ATTACHMENT A: DETAILED TECHNICAL SPECIFICATIONS

Protective Clothing for Structural Firefighting: Coat and Pant

LEGAL RIGHT TO SPECIFY

The Fire Department (for the remainder of this section referred to as the "specifier") chooses to exercise its Legal Right to Specify as determined by the U.S. Supreme Court's affirmation of the decision handed down in the case of *Whitten Corp. vs. Paddock*, by the U.S. District Court of Massachusetts, the First Federal District Court, which in effect states:

1) That as trained professionals, specifiers make informed judgments on products that they feel best serve their needs. Also, that proprietary specifications (if chosen) DO NOT violate any antitrust laws. Technically, very few brands of material or equipment are exactly alike, and if the specifier wants to limit the specification to one source, he has the right to do so and enforce it.
2) Only the specifier has the responsibility and judgment for determining whether a proposed substitution is an "or equal".
3) That from start to finish in the procurement process, only the specifier can ultimately decide if another desirable product is available in lieu of the specification.
4) Finally, that the courts concluded "the burden is on the supplier or manufacturer, who has NOT been specified, to convince the specifier that their product is equal for the purpose of a particular project".

The specifier has determined that this product specification shall represent the product to which all offerings shall be compared. Due to the fact that firefighting is an ULTRAHAZARDOUS, UNAVOIDABLY DANGEROUS activity, only trained specifier personnel with specific knowledge in the area of Personal Protective Equipment shall be allowed to make the final determining decision on the selection of the appropriate product to serve the specifier's needs.

SCOPE

The following specifications, developed by the LFD, define the minimum requirements and attributes for structural firefighter personal protective equipment (PPE). Offerors shall identify in their proposals any specific areas where their proposed gear does not meet the below specifications and provide details of their alternate approach to the particular specification exception. Where exceptions to specifications are NOT noted in the proposal, the Offeror shall be required to furnish gear meeting the specifications in their entirety.

STANDARDS, APPLICABLE DOCUMENTS, UNITS OF MEASURE, AND CERTIFICATION

The following standards in their most active versions on the date of proposal submittal shall form part of this specification to the extent herein.

STANDARD	TITLE
ASTM D 6193-97	Standard Practice for Stitches and Seams
NFPA 1500, Latest Edition	Standard on Fire Department Occupational Safety and Health Program

NFPA 1851, Latest Edition	Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles
NFPA 1971, Latest Edition	Standard on Protective Ensemble for Structural Fire Fighting

The manufacturer shall certify that the garments proposed meet or exceed all requirements of NFPA 1971. The manufacturer must also list and label this product with Underwriters Laboratories Inc. (UL) or Safety Equipment Institute (SEI), as the third party certification organization prescribed in NFPA 1971. All certification testing and test preconditioning shall have been performed by an ISO 17025- certified laboratory. UL, SEI or a UL Authorized Client Test Data Program laboratory will fulfill this requirement.

Current NFPA standards applicable to this product specification express values for measurement requirements in SI (metric-based) units, followed by US (inch-pound) approximate equivalents in parentheses. For the convenience of the LFD, this product specification *reverses the order* and presents the more familiar US approximation first, followed by the SI requirement in parentheses.

The manufacturer shall be registered to ISO 9001, Quality Management Systems Requirements, (2000).

WARRANTY

The manufacturer must provide a lifetime warranty against defects in materials and workmanship.

PRODUCT COUNTRY OF ORIGIN

For liability reasons, companies must manufacture garments in the United States of America or Canada with their assets and incorporation within the United States of America or Canada.

LABELING REQUIREMENTS

Labels shall be permanently and integrally printed onto materials that meet all the requirements for labels of NFPA 1971. The garment shall be clearly labeled to fully identify the material content of all three layers: outer shell, moisture barrier and thermal liner.

In addition, each separable outer shell component of the garment shall be labeled with the FEMSA-style DANGER label in an obvious location. Label shall include separate bar codes for the serial number, size, manufacturer date, and member's first/last name.

CARE INSTRUCTIONS

The Contractor shall provide a user information guide for the garments, which complies with user information requirements of NFPA 1971. Topics shall include, but not necessarily be limited to pre-use information, preparation for use, inspection frequency and details, don/doff, use consistent with NFPA 1500, maintenance and cleaning, and retirement and disposal criteria and considerations.

This document shall be packaged with each garment along with a specification summary sheet describing garment custom options, sizing and production details. This written information shall be in complete compliance with NFPA 1971 requirements, and shall reference same.

TRACEABILITY PROGRAM

The Contractor shall have in place a computer maintained traceability program that provides for the assignment of a production control number to each garment. The traceability program must be capable of tracing the garment through production, from the bolts of cloth used in all three layers of the garment composite construction, to the assignment of the garment to the individual firefighter. This production control number shall be visibly located on the garment label and on other protected areas of garment.

PATENT CONSIDERATIONS

The Contractor, without exception, shall indemnify and save harmless the Purchaser and its employees from liability of any nature and kind, including cost and expenses for or on account of any copyrighted, patented or un-patented invention, process, or article manufactured or used in the performance of the contract, including its use by the Purchaser. If the Contractor uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the Contractor prices shall include all royalties or costs arising from the use of such design, device, or materials in any way involved in the work.

SIZING

To ensure a perfect fit, sizing shall be determined by actual measurements taken of the firefighter by a trained measurement specialist, or sizing try-ons, or both. Sizing measurements shall be taken according to a schedule and location(s) mutually agreed between the manufacturer and the department.

Garments shall be available in custom sizing as follows: coat chest in 2-inch (5.1 cm) increments, coat sleeve in 0.5-inch (1.3 cm) increments, coat back length in 1-inch (2.5 cm) increments, pant waist in 2-inch (5.1 cm) increments and pant inseam in 1-inch (2.5 cm) increments. A full range of women's sizing, on women's patterns, must also be available. Each sleeve and inseam length shall provide 100% gradation from shoulder to wrist, and from hip to ankle, to provide proper fit for individual arm and leg lengths. Pattern tailoring to custom-fit neck, bicep, hip/seat and thigh circumferences must also be provided, when needed, at no additional charge. Neither Small-Medium-Large-Extra Large sizing nor women's garments cut to men's patterning are considered acceptable, since proper fit facilitates mobility and minimizes stress.

SELF-BINDING

Liner and moisture barrier shall be stitched together and turned, then topstitched, to create a self-binding edge. The extra bulk of separate binding material is specifically prohibited.

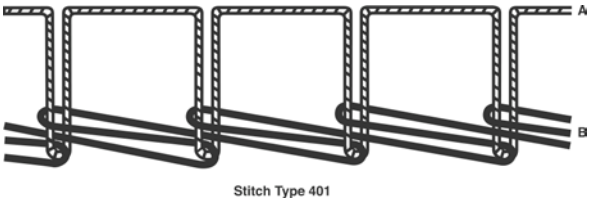
THREAD

All thread used in structural seams shall be Nomex® of a minimum Tex size T-70. Light colored garments and trim areas shall feature yellow thread. Black and dark garments shall feature black thread. Tan or bronze colored garments shall feature tan thread.

STITCH METHODS

Major A & B seams

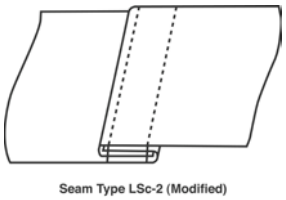
Except for the collar Major A seam, which is single-needle lock stitched three times, all Major A & B seams (as defined by NFPA 1971) shall be double stitched, double feld throughout all three layers (outer shell, moisture barrier and thermal liner), and shall be made with Nomex® thread, minimum Tex size T-90. Detailed stitch and seam type requirements are shown below.



Stitch Type 401

Stitch Type 401

Double lockstitch, as defined by ASTM D 6193-97


Seam Type LSc-2 (Modified)

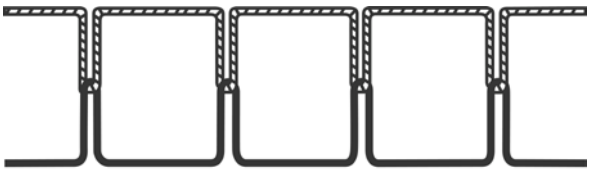
Modified Seam Type LSc-2

Double feld seam, modified only to ensure that both stitch lines penetrate all layers of cloth at joining, otherwise as defined by ASTM D 6193-97

Also, all moisture barrier seams shall be tape-sealed to meet all requirements of the NFPA 1971 Liquid Penetration Resistance Test.

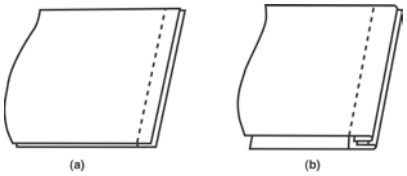
Minor seams

Most Minor seams, such as storm shields and mated hems, shall also be stitched with the specified Nomex thread. Detailed stitch and seam type requirements are shown below.


Stitch Type 301

Stitch Type 301

Lockstitch as defined by ASTM D 6193-97



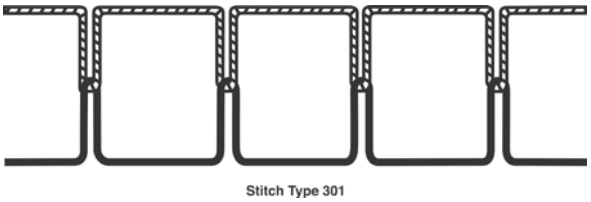
Seam Type SSae-2

Seam Type SSae-2

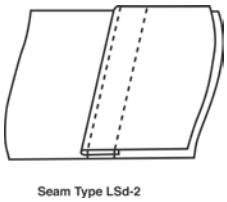
As defined by ASTM D 6193-97, shown (a) before and (b) after required turning

POCKETS

Flat garment pockets shall be stitched with the specified Nomex® thread. Detailed stitch and seam type requirements are shown below.

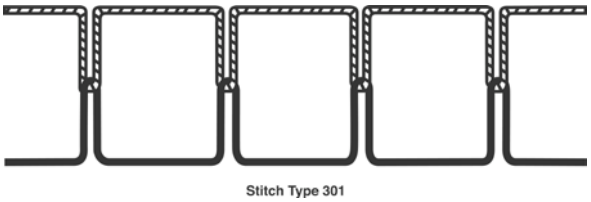


Stitch Type 301
Lockstitch as defined by ASTM D 6193-97

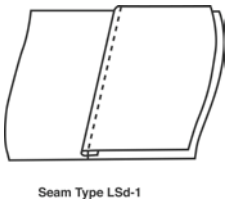


Seam Type LSd-2
As defined by ASTM D 6193-97

3-Dimensional pocketing shall feature these same construction details, but the reinforced single stitch Seam Type LSd-1 may be substituted for LSd-2. Detailed seam type requirements are shown below.



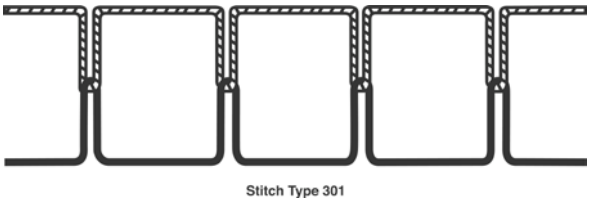
Stitch Type 301
Lockstitch as defined by ASTM D 6193-97



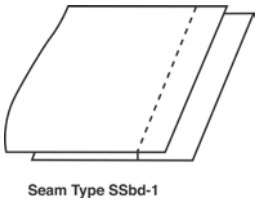
Seam Type LSd-1
As defined by ASTM D 6193-97

Trim and DANGER labels

Trim and DANGER labels shall be stitched with the specified Nomex® thread. Detailed stitch and seam type requirements are shown below.



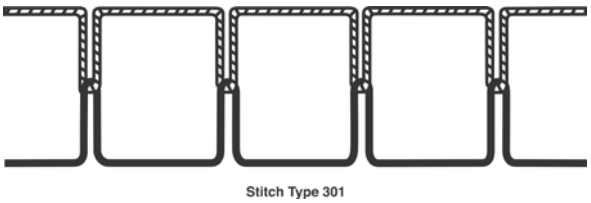
Stitch Type 301
Lockstitch as defined by ASTM D 6193-97



Seam Type SSbd-1
As defined by ASTM D 6193-97

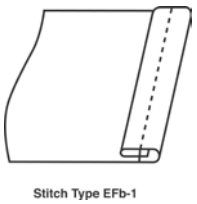
Single layer hemming and finishing

Single layer hemming and finishing shall be stitched with the specified Nomex® thread. Detailed stitch and seam type requirements are shown below.



Stitch Type 301

Lockstitch as defined by ASTM D 6193-97



Seam Type EFb-1

As defined by ASTM D 6193-97

POCKETS

When exterior pockets are specified, the following requirements shall apply to all such custom option specified exterior pockets:

- All pockets and flaps shall be reinforced at the top corners with bar tack stitching.
- All pockets shall be reinforced with an extra layer of NFPA-certified outer shell, moisture barrier, or other NFPA-certified reinforcement material for extra durability. The exact location of the reinforcements shall be identified in the custom options section(s).
- All pockets shall have a means to drain water and shall have a means of closure.
- All pocket closures shall be made either with hook and loop fastener tape a minimum of 1.5 inches (3.8 cm) wide, with a flap, or with snaps. The specific placement of the closure system shall be outlined in the custom options sections.

TAILORED GRADING OF GARMENT LININGS

Wherever garment linings are specified, including, but not limited to the thermal linings and moisture barriers, each such lining layer should be tailor-graded to fit with respect to overall garment composite of all layers without causing bunching or binding when the garment is worn. All garment layers and cold weather accessory linings shall be graduated in size to fit within in each other in the overall composite without causing bunching or binding when the garment is worn.

POINTS OF STRESS

All points of stress shall be reinforced with sturdy bar tacks. Rivets are not acceptable because of their potential for rust and electrical or heat conduction. Areas with stitching such as the coat light strap should utilize a box stich method and not a single line stitch method to enhance durability.

ASSET TRACKING SERVICES

The Contractor shall be capable of providing a Windows-compatible software program for the tracking of care, cleaning and maintenance of the department's PPE.

This tracking program shall meet or exceed all record-keeping requirements of standard NFPA 1851, *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles*, Latest Edition

Labels on each separable part of the garment shall include a standard style interleaved 2 of 5 barcode containing (at a minimum) an individualized serial number for asset tracking purposes.

The Contractor must be capable of providing onsite or internet training to department personnel who are involved with the daily use of this tracking program, and if there is an additional cost involved for this service, the Contractor must disclose those costs in the proposal.

Software upgrades for the tracking system shall be included. If there are additional costs for the upgrades, the cost must be provided in the proposal.

REPAIRS AND ALTERATION SUPPORT

The Contractor shall furnish, free of charge, reasonable quantities of NFPA 1971-certified thread, materials and other supplies to allow the department to manage its own ongoing internal maintenance efforts. **A detailed list of materials and supplies shall be included with proposals.** Also, the manufacturer shall provide on call at no charge, during normal business hours, a liaison for the repair department to assist the LFD on a telephone consultation basis, on all maintenance or repair questions that might arise. Additionally, the manufacturer shall agree to expedite, on its own cost-only basis, all repairs that must be performed at the manufacturer's plant, rather than in department, over the life of the contract. **A list of normal repairs and costs should be provided with the proposal.**

Additionally, the Contractor shall provide, prior to the first delivery of any garments, and then annually thereafter, training according to the current NFPA 1851 standards, at no-charge to LFD. The training shall be provided for sewing technicians and other designated personnel to educate as to current basic garment repairs, cleaning and washing instructions, and basic garment inspection practices.

HIGH TEMPERATURES THERMAL INSULATING MATERIALS REQUIREMENT

Because thermally stable materials are essential to maximizing protective performance in firefighters' PPE, and because NFPA only states "minimum" performance requirements, all thermal liner or thermal enhancing materials used in the garments shall also meet the following criteria after the 500 degree F oven test:

1) Material shall remain intact and flexible
2) No portion of the material shall crack, crumble or flake

BREATHABILITY REQUIREMENT

Excluding where required by NFPA standard, necessary for functionality, or specifically called out in the custom option sections, all materials fabrics and reinforcements used in the construction of the garments shall be breathable and all moisture barrier material must be as specified in the Materials Section.

The breathability requirement includes but is not limited to collar, chinstrap, storm flap/shield, fly, water wells, front coat facings, and reinforcement cushioning where applicable.

Areas where non-breathability is allowed (absent Custom Option specifications): trim or other items placed externally on the arms that might need extra material to pass NFPA required Stored Energy Testing, hook and loop fastening, hardware or hardware backing, and pocket linings where used exterior to the outer shell.

CONDUCTIVE AND COMPRESSIVE HEAT RESISTANCE (CCHR)

Using breathable materials as outlined in the section titled Breathable Materials, there shall be a minimum area of 4" x 4" (10.2 cm x 10.2 cm) at the shoulders and elbows that provides a minimum of 25 CCHR at 2 psi and a minimum area of 6" x 6" (15.2 cm x 15.2 cm) at the knees that provides 25 CCHR at 8 psi.

In all three of these compression areas at least a portion of the protective area shall be made from high temperature fiber based materials sewn to the thermal liner on the inside of the liner toward the moisture barrier.

SEAM PROTECTION AT CUFFS

At the coat and pant cuff Major A seams, the reflective trim shall stop just before the folding of the full feld seam and for additional abrasion protection be covered by a sewn on strip of polymer coated Kevlar material laid on top of the Major A seam and covering each end of the trim.

COAT SPECIFICATION DETAILS

Spec # 1 and Spec # 2

To avoid liability and interface problems, coats and pants shall be procured from the same manufacturer.

DESIGN CONCEPT (STYLING)

The standard coat design shall be 6-inches (15.2 cm) longer at the rear hem than at the front hem and provide continuous and unbroken moisture barrier and thermal liner protection from the collar seam to the hem at the bottom of the coat tail. Each coat length shall be determined by each individual's torso length to provide the coat-to-pant interface as defined by NFPA 1500. Coat design must interface properly with standard waist high bunker pants. To facilitate various body types the front to rear length differential shall be made available in 3-inch (7.5cm), 4-inch (10.0cm), 5-inch (12.5cm and 6-inch (15.0cm) "Tail Drops".

PATTERNING CONCEPT

Garments shall feature a tailored three-piece body (with one-piece back) and one-piece, set-in sleeve construction throughout the outer shell, moisture barrier and thermal liner layers. One-piece garment body (either all layers or some layers) will not be considered acceptable since they cannot be tailored to hard-to-fit personnel. Similarly, garments with seams in mid-back are not considered acceptable because of backbone irritation that can occur with SCBA use. To facilitate individual tailoring needs, the major A & B seams joining the one-piece back to the right and the left front body panels (outer shell and all interior layers) shall be located at the most lateral position when the coat is laid flat for inspection.

PATTERNING REQUIREMENTS

To assure maximum freedom of movement and reduce kinetic resistance with minimum garment weight and bulk, coat patterning shall include the following features:

1. Degree of slope on shoulders shall be no more than 20%.
2. Hydraulic Butterfly sleeve patterning having built-in underarm bellow with 85-degree Lift Up Release Action shall be provided to minimize coat hem rise.
3. Sleeve attachment shall minimize shoulder lift and allow a full 360 degrees freedom of movement.
4. Coat hem rise with overhead reach of both arms not to exceed 4-inch (10.2-cm) maximal extension on properly fitted garments.
5. Shell-and-liner retraction at the cuff shall not exceed 1 inch (2.5 cm) when both arms are raised overhead. This helps eliminate wrist exposure.
6. 10-inch (25.4-cm) chest over-sizing shall be provided.
7. Coat sweep measurements must be consistent with the chest over-size at the hem.
8. Reach when measured from cuff to cuff, with coat lying flat, and standard length sleeves extended to each side, shall be provided as detailed below.
9. An alteration point at the hem that during manufacture allows the sweep dimension to be adjustable in two-inch (5.0cm) increments

Chest Size	Standard Reach
40 in (101.6 cm)	66 in (167.6 cm)
42 in (106.7 cm)	67 in (170.2 cm)
44 in (111.8 cm)	68 in (172.7 cm)
46 in (116.8 cm)	68 in (172.7 cm)

DRAG RESCUE DEVICE (DRD)

Contractor shall supply an NFPA required and certified Drag Rescue Device with each coat. Each strap will be properly labeled with the chest size(s) the Rescue Strap is designed to fit. Each strap shall be properly labeled with DANGER labels that include what chest size the Rescue Strap is designed to fit, instructions for care and maintenance, and installation/removal of the Rescue Strap.

Rescue Strap shall be designed in a fashion that it functionally provides a dynamic and articulated action and to eliminate excess strapping material hanging down the back when installed between the garment's liner and outer shell.

The device shall be constructed using two components: a 1.75" (4.45 cm) Kevlar webbing grab handle; and a free-floating loop of Kevlar rope to go around each of the wearer's arms/shoulder.

The grab loop shall extend upward and pass through a tunnel of outer shell and pass out through a reinforced slot in the coat outer shell just below the center rear of the collar seam. . The protruding grab loop shall then fold back down and be stored by hook and loop fastener.

The end of the garb loop shall be covered with an outer shell flap sewn below the held in place with hook & loop fastener to reduce the chances of snagging the grab loop by accident.

The Grab Handle shall be constructed of soft and pliable Kevlar webbing meeting the following specifications:

Description	100% Kevlar Double Plain Weave
Width	1.75" (4.45 dm)
Thickness	0.064" ± 0.010" (.163 cm ± .0254 cm)
Tensile	5,000 lb minimum (22.24 kN)

To facilitate comfort and safety the free-floating loop shall be constructed of soft and pliable Kevlar rope meeting the following specifications:

Description	100% Kevlar Tubular Plain Weave - Natural
Width	.038" (.097 cm)
Thickness	0.144" ± 0.005" (.366 cm ± .013 cm)
Tensile	3500 lb minimum (15.57 kN)

Rescue Strap shall be sewn with Kevlar thread.

LINER ATTACHMENT

The completed liner-moisture barrier assembly shall attach by means of four (4) evenly spaced glove snaps to each outer shell front facing to reduce weight, bulk and stiffness. To provide continuous moisture and pathogen protection at the front, the liner shall be positioned so it is sandwiched between the coat front facing and a breathable pathogen shield. The use of zippers or hook and loop fasteners in this area is not allowed due to their added weight, bulk and stiffness.

Liner sleeves shall be attached at the cuff by means of snaps on two (2) sets of Nomex tabbing per liner cuff. The male and female snap parts shall both be located on Nomex tabbing that is sewn to the liner at the cuff. In an effort to prevent abrasion, a separate piece of Nomex tabbing shall be sewn to the shell cuff and fashioned as a loop without any snap hardware.

To provide continuous moisture protection and pathogen protection at the neck, the liner shall be positioned so that it is sandwiched between an outer-facing pathogen shield and an inside facing of the specified outer shell material, both folded over and sewn in at the neck seam,

The liner system design should not allow products of combustion or other contaminants to move into the liner interior between the moisture barrier and the thermal liner. For example, separately hemmed and bartacked liner and moisture barrier with open edge designs would not be acceptable.

Attachment at the neck shall be by means of four (4) glove straps that penetrate only the layer of the attachment strip facing towards the liner, so that metal contact at a wearer's neckline is eliminated.

Attachment of the inner liner to the tail of the coat shall be attached by means of 5 snaps on two (2) sets of outer shell fabric tabbing strips with one in the center back of coat and the other 4 spaced evenly to prevent the two different layers of the coat from separating when donning or doffing the garment.

COAT CERTIFICATION LABEL ON LINER

The coat certification label on the liner shall be integrally printed on FR Cotton Indura® affixed and lock stitched to the inside right body panel of the liner in a fashion to provide an inside liner pocket.

COAT CERTIFICATION LABEL ON SHELL

The coat label on the shell shall be integrally printed on FR Cotton Indura® affixed and lock stitched in a conspicuous location once the liner is removed.

COLLAR

The collar shall be of layered construction, consisting of a layer of waterproof moisture barrier and a layer of NFPA 1971-certified insulating material, sandwiched between two (2) layers of specified outer shell material. NFPA compliant collars shall be at least 3 inches (7.6 cm) high while CGSB compliant collars shall be at least 4 inches (10.2 cm) high. The design shall incorporate in its patterning a natural contour that will allow proper fit and performance in the standing (upright) or stowed position.

There shall be no vertical or horizontal seams or stitching in the body of the collar. The left outside of the collar shall have a sewn piece of 2-inch x 2-inch (5.0-cm x 5.0-cm) hook fastener tape for chinstrap-to-collar closure. The fastener tape shall be located rearward far enough to allow for the location of a forward mounted microphone tab if so desired. Each collar shall be graded to individual coat sizes.

CHIN STRAP

The chinstrap shall be of layered construction identical to that of the collar configuration described in the previous paragraphs. Chinstrap shall be of a crescent shaped design with *minimum dimensions of*: 9 inches (22.5 cm) long across the top corners, 10.5 inches (26 cm) long across the bottom corners, and 3.5 inches (8.75 cm) in vertical height, measured at the center. The leading underside edge of the chinstrap shall have a 4.0-inch-wide (3.8 cm-wide) horizontal strip of loop fastener tape to ensure an adequately adjustable closure and to ensure passage of the Whole Garment Liquid Penetration Test.

HANG-UP LOOP

An 80-pound (36.3 kg) tear strength hang-up loop shall be provided at the interior collar seam. The loop shall be constructed of triple layers of the specified outer shell material, lock stitched to the coat. Webbing is not acceptable.

SLEEVES

To prevent stove piping, the sleeves shall be individually graded by coat size and sleeve length. For maximum freedom, the sleeve design shall feature extra full cut one-piece set-in sleeves with built-in bellows. To reduce the chances of possible top seam failure in that high thermal exposure area, the sleeve Major seams shall follow the underside of the arm and shall not cross over the outside of the elbow joint. Sleeve seam and sleeve attachment to coat body in all layers shall be 100% double feld and double stitched for maximum strength (Major A seam requirement, previously defined in this specification).

INNER WRISTLET & WATERWELL

Every coat shall feature a minimum 4.5-inch (11.4-cm) long, double-layer 100% Nomex knit inner wristlets protected by a flame-resistant and moisture-resistant inner water well. The inner wristlet shall be sewn to the thermal liner sleeve end (not to the outer shell). The specified moisture barrier shall form an inner water well with an elastic gather sewn to the moisture barrier sleeve end. The water well shall pass the NFPA 1971 Whole Garment Liquid Penetration Test. The thermal liner shall be bar tacked and seam sealed to prevent liner pullout. This inner water well assembly shall be interface capable with the appropriate glove to provide protection during the NFPA 1971 Whole Garment Liquid Penetration Test.

EXTERNAL WRISTLET

Every coat shall feature a 2.5-inch (6.4 cm) long 100% Nomex knit outer wristlet, which shall be mounted to the end of each outer shell sleeve to prevent liquid and debris movement up the sleeve between the outer shell and the moisture barrier/ thermal liner assembly.

FRONT CLOSURE PROTECTIVE OVERLAP

Two-inch-wide (5.1 cm-wide) panels of breathable moisture/pathogen barrier and specified thermal liner materials shall be provided at coat front closure facings to preclude any type of break in the protective envelope. The entire circumference of a closed coat shall consist of specified shell, moisture barrier and thermal liner materials.

The inside trailing edge of each 2-inch-wide (5.1-cm-wide) inner panel should have the breathable moisture/pathogen material wrapped around the edge by .5-inch (1.3-cm) to create an anti-wick guard to prevent soak through during the required NFPA 1971 Whole Garment Liquid Penetration Test. An additional layer of breathable moisture/ pathogen barrier material shall be sewn between the 2-inch-wide (5.1 cm-wide) panels and outer shell coat body for the entire length of coat front in a fashion to prevent liquid entry during the NFPA 1971 Whole Garment Liquid Penetration Test.

COMPOSITE MATERIALS

IWFR has determined that the combination of materials found below is desired. Any exceptions to these materials shall be specifically detailed and alternates explained in the Offeror's proposal.

Coat Spec #1

Outer shell
Pioneer w/freefas Black

Thermal lining
Synergy 2 layer

Moisture barrier
Stedair 4000

Coat Spec #2

Outer shell
PBI Max PF Zero

Thermal lining
Glide ice 2 layer

Moisture barrier
Stedair 4000

DEAD AIR PANEL

The coat's composite shall have additional thermal enhancement in the shoulders, upper back (4" down from the crest of shoulders), upper chest (4" down from the crest of shoulder) and extending down the outside of the upper arm. The CCHR rating in this area shall not be less than 35 wet and 43 dry. When requested, the contractor shall provide ISO 17025 certified lab results and samples of designs they intend to submit. Design shall use three layers of one-inch wide, nine-ounce Aramid attached side-by-side and spaced 2.25-inches on dead-center. Design shall not inhibit moisture vapor transmission. Comfort and flexibility of the system shall be used by trained IWFR personnel to determine the design's acceptability.

COAT CUSTOM OPTIONS TO BE PROVIDED

Instructions in this custom options section that contradict earlier specifications or statements supersede those earlier specifications or statements as long as the required certifications are not compromised.

Spec # 1

LTO-Tails
(020) Std -Inspection Port Liner Std-Liner detachable
Std -SET Thermal Enhancement Std -Liner Label Pocket
(ROI) Std-Articulating Rapid Rescue Strap
(001) Std -Take Up Straps - 2 Postman Std -Trim Double-Stitched

Trim -(4) NEW YORK -lime 2-tone Scotchlite (3") Back Patch - Pioneer
W/FREEFAS -Black
< ISLE Of WIGHT
COUNTY>
17 -2" sewn letters -lime Scotchlite
Hem Patch - Pioneer W/FREEFAS -Black
- FF LAST NAME (1st INITIAL when specified)
- Avg. 7 letters
- OK to use 2" letters to fit
7 -3" sewn letters -lime Scotchlite

Hooks & Dees/Zipper Interior (Q02) LTO Comfo1t Chinstrap
Black Knit Material on Comfort chin strap

Dead Air Panels

Half Hi Bellows Pockets
-- 6 x 9 x 1.5
Mic Tab
-- left chest
-- 0.5 x 2.5
Radio Pocket Pioneer w/FREEFAS - Black
-- left chest
-- 8 x 3 x 2
SL-90 Flashlight Clip
-- right chest

Sub Wristlets -Long Hybrid with tabs -Nomex - black

Spec # 2

LTO Tail

(E02) Std - Hooks & Dees/2" Velcro Interior
(020) Std -Inspection Port Liner Std-Liner detachable
Std -SET Thermal Enhancement Std -Liner Label Pocket
(ROI) Std-Articulating Rapid Rescue Strap
(001) Std -Take Up Straps - 2 Postman Take Up Straps Placed Above Pockets
*** TAIL DROP - 5" ***
Std -Trim Double-Stitched

Trim-(4) New York - lime 2-tone Oralite Brilliance (3") Back Patch - PBI Max PF Zero
< S. V. F. D. > * straight
4 -3" sewn letters -lime Reflexite Brilliance 4-Sewn Periods
Hem Patch *with velcro* - PBI Max PF Zero
- FF LAST NAME (1st INITIAL when specified)
- Avg. 7 letters
- OK to use 2" letters to fit

7 -3" sewn letters-lime Reflexite

(Q02) LTO Comfort Chinstrap
Black Knit Material on Comfort Chinstrap

(S03) Liner within l" of Hem
(015) Dead Air Panels Extended

X-Large Half Hi Bellows Pockets - PBI Max PF Zero
-- 7 x 12 x 3.5
Bartack All 4 Comers of Bellows Pockets Flap Angled\MB Lined
4 Vertical Strips Velcro on Flap/Full Velcro on Pocket Senn Bellows
Mic Tab - PBI Max PF Zero
-- left chest
-- 0.5 x 2.5
- Place 3" below shoulder seam & 3" over from leading edge

Radio Pocket - PBI Max PF Zero

-- right chest

-- 8 x 3 x 2

Notch Flap -Left

Lanyard Flashlight Clip -Style #2 - PBI Max - Black

-- left chest

(S09) - 2 additional snap tabs, one on each side seam

(W50) Sub Wristlets -Long Hybrid with tabs -Nomex - black

PANT SPECIFICATION DETAILS

Pants Spec # 1

DESIGN CONCEPT (STYLING)

The pant shall be of a traditional waist-high-only design to facilitate full torso ventilation of front, rear and sides of trunk for maximum body cooling effect to help minimize firefighter heat stress. For this reason, other than waist-high pants will not be considered acceptable or "equal," since additional trunk wrapping traps heat and moisture, increasing heat stress buildup while also creating mechanical resistance when covering the natural torso flexion point of the waist.

PATTERNING CONCEPT

Garments shall feature a tailored four-piece outer shell with a two-piece moisture barrier and lining. In addition, it shall include a one-piece, over-sized crotch diamond pattern in the outer shell, moisture barrier and thermal liner.

PATTERNING REQUIREMENTS

To assure maximum freedom of movement and reduced kinetic resistance with minimum garment weight and bulk, the pants patterning shall:

1. Incorporate hydraulic, swivel action leg-to-torso interfaces.
2. Incorporate an oversized diamond-shaped crotch insert, graded according to size, for maximum action stride, optimum stepping reach and no "in-crotch" seaming.
3. In the outer seam hip area, in all three layers shall, incorporate convex seam technology to provide for generous seat expansion when squatting and crawling without creating unsightly bagginess.
4. That the diamond extends from just above the left knee to just above the right knee, and be centered equally from front to rear. Width of diamond at top of crotch shall be approximately proportionally graded to waist size and inseam length.
5. Ensure that pants rest in normal body line balance of 22 inches (55.9 cm) center distance at the cuff for 42 waist, 30 inseam pants.
6. Provide for an alteration point at the hips so that during manufacture the hip dimension can be adjustable in two-inch (5.0cm) increments
7. Meet individual tailoring needs, and offer superior functionality. Diamond should extend

   from just above the left knee to just above the right knee, and be centered equally from front to rear. Width of diamond at top of the crotch should be approximately 4" (10.2 cm), graded to size.

LINER ATTACHMENT

The moisture barrier and thermal liner assembly shall be attached to the outer shell at the waistband with seven (7) evenly-spaced glove snaps.

Liners shall be attached at the cuff by means of snaps on two (2) sets per leg of Nomex® tabbing per liner cuff. The male and female snap parts shall both be located on Nomex tabbing that is sewn to the liner at the cuff. A separate piece of Nomex tabbing shall be sewn to the shell cuff and fashioned as a loop without any snap hardware.

The liner system design shall not allow products of combustion or other contaminants to move into the liner interior between the moisture barrier and thermal liner. For instance, separately hemmed and bar tacked liner and moisture barrier with open edge designs would not be acceptable.

PANT CERTIFICATION LABEL ON SHELL

The pant label on the shell shall be integrally printed on FR Cotton Indura® affixed and lock stitched to the facing at the fly.

FLY FRONT

The outer shell fly shall be lock stitched to the left side of the front opening and shall be in proportion to waist size and crotch rise in both length and width. Fly inner lining shall extend at least 2 inches (5.1 cm) to the left of the outer shell fly attachment seam and shall be constructed of certified breathable moisture barrier and thermal liner. The right front pant opening shall have an internal facing extending at least 2 inches (5.1 cm) to the right and constructed of specified fabric. In combination with the liner, the system shall offer 360-degree protection without gaps during movement of the outer shell moisture barrier and thermal liner. Closure shall be by means of a minimum 1.5-inch-wide (3.8-cm-wide) hook and loop fastener, and all construction techniques used shall provide liquid penetration protection under the NFPA 1971 Whole Garment Liquid Penetration Test. The fly shall be graded to the waist size of garments and crotch rise.

REINFORCED CUSHIONED KNEE, HEAT CHANNEL (BIFLEX TYPE)

The heat knee area shall be provided with increased thermal protection consisting of one (1) layer of polymer coated Kevlar material covering multiple layers of 9.0-ounce, Aramid batt style insulating and cushioning material. These knees shall consist of 9 horizontal corrugations down the center to allow for ease of bending while still providing an extra high level of protection. At the sides of each pad vertical corrugations of specified outer shell material will allow the knee padding to wrap around the cylindrical

shape of the leg. Pads shall measure approximately 13" high by 9" wide, and sewn onto the knee area of the outer shell.

The cushioning for the knee reinforcement, and thermal pad sewn to the internal side of the thermal liner assembly, should provide a minimum of 25 Compressive Conductive Heat Resistance (CCHR).

DYNA-FIT STYLE SUSPENDERS WITH SNAP ATTACHMENT, QUICK ADJUSTMENT FEATURE, AND PADDING

The suspenders shall be attached to the front and back of the pants by four (4) single layer 2" wide elastic straps assembled at each of the four (4) circular connectors located at the ends of the front and back of the suspender. At each end of the elastic straps, male and female snaps are installed to attach the suspender to the pant. The design shall then provide four (4) loops attached at the waist of the pant with bar tacks. The back of the suspenders shall be "Free floating," crossover shall be accomplished by threading the right and left suspender body through fabric loops constructed as part of the rear and lower suspender body. The rear lower suspender shall be in 2" wide webbing. The suspenders shall be adjustable by means of a 2" wide slider buckles at the front of the suspenders. The suspenders shall contain quick adjust and padding.

PANT CUFFS

Pant Cuffs shall be notched 1.5" higher at the rear in all three layers and shall be reinforced in the high wear areas with Black Arashield type material attached using lock stitching method.

TAKE UP STRAPS

At the right and left sides of the pant waist, provide outer shell straps with postman slide buckles configured to operate with a forward pulling motion of the hands.

COMPOSITE MATERIALS

IWFR has determined that the combination of materials found below is desired. Any exceptions to these materials shall be specifically detailed and alternates explained in the Offeror's proposal.

Pants Spec # 2

design concept (styling)

The pant shall be of a traditional waist-high design to facilitate full torso ventilation of front, rear and sides of trunk for maximum body cooling effect to help minimize firefighter heat stress. For this reason, other than waist-high pants shall not be considered acceptable or "equal," since additional trunk wrapping traps heat and moisture, increasing heat stress buildup while also creating mechanical resistance when covering the natural torso flexion point of the waist.

patterning concept

Garments shall feature a tailored four-piece body plus a one-piece, over-sized crotch diamond pattern in the outer shell, moisture barrier and thermal liner.

patterning requirements

To assure maximum freedom of movement and reduced kinetic resistance with minimum garment weight and bulk, the pants patterning shall:

- Incorporate hydraulic, swivel action leg-to-torso interfaces.
- Incorporate an oversized diamond-shaped crotch insert, graded per size, for maximum action stride, optimum stepping reach and no "in-crotch" seaming.
- In the outer seam hip area, in all three layers shall, incorporate convex seam technology to provide for generous seat expansion when squatting and crawling without creating unsightly bagginess.
- That the diamond extends from just above the left knee to just above the right knee, and be centered equally from front to rear. Width of diamond at top of crotch shall be approximately proportionally graded to waist size and inseam length.
- Ensure that pants rest in normal body line balance of 22 inches (55.9 cm) center distance at the cuff for 42 waist, 30 inseam pants.
- Provide for an alteration point at the hips so that during manufacture the hip dimension can be adjustable in two-inch (5.0cm) increments

Suspender Attachment

8 snap style suspender loops shall be positioned on the internal waist facing. Suspender loops shall be mounted through top of waistband with triple later outershell material, thermal and moisture barrier.

liner attachment

The moisture barrier and thermal liner assembly shall be attached to the outer shell at the waistband with seven (7) evenly-spaced glove snaps. Liners shall be attached at the cuff by means of snaps on two (2) sets Hypolan coated Kevlar tabbing per liner cuff. The male and female snap parts shall both be located on Hypalon coated Kevlar tabbing that is sewn to the liner at the cuff. A separate piece of Hypalon coated Kevlar tabbing shall be sewn to the shell cuff.

fly front

The outer shell fly shall be lockstitched to the left side of the front opening and shall be in proportion to waist size and crotch rise in both length and width. Fly inner lining shall extend at least 2 inches (5.1 cm) to the left of the outer shell fly attachment seam and shall be constructed of certified breathable moisture barrier and thermal liner. The right front pant opening shall have an internal facing extending at least 2 inches (5.1 cm) to the right and constructed of specified fabric. In combination with the liner, the system shall offer 360-degree protection without gaps during movement of the outer shell moisture barrier and thermal liner. Closure shall be by means of a minimum 1.5-inch-wide (3.8-cm-wide) hook and loop fastener, and all construction techniques used shall provide liquid penetration protection under the NFPA 1971 Whole Garment Liquid Penetration Test. The fly shall be graded to the waist size of garments and crotch rise.

Spec # 1

Outer shell
Pioneer w/freefas Black

Thermal lining
Synergy 2 layer

Moisture barrier
Stedair 4000

Spec #2

Outer shell
PBI Max PF Zero

Thermal lining
Glide ice 2 layer

Moisture barrier
Stedair 4000

PANT CUSTOM OPTIONS TO BE PROVIDED

Instructions in this custom options section that contradict earlier specifications or statements supersede those earlier specifications or statements as long as the required certifications are not compromised.

Pants Spec #1

LTO pants
(102) STD Narrow Fly -2" Velcro w/ Hook & Dee
(021) Std -Inspection Port Liner Std -Liner Detachable
Std -Trim Double-Stitched

Trim -(7) NFPA -lime 2-tone Scotchlite (3")

(003) Angled Cuffs - Arashield - Black (M27) Pant Cuffs - Arashield - Black
(KOS) BiFlex Heat Channel Knees -Pioneer W/FREEFAS 6.6 oz (K54) Horizontal Strips in BiFlex knees to be Arashield - Black
(001) Take Up Straps - 2 Postman - Pioneer W/FREEFAS 6.6 oz - Bl

Bellows Pockets -Pants -Pioneer W/FREEFAS Black
-- 9 **x** 9 x 1.5

Basic H-Back Suspenders w/ Quick Adjust Installed

Pants Spec #2

MPL PRO FIT Pants

(M26) Std Pants Cuffs - PBI Max PF Zero
(021) Std -Inspection Port Liner Std -Liner Detachable
Std -Trim Double-Stitched
Trim -(7) NFPA -lime 2-tone Oralite Brilliance (3") (J126) R/L Narrow 2"

Velcro/ZipperFly

(003) Angled Cuffs - Arashield - Black

(KOS) BiFlex Heat Channel Knees - PBI Max PF Zero
(K53) Both center sections in BiFlex Knee to be Arashield - Blac Delete Standard Take Up Straps
Postman on Pants **PBI**

Std Bellows Pockets -Pants - PBI Max PF Zero

-- 9 x 9 x 1.5

Std 3 Strips Velcro on flap/full Velcro on pocket Std Full Kevlar Lined

Std E Z Grip Flaps - PBI Max PF Zero

(X02) Std Snap Style Suspender Attachment

(Hl6) R/L Life Grip Ladder/Escape Pant Adapt Lower Placement (H53)Set & Forget Life Grip Belt w/2 D rings

Basic H-Back Suspenders w/ Snap Attach & Quick Adjust Install

ATTACHMENT B: PRICING SCHEDULE

Quantities shown below are estimated annual requirements.

ITEM #	QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	30 Each	Coats	$	$
Manufacturer and Part Number: Spec # 1 Honeywell VAISLE00197				
2	30 Each	Pants, Firefighter	$	$
Manufacturer and Part Number: Spec # 1 Honeywell VAISLE00198				
3	10 Each	Coats	$	$
Manufacturer and Part Number: Spec #2 Honeywell VAISLE00162				
4	10 Each	Pants	$	$
Manufacturer and Part Number: Spec #2 Honeywell VAISLE00163				
			GRAND TOTAL PRICE	**$**

In addition, modifications may be required to future firefighting equipment, including Coats and Pants. To accommodate these changes, if approved by the County, please indicate % rate of discount from Catalog List Pricing for each item below. The purchase prices below are optional and are in no way a guarantee of purchase.

ITEM #	QTY	DESCRIPTION	% Discount from Catalog
1	Vary	Coats, Options	%
Manufacturer: Honeywell/Morning Pride			
2	Vary	Pants, Options	%
Manufacturer: Honeywell/Morning Pride			
3	Vary	Gloves	%
Manufacturer: Vanguard MK-1 and MK1 ultra			
4	Vary	Hoods	%
Manufacturer: Honeywell			
5	Vary	Helmets	%
Manufacturer: Honeywell			
6	Vary	Hoods	%

Manufacturer: Honeywell