

DEPARTMENT OF LABOR**Mine Safety and Health Administration****30 CFR Parts 56, 57, and 75**

RIN 1219-AB00

Safety Standards for Roof Bolts in Metal and Nonmetal Mines and Underground Coal Mines

AGENCY: Mine Safety and Health Administration (MSHA), Labor.

ACTION: Final rule.

SUMMARY: MSHA is revising its safety standards for roof and rock bolts at metal and nonmetal mines and underground coal mines by updating the reference to the American Society for Testing and Materials (ASTM) standard for roof and rock bolts and accessories. The new reference reflects technological advances in the design of roof and rock bolts and support materials. It will improve the level of protection provided by the standards currently in use.

DATES: The final rule is effective June 22, 1998.

Compliance: Compliance is mandatory, April 22, 1999.

FOR FURTHER INFORMATION CONTACT: Patricia W. Silvey, Director; Office of Standards, Regulations, and Variances, MSHA; phone: 703-235-1910, fax: 703-235-5551.

SUPPLEMENTARY INFORMATION:**I. Background**

On April 28, 1997 (62 FR 22998), MSHA published a proposed rule to revise its safety standards for roof and rock bolts at metal and nonmetal mines and underground coal mines by updating existing §§ 56.3203, 57.3203, and 75.204 by replacing the references to the ASTM standard for roof and rock bolts and accessories. The comment period was scheduled to close on June 27, 1997. Due to requests from the mining community, the comment period was extended to and closed on July 14, 1997.

MSHA participated in the development of ASTM F432-95 through active representation at meetings of the American Mining Congress (predecessor organization to the National Mining Association) Roof Support Group. That committee prepared the revised document for consideration by ASTM. The committee was open to all manufacturers of roof and rock bolts and accessories, and considered comments from all participants in developing the new specifications. MSHA Technical Support personnel conducted both laboratory and field studies which

provided supporting data for the various changes. This rulemaking has been followed closely by the National Mining Association, the United Mine Workers of America, and the United Steelworkers of America.

MSHA is updating the standards because the Agency believes that ASTM F432-95 is more comprehensive than the references contained in existing standards, that it reflects advances in rock and roof bolt technology, and that it will provide better protection for miners than the standards currently in place. As discussed below, these revisions will not reduce the protection afforded miners by the MSHA standards currently in place.

A. Metal and Nonmetal Mines

On October 8, 1986, MSHA published a final rule (51 FR 36194) revising its safety standards for ground control at metal and nonmetal mines. This rulemaking included comprehensive rock bolt standards in Title 30 Code of Federal Regulations (30 CFR) §§ 56/57.3203 which addressed the quality of rock fixtures and their installation. Roof and rock bolts and accessories are an integral part of ground control systems and are used to prevent the fall of roof, face, and ribs. Accidents involving falls of roof in underground mines or falls of highwall in surface mines have resulted in injuries and fatalities.

These standards currently require that metal and nonmetal mine operators obtain a certification from the manufacturer that roof and rock bolts and accessories are manufactured and tested in accordance with the 1983 ASTM publication "Standard Specification for Roof and Rock Bolts and Accessories" (ASTM F432-83). The ASTM standard for roof and rock bolts and accessories is a consensus standard used throughout the United States. It contains specifications for the chemical, mechanical, and dimensional requirements for roof and rock bolts and accessories used for ground support systems.

The manufacturer's certification is made available to an authorized representative of the Secretary to attest to the appropriate testing and manufacture of the rock bolts and accessories. Requiring that the mine operator obtain a certification from the manufacturer assures mine operators that the material they use meets technical requirements established to promote safety.

B. Underground Coal Mines

MSHA published a final rule for roof support in underground coal mines on February 8, 1990 (55 FR 4592) revising

paragraphs (a) and (b) of § 75.204. This standard references ASTM publication "Standard Specification for Roof and Rock Bolts and Accessories" (ASTM F432-88), which was the most recent revision available at that time. This standard also required mine operators to obtain a certification from the manufacturer that roof and rock bolts and accessories are manufactured and tested in accordance with ASTM F432-88. To comply with this rule, mine operators are required to provide the certification document, upon request, to an authorized representative of the Secretary to confirm that their roof and rock bolts are designed and tested in accordance with the ASTM standard.

This reference to the ASTM standard performs the same function as the reference to the 1983 ASTM standard for metal and nonmetal mining application. That is, the certificate assures mine operators that the material they use meets technical requirements established to promote safety.

II. Discussion

In promulgating this final rule, MSHA has addressed the comments received during the rulemaking process, and has developed practical requirements. Both costs and benefits were also considered.

MSHA has found that the existing certification requirement has been successful in maintaining compliance with requirements for roof and rock bolts and accessories. MSHA, therefore, is retaining the certification requirement and updating existing § 56.3203, 57.3203, and 75.204 by replacing the references to outdated ASTM F432-83 and ASTM F432-88 with a new reference to ASTM F432-95.

One commenter suggested that MSHA revise the paragraphs to state Make the certification available to an authorized representative of the Secretary and a miners' representative. The commenter further stated that although it may be assumed that "miners' representatives" have a right to the certification information, no such specified right is accorded under the rule. Short of such specified right, miners' representatives have had to demand certification information with threats of section 105(c) complaints against mine operators.

The Agency intends that the miners' representatives have access to the certification statements as stated in the preamble to the proposed rule (62 FR 22998).

* * * Mine operators currently are required to obtain a certification statement that the testing and manufacture of roof and rock bolts comply with the specified standard, and to keep a copy of this

certification statement so that it can be made available to miners' representatives and representatives of the Secretary of Labor (the Secretary) * * *

In response to the comment, §§ 56.3203(a)(2), 57.3203(a)(2), and 75.204(a)(2) have been revised to require the operator to "make this certification available to an authorized representative of the Secretary and the representative of miners."

A. New Products Addressed

ASTM F432-95 covers products not addressed by the current standards including grouting materials, large diameter bolts, thread deformed bars, and formable anchorage devices.

1. Grouting Materials

Grouting materials, which were not addressed by either ASTM F432-88 or ASTM F432-83, are extensively covered by ASTM F432-95. The term "grouting materials" is used in ASTM F432-95 to include any chemical materials (such as polyester, polyurethane, or epoxy resins) that are used to anchor mine roof bolts. While grouted bolts have been used successfully to support mine roofs since the 1970's, each manufacturer has a different method to describe proper application of grouting materials and their performance characteristics. This lack of standardization has caused confusion and occasional misapplication of a particular grout formulation and, therefore, has resulted in improperly grouted boreholes. Improperly grouted boreholes can result in poor bolt performance and, potentially, an inadequately supported roof. A survey of MSHA field personnel revealed that improper borehole grouting has been a contributing factor in roof fall accidents. Under ASTM F432-95, there are specific requirements regarding strength, cure rate, cartridge volume, and labeling that will standardize the production and application of grouting materials and reduce the likelihood that grouted bolts will be improperly installed.

The majority of commenters were in support of this provision. However, one commenter was concerned that standardization of grout cure rates could be hazardous. The commenter also stated that some mines need bolt lengths ranging from 5 feet to 20 feet and that flexibility in grout cure rates is vital. The commenter further suggested that it is far more important that the operator be trained to use the materials properly than to attempt to standardize the products.

The Agency does not believe that the standardization of grout cure rates by ASTM F432-95 will cause a safety

hazard or alter the variety of grouting materials available to the mining industry. Rather, it provides a classification system by which performance characteristics of current and future grout formulations can be grouped and identified, and enables the user to select the proper formulation for a particular application. Therefore, the provision remains as proposed.

2. Large Diameter Bolts

Similarly, large diameter bolts, ranging in size from 1½ inch to 1½ inch, are now addressed by ASTM F432-95. MSHA field personnel report that these large diameter bolts are growing in popularity and are being used in areas of adverse roof conditions where smaller diameter bolts would fail. ASTM F432-95 provides standard strength and thread tolerance limits that ensure minimum performance levels and the interchangeability of components produced by different manufacturers. Compatibility is essential in ensuring that components acquired from different sources function properly when used together, such as mechanical anchors from one manufacturer and bolts from another, and provide an adequate margin of safety.

The majority of commenters supported this requirement. One commenter supported the use of large diameter bolts, but was concerned that in-mine tests will still be necessary because conditions vary from mine to mine.

The inclusion of large diameter bolts in ASTM F432-95 does not exempt those bolts from the plan approval process; any bolting system must be approved as suitable for the ground conditions of a particular mine. It does, however, ensure that large diameter bolts meeting those specifications are compatible with other components (expansion anchors, nuts, etc.) and will function properly, essentially removing that aspect of the evaluation (which is often time consuming) from the approval process.

3. Thread Deformed Bars and Formable Anchorage Devices

Two new technologies, thread deformed bars and formable anchorage devices, are also addressed by ASTM F432-95. These bolting systems were not in use at the time ASTM F432-83 and ASTM F432-88 were adopted. Their effectiveness has been demonstrated at a number of mines, however, and this has led MSHA to approve their use in roof control plans. ASTM F432-95 provides specific manufacturing, strength, and

identification requirements for these products to ensure that minimum performance levels are met and that reliable products are available to the mine operator. Updating the roof control standards which reference the ASTM specifications covering these systems will reduce the time required by mine operators to receive approval to use these devices in the roof control plan, and will eliminate the need for repetitive and time consuming underground tests.

One commenter was confused as to whether fixtures and accessories addressed under ASTM F432-95 will have to be approved individually under the roof control plan, or will unilaterally be approved for inclusion in roof control plans without submitting each plan separately. The commenter referred to the statement in the preamble to the proposal (62 FR 23000) which noted that:

Updating the roof control standards which reference the ASTM specifications covering these systems would reduce the time required by mine operators to receive approval to use these devices in the roof control plan, and eliminate the need for repetitive and time consuming underground tests.

Section 75.220 requires each mine operator to develop and follow a roof control plan approved by the District Manager. If the roof bolts and accessories are not addressed under ASTM F432-95, the operator will have to perform tests to show that they meet the requirements of 75.204(b). The inclusion in the roof control plan of a particular product that meets the specifications in ASTM F432-95 relieves the mine operator of having to perform tests to show that these items meet the requirements of the standard and, thus, reduce the time involved in the roof control plan approval process. Meeting the specifications of ASTM F432-95 also assures the mine operator and MSHA that the manufactured product will function as designed.

B. Additional Safety Benefits

ASTM F432-95 provides a number of additional safety benefits, including strength standards for couplers, tolerances for external and internal threads, dimensions for hardened washers, and bolt grading and identification systems. The Agency did not receive any comments regarding these additional safety features.

C. Existing Inventory

This final rule will allow mine operators to use inventories of roof support components meeting the design criteria of ASTM F432-83 and ASTM

F432-88 for up to 1 year from the effective date of this rule. After that year, only roof support components meeting ASTM F432-95 will be permitted to be installed. This 1-year period will not result in a diminution of safety to miners and will allow mine operators, including small mines and seasonal operations, to exhaust existing supplies of roof support materials on site. It also will allow miners who use roof support materials to become sufficiently trained in the use of roof bolts and accessories that meet the requirements of ASTM F432-95. The Agency is allowing mine operators to start using components meeting the ASTM F432-95 standard upon the effective date of this final rule.

In response to this provision, the majority of the commenters believed that 1 year was a sufficient amount of time to allow operators to exhaust their inventories. However, one commenter is concerned that the 1-year time period is not long enough. The commenter stated that a better approach would be to require new production of bolts to meet ASTM F432-95 by a certain date, then each mine would achieve compliance when they replace inventory no matter what the time frame.

An inventory of roof bolt manufacturers conducted in April and May of 1995 indicated that all manufacturers could consume present tooling, exhaust products meeting current specifications, and produce and make available to mine operators quantities of roof support materials meeting ASTM F432-95 within a 6-month time period. Contact with several coal mine operators at that time indicated that an additional 6-12 months would enable them to exhaust inventories of existing ASTM F432-88 products. While ASTM F432-88 products are quality products, there are conflicts with ASTM F432-95 that could cause confusion if not used within a specified time frame. For instance, the bolt head identification markings of F432-95 are substantially different from those of F432-88 and F432-83. Long term usage of bolts covered by both specifications could lead to the mis-identification of bolt properties (grade and diameter) and the inadvertent mis-application of the bolting system. Similarly, the equivalent length requirements of F432-95 may produce resin cartridges with different volumes than those currently marketed. In situations where the shelf life would be extended beyond 1 year, the potential existence of two cartridge sizes could result in confusion and improper borehole grouting. The 1-year time frame will minimize the period of time

that mine operators must closely monitor the use of products covered by two specifications and yet will provide a reasonable amount of time to exhaust inventories of F432-83 and F432-88 products.

Another commenter stated that the 1-year time period puts technology too far off in the future. The commenter further stated that MSHA should stipulate provisions for operators opting to use the new ASTM standard voluntarily, i.e., must notify the appropriate District Manager and can no longer use roof bolts manufactured under ASTM F432-83 or ASTM F432-88.

The primary thrust of ASTM F432-95 is the introduction and coverage of technology not addressed by ASTM F432-83 and/or ASTM F432-88. The minimum performance requirements of previously addressed components generally remain unchanged. Roof support components meeting ASTM F432-83 and ASTM F432-88 are quality items that have been safely and effectively used. While MSHA is not aware of any manufacturer currently producing roof support components to the ASTM F432-83 standard (manufacturers voluntarily adopted the upgraded ASTM F432-88 standard), extending the use of products meeting both ASTM F432-83 and ASTM F432-88 for up to a year will pose no safety concern.

For underground coal mines, any bolting system must be approved by the District Manager as suitable for the ground conditions of a particular mine. Therefore, operators will stipulate in the roof control plan if the roof and rock bolts and accessories meet the specifications of ASTM F432-88 or ASTM F432-95, or were tested by the operator and shown to be effective. Additionally, the final rule states that an operator may continue to use roof and rock bolt accessories that meet the specifications of ASTM F432-88 until 1 year after the effective date of this final rule.

Underground metal and nonmetal mine operators are not required to submit a roof control plan to the MSHA District Manager. However, the incorporation of ASTM F432-95 into § 56.3203 and 57.3203 will ensure that roof and rock bolts and accessories will be of high quality and manufactured to the same specifications as those used in underground coal mines.

MSHA also believes that the 1-year time period gives sufficient time for roof bolt manufacturers to consume present tooling, exhaust inventories of products meeting current specifications, and produce and make available to mine operators quantities of roof bolts

meeting the design criteria of ASTM F432-95. MSHA did not receive any comments in response to the amount of time needed to produce roof bolts meeting the design criteria of ASTM F432-95.

III. Paperwork Reduction Act

On August 29, 1995, the Office of Management and Budget (OMB) published a final rule in the **Federal Register** (60 FR 44978) implementing the new Paperwork Reduction Act of 1995 (PRA 95). Consistent with PRA 95, these OMB rules expanded the definition of "information" to clarify that a "certification" would involve the collection of "information" if the Agency used it to monitor compliance. Mine operators currently are required to obtain a certification statement that the testing and manufacture of roof and rock bolts comply with the specified standard, and to keep a copy of this certification statement so that it can be made available to miners' representatives and representatives of the Secretary of Labor (the Secretary). Although the final rule does not change this requirement, it is now considered an information collection burden because of the expanded definition of "information" under PRA 95. The burden hours and costs associated with roof bolt certifications, therefore, do not reflect any increase for the mining industry.

One commenter stated that MSHA's cost estimates were greatly underestimated. This commenter pointed out that the cost estimates were based on each mine using one roof support type and one roof support supplier. Some companies use multiple types of roof bolts which are distributed by different suppliers. The burden of providing a certification could be 3 to 6 times more than MSHA estimates depending on the geographic location and geology of the mine. The commenter further stated that the cost estimates did not include the cost of initial filing of documents and quarterly locating and copying for inspectors. New testing, identification, and other manufacturing costs created by the new ASTM standard will not be absorbed by the manufacturers; they will be passed along to mine operators.

A second commenter supported MSHA's estimates stating that MSHA has reasonably and logically established the burden of hours and costs associated with roof bolt certifications by close comparison to that which has been collected as required under the current standards.

In response to these comments MSHA has increased the estimated number of

times that mine operators would have to file or retrieve certifications. These revised estimates reflect the obtaining and filing of certifications from more than one manufacturer or supplier and the retrieval of certifications to show to an authorized representative during an inspection.

Description: Sections 56.3203(a)(1), 57.3203(a)(1), and 75.204(a)(1) require the mine operator to obtain a manufacturer's certification that the material was manufactured and tested in accordance with the specifications of ASTM F432-95. Agency experience has shown that major roof and rock bolt manufacturers routinely provide a certification to mine operators at the time of the initial contract and update the certification annually. Smaller manufacturers provide a certification at the time of initial contract and upon request from the mine operator. MSHA estimates that it takes the mine operator

about 3 minutes to obtain a signature and file the certification form, and that underground mines use an average of four different manufacturers or suppliers and surface mines use two.

Sections 56.3203(a)(2), 57.3203(a)(2), and 75.204(a)(2) require that the certification be made available to an authorized representative of the Secretary and to a miner's representative. MSHA estimates that it takes about 3 minutes per inspection to show the certifications to the authorized representative and the miner's representative. Underground mines are inspected four times per year and surface mines are inspected twice per year.

Description of Respondents: The respondents are mine operators. MSHA estimates that this provision annually affects about 233 surface metal and nonmetal mines; 243 underground

metal and nonmetal mines; and 888 underground coal mines.

Information Collection Burden: The total estimated annual information collection burden for surface metal and nonmetal mines is about 47 hours at an estimated annual cost of about \$1,680. The total estimated annual information collection burden for underground metal and nonmetal mines is about 97 hours at an estimated annual cost of about \$3,500. The total estimated annual information collection burden for underground coal mines is about 355 hours at an estimated annual cost of about \$14,920. The burden hours and costs associated with roof bolt certifications do not reflect any increase for the mining industry because mine operators currently are required to perform these activities.

The following chart summarizes MSHA's estimates by section.

Regulation in 30 CFR	Number of respondents	Hours per response	Number of responses	Number of responses per respondent	Annual costs	Total hours per regulation
56.3203(a)(1)	233	0.05	932	4	\$ 1,680	47
57.3203(a)(1)	243	0.05	1,944	8	3,500	97
75.204(a)(1)	888	0.05	7,104	8	14,920	355
Total	1,364	0.05	9,980	20,100	499

The information collection requirements contained in this rule were submitted to the Office of Management and Budget (OMB) for review under the Paperwork Reduction Act of 1995 and have been approved under OMB Control Number 1219-0121.

IV. Executive Order 12866 and Regulatory Flexibility Act

Executive Order 12866 requires that regulatory agencies assess both the costs and benefits of regulations. MSHA estimates that the cost impact of the final rule is essentially the same as under the existing rule. The primary benefit of the final rule is that it provides for advancements in roof bolt technology and, therefore, will increase safety protection for miners. MSHA has determined that this final rule does not meet the criteria of a significant regulatory action and, therefore, has not prepared a separate analysis of costs and benefits. The analysis contained in this preamble meets MSHA's responsibilities under Executive Order 12866 and the Regulatory Flexibility Act.

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's impact on small entities. Under the RFA, MSHA must use the Small Business Administration (SBA) definition for a small mine of 500 or

fewer employees or, after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the **Federal Register** for notice and comment. MSHA traditionally has considered small mines to be those with fewer than 20 employees. For the purposes of the RFA and this certification, MSHA has analyzed the impact of the final rule on all mines, on those with fewer than 20 employees, and on those with fewer than 500 employees, and has concluded that the cost impact on the mining industry is negligible.

Regulatory Flexibility Certification

In accordance with § 605 of the RFA, MSHA certifies that this final rule will not have a significant economic impact on a substantial number of small entities. No small governmental jurisdictions or nonprofit organizations are affected.

Under the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the RFA, MSHA must include in the final rule a factual basis for this certification. The Agency also must publish the regulatory flexibility certification in the **Federal Register**, along with its factual basis.

Factual Basis for Certification

MSHA used a qualitative approach in concluding that the final rule will not have a significant economic impact on a substantial number of small entities. In the preamble to the proposed rule, MSHA stated that the cost of purchasing roof and rock bolts and accessories would not increase significantly as a result of the requirement that they meet the new ASTM specification (ASTM F432-95). Additionally, MSHA stated that the new ASTM standard incorporates technological advances that are currently available and being used by the mining industry. One commenter stated that the costs of the new testing, identification, and other manufacturing costs created by the new ASTM standard will not be absorbed by the manufacturers; it will be passed along to mines.

In preparing the proposed rule, MSHA had determined that roof bolt manufacturers routinely change dies and other machining parts because of wear. The Agency concluded that, because of the 1-year phase in period, changing dies and other machine parts to accommodate the new ASTM specification would not pose an additional cost on manufacturers.

The largest cost under the final rule is due to the increase of resin volume in cartridges. The result would be that the resin manufacturer may increase the cost of resin cartridges to mine operators comparable to the increased volume of resin. MSHA believes that any increased cost to mine operators for resin cartridges would be offset by this increased resin volume. MSHA estimates that the total cost increase, if passed on to mine operators, would represent less than one percent of their cost for roof and rock bolts and accessories.

V. Unfunded Mandates Act

For purposes of the Unfunded Mandates Reform Act of 1995, as well as E.O. 12875, this rule does not include any Federal mandate that may result in increased expenditures by State, local, and tribal governments, or increased expenditures by the private sector of more than \$100 million.

VI. Executive Order 13045

In accordance with Executive Order 13045, protection of children from environmental health risks and safety risks, MSHA has evaluated the environmental health or safety effects of the final rule on children. The Agency has determined that the final rule will have no effects on children.

List of Subjects

30 CFR Parts 56 and 57

Mine safety and health, Surface mining, Underground mining.

30 CFR Part 75

Coal, Mine safety and health, Underground mining.

Dated: April 16, 1998.

J. Davitt McAteer,

Assistant Secretary for Mine Safety and Health.

For the reasons set out in the preamble, chapter I of title 30 of the Code of Federal Regulations is amended as follows:

PART 56—SAFETY AND HEALTH STANDARDS—SURFACE METAL AND NONMETAL MINES

1. The authority citation for part 56 continues to read as follows:

Authority: 30 U.S.C. 811.

2. Section 56.3203 is amended by revising the introductory text of paragraph (a), paragraph (a)(1), paragraph (a)(2), and the introductory text of paragraph (b) to read as follows:

§ 56.3203 Rock fixtures.

(a) For rock bolts and accessories addressed in ASTM F432-95, "Standard Specification for Roof and Rock Bolts and Accessories," the mine operator shall—

(1) Obtain a manufacturer's certification that the material was manufactured and tested in accordance with the specifications of ASTM F432-95; and

(2) Make this certification available to an authorized representative of the Secretary and to the representative of miners.

(b) Fixtures and accessories not addressed in ASTM F432-95 may be used for ground support provided they—

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PART 57—SAFETY AND HEALTH STANDARDS—UNDERGROUND METAL AND NONMETAL MINES

3. The authority citation for part 57 continues to read as follows:

Authority: 30 U.S.C. 811.

4. Section 57.3203 is amended by revising the introductory text of paragraph (a), paragraph (a)(1), paragraph (a)(2), and the introductory text of paragraph (b) to read as follows:

§ 57.3203 Rock fixtures.

(a) For rock bolts and accessories addressed in ASTM F432-95, "Standard Specification for Roof and Rock Bolts and Accessories," the mine operator shall—

(1) Obtain a manufacturer's certification that the material was manufactured and tested in accordance with the specifications of ASTM F432-95; and

(2) Make this certification available to an authorized representative of the Secretary and to the representative of miners.

(b) Fixtures and accessories not addressed in ASTM F432-95 may be used for ground support provided they'

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PART 75—MANDATORY SAFETY STANDARDS—UNDERGROUND COAL MINES

5. The authority citation for part 75 continues to read as follows:

Authority: 30 U.S.C. 811.

6. Section 75.204 is amended by revising the introductory text of paragraph (a), paragraph (a)(1), paragraph (a)(2), and the introductory text of paragraph (b) to read as follows:

§ 75.204 Roof bolting.

(a) For roof bolts and accessories addressed in ASTM F432-95, "Standard Specification for Roof and Rock Bolts and Accessories," the mine operator shall—

(1) Obtain a manufacturer's certification that the material was manufactured and tested in accordance with the specifications of ASTM F432-95; and

(2) Make this certification available to an authorized representative of the Secretary and to the representative of miners.

(b) Roof bolts and accessories not addressed in ASTM F432-95 may be used, provided that the use of such materials is approved by the District Manager based on—

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