



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 539-2004

SUPPLY AND DELIVERY OF BOMBER JACKETS

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FORM A: BID
(See B7)

1. Project Title SUPPLY AND DELIVERY OF BOMBER JACKETS

2. Bidder

Name of Bidder

Street

City

Province

Postal Code

Facsimile Number

(Mailing address if different)

Street or P.O. Box

City

Province

Postal Code

The Bidder is:

(Choose one)

a sole proprietor

a partnership

a corporation

carrying on business under the above name.

3. Contact Person

The Bidder hereby authorizes the following contact person to represent the Bidder for purposes of the Bid.

Contact Person

Title

Telephone Number

Facsimile Number

4. Definitions

All capitalized terms used in the Contract shall have the meanings ascribed to them in the General Conditions and D3.

5. Offer

The Bidder hereby offers to perform the Work in accordance with the Contract for the price(s), in Canadian funds, set out on Form B: Prices, appended hereto.

6. Commencement of the Work

The Bidder agrees that no Work shall commence until he is in receipt of a purchase order authorizing the commencement of the Work.

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7. Contract The Bidder agrees that the Bid Opportunity in its entirety shall be deemed to be incorporated in and to form a part of this offer notwithstanding that not all parts thereof are necessarily attached to or accompany this Bid Submission.

8. Addenda The Bidder certifies that the following addenda have been received and agrees that they shall be deemed to form a part of the Contract:

No.	_____	Dated	_____
	_____		_____
	_____		_____

9. Time This offer shall be open for acceptance, binding and irrevocable for a period of sixty (60) Calendar Days following the Submission Deadline.

10. Signatures In witness whereof the Bidder or the Bidder's authorized official or officials have signed this

_____ day of _____, 20_____.

(If no corporate seal)
Signed and sealed in
the presence of:

(Witness)

(Witness)

Signature of Bidder or
Bidder's Authorized Official or Officials

(Print here name and official capacity of individual whose signature appears above)

(Print here name and official capacity of individual whose signature appears above)

SEAL

FORM B: PRICES
(See B8)

SUPPLY AND DELIVERY OF BOMBER JACKETS

UNIT PRICES

ITEM NO.	DESCRIPTION	UNIT	APPROX.TOTAL QUANTITY	UNIT PRICE
1.	Bomber Jackets	ea	125	
2.	Bomber Jackets (reflective tape only, no wording)	ea	50	

Name of Bidder

PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

B1.1 SUPPLY AND DELIVERY OF BOMBER JACKETS

B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, March 21, 2005.
- B2.2 Bid Submissions determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. ENQUIRIES

- B3.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.
- B3.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.
- B3.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.
- B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.
- B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B4. ADDENDA

- B4.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B4.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B4.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.
- B4.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Branch internet site for addenda shortly before submitting his Bid.
- B4.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B5. SUBSTITUTES

B5.1 The Work is based on the materials, equipment, methods and products specified in the Bid Opportunity.

B5.2 **No Substitutions shall be allowed.**

B6. BID SUBMISSION

B6.1 The Bid Submission consists of the following components:

- (a) Form A: Bid;
- (b) Form B: Prices.

B6.2 All components of the Bid Submission shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely in ink, to constitute a responsive Bid.

B6.3 The Bid Submission may be submitted by mail, courier or personal delivery, or by facsimile transmission.

B6.4 If the Bid Submission is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Branch
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B6.4.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.

B6.5 If the Bid Submission is submitted by facsimile transmission, it shall be submitted to (204) 949-1178

B6.5.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.

B6.6 Bid Submissions submitted by internet electronic mail (e-mail) will not be accepted.

B7. BID

B7.1 The Bidder shall complete Form A: Bid, making all required entries.

B7.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

- B7.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B7.2.
- B7.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B7.4 Paragraph 10 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
 - (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B7.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.
- B7.4.2 All signatures shall be original and shall be witnessed except where a corporate seal has been affixed.
- B7.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid Submission and the Contract, when awarded, shall be both joint and several.

B8. PRICES

- B8.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B8.1.1 Prices on Form B: Prices shall include:
- (a) duty;
 - (b) freight and cartage;
 - (c) Provincial and Federal taxes [except the Goods and Services Tax (GST) and Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable] and all charges governmental or otherwise paid;
 - (d) profit and all compensation which shall be due to the Contractor for the Work and all risks and contingencies connected therewith.
- B8.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B8.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9. QUALIFICATION

- B9.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly

registered, licensed or permitted by law to carry on business in Manitoba, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business;

- (b) be responsible and not be suspended, debarred or in default of any obligation to the City;
- (c) be financially capable of carrying out the terms of the Contract;
- (d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;
- (e) have successfully carried out work, similar in nature, scope and value to the Work;
- (f) employ only Subcontractors who:
 - (i) are responsible and not suspended, debarred or in default of any obligation to the City (a list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>); and
 - (ii) have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of performing the Work required to be done in accordance with the terms of the Contract;
- (g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);

B9.2 The Bidder shall be prepared to submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B9.3 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B10. OPENING OF BIDS AND RELEASE OF INFORMATION

B10.1 Bid Submissions will not be opened publicly.

B10.2 Within two (2) Business Days following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

B10.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

B10.4 The Bidder is advised that any information contained in any Bid Submission may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B11. IRREVOCABLE BID

B11.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.

B11.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work for the time period specified in Paragraph 9 of Form A: Bid.

B12. WITHDRAWAL OF BIDS

B12.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B12.1.1 Notwithstanding GC.7.05(2), the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B12.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B12.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials shall:

- (a) retain the Bid Submission until after the Submission Deadline has elapsed;
- (b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B12.1.3(b), declare the Bid withdrawn.

B12.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B11.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B13. EVALUATION OF BIDS

B13.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B9 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B5.

B13.2 Further to B13.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements if the interests of the City so require.

- (a) The Bidder shall, within three (3) Business days of a request of the Contract Administrator supply the test results of representative samples as per E9 Testing Requirements, shall be required prior to receiving any representative samples, to determine product conformance.
- (b) The Bidder shall, within ten (10) Business days of a request of the Contract Administrator, provide representative samples of the goods offered.
 - (i) Representative samples provided by the Bidder may be subjected to testing by any Testing Laboratory of the Contract Administrators choosing. The Bidder shall be responsible for all costs in connection with any such tests deemed appropriate in the evaluation process of the goods.

B13.3 Further to B13.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.

B13.4 Further to B13.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B13.5 This Contract will be awarded as a whole.

B14. AWARD OF CONTRACT

B14.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B14.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B14.2.1 Without limiting the generality of B14.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B14.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid.

B14.4 Notwithstanding GC.3.01 and GC.3.02, the City will issue a purchase order to the successful Bidder in lieu of the execution of a Contract.

B14.5 The Contract Documents, as defined in GC.1.01(7), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

C1.1 The *General Conditions for the Supply and Delivery of Goods* (Form 21: 88 03) are applicable to the Work of the Contract.

C1.1.1 The *General Conditions for the Supply and Delivery of Goods* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

- D1.1 In addition to the *General Conditions for the Supply and Delivery of Goods*, these Supplemental Conditions are applicable to the Work of the Contract.
- D1.2 The General Conditions are amended by striking out "The City of Winnipeg Act" wherever it appears in the General Conditions and substituting "The City of Winnipeg Charter".
- D1.3 The General Conditions are amended by striking out "Board of Commissioners" or "Commissioner" wherever it appears in the General Conditions and substituting the "Chief Administrative Officer".
- D1.4 The General Conditions are amended by striking out "Tender Package" wherever it appears in the General Conditions and substituting "Bid Opportunity".
- D1.5 The General Conditions are amended by striking out "Tender Submission" wherever it appears in the General Conditions and substituting "Bid Submission".
- D1.6 The General Conditions are amended by striking out "Bidding Instructions" wherever it appears in the General Conditions and substituting "Bidding Procedures".

D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of supply and delivery of bomber jackets from the date of award to March 31, 2007.
- D2.2 The Work shall be done on an "as required" basis during the term of the Contract.
- D2.2.1 The type and quantity of Work to be performed under this Contract shall be as authorized from time to time by the Contract Administrator and/or Users.
- D2.2.2 Subject to GC.4.08, the City shall have no obligation under the Contract to purchase any quantity of any item in excess of its actual operational requirements.

D3. DEFINITIONS

- D3.1 When used in this Bid Opportunity:
- (a) "**Business Day**" means any Calendar Day, other than a Saturday, Sunday, or a Statutory or Civic Holiday;
 - (b) "**Submission Deadline**" and "**Time and Date Set for the Final Receipt of Bids**" mean the time and date set out in the Bidding Procedures for final receipt of Bids;
 - (c) "**User**" means a person, department or other administrative unit of the City authorized by the Contract Administrator to order Work under this Contract;

D4. CONTRACT ADMINISTRATOR

- D4.1 The Contract Administrator is:
Diane Kowaliuk C.P.P.
Supervisor of Stores
2546 McPhillips Street

Winnipeg, Manitoba R2P 2T2
Telephone No. (204) 986-5255
Facsimile No. (204) 334-4308

D5. NOTICES

- D5.1 GC.7.05 is hereby amended to delete reference to "registered mail" and to replace same with "ordinary mail".
- D5.2 GC.7.05 is further amended hereby to include delivery by facsimile transmission (fax) as an acceptable means of delivering notices, consents, approvals, statements, authorizations, documents or other communications required or permitted to be given under this Contract. Deliveries by fax will be deemed to have been received on the day of delivery, if a business day, or if not a business day, on the business day next following the day of delivery.
- D5.3 Further to GC.7.05, all notices, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D5.4, D5.5 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D4.1.
- D5.4 All notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following address or facsimile number:
The City of Winnipeg
Chief Administrative Officer Secretariat
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9
Facsimile No.: (204) 949-1174
- D5.5 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following address or facsimile number:
The City of Winnipeg
Corporate Services Department
Legal Services Division
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1
Facsimile No.: (204) 947-9155

SUBMISSIONS

D6. AUTHORITY TO CARRY ON BUSINESS

- D6.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

CONTROL OF WORK

D7. COMMENCEMENT

- D7.1 The Contractor shall not commence any Work until he is in receipt of a purchase order authorizing the commencement of the Work.
- D7.2 The Contractor shall not commence any Work until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence that the Contractor is in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;
 - (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.

D8. ORDERS

- D8.1 The Contractor shall provide a local Winnipeg telephone number or a toll-free telephone number at which orders for delivery may be placed.

D9. RECORDS

- D9.1 The Contractor shall keep detailed records of the goods supplied under the Contract.
- D9.2 The Contractor shall record, as a minimum, for each item listed on Form B: Prices:
- (a) User name(s) and addresses;
 - (b) order date(s);
 - (c) delivery date(s); and
 - (d) description and quantity of goods supplied.
- D9.3 The Contractor shall provide the Contract Administrator with a copy of the records for each quarter year within fifteen (15) Calendar Days of the end of that quarter.

MEASUREMENT AND PAYMENT

D10. INVOICES

- D10.1 Further to GC.9.01 and notwithstanding GC.9.03, the Contractor shall submit an invoice for each order delivered.
- D10.2 Further to D5.3, the Contractor shall submit invoices to the locations designated at the time of ordering.
- D10.3 Invoices must clearly indicate, as a minimum:
- (a) the City's order number;
 - (b) date of delivery;
 - (c) delivery address;
 - (d) type and quantity of goods delivered;
 - (e) the amount payable with GST and MRST shown as separate amounts; and

(f) the Contractor's GST registration number.

D10.4 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

D11. PAYMENT

D11.1 Further to GC.9.01 and GC.9.03, payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Contractor's invoice.

WARRANTY

D12. WARRANTY

D12.1 Notwithstanding GC.10.01 and GC.10.02, the warranty period for each item of Work supplied shall begin on the date of successful delivery and shall expire one (1) year thereafter unless extended pursuant to D12.2, in which case it shall expire when provided for thereunder.

D12.2 If a defect or deficiency prevents the full and normal use or operation of the Work or any portion thereof, for purposes of calculating the warranty period, time shall be deemed to cease to elapse for the defective or deficient portion, and for any portion of the Work whose use or operation is prevented by such defect or deficiency, as of the date on which the defect or deficiency is observed or the use or operation is prevented and shall begin to run again when the defect or deficiency has been corrected or the Work may be used or operated to the satisfaction of the Contract Administrator.

D12.3 Notwithstanding GC.10.01, GC.10.02 and D12.2, if any law of Manitoba or of the jurisdiction in which the Work was manufactured requires, or if the manufacturer provides, a longer warranty period or a warranty which is more extensive in its nature, then the provisions of such law or manufacturer's warranty shall apply.

PART E - SPECIFICATIONS

GENERAL

E1. GENERAL

E1.1 These Specifications shall apply to the Work.

E2. BOMBER JACKET MATERIALS

E2.1 Shell Fabric

E2.1.1 The shell fabric shall consist of a Crosstech waterproof-breathable membrane laminated between an outside woven polyester face fabric (Gore-Tex US101) and an inside knit polyester backing fabric resulting in a washable waterproof material with high moisture vapour transmission, blood-borne pathogen resistance, and common chemical resistance.

(a) Overall Weight: 5.4 oz. per square yard.

(b) Color: Dark Navy

E2.2 Ribbon Loops

E2.2.1 Ribbon loops shall be 0.5 inch nylon braid MIL-T-5038 Type III #7407.

(a) Color: Black

E2.3 Seam Tape

E2.3.1 Seam tape for all stitching and seams shall be 3-layer Gore-Seam tape 1 inch in width compatible with the Crosstech membrane.

(a) Color: Black

E2.4 Wicking Barrier Tape

E2.4.1 Waterproof tape for inside wicking barrier at cuffs and hem shall be Gore-Seam 2 inches wide tape compatible with the Crosstech membrane.

(a) Color: Clear

E2.5 Snaps

E2.5.1 Snaps shall be non-rusting, 20 ligne prong style with closed backs, gunmetal finish on brass, heavy-duty closure, 24 ligne black nylon cap.

E2.6 Zippers

E2.6.1 The front zipper shall be delrin, 2-way, separating, size #5, 29 inches long. Side zippers shall be nylon coil, 2-way, size #5, 14 inches long. Pocket zippers shall be nylon coil, size #5, 9.5 inches long. Inside zippers (for optional liner) shall be delrin, size #5, 23 inches long. (Specified zipper lengths are for size L/Reg)

(a) Color: Black.

E2.7 Hook and Loop

E2.7.1 The hook and loop fastener tape shall meet specification MIL-F-21840 and shall measure 1 inch wide.

(a) Color: Black

E2.8 Thread

- E2.8.1 Thread for single needle lockstitch and double-needle seams shall be size #50 polyester wrapped polyester core, direct dyed.
- (a) Color: Shall match specified fabric.

E3. DESIGN AND CONSTRUCTION

E3.1 General Design

- E3.1.1 The jacket shall be hip length, waterproofed by design with drop shoulder, equipment strap epaulets, side zippers with double inside flies, front zipper with double outside storm flies, hook and loop adjustable cuff closure, and two slanted front pockets with flaps and zipper closure, and two lower pockets with hand warmer pockets. There shall be snaps for an optional snap-off radial hood with drawstring adjustment. Optional removable liner system fleece insulation jacket with zip off sleeves to serve as zip-in Bomber or vest and stand alone bomber or vest. There shall be a collar and cuff snap system to hold the zip-out fleece bomber in the shell garment. In addition an inner security pocket on the inside left of both the outer and inner liner jackets. Each jacket will be complete with scotchlite package.

E3.2 Sleeves

- E3.2.1 The sleeves shall be 2-piece drop shoulder design with a 1.5 inch finished sleeve hem. There shall be sleeve tabs constructed from two plies of shell fabric with a 2 inch by 1 inch piece of hook fastener to mate with a 6 inch by 1 inch piece of loop fastener sewn to the sleeve 0.5 inch above the end of the finished sleeve to provide adjustable wrist closure. There shall be a 0.5 inch wide ribbon loop inserted in the sleeve hem at the inseam to attach the removable insulated liner.

E3.3 Collar

- E3.3.1 The sport collar shall be made of two plies of the shell fabric 3.5 inches high. There shall be three male snaps set to the under collar with one set at the center back and the others set 7 inches from the center on either side for an optional snap-off hood.

E3.4 Upper Pockets

- E3.4.1 There shall be two front pockets with angled flaps covering a zipper closure. The pockets shall measure 11 inches high, 9.5 inches wide at the bottom and 5.5 inches wide at the top with a 2 inch wide angled flap. There shall be a buttonhole set on the inside of each pocket flap to hold a pen.

E3.5 Lower Pockets

- E3.5.1 The pleated patch pockets shall measure approximately 7 inches wide by 8 inches high. There shall be a mitered flap, measuring approximately 7 inches wide 2.5 inches at the center. The pocket shall have a reverse pleat and the top shall be bound. There shall be a 1-inch by 2-inch pieces of hook and loop on the flap and pocket for closure. The outside (top) edge of the pocket and pocket flap shall be securely barracked. The sides shall open approximately 6.5 inches to accommodate the hands. The ends of the opening shall be securely barracked (top and bottom).

E3.6 Inner Security Pockets

- E3.6.1 The inside left security pocket shall measure 7 inches wide by 9 inches deep and close with a 1-inch by 1-inch piece of hook and loop IN BOTH THE JACKETS.

E3.7 Fronts

- E3.7.1 The fronts shall have a full front zipper sewn from the top of the collar and extending to the bottom hem. There shall be double outside storm flies measuring 2.25 inches wide. There

shall be an inside front facing constructed from shell fabric measuring 1.5 inches long along both sides of the front opening. There shall be a zipper to secure an optional insulated liner sewn under the edge of the facings.

E3.8 Seam Stitching

E3.8.1 Shoulder, sleeve, and front yoke seams shall be 0.1875 inch gauge, double needle chain stitch, lap seam felled construction. All other seams shall be single needle construction. All seams shall be eight stitches per inch minimum to twelve stitches per inch maximum. Seams shall be free from puckering, pleats, runoffs and raw edges.

E3.9 Seam Waterproofing

E3.9.1 All seams and stitching through the permanent waterproof breathable lining shall be waterproof seam taped with the specified seam tape. The tape shall be applied by hot air methods. The tape shall not be affected by weather, temperature, or storage. The taped seams shall be tested for waterproofing in accordance with Federal Test Std. #191A, Method #5516 when new and after 10 wash/dry cycles and dry cleanings. There shall be no appearance of water in the test area at 2 PSI for a period of 3 minutes.

E3.10 Wicking Barrier

E3.10.1 There shall be a waterproof wicking barrier tape applied above the bottom hem and above the cuff hem of the jacket. The barrier shall consist of a layer of 2-layer clear Gore-Seam tape.

E3.11 Labelling

E3.11.1 The jacket shall be permanently labelled with the manufacturer, size, and NFPA 1999 (2003 Edition) certification label to meet the standard.

E3.12 Removable Pile Lined Jacket

E3.12.1 There shall also be an available zip-out waist-length inner jacket/vest which can also be used separately as a bomber/vest style outer jacket. This jacket shall have a zipper front, knit collar, lower slash pockets with zippers, zip-off sleeves and knit waistband and sleeve cuffs. The jacket shall be lined in the body with Malden Mills Polartec 300 series pile liner and shall be lined in the sleeves with a insulation package consisting of a nylon taffeta fabric face quilted in a 6 inch diamond pattern to DuPont Thermolite insulation having a clo value of 1.74.

(a) Color: Dark Navy

E3.13 Hood

E3.13.1 The radial styled snap-off hood shall be constructed of shell fabric with one back and one front piece with integral visor. The hood-joining seam shall be waterproofed with seam tape. The hood shall be hemmed at the bottom and a stitched down facing shall be sewn around the front opening of the hood securing an elasticized cord with cordlocks to adjust the fit of the hood. Three female snaps shall be set through the bottom hem with one set at the center back and the others set 7 inches from the center on either side to match up with the snaps set on the jacket collar.

E3.14 Epaulettes

E3.14.1 Epaulettes shall be 2.5 inches in width at the sleeve joining seam and shall taper to 2 inches in width at the narrow end

E3.14.2 The point of the epaulettes shall finish at the collar, joining seam of the coat, fastened with buttonhole and black button.

E3.14.3 Epaulettes shall be removable.

E4. SCOTCHLITE

E4.1 Jackets required shall be with and without "Paramedic" Scotchlite wording. Jackets not requiring "Paramedic" wording on them, will still require reflective tape as noted in E4.1.1.

E4.1.1 1.5" Scotchlite stripe package is to be sewn and seam sealed on the garment around chest and upper arms

E4.1.2 On upper back wording such as "PARAMEDIC" or otherwise specified, is to be heat transferred onto each garment in Scotchlite three (3) inch high letters by ten (10) inches long in the middle of the back.

E4.1.3 1.5" wide Scotchlite stripe on each side of the word "PARAMEDIC" or otherwise specified. These lines are to be sewn onto garments and seam sealed.

E4.1.4 Wording such as "PARAMEDIC" or otherwise specified is to be heat transferred in one (1) inch high Scotchlite letters on wearers upper left front.

E4.1.5 Crests will be provided by the Fire Paramedic service and shall be sewn onto the garment and seam sealed.

E5. SIZE AND MEASUREMENTS

E5.1 Size Range

E5.1.1 The size range shall be unisex sizing:

- (a) Small: XS – 3XL
- (b) Regular: XS - 3XL
- (c) Tall: M - 3XL

E5.2 Measurements

E5.2.1 Measurements required shall be:

(a) Size: XS S M L XL XXL XXXL

(b) Chest: 42 46 50 54 58 62 66
(Measured at armhole and side seam + or - 0.75 inch)

(c) Back Length size L: Small = 29.5 Reg = 31 Tall = 32.5
(increases 0.5 inch for each size (i.e. size Large Reg. = 31.5 inches)
(measured from neck seam to bottom of hem + or - 0.75 inches)
Sleeve Inseam: Small = 23.5 Reg = 25 Tall: = 26.5 (all + or - 0.5 inches)

Template Version: G220050301

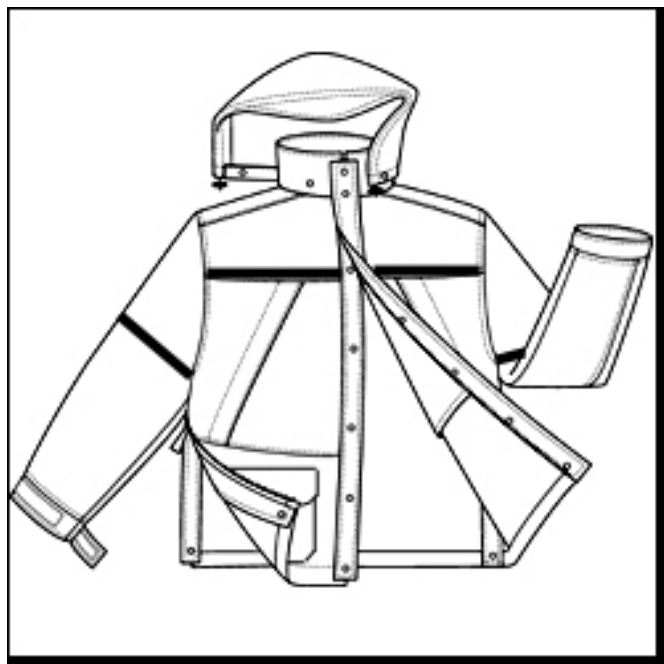
Name:	<ul style="list-style-type: none"> ● Jacket with Crosstech Fabric ● N.F.P.A. 1999 (2003 edition) compliant 						
Fabric:	<ul style="list-style-type: none"> ● Waterproof-breathable 3-layer Crosstech fabric 						
Component:	<ul style="list-style-type: none"> ● Heavy-duty nylon zipper ● Seams factory sealed with Gore-seam tape 						
Description:	<ul style="list-style-type: none"> ● Hood ● Waterproof upper cargo/hand warmer pockets with zippered closures ● Double-entry lower pockets with flaps ● Double storm flies cover delrin zipper ● 14" side zippers ● Hook and loop cuff closure ● Scotchlite around chest and arms ● 31" long 						
In stock:	<ul style="list-style-type: none"> ● 						
Special order:	<ul style="list-style-type: none"> ● Dark navy 						
Size:	XS	S	M	L	XL	XXL	XXXL
S	•	•	•	•	•	•	•
R		•	•	•	•	•	•
T			•	•	•	•	•

Options:

Scotchlite requirement:

PARAMEDIC or otherwise specified in 1" high Scotchlite upper left front. The wording "Paramedic" or otherwise specified, will be heat transferred onto garment.

Across the back 1.5" Scotchlite stripe with a 10" break in the middle for **PARAMEDIC** or otherwise specified in 3" high letters also in Scotchlite. Scotchlite on sleeves is 1.5" on outer shell to be sewn on and seam sealed.



E6. BOMBER JACKET WITH FLEECE BODY LINING AND THERMOLITE PLUS SLEEVE LINING MATERIALS

E6.1 Shell Fabric Cloth Type

E6.1.1 3X1 right hand twill weave, 2-ply 70 Denier textured Nylon (filling), and single ply 70 denier mid dull taslanized nylon warp, treated with durable fluorocarbon water and stain release agents.

E6.1.2 (The following values are plus or minus 10%)

Count: Warp: 174 Filling: 83
Weight: 4 oz. per sq. yd. Federal Test Method 5041
Tensile Strength (lbs): Warp: 218 Filling: 175 Federal Test Method 5100
Tear Strength (lbs): Warp: 6.3 Filling: 8.5 Federal Test Method 5134
Tear Strength (lbs): Warp: 8.2 Filling: 8.6 Federal Test Method 5132
Color Fastness and Crocking: Good
Backcoating: Honeycomb pattern printed urethane non-ravel coating to insure breathability, prevent seam slippage, and to maintain shell fabric appearance.
Color: Dark Navy

E6.2 Permanent Insulated Liner

E6.2.1 Cloth Type: Spun polyester, sheared both sides to ensure a low pill face and back for maximum performance. High moisture vapour transmission rate and warmth retention.
Weight: 17.0 oz. per linear yard
Fiber Content: 100% Polyester
Shrinkage: Warp: 5% Filling: 2%
Colorfastness: 3 (Good)
Color: Black

E6.3 Sleeves

E6.3.1 The permanent insulated liner shall be constructed of a quilted package of woven face fabric, synthetic thin insulation, and woven backing fabric. The insulation must resist fiber migration without the use of layers of scrim in order to maintain superior softness and quietness and wick moisture vapour away from the body. The quilted package must be both machine washable/dryable and drycleanable to accommodate a variety of cleaning requirements.

E6.4 Face Fabric

E6.4.1 Cloth Type: 100% nylon 70 denier ripstop
(The following values are plus or minus 10%.)
Count: Warp: 106 Filling: 96
Weight: 1.85 oz. per square yard
Breaking Strength: Warp: 114 lbs. Filling: 92 lbs.
Tearing Strength: Warp: 7 lbs. Filling: 5 lbs.
Shrinkage: Warp: 2% Filling: 2%
Color Fastness and Crocking: 4 (Good)
Color: Charcoal

E6.5 Insulation: DuPont Thermolite Plus BSCL-100 quilted in a 6" diamond pattern

E6.5.1 Backing Fabric:

(a) Cloth Type: 100% nylon 70 denier plain weave taffeta.
(The following values are plus or minus 10%.)
Count: Warp: 110 Filling: 80
Weight: 1.8 oz. per square yard

Color Fastness and Crocking: 4 (Good)
Color: Black

E6.6 Construction

E6.6.1 Thread type: Textured polyester wrapped, polyester core
Quilt stitches per inch (min.): 10 spi

E6.7 Interlining

E6.7.1 For Front Zipper Reinforcement:

Cloth Type:	100% cotton Osnaburg	
Count:	Warp: 32	Filling: 26
Weight:	3.55 oz. per sq. yard	
Break Strength [lbs]	Warp: 60 (min.)	Filling: 35 (min.)
Shrinkage:	Warp: 3% (max)	Filling: 3% (max)
Color:	Black	

E6.7.2 For Pocket Welts

Cloth Type:	100% polyester non-woven	
Weight:	2.5 oz. per square yard	
Break Strength:	Machine direction:	5 lbs per inch
Across machine:	5.5 lbs. per inch	
Color:	Charcoal	

E6.8 Knit

E6.8.1 The yarn used for all knit shall be single-ply 100% continuous filament texturized polyester. The minimum wales per inch shall be 28 and the minimum courses per inch shall be 18. The knit shall show colorfastness to light, perspiration, wet-dry cleaning and crocking equal to or better than the standard sample. When a standard sample is not available, the cuffs and cloth shall show a minimum of "good" fastness to light; perspiration; wet-dry cleaning and shall show a Munsel value for crocking no lower than 8.5.

E6.9 Knit Wristlets

E6.9.1 Knit wristlets shall be 100% polyester, 1 X 1 rib knit, flare type. Wristlets shall measure 7 x 3.25 inches.

(a) Color: Dyed to match shell fabric.

E6.10 Knit Waistband Material

E6.10.1 The knit waistband shall be 100% polyester 1 x 1 rib stitch. The knit cloth shall weight a minimum of 11 ounces per square yard. The waistband length (wale direction) shall be 6.5 inches.

(a) Color: Dyed to match shell fabric.

E6.11 Knit Collar Material

E6.11.1 The knit collar shall be 100% polyester 1 x 1 rib stitch. The knit cloth shall weight a minimum of 11 ounces per square yard. The collar length (wale direction) shall be 4.5 inches.

(a) Color: Dyed to match shell fabric.

E6.12 Ribbon Loops

E6.12.1 Ribbon loops shall be 0.5" nylon braid MIL-T-5038 Type III #7407.

(a) Color: Black

E6.13 Zippers

E6.13.1 Front zipper shall be one-way, reversible (to allow jacket to zip into a component shell garment), delrin, size #5, 23 inches in length (for size L/Reg). Pocket zippers shall be one-way, coil, size #3, 7 inches in length. Side zippers shall be black coil one-way, size #3, 10 inches in length. Zipper to remove sleeves shall be size #3, 25" in length.

(a) Color: Black

E6.14 Thread

E6.14.1 Thread for single needle lockstitch seams shall be size #50 polyester wrapped polyester core, direct dyed. Thread for safety stitch seams shall be polyester wrapped polyester core, direct dyed size #50 in the needles and size #70 in the loopers.

(a) Color: Shall match specified fabric.

E6.15 Design and Construction

E6.16 The jacket shall be waist length, drop shoulder single-breasted design with two-piece sleeves, zipper front closure, knit collar, knit waistband, and knit cuffs. There shall be mock yokes front and back to provide access to sew on the Scotchlite package. There shall be two lower slash pockets with zippers, fleece pile body lining and insulated sleeve lining quilted to nylon taffeta face fabric. Zip-off sleeves to allow wear as stand alone Bomber/Vest or zip-in Bomber/Vest. Scotchlite Package across chest, back and upper arms.

E6.17 Sleeves

E6.17.1 Sleeves shall be two piece, drop shoulder design, with specified knit cuffs at the bottom. The sleeve shall have a hidden zipper sewn in at the shoulder seam to allow the sleeves to be zipped off and the garment worn as a vest. The shoulder zipper will have a 1" wide storm flap to conceal the zipper. There shall be a ribbon loop at each cuff seam and the collar to allow for attachment into a component shell garment.

E6.18 Outer Pockets

E6.18.1 There shall be two angled lower slash pockets with zippers measuring 7 inches long. The pocket bags shall be constructed of brushed polyester for hand warming and overlock stitched for durability.

E6.19 Inner Security Pocket

E6.19.1 The inside left security pocket shall measure 7 inches wide by 9 inches deep and close with a 1-inch by 1-inch piece of hook and loop the same as the outer shell.

E6.20 Interlining

E6.20.1 The following parts shall be interlined: Fronts and Pocket Welts.

E6.21 Seam Stitching

E6.21.1 All stitching shall be even and uniform. All joining seams shall be five thread safety stitch and overlock construction. All seams shall be eight stitches per inch minimum to twelve stitches per inch maximum. All seams shall be straight and clean with thread ends trimmed. All other seams shall be single needle lock stitch. Seams shall be free from puckering, pleats, runoffs and raw edges.

(a) Color: Shall match specified fabric color.

E6.22 Labelling

E6.22.1 Shall be permanently labelled with the manufacturer, care instructions, and size.

E6.23 Epaulettes

- E6.23.1 Epaulettes shall be 2.5 inches in width at the sleeve joining seam and shall taper to 2 inches in width at the narrow end.
- E6.23.2 The point of the epaulettes shall finish at the collar, joining seam of the coat, fastened with buttonhole and black button.
- E6.23.3 Epaulettes shall be removable.

E7. SCOTCHLITE

- E7.1 Jackets required shall be with and without "Paramedic" Scotchlite wording. Jackets not requiring "Paramedic" wording on them, will still require reflective tape as noted in E7.1.1.
 - E7.1.1 1.5" Scotchlite stripe package is to be sewn and seam sealed on the garment around chest and upper arms.
 - E7.1.2 1.5" Scotchlite stripe package around chest and upper arms. On upper back Scotchlite will have a space to allow wording such as "PARAMEDIC" or otherwise specified, in Scotchlite three (3) inch high letters by 10" long in the middle of the back.
 - E7.1.3 1.5" wide Scotchlite stripe on each side of the word "PARAMEDIC" or otherwise specified. All scotchlite is to be sewn onto garments.
 - E7.1.4 Wording such as "PARAMEDIC" or otherwise specified is to be heat transferred in one (1) inch high Scotchlite letters on wearers upper left front.

E8. SIZE AND MEASUREMENTS

E8.1 Stock Size Range

- E8.1.1 The size range shall be:
 - (a) Men's: Regular: S (36-38) to 3XL (56 - 58)
 - (b) Tall: M (40-42) to 3XL (56 - 58)

E8.2 Measurements

- E8.2.1 Measurements required shall be:
 - (a) Size: XS S M L XL 2XL 3XL
 - (b) Chest: 44 48 52 56 60 64 68
(measured in inches at armhole and side seam, + or - 0.75 inches)
 - (c) Back Length: Size L: Small = 25.5 Reg = 27, Tall = 28.5
(increases 0.5 inches for each size (example: size X-Large/Reg. = 27.5)
(measured in inches from neck seam to bottom of hem + or - 0.75 inches)
 - (d) Sleeve Inseam Length: Size L: Small 23.5 Reg=24.5, Tall = 27
(measured in inches from armhole seam to bottom of cuff + or - 0.5 inches)

Template Version: G220050301

	<ul style="list-style-type: none"> ● Bomber Jacket Liner 							
	<ul style="list-style-type: none"> ● 							
Fabric:	<ul style="list-style-type: none"> ● Nylon 70 denier warp and 2-ply 70-Denier taslanized nylon filling plain weave, Pantone TC1940/15 ● Treated with durable fluorocarbon water and stain release agents ● Backcoating: Honeycomb pattern printed urethane non-ravel coating to insure breathability, prevent seam slippage, and to maintain shell fabric appearance. ● Polartec body lining, 7768 black ● Thermolite sleeve lining 100 g. (Dupont) 							
Component:	<ul style="list-style-type: none"> ● Heavy-duty nylon zipper 							
Description:	<ul style="list-style-type: none"> ● Bomber style with knit collar, wristlets and waistband ● Zipper slash front pockets ● Zipper front ● Detachable sleeves bomber ● Scotchlite 1 inch stripe around chest and upper arms 							
Stock:	<ul style="list-style-type: none"> ● 							
Special order:	<ul style="list-style-type: none"> ● Dark navy 							
Size:		XS	S	M	L	XL	XXL	XXXL
S		•	*	•	•	•	•	•
R			*	*	*	*	*	*
T				•	•	•	•	•

Features:

Designed to zip into the Outer Shell as a zip in Bomber or Vest, and be worn as a stand alone Bomber or Vest.

Upper Left Front to have "PARAMEDIC" or otherwise specified in 1" high Scotchlite lettering. The wording "Paramedic" or otherwise specified is to be heat transferred onto the garment.

Scotchlite 1.5" stripe on back to have a break in the stripe and inserted "PARAMEDIC" or otherwise specified 3" high in Scotchlite letters and 1.5" scotchlite on sleeves. All Scotchlite is to be sewn onto each garment.

Special option:



E9. TESTING REQUIREMENTS

E9.1 Minimum Performance Specifications, 3-Layer Waterproof/Breathable Fabric and Seam tape for Shell Constructions where Blood, Body Fluid and “Common Chemical” Penetration Resistance is required.

E9.2 Composition: Waterproof/Breathable Shell Fabric and Seam Tape:

- (a) Base Materials Top Layer:
 - (i) Fabric: 100% Woven Polyester
- (b) Base Materials Middle Layer
 - (i) Bi-component expanded polytetrafluoroethylene membrane
- (c) Base Materials Bottom Layer
 - (i) Fabric: 100% Tricot Polyester
- (d) Base Materials: Seam Tape
 - (i) Seam tape materials must be made with the same base materials as the fabric materials and be manufactured by the same source as the waterproof/breathable fabric for durable compatibility.

E9.3 Physical Properties: Waterproof/Breathable Shell Fabric (Footnotes with Test methodology follow at the end of this specification).

E9.4 Measured Property Testing

<u>Characteristic</u>	<u>Requirement</u>	<u>Test Method</u>	<u>Footnote</u>
	Weight	5.4 Maximum	ASTM D 3776-96

OPTION C

(oz./sq. yard)

Moisture Vapour Transmission Rate
 (g/m²/24hr)

Procedure	B 600 Minimum	ASTM E 96-93	E10.1
Procedure BW	5000 Minimum	ASTM E 96-93	E10.2

Hydrostatic Resistance

(psi)	140 Minimum	FED-STD-191A 5512	E10.3
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Low Pressure Water Permeability

Initial	No Leakage	FED-STD-191A 5516	E10.4
After Cold Flex		ASTM D 2097-69 (1980)	E10.5
Warp	No Leakage		
Fill	No Leakage		
After 100 Hours of Continuous Wet Flex	No Leakage	AATCC 135-1992	E10.6
(agitation)			
After Dry Cleaning	No Leakage	FED-STD-191A 5516	E10.7

<u>Characteristic</u>	<u>Requirement</u>	<u>Test Method</u>	<u>Footnote</u>
High Pressure Water Permeability			
Initial	No Leakage	BS 3424: Part 26: 1990 Method 29A	E10.8
After Unleaded Gasoline	No Leakage	BS 3424: Part 26: 1990 Method 29A	E10.9
After DEET Insect Repellent	No Leakage	BS 3424: Part 26: 1990 Method 29A	E10.9
After Hoppes #9 Gun Cleaner	No Leakage	BS 3424: Part 26: 1990 Method 29A	E10.9
After Motor Oil SAE 15W-40	No Leakage	BS 3424: Part 26: 1990 Method 29A	E10.9
After Synthetic Perspiration	No Leakage	BS 3424: Part 26: 1990 Method 29A	E10.10

Liquid Blood and Body Fluid Penetration Resistance

After 25 Laundry Cycles	No Penetration	ASTM F1671	E10.11
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“Common Chemical” Penetration Resistance

“Common Chemicals” as defined by the National Fire Protection Association (NFPA): battery acid (37% sulfuric acid); hydraulic fluid; gasoline (reference fuel C); AFFF (aqueous fire fighting foam); and swimming pool chlorine.

After 25 Laundry Cycles	No Penetration	ASTM F903C	E10.12
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Seam Tape Water Permeability

Initial	No Leakage	FED-STD-191A 5516	E10.13
After 10 laundry cycles	No Leakage	FED-STD-191A 5516 ANSI/AATCC 135	E10.14
After 10 dry-clean cycles	No Leakage	FED-STD-191A 5516	E10.16

E10. FOOTNOTES: (TEST METHODOLOGY FROM SHELL FABRIC SPECIFICATIONS)

E10.1 The knit side of the laminated cloth shall face the water. The free stream air velocity shall be 550 ± 50 fpm as measured at least 2 inches from any surface. The test shall be for 24 hours and weight measurements shall be taken only at the start and completion of the test. At the start of the 24 hour test period, the air gap between the water surface and the back of the specimen shall be $3/4 \pm 1/16$ inch. Five specimens shall be tested. The test chamber shall be $73.4 \pm 1^\circ\text{F}$ and relative humidity shall be $50 \pm 2\%$. The face of the rim of the test dish shall project $1/32$ " into the tunnel.

E10.2 The knit side of the laminated cloth shall face the water. The free stream air velocity shall be 550 ± 50 fpm as measured at least 2 inches from any surface. The test shall be for 2 hours and weight measurements shall be taken only at the start and completion of the test. Five specimens shall be tested. Specimens shall be sealed in any manner which prevents wicking and/or leakage of water out of the cup. The test chamber shall be $73.4 \pm 1^\circ\text{F}$ and relative humidity shall be $50 \pm 2\%$. The face of the rim of the test dish shall project $1/32$ " into the tunnel.

E10.3 The water pressure shall be applied to the knit side of the laminated cloth.

- E10.4 The knit side of the laminated cloth shall contact the water. The hydrostatic head shall be 30 inches (1.1 psi) and shall be held for 3 minutes. Leakage is defined as the appearance of water any place within the 4.5 inch diameter test area. The test may be performed using any device which tests the same specimen area at the equivalent pressure. In case of dispute, the apparatus described in FED-STD-191A Method 5516 shall be used.
- E10.5 Ten warp and ten fill specimens 3.25" x 4.5" shall be selected from each sample unit. The 3.25" dimension is the test direction. Specimens shall be flexed for 20,000 cycles as specified in ASTM-D 2097 and as follows. Mark the knit side of each specimen with two lines 1.7 inches apart and perpendicular to the test direction. The area between the lines is the test area and shall be centered on the knit side of the specimen. Wrap the specimens around fully extended pistons with the knit side out. The test area lines shall meet evenly and shall line up with the edges of the pistons. Clamp in place making sure the clamps are not in the test area. Check specimen for smoothness and tautness (wrinkles cause improper flexing). The distance between the pistons shall be 1.7" in the open position and 0.5" in the closed position as measured from the bottom of the upper piston and top of the lower piston. Place the test apparatus with mounted specimens in a test chamber at $-25 \pm 2^{\circ}\text{F}$ for a one hour conditioning period and then flex in the test chamber at $-25 \pm 2^{\circ}\text{F}$. After flexing, test for water permeability as in footnote E10.4 except that the orifice of the tester shall be modified to accommodate the smaller specimen size.
- E10.6 One 14 inch by full width specimen shall be selected from each sample unit. The specimens shall be agitated using the "normal" cycle in an automatic home laundering machine as specified in AATCC 135-1992 except that the machine shall be capable of continuous agitation. The water level shall be maintained at 16 ± 1 gallons, and the water temperature shall be $32 \pm 9^{\circ}\text{C}$. The load shall be 2 ± 0.2 pounds. The specimen shall be removed from the washer after 100 hours of continuous agitation. The specimen shall be air dried and then tested for water permeability at three sites across the width of the specimen according to footnote E10.4.
- E10.7 One 1 yard by full width specimen shall be selected from each sample unit. The specimens shall be professionally dry-cleaned ten (10) times with a pure distilled solvent rinse. The specimens shall be tested for water permeability at three sites across the width of the specimen according to footnote E10.4.
- E10.8 The water pressure shall be applied to the knit side of the laminated cloth from below the test specimen. The maximum pressure of 25 psi shall be attained in 2 minutes \pm 20 seconds and shall be applied for 5 minutes. Leakage is defined as the appearance of water any place within the test area.
- E10.9 Place a 6" x 6" piece of blotting paper on a flat surface and cover with a 10" x 10" test specimen with the face side up. Weigh out 2.0 ± 0.1 grams of solid contaminant or pipette 2.0 ml of liquid contaminant. Place the contaminant on the center of the specimen and cover with a 6" x 6" piece of glassine paper. Place a 4 pound weight on the glassine paper directly over the contaminated area. Allow the weight to remain on the specimen for 30 minutes. Remove the weight and glassine paper and allow the specimen to sit undisturbed for an additional 30 minutes. Wipe off any excess contaminant using a fresh piece of blotting paper and test for water permeability as in footnote E10.8 except that the water pressure shall be applied for 3 minutes.
- E10.10 One specimen per sample unit shall be tested for water permeability after exposure to synthetic perspiration. The specimen shall be not less than six inches in diameter. The test cups shall accommodate this size specimen and shall have a depth of at least one inch. The cups shall be sealed to prevent leakage. The solution shall contact the knit side of the laminate.
- (a) Synthetic perspiration shall be prepared by stirring the following ingredients into 500 ml of distilled water:
- (i) 3 grams sodium chloride

- (ii) 1 gram predigested protein
- (iii) 1 gram n-propyl propionate
- (iv) 0.5 gram lecithin (phosphatidyl choline)

E10.11 The predigested protein shall contain the following amino acids:

<u>Ingredient</u>	<u>Milligrams (mg)</u>
Lysine	82.5
Histidine	27.5
Arginine	40.0
Aspartic acid	72.5
Threonine	42.5
Serine	50.0
Glutamic acid	197.5
Proline	92.5
Glycine	22.5
Alanine	28.7
Cystine	4.7
Valine	66.2
Methionine	30.0
Isoleucine	53.8
Leucine	87.5
Tyrosine	51.3
Phenylalanine	48.8
Tryptophane	18.8

- (a) The solution shall be stirred continuously and heated to $50 \pm 1^\circ\text{C}$, then covered and cooled to approximately 35°C .
- (b) The solution shall be stirred such that any solid particles are suspended in solution and poured into the test cup. The cup shall be inverted to allow the synthetic perspiration to evaporate through the specimen.
- (c) After the solution has evaporated through the specimen, such that no more than 0.125 inch of solution remains, the specimen shall be removed from the cup, rinsed in warm water, dried and tested for water permeability as specified in footnote E10.8 except that the water pressure shall be applied for 3 minutes.

E10.11.1 One 14 inch by full width specimen shall be selected from each sample unit. The specimens shall be subjected to 25 cycles of washing and drying in accordance with the procedure specified in Machine Cycle 3, Wash Temperature III, and Drying Procedure Aiii as specified in AATCC 135-1992. The specimen shall then be subjected to ASTM F 1671 in three locations and checked for viral penetration. The film side of the fabric shall face the challenge fluid.

E10.12 One 14 inch by full width specimen shall be selected from each sample unit. The specimens shall be subjected to 25 cycles of washing and drying in accordance with the procedure specified in Machine Cycle 3, Wash Temperature III, and Drying Procedure Aiii as specified in AATCC 135-1992. The specimen shall then be subjected to ASTM F 903C in three locations and checked for resistance to the following "common chemicals" as defined by the National Fire Protection Association: battery acid (37% sulfuric acid); hydraulic fluid; gasoline (reference fuel C); AFFF (aqueous fire fighting foam); and swimming pool chlorine. The film side of the fabric shall face the challenge fluids. The duration of the test shall be 1 hour (5 minutes at ambient pressure, 1 minute at 2 psi and 54 minutes at ambient pressure). Any liquid strike though is considered a failure.

E10.13 A minimum of 3 straight seams and 2 cross-over seams should be tested prior to laundry cycle testing and remain waterproof (no leakage) when tested at 2 psi for 3 minutes with the seam

tape side facing up, away from the water challenge. Leakage is defined as the appearance of water any place within the 4.5 inch diameter test area since the seam tape process can damage the fabric adjacent to the tape. The test may be performed using any device that tests the same specimen area at the equivalent pressure. In case of dispute, the apparatus described in FED-STD-191A Method 5516 shall be used.

E10.14 A minimum of 3 straight seams and 2 cross-over seams should be tested after ten (10) home laundry cycles and remain waterproof (no leakage) when tested at 2 psi for 3 minutes with the seam tape side facing up, away from the water challenge. Leakage is defined as the appearance of water any place within the 4.5 inch diameter test area since the seam tape process can damage the fabric adjacent to the tape. The test may be performed using any device that tests the same specimen area at the equivalent pressure. In case of dispute, the apparatus described in FED-STD-191A Method 5516 shall be used. Laundry testing should be performed in accordance with the procedure specified in Machine Cycle 3, Wash Temperature III, and Drying Procedure Aiii of ANSI/AATCC 135.

E10.15 A minimum of 3 straight seams and 2 cross-over seams should be tested after ten (10) dry clean cycles and remain waterproof (no leakage) when tested at 2 psi for 3 minutes with the seam tape side facing up, away from the water challenge. Leakage is defined as the appearance of water any place within the 4.5 inch diameter test area since the seam tape process can damage the fabric adjacent to the tape. The test may be performed using any device that tests the same specimen area at the equivalent pressure. In case of dispute, the apparatus described in FED-STD-191A Method 5516 shall be used.

E10.16 Measured Property Acceptance Criteria

E10.16.1 For moisture vapour transmission rate and hydrostatic resistance, the mean of each sample unit must meet the requirement specified. The mean is the average of five cross-web specimens. For water permeability, blood and body fluid and common chemical testing, each individual specimen must meet the requirement specified.

E11. DELIVERY

E11.1 Goods shall be delivered on an "as required" basis during the term of the Contract, f.o.b. destination, freight prepaid, to 2546 McPhillips Street, Winnipeg, Manitoba R2P 2T2.

E11.1.1 Goods shall be delivered within sixty (60) Business Days of the placing of an order, except where otherwise agreed at the time of ordering.

E11.2 Goods shall be delivered between 7:00 a.m. and 3:30 p.m. on Business Days.

E11.3 The Contractor shall off-load goods as directed at the delivery location.