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AVIS

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MANUFACTURING DATA FOR TROUSERS, COLD WEATHER, MULTICAM®

1.0 SCOPE

1.1 Scope

This Manufacturing Data covers the materials, design and construction requirements for the Trousers, Cold Weather, MULTICAM® for use by the Canadian Special Operations Forces Command (CANSOFCOM).

1.2 Intended Use

The Trousers, Cold Weather, MULTICAM® is worn with the Coat, Cold Weather, MULTICAM®.

1.3 Classification

Trousers covered by this Manufacturing Data are classified as follows: Trousers, Cold Weather, MULTICAM®.

2.0 GENERAL

2.1 Intellectual Property

The information, data, know-how, formulas, algorithms, software, processes, systems, methods, designs, text, works, figures, tables, sketches, photographs, plans, drawings, specifications, samples, reports, names, inventions and/or ideas contained herein (hereinafter "Intellectual Property") is the exclusive property of Her Majesty The Queen in Right of Canada as represented by the Minister of National Defence (hereinafter referred to as "DND"). No one has the right to reproduce, disclose, disseminate, or utilize, in any manner or in any form, this Intellectual Property, or any part thereof, without the prior written consent of DND. For further information on the restrictions applicable to this Intellectual Property, or to request consent from DND, please contact the Contracting Authority.

2.2 Applicable Documents

The following documents form part of this Manufacturing Data to the extent specified, and are supportive of this Manufacturing Data when referenced; all other document references are to be considered supplemental information only. In the event of a conflict between the documents referenced and the contents of this Manufacturing Data, then the contents of this Manufacturing Data must take precedence:

DND Specifications and Standards (provided upon request)

- CF-B-854 Buttons, Nylon

- D-80-001-028/SF-001 Specification for Cord, Plaited, Spun, Synthetic Fibre
- D-80-001-055/SF-001 Specification for Label, Clothing and Equipment
- D-83-001-005/SF-001 Fastener, Slide, Interlocking
- D-LM-008-002/SF-001 Specification for Marking for Storage and Shipment

DND Drawings (provided upon request)

- 2811 Strap and Button Assembly, 45-Ligne
- 373118 Button, Nylon, Slotted, 30-Ligne
- 389556 Button, Bar, Plastic, 45-Ligne
- 8790166 Strap and Button Arrangement, 30-Ligne, Type I
- CS-149 Socket, Fastener
- CS-150 Studs, Fastener
- CS-151 Eyelet, Fastener
- CS-153 Button, Fastener

CAN/CGSB Standards (email: ncr.cgsb-ongc@pwgsc.gc.ca)

- CAN/CGSB-4.2-M Textile Text Methods
- CAN/CGSB-4.131-M Cotton-Covered or Polyester-Covered, Polyester Thread
- CAN/CGSB-4.139 Polyester Staple Thread
- CAN/CGSB-54.1-M Stitches and Seams, Parts I and II
- CAN/CGSB-86.1-2003 Care Labelling of Textiles
- 4-GP-80Ma Cotton Thread

American Society for the Testing of Materials (www.astm.org)

- D 5736 Standard Test Method for Thickness of Highloft Nonwoven Fabrics
- D 6242 Standard Test Method for Mass Unit Area of Nonwoven Fabrics

International Standards Organization (ISO) (www.iso.org)

- ISO 11092 Textiles - Physiological Effects - Measurement of Thermal and Water Vapour Resistance Under Steady-State Conditions (Sweating Guarded Hot-Plate Test)

FED Standards (Download Documents: <http://assist.daps.dla.mil/quicksearch/>)

- FED-STD-595C - Colors Used in Government Procurement

2.2.1 Order of Precedence

The order of preference is as follows:

- (a) In the event of inconsistency between contract documents, such as contract, Manufacturing Data, drawing and sealed pattern, the order of precedence shall be contract, Manufacturing Data, drawing and sealed patterns;
- (b) In the event of a conflict between the text of this manufacturing data and the references cited herein, the text of this manufacturing data must take precedence;

- (c) In the event of inconsistency within this manufacturing data, the Contracting Authority must be contacted for clarification; and
- (d) Nothing in this document supersedes applicable laws and regulations, unless a specific exemption has been obtained.

2.3 Material Standards

The following material standards are supplemental to this standard:

- (a) Specification for Cloth, Nylon/Cotton, MULTICAM®, Oil and Water Repellent Treated;
- (b) Specification for Waterproof Moisture Vapour Permeable (WMVP) Barrier Fabric;
- (c) Specification for Cloth, Taffeta, Nylon; and
- (d) Specification for Cloth, Plain Weave, Nylon.

2.4 Definitions

Earth Tone	By definition, earth tone is considered a color scheme that draws from a color palette of browns, tans, grays, greens, oranges, whites and some reds. The colors in an earth tone scheme are muted and flat in an emulation of the natural colors found in soils, moss, trees and rocks. For the purpose of this specification, the earth tone color (where specified) must be based on the predominantly brown, tan and gray color series (lusterless) within FED STD-595C, where those colors do not include any elements of orange, red and white.
MULTICAM®	A proprietary design for a computer generated digital camouflage pattern patented by Crye Precision Ltd.
Slide Fastener	A fastener for locking together two toothed edges by means of a sliding tab, commonly referred to as a zipper.

2.5 Layout Sketches

Schematic layout sketches for the Trousers are included as part of this Annex. The sketches are designed to provide a general layout of the Trousers only. They are not to scale and are not representative of the style, fit, colour scheme or form of the final garment. The following sketches are included in Appendix 1:

- (a) Figure 1: Front and Back View;
- (b) Figure 2: Finished Front Pocket Measurements;
- (c) Figure 3: Finished Cargo Pocket Measurements;
- (d) Figure 4: Suspender Buttons;
- (e) Figure 5: Leg Suppression; and
- (f) Figure 6: Marking and Care Label.

2.6 Patterns

DND will provide patterns as follows:

- (a) Sealed pattern: CANSOFCOM - Trousers, Cold Weather, MULTICAM® (Sealed for construction and design only); and
- (b) Paper patterns - DSSPM paper patterns for all sizes under Style Code TALWC13 - Trousers, Combat, CADPAT™ (TW), Integrated Clothing Ensemble (ICE). Size 7034 (Regular/Medium) will be used for tendering purposes.

Note: The patterns for the Trousers, Combat, CADPAT™ (TW), Integrated Clothing Ensemble (ICE) are to be used for the construction of the Trousers, Cold Weather, MULTICAM®.

3.0 REQUIREMENTS

3.1 Design

The design must be in accordance with Sealed Patterns and must incorporate the following features:

- (a) Loose fitting;
- (b) Slide fastener front closure;
- (c) Seat and knee patches;
- (d) Partially elasticised waistband with belt loops and buttons for suspenders;
- (e) Front slanted pockets with covered buttoning flaps;
- (f) Cargo pockets with covered buttoning flaps on thighs;
- (g) Front and back bottom leg reinforcement;
- (h) Side leg suppression with slide fastener and drawcord;
- (i) Full quilted insulation lining; and
- (j) Full interlining of a waterproof, moisture vapour permeable membrane;

Note: Unless otherwise specified, these garments must be governed by the Scale of Measurements at Appendix 2.

3.2 Materials

The following applies:

- (a) Shell Material - The shell material must be Cloth, Nylon/Cotton, MULTICAM®, Oil and Water Repellent Treated;
- (b) Barrier Layer - The barrier layer material must be Waterproof Moisture Vapour Permeable (WMVP) Barrier Fabric;
- (c) Lining Material - Taffeta - The Trousers lining material must be Cloth, Taffeta, Nylon;
- (d) Insulation - The following applies:

- i. The batting must be a commercially available product made from synthetic Fibers, manufactured for use in outerwear garments meant to provide a high degree of cold weather protection;
- ii. The integrity of the batting must be maintained through the normal service life of the garments, through wear and tear of motion, abrasion between layers of cloth, frequent stuff packing and unpacking, etc. No thin spots, lumping, clumping, curling, slipping, or changes in dimensional stability over time are allowed;
- iii. There must be no fiber migration of the batting through the fabric;
- iv. The batting and any accompanying scrim must:
 - a. Be launderable at high temperatures up to 70°C, in domestic machines, coin operated machines, commercial or field laundries; and
 - b. Be machine tumble dryable at high temperatures up to 75°C;
- v. Any scrim, quilting, surface treatment, or other addition to the actual insulation batting must be compatible with the batting and must not degrade its performance;
- vi. Any scrim, quilting, etc. required for the necessary performance of the batting when in the garment must be incorporated; and
- vii. The batting must be in compliance with Table 1. Testing must be conducted on the batting alone, without any scrim or lining material attached;

Table 1: Requirements for Insulation

Property	Test Method	Requirement
Fiber Content – Batting	CAN/CGSB-4.2-M Test Method 14	100% polyester
Fiber Content – Scrim (if applicable)	CAN/CGSB-4.2-M Test Method 14	100% polyester
Mass (g/m ²) – batting only	ASTM D 6242	Maximum: 120
Thickness (mm)	ASTM D 5736 (0.014 kPa pressure)	Maximum: 20
CLO (CLO/g/m ²)	ISO 11092 (dry)	Minimum: 0.02

Note: PRIMALOFT® Silver (100 g/m²) has been known to meet these requirements.

- (e) Nylon - The fabric used as the front and back cuff reinforcement must be Cloth, Plain Weave, Nylon;
- (f) Tricot Material - The material used as some pocket bags and the bottom gusset must be commercially available porous nylon tricot, in accordance with Table 2;

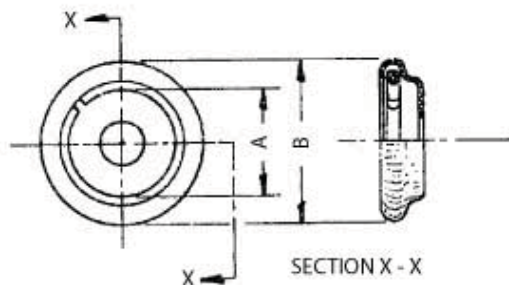
Table 2: Technical requirements for Tricot Material

Description	100% dull nylon tricot, 2 bar knit	
Gauge	32	
Wales	40 per inch	Tolerance ± 3
Courses	41 per inch	Tolerance ± 2
Weight	85 g/m ²	Tolerance ± 5%
Shrinkage Length	Tolerance ± 6%	

Shrinkage Width	Tolerance $\pm 8\%$
Colour	Non-Florescent Earthtone

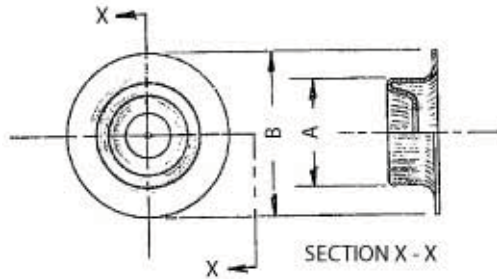
- (g) Sealing Tape - The sealing tape must be commercially available tape compatible with the Waterproof Moisture Vapour Permeable (WMVP) Barrier Fabric. The tape must be a non-florescent earth tone colour to match the MULTICAM® camouflage pattern;
- (h) Slide Fasteners (Non Water Resistant) - The slide fasteners must be as follows:
- i. Front Fly:
 - a. Be Class 3, Type 13 (#5 regular teeth) moulded chain type with a long pull and top stops on both ends; and
 - b. Have plastic interlocking members, automatic lock sliders and 100% polyester tape in accordance with D- 83-001-005/SF-001;
 - ii. Bottom Leg Suppression:
 - a. Be Class 3, Type 1 moulded chain type with a long pull; and
 - b. Have plastic interlocking members, automatic lock sliders and 100% polyester tape with in accordance with D- 83-001-005/SF-001;
 - iii. Be a non-florescent earth tone colour to match the MULTICAM® camouflage pattern;
- (i) Herringbone Twill Tape - The herringbone twill tape for buttonhole reinforcement (if required) must be:
- i. Commercially available 100% polyester woven edge twill tape, herringbone weave;
 - ii. Width: 2.5 cm (1 in); and
 - iii. Non-florescent earthtone in colour;
- (j) Draw Cord - The draw cord for the leg bottoms, hanger loop on liner and slide fastener pulls must:
- i. Be Cord, Plaited, Spun Synthetic Fibre, Type I in accordance with D-80-001-028/SF-001; and
 - ii. Be a non-florescent earth tone colour to match the MULTICAM® camouflage pattern;
- (k) Snap Fasteners - Snap fasteners must be regular spring clamp type in brass with a black finish and a phosphor bronze spring as detailed in the following drawings:

Drawing 1: CS-149 - Socket Fastener



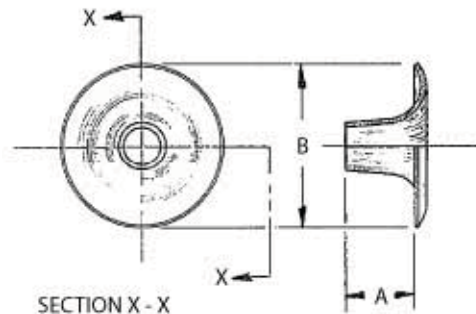
Inside diameter "A"	8.7 mm (0.3425 in)
Outside diameter "B"	14.3 mm 0.5625 in)

Drawing 2: CS-150 - Stud Fastener



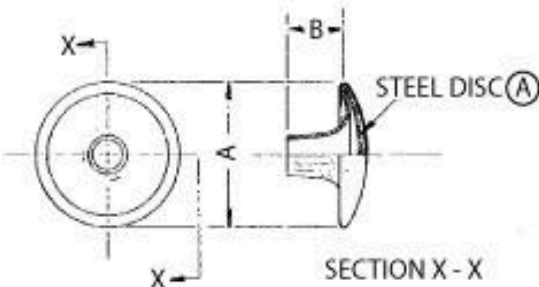
Diameter "A"	9.5 mm (0.375 in)
Diameter "B"	14.3 mm 0.5625 in)

Drawing 3: CS-151 - Eyelet Fastener



Barrel Length Diameter "A"	6.3 mm (0.25 in)
Flange Diameter "B"	14.3 mm (0.5625 in)

Drawing 4: CS-153 - Button Fastener



Diameter "A"	Ligne	24
	Diameter	15.5 mm (0.609 in)
Diameter "B"	Barrel Length	4.4 mm (0.172 in)

- (l) Elastic - The waistband elastic must:
- Commercially available elastic with knitted construction using 43% extruded rubber, 19% clear polyester monofilament, and 38% textured polyester;
 - Weight: 1.5 kg/91.4 m (3.3 lbs/100 yards) ($\pm 5\%$) when tested in accordance with test method 5.1 of CAN/CGSB-4.2-M;
 - Stretch: 90-100%;
 - Width: 4.5 cm (1.75 in) (maintained when stretched); and
 - Be black or white in colour;
- (m) Buttons - The buttons must:
- Be nylon conforming to specification CF-B-854 and drawing 373118 (30-ligne) or 389556 (45-ligne); and
 - Be a non-florescent earth tone colour to match the MULTICAM® camouflage pattern;

- (n) **Thread** - The following applies:
- i. The thread for seaming, stitching, buttonholes and bartacks must:
 - a. Be cotton-covered or polyester-covered, polyester thread (R50 Tex) conforming to CAN/CGSB-4.131-M; and
 - b. Be a non-florescent earth tone colour to match the MULTICAM® camouflage pattern;
 - ii. The thread for seaming and serging the lining, interlining and pocket linings must:
 - a. Be polyester staple thread (R40 Tex) conforming to CAN/CGSB-4.139; and
 - b. Colour to match the material being seamed and serged;
 - iii. The thread for quilting the lining must:
 - a. Be Nylon 70/2 thread conforming to 4-GP-85Ma on the nylon taffeta side of the quilt;
 - b. Be polyester staple thread in accordance with CAN/CGSB-4.139 on the backing side of the quilt; and
 - c. Match the colour of the lining material being used;
 - iv. Unless otherwise specified, all other garment components must be matched for thread colour;
- (o) **Buttonhole Gimp** - The buttonhole gimp must:
- i. Be 100% cotton, 3 cord soft finish, R210 Tex, conforming to 4-GP-80Ma, Type 2A; and
 - ii. Be a non-florescent earth tone colour to match the MULTICAM® camouflage pattern;
- (p) All material must be sourced and supplied by the Contractor.

3.3 **Sizing**

The Trousers must be available in the following sizes in accordance with the Scale of Measurements at Appendix 2:

Inseam (in)	Waist (in)					
	26	30	34	38	42	46
64	X	X	X			
67		X	X	X	X	
70		X	X	X	X	X
73		X	X	X	X	X
76			X	X	X	X

Size	NSN
A/A	8415-20-012-3916
6426	8415-20-012-3917
6430	8415-20-012-3918
6434	8415-20-012-3919
6730	8415-20-012-3920
6734	8415-20-012-3921
6738	8415-20-012-3922
6742	8415-20-012-3923
7030	8415-20-012-3924
7034	8415-20-012-3925
7038	8415-20-012-3926

7042	8415-20-012-3927
7046	8415-20-012-3928
7330	8415-20-012-3929
7334	8415-20-012-3930
7338	8415-20-012-3931
7342	8415-20-012-3932
7346	8415-20-012-3933
7634	8415-20-012-3934
7638	8415-20-012-3935
7642	8415-20-012-3936
7646	8415-20-012-3937

The Trousers must also be available in special/extended sizes where the above sizes are not suitable.

3.4 Cutting

The following applies:

- (a) The Trousers must be cut using duplicates of Government supplied paper patterns as follows:
 - i. Paper patterns include seam allowance but do not include 'make-up' allowance; and
 - ii. The Contractor is responsible for adding 'make-up' allowance to suit their production methods without changing the design, grade or requirements for the Trousers;

Note: Paper patterns will not be supplied to the Contractor for special/extended sizes.

- (b) The shell parts of the Trousers must:
 - i. Be cut and used in accordance with best commercial standards;
 - ii. Be cut in the direction of the warp as shown on the paper patterns; and
 - iii. Be cut from the same piece of shell material with the exception of all buttoning portions of the flaps, slide fastener placket and button strap, which may be cut from separate lays or ends of shell material.

3.5 Sewing

The following applies:

- (a) Seams must be as follows:
 - i. Conform to CAN/CGSB-54.1-M; and
 - ii. Be a minimum of 9.5 mm (0.375 in) wide unless otherwise specified;
- (b) Stitching must be as follows:
 - i. Be either lock stitched Type 301 or chain stitch Type 401 (unless otherwise specified) conforming to CAN/CGSB-54.1-M, having not less than eight (8) nor more than ten (10) stitches per 2.5 cm (1 in);
 - ii. For double-needle stitched, needles set 6.4 mm (0.25 in) apart;
 - iii. Ends of all lock stitched seams and stitching, also breaks in thread, securely backstitched; and
 - iv. Present a regular even appearance without fabric pucker and be free from skips that may result from faulty machine thread tension or other stitching malfunctions;

- (c) Where double-lapped seams are specified, the needles must be set 6.4 mm (0.25 in) apart conforming to numerical designation 2.04.03 of CAN/CGSB-54.1-M;
- (d) Where seaming, turning and stitching is specified, the edges must be properly worked out before stitching;
- (e) Where seaming and serging is specified, this may be done in one or two operations;
- (f) All exposed raw edges must be serge finished with any 500 series, with not less than 10 stitches per inch (2.5 cm)
- (g) Buttonholes must:
 - i. Be gimp reinforced eyelet type with not less than 22 stitches per 2.5 cm (1 in);
 - ii. Have ends fishtailed or bartacked; and
 - iii. When buttonholes are used for water drainage purposes, only the eyelet of the buttonhole is to be cut;
- (h) Bartacks, unless specified otherwise, must be 12.7 mm (0.5 in) long and have not less than twenty (20) cover stitches.
- (i) Button and strap assemblies (where specified) must:
 - i. Have buttons threaded with a strap of shell material in accordance with Drawing 8790166 for 30-ligne buttons or Drawing 2811 for 45-ligne buttons; and
 - ii. Have straps as follows:
 - a. Seam type numerical designation 8.06.02 or 8.19.01;
 - b. Finished width of 8 mm (0.3125 in); and
 - c. Attached with bartacks;

3.6 Snap Fasteners

When inlaying snap fasteners, reinforcement under the shell material may be added as required. Careful consideration must be given to the attaching force of the snap fastener machine to ensure that all parts of the snap fastener will remain attached and functional for the life of the garment.

3.7 Seam Sealing

When specified, seams must be sealed in a manner that will ensure the integrity of the waterproof barrier layer in the garment. The following requirements must be met:

Table 3: Requirements for Visual and Physical Examination

Construction Detail	Test Method	Unacceptable Faults
Seams	Visual Examination	<ul style="list-style-type: none"> – Tape which is not centered across the width of the seam; – Delamination along edges of tape, over seam allowance and stitching or across the width of the tape; – Bubbling; – Blistering; – Puckering; – Melting; and/or – Ends of threads which have not been trimmed.
Ends and Joins	Visual	<ul style="list-style-type: none"> – Loose ends and corners which have not bonded;

	Examination	<ul style="list-style-type: none"> – Rough edges or beads at the ends; and – An overlap at a join of less than 19.1 mm (0.75 in).
Drill holes and stitching lines not in seams	Visual Examination	<ul style="list-style-type: none"> – Left uncovered without a designated exception.
Stiffness of seamed area	Physical Examination	<ul style="list-style-type: none"> – Marked increase of stiffness.

3.8 Quilting

The taffeta lining and the insulation must be quilted together in accordance with the insulation supplier's instructions. Quilt stitching should be kept to a minimum to optimise the thermal value of the insulation. Ideally, the quilt pattern should not be smaller than a 30 cm (12 in) diamond pattern.

3.9 Marking and Care Label

The Trousers must include a Marking and Care Label (see Figure 6), in French and English, as follows:

- (a) A label, sized to include all of the information detailed in this section, positioned on the upper corner of the left front lining, 2.5 cm (1 in) from the fly, and stitched around all edges;
- (b) Light sand in colour with black printing in characters not less than 3.2 mm (0.125 in) nor more than 6.4 mm (0.25 in) in height, with the exception of the size identification which must be twice the height;
- (c) Care symbols in accordance with CAN/CGSB-86.1-2003 including the following:
 - i. Table 1 - Washing – Symbol 6;
 - ii. Table 2 - Bleaching – Symbol 3;
 - iii. Table 3 - Drying – Symbol 3;
 - iv. Table 4 - Ironing/Pressing – Symbol 5; and
 - v. Table 5 - Professional Textile Care – Symbol 3;
- (d) Marking label in accordance with D-80-001-055/SF-001 including the following:
 - i. Nomenclature in English and French:

TROUSERS, COLD WEATHER, MULTICAM®
PANTALONS, TEMP FROID, MULTICAM®
 - ii. NATO Stock Number as required for each size;
 - iii. Size by height and waist;
 - iv. NATO size designation;
 - v. Contract Number;
 - vi. Name of Contractor and/or Sub-Contractor as applicable (no logos or trademarks);
 - vii. Month/Year of manufacture;
 - viii. Fiber content;
 - ix. Care Symbols (in black ink);
 - x. Care instructions in English and French as follows:
 - a. Dry clean only when proper laundering fails to remove soil. / Nettoyage à sec lorsque le blanchiment approprié ne parvient pas à enlever la saleté; and
 - b. Do not stitch or puncture the membrane in this garment. / Ne pas coudre ou perforer la membrane interne imperméable;
 - xi. User Identification;

- (e) Include a bar code in accordance with D-LM-008-002/SF-001, Appendix 3 that identifies the NATO stock number.

3.10 Construction

The Trousers are to be manufactured in accordance with the following requirements:

- (a) **Waist** - The Trouser must have an elasticized waist as follows:
- i. Elasticized waistband as follows:
 - a. Constructed from one (1) ply of shell material and two (2) pieces of elastic;
 - b. Elastic pieces are placed on the left and right side seam areas of the waistband; and
 - c. Both ends of each elastic are stitched to the designated stitching line, as indicated on the paper patterns;
 - ii. Include a center front fly as follows:
 - a. Include fly facings as follows:
 1. Constructed from one (1) ply of shell material; and
 2. With the inside edges folded under, the fly facings are stitched 1.6 mm (0.0625 in) gauge to the lining and waistband;
 - b. Have a two-way water resistant slide fastener;
 - c. With the top end of the right slide fastener tape turned under, the slide fastener is seamed to the right fly opening with a double-needle lockstitch;
 - d. With the top end of the left slide fastener tape turned under, the slide fastener is seamed to the left fly opening with a single needle lockstitch;
 - e. The left fly is then lapped over the right fly to effect proper closure and stitched 1.6 mm (0.0625 in) gauge at the bottom of the opening to form a triangle; and
 - f. Horizontal and diagonal bartacks are included over the stitching on the lower portion of the fly opening;
 - iii. Include a fly closure as follows:
 - a. Two (2) male snap fastener, stud facing outward, are inlaid on the waistband's right side, one 19.1 mm (0.75 in) behind the pointed end and the second 5.7 cm (2.25 in) from first, with both positioned 2.8 cm (1.125 in) below the top waistband edge; and
 - b. Two (2) female snap fasteners, buttons facing outward, are inlaid on the waistband's left side, effecting proper closure with the male snap fasteners on the right side;
 - iv. Include belt loops as follows:
 - a. Have five (5) belt loops made of shell material as follows:
 1. Width: 15.8 mm (0.675 in);
 2. Functional Length: 6.3 cm (2.5 in); and
 3. Made on a looping machine;
 - b. Positioned on the waistband as follows:
 1. One (1) over the center back seam;
 2. Two (2) centered over the back pieces (left and right); and
 3. Two (2) centered over the front pieces (left and right);
 - c. Stitched at the top in the waistband seam and secured at the bottom bartacks;
 - v. Include suspender buttons as follows (see Figure 4):
 - a. Six (6) 30-ligne button and strap assemblies;
 - b. Placed on the inside of the waistband as indicated on the paper patterns; and
 - c. Bartacked to the inside of the waistband with the straps parallel to the top of the waistband;

(b) **Seams** - The Trousers must have seams as follows:

- i. The waistband seamed as follows:
 - a. Waistband seamed together along the centre back; and
 - b. Lower edge of the waistband seamed to the lining along the waist seam;
- ii. The crotch seamed as follows:
 - a. Fronts joined along the crotch below the slide fastener opening; and
 - b. Pressed towards the left front piece and stitched 1.6 mm (0.0625 in) gauge;
- iii. The back pieces joined along the seat seam with a double-lapped seam;
- iv. The front and back pieces joined along the inseams with a double-lapped seam in one continuous operation, with the front overlapping the back on the outside;
- v. The front and back pieces joined along the side seams with a double-lapped seam with the front overlapping the back on the outside, ensuring the front tape of the leg suppression is included in the seam;
- vi. Front pleats be formed and stitched in place along the waistline with the center fold line facing the side seams;
- vii. Barrier seamed as follows:
 - a. The front and back barrier pieces joined together along the seat seam, crotch seam and inseam; and
 - b. Seams to be sealed;
- viii. The front and back lining pieces seamed and serged together along the seat seam, crotch seam and inseam; and
- ix. The shell, barrier and lining assembled as follows:
 - a. The lining and barrier basted together along the waistline, fly edges and leg bottoms to facilitate handling as one (1) layer;
 - b. With right sides together, the shell and lining/barrier seamed along the fly, curtain and waistband edges;
 - c. The trousers turned inside out and stitched 1.6 mm (0.0625 in) gauge around waistband and fly edges; and
 - d. The waistband, shell and facing secured with a stitch;

(c) **Pockets** - The Trousers must have pockets as follows:

- i. **Front Hip Slanted Pockets** - A slanted pocket with a flap closure at the side of each front hip as follows:
 - a. Include a pocket bag constructed from one (1) ply of shell material (back) and one (1) ply of tricot material (front), and a welt constructed from one (1) ply of shell material;
 - b. With wrong sides facing, the pocket welt to be folded in half and set in place under the pocket tricot piece by stitching 6.4 mm (0.25 in) gauge;
 - c. The front pocket bag is then placed on the opposite side and stitched 6.4 mm (0.25 in) gauge;
 - d. The pocket opening is cut and all pocket openings pulled through to the inside;
 - e. The raw edges at each end of the pocket opening to be turned under and properly worked out;
 - f. The pocket opening to be stitched 1.6 mm (0.0625 in) gauge around all edges;
 - g. The outer edge of the pocket bag seamed and serged;
 - h. Both ends of the pocket welt bartacked;
 - i. Include a covered buttoning flap as follows:
 1. Consist of two (2) parts, a covering flap and a buttoning flap, both constructed from shell material;

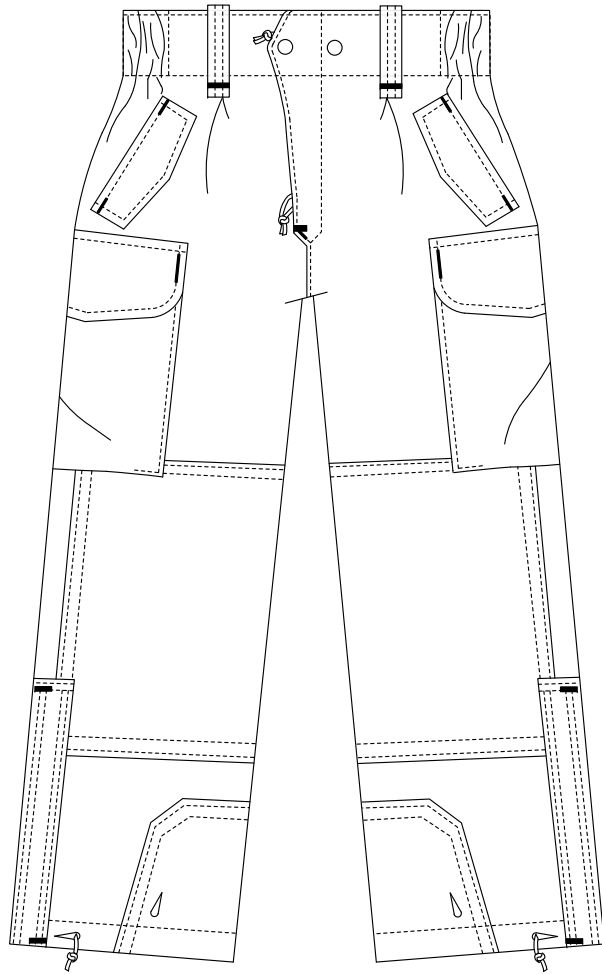
2. With right sides together, the buttoning flap and buttoning flap facing seamed along the buttoning opening, turned inside out with corners properly worked out and stitched 3.2 mm (0.125 in) gauge;
 3. A vertical buttonhole to fit a 30-ligne button is then placed 15.8 mm (0.625 in) from pointed end;
 4. With right sides together, the buttoning flap and buttoning flap facing is then seamed along each side of the flap facing 9.5 mm (0.375 in) gauge ensuring only the facings are caught in the stitching;
 5. A bartack is then placed at each corner of the opening;
 6. With right sides together, the flap is then seamed along the outer edges to the flap facing with the buttoning flap assembly sandwiched between the flap pieces during this operation such that they are partially caught in the seam; and
 7. The flap assembly is then turned inside out and stitched 6.4 mm (0.25 in) gauge;
 8. The flap assembly is centered above the pocket, as indicated on the paper patterns, seamed, turned down and stitched 6.4 mm (0.25 in) gauge ensuring the flap effects proper closure with button assembly on pocket; and
 9. Include a 30-ligne button and strap assembly as follows:
 - a. Centered on the outside of the pocket to effect proper closure with flap with the strap parallel to the top of the pocket opening; and
 - b. Bartacked on both ends;
- ii. Cargo Pockets - Cargo pockets with a flap closure located on each side seam at thigh level as follows:
- a. Include a pocket bag as follows:
 1. Constructed from one (1) ply of shell material and one (1) ply of nylon material;
 2. Both layers seamed together along the upper edge, turned inside out and stitched 6.4 mm (0.25 in) gauge;
 3. Outer edges serged together;
 4. Bellows cuts seamed and serged;
 5. Include a drainage type buttonhole placed in the lower edge of the pocket, as indicated on paper patterns;
 - b. With back and bottom edges of the pocket folded under, the pocket is stitched 1.6 mm (0.0625 in) gauge beginning 2.5 cm (1 in) from the back top edge and ending 3.2 cm (1.25 in) from the front pocket edge;
 - c. With the front pocket edge turned under and the front corner pleated to form a bellows, the pocket is stitched 1.6 mm (0.0625 in) gauge beginning 2.5 cm (1 in) from the front top edge and ending 3.2 cm (1.25 in) behind the front pocket edge;
 - d. The free top side edges of the pocket are then stitched to the sides of the flap 3.2 mm (0.125 in) gauge to form an envelope fold, with the stitching secured with a bartack on both sides;
 - e. Include a covered buttoning flap as follows:
 1. Consist of two (2) parts, a covering flap and a buttoning flap , both constructed from shell material;
 2. With right sides together, the buttoning flap and buttoning flap facing seamed along the buttoning opening, turned inside out with corners properly worked out and stitched 3.2 mm (0.125 in) gauge;

3. A vertical buttonhole to fit a 45-ligne button is then placed 15.8 mm (0.625 in) from pointed end;
 4. With right sides together, the buttoning flap and buttoning flap facing is then seamed along each side of the flap facing 9.5 mm (0.375 in) gauge ensuring only the facings are caught in the stitching;
 5. A bartack is then placed at each corner of the opening;
 6. With right sides together, the flap is then seamed along the outer edges to the flap facing with the buttoning flap assembly sandwiched between the flap pieces during this operation such that they are partially caught in the seam; and
 7. The flap assembly is then turned inside out and stitched 6.4 mm (0.25 in) gauge;
 8. The flap assembly is placed on the trousers as indicated on the paper patterns, seamed, turned down and stitched 6.4 mm (0.25 in) gauge ensuring the flap effects proper closure with button assembly on pocket; and
 9. Include a 45-ligne button and strap assembly as follows:
 - a. Centered on the outside of the pocket to effect proper closure with flap with the strap perpendicular to the top of the pocket opening; and
 - b. Bartacked on both ends;
- (d) **Seat Reinforcement Patches** – The Trousers must have seat reinforcement patches as follows:
- i. Constructed of one (1) ply of shell material; and
 - ii. With the outer edges folded under, the patches to be placed on the outsides of the back panels and stitched 1.6 mm (0.0625 in) and 6.4 mm (0.25 in) gauge, or double-needle stitched;
- (e) **Knee Reinforcement Patches** – The Trousers must have knee reinforcement patches as follows:
- i. Constructed of one (1) ply of shell material; and
 - ii. With the outer edges turned under, the patches to be placed on the fronts, as indicated on paper patterns, and stitched 1.6 mm (0.0625 in) and 6.4 mm (0.25 in) gauge, or double-needle stitched;
- (f) **Leg bottom** - The Trousers must have bottom leg portions with a leg suppression system as follows (see Figure 5):
- i. Include bottom leg reinforcement patches, on the front and back inner sides of the leg bottom, as follows:
 - a. Constructed from one (1) ply of Cloth, Plain Weave, Nylon material;
 - b. With the outer edges turned under, the bottom leg reinforcements to be placed on the bottom front and back pieces, as indicated on paper patterns, and stitched 1.6 mm (0.0625 in) and 6.4 mm (0.25 in) gauge, or double-needle stitched; and
 - c. Include a drainage type buttonhole on lower outer corners of the front and back reinforcement patches;
 - ii. Include bottom leg suppression as follows (see Figure 5):
 - a. The front tape of the slide fastener is seamed to the side seam allowance of the back piece;
 - b. The back tape of the slide fastener is stitched to the placement line on the back piece, as indicated on paper patterns;
 - c. Include a leg suppression placket as follows:

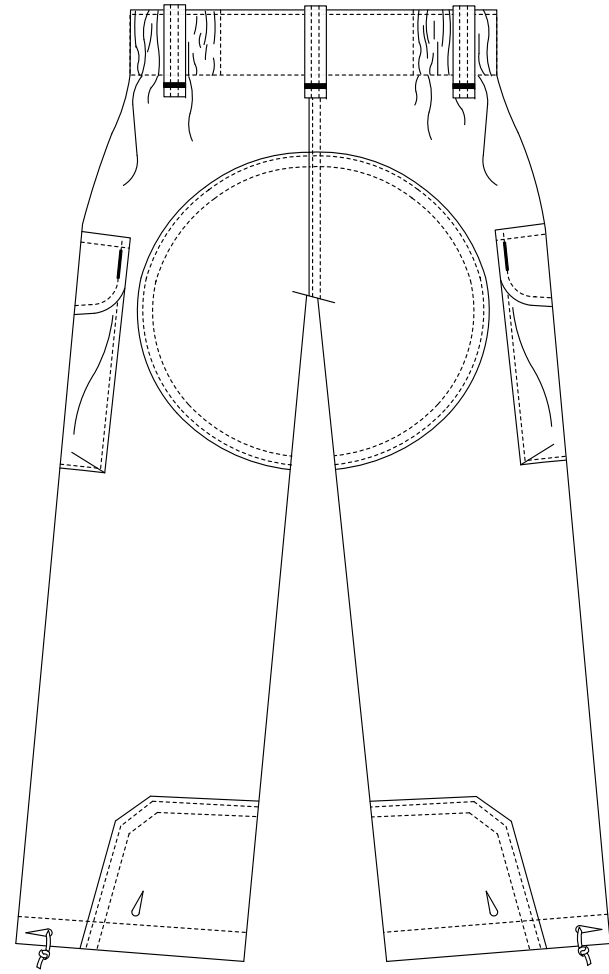
1. Made of one (1) ply of shell material, folded in three (3) layers with the raw edge of the bottom layer 3.2 mm (0.125 in) from the folded edge;
 2. Placed over the back tape of the slide fastener and stitched 1.6 mm (0.0625 in) and 6.4 mm (0.25 in) gauge, or double-needle stitched; and
 3. Include two (2) bartacks placed along the bottom of each row of stitching;
 - d. Include a leg suppression cover as follows:
 1. Made of one (1) ply of shell material, folded in three (3) layers with the raw edge of the bottom layer 3.2 mm (0.125 in) from the folded edge;
 2. Seamed across the bottom, then turned inside out;
 3. Stitched to the leg bottom 1.6 mm (0.0625 in) and 6.4 mm (0.25 in) gauge, or double-needle stitched;
 4. Include a topstitch placed across the top and bottom; and
 5. Include bartacks as follows:
 - a. Secure the top edge of the cover to the front leg; and
 - b. Secure the bottom edge of the cover to the back leg;
 - iii. Two (2) buttonholes are placed on the outside of the leg bottom hem, as indicated on paper patterns, reinforced with either twill tape, shell material or barrier fabric;
 - iv. Include a drawcord wrapped twice around the hem such that, when the leg bottoms are fully extended, the drawcords extend from the buttonholes by 5 cm (2 in); and
 - v. Leg bottom is then turned up over the drawcord, the raw edge turned under and stitched 1.6 mm (0.0625 in) gauge to form a finished hem of 3.8 cm (1.5 in) wide;
- (g) **Slide Fastener Thongs** - Each slide fastener must have a thong as follows:
- i. A length of drawcord threaded through each slide fastener pull, tied with a single knot at the pull tab and knotted again at the thong end;
 - ii. Ends of the drawcords fused to prevent ravelling; and
 - iii. Finished functional length: 6.3 cm (2.5 in).

APPENDIX 1 LAYOUT SKETCHES

Figure 1: Front and Back View



FRONT



BACK

Figure 2: Finished Front Pocket Measurements

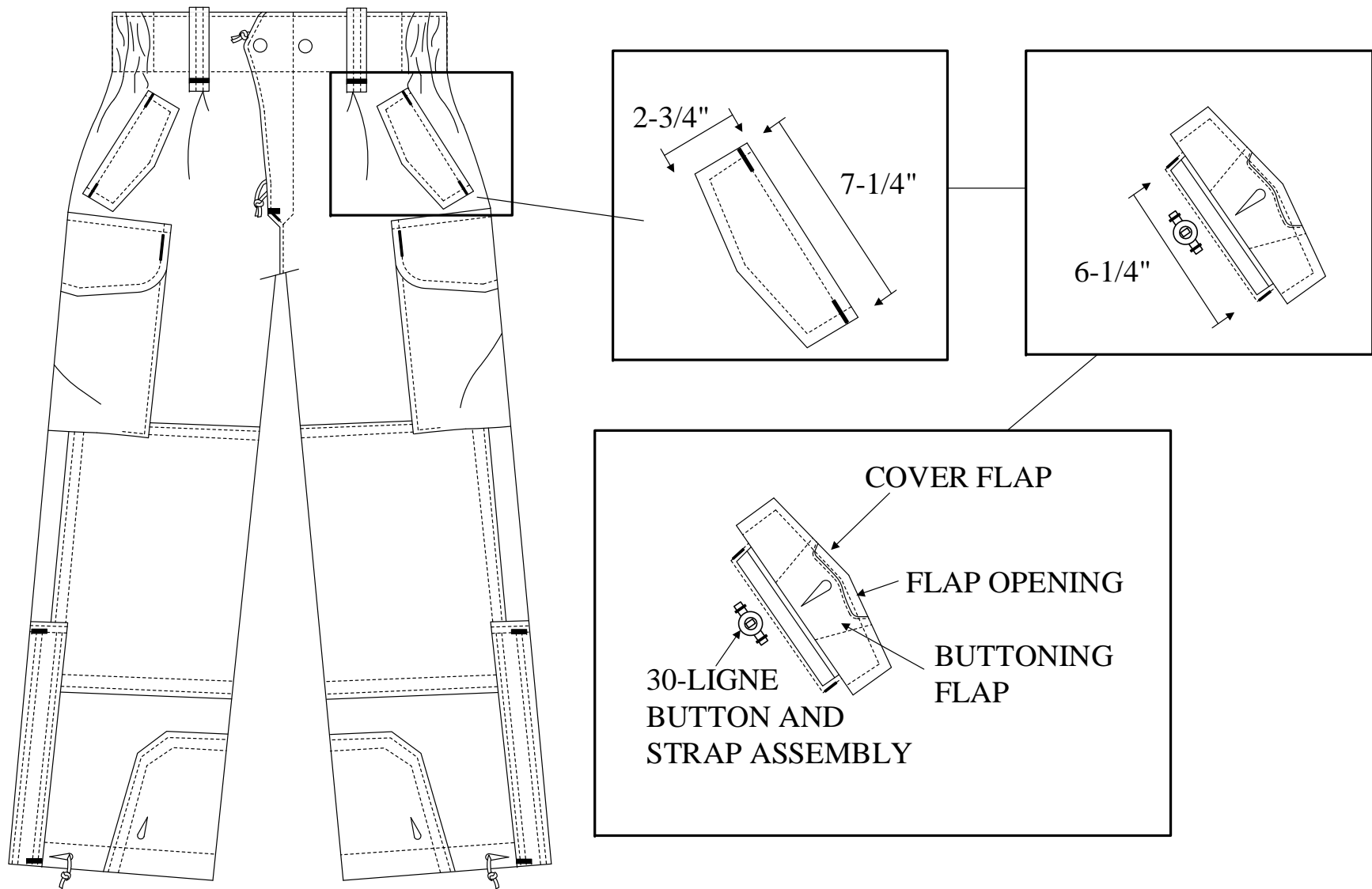


Figure 3: Finished Cargo Pocket Measurements

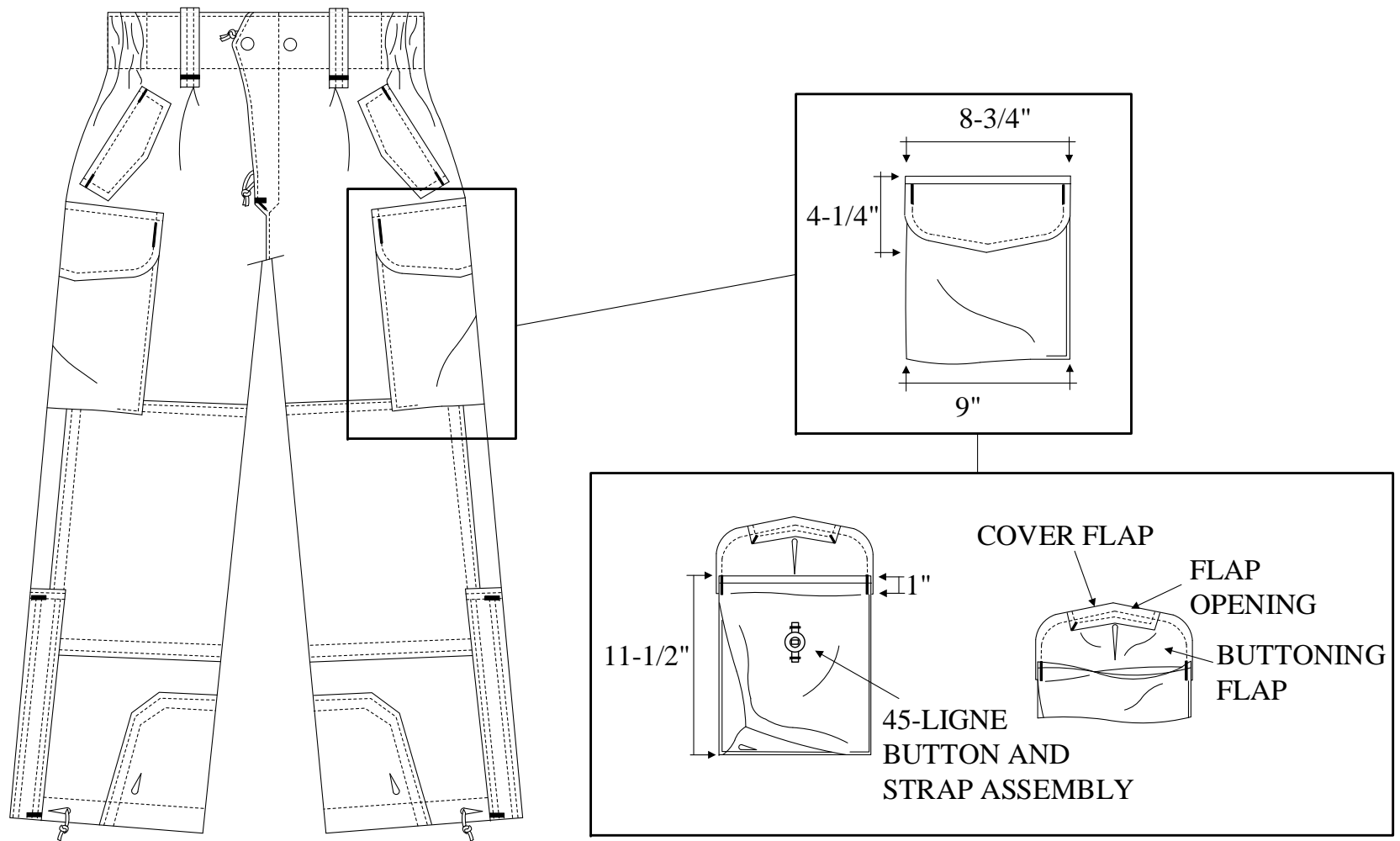
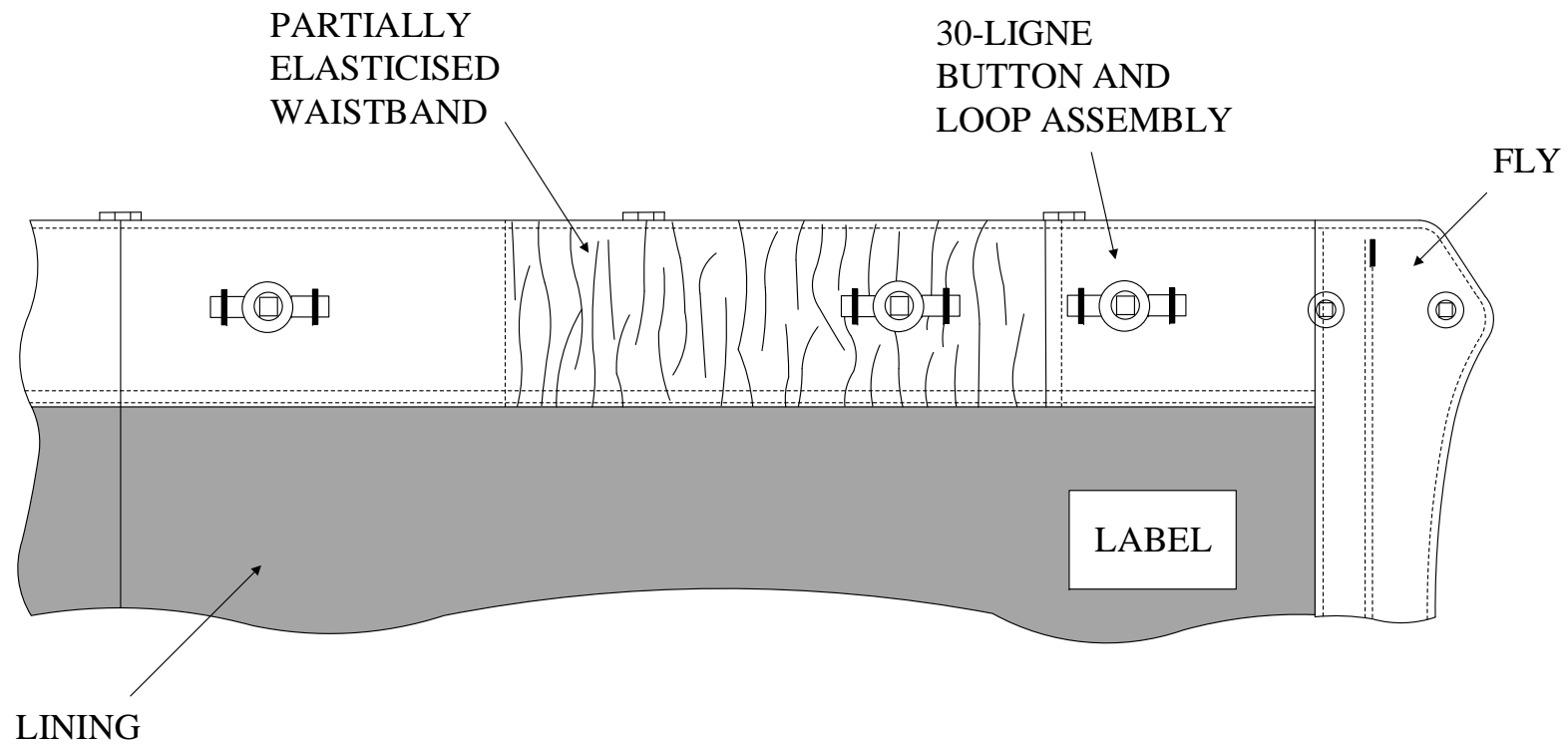


Figure 4: Suspender Buttons



NOTE: LOCATION AS PER PATTERN DRAWINGS

Figure 5: Leg Suppression

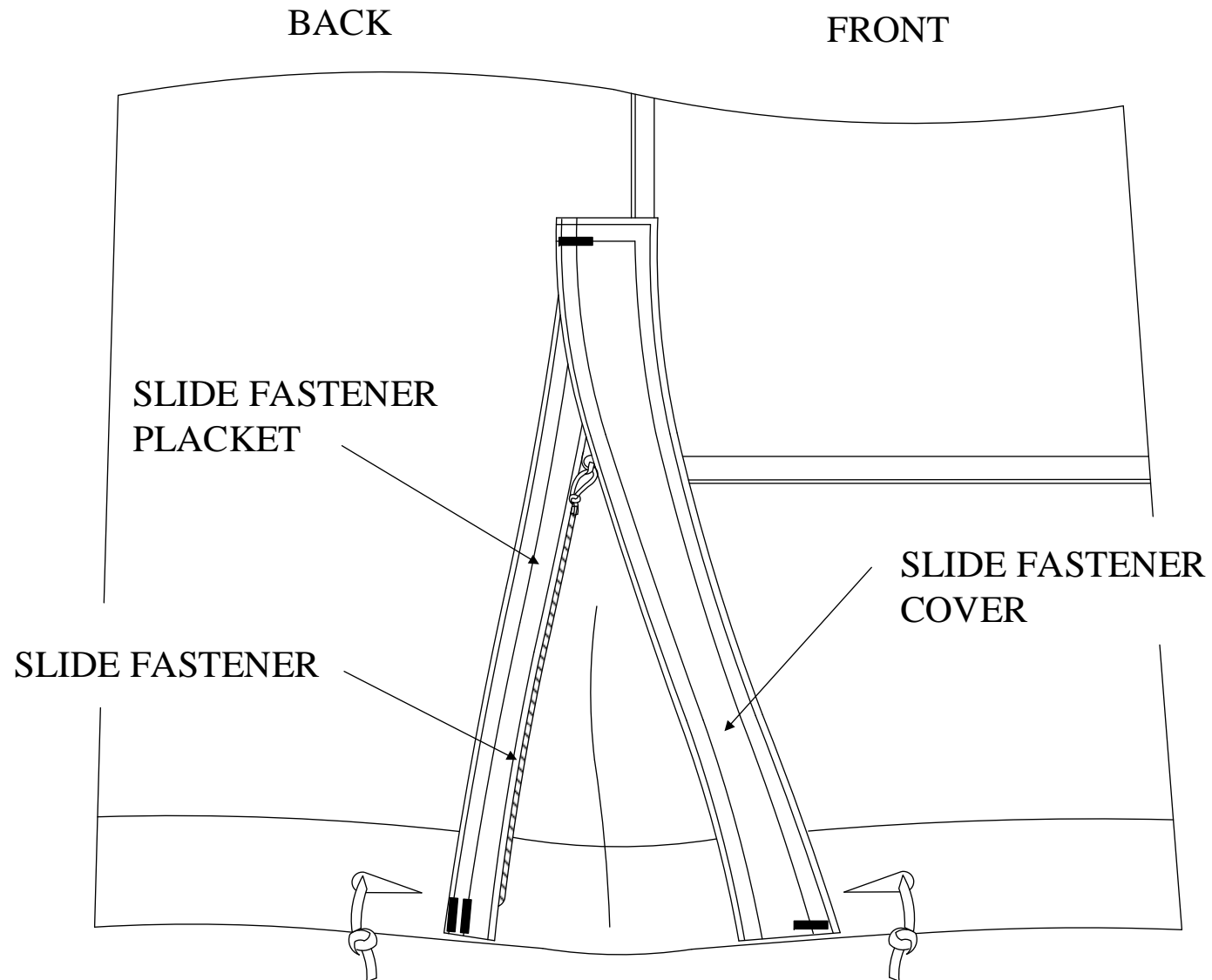



Figure 6: Marking and Care Label

ITEM & CONTRACT INFO	ARTICLET INFO SUR LE CONTRAT	<p>TROUSERS, COLD WEATHER, MULTICAM® PANTALONS, TEMP FROID, MULTICAM® NSN/NNO: 8415-20-XXX-XXXX</p> <p>SIZE/TAILLE 7034</p> <p>NATO SIZE/TAILLE OTAN: XXXX-XXX CONTRACT NO./NO. DE CONTRAT: WXXXX-XXXXXX ABC CONTRACTOR NAME/NOM DE L'ENTREPRENEUR: Jones & Company DATE OF/DE MANUFACTURE: MM/YY FIBRE CONTENT: XXXXXXXXXXXX</p>
CARE SYMBOLS	SYMBOLS D'ENTRETIEN	 <p>40 C Tumble dry on low heat. / Séchage par culbutage T/basse. Iron at low temperature. Do not steam press. / Repasser a T/basse. Ne pas repasser a la vapeur. Do not bleach. / Ne pas javeliser. Do not dry-clean. / Ne pas nettoyer à sec.</p>
CARE INSTRUCTIONS	CONSIGNES D'ENTRETIEN	<p>1. DRY CLEAN ONLY WHEN PROPER LAUNDERING FAILS TO REMOVE SOIL. 2. DO NOT STITCH OR PUNCTURE THE MEMBRANE IN THIS GARMENT.</p> <p>1. NETTOYAGE A SEC LORSQUE LE BLANCHIMENT APPROPRIÉ NE PARVENT PAS A ENLEVER LA SALETÉ. 2. NE PAS COUDRE OU PERFORER LA MEMBRANE INTERNE IMPERMÉABLE.</p>
USERID	ID DE L'UTILIS- ATEUR	<p>I.D. _____</p>

APPENDIX 2 SCALE OF MEASUREMENTS

MEASUREMENTS OF BODY					MEASUREMENTS OF GARMENT								
SIZES BY HEIGHT AND WAIST	HEIGHT WITHOUT SHOES		WAIST	NATO SIZES	WAIST FULLY EXTENDED	WAIST FULLY RELAXED	SEAT IN LINE WITH BOTTOM OF FLY	OUTSEAM FINISHED	INSEAM FINISHED	THIGH 2" BELOW CROTCH	WIDTH AT BOTTOM OPEN	SLIDE FASTENER LENGTH AT BOTTOM	SLIDE FASTENER LENGTH AT FLY
6426	5' 1" to 5' 3 1/2"	X-SHORT	23-26	7075-6070	29	22	44	36	26	26 1/2	22 1/2	11	7 1/2
6430			27-30	7075-7080	33	26	48			28 1/2	23		
6434			31-34	7075-8090	37	30	52			30 1/2	23 1/2		
6730	5' 4" to 5' 6 1/2"	SHORT	27-30	7580-7080	33	26	48	39	28	28 1/2	23	11	8 1/2
6734			31-34	7580-8090	37	30	52			30 1/2	23 1/2		
6738			35-38	7580-9000	41	34	56			32 1/2	24		
6742			39-42	7580-0010	45	38	60			34 1/2	24 1/2		
7030	5'7" to 5'9 1/2"	REG	27-30	8085-7080	33	26	48	42	30	28 1/2	23	11	9 1/2
7034			31-34	8085-8090	37	30	52			30 1/2	23 1/2		
7038			35-38	8085-9000	41	34	56			32 1/2	24		
7042			39-42	8085-0010	45	38	60			34 1/2	24 1/2		
7046			43-46	8085-1020	49	42	64			36 1/2	25		
7330	5'10" to 6'1/2"	TALL	27-30	8590-7080	33	26	48	45	32	28 1/2	23	11	10 1/2
7334			31-34	8590-8090	37	30	52			30 1/2	23 1/2		
7338			35-38	8590-9000	41	34	56			32 1/2	24		
7342			39-42	8590-0010	45	38	60			34 1/2	24 1/2		
7346			43-46	8590-1020	49	42	64			36 1/2	25		
7634	6'1" to 6'3 1/2"	X-TALL	31-34	9095-8090	37	30	52	48	34	30 1/2	23 1/2	11	11 1/2
7638			35-38	9095-9000	41	34	56			32 1/2	24		
7642			39-42	9095-0010	45	38	60			34 1/2	24 1/2		
7646			43-46	9095-1020	49	42	64			36 1/2	25		
TOLERANCE PLUS OR MINUS					1	3/4	3/4	3/4	1/2	1/2	1/2	0	0