.34	15.90	18.51	22.90	30.72	42.61	66.91	93.91	128.35	369.99	868.77
	20	18.11	22.10	30.69	46.96	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	22.64	32.99	56.47	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
700	15	15.38	16.97	19.56	23.73	31.02	42.63	66.91	93.91	128.35	369.99	868.77
	20	19.38	23.30	31.29	46.99	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	24.09	33.79	56.48	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
800	15	16.37	17.98	20.55	24.58	31.44	42.68	66.91	93.91	128.35	369.99	868.77
	20	20.58	24.45	32.01	47.05	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	25.47	34.69	56.51	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
900	15	17.30	18.93	21.51	25.44	31.94	42.77	66.91	93.91	128.35	369.99	868.77
	20	21.72	25.56	32.79	47.16	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	26.79	35.64	56.57	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1000	15	18.19	19.84	22.43	26.29	32.52	42.91	66.91	93.91	128.35	369.99	868.77
	20	22.81	26.63	33.62	47.34	69.33	98.04	155.52	219.43	300.94	873.24	2055.0
	25	28.04	36.63	56.68	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: MEDIUM (ALPHA = .0111 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	19.05	20.72	23.32	27.13	33.13	43.11	66.91	93.91	128.35	369.99	868.77
	20	23.85	27.66	34.46	47.60	69.34	98.04	155.52	219.43	300.94	873.24	2055.0
	25	29.25	37.63	56.85	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1200	15	19.87	21.56	24.18	27.96	33.78	43.38	66.91	93.91	128.35	369.99	868.77
	20	24.85	28.66	35.32	47.92	69.35	98.04	155.52	219.43	300.94	873.24	2055.0
	25	30.41	38.63	57.08	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1300	15	20.66	22.37	25.01	28.77	34.45	43.70	66.92	93.91	128.35	369.99	868.77
	20	25.82	29.63	36.17	48.30	69.38	98.04	155.52	219.43	300.94	873.24	2055.0
	25	31.54	39.62	57.38	89.75	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1400	15	21.43	23.16	25.81	29.56	35.13	44.07	66.94	93.91	128.35	369.99	868.77
	20	26.76	30.57	37.02	48.74	69.41	98.04	155.52	219.43	300.94	873.24	2055.0
	25	32.63	40.60	57.74	89.76	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1500	15	22.18	23.92	26.60	30.33	35.81	44.48	66.97	93.91	128.35	369.99	868.77
	20	27.67	31.49	37.86	49.23	69.47	98.04	155.52	219.43	300.94	873.24	2055.0
	25	33.68	41.58	58.16	89.77	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1600	15	22.90	24.67	27.36	31.09	36.50	44.93	67.01	93.91	128.35	369.99	868.77
	20	28.55	32.38	38.70	49.76	69.55	98.04	155.52	219.43	300.94	873.24	2055.0
	25	34.71	42.54	58.63	89.79	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1700	15	23.60	25.39	28.10	31.84	37.18	45.40	67.06	93.92	128.35	369.99	868.77
	20	29.41	33.26	39.52	50.31	69.66	98.05	155.52	219.43	300.94	873.24	2055.0
	25	35.71	43.48	59.15	89.81	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1800	15	24.29	26.10	28.83	32.57	37.86	45.90	67.13	93.92	128.35	369.99	868.77
	20	30.25	34.11	40.34	50.89	69.79	98.05	155.52	219.43	300.94	873.24	2055.0
	25	36.69	44.41	59.70	89.85	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
1900	15	24.97	26.79	29.54	33.29	38.54	46.42	67.23	93.92	128.35	369.99	868.77
	20	31.07	34.94	41.14	51.49	69.95	98.06	155.52	219.43	300.94	873.24	2055.0
	25	37.65	45.33	60.28	89.90	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8
2000	15	25.62	27.46	30.24	33.99	39.21	46.95	67.34	93.92	128.35	369.99	868.77
	20	31.87	35.76	41.93	52.10	70.15	98.07	155.52	219.43	300.94	873.24	2055.0
	25	38.58	46.23	60.88	89.97	133.41	189.44	301.62	426.36	585.49	1702.9	4010.8

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
100	15	44.57	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.76	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
200	15	44.57	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.76	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
300	15	44.64	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.76	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
400	15	45.00	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.76	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
500	15	45.78	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.76	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
600	15	46.91	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.77	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
700	15	48.25	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.78	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
800	15	49.71	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.81	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
900	15	51.23	105.54	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	101.88	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1000	15	52.77	105.55	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	102.01	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.

TIME TO ACTUATE HEAT DETECTOR, MINUTES

SPACING = 60.0 Ft (RADIUS = 42.4 Ft)
FIRE GROWTH: SLOW (ALPHA = .00278 BTU/s^3)

RESPONSE TIME INDEX	RATE OF RISE	CEILING HEIGHT, Ft										
$(Ft*s)^{1/2}$	°F/min	4	8	12	16	20	24	30	35	40	60	80
1100	15	54.32	105.56	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	102.22	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1200	15	55.85	105.60	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	102.53	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1300	15	57.36	105.65	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	102.94	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1400	15	58.86	105.74	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	103.46	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1500	15	60.33	105.86	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	104.08	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.06	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1600	15	61.78	106.03	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	104.79	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.07	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1700	15	63.20	106.25	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	105.57	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.08	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1800	15	64.60	106.52	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	106.43	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.09	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
1900	15	65.98	106.84	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	107.34	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.12	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.
2000	15	67.34	107.21	190.82	305.79	456.58	650.12	1037.6	1468.5	2018.3	5879.3	13855.
	20	108.31	246.49	448.66	721.13	1078.5	1537.1	2455.4	3476.7	4779.8	13931.	32835.
	25	196.16	478.86	873.75	1405.9	2103.8	2999.5	4793.0	6787.6	9332.5	27206.	64127.

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☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

11. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)*

This report presents a methodology for evaluating heat detection systems installed in buildings. Previous work for use primarily in designing new thermal fire detection systems was used as a starting point. The previous work was enhanced and supplemented to make it more useful for evaluating existing systems. The resulting equations were programmed into a user interactive computer program. This program is available in both BASIC and FORTRAN and will run on mainframes as well as personal computers. In addition, a modified version of the FORTRAN program was used to develop an extensive set of tables listing detector activation times for given building geometries, detector characteristics, and fire growth rates. These tables are useful for quick evaluation of alternative heat detector installations. Finally, practical examples are included to illustrate the use of the tables and computer programs.

12. KEY WORDS *(Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)*

fire alarm systems; fire detection; fire detection systems; fire hazard assessment; fire protection; fire suppression; heat detectors; sprinkler systems

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