GENERAL SPECIFICATIONS
PROTECTIVE JACKET AND PANTS
FOR STRUCTURAL FIRE FIGHTING

Plainfield FPD

Section 1

SCOPE

This specification details design and materials criteria to afford protection to the upper and lower body, excluding head, hands against adverse environmental effects during structural fire fighting. All materials and construction will meet or exceed NFPA Standard #1971 and OSHA for structural fire fighters protective clothing.

_____Comply _____Exception

OUTER SHELL MATERIAL - JACKETS AND PANTS

The outer shell shall be constructed of TENCATE **"BLACK ADVANCE™ PCA (Producer Colored Aramid)"** 50/50 Kevlar®/Nomex® blend material with an approximate weight of 7.0 oz. per square yard. The shell material must be treated with **SST™ (SUPER SHELLTITE)** which is a durable water-repellent finish that also enhances abrasion resistance. Color of the garments shall be black. **Bids offering this shell material without the SST™ will not be considered. An alternate bid of black Advance in place of the black Advance™ PCA will not be considered.**

_____Comply _____Exception

THERMAL INSULATING LINER - JACKET AND PANTS

The thermal liner shall be constructed of 7.4 oz. per square yard Safety Components **GLIDE™ GOLD 2L-E89;** one layer of 1.5 oz. and one layer of 2.3 oz. per square yard E-89™ spunlaced Nomex®/Kevlar® aramid blend, quilt stitched to a 60% Kevlar® Filament/40% Nomex®/Lenzing spun yarn Face Cloth. A 7 inch by 9 inch pocket, constructed of self material and lined with moisture barrier material, shall be affixed to the inside of the jacket thermal liner on the left side by means of a lock stitch.. The thermal liner shall be attached to the moisture barrier and bound together by bias-cut Neoprene coated cotton/polyester around the perimeter. This provides superior abrasion resistance to the less expensive, less durable “stitch and turn” method. Further mention of “Thermal Liner” in this specification shall refer to this section. *NOTE: This thermal liner MUST be used exclusively with a minimum 7 oz. per square yard outer shell material.*

_____Comply _____Exception

MOISTURE BARRIER - JACKETS AND PANTS

The moisture barrier material shall be W.L. GORE **CROSSTECH® black moisture barrier** - Type 2F, which is comprised of a CROSSTECH® membrane laminated to a 3.3 ounce per square yard Nomex® IIIA woven pajama check substrate. The CROSSTECH® membrane is an enhanced bicomponent membrane comprised of an expanded PTFE (polytetrafluoroethylene, for example Teflon®) matrix having a continuous hydrophilic (i.e. water-loving) and oleophobic (i.e. oil-hating) coating that is impregnated into the matrix. CROSSTECH® moisture barrier seams shall be

sealed with GORE-SEAM® tape using a Series 6000 (or higher) GORE-SEAM™ sealing machine to afford comparable bacteriophage penetration resistance performance. Further mention of "Specified Moisture Barrier" in this specification shall refer to this section.

_____Comply _____Exception

SEALED MOISTURE BARRIER SEAMS

All moisture barrier seams shall be sealed with a minimum 1 inch wide sealing tape. One side of the tape shall be coated with a heat activated glue adhesive. The adhesive side of the tape shall be oriented toward the moisture barrier seam. The adhesive shall be activated by heat and the sealing tape shall be applied to the moisture barrier seams by means of pressure exerted by rollers for that purpose.

_____Comply _____Exception

METHOD OF THERMAL LINER/MOISTURE BARRIER ATTACHMENT FOR JACKETS AND PANTS

The position of the male snap portion on the liner shall be positioned in exactly the same location of similar liner sizes and the female snap portion on the outer shell shall be positioned in exactly the same location of similar shell sizes. The remainder of the thermal liner/moisture barrier shall be secured with snap fasteners appropriately spaced on each jacket facing and Ara-Shield® snap fasteners at each sleeve end. One of the Ara-shield® snap tabs shall be a different color in the liner to correspond with color coded snap tabs for ease of matching the liner system to the outer shell after inspection or cleaning is completed. The jacket collar, which is attached to the liner assembly, shall interface with the annular neck tab on the outer shell with hook and loop fastener tape (see Collar / Free Hanging Throat Tab).

The thermal liner and moisture barrier shall be completely removable from the pant shell. Nine snap fasteners shall be spaced along the waistband to secure the thermal liner/moisture barrier to the shell. The legs of the thermal liner/moisture barrier shall be secured to the shell by means of Ara-Shield® snap fasteners, 2 per leg. The Ara-shield® snap tabs shall be color coded to a corresponding snap tab in the liner for ease of matching the liner system to the outer shell after inspection or cleaning is completed.

_____Comply _____Exception

THERMAL PROTECTIVE PERFORMANCE

The assembled garment, consisting of an outer shell, moisture barrier, and thermal liner, shall exhibit a TPP (Thermal Protective Performance) rating of not less than 35.

_____Comply _____Exception

STITCHING

The outer shell shall be assembled using stitch type #301, #401, #514 and #516. The thermal liners and moisture barriers shall be assembled using stitch type #301, #401, #504, #514, and #516. Stitching in all seams shall be continuous. Major A outer shell structural seams, major B structural liner seams and shall have a minimum of 8 to 10 stitches per inch. All Major A seams shall be sewn with ball point needles only. All seams shall be continuously stitched only.

_____Comply _____Exception

JACKET CONSTRUCTION

BODY

The body of the outer shell shall be constructed of three separate panels consisting of two front panels and one back panel. The body panels shall be shaped so as to provide a tailored fit thereby enhancing body movement and shall be joined together by double stitching with Nomex® thread. One-piece outer shells shall not be acceptable.

_____Comply _____Exception

SIZING

The jacket length shall be measured from the juncture of the collar and back panels to the hem of the jacket and shall measure

29 inches long. (ladies)
32 inches long. (standard)
35 inches long.

The jacket shall be available in male and female patterns in even size chest measurements of two inch increments, and shall range from a small size of 30 to a large size of 68. Generalized sizing, such as small, medium, large, etc., will not be considered acceptable.

_____Comply _____Exception

DRAG RESCUE DEVICE (DRD)

A Firefighter Drag Rescue Device shall be installed in each jacket. The ends of a 1½ inch wide strap, constructed of black Kevlar® with a red Nomex® center stripe, will be sewn together to form a continuous loop. The strap will be installed in the jacket between the liner system and outer shell such that when properly installed will loop around each arm. The strap will be accessed through a portal between the shoulders on the upper back where it is secured in place by an FR strap. The DRD shall be removable for laundering. The access port will be covered by an outside flap of shell material, with beveled corners designed to fit between the shoulder straps of an SCBA. The flap will have a NFPA-compliant 3M Scotchlite™ reflective logo patch sewn to the outside to clearly identify the feature as the DRD (Drag Rescue Device). The DRD shall not extend beyond the outside flap. This device provides a quickly deployed means of rescuing a downed firefighter. Flimsy, rope-style DRD straps will not be considered.

_____Comply _____Exception

LINER ACCESS OPENING - JACKET

The liner system of the jacket shall incorporate an opening at each of the leading edges of the left and right front panels. This opening shall run a minimum of 12 inches along the perimeters for the purpose of inspecting the integrity of the jacket liner system. When installed into the outer shell the Liner Access Opening will be covered and protected by the overlap of the outer shell facing.

_____Comply _____Exception

RETROREFLECTIVE FLUORESCENT TRIM

The retroreflective fluorescent trim shall be lime/yellow 3M Scotchlite™Triple Trim (L/Y borders with silver center).

Each jacket shall have an adequate amount of retroreflective fluorescent trim affixed to the outside of the outer shell to meet the requirements of NFPA #1971 and OSHA.

The trim shall be in the following widths and shall be **NYC style**; 3 inch wide stripes - around the bottom of the jacket within approximately 1 inch of the hem, around the back and chest area approximately 3 inches below the armpit, around each sleeve below the elbow, around each sleeve above the elbow.

_____Comply _____Exception

REINFORCED TRIM STITCHING

All reflective trim is secured to the outer shell with Nomex® thread, using a locking chainstitch protected by our exclusive TrimTrax® system. Developed exclusively by Globe Manufacturing Co., LLC. this strip of 3/32-inch strong, durable, flame resistant black Kevlar® cording provides a bed for the stitching along each edge of the retroreflective fluorescent trim surface and affords extra protection for the thread from abrasion. TrimTrax® has been proven to be 5 to 7 times more durable than single or even double rows of stitching, significantly reducing maintenance costs and providing more value and a longer service life. Two rows of stitching used to attach the trim in place of the TrimTrax® shall be considered an unacceptable alternative, since it has been proven that the two rows of stitching has insignificant impact on wear life. All trim ends shall be securely sewn into a seam for a clean finished appearance.

_____Comply _____Exception

SEWN ON RETROREFLECTIVE LETTERING

Each jacket shall have

3” lime/yellow 3M Scotchlite™ lettering arched on Row A reading: PLAINFIELD

3” lime/yellow 3M Scotchlite lettering on hem of coat with firefighter name.

_____Comply _____Exception

COLLAR & FREE HANGING THROAT TAB

The collar shall be of 4 layer construction, consisting of a minimum two layers of the specified moisture barrier between two layers of outer shell material. The collar shall have a minimum of 3 rows of quilting. The collar shall be a minimum 3½ inches high at the back center and graded proportionately to body size. The inside rear layer of moisture barrier shall be bound to the rear

layer of outer shell at the perimeter only. The rear layer of outer shell shall have four rows of lateral stitching enhancing stability and shape of the collar.

The forward outer shell and moisture barrier layers of the collar shall be bound to the liner/moisture barrier assembly and then felled with two rows of stitching. The front layer of outer shell shall be attached to the thermal liner layer of the liner system. The front layer of moisture barrier shall be attached to the moisture barrier layer of the liner system and seam sealed.

This design shall provide a pocket for interface with an annular neck tab on the outer shell. The annular tab will be constructed of a layer of outer shell material and shall be sewn to the top neck opening of the outer shell and finished along the edge by means of overedging. A row of ⅝ inch FR Velcro® hook fastener tape shall be sewn to the rear of the tab, installed in such a manner as to align with the corresponding loop fastener tape inside the collar.

The throat tab shall be a scoop type design and constructed of two plies of outer shell material with two center plies of moisture barrier material. The throat tab shall measure not less than 4 inches wide at the center tapering to 2 inches at each end with a total length of approximately 9 inches. The throat tab will be attached to the right side of the collar by a 1 inch wide by 1½ inch long piece of Nomex® twill webbing. The throat tab shall be secured in the closed and stowed position with FR Velcro® fastener tape. The FR Velcro® fastener tape shall be oriented to prevent exposure to the environment when the throat tab is in the closed position. Two 2 inch by 3 inch pieces of FR Velcro® loop shall be sewn vertically to the inside of each end of the throat tab. Corresponding pieces of FR Velcro® hook measuring 1 inch by 3 inches shall be sewn horizontally to the leading outside edge of the collar on each side, for attachment and adjustment when in the closed position and wearing a breathing apparatus mask. In order to provide a means of storage for the throat tab when not in use, a 1 inch by 3 inch piece of FR Velcro® hook shall be sewn horizontally to the inside of the throat tab immediately under the 1½ inch by 3 inch pieces of FR Velcro® loop. The collar closure strap shall fold in half for storage with the FR Velcro® loop fastener tape engaging the FR Velcro® hook fastener tape.

A hanger loop constructed of a double layer of outer shell material shall be sewn to the top inside of the collar at the center.

_____Comply _____Exception

JACKET FRONT

The jacket shall incorporate separate facings to ensure there is no interruption in thermal or moisture protection in the front closure area. The facings shall measure approximately 3 inches wide, extend from collar to hem, and be double stitched to the underside of the outer shell at the leading edges of the front body panels. A breathable moisture barrier material shall be sewn to the jacket facings and configured such that it is sandwiched between the jacket facing and the inside of the respective body panel. The breathable film side shall face inward to protect it. There shall be wicking barrier constructed of Crosstech 2F moisture barrier material installed on the front closure system on the left and right side directly below the front facings to ensure continuous protection and overlap. The wicking barrier shall extend no more than a maximum of ¾" beyond the inner facing and false facing shall be unacceptable. The thermal liner and moisture barrier assembly shall be attached to the jacket facings by means of snap fasteners.

_____Comply _____Exception

STORM FLAP

A rectangular storm flap measuring 3¼ inches (6 inches for hook&dee inside/FR Velcro® outside closure; aka #7C) wide and 22 inches long shall be centered over the left and right body panels to ensure there is no interruption in thermal or moisture protection in the front of the jacket. The outside storm flap shall be constructed of two plies of outer shell material with a center ply of breathable moisture barrier material. The outside storm flap shall be double stitched to the right side body panel and shall be reinforced at the top and bottom with bartacks.

_____Comply _____Exception

STORM FLAP AND JACKET FRONT CLOSURE SYSTEM

The jacket shall be closed by means of four non-ferrous inward facing hook and dee rings plus FR Velcro® fastener tape on the storm flap. The inner closure hook and dee rings shall be riveted to the leading edges of the left and right jacket body panels. The rivets shall be reinforced on the inside of the respective body panels with leather. The inward facing hooks shall be installed on the right front body panel and the dee rings shall be installed on the left front body panel. The storm flap shall close over the left and right jacket body panels and shall be secured with FR Velcro® fastener tape. A 1½ inch piece of FR Velcro® loop fastener tape shall be sewn with four rows of stitching along the leading edge of the storm flap on the underside. A corresponding 1½ inch piece of FR Velcro® hook fastener tape shall be sewn with four rows of stitching to the left front body panel and positioned to engage the loop fastener tape when the storm flap is closed over the front of the jacket.

_____Comply _____Exception

CARGO/HANDWARMER SEMI-EXPANSION POCKETS

Each jacket front body panel shall have a 2 inch deep by 9 inch wide by 8 inch high semi-expansion pockets. The leading edge of the pockets shall be sewn flush with the jacket and the rear of the pockets shall expand to a depth of 2 inches. The pockets will be double stitched to the jacket and shall be located such that the bottoms of the pockets are at the bottom of the jacket for full functionality when used with an SCBA. Retroreflective trim shall run over the bottom of the pockets so as not to interrupt the trim stripe. Two rust resistant metal drain eyelets shall be installed in the bottom of each expansion pocket to facilitate drainage of water. *The pocket shall be reinforced with an extra layer of outer shell material approximately 5 inches up on the inside.* The pocket flaps shall be rectangular in shape, constructed of two layers of outer shell material and shall measure 3 inches deeper than the pocket expansion and ½ inch wider than the pocket. The upper pocket corners shall be reinforced with proven backtacks and pocket flaps shall be reinforced with bartacks,. The pocket flaps shall be closed by means of FR Velcro® hook and loop tape. Two pieces of 1½ inch by 3 inch FR Velcro® hook fastener tape shall be installed vertically on the inside of each pocket flap (one piece on each end). Two corresponding pieces of 1½ inch by 3 inch FR Velcro® loop fastener tape shall be installed horizontally on the outside of each pocket near the top (one piece on each end) and positioned to engage the hook fastener tape.

Additionally, a separate hand warmer pocket compartment will be provided under the expandable cargo pocket. This compartment will be accessed from the rear of the pocket and shall be lined with Nomex® Fleece for warmth and comfort.

_____Comply _____Exception

EXPANSION POCKET REINFORCEMENTS

The expansion pockets shall be reinforced on the inside with a layer of Kevlar® twill.

_____Comply _____Exception

AXTION® SLEEVES

The sleeves shall be of two piece construction and contoured, having an upper and a lower sleeve. Both the under and upper sleeve shall be graded in proportion to the chest size. For unrestricted movement, on the underside of each sleeve there shall be two outward facing pleats located on the front and back portion of the sleeve on the shell and thermal liner. On the moisture barrier, the system will consist of two darts, rather than pleats, to allow added length in the under sleeve. The moisture barrier darts will be seam sealed to assure liquid resistance integrity.

The pleats shall expand in response to upper arm movement and shall fold in on themselves when the arms are at rest. This expansion shall allow for greater multi-directional mobility and flexibility in the shoulder and arm areas, with little restriction or jacket rise. Neither stove-pipe nor raglan-style sleeve designs will be considered acceptable.

_____Comply _____Exception

SLEEVE CUFF REINFORCEMENTS

The sleeve cuffs shall be reinforced with black suede leather.

The cuff reinforcements shall not be less than 2 inch in width and folded in half, approximately one half inside and one half outside the sleeve end for greater strength and abrasion resistance. The cuff reinforcement shall be double stitched to the sleeve end; a single row of stitching shall be considered unacceptable. This independent cuff provides an additional layer of protection as compared to a turned and stitched cuff. Jackets finished with a turned and stitched cuff do not provide the same level of abrasion resistance and will be considered unacceptable.

_____Comply _____Exception

WRISTLETS / ELASTICIZED ADJUSTABLE SLEEVE WELLS

Each jacket shall be equipped with **Nomex® hand and wrist guards** (over the hand) not less than 7 inches in length and of double thickness. A separate thumbhole with an approximate diameter of 2 inches shall be recessed approximately 1 inch from the leading edge. Nomex® knit is constructed of 96% Nomex® and 4% Spandex for shape retention. The color of the wristlets shall be white, grey.

The wristlets shall be sewn to the end of the liner sleeves. Flame resistant neoprene coated cotton/polyester impermeable barrier material shall be sewn to the inside of the sleeve shell approximately 5 inches from the sleeve end and extending toward the cuff forming the sleeve well. The neoprene sleeve well shall form an elasticized cuff end with an FR Velcro® tab providing a snug fit at the wrist and covering the knit wristlet. This sleeve well configuration serves to prevent water and other hazardous elements from entering the sleeves when the arms are raised. The neoprene barrier material shall also line the inside of the sleeve shell from the cuff to a point approximately 5 inches back, where it joins the sleeve well and is double stitched to the shell. Four Ara-shield® snap tabs will be sewn into the juncture of the sleeve well and wristlet. The tabs will be spaced equidistant from each other and shall be fitted with female snap fasteners to accommodate corresponding male snaps in the liner sleeves. . One of the Ara-shield® snap tabs shall be a different color in the liner to correspond with color coded snap tabs for ease of matching the liner system to the outer shell after inspection or cleaning is completed. This configuration will ensure there is no interruption in protection between the sleeve liner and wristlet.

_____Comply _____Exception

LINER ELBOW THERMAL ENHANCEMENT

An additional layer of thermal liner material shall be sewn to the elbow area of the liner system for added protection at contact points and increased thermal insulation in this high compression area. The elbow thermal enhancement layers shall be sandwiched between the thermal liner and moisture barrier layers of the liner system and shall be stitched to the thermal liner layer only. Finished dimension shall be approximately 5 inches by 8 inches. All edges shall be finished by means of overedging. Raw or unfinished edges shall be considered unacceptable. Thermal scraps shall not be substituted for full-cut fabric padding.

_____Comply _____Exception

LINER SHOULDER, FRONT AND UPPER BACK THERMAL ENHANCEMENT

A minimum of one additional layer of thermal liner material shall be used to increase thermal insulation in the upper back, front and shoulder area of the liner system. This full-cut thermal enhancement layer shall drape over the top of each shoulder extending from the collar to the sleeve/shoulder seam, down the front approximately 5 inches from the juncture of the collar down the back to a depth of approximately 7 inches to provide greater CCHR protection in this high compression area. The upper back, front and shoulder thermal enhancement layers shall be sandwiched between the thermal liner and moisture barrier layers of the liner system and shall be stitched to the thermal liner layer only. The thermal enhancement layer shall have finished edges by means of overedging. Raw or unfinished edges shall be considered unacceptable. Thermal scraps shall not be substituted for full-cut fabric padding. Smaller CCHR reinforcements shall not be considered acceptable since they provide far less area of coverage.

_____Comply _____Exception

RADIO POCKET

Each jacket shall have a pocket designed for the storage of a portable radio. This pocket shall be of box type construction, double stitched to the jacket and shall have one drainage eyelet in the bottom of the pocket. The pocket flap shall be constructed of two layers of outer shell material measuring approximately 5 inches deep and ¼ inch wider than the pocket. The pocket flap shall be closed by means of FR Velcro® fastener tape. A 1½ inch by 3 inch piece of FR Velcro® hook fastener tape shall be installed on the inside of the pocket flap beginning at the center of the bottom of the flap. A 1½ inch by 3 inch piece of FR Velcro® loop fastener tape shall be installed horizontally on the outside of the pocket near the top center and positioned to engage the hook fastener tape. In addition, the entire inside of the pocket shall be lined with neoprene coated cotton/polyester impermeable barrier material to ensure that the radio is protected from the elements. The impermeable barrier material shall also be sandwiched between the two layers of outer shell material in the pocket flap for added protection. The radio pocket shall measure approximately 2 inches deep by 3.5 inches wide by 8 inches high and shall be installed on the left chest.

Note: radio pocket 6-inch and over in height requires trim.

Note: Radio pockets on the sleeves will be fully lined with neoprene to comply with the NFPA 2013 Stored Energy Test.

The radio pocket shall have a layer of Dragon Hide sewn on the outside of the radio pocket.

_____Comply _____Exception

MICROPHONE STRAP

A strap shall be constructed to hold a microphone for a portable radio. It shall be sewn to the jacket at the ends only. The size of the microphone strap shall be 1 inch x 3 inches.

The microphone strap shall be mounted above the radio pocket and shall be constructed of black suede leather.

_____Comply _____Exception

HEM SNAPS

There shall be 2 evenly spaced snaps holding the liner to the shell.

_____Comply _____Exception

SURVIVOR FLASHLIGHT HOLDER

Each jacket shall be equipped with a “Survivor” flashlight holder. An inward facing metal safety coat hook shall be triple riveted in a vertical position to the upper chest. The inward facing coat hook will accommodate the clip portion of the flashlight. Below the coat hook will be a strap constructed of outer shell material measuring approximately 2½ inches high and 9 inches wide, and will hold the barrel of the flashlight. The lower strap will be equipped with a 1½ inch by 2½ inch FR Velcro® closure at the front of the strap to facilitate easy removal of the flashlight. There shall be approximately 3 inches between the upper coat hook and lower strap. The "Survivor" flashlight holder shall be sewn to the jacket on the right chest.

_____Comply _____Exception

EMBROIDERED AMERICAN FLAG – RIGHT SLEEVE

Each jacket shall have a Nomex® embroidered American flag that measures approximately 2½ inches high by 3½ inches wide. Per Military protocol the field of stars shall be to the top right corner for installation on the right sleeve. Flags made of fabric other than Nomex® shall be considered unacceptable.

_____Comply _____Exception

3-INCH EXTENSION PANEL SYSTEM (XPS)

The hem of the jacket and liner system shall be constructed with extension panels incorporating all 3-layers of the system (outer shell, thermal liner & moisture barrier). The panels will be double stitched to the hem and extend approximately 3 inches lower in the back than the front of the jacket providing and maintaining proper overlap when bending or crawling.

The bottom of the 3 inch extended outer shell panel will be complete with the specified trim. The hem trim of the jacket shall stop at the juncture of the extension panel, staggering the trim, such that the top corners of the trim on the extension panel align with the bottom corners of the trim at the jackets hem. The staggered trim provides room for lettering at the very hem of the jacket in line with the trim on the front of the jacket hem.

_____Comply _____Exception

PANT CONSTRUCTION

BODY

The body of the shell shall be constructed of four separate body panels consisting of two front panels and two back panels. The body panels shall be shaped so as to provide a tailored fit, thereby enhancing body movement, and shall be joined together by double stitching with Nomex® thread. The body panels and seam lengths shall be graded to size to assure accurate fit in a broad range of sizes.

The front body panels will be wider than the rear body panels to provide more fullness over the knee area. This is accomplished by rolling the side leg seams (inside and outside) to the rear of the pant leg beginning at the knee. The slight taper will prevent premature wear of the side seams by pushing them back and away from the primary high abrasion areas encountered on the sides of the lower legs.

_____Comply _____Exception

AXTION® SEAT

The rise of the rear pant center back seam, from the top back of the waistband to where it intersects the inside leg seams at the crotch, shall exceed the rise at the front of the pant by 8 inches. The longer rear center back seam provides added fullness to the seat area for extreme mobility without restriction when stepping up or crouching and will be graded to size. This feature in combination with other design elements will maintain alignment of the knee directly over the knee pads when kneeling and crawling.

_____Comply _____Exception

LINER SYSTEM (PANT)

The combined moisture barrier and the thermal liner shall be completely removable for the pant. The thermal liner and moisture barrier layers of the liner system shall be stitched together and bound around the top waist and cuffs with Bias-Cut neoprene coated cotton/polyester binding for a finished appearance that prevents fraying and wicking of contaminants.

The body of the liner system (thermal liner & moisture barrier) shall be of a four piece design to match the cut of the shell to include the rolled back side seams. The design of the liner system will incorporate darts in the knee area providing a contour to the leg and will also have a reverse boot cut at the rear of the liner cuff and a concave cut at the front to keep the liner from hanging below the shell.

The liner system shall have a reinforcement of black Nomex® twill sewn to the bottom of the fly opening. This reinforcement will serve to prevent the liner from tearing in that area from the constant donning and doffing of the pants.

_____Comply _____Exception

LINER ACCESS OPENING - PANT

The liner system of the pant shall incorporate a full length opening along the entire waistline for ease in inspecting the inner layers as well as performing the complete Liner Inspection. The thermal liner and moisture barrier shall be individually bound with a neoprene coated bias cut tape, and joined together with a snap at the center back. There shall be a minimum of 4 snap tabs sewn to the underside of the waistband, with corresponding snaps in the moisture barrier layer to secure the barrier to the shell. As described previously, the pant thermal layer snaps directly to the independent waistband by means of nine snap fasteners. There shall be no hook and loop used to close the liner access opening.

_____Comply _____Exception

SIZING

The pants shall be available in even size waist measurements of two inch increments and shall be available in a range of sizes from 24 to 68. The pant inseam measurement shall be available in two inch increments. Generalized sizing, such as small, medium, large, etc., will not be considered acceptable. Sizing specifically for women shall also be available.

_____Comply _____Exception

RETROREFLECTIVE FLUORESCENT TRIM

The pants shall have a stripe of retroreflective fluorescent trim encircling each leg below the knee to comply with the requirements of NFPA #1971 in 3 inch lime/yellow 3M Scotchlite™ Triple Trim (L/Y borders with silver center).

Bottom of trim band shall be located approximately 3” above cuff.

_____Comply _____Exception

REINFORCED TRIM STITCHING

All reflective trim is secured to the outer shell with Nomex® thread, using a locking chainstitch protected by our exclusive TrimTrax® system. Developed exclusively by Globe Manufacturing Co., LLC. this strip of 3/32-inch strong, durable, flame resistant black Kevlar® cording provides a bed for the stitching along each edge of the retroreflective fluorescent trim surface and affords extra protection for the thread from abrasion. TrimTrax® has been proven to be 5 to 7 times more durable than single or even double rows of stitching, significantly reducing maintenance costs and providing more value and a longer service life. Two rows of stitching used to attach the trim in place of the TrimTrax® shall be considered an unacceptable alternative, since it has been proven that the two rows of stitching has insignificant impact on wear life. All trim ends shall be securely sewn into a seam for a clean finished appearance.

_____Comply _____Exception

WAISTBAND

The pant design facilitates the transfer of the weight of the pant to the hips instead of the shoulders and suspenders. The waist area of the pants shall be reinforced on the inside with a separate piece of black aramid outer shell material not less than two inches in width. Neoprene coated cotton/polyester shall be sewn to the back of the waistband as a reinforcement. The aramid/neoprene waistband shall be cut on the bias to allow the waistband to stretch for unrestricted movement and increased comfort. The top edge of the waistband reinforcement shall be double stitched to the outer shell at the top of the pants. The lower edge of the waistband shall be serged and unattached to the shell to accept the thermal liner and moisture barrier. The top of the thermal liner and moisture barrier shall be secured to the underside of the waistband reinforcement so as to be sandwiched between the waistband reinforcement and outer shell to reduce the possibility of liner detachment while donning and to avoid pass through of snaps from the outer shell to the inner liner.

_____Comply _____Exception

BLACK ARAMID BELT WITH BELT LOOPS

Each pant shall include a 2 inches wide belt constructed of black aramid webbing material with an adjustable hi-temp thermoplastic Delrin buckle serving as the exterior primary positive locking closure. This buckle shall also provide a quick-release mechanism for donning and doffing.

The pants shall be equipped with a series of outer shell material belt loops spaced around the waist to accommodate the aramid belt.

_____Comply _____Exception

EXTERNAL/INTERNAL FLY FLAP

The pants will have a vertical outside fly flap constructed of two layers of outer shell material, with a layer of moisture barrier material sandwiched between. The fly flap shall be double stitched to the left front body panel and shall measure approximately 2 ½ inches wide, with a length graded to size based on waist measurement and reinforced with bartacks at the base. An internal fly flap constructed of one layer of outer shell material, thermal liner and specified moisture barrier, measuring approximately 2 inches wide, with a length graded to size based on waist, shall be sewn to the leading edge of the right front body panel. The inside of the right front body panel shall be thermally enhanced directly under the outside fly with a layer of moisture barrier and thermal liner material.

The underside of the outside fly flap shall have a 1½ inch wide piece of FR Velcro® loop fastener tape quadruple stitched along the full length and through the shell material only; stitching shall not penetrate the moisture barrier insert between the two layers to insure greater thermal protection and reduced water penetration. A corresponding strip of 1½ inch wide piece of FR Velcro® hook fastener tape shall be quadruple stitched to the outside right front body panel securing the fly in a closed position.

Appropriate snap fastener halves shall be installed at the leading edge of the waistband for the purpose of further securing the pants in the closed position.

_____Comply _____Exception

AXTION® KNEE

The outer shell of the pant legs shall be constructed with horizontal expansion pleats in the knee area with corresponding darts in the liner to provide added fullness for increased freedom of movement and maximum flexibility. The pleats shall be folded to open outwardly towards the side seams to insure no restriction of movement. The AXTION® knee will be installed proportionate to the pant inseam, in such a manner that it falls in an anatomically correct knee location.

The thermal liner shall be constructed with four pleats per leg in the front of the knee. Two will be located above the knee (one on each side) and two will be located below the knee (one on each side). On the moisture barrier, the system will consist of two darts, rather than pleats, to allow added length in the under knee. The darts in the liner provide a natural bend at the knee. The pleats and darts in the liner work in conjunction with the expansion panels in the outer shell to increase freedom of movement when kneeling, crawling, climbing stairs or ladders, etc.

_____Comply _____Exception

LINER KNEE THERMAL ENHANCEMENT

A minimum of one additional layer of specified thermal liner and one additional layer of moisture barrier material, measuring a minimum of 9 inches by 11 inches, will be sewn to the knee area of the liner system for added CCHR protection and increased thermal insulation in this high compression area. The knee thermal enhancement layers shall be sandwiched between the thermal liner and moisture barrier layers of the liner system and shall be stitched to the thermal liner layer only. The thermal enhancement layer shall have finished edges by means of overedging. Raw or unfinished edges shall be considered unacceptable. Thermal scraps shall not be substituted for full-cut fabric padding. Smaller CCHR reinforcements shall not be considered acceptable since they provide far less area of coverage.

_____Comply _____Exception

KNEE REINFORCEMENTS

The knee area shall be reinforced with black suede leather.

The knee reinforcement shall be centered on the leg to insure proper coverage when bending, kneeling and crawling. The knee reinforcements shall measure 9 inches wide by 12 inches high and shall be double stitched to the outside of the outer shell in the knee area for greater strength and abrasion resistance. Knee reinforcements of a smaller size do not provide the same protective coverage and shall be considered unacceptable. The knee reinforcement specified shall be removable without opening up any seams of the outer shell of the pant.

_____Comply _____Exception

PADDING UNDER KNEE REINFORCEMENTS

Padding for the knees shall be accomplished with one layer of **Silizone®** foam sewn to the liner, sandwiched between the thermal liner and moisture barrier.

_____Comply _____Exception

ANGLED EXPANSION (BELLOWS) POCKETS

Two 1 ½ inch deep by 10 inch wide by 8 inches to 11 inches angled bellows pockets shall be placed over the outer leg seams at thigh level. The pockets shall be sewn to the pant with two rows of lock stitching and shall provide two aluminum eyelets, installed at the bottom of each pocket, for water drainage. *The lower portion of each pocket shall be reinforced with an additional layer of outer shell material, angled half way up the since of the pocket.* The pocket flaps shall be rectangular in shape, constructed of two layers of outer shell material and double stitched to the outer shell. One piece of 1½ inch by 3 inch FR Velcro® hook fastener tape on the inside of each pocket flap on each side. One piece of corresponding 1½ inch by 3 inch FR Velcro® loop fastener tape shall be installed horizontally on the outside of each side of pocket near the top and positioned to engage the hook fastener tape. Each pocket shall be reinforced with proven backtacks, and pocket flaps shall be reinforced with bartacks in uppermost corners.

_____Comply _____Exception

EXPANSION POCKET REINFORCEMENTS

The expansion pockets shall be reinforced on the inside with Kevlar twill material and the outside with a layer of black Dragonhide® material.

_____Comply _____Exception

PANT CUFF REINFORCEMENTS

The cuff area of the pants shall be reinforced with black suede leather.

The cuff reinforcement shall not be less than 2 inch in width and folded in half, approximately one half inside and one half outside the end of the legs for greater strength and abrasion resistance. The cuff reinforcement shall be double stitched to the outer shell for a minimum of two rows of stitching. This independent cuff provides an additional layer of protection over a hemmed cuff. Pants that are turned and stitched at the cuff, as opposed to an independent cuff reinforcement, do not provide the same level of abrasion resistance and shall be considered unacceptable.

_____Comply _____Exception

PADDED RIP-CORD SUSPENDERS & ATTACHMENT

On the inside waistband shall be attachments for the standard "H" style "Padded Rip-Cord" suspenders. There will be four attachments total – 2 front, 2 back. The suspender attachments shall be constructed of a double layer of black aramid measuring approximately ½ inch wide by 3-inches long. They shall be sewn in a horizontal position on the ends only to form a loop. The appearance will be much like a horizontal belt loop to capture the suspender ends.

A pair of "H" style "Padded Rip-Cord" suspenders shall be specially configured for use with the pants. The main body of the suspenders shall be constructed of 2 inch wide black webbing straps. The suspenders shall run over each shoulder to a point approximately shoulder blade high on the back, where they shall be joined by a 2 inch wide horizontal piece of webbing measuring approximately 8-inches long, forming the “H”. This shall prevent the suspenders from slipping off the shoulders. The shoulder area of the suspenders will be padded for comfort by fully encasing the webbing with aramid batting and wrap-around black aramid.

The rear ends of the suspenders will be sewn to 2-inch wide elasticized webbing extensions measuring approximately 8-inches in length and terminating with thermoplastic loops. The forward ends of the suspender straps shall be equipped with specially configured black powder coat non-slip metal slides with teeth. Through the metal slides will be the 9 inch lengths of strap

webbing "Rip-Cords" terminating with thermoplastic loops on each end. Pulling on the "Rip-Cords" shall allow for quick adjustment of the suspenders.

Threaded through and attached to the thermoplastic loops on the forward and rear ends of the suspenders will be black aramid suspender attachments incorporating two snap fasteners. The aramid suspender attachments are to be threaded through the suspender attachment loops on the inside waistband of the pants. The aramid suspender attachments will then fold over and attach to themselves securing the suspender to the pants.

_____Comply _____Exception

REVERSE BOOT CUT

The outer shell pant leg cuffs will be constructed such that the back of the leg is approximately 1 inch shorter than the front. The liner will also have a reverse boot cut at the rear of the cuff and a concave cut at the front to keep the liner from hanging below the shell. This construction feature will minimize the chance of premature wear of the cuffs and injuries due to falls as a result of "walking" on the pant cuffs. Pants that have “cut-outs” in the back panel rather than a contoured boot cut shall be considered unacceptable.

_____Comply _____Exception

THIRD PARTY TESTING AND LISTING PROGRAM

All components used in the construction of these garments shall be tested for compliance to NFPA Standard #1971 by Underwriters Laboratories (UL). Underwriters Laboratories shall certify and list compliance to that standard. Such certification shall be denoted by the Underwriters Laboratories certification label.

_____Comply _____Exception

LABELS

Appropriate warning label(s) shall be permanently affixed to each garment. Additionally, the label(s) shall include the following information.

Compliance to NFPA Standard #1971
Underwriters Laboratories classified mark
Manufacturer's name
Manufacturer's address
Manufacturer's garment identification number
Date of manufacture
Size

_____Comply _____Exception

ISO CERTIFICATION / REGISTRATION

The protective clothing manufacturer shall be certified and registered to ISO Standard 9001 to assure a satisfactory level of quality. Indicate below whether the manufacturer is so certified and registered by checking either "Yes" or "No" in the space provided.

_____Yes _____No

BETTER BUSINESS BUREAU:

The manufacturer is accredited by the Better Business Bureau, showing a commitment to ethical and principled business practices.

_____Comply _____Exception

WARRANTY

The manufacturer shall warrant these jackets and pants to be free from defects in materials and workmanship for their serviceable life when properly used and cared for.

_____Comply _____Exception

HOOK AND LOOP SUPPORT PROGRAM

Support program shall cover hook or loop tape that has begun to fray or otherwise degrade from normal wear. This program shall remain in effect for a period of five years from the original date of manufacture of the garment. This support program shall cover the repair or replacement, without charge, of any hook and/or loop on the garments produced by the manufacturer providing the garments are otherwise serviceable.

This support program does NOT cover damage from fire, heat, chemicals, misuse, accident or negligence. Failure to properly care for garments will serve to void this support program.

_____Comply _____Exception

SIZING BY VENDOR

Both male and female sizing samples shall be available.

Both male and female sizing samples shall be on hand for use when sizing. The vendor shall be available to perform all sizing requirements within 96 hours of written notice. Measuring with a tape measure is not acceptable.

_____Comply _____Exception

GARMENT TRAINING AND SUPPORT

OSHA requires employees be trained on the capabilities and limiations of their Personal Protective Equipment. The selected vendor shall provide the following:

On-site care and maintenance training shall be provided by the manufacturer. Training shall be in compliance with NFPA 1851, current edition, at the conclusion of which each participant shall receive a certificate of completion.

An on-site OSHA mandated training class on the Knowing the Limits of Your PPE shall be provided at no charge. The training shall include structural firefighting coat, pant and boots.

_____Comply _____Exception

BAR-CODE/RECORD KEEPING INTERFACE

A 1 dimensional barcode, in the interleaved 2 of 5 format shall be printed on the label of each separable layer of the garment.

This barcode shall represent the serial number of the garment. The manufacturer shall be able to provide a detailed list of each asset of a drop-shipped order, and shall include the following:

- Brand
- Order Number
- Serial Number
- Style Number
- Color
- Description
- Chest/Waist Size
- Jacket/pant Length
- Sleeve Length
- Date of Manufacture
- Mark-For Data

This information shall be able to be imported into the manufacturers web-based system designed to facilitate the organization and tracking of assests in accordance with the cleaning and inspection requirements of OSHA and NFPA 1851.

_____Comply _____Exception

PPE RECORD KEEPING

The manufacturer shall make available and no-charge, a password protected data based backed website that does not care whose brand of PPE assets are being recorded. The website shall have the functionality to allow the manufacturer to import all of the pertinent data into the department's account so that the initial data entry by fire department personnel is eliminated.

The website shall allow for the department to use a barcode scanner, if desired, to scan the Interleaved 2 of 5 barcode found in the gear by going to the Search the Serial Number page in PPE record keeping program, and scanning the asset's barcoded serial number.

_____Comply _____Exception

EXCEPTIONS TO SPECIFICATIONS

Any and all exceptions to the above specifications must be clearly stated for each heading. Use additional pages for exceptions, if necessary.

COUNTRY OF ORIGIN

Jackets and Pants shall be manufactured in the United States.

Specifications for Structural Fire Fighting 14” Pull-On Boots
Globe FootGear Structural Supreme™

Plainfield FPD

SECTION 2

NFPA 1971 and NFPA 1992 Compliant
Meets or exceeds NFPA 1971, *Standard on Protective Ensembles for Structural Firefighting and Proximity Firefighting, 2013 Edition* for Structural Fire Fighting and NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies, 2012 Edition*.

_____Comply _____Exception

General Design
14” Pull-On athletic footwear (cement construction) boot, black flame-resistant and water-resistant leather, double-stitched leather joining seams, hi-vis yellow and silver reflective trim, leather-trimmed webbing pull straps, padded leather collar, padded leather flex joints in the shaft above vamp and heel, liquid and chemical resistant breathable bootie liner, cut-resistant and thermal protective bootie-shield liner, composite safety toe cap, composite shank, composite penetration-resistant insole barrier, molded shin guard, flame-resistant synthetic rubber molded cup outsole and toe bumper, 3D lasting board, molded heel counter, internal heel fit system, and removable molded footbeds including a second thicker pair.

_____Comply _____Exception

Slip Resistance
Boots must exceed the minimum test values for slip resistance (average of left and right foot) as detailed below to provide superior performance in dry, wet, and frosted ice conditions. Boots that do not exceed these minimums in all conditions shall not be acceptable. Bidders must promptly supply a Technical Services Report from a recognized independent testing laboratory upon request showing the boots bid exceed this requirement.

Test Method: SATRA TM144:2011
Slip Resistance of Footwear and Floorings
Load = 500 N
Dry Clay Quarry Tile: Forepart = 1.00
Heel = 0.90
Wet Clay Quarry Tile: Forepart = 0.60
Heel = 0.60
Frosted Ice: Forepart = 0.25
Heel = 0.20

For maximum slip resistance each outsole shall have Siping lines. Siping lines cut into flat areas open up when flexed to provide additional traction on water and ice. The boot shall also include self-cleaning lugs and an omni-direction tread pattern designed for superior performance in all terrains and when working on ladders.

_____Comply _____Exception

Flexibility
Boots must reach the Maximum Flex Angle of 50 degrees without exceeding the critical bending moment with a resulting stiffness index not to exceed 10.0 as detailed below to provide maximum flexibility. Boots that do not meet this requirement shall not be acceptable. Bidders must promptly supply a Technical Services Report from a recognized independent testing laboratory upon request showing the boots bid meet this requirement.

Test Method: SATRA TM194:2004
Longitudinal stiffness of footwear

_____Comply _____Exception

FireStorm Leather
Boots shall be made from heavy-duty, flame-resistant and water-resistant full-grain cattle hide leather measuring 2.0 – 2.2 mm of thickness for durable tear and puncture resistance. Tumbled full-grain cattle hide leather shall be utilized in collar and flex areas for mobility. The leather shall be chrome tanned to withstand high temperature with minimal shrinkage, re-tanned to impart water resistance and low water absorption, and finished to retain maximum breathability. Leather shall meet or exceed the following physical tests:

Water Penetration	ASTM D2099	15,000 flex minimum
Dynamic Water Absorption	ASTM D2099	15% maximum
Static Water Absorption	ASTM D6015	30% maximum
Slit Tearing Strength	ASTM D2212	30 pound minimum
Moisture Vapor Transmission	ASTM D5052	350 g/meter2/24 hours minimum
Flame Resistance	NFPA 1971	afterflame no more than 2.0 sec, not melt or drip, no burn through.

_____Comply _____Exception

CROSSTECH® Footwear Fabric
A full-height, full sock, bootie liner made from a package of Omaha lining fabric, 300g felt insulation, and CROSSTECH® moisture barrier shall be provided for a waterproof and breathable moisture barrier as well as thermal protection as defined by the specified NFPA standards.

_____Comply _____Exception

Athletic Footwear (Cement) Construction
For optimum flexibility and comfort, boot shall include a VIBRAM® Synthetic Rubber Contoured Cup Outsole cemented to the bottom and sides of the upper using a 2-part cross-linking adhesive that forms a bond stronger than the materials it attaches. The outsole must be made from a flame, abrasion, oil, acid, and slip resistant compound engineered for high-traction, cold-weather resistance, and durability. Goodyear welt or direct attach construction methods shall not be acceptable.

_____Comply _____Exception

Bootie-Shield Liner
A protective bootie-shield of KEVLAR® fiber blend stitchbonded non-woven batting weighing 4.0 oz/yd^2 shall be positioned between the leather shell and the CROSSTECH® moisture barrier bootie to provide abrasion and cut resistance and additional thermal protection. Boots that do not have an additional Flame Resistant (FR) protective bootie-shield between the leather shell and the CROSSTECH® moisture barrier bootie shall not be acceptable.

_____Comply _____Exception

Composite Safety Toe Cap
The safety toe shall consist of a composite material that is lighter than steel, doesn't transmit heat or cold, and will spring back to shape after impact. Must exceed NFPA standards for safety. Metal toe caps shall not be acceptable.

_____Comply _____Exception

Padded Leather Collar
The padded collar shall have a rolled top edge formed by folding over the leather to help the boots slide against the pants liner and reduce the potential for the pants liner to hang up on the top of the boots as well as to reduce abrasion against the wearer's calf.

_____Comply _____Exception

Composite Penetration Resistant Insole Barrier
Penetration resistance shall be provided by a composite insole to maximize flexibility and insulate from heat or cold transmission. Must exceed NFPA standards for safety. Metal plates shall not be acceptable.

_____Comply _____Exception

3D Composite Lasting Board
Boot uppers shall be lasted to a molded and contoured dual-density lasting board with a built-in flex zone in the forefoot and a torsionally stable heel.

_____Comply _____Exception

Composite Shank
The shank shall consist of a composite material that is lighter than steel, doesn't transmit heat or cold, and springs back to shape better. Metal shank shall not be acceptable.

_____Comply _____Exception

Molded Heel Counter
Boots shall have a molded heel counter of water-resistant composite material individually molded to fit each size perfectly. Leather or fiber board heel counters shall not be acceptable.

_____Comply _____Exception

Padded Shin Guard
Boots shall include a padded polymer shin guard to provide extra protection when working on a ladder. Moisture absorbing natural fiber padding shall not be acceptable.

_____Comply _____Exception

Synthetic Rubber Toe Bumper
Boots shall have a molded Flame Resistant (FR) synthetic rubber toe bumper to provide abrasion resistance when crawling. The toe bumper shall be cemented and 2-needle stitched to the vamp.

_____Comply _____Exception

3M SCOTCHLITE™ Reflective Material
Boots shall have flame-resistant fluorescent yellow and silver 3M SCOTCHLITE™ reflective material sewn to both sides of the shaft for added visibility.

_____Comply _____Exception

Webbing Pull-Straps
Boots shall have NOMEX® webbing pull-straps with leather trim securely attached to the leather uppers by inserting into to collar seam to minimize stitching through the leather. Pull strength must be a minimum of 120 lbs when tested with a single handle.

_____Comply _____Exception

Internal Fit System
Boots shall have an anatomical foam insert that wraps around the top and sides of the heel with an opening to fit and hold the back of the heel securely while cushioning the ankle.

_____Comply _____Exception

3D Molded Footbed
Boots shall have a removable urethane foam footbed contoured to cradle and cushion the bottom of the foot and to provide arch support. The footbed shall have a moisture-wicking and anti-microbial fabric top layer.

_____Comply _____Exception

Custom Fit System
Boots shall include a second pair of 3D molded footbeds that are thicker in the forefoot to provide a snugger fit if needed.

_____Comply _____Exception

Sizes
Boots must be available in Men's 5 – 16 (full and half sizes), 17 – 18 (full sizes only) in Narrow, Medium, Wide, and X-Wide widths. Boots must also be available in a Wide Calf model in the same size range that shall provide an additional 3 inches in circumference at the calf to fit those with larger calves. Boots must be available in Women's 5 – 12 (full and half sizes) in Narrow, Medium, Wide, and X-Wide widths.

_____Comply _____Exception

Resoling Service
The winning vendor shall have resoling services available at their factory as needed.

_____Comply _____Exception

Country of Origin
Boots shall be manufactured in the United States.

_____Comply _____Exception