12.6 A damper intended to be adjustable between open and closed positions is to be regulated to produce severe conditions, and is not to be closed to the extent that flue gases spill into the living space.

12.7 After ignition, fuel is to be added at 7-1/2 minute intervals and at each interval the fire is to be poked or stirred in an effort to maintain a 6 inch (152 mm) bed of fuel burning at maximum intensity. Poking and stirring are to be accomplished by inserting a flat bar of steel at the midpoint of the basket at one end and sliding it through the fire bed, and then inserting the bar at the bottom of the basket at the other end and sliding it the opposite way through the fire bed. Ashes on the hearth are to be removed prior to each addition of fuel.

12.8 Temperatures at all points of measurement are to be recorded at intervals not exceeding 30 minutes until it is apparent the maximum temperatures have been attained. Maximum temperatures are identified to have been attained when three successive readings taken at 30-minute intervals show no change or show a decrease.

12.9 When the fireplace is fired as described in 12.5 – 12.7, the maximum temperature rise above ambient zone temperature shall not exceed:

a) 117°F (65°C) on exposed surfaces of the test enclosure and

b) 90° F (50° C) on concealed surfaces of the test enclosure, such as beneath the hearth (fire chamber), beneath the hearth extension, behind the wall-mounted shields, within the chimney enclosure and surrounding the fire chamber.

12.10 The temperature rise of any part of the fireplace and chimney shall not exceed the maximum values specified in Column 1 of Table 10.1 for the material employed.

12.11 The temperature rise of the outlet air at the outlet in an air duct system shall not exceed 250° F (139°C) above room ambient temperature.

12.12 The temperature rise of the surface grille of remote air outlets located in areas other than directly in front of and above the fire chamber opening shall not exceed:

a) 140° F (78° C) above ambient zone temperature for grilles located 36 inches (914 mm) or less above the floor.

b) 180° F (100° C) above ambient zone temperature for grilles located more than 36 inches (914 mm) above the floor.

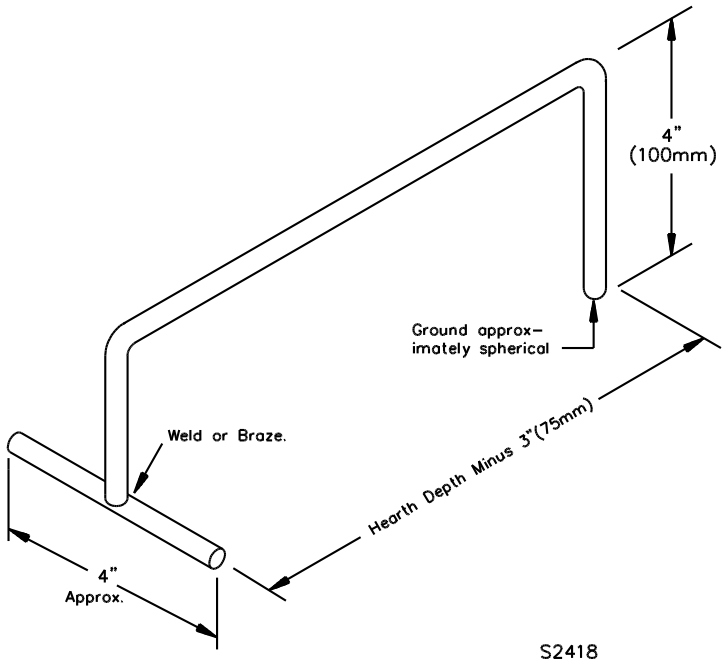
13 Brand Fire Test

13.1 Andirons to be used in this test are to be constructed as illustrated in Figure 13.1.

Exception: This requirement does not apply when integral grates are provided.

Figure 13.1

Andiron

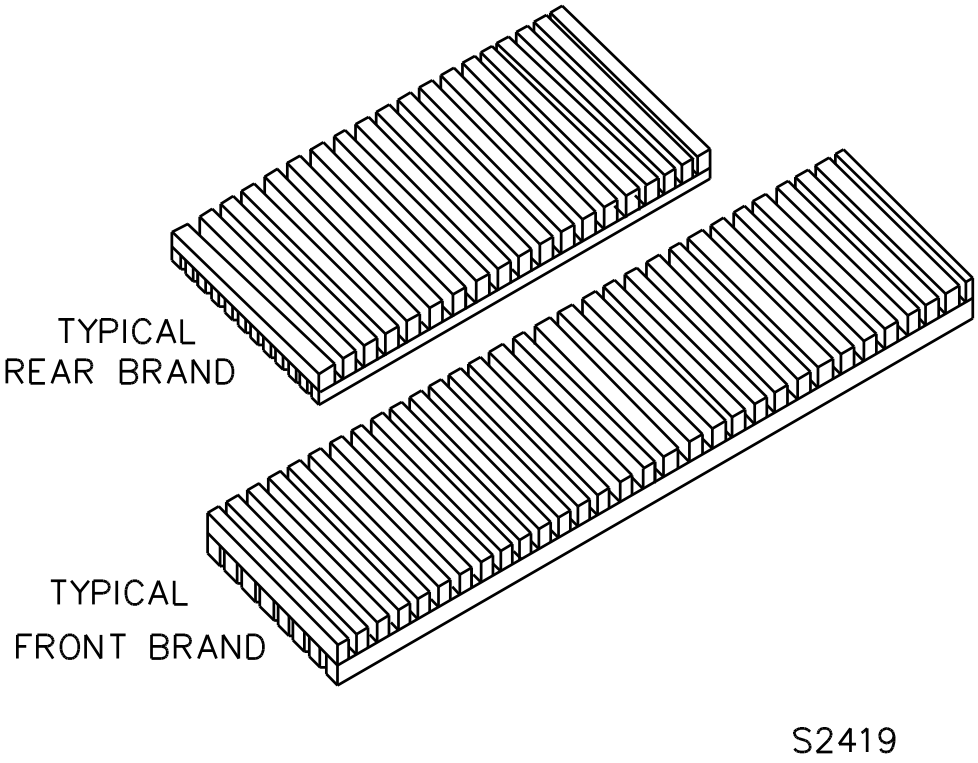


Material: 5/8 inch (15.9 mm) round or square steel bar stock. Two each required.

13.2 The brands are to be constructed as illustrated in Figure 13.2, and are to employ strips of dry (moisture content of 19 percent or less) Douglas fir finished to 3/4 by 3/4 inch (19.1 by 19.1 mm), weighing 0.02 ±0.002 pounds per cubic inch (554.0 ±55.4 kg/m^3) and spaced 1 inch (25.4 mm) apart on centers. The brands are to be conditioned in an oven at 105 – 150°F (40.5 – 66°C) for at least 16 hours prior to being burned. Conditioned brands are to be used within 3 hours after their removal from the oven.

Figure 13.2

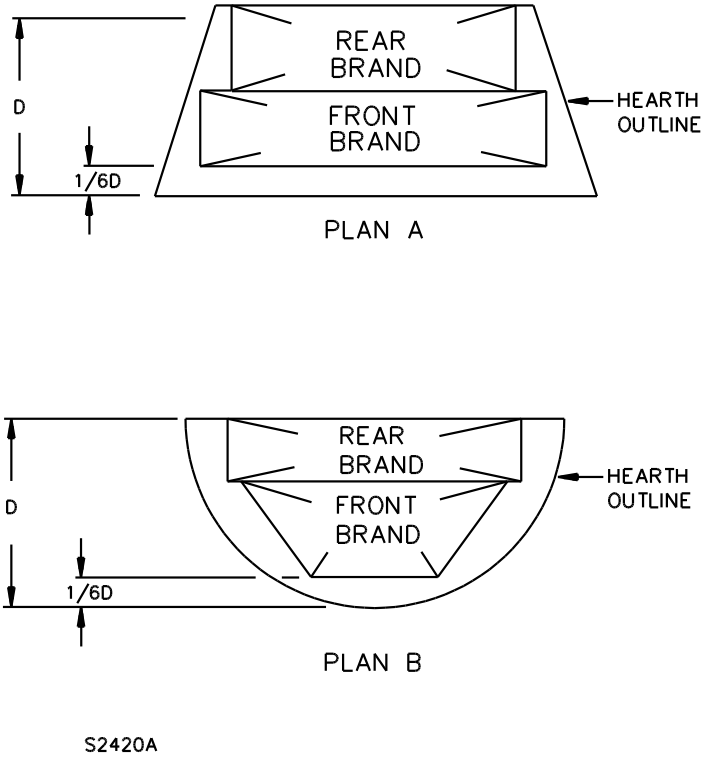
Brands



13.3 The brands are to be placed in the hearth area as illustrated in Figure 13.3 which shows two typical hearth shapes. Each front and rear brand is to have an area in the plan view equal to one-third of the total hearth area. When the brands are located as illustrated in Figure 13.3, the distance from the front edge of the front brand to the front of the hearth is to be one-sixth of the maximum hearth depth measured between the front and back edges of the hearth.

Figure 13.3

Typical relation of brands to hearth



13.4 The hearth area is identified to be the effective area on which the fuel is to be burned, and consists of the area bordered by the back and side walls of the fireplace, and the plane of the front opening of the fireplace.

Exception No. 1: For a fireplace incorporating raised ledges, the hearth area is to be defined as specified in 13.5.

Exception No. 2: For a fireplace incorporating an integral grate, the hearth area is to be defined as specified in 13.6.

13.5 For a fireplace whose hearth area incorporates raised ledges, each brand is to have an area in the plan view equal to one-third of the hearth area as defined by the ledges. For the purpose of defining the hearth depth, the minimum ledge height above the hearth is to be identified as 1-1/2 inches (38.1 mm) at the front, and 6 inches (152 mm) at the sides and back and the maximum depth of the front ledge (regardless of actual depth) is identified not to exceed one-sixth of the depth of the hearth measured between the back wall of the fire chamber and the plane of the front opening (plane of door when used) of the fireplace.

13.6 When the fuel burning area is defined by the front of a log retainer with a minimum height of 4 inches (102 mm) and the sides and rear of the fireplace, each brand is to be one-half of the effective burning area of the hearth. When the fuel burning area is defined by an integral grate having a front with a minimum height of 4 inches (102 mm) and the sides and rear of the grate are a minimum of 6 inches (152 mm) high, each brand is to be one-half of the area of the integral grate. When the effective burning area of the integral grate is less than one-half the hearth area of the fireplace, each brand is to have an area equivalent to one-half of the hearth area of the fireplace.

13.7 A damper constructed to be adjustable between open and closed positions is to be regulated to produce severe conditions and is not to be closed to the extent that flue gases spill into the living space.

13.8 Throughout the test there shall be no evidence of spillage of products of combustion or flame from the fireplace. Intermittent or sporadic wisps of smoke (smoking not longer than 15 seconds at a time) is not to be regarded as spillage.

13.9 After ignition, one brand is to be added every 7-1/2 minutes, alternating front and rear, with the long strips placed downward and parallel to the face of the fire chamber opening. Embers are to be leveled; ashes are not to be removed from the hearth.

Exception No. 1: A slower feed rate is to be used when greater temperature rises are produced.

Exception No. 2: When embers build up to a level of one-half of the fire chamber opening height, a slower feed rate is to be used to maintain a fuel bed that does not exceed this height.

13.10 Temperatures at all points of measurement are to be recorded at intervals not exceeding 30 minutes until it is apparent that maximum temperatures have been attained. Maximum temperatures are identified to have been attained when three successive readings taken at 30-minute intervals show no change or show a decrease.

13.11 When the fireplace is fired as described in 13.2 – 13.9, the maximum temperature rise above ambient zone temperature shall not exceed:

a) 117°F (65°C) on exposed surfaces of the test enclosure; and

b) 90° F (50° C) on concealed surfaces of the test enclosure, such as beneath the hearth (fire chamber), beneath the hearth extension, behind the wall-mounted shields, within the chimney enclosure and surrounding the fire chamber.

13.12 The temperature rise of any part of the fireplace and chimney shall not exceed the maximum specified in Column 1 of Table 10.1 for the material employed.

13.13 The temperature rise of the outlet air at the outlet in an air duct system of a circulating warm-air ducted fireplace shall not exceed 250°F (139°C) above ambient zone temperature.

13.14 The temperature rise of the surface grille of remote air outlets located in areas other than directly in front of and above the fire chamber opening shall not exceed:

a) 140° F (78° C) above ambient zone temperature for grilles located 36 inches (914 mm) or less above the floor.

b) 180° F (100° C) above ambient zone temperature for grilles located more than 36 inches (914 mm) above the floor.

14 Flash Fire Test

14.1 This test is to be conducted as a continuation of the Brand Fire Test, Section 13. The embers remaining from the Brand Fire Test are to be removed to a plane level with the top of the andirons.

14.2 Eight brands are to be stacked on the andirons, four in front and four in the rear, with the long strips placed downward. Each stack of four brands are tied together with wire not larger than 18 AWG (0.04 inch diameter).

14.3 The flue-gas outlet damper is to be fully opened.

14.4 During the resultant fire, there shall be no evidence of spillage of products of combustion, or flame from the fireplace. Intermittent or sporadic wisps of smoke (smoking not longer than 15 seconds at a time) is not to be regarded as spillage.

14.5 Temperatures at all points of measurement are to be recorded at intervals not exceeding 5 minutes until it is apparent that the maximum temperatures have been attained.

14.6 When the fireplace is fired as described in 14.1 – 14.4, the maximum temperature rises shall not exceed 140°F (78°C) above ambient zone temperature on the following surfaces:

a) Test enclosure;

b) Fireplace, or chimney parts at points of zero clearance to the test structure; and

c) Beneath a hearth extension installed on the area specified for such an extension.

14.7 The temperature rise of any part of the fireplace and chimney shall not exceed the maximum value specified in Column 2 of Table 10.1 for the material employed.

14.8 The temperature rise of the surface grille of the air outlet is not to be recorded during this test.

15 Optional Unvented Decorative Log Temperature Test

15.1 This test shall be conducted upon completion of the Brand Fire Test, Section 13, and the Flash Fire Test, Section 14.

15.2 Unvented decorative log sets of the single and double burner type that comply with the Standard for Unvented Room Heaters, ANSI/IAS/AGA Z21.11.2, are to be installed into the hearth of the previously investigated factory-built fireplace in accordance with the manufacturer's instructions. The unvented log set is to be of the largest size which fits into the hearth of the fireplace and is to employ an input rating of 40,000 Btu/h while fired with either natural or propane gas.

15.3 The unvented log sets are to be fired with the flue-gas outlet damper of the factory-built fireplace fully closed, the screen mesh doors drawn closed, and the fireplace glass doors (when provided) fully open. The chimney system is to remain installed on the fireplace during these tests.

15.4 The installation and operation of the unvented log sets are to be conducted in accordance with the log manufacturer's installation and operating instructions.

15.5 The temperatures at all points of measurement are to be recorded at intervals not exceeding 30 minutes until it is apparent the maximum temperatures have been attained. Maximum temperatures are considered to have been attained when three successive readings taken at 30-minute intervals show no change or show a decrease.

15.6 When the unvented log sets are fired as described in 15.2 and 15.3, the maximum temperature rise above ambient zone temperatures shall not exceed the temperature limits required by 13.11.

16 Support Test

16.1 Parts of the fireplace shall not be damaged or become distorted, nor shall the security of their attachment to a building structure be impaired, when tested as described in 16.2 and 16.3.

16.2 Parts of the fireplace required to support the chimney, hood, or other part above the fireplace opening are to be installed as described in the manufacturer's instructions, in a framework simulating a typical installation. A section of the chimney, hood, or other part is to be placed on the fireplace as intended and is to be loaded either by means of weights or by a machine.

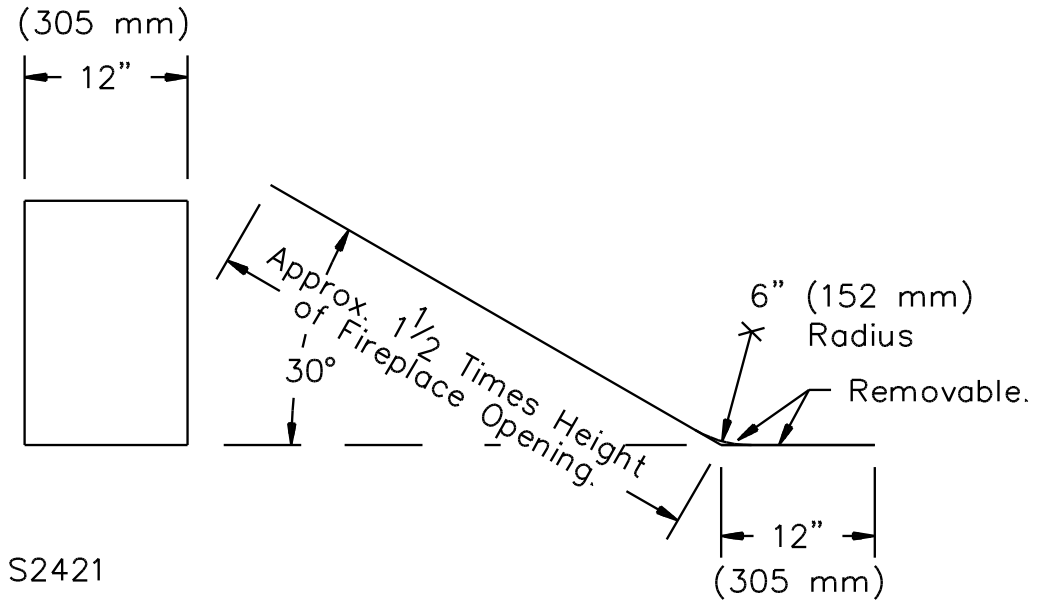
16.3 The maximum static load applied is to be equal to four times the load imposed by the heaviest chimney or by any other part that the fireplace is required to sustain in service. The load is to be applied for a minimum of 60 minutes.

17 Fire Chamber Strength Test

17.1 The fireplace, its hearth, and any factory-installed hearth extension are to be positioned and supported as intended with relation to a building structure. An inclined plane and a simulated log are to be prepared for use in this test. See Figure 17.1 and Figure 17.2.

Figure 17.1

Inclined plane for strength test

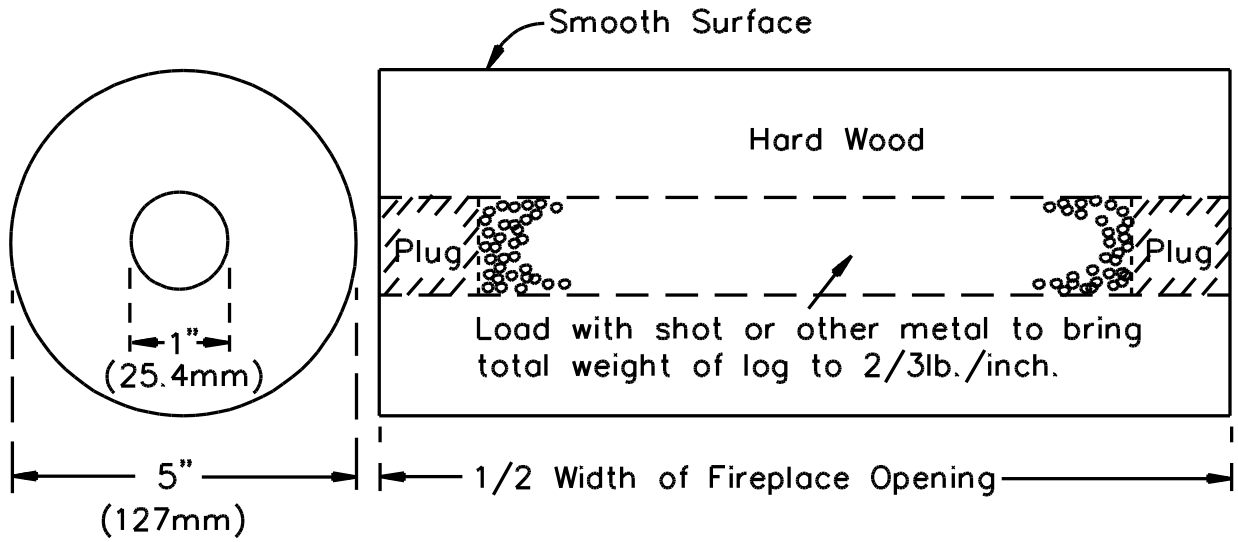


Material: Hardboard or other smooth surfaced material – sheet metal formed to radius as shown.

Support: As convenient.

Figure 17.2

Simulated log



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17.2 The inclined plane is to be positioned with respect to the fireplace as illustrated in Figure 17.3 and Figure 17.4. The andirons shown in Figure 17.3 and Figure 17.4 are to be as illustrated in Figure 13.1.

Figure 17.3

Inclined plane in position for strength test of back wall

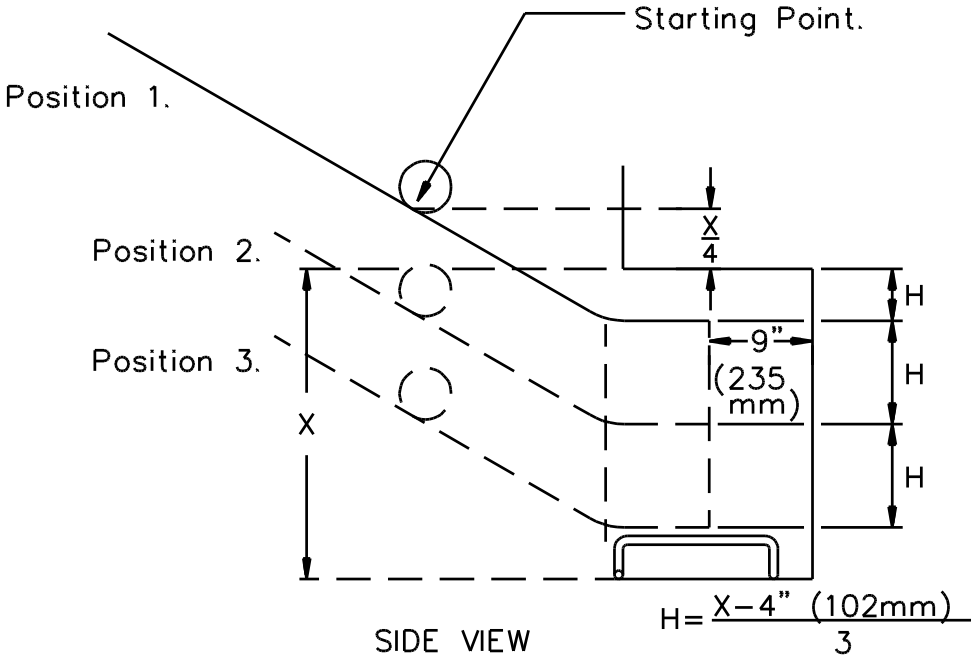

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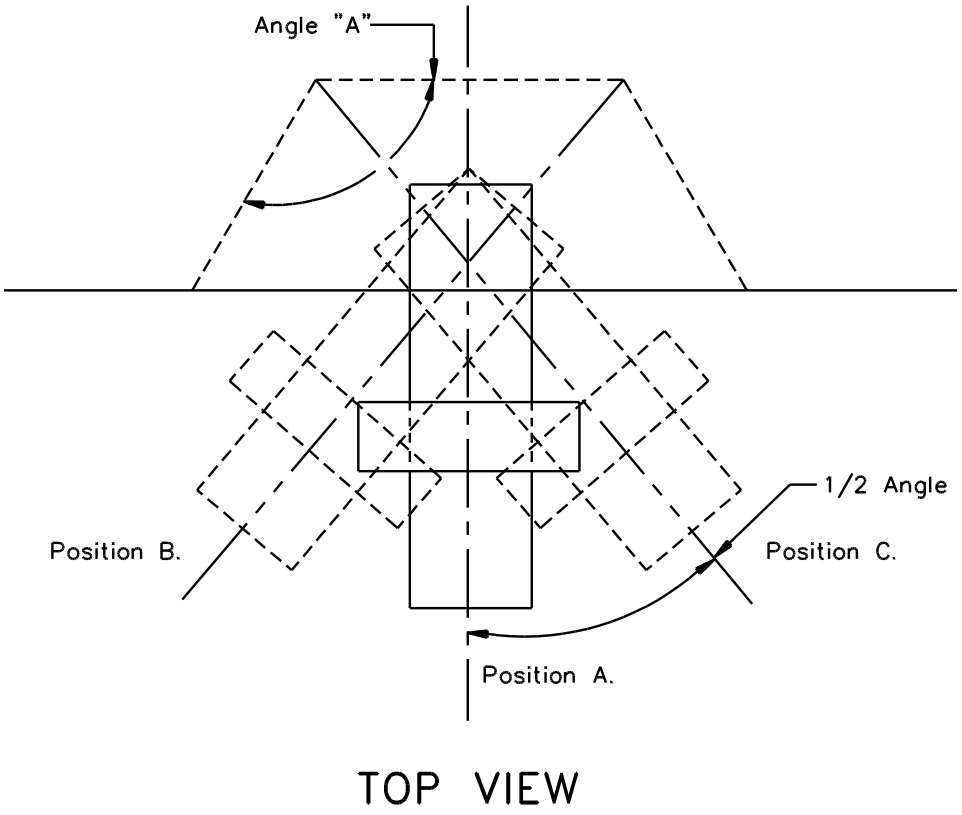
Figure 17.4

Inclined plane in position for strength test of back and side walls



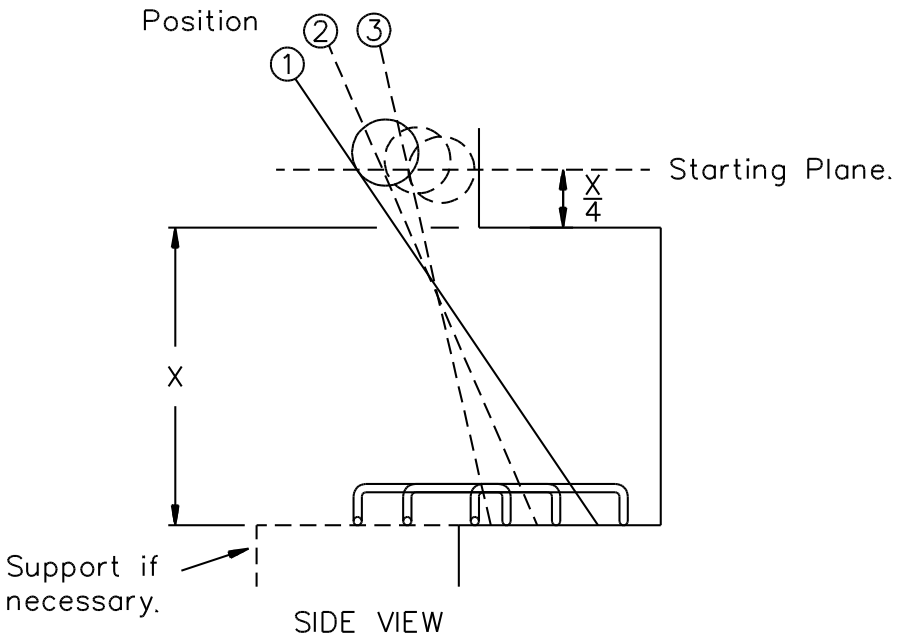
17.3 While remaining in position "A" as illustrated in Figure 17.4, the inclined plane is to be elevated successively to each of the three positions shown in Figure 17.3 and the simulated log is to be rolled down the plane once at each elevation of the plane, for a total of three impacts against the back wall of the fire chamber.

17.4 The test described in 17.3 is to be repeated with the inclined plane in position "B" (Figure 17.4) and then in position "C", for a total of six additional impacts.

17.5 With the inclined plane remaining in position "A" as illustrated in Figure 17.4, the andirons are to be positioned successively in the three positions shown in Figure 17.5. The slope of the inclined plane then is to be adjusted so that the simulated log to roll down the plane and impact the rear half of the andiron. There is to be one impact at each position of the andiron, for a total of three impacts.

Figure 17.5

Inclined plane in position for strength test of hearth[a]



[a] No one point on the hearth is to be struck repeatedly. The andirons shall be moved from side to side as well as in and out.