805 KAR 5:070. Minimum requirements for roof support and the roof control plan approval process.

RELATES TO: KRS 352.201
STATUTORY AUTHORITY: KRS 351.070(13)
CERTIFICATION STATEMENT:
NECESSITY, FUNCTION, AND CONFORMITY: KRS 352.201 requires each underground coal mine to formulate and follow an approved roof control plan. This proposed administrative regulation establishes those minimum standards for roof support and the roof control plan approval process.

Section 1. Definitions. The definitions established in KRS 351.010 and 352.010 shall apply to this administrative regulation, in addition to those set out below:

(1) "Automated temporary roof support" or "ATRS" means a mechanical device used to temporarily support the roof while roof bolts are being installed.

(2) "Automated temporary roof support system" means the devices and mechanisms - including the ATRS - used, and methods followed by which ATRS is activated and set to support the roof.

(3) "Mining height" means the distance between the bottom of the coal seam and the bottom of permanent mechanical roof support, and specifically does not include or apply to the brushing of top or bottom for construction work and to coal left unmined for purposes of providing additional roof support.

(4) "Pillar recovery" means any reduction in pillar size during retreat mining.

(5) "Roof control plan" means the plan and its revisions which has been adopted by the licensee for support of the mine roof and approved by the commissioner or his authorized representative pursuant to KRS 352.201(1).

Section 2. Mining Methods.

(1) The method of mining shall not expose any person to hazards caused by excessive widths of rooms, crosscuts and entries, or faulty pillar recovery methods. Pillar dimensions shall be compatible with effective control of the roof, face, ribs and coal or rock bursts.

(2) A sightline or other method of directional control shall be used to maintain the projected direction of mining in entries, rooms, crosscuts and pillar splits.

(3) A sidecut shall be started only from an area that is supported in accordance with the roof control plan.

(4) A working face shall not be mined through into an unsupported area of active workings, except when the unsupported area is inaccessible.

(5) Additional roof support shall be installed where:

(a) The width of the opening specified in the roof control plan is exceeded by more than twelve (12) inches; and

(b) The distance over which the excessive width exists is more than five (5) feet.

Section 3. Roof Bolting.

(1) For roof bolts and accessories addressed in American Society for Testing and Materials (ASTM, F 432-95), the licensee shall:

(a) Obtain a manufacturer's certification that the material was manufactured and tested in accordance with the specifications of ASTM; and

(b) Make this certification available to an authorized representative of the commissioner.

(2) Roof bolts and accessories not addressed in the material incorporated by reference may be used, if the use of those roof bolts and accessories is approved by the commissioner or his authorized representative based on:

(a) Demonstrations which show that the materials have successfully supported the roof in an area of a coal mine with similar strata, opening dimensions and roof stresses; or

(b) Tests which show the materials to be effective for supporting the roof in an area of the affected mine which has strata, opening dimensions and roof stresses similar to those in the area where the roof bolts are to be used; during the test process, access to the test area shall be limited to persons necessary to conduct the test.

(3) A bearing plate shall be firmly installed with each roof bolt.

(4) A bearing plate used directly against the mine roof shall be at least six (6) inches square, except that if the mine roof is firm and not susceptible to sloughing, bearing plates five (5) inches square may be used.

(5) A bearing plate used with wood or metal materials shall be at least four (4) inches square.

(6) Wooden materials that are used between a bearing plate and the mine roof in an area which will be used for three (3) years or more shall be treated to minimize deterioration.

(7) When washers are used with roof bolts, the washers shall conform to the shape of the roof bolt head and bearing plate.

(8) The diameter of a finishing bit shall be within a tolerance of plus or minus 0.030 inch of the manufacturer's recommended hole diameter for the anchor used.

(9) When separate finishing bits are used, they shall be distinguishable from other bits.

Section 4. Tensioned Roof Bolts.

(1) Roof bolts that provide support by creating a beam of laminated strata shall be at least thirty (30) inches long. Roof bolts that provide support by suspending the roof from overlying stronger strata shall be long enough to anchor at least twelve (12) inches into the stronger strata.

(2) Test holes, spaced at intervals specified in the roof control plan, shall be drilled to a depth of at least twelve (12) inches above the anchorage horizon of the bolts being used. When a test hole indicates that bolts would not anchor in competent strata, corrective action shall be immediately taken.

(3) The installed torque or tension ranges for roof bolts as specified in the roof control plan shall maintain the integrity of the support system and shall exceed neither the yield point of the roof bolt nor anchorage capacity of the strata.

(4) In each roof bolting cycle, the actual torque or tension of the first tensioned roof bolt installed with each drill head shall be measured immediately after it is installed. Thereafter, for each drill head used, at least one (1) roof bolt out of every four (4) installed shall be measured for actual torque or tension. If the torque or tension of any of the roof bolts measured is not within the range specified in the roof control plan, corrective action shall be taken.

(5) In a working place from which coal is produced during any portion of a twenty-four (24) hour period, the actual torque or tension on at least one (1) out of every ten (10) previously installed, mechanically anchored, tensioned roof bolts shall be measured from the outby corner of the last open crosscut to the face in each advancing section. Corrective action shall be taken if the majority of the bolts measured:

(a) Do not maintain at least the following percentages of the minimum torque or tension specified in the roof control plan:

1. Seventy (70) percent; or
2. Fifty (50) percent if the roof bolt plates bear against wood;

(b) Have exceeded the maximum specified torque or tension by fifty (50) percent.

(6) The licensee or a person designated by him shall certify by signature and date that measurements required by subsection (5) of this section have been made. This certification shall be maintained for at least one (1) year and shall be made available to an authorized representative of the commissioner and representatives of the miners.

(7) A tensioned roof bolts installed in the roof support pattern shall not be used to anchor trailing cables or used for any other purpose that could affect the tension of the bolt. The hanging of trailing cables, line brattice, telephone lines, or other similar devices which do not place a sudden load on the bolts is permitted.

(8) An angle compensating device shall be used when tensioned roof bolts are installed at an angle greater than five (5) degrees from the perpendicular to the bearing plate.

(9) The first nontensioned grouted roof bolt installed during each roof bolting cycle shall be tested during or immediately after the first row of bolts has been installed. If the bolt tested does not withstand at least 150 foot-pounds of torque without rotating in the hole, corrective action shall be taken.

Section 5. Installation of Roof Support Using Mining Machines with Integral Roof Bolters. When roof bolts are installed by a continuous mining machine with integral roof bolting equipment:

(1) The distance between roof bolts shall not exceed ten (10) feet crosswise;

(2) Roof bolts to be installed nine (9) feet or more apart shall be installed with a wooden crossbar at least three (3) inches thick and eight (8) inches wide, or material which provides equivalent support; and

(3) Roof bolts to be installed more than eight (8) feet but less than nine (9) feet apart shall be installed with a wooden plank at least two (2) inches thick and eight (8) inches wide, or material which provides equivalent support.

Section 6. Conventional Roof Support.

(1) When conventional roof support materials are used as the only means of support:

(a) The width of any opening shall not exceed twenty (20) feet;

(b) The spacing of roadway roof support shall not exceed five (5) feet;

(c) Supports shall be installed to within five (5) feet of the uncut face;

(d) If supports nearest the face must be removed to facilitate the operation of face equipment, equivalent temporary support shall be installed prior to their removal;

(e) A straight roadway shall not exceed sixteen (16) feet wide where full overhead support is used and fourteen (14) feet wide where only posts are used;

(f) A curved roadway shall not exceed sixteen (16) feet wide; and

(g) The roof at the entrance of all openings along travelways which are no longer needed for storing supplies or for travel of equipment shall be supported by extending the line of support across the opening.

(2) Conventional roof support materials shall meet the following specifications:

(a) The minimum diameter of cross-sectional area of wooden posts shall be as follows:

Post Length (in inches)	Diameter of round post (in inches)	Cross-sectional area of split post (in square inches)
60 or less	4	13
Over 60 to 84	5	20
Over 84 to 108	6	28
Over 108 to 132	7	39
Over 132 to 156	8	50
Over 156 to 180	9	64
Over 180 to 204	10	79

Over 204 to 228	11	95
Over 228	12	113

(b) Wooden materials used for support shall have the following dimensions:

1. Cap blocks and footings shall have flat sides and be at least two (2) inches thick, four (4) inches wide and twelve (12) inches long;

2. Crossbars shall have a minimum cross-sectional area of twenty-four (24) square inches and be at least three (3) inches thick;

3. Planks shall be at least six (6) inches wide and one (1) inch thick.

(c) Cribbing materials shall have at least two (2) parallel flat sides.

(3)

(a) A cluster of two (2) or more posts that provide equivalent strength may be used to meet the requirements of subsection (2)(a) of this section.

(b) A post shall not have a diameter less than four (4) inches or have a cross-sectional area less than thirteen (13) square inches.

(4) Materials other than wood used for support shall have support strength at least equivalent to wooden material meeting the applicable provisions of this section.

(5) Posts and jacks shall be tightly installed on solid footing.

(6) If a post is installed under roof susceptible to sloughing, a cap block, plank, crossbar or materials that are equally effective shall be placed between the post and the roof.

(7) Blocks used for lagging between the roof and crossbars shall be spaced to distribute the load.

(8) A jack used for roof support shall be used with at least thirty-six (36) square inches of roof-bearing surface.

Section 7. Pillar Recovery.

(1) Full and partial pillar recovery shall not be conducted on the same pillar line, except where physical conditions such as unstable floor or roof, falls of roof, oil and gas well barriers or surface subsidence require that pillars be left in place.

(2) Before mining is begun in a pillar split or lift:

(a) At least two (2) rows of breaker posts or equivalent support shall be installed as close to the initial intended breakline as practicable and across each opening leading into an area where full or partial pillar extraction has been completed; and

(b) A row of roadside-radius (turn) posts or equivalent support shall be installed leading into the split or lift.

(3) Before mining is started on a final stump:

(a) At least two (2) rows of posts or equivalent support shall be installed on not more than four (4) foot centers on each side of the roadway;

(b)

1. No more than one (1) roadway, which shall not exceed sixteen (16) feet wide, shall lead from solid pillars to the final stump of a pillar; and

2. If posts are used as the sole means of roof support, the width of the roadway shall not exceed fourteen (14) feet.

(4) During open-end pillar extraction:

(a) At least two (2) rows of breaker posts or equivalent support shall be installed on not more than four (4) foot centers.

(b) These supports shall be:

1. Installed between the lift to be started and the area where pillars have been extracted; and

2. Maintained to within seven (7) feet of the face.

(c) The width of the roadway shall not exceed sixteen (16) feet.

(d) If posts are used as the sole means of roof support, the width of the roadway shall not exceed fourteen (14) feet.

Section 8. Installation and Use of Automated Temporary Roof Support Systems. This section establishes the requirements for and criteria of automated temporary roof support in an underground coal mine in which both the coal bed thickness and the mining height exceed thirty (30) inches.

(1) All roof bolting machines and continuous mining machines with integral roof drills used in a working place in a coal mine shall be provided with an approved automated temporary roof support system unless other methods of temporarily supporting the roof have been approved by the commissioner.

(2) Automated temporary roof support systems and all other methods of temporarily supporting the roof shall be approved on an individual mine basis by the commissioner and shall become part of the roof control plan required by KRS 352.201(1).

(3)

(a) The commissioner may grant a waiver of the requirement for the use of an automated temporary roof support system if:

1. It has been demonstrated by the licensee and determined during an investigation by an authorized representative of the commissioner that:

a. The use of the system would create a greater danger in areas where permanent supports have been installed than the method employed or proposed for temporary support of the roof; or

b. The technology of an automated temporary roof support system does not exist to allow compliance with the requirements of subsection (5) of this section;

2. The configuration of the surface of the roof or other conditions make the use of an ATRS system ineffective or impractical; or

3. The licensee's present roof control plan provides adequate safety to the miner due to the geology or condition of the roof.

(b) In granting a waiver, the commissioner may approve the use of temporary jacks and posts in lieu of the ATRS.

(4)

(a) In the event of a mechanical breakdown in the ATRS, the licensee shall:

1. Provide for comparable temporary roof support;

2. Immediately notify the commissioner or his authorized representative of:

a. The temporary roof support being used; and

b. The provisions being made to repair or replace the ATRS.

(b) The commissioner or his authorized representative shall order the removal of miners from the work area, if it is determined that the roof support system being used during repair of the ATRS does not adequately provide for their safety.

(5) A machine using, or used as, an automated temporary roof support system shall comply with the following minimum requirements unless a waiver has been granted or another method of temporarily supporting the roof has been approved by the commissioner, pursuant to subsection (2) of this section:

(a) The controls necessary to position the machine and place the ATRS against the roof shall be operated from under permanently supported roof, unless the design of the system provides adequate protection of the miner;

(b) The ATRS shall be placed firmly against the roof prior to work inby the permanent roof supports and shall remain in place while work is performed, unless the configuration of the roof surface prevents uniform placement of the ATRS;

(c) A hydraulic jack affecting the support capacity of an ATRS shall have check valves or equivalent protection, to prevent support failure if there is a sudden loss of hydraulic pressure;

(d) An ATRS used in conjunction with single bolt installation shall elastically support, at a minimum, a deadweight load of 11,250 pounds for each five (5) feet by five (5) feet square area of the roof to be supported;

(e) An ATRS consisting of pads or crossbars used in single or multiple rows shall elastically support, at a minimum, a deadweight load in pounds of 450 x ((L+5) x (W+5)), where L is the length of the support structure from tip to tip and W is the width taken at the center line of a support structure to the center line of another support structure;

(f) The actual capacity of the ATRS to support elastically a deadweight load shall be certified by a registered professional engineer;

(g) The distance that the ATRS may be set inby the last row of permanent supports shall be dependent on the row spacing requirements of the permanent roof supports and shall be authorized in the approved roof control plan; and

(h) A person shall not work or travel inby the ATRS.

Section 9. Manual Installation of Temporary Support.

(1) During manual installation of temporary support:

(a) Only a person engaged in installing the support shall proceed beyond permanent roof support;

(b) The first temporary support shall not be set more than five (5) feet from a permanent roof support and the rib.

(2) A temporary support shall be:

(a) Set so that the person installing the support remains between it and two (2) other supports which shall not be more than five (5) feet away;

(b) Completely installed prior to installation of the next temporary support;

(c) Placed on no more than five (5) foot centers.

(3) After temporary supports have been installed, work or travel beyond the permanent roof support shall be between:

(a) Temporary supports and the nearest permanent support; or

(b) Other temporary supports.

Section 10. Warning Devices. Except during the installation of roof supports, the end of permanent roof support shall:

(1) Be posted with a readily visible warning; or

(2) Have a physical barrier installed to impede travel beyond permanent support.

Section 11. Roof Testing and Scaling.

(1) A visual examination of the roof, face and ribs shall be made immediately before any work is started in an area and during the workshift as conditions warrant.

(2) If the mining height permits and the visual examination does not disclose a hazardous condition, sound and vibration roof tests, or other equivalent tests, shall be made where supports are to be installed. If sound and vibration tests are made, they shall be conducted:

(a) After the automated temporary roof support system is set against the roof and before other support is installed; or

(b) Prior to manually installing a roof support.

(3) Sound and vibration roof tests, or other equivalent tests, shall begin under supported roof and shall not progress further than the location where the next support is to be installed.

(4)

(a) If a hazardous roof, face, or rib condition is detected, the condition shall be corrected before work or travel is conducted in the affected area.

(b) If the affected area is left unattended, each entrance to the area shall:

1. Be posted with a readily visible warning; or
2. Have a physical barrier installed to impede travel in the area.

(c) A bar for removing loose material shall be:
1. Available in the working place; or
2. On all face equipment, except haulage equipment; and
3. Of a length and design that will permit the removal of loose material from a position that will not expose the worker to injury from falling material.

Section 12. Rehabilitation of Areas with Unsupported Roof.

(1) General rehabilitation plans shall be submitted with the roof control plan.

(2) Before rehabilitating an area where a roof fall has occurred or the roof has been removed by mining machines or blasting:

(a) The licensee shall establish the clean-up and support procedures to be followed;

(b) A person assigned to perform rehabilitation work shall be instructed in the clean-up and support procedures; and

(c) Ineffective, damaged or missing roof support at the edge of the area to be rehabilitated shall be replaced or other equivalent support installed.

(3) A person performing rehabilitation shall be experienced in that work or supervised by a person, designated by the licensee, who is experienced.

(4) If work is not being performed to rehabilitate an area in active workings where a roof fall has occurred or the roof has been removed by mining machines or by blasting, each entrance to the area shall be supported by at least one (1) row of posts on not more than five (5) foot centers, or equally effective support.

Section 13. Supplemental Support Materials, Equipment and Tools.

(1) A supply of supplemental roof support materials and the tools and equipment necessary to install the materials shall be available at a readily accessible location on each working section or within four (4) crosscuts of each working section.

(2) The quantity of support materials, tools, and equipment made available in accordance with this section shall be sufficient to support the roof if adverse roof conditions are encountered, or in the event of a roof fall.

Section 14. Longwall Mining Systems. For each longwall mining section, the roof control plan shall specify:

(1) The methods that will be used to maintain a safe travelway out of the section through the tailgate side of the longwall; and

(2) The procedures that shall be followed if a ground failure prevents travel out of the section through the tailgate side of the longwall.

Section 15. Roof Control Plan.

(1) When revisions are proposed to the roof control plan required by KRS 352.201, only the revised pages shall be submitted unless otherwise specified by the commissioner or his authorized representative.

(2) The licensee shall be notified in writing of the approval or denial of a proposed roof control plan or proposed revision.

(3) When approval of a proposed plan or revision is denied, the deficiencies of the plan or revision and recommended changes shall be specified and the licensee shall be afforded an opportunity to discuss the deficiencies and changes with the commissioner or his authorized representative.

(4) Before new support materials, devices or systems other than roof bolts and accessories are used as the only means of roof support, the commissioner or his authorized representative may require that the effectiveness of those new support materials, devices, or systems be demonstrated by experimental installations.

(5) A proposed roof control plan or revision to a roof control plan shall not be implemented before it is approved.
(6) Before implementing an approved revision to a roof control plan, a person who is affected by the revision shall be instructed in its provisions.
(7) The approved roof control plan and any revision shall be available to the miners and representative of miners at the mine.

Section 16. Roof Control Plan Information. The following information shall be included in each roof control plan:
(1) The name and address of the licensee;
(2) The name, address, mine identification number and location of the mine;
(3) The name and title of the company official responsible for the plan;
(4) A typical columnar section of the mine strata which shall:
(a) Show the name and the thickness of the coalbed to be mined and any persistent partings;
(b) Identify the type and show the thickness of each stratum up to and including the main roof above the coalbed and for distance of at least ten (10) feet below the coalbed; and
(c) Indicate the maximum cover over the area to be mined.
(5) A description and drawings of the sequence of installation and spacing of supports for each method of mining used;
(6) If an automated temporary roof support system is used, the maximum distance that an automated temporary roof support system is to be set beyond the last row of permanent support;
(7) If tunnel liners or arches are to be used for roof support, specifications and installation procedures for the liners or arches;
(8) Drawings indicating the planned width of openings, size of pillars, method of pillar recovery, and the sequence of mining pillars;
(9) A list of all support material required to be used in the roof, face and rib control system, including, if roof bolts are to be installed:
(a) The length, diameter, grade and type of anchorage unit to be used;
(b) The drill hole size to be used; and
(c) The installed torque or tension range for tensioned roof bolts.
(10) When mechanically anchored tensioned roof bolts are used, the intervals at which test holes shall be drilled;
(11) A description of the method of protecting persons:
(a) From falling material at drift openings; and
(b) When mining approaches within 150 feet of an outcrop.
(12) A drawing submitted with a roof control plan shall contain a legend explaining all symbols used and shall specify the scale of the drawing, which shall not be less than five (5) feet to the inch or more than twenty (20) feet to the inch;
(13) All roof control plan information, including drawings, shall be submitted on eight and one half (8.5) by eleven (11) inch paper, or paper folded to this size; and
(14) Any other information required by the commissioner.

Section 17. Roof Control Plan Approval Criteria. This section sets forth the criteria that shall be considered on a mine-by-mine basis in the formulation and approval of roof control plans and revisions.
(1) Roof bolts shall be installed on centers not exceeding five (5) feet lengthwise and crosswise, except as approved by the commissioner or his authorized representative.
(2) When tensioned roof bolts are used as a means of roof support, the torque or tension range shall be capable of supporting roof bolt loads of at least fifty (50) percent of either the yield point of the bolt or anchorage capacity of the strata, whichever is less.

(3) Any opening that is more than twenty (20) feet wide shall be supported by a combination of roof bolts and conventional supports.
(4) In any opening more than twenty (20) feet wide:
(a) Posts shall be installed to limit each roadway to sixteen (16) feet wide, where straight, and eighteen (18) feet wide, where curved; and
(b) A row of posts shall be set for each five (5) feet of space between the roadway posts and the ribs.
(5) An opening shall not be more than thirty (30) feet wide.
(6) If installing roof support using mining machines with integral roof bolters:
(a) Before an intersection or pillar split is started, roof bolts shall be installed on at least five (5) foot centers where the work is performed;
(b) Where the roof is supported by only two (2) roof bolts crosswise, openings shall not be more than sixteen (16) feet wide.
(7) Pillar recovery.
(a) During development, any dimension of a pillar shall be at least twenty (20) feet;
(b) Pillar splits and lifts shall not be more than twenty (20) feet wide;
(c) A breaker post shall be installed on a center of not more than four (4) feet;
(d) Roadside-radius (turn) posts, or equivalent support, shall be installed on not more than four (4) foot centers leading into each pillar split or lift;
(e) Before full pillar recovery is started in areas where roof bolts are used as the only means of roof support and openings are more than sixteen (16) feet wide, at least one (1) row of posts shall be installed to limit the roadway width to sixteen (16) feet. These posts shall be:
1. Extended from the entrance to the split through the intersection outby the pillar in which the split or lift is being made; and
2. Spaced on not more than five (5) foot centers.
(8) Openings that create an intersection shall be permanently supported or at least one row of temporary supports shall be installed on not more than five (5) foot centers across the opening before any other work or travel is permitted in the intersection.
(9) In a working section where the mining height is below thirty (30) inches, an automated temporary roof support system shall be used to the extent practicable during the installation of roof bolts with roof bolting machines and continuous-mining machines with integral roof bolters.
(10) In a mine with a longwall mining system:
(a) Systematic supplemental support shall be installed throughout:
1. The tailgate entry of the first longwall panel prior to any mining; and
2. In the proposed tailgate entry of each subsequent panel in advance of the frontal abutment stresses of the panel being mined.
(b) If a ground failure prevents travel out of the section through the tailgate side of the longwall section, the roof control plan shall address:
1. Notification of miners that the travelway is blocked;
2. Reinstruction of miners regarding escapeways and escape procedures in the event of an emergency;
3. Reinstruction of miners on the availability and use of self-contained self-rescue devices;
4. Monitoring and evaluation of the air entering the longwall section;
5. Location and effectiveness of the two (2) way communication system; and
6. A means of transportation from the section to the main line.
(c) The plan provisions addressed by paragraph (b) of this subsection shall remain in effect until a travelway is reestablished on the tailgate side of a longwall section.
(11) A roof control plan that does not conform to the criteria set out in this section may be approved by the commissioner or his authorized representative, if the plan provides

effective control of the roof, face, and ribs. The commissioner or his authorized representative may require additional safety measures in a roof control plan.

Section 18. Evaluation and Revision of Roof Control Plan.

(1) A revision of the roof control plan shall be proposed by the licensee:

(a) If conditions indicate that the plan is not suitable for controlling the roof, face, ribs, or coal or rock bursts; or

(b) If accident and injury experience at the mine indicates the plan is inadequate; the accident and injury experience at each mine shall be reviewed at least every six (6) months.

(2) An unplanned roof fall, rib fall, and coal or rock burst that occurs in the active workings shall be plotted on a mine map if it:

(a) Is above the anchorage zone where roof bolts are used;

(b) Impairs ventilation;

(c) Impedes passage of persons;

(d) Causes miners to be withdrawn from the area affected; or

(e) Disrupts regular mining activities for more than one (1) hour.

(3) The mine map on which roof falls are plotted shall be available at the mine site for inspection by an authorized representative of the commissioner and a representative of miners at the mine.

(4) The roof control plan for each mine shall be reviewed every six (6) months by an authorized representative of the commissioner. This review shall take into consideration any falls of the roof, face and ribs and the adequacy of the support systems used at the time.

Section 19. Incorporation by Reference.

(1) "Standard Specification for Roof and Rock Bolts and Accessories", (1995 Edition), American Society for Testing and Materials (ASTM), Designation F 432-95.

(2) It may be inspected or copied at Kentucky Department for Natural Resources, Administration Building, 300 Sower Boulevard, Frankfort, Kentucky 40601, Monday through Friday, 8 a.m. to 4:30 p.m.

(3) It may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103, (610) 832-9500.

(23 Ky.R. 1478; 2185; 2493; eff. 12-11-1996; TAm eff. 8-9-2007; TAm eff. 7-6-2016; Crt eff. 6-27-2018; Crt eff. 5-13-2025; Crt eff. 5-13-2025.)