ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeals of --	)	
	)	
Harper/Nielsen Dillingham Builders JV	)	ASBCA Nos. 53211, 53363
	)	
Under Contract No. N44255-98-C-5001	)	

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OPINION BY ADMINISTRATIVE JUDGE WILLIAMS

These appeals are pass-through claims brought by Harper/Nielsen Dillingham Builders JV (HNDB) on behalf of its fire protection subcontractor, Fireshield Inc. (Fireshield). The claims arose in connection with a contract to remodel portions of a hospital and construct a new addition and parking garage. ASBCA No. 53211 is a claim for $90,437.64 for reconfiguring the sprinkler system designs in the hospital addition and garage. ASBCA No. 53363 is a claim for $21,698 for providing galvanized fittings and couplings for the garage system. Only entitlement is before us.

FINDINGS OF FACT

1. In July 1999, the Navy (government) awarded Contract No. N44255-98-C-5001 to HNDB for the amount of $23,801,220. The contract required remodeling portions of the Naval Hospital in Bremerton, Washington, and construction of a new hospital addition and parking garage. Fireshield was HNDB's subcontractor for the design and installation of the fire suppression sprinkler systems. (R4, vol. 1, tab 1, vol. 4, tab 5; tr. 32-33)[1]

[1] Unless otherwise indicated, references are to the Rule 4 file for ASBCA No. 53211.

2. The sprinkler system in the hospital addition was a wet-pipe system, meaning there was water in the piping constantly. The system in the garage was a dry-pipe system, meaning that the piping carried water only when the system was activated. (Tr. 34)

3. The contract incorporated FAR 52.243-4 CHANGES (AUG 1987) and FAR 52.233-1 DISPUTES (DEC 1998) – ALTERNATE I (DEC 1991) by reference (R4, vol. 1, tab 1).

4. Section 13 of the National Fire Protection Association's Handbook (1996) (NFPA 13), which was incorporated into the contract by reference, provided standards and codes for sprinkler systems (R4, vol. 2, tab 1, vol. 4, tab 4; tr. 60).

5. Fire Protection Plan drawings for both the hospital addition and the parking structure included a note stating, "ALL AREAS SHOWN ON THIS SHEET FULLY SPRINKLERED IN ACCORDANCE WITH NFPA 13" (R4, vol. 3, tab 2).

6. Relevant portions of NFPA 13, Chapter five "Design Approaches," stated as follows:

> 5-2.3.1.2 The water supply for sprinklers only shall be determined either from the area/density curves of Figure 5-2.3 in accordance with the method of 5-2.3.2 [Area/Density Method] or be based upon the room design method in accordance with 5-2.3.3 at the discretion of the designer. . . .
>
> 5-2.3.1.3 Regardless of which of the two methods is used, the following restrictions apply:
>
> (a) For areas of sprinkler operation less than 1500 sq[.] ft[.] (139 m^2) used for Light and Ordinary Hazard Occupancies, the density for 1500 sq[.] ft[.] (139 m^2) shall be used.
>
> (b)* For buildings having unsprinklered combustible concealed spaces . . . the minimum area of sprinkler operation shall be 3000 sq[.] ft[.] . . .
>
> . . . .

[Figure 5-2.3 Area/density curves]

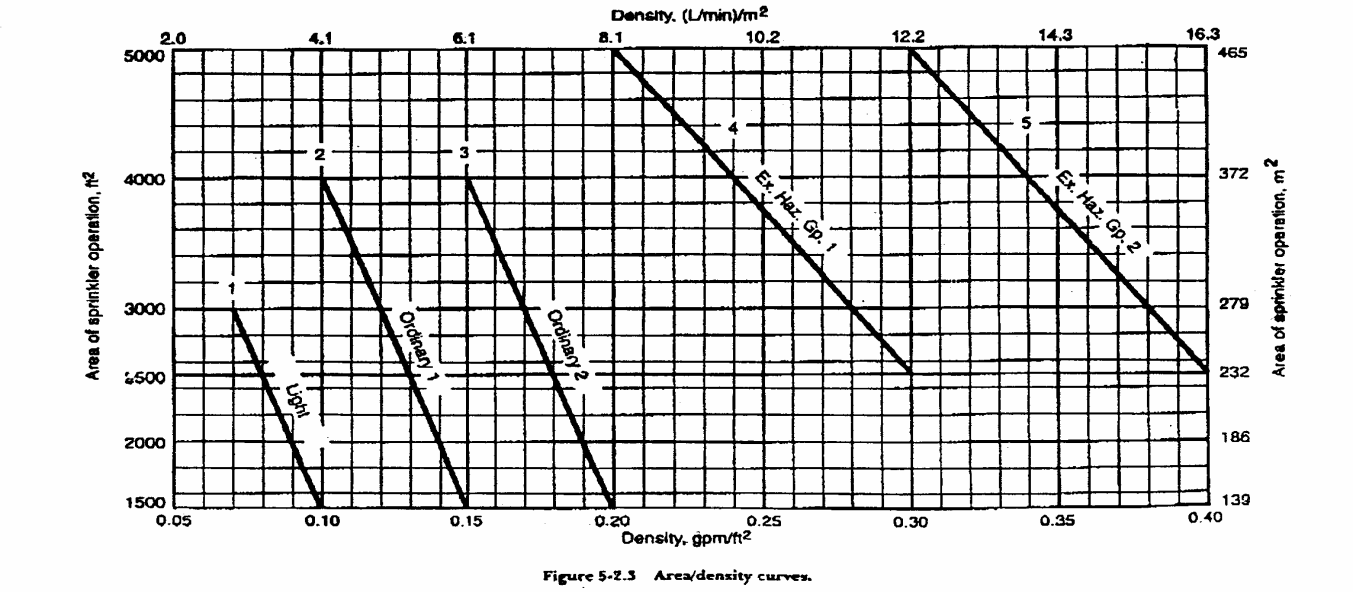

Figure 5-2.3 Area/density curves.

5-2.3.2 Area/Density Method.

5-2.3.2.1 The water supply requirement for sprinklers only shall be calculated from the area/density curves in Figure 5-2.3. . . .

. . . .

5-2.3.2.4 Where listed quick-response sprinklers are used throughout, the system area of operation is permitted to be reduced without revising the density as indicated in Figure 5-2.3.2.4 when all of the following conditions are satisfied:

Wet pipe system
Light hazard or ordinary hazard occupancy
20-foot (9.0-m) maximum ceiling height.

. . . .

5-2.3.2.6 For dry pipe systems . . . the area of sprinkler operation shall be increased by 30 percent without revising the density.

. . . .

5-2.3.3 Room Design Method.

5-2.3.3.1* The water supply requirements for sprinklers only shall be based upon the room that creates the greatest demand. The density selected shall be that from Figure 5-2.3 corresponding to the room size. To utilize this method, all rooms shall be enclosed with walls having a fire-resistance rating . . . .

5-2.3.3.2 If the room is smaller than the smallest area shown in the applicable curve in Figure 5-2.3, the provisions of 5-2.3.1.3(a) shall apply.

. . . .

6-4.4* Calculation Procedure.

6-4.4.1* For all systems the design area shall be the hydraulically most demanding based on the criteria of 5-2.3.

. . . .

(a) Where the design is based on area/density method, the design area shall be a rectangular area having a dimension parallel to the branch lines at least 1.2 times the square root of the area of sprinkler operation (A) used. . . .

. . . .

(b) Where the design is based on the room design method, see 5-2.3.3. The calculation shall be based on the room and communicating space, if any, that is the hydraulically most demanding.

. . . .

6-4.4.4* Each sprinkler in the design area and the remainder of the hydraulically designed system shall discharge at a flow rate at least equal to the stipulated minimum water application rate (density) multiplied by the area of sprinkler operation. . . .

. . . .

6-4.4.5 Pipe friction loss shall be calculated in accordance with the Hazen-Williams formula with C values from Table 6-4.4.5.

(a) Include pipe, fittings, and devices such as valves, meters, and strainers, and calculate elevation changes that affect the sprinkler discharge.

. . . .

Table 6-4.4.5 Hazen-Williams C Values

Pipe or Tube	C Value*
. . . .	
Black steel (dry systems including preaction)	100
Black steel (wet systems including deluge)	120
Galvanized (all)	120
. . . .	

*The authority having jurisdiction is permitted to consider other C values.

(R4, vol. 4, tab 4)

7. Contract specification section 13930, entitled "WET-PIPE FIRE SUPPRESSION SPRINKLERS," which applied to the hospital addition but not the garage, included the following sections:

1.3 SPRINKLER SYSTEM DESIGN

Design automatic wet pipe fire extinguishing sprinkler systems in accordance with the required and advisory provisions of NFPA 13, except as modified herein. . . .

. . . .

1.3.2 Water Distribution

Discharge from any individual head in the hydraulically most remote area shall be at least 100 percent of the specified density.

1.3.3 Density of Application of Water

Size pipe to provide the specified density when the system is discharging the specified total maximum required flow. Application to horizontal surfaces below the sprinklers shall be 0.10 gpm per sq[.] ft**.**

1.3.4 Sprinkler Discharge Area

Area shall be the hydraulically most remote 3,000 sq[.] ft[.] area as defined in NFPA 13.

1.3.5 Outside Hose Allowances

Hydraulic calculations shall include an allowance of 250 gpm for outside hose streams.

1.3.6 Friction Losses

Calculate losses in piping in accordance with the Hazen-Williams formula with ‘C’ value of 120 for steel piping . . . .

. . . .

2.1 ABOVEGROUND PIPING SYSTEMS

Provide fittings for changes in direction of piping and for connections. . . .

2.1.1 Sprinkler Piping

NFPA 13, except as modified herein. Steel piping shall be Schedule 40 for sizes less than 1.5 inches, and schedule 10 for sizes 1.5 inches and larger. Fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded shall be welded, threaded, or grooved-end type. . . . Fittings shall be UL FPED listed or FM P7825 approved for use in wet pipe sprinkler systems. Fittings, mechanical couplings, and rubber gaskets shall be supplied by the same manufacturer. Steel piping with wall thickness less than Schedule 30 shall not be threaded. Side outlet tees using rubber gasketed fittings shall not be permitted. Sprinkler pipe and fittings shall be steel.

2.1.2 Sprinkler Heads

Provide nominal .50 inch orifice sprinkler heads. Except in the Elevator Machine Room where 212 degree standard response heads shall be used, sprinklers shall be quick response . . . .

(R4, vol. 2, tab 1)

8. Contract specification section 13935, entitled "DRY-PIPE FIRE SUPPRESSION SPRINKLERS," which applied to the garage but not the hospital addition, included the following sections:

1.3 SPRINKLER SYSTEM DESIGN

Design automatic dry pipe fire extinguishing sprinkler systems in accordance with the required and advisory provisions of NFPA 13. . . .

. . . .

1.3.2 Water Distribution

Discharge from any individual head in the hydraulically most remote area shall be at least 100 percent of the specified density.

1.3.3 Density of Application of Water

Size pipe to provide the specified density when the system is discharging the specified total maximum required flow. Application to horizontal surfaces below the sprinklers shall be .15 gpm per sq. ft.

1.3.4 Sprinkler Discharge Area

Area shall be the hydraulically most remote 3,900 sq[.] ft[.] area as defined in NFPA 13.

1.3.5 Outside Hose Allowances

Hydraulic calculations shall include an allowance of 500 gpm for outside hose streams.

1.3.6 Friction Losses

Calculate losses in piping in accordance with the Hazen-Williams formula with 'C' value of 100 for steel piping, 150 for copper tubing, and 140 for cement-lined ductile-iron piping**.**

. . . .

2.1 ABOVEGROUND PIPING SYSTEMS

Provide fittings for changes in direction of piping and for connections.

2.1.1 Sprinkler Piping

NFPA 13, except as modified herein. Steel piping shall be hot dipped galvanized Schedule 40. Fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded shall be welded, threaded, or grooved-end type. . . . Plain-end fittings with mechanical couplings and fittings which use steel gripping devices to bite into the pipe when pressure is applied will not be permitted. Rubber gasketed grooved-end pipe and fittings with

> mechanical couplings shall be permitted in pipe sizes 1.5 inches and larger. Fittings shall be UL FPED listed or FM P7825 approved for use in dry pipe sprinkler systems. Fittings, mechanical couplings, and rubber gaskets shall be supplied by the same manufacturer. Side outlet tees using rubber gasketed fittings shall not be permitted. Sprinkler pipe and fittings shall be steel.

(R4, vol. 2, tab 1)

9. Standard reference works such as the MEANS ILLUSTRATED CONSTRUCTION DICTIONARY define piping as "an assembly of lengths of pipe and fittings, *i.e.*, a run of pipe." The STANDARD HANDBOOK FOR MECHANICAL ENGINEERS states "the term piping is generally and broadly applied to pipe, fittings, valves, and other components that convey liquids, gasses, [sic] slurries, et cetera." (Tr. 256-60; exs. G-3, Kornelis Smit & Howard M. Chandler, MEANS ILLUSTRATED CONSTRUCTION DICTIONARY 421 (1991), G-4, Eugene A. Avallone & Theodore Baumeister III, STANDARD HANDBOOK FOR MECHANICAL ENGINEERS (9th ed. 1987))

10. HNDB received bids from several potential subcontractors. HNDB negotiated with Fireshield and ultimately agreed on a price that was an insignificant amount less than Fireshield's original bid. (Tr. 42-43) Fireshield's bid was prepared by its president, Randall Porcher, and Robert Moren (tr. 24, 36). Mr. Porcher had no design responsibility (tr. 33). The bid, based on review of a complete set of the drawings and specifications, was submitted to HNDB and other potential contractors the day before submission of their bids to the government (tr. 42, 43). The Fireshield design was prepared by Andrew Moren (Mr. Moren) and reviewed by Robert Moren (tr. 56-57). Mr. Moren testified, and we find, that he did not begin his design until after contract award (tr. 136-37). Mr. Robert Moren did not testify. Although Mr. Robert Moren submitted a letter to HNDB seeking compensation for the design ultimately installed in which, *inter alia*, he maintained that Fireshield's "original design is based on the room design method as allowed by NFPA 13" (R4, tab 12), it is not feasible on this record to determine whether the reference is to a pre-award or post-award design. There is no contemporaneous, pre-award evidence as to the interpretation of HNDB or Fireshield at bid submission with respect to the design of the sprinkler system.

11. Mr. Moren was Fireshield's principal designer on this project. His designs were submitted to his father, Mr. Robert Moren, a certified fire protection designer, for approval and drawing certification. (R4, vol. 4, tab 5; tr. 55-57, 134-35) The design/engineering effort included a number of steps. First, Mr. Moren reviewed the fire protection drawings and fire protection requirements. He observed the general layout and

the occupancies of each room to determine combustibility, which can primarily be broken down into three different hazards – light, ordinary and extra. For example, the mechanical room was viewed as an ordinary hazard while the adjoining corridor was viewed as a light hazard. Different hazards are subject to different code requirements due to the different needs for protection (tr. 60-61, 81). NFPA 13 classifies a hospital as a light hazard (tr. 81-82; ex. G-5). Second, he reviewed the specifications for wet-pipe and dry-pipe fire systems along with the mechanical and architectural drawings. Third, he prepared shop drawings, showing the location of the sprinkler heads, the pipe sizes, and layouts. Finally, he submitted the design to the government for review and approval. In addition to shop drawings, the fire protection submittal included information from manufacturers regarding the equipment to be installed and the hydraulic calculations which were produced using HASS design software. (Tr. 55-61, 72-76, 108-13)

12. One crucial element of sprinkler system design is the sprinkler discharge area and determination of the "hydraulically most remote" area, which is defined as the most difficult area to cover with respect to demand on the sprinkler system (tr. 78-79). On the third floor of the hospital, which Mr. Moren considered the hydraulically most remote area for the wet pipe system, he calculated two remote areas using both the room design and area/density methods from NFPA (finding 7). First, for the three-story waiting area, he used the room design method. He did this because he believed it to be in a remote area of the building and it was less than 1,500 square feet. Second, he calculated the area outside the elevator bank using the area/density method (tr. 61-62, 85-86, 96-102). His system demand calculations were based on the 1,500 square feet standard set forth in NFPA. Mr. Moren's design also included area deductions permitted by NFPA 13 based on the height of the ceilings, and the use of the specified quick response heads (tr. 83-84, 89). According to Mr. Moren, the 3,000 square feet area standard specified in NFPA 13, ¶ 5-2.3.1.3, was only required when there were combustible, non-sprinklered areas in the building. In his opinion, no such condition existed in the hospital addition (R4, vol. 7, tab 19; tr. 79-82) and none have been identified by the government (ex. G-5).

13. Fireshield's initial fire protection submittal, dated 29 February 2000, was rejected because it included both the wet and the dry systems in one submittal (R4, vol. 4, tab 6; tr. 92, 113).

14. On 6 March 2000, Fireshield resubmitted the wet-pipe system, which included calculations using less than 3,000 square feet for the hydraulically most remote areas. On 12 April 2000, the government disapproved the submittal stating:

> (a) The fire sprinkler discharge area must be the hydraulically most remote 3,000 sq. ft. area as required by contract specification 13930 1.3.4. The term "as

> defined in NFPA 13" is referring to the definition of the hydraulic design area and not the size of the area required by NFPA 13. Paragraph 1.3, of specification section 13930, indicates to design in accordance with NFPA 13, except as modified herein. [Emphasis in original]
>
> (b) Hydraulic calculations must also be provided for the grid part of the fire sprinkler system in accordance with NFPA 13 § 6-4.4.2. This part of the system appears to be the hydraulically most demanding.

(R4, vol. 5, tab 7; tr. 119)

15. Fireshield responded, in part, as follows on 17 April 2000:

> In the contract specifications section 13930 part 1.3.4 "Sprinkler Discharge Area", the only term used was "as defined in NFPA-13," to which we have complied. NFPA-13 (1999) 7-2.3.1.3 (b.) states that a minimum area of sprinkler operation shall be 3000 sq ft in unsprinklered combustible concealed spaces. The concealed spaces in this building are non-combustible. Therefore, as defined in NFPA-13 the minimum area of sprinkler operation is 1500 sq ft. Furthermore, NFPA-13 (1999) 7-2.3.2.4 allows up to a 40% reduction of the remote area when quick response heads are used in this wet system . . . . The request for a 3000 sq ft remote area is above the minimum requirements of NFPA-13 for this contract. If you would like us to redesign the remote area to 3000 sq ft, please send us a cost change directive. [Emphasis in original]

(R4, vol. 6, tab 9; tr. 122-23)

16. With respect to the application of the NFPA 13 3,000 square feet requirement, Mr. Moren stated:

> When I first read this section it was confusing to me because I didn't agree with it because NFPA – reading the specifications and reading the general notes number 1 on my drawings, both indicate to me to use NFPA-13. When I did use NFPA-13 as I was told to, I found where 3,000 square

> feet applies, and it does not apply in this system in the system that I provided either of the three systems in the medical clinic.
>
> . . . .
>
> I'd say it can apply to the renovated existing hospital which is phase 3, but – the wet system that was detailed in there. It was not – it does not apply in the medical clinic. So the thing that surprised me was the 3,000 square feet versus the 1,500 that I based my original hydraulic remote area on through NFPA-13, and using quick response heads like I was told to and using the rules as defined in NFPA-13 that allow me to reduce that area to in some cases and in this case 900 square feet, using those rules that NFPA define, there's only one way I could come up with that answer. And the only way I can do it and the only way that both of the statements I've been told in general notes number 1 that says all areas fully sprinklered in accordance with NFPA-13, for that to be true and for his specifications 13-930, chapter 1.3.4 that says – that says the most remote 3,000 square feet as defined in NFPA-13, that can only lead me to one answer, and I would be remiss in doing it any other way. And the only way I could come up with is to per NFPA-13 using the quick response area and allowing 900 square feet. That's the only way that to me both of those statements could be true.

(Tr. 117-18)

17. When asked as to the meaning of the phrase "as defined in NFPA-13 except as modified herein" in paragraph 1.3 of specification section 13935, Mr. Moren stated:

> Well, this paragraph is talking about the sprinkler discharge area and the – which has to be the hydraulically most remote area. So this paragraph refers you back to NFPA-13 because there's many aspects of a hydraulically most remote area, and this paragraph is modifying or specifically giving you the size and referring you back to 13 to reinforce all the other requirements and subtleties that go into determining the hydraulically most remote area.

(Tr. 236-37)

18. Mr. Eric Snider, the Navy's registered fire protection engineer, testified that appellant's design did not comply with NFPA because the walls of the three-story waiting room were glass and not fire-rated. He testified that NFPA required all rooms to be fire-rated before the room design method could be used. (Ex. G-2 at 2; tr. 181-83) We find that the walls surrounding the three-story waiting room were glass and not fire-rated (*id.*; R4, vol. 4, tab 6, drawing 4 of 8). We find that to use the room design method, NFPA 5-2.3.3.1 at a minimum required that the walls enclosing the three-story waiting room must be fire-rated (finding 5). Accordingly, we further find that use of the room design method for the three-story waiting room was not allowed by NFPA. Mr. Snider also criticized Fireshield's choice of the single room entrance area as hydraulically more remote than the large waiting area because in his opinion rooms with over 30 sprinklers in them would create a greater hydraulic demand than a room with only six sprinklers (tr. 181-84).

19. Mr. Moren agreed that in order to use the room design method for the wet pipe sprinkler system, the area had to be fire-rated. He testified that he used the room design method for the single room entrance area on the third floor because "that room did have exterior walls on it which do have a rating." He noted that many of the interior walls in the clinic were not fire-rated but stated he did not use the room design method for any calculations on these areas. He also testified that the room design method for the entrance area was the only method he could use under NFPA 13 because the area of application was less than either the 1,500 or 3,000 square feet criteria. (Tr. 85-89, 100-01, 142-44) Mr. Moren explained that the hydraulically most remote area deals with the worst case scenario, *i.e.*, the greatest demand on the system not the largest area to be covered. The calculation procedures in NFPA 13 section 6-4.4.1(a) are designed to accurately predict where the worst case scenario is going to be. The model, using a 1.2 square formula dictates a certain size and shape area. (R4, vol. 4, tab 4; tr. 78, 86-87, 97-99, 145-46, 158-59) When the government reviewed Fireshield's sprinkler submittal, Mr. Snider testified he "didn't even bother commenting about the room design method because it was clearly specked out to use a 3,000 square foot area at a 0.1 density." (Tr. 197-98, 204)

20. Mr. Larry Swartz, a mechanical engineer consultant subcontractor for the architect, viewed NFPA 13 as a minimum standard only. He believed the values for area and density that were specified in the contract were more stringent than the NFPA 13 values and that those more stringent requirements were clear and unambiguous. (Tr. 270, 273) Mr. Swartz stated:

> [T]he intent is to establish two things; one, level of quality and also a level of comfort as to the system is going to operate properly. By putting in the values that we did, which are more stringent than NFPA-13, what we have done is put in a factor of safety. Thereby, the real - - the flows that we're anticipating getting out of the sprinkler system, they're actually going to get. When you do multitudes of these systems - - these sprinkler systems and you have several buildings that you have to keep tabs on, the best way to do it is basically is to provide that factor of safety so you have a level of comfort that the system is going to work when it's needed.

(Tr. 282)

21. In response to Fireshield's claim allegations, Mr. Swartz stated:

> We are unclear why Fireshield would claim that Section 13950 directs that the discharge area be anything other than 3,000 sq. ft. Industry standard dictates that if the specification calls out a discharge area, then that is the basis of the design, even if NFPA 13 can be interpreted as requiring a smaller area.
>
> . . . .
>
> Section 13930-1.3.3, 1.3.4, and 1.3.5 is quite clear that the required density is 0.10 gpm per sq.ft., the required discharge area is the hydraulically most remote 3,000 sq.ft. area as defined in NFPA 13, and the hose allowance is 250 gpm. This is very clear, and industry standard dictates that if the specification calls out these parameters then they are the basis of the design, even if NFPA 13 can be interpreted as requiring less. NFPA 13 is a minimum level standard. Navy standards (MIL-HDBK-1008C), and therefore the specifications for this project, go beyond just the minimum required by NFPA 13.

(Ex. G-5)

22. The contract does not include or incorporate by reference a military handbook, Navy standard or MILSPEC which sets a higher requirement for the sprinkler

system than the minimum requirements of NFPA 13. (R4, vol. 1, tabs 1, 2, vol. 6, tab 11; tr. 68-69, 87, 138-39, 277-78) In determining the scope of work for the design of the sprinkler system, Mr. Moren was aware that the Navy had included some provisions in the contract specifications that exceeded the minimum provision of NFPA 13. According to Mr. Moren, he was careful to note these requirements. (Tr. 69-71)

23. On 21 March 2000, Fireshield submitted the dry-pipe system proposal using a most remote 1,950 square feet. The proposal was disapproved by the government on 24 April 2000 with a notation, similar to that on the wet-pipe system proposal, which stated: "[t]he sprinkler discharge area must be the most remote 3,900 sq. ft. area as required by contract specification 13935 1.3.4." In addition, the government noted "[t]he hydraulic calculations must use a "C" value . . . of 100 for the steel piping" and "[t]he notes and catalogue sheets must indicate the fittings to be galvanized for the dry-pipe system." (R4, vol. 5, tab 8, vol. 6, tab 8; tr. 199-200) Mr. Swartz testified that the military handbook requires galvanized steel for dry pipe systems including fittings and that the AIA master specification allows for galvanized and copper fittings. However, he was uncertain as to whether the Factory Mutual Engineering and Research Corporation Approval Guide (Factory Mutual) referenced in contract sections 13930 and 13935 required galvanized fittings. (Tr. 275-76)

24. Contract specification section 13935, paragraph 1.3.6, required friction loss on the galvanized dry-pipe system to be calculated in accordance with the Hazen-Williams formula using a "C" value of 100. The "C" value required by the specifications differed from, and was more strict than, the NFPA Hazen-Williams "C" value for galvanized pipe, which was listed as 120. NFPA included a note that allowed the authority having jurisdiction (the government) to specify other values (R4, vol. 4, tab 4 at table 6-4.4.5; tr. 178-79). Mr. Moren agreed that the contract specifically called for galvanized dry-piping with a Hazen-Williams formula "C" value of 100; nevertheless, Mr. Moren's original calculations for the galvanized piping used a "C" value of 120. Mr. Robert Moren stated in a 25 July 2000 letter to HNDB, that the "C" value is "an inherent property of the actual piping, unchangeable without miss-representation [sic]." (R4, vol. 2, tab 1, vol. 4, tab 4, vol. 7, tab 19; tr. 77, 147-50, 295-98) There is no evidence that Fireshield bid on the basis of a 120 "C" value.

25. During a 3 May 2000 conference call with Fireshield representatives, Mr. Snider told Fireshield that paragraph 1.3.4 of specification section 13935 should have led the designer to use the area/density method because the government provided the area to be calculated and the density to be applied to that area. The parties also discussed the government's requirement for a more stringent "C" value. Following the conference call, Fireshield informed the government that it considered the government's directive to recalculate the design using a different method and "C" value, to be a change

to the contract. Fireshield submitted an estimate of $25,000 for the work. (R4, vol. 6, tabs 11, 12; tr. 211)

26. By letter dated 17 May 2000, the government summarized a conference call concluding the parties could not agree on the interpretation of NFPA 13 and the contract documents and stated, "Our position has been, and remains, that the specification required you to use the Area/Density method in the design of the fire sprinkler systems." (R4, vol. 6, tab 13) The government believes the room design method could not be used by the contractor because the government had provided the contractor with an area and a density (tr. 190-94, 210-11).

27. On 12 June 2000, Fireshield resubmitted its design for the dry-pipe system, which included the change to the 3,900 square feet most remote area. Fireshield used a "C" value of 100 as requested by the government, which resulted in a need for larger pipes. Fireshield's design included galvanized piping with painted fittings (tr. 76-77). The submittal was "approved as noted" on 12 July 2000, with the comment that the fittings for the dry-pipe system had to be galvanized. (R4, vol. 7, tab 15; R4, ASBCA No. 53363, tab 6; tr. 126-27, 149) Mr. Swartz testified that galvanized steel fittings were required by the guide specifications that the architect used in designing the project. (Tr. 283-84)

28. On 14 July 2000, Fireshield resubmitted the revised design for the wet-pipe system, including calculations for the most remote 3,000 square feet. The three-story waiting room was not the most remote area in the new design. Instead, an area in the main body of the third floor of the addition, shown as a dark grid on drawing 4 of 8, was used. On 28 July 2000, the submittal was approved "as noted." (R4, vol. 7, tab 21; tr. 130, 194, 213)

29. Paragraph A-4-14.4.2.1 of Chapter 4 of NFPA 13 provides that galvanized steel pipe fittings were suitable where moisture conditions were severe but corrosive conditions were not of great intensity (ex. G-3). Mr. Randall Porcher, Fireshield's president, testified that although the garage was approximately 300 feet from the shoreline of Puget Sound, the project was neither in a corrosive area nor exposed to a corrosive atmosphere, as the sprinkler system was installed under cover on the garage deck (tr. 39-41, 45-46). When asked whether galvanized piping is used with painted fittings, he stated it was the typical installation on his projects (tr. 40) and that painted fittings are the industry standard on dry systems (tr. 38). Mr. Porcher stated:

> In our industry it's very clear that pipe and fittings are not tied together. There's several different manufacturers of fittings and several different manufacturers of piping, as long

> as the two are compatible, which they are, galvanized fittings are compatible with painted fittings. Several insurance companies and approving agencies recognize that.

(Tr. 46-47)

30. Appellant's expert witness, Mr. Don Hirst, a plant manager for TYCO Manufacturers, deals with pipes and fittings everyday. He testified that he uses primarily non-galvanized fittings with galvanized pipes unless the specification states otherwise, and that it is permitted by Factory Mutual (tr. 168-69). The Navy engineer testified that it was "common sense to use galvanized fittings" (tr. 175).

31. Despite repeated deficiency notices and Mr. Porcher's assurance that Fireshield would use galvanized fittings for the dry-pipe system, Fireshield was still installing non-galvanized painted fittings as of 29 December 2000. (R4, ASBCA No. 53363, tabs 8-10, 14, 18, 19, 21, 22; tr. 219, 223-25, 260-62)

32. On 27 July 2000, appellant submitted Fireshield's request for a contracting officer's final decision on a claim for $90,437.64 resulting from the government's directive to redesign the sprinkler discharge area and provide additional piping required by the use of the more stringent "C" value. On 26 October 2000, the contracting officer denied the claim. (R4, vol. 7, tabs 20, 24, 28) Appellant timely appealed and we docketed the appeal as ASBCA No. 53211.

33. On 26 January 2001, appellant submitted a claim for $21,698.24 for added costs and an undefined time extension resulting from the government directive to use galvanized fittings and couplings. The contracting officer denied this claim on 29 March 2001. Appellant timely appealed. (R4, ASBCA No. 53363, tabs 25, 28) We docketed the appeal as ASBCA No. 53363.

DECISION

ASBCA No. 53211

Fireshield contends that the government improperly rejected its submitted designs for the wet and dry sprinkler systems. The government contends that appellant's interpretation of NFPA 13 and the contract documents is erroneous. At issue is the tension arising because of the specification's use of defined square footage and density regarding the sprinkler discharge areas while including the qualifier "as defined in NFPA 13."

The specification at issue contains express provisions as to the size of the wet and dry sprinkler discharge areas (3000 square feet and 3900 square feet, respectively). It also contains express provisions as to the density of the water application for the wet system (0.10 gpm per square foot) and the dry system (0.15 gpm per square foot). (Findings 7, 8) HNDB argues that those contract requirements were "ambiguous and unclear" (app. br. at 11, 13).[2] Assuming, *arguendo*, that the contested specification provisions were ambiguous, HNDB has the burden of proving, inasmuch as Fireshield performed the work at issue, that Fireshield relied on its interpretation of the specification in submitting its bid to HNDB. *Fruin-Colnon Corp. v. United States*, 912 F.2d 1426, 1429-30 (Fed. Cir. 1990). It has failed to do so (finding 10). Accordingly, we deny this portion of HNDB's claim.

The other issue regarding the design of the sprinkler system involves the dry pipe system. Paragraph 1.3.6 of specification section 13935 required the use of a "C" value of 100 in calculating pipe friction loss. In its design, Fireshield used a "C" value of 120. Fireshield argues that the "C" value of 100 is contrary to table 6-4.4.5 of NFPA 13 which requires a value of 100 for systems using black steel pipes, not the galvanized pipe specified for the garage.

NFPA 13 includes a note that allows the authority having jurisdiction, the government, to specify other friction values. The "C" value of 100 was specified in paragraph 1.3.6 of specification section 13935. Fireshield could not reasonably conclude that the "C" value of 120 was what the contract required. Its interpretation of the "C" value provision ignored a part of the contract and its unilateral decision to change the value to 120 was without a rational basis. Moreover, even if the "C" value specification was somehow ambiguous, HNDB must establish that Fireshield bid based on the "C" value of 120. *Fruin-Colnon*, *supra.* It has offered no evidence of its interpretation at the time of bidding (findings 10, 24). Accordingly, this part of its claim must also be denied.

ASBCA No. 53211 is denied.

ASBCA No. 53363

Fireshield contends that the government's direction to use galvanized fittings and couplings for the dry-pipe sprinkler system constitutes a change for which Fireshield is

[2] We do not understand HNDB to argue that the government's interpretation was unreasonable. In any event, the inclusion of specific square footage and gpm persuades us that the government's interpretation requiring adherence to those express requirements is reasonable.

entitled to an equitable adjustment. In *Northwestern Industrial Piping, Inc.*, ASBCA No. 12676, 70-2 ¶ 8551 at 39,760-61, *aff'd*, 467 F.2d 1308 (Ct. Cl. 1972), we said:

> The meaning manifested by the specifications cannot be ascertained from the dictionary or technical meaning of isolated words. Such terms as "piping" and "fittings", like many words in common usage, do not have fixed single word meanings, with the result that the intended meaning in a particular instance must be arrived at from the context in which they are used.

To determine whether galvanized fittings were required by the contract, we must first analyze paragraph 2.1.1 of specification section 13935, which provides that "steel piping shall be hot dipped galvanized." The government argues the word piping can be defined as a run of pipe including fittings. While piping in general may refer to a complete system of piping and fittings, several provisions in the contract refer to both pipe and fittings. Paragraph 6-4.4.5(a) of NFPA 13 refers to both pipe and fittings. Paragraph 2.1 of specification section 13930 refers to fittings for changing the direction of piping and paragraph 2.1.1 provides that pipe and fittings shall be steel. Contract specification 13935 also references both piping and fittings. In the very paragraph in dispute, paragraph 2.1.1 of specification 13935 provides "Steel piping shall be hot dipped galvanized Schedule 40" and that "Sprinkler pipe and fittings shall be steel." Both piping and fittings are required to be steel but only the piping is required to be galvanized. In our opinion, the specifications reasonably read, require that only the piping be galvanized not the fittings.

Appellant's arguments that fittings are separate items are bolstered by the testimony of witnesses, well-versed in the industry, who stated that it is not uncommon for painted fittings to be used with galvanized pipe unless the specifications state otherwise, and by Factory Mutual, which is referenced in the contract specification. We recognize that trade practice cannot override unambiguous contract provisions, but in the matter before us, industry practice is in harmony with the contract language. We do not find the specification to be ambiguous.

In light of the fact that piping and fitting are separately referred to in various areas of the specification, and the common usage in the industry of galvanized pipe with painted fittings, we find appellant's interpretation to be the only reasonable interpretation.

However, appellant should not be compensated for costs related to replacing painted fittings that it installed subsequent to receipt of the government's directive to use galvanized fixtures. By ignoring the non-compliance notices, appellant assumed the risk

that it would not be paid for the added costs relating to replacing painted fittings which it should not have installed.

There is no evidence in the record that any of the work relating to the sprinkler system has caused a delay to the project. Thus, appellant has not proved that it is entitled to a time extension or delay costs.

ASBCA No. 53363 is sustained in part and denied in part as indicated above.

CONCLUSION

ASBCA No. 53211 is denied. ASBCA No. 53363 is sustained in part, denied in part, and remanded to the parties for determination of quantum.

Dated: 31 January 2006

PAUL WILLIAMS
Administrative Judge
Chairman
Armed Services Board
of Contract Appeals

(Signatures continued)

I concur

EUNICE W. THOMAS
Administrative Judge
Vice Chairman
Armed Services Board
of Contract Appeals

I concur

CARROLL C. DICUS, JR.
Administrative Judge
Armed Services Board
of Contract Appeals

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA Nos. 53211, 53363, Appeals of Harper/Nielsen Dillingham Builders JV, rendered in conformance with the Board's Charter.

Dated:

CATHERINE A. STANTON
Recorder, Armed Services
Board of Contract Appeals