

## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 The following are applicable to the Work:

| <u>Specification No.</u>              | <u>Specification Title</u>  |
|---------------------------------------|---|
| NIJ Standard<br>0101.04               | Ballistic Resistance of Personal Body Armour<br><a href="http://www.nlectc.org/pdf/files/0101.04RevA.pdf">http://www.nlectc.org/pdf/files/0101.04RevA.pdf</a>   |
| NIJ Standard<br>0101.04<br>Addendum A | Ballistic Resistance of Personal Body Armour<br>Addendum A<br><a href="http://www.nlectc.org/pdf/files/04addendum_a.pdf">http://www.nlectc.org/pdf/files/04addendum_a.pdf</a>   |
| MIL-Standard<br>662F                  | Military Standard Ballistic Test for Armour – V50 Test<br>Source: U.S. Department of Defence<br><a href="http://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=35877">http://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=35877</a> |
| CGSB 4.2 NO.<br>26.5-M89-<br>CAN/CGSB | Textile Test Methods Water Resistance - High-Pressure Penetration Test<br><a href="http://canada.ihs.com/document/abstract/NV/IIHBAAAAAAAAAAAA">http://canada.ihs.com/document/abstract/NV/IIHBAAAAAAAAAAAA</a>   |
| <u>Drawing No.</u>                    | <u>Drawing Name/Title</u>   |
| 1                                     | Front Ballistic Panel   |
| 2                                     | Back Ballistic Panel  |
| 3                                     | Pouches, Front and Back   |
| 4                                     | Internal Carrier – Front  |
| 5                                     | Internal Carrier – Rear   |
| 6                                     | External Carrier – Front  |
| 7                                     | External Carrier – Rear   |
| 8                                     | External Carrier – Suspender Configuration  |
| 9                                     | Label Patterns  |

E1.3 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B5.

#### E2. GOODS

E2.1 The Contractor shall supply soft body armour vests in accordance with the requirements hereinafter specified.

E2.2 These specifications shall govern the manufacture and inspection of Soft Body Armour Vests, Male and Female.

E2.3 These specifications, schedules, drawings or other information issued in connection therewith, may only be used for specific enquiries, tenders, quotations, or orders placed on behalf of the Winnipeg Police Service.

#### E3. GENERAL REQUIREMENTS

E3.1 The article or material covered by this specification shall be free from imperfections or blemishes such as may affect its appearance or serviceability. All workmanship is to be of first quality. No defect that might affect the performance, wearability, or durability of the vest will be

tolerated. The City of Winnipeg shall have the sole right to determine if this and all other requirements have been met.

- E3.2 Soft Body Armour panels manufactured to this Specification shall be certified by LECTC to Level II NIJ Standard 0101.04, NIJ Standard 0101.04 Addendum A, and all lesser Ballistic threats, and further to E3.1 shall be free from imperfections, wrinkles, blisters, cracks, fabric tears, blemishes such as may adversely affect its wear, appearance and or serviceability.
- E3.3 Design – Soft body Armour Vest coverage is to provide full wrap, but not overlap, protection of the torso. Coverage is to be the maximum available consistent with wearability needs. Vests shall provide:
- (a) “full wrap” side panels that “butt fit” at the sides, with no more than a one (1”) inch gap or overlap
  - (b) Suitable relief of one (1”) inch to two (2”) inch shall be allowed between the bottom of the vest and the gun belt while standing so that no binding occurs when the wearer is in the sitting position.
  - (c) Ample relief to the armpit region.
  - (d) Ample relief to neck area
  - (e) Further to E3.3 (d) a two (2”) inch to three (3”) inch scoop shall be cut into the neck region that prevents the armour from showing when worn under a shirt with an open collar when worn in conjunction with the Internal Carrier
- E3.4 Vests shall consist of two carriers, one to be worn under the uniform shirt (internal) and one to be worn overtop of the uniform shirt (external). Each shall be capable of containing a front and rear ballistic panels described below. The Ballistic panels shall be able to be removed to allow for cleaning. Both internal and external carriers are to be designed to be washed and the ballistic panels are to be designed to be wiped clean.

## **BALLISTIC PANELS (Drawings 1 and 2)**

### **E4. PROTECTION LEVEL (BALLISTIC RESISTANCE)**

- E4.1 Each ballistic panel shall protect against Type II ballistic threats as specified in NIJ Standard 0101.04 section 2.3 as well as all lesser threat levels mentioned in sections 2.1 and 2.2.
- E4.2 The Contractor shall warrant that each certified model will continue to perform at its established levels as demonstrated by independent laboratory tests, within a normal variation of six percent (6%) of the NIJ 0101.04 standard (Level II) for a minimum service life of five years.

### **E5. CLOTH, BALLISTIC ARAMID**

- E5.1 Shall be constructed of Ballistic Aramid Yarn with a maximum yarn size of 930 Decitex (840 Denier), plain weave.
- E5.2 Yarn produced under the trade names Kevlar or Twaron are acceptable.
- E5.3 The cloth shall be natural in colour and shall be thoroughly scoured with not more than 0.7% residuals. No bleaching or loading may be applied in processing the cloth and shall be free of imperfections.
- E5.4 The fabric shall be treated with fluorochemicals water-repellent material such as Zepel D fluropolymer or equivalent. A single coat of waterproofing on one side is required for waterproofed material. The water repellence of the fabric shall be such that when tested in accordance with CGSB 4.2 NO. 26.5-M89-CAN/CGSB, Sample Conditions 21°C, 65% RH shall meet standard.
- E5.5 Ballistic panels shall be constructed using a number of unbound layers of ballistic aramid cloth which shall not exceed a total weight of 470g/m<sup>2</sup> for level II protection. The layers of the

finished panel must be held together by means of stitching through all plies at a minimum of each shoulder and also across the full length of the bottom.

- E5.6 Female front panels shall have an overlap of 3 cm minimum to form the bust shape and shall have a minimum of three rows of stitching using bonded nylon thread (Type II R70 Tex.) to ensure ballistic integrity. Seams and shape may vary in order to produce the correct cup size (female darted style).
- E5.7 Stitch type for seams shall be Type 301 (lock stitch) with type 504 (serge) or alternately type 516 or 517 (seam and serge). Type 504 will have no less than 2 or more than 4 stitches per cm (5 to 10 stitches per inch). The beginning and ending of all stitching shall be securely backstitched tacked, unless secured by other stitching. Stitching shall present a regular, even appearance without fabric pucker. Where seaming, turning and stitching is specified, the edges shall be properly worked out before stitching. Loose thread shall be trimmed off and removed.
- E5.8 Ballistic panels shall have equal ballistic resistance capabilities when shot from either side of the panel.

**E6. BALISTIC REQUIREMENTS:**

- E6.1 Plain type weave
- E6.2 Warp x fill (ends/cm) 11 x 11, tolerance of  $\pm 0.50$
- E6.3 Basic weight ( $\text{g/m}^2$ ) 206, tolerance of  $\pm 5.0$
- E6.4 Width (cm) 175.25, must be greater than 172.75
- E6.5 Thickness (mm) 0.28, tolerance of  $\pm 0.02$
- E6.6 Warp x fill – yarn breaking strength (N) 140.0, must be greater than 135.0
- E6.7 Warp x fill – 1 inch strip break (N) 3500.0, must be greater than 3000.0
- E6.8 9mm – 124 gr. FMJ V50 testing, 20 layers, clay backing, (m/sec) 420, must be greater than 400
- E6.9 357 M – 158 gr. JSP V50 testing, 22 layers, clay backing, (m/sec) 460, must be greater than 450
- E6.10 Shrinkage: 2.5% Maximum
- E6.11 Spray rating: 100
- E6.12 High Pressure Penetration Test using Mullan Head tester: 690 KPA (100psi)

**E7. REPORTS AND QUALITY CONTROL,**

- E7.1 Ballistic Aramid Cloth and Panels – A lot shall consist of approximately 1000 to 3000 metres of ballistic aramid cloth. Every lot shall be tested for the following:
  - E7.1.1 Cloth
    - (a) Crimp Balance;
    - (b) Extracted yarn strength;
    - (c) Shower rating for water repellence;
    - (d) Other tests required by yarn manufacturer or mill as required.
  - E7.1.2 Panels

- (e)  $V_{50}$  ballistic resistance as specified in MIL Standard 662F using 9mm FMJ 124 grain ammunition to be performed on a finished front and back size 44-46 regular male vest without carrier, Dry Test Only;
  - (f)  $V_{50}$  ballistic resistance as specified in MIL Standard 662F using .357 Magnum, jacketed soft point, 158 grain ammunition to be performed on a finished front and back size 44-46 regular male vest without carrier, Dry Test Only;
  - (g) NIJ sampling, minimum two complete vests per lot for dry, wet and angle shots Type II.
- E7.1.3 All test costs will be paid for and arranged by the contractor/manufacturer
- E7.1.4 All test reports related to each lot must be submitted to the Contract Administrator prior to the shipping of any goods. Records related to and including production and testing of ballistic cloth and ballistic panels shall be maintained by the producing textile mil and vest manufacturer for a minimum period of ten (10) years.
- E7.1.5 In addition to E7.1.4 the manufacture shall also provide a data sheet on the ballistic fabric used showing the following information including test methodologies used:
- (a) Fibre type;
  - (b) Size;
  - (c) Weave count (warp and weft);
  - (d) Weave type;
  - (e) Weight;
  - (f) Breaking strength (warp and weft);
  - (g) Tearing strength (warp and weft);
  - (h) Shrinkage.

### **CLOTH POUCH – BALLISTIC PANEL (drawing 3)**

#### **E8. CLOTH POUCH**

- E8.1 Cloth Pouch for Ballistic Panel: Each ballistic panel shall be permanently covered with a water resistant material. The cover must prevent body oils, and liquids from contaminating the ballistic panel and/or compromising the water-resistant properties of the cover.
- E8.2 Front cloth pouch shall have pile type Velcro attached to both left and right shoulder portions of the pouch, away from body. Each portion shall be a minimum of 5 cm wide and 8 cm high.
- E8.3 Back cloth pouch shall have pile type Velcro attached to panel away from body approx 3cm from top of pouch. Velcro is to be horizontally centered and to be a minimum of 10cm wide and 5cm high.
- E8.4 A label shall be affixed to the body side of the cloth pouch on both the front and back pouch. This label shall contain all completed information listed in Drawing No. 9, LABEL FOR BALLISTIC CLOTH POUCH and placed in accordance with Drawing No. 3, POUCHES, FRONT AND BACK.
- E8.5 All vests shall be serialized, 100 percent (100%) inspected and traceable. Records must be available to the Winnipeg Police Service for inspection within seven (7) calendar days of a request by the Contract Administrator. This serial number must be clearly marked on both the Cloth pouch label for the Ballistic panel as specified in E8.4as well as both the internal and external carrier labels.

### **CARRIERS – GENERAL INFORMATION**

## **E9. CARRIER - GENERAL**

- E9.1 The carrier shall not restrict the wearer's movements. Relief under the arm shall be such that the garment does not ride up and chafe the wearer under the arm.
- E9.2 Components of the carrier shall be cut and assembled so that on the finished garment the warp shall run in the same direction (up and down the garment). There shall be no discernible differences in the shade between the fabric components of the finished garment.
- E9.3 Opening shall be constructed to form front and back pockets shaped to securely retain the ballistic panels in place. Openings shall be located so as to facilitate the insertion and removal of the ballistic panels. Panels are to be inserted toward body and closed by Velcro across the entire opening.
- E9.4 Panel Suspension system shall secure the ballistic pouch in place. The hook portion shall hang from each shoulder seam to accept the loop portion stitched on the cloth pouch on the front carrier and horizontally centered to accept the loop portion stitched on the cloth pouch on the back panel.
- E9.5 A label shall be positioned on the carriers stating model, size, date of issue, and carrier care instructions. Washable indelible ink must be used. Internal and external carriers shall be guaranteed against defects in workmanship. Internal carrier label placement shall be as illustrated in Drawings 4 and 5. External carrier placement shall be as illustrated in Drawings 7 and 8.
- E9.6 Both Internal and External carriers must have two (2) armour plate pockets so that the wearer has the option of using either a standard 5" by 8" (13cm by 20cm) or a 7" by 10" (18cm by 25cm) armour plate. The closures for both these openings must contain hook and loop closures. Placement of pockets shall be as illustrated in Drawing 6 and as described in Drawing 4.

## **INTERNAL CARRIER (drawings 4 and 5)**

### **E10. INTERNAL CARRIER**

- E10.1 Cloth covering shall be Dark Navy in colour and shall meet the following specification:
- (a) Fibre Blend – 65% (+/- 3%) poly, 35% (+/- 3%) cotton
  - (b) Weave – plain
  - (c) Poplin composition with SD0S (soft & drapery & sanforized)
  - (d) Weight 178 g/m<sup>2</sup>
  - (e) Shrinkage 2% by 2%
  - (f) Pilling – 3% (max)
  - (g) Washing – Grey Scale 4 (min)
  - (h) Light – L-4 (min)
  - (i) Perspiration – Grey Scale 4 (min)
  - (j) Crocking – Dry 4 (min), Wet 4 (min)
  - (k) Crease Recovery – 70%
  - (l) Non-Fibrous Material – 3.1% (max)

Note: Doubletex "Calypso US" and Bounty Set US" meet these specifications. Other manufacturers' fabrics will be acceptable provided they meet this standard

- E10.2 Elastic used with the Internal Carrier shall be heavy elastic 50mm +/- 2mm in width, black in colour, meeting the following requirements:
- (a) Stretch – 95-130%

- (b) Drop tension - 35%-45% @ 1.36 kg
- (c) Content – 53% polyester, 47% rubber
- (d) Shrink – maximum of 7%

Note: Narroflex product #NC72 is known to meet the requirements

- E10.3 The neck cut-out (“U” type) and general configuration shall be compatible with the ballistic panel pattern.
- E10.4 Each internal carrier shall be six (6) points adjustable. Location of these elastic points and attachment of the Hook Velcro is as specified in Drawing 5. Pile Velcro locations on the front carrier to attach these points to is specified as per Drawing 4.
- E10.5 The front and back panels shall be stitched and turned and then stitched 3mm gauge. The shoulder and side elastic straps of the back carrier specified in E10.2 shall be caught by both rows of stitching. On the initial stitching the elastic straps shall be securely backstitched.
- E10.6 The carrier shall have integral front and rear shirrtails, one layer of material, serge, turned and top stitched as shown in Drawings 4 and 5.

## **EXTERNAL CARRIER (drawings 6, 7)**

### **E11. EXTERNAL CARRIER**

- E11.1 Cloth covering shall be Black in colour and shall meet the following specification:
  - (a) 500 Denier Cordura
  - (b) Weave – plain
  - (c) 100% nylon
- E11.2 8 oz. per sq yd
- E11.3 Straps shall be Black Poly Pro webbing 25mm (one inch) wide
- E11.4 Strap buckle shall be a Trovato side release buckle 1” or equivalent. Equivalency must be approved by the City of Winnipeg as stated in B5 of this document.
- E11.5 Each vest shall be supplied with an external wear four point adjustable carrier. The front and back carrier panels must have two shoulder extensions. These extensions are to be equipped with a 4 inch (10 centimetre) hook and loop closure system with the back panel extensions to overlap the front. Each back panel shoulder extension is to be equipped with one inch (2.5 cm) horizontal microphone straps. Each torso side area is also to be equipped with a 6 inch (15 cm) hook and loop closure system with the back panel sides extending and overlapping the front.
- E11.6 The carrier front is to have two chest pockets with plastic zipper closures. Pockets shall be 5 inches (13cm) wide by 7 inches (18cm) deep. The lift pocket will be equipped with a retractable drop down badge tab. This tab will be clearly marked with white “POLICE” lettering. This tab shall consist of two plies of shell fabric measuring 4 inches (10cm) wide by 3 inches (8cm) high with finished edges. The right pocket will fit an officer's notebook and also have an insert to hold a pen or pencil.

## **SUSPENDER CONFIGURATION (drawing 8)**

### **E12. SUSPENDER CONFIGURATION**

- E12.1 Suspender configuration to be as per drawing 8. Two (2) black poly pro webbing straps shall be attached to the external carriers, both front and back panels, extending the full vertical length from shoulder to panel pouch opening.

- (a) The front carrier straps shall have previously been affixed, with stitching, pile type Velcro which will run from the neck opening to the panel pouch opening at it's base on the front carrier.
- (b) The rear carrier strap shall have previously been affixed, with stitching, pile type Velcro which will run from an equidistant point parallel to the front carrier's Velcro to the panel pouch opening at the base of the rear carrier.

### **E13. SUSPENDER STRAP**

- E13.1 Suspender strap shall be as per drawing 8 and shall consist of black poly pro webbing, as specified in E11.3. This webbing shall be in two parts:
- (a) Part one: four vest straps will have the male portion of the strap buckle mentioned in E11.4 attached by X cross anchor stitching. The length of the strap shall be similar in length requirement of E12.1(a) and E12.1(b). This strap shall be sewn with hook type Velcro. The intent of these straps are to attach to the straps previously mentioned in E12
  - (b) Part two: four vest straps shall have the female portion of the strap buckle mentioned in E11.4 attached by X cross anchor stitching. This strap shall be in a single loop with a 7.5cm opening. This opening's intent is to attach to the members service belt.

### **E14. SIZES AND FITTING**

- E14.1 Male and Female sizes – the Contractor shall be required to individually size and fit all garments to male and female members at;

Winnipeg Police Service  
Quartermaster Stores Unit  
472 Notre Dame Avenue  
Winnipeg, MB R3B 1R5

- E14.2 Further, the Contract Administer shall pre-determine the measurement dates of two separate weeks for Soft Body Armour Measuring per year, each week to consist of a consecutive Monday through Friday, 9am through 3pm. These measurement weeks shall be spaced out at an approximate ratio of one week per six month period. Notification of the measurement dates required shall be provided to the Contractor at the commencement of each calendar year of the Contract.
- E14.3 Initial fit of custom-measured vests shall be guaranteed to fit satisfactorily on delivery. The Contractor agrees to provide alterations or replacement free, until the wearer is satisfied, and all sizing and fitting shall be conducted at the Contractor's expense.

### **E15. PACKAGING AND DELIVERY**

- E15.1 Each vest must be packaged individually in a protective plastic bag and shipped in a specially designed protective cardboard box. A packing slip shall be enclosed showing the contents of each shipment.
- E15.2 Goods shall be delivered on a "scheduled" basis during the term of the Contract, f.o.b. destination, freight prepaid to:

Winnipeg Police Service  
Quartermaster Stores Unit  
472 Notre Dame Avenue  
Winnipeg, MB R3B 1R5

- E15.3 Scheduled dates where measurements will be required to be taken by the Contractor shall correspond with existing Winnipeg Police Service Recruit Training. To ensure processes are not disrupted, all soft Body Armour Vests shall be completed within the following schedule.

- (a) Recruit Vests shall be delivered within thirty (30) Calendar days after date of measurement. The Standard Recruit class is between 24 and 50 members.
- (b) Balance of shipment within ninety (90) Calendar days after date of measurement.

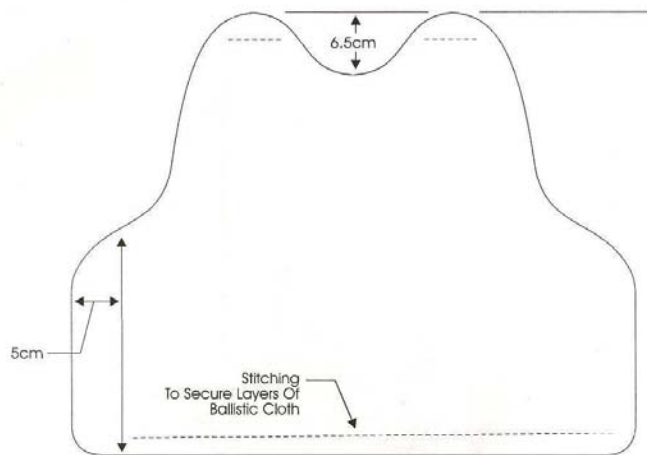
E15.4 Goods shall be delivered between 8:00 a.m. and 4:00 p.m. on Business Days.

E15.5 The Contractor shall off-load goods as directed at the delivery location.



**E16. DRAWINGS**

City of Winnipeg  
Front Ballistic Panel  
Dwg. 1

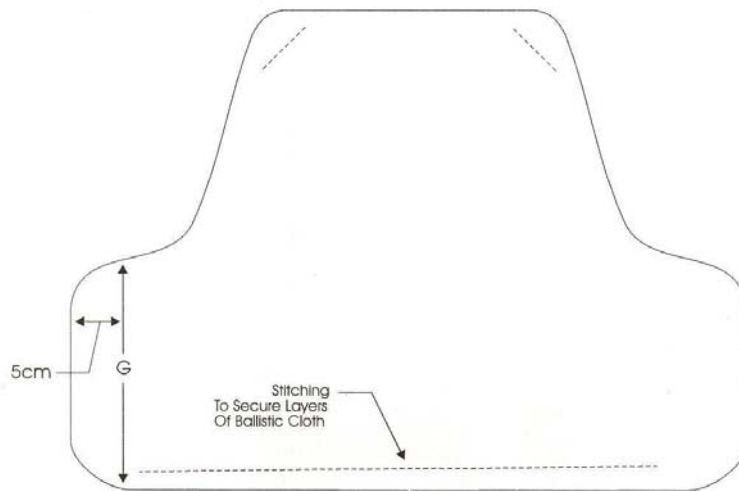


NOT TO SCALE

The City of Winnipeg

Back Ballistic Panel

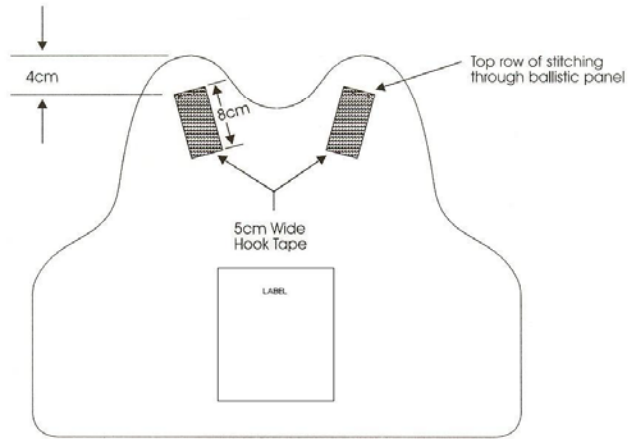
Dwg. 2



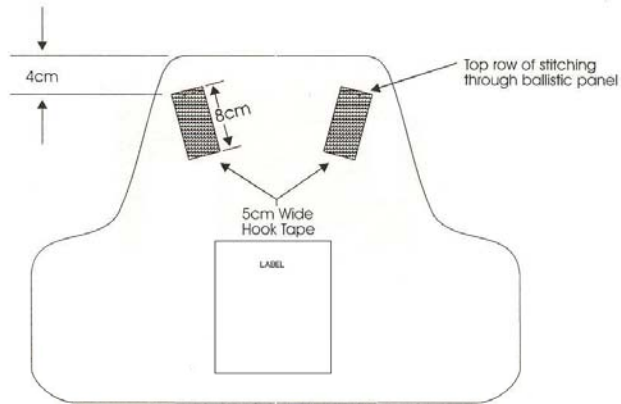
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The City of Winnipeg  
Pouches, Front and Back

Dwg. 3



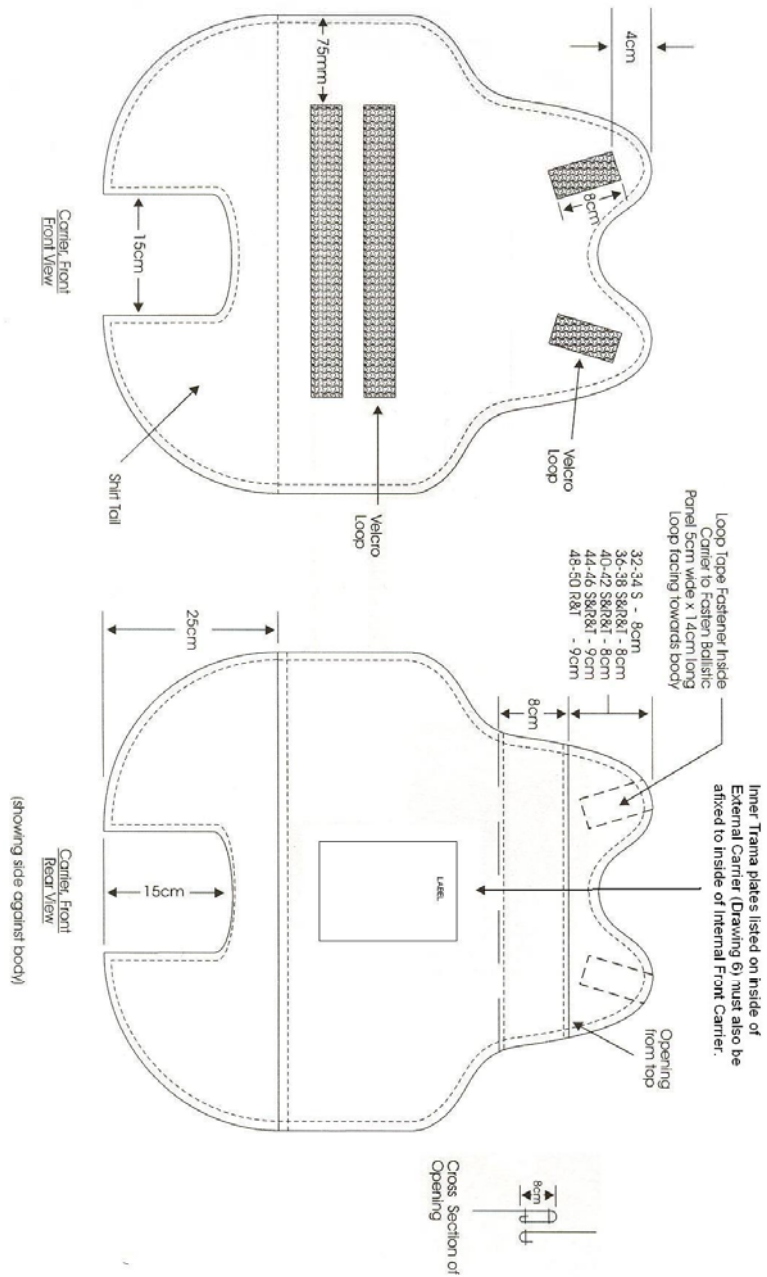
Pouch, Front



Pouch, Back

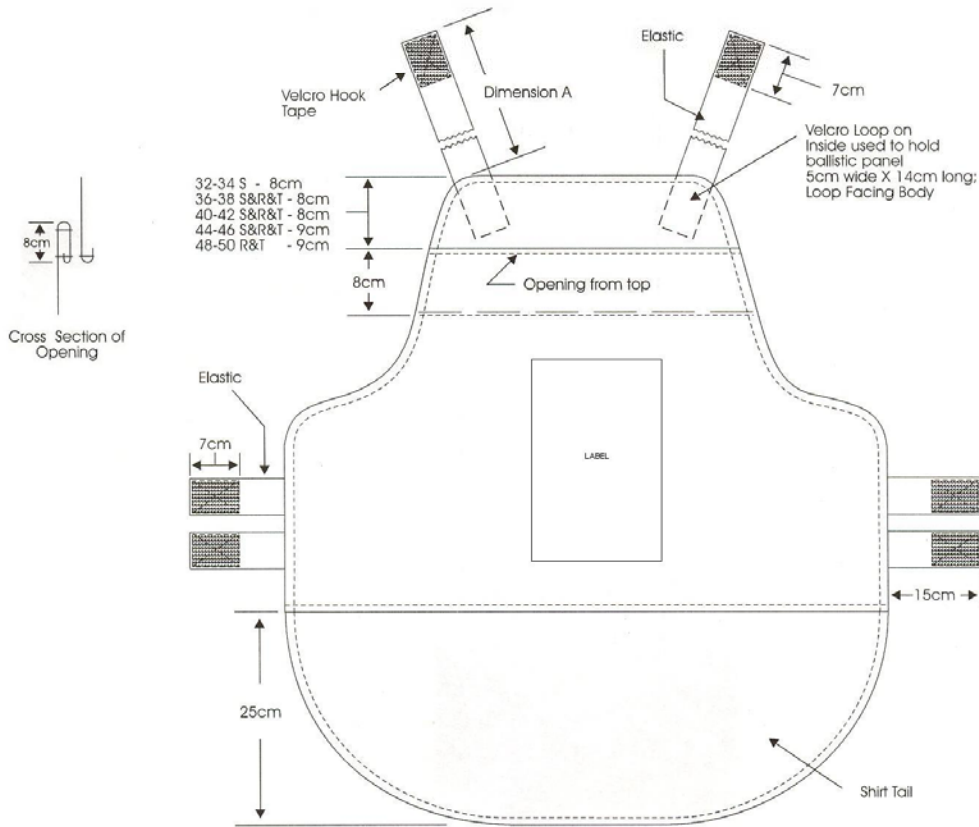
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City of Winnipeg  
 Internal Carrier - Front  
 Dwg. 4

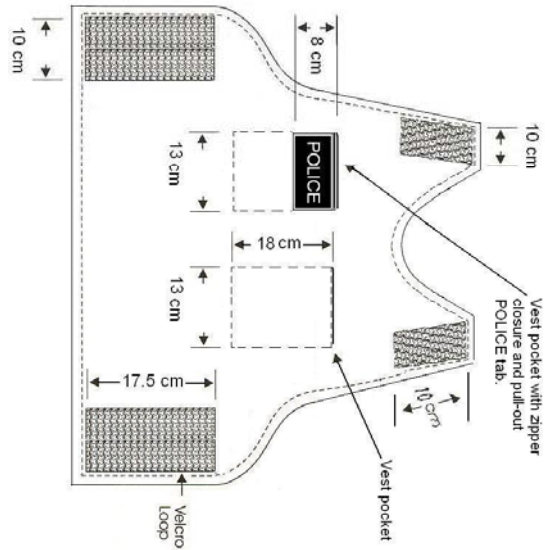
The City of Winnipeg  
 Internal Carrier - Rear  
 (Showing side against body)  
 Dwg. 5



| Size (Male) | Dimension A |
|-------------|-------------|
| 32-34 S     | 23cm        |
| 36-38 S&R&T | 24cm        |
| 40-42 S&R&T | 25cm        |
| 44-46 S&R&T | 26cm        |
| 48-50 R&T   | 26cm        |

Note: Female Sizes As Per Custom Order

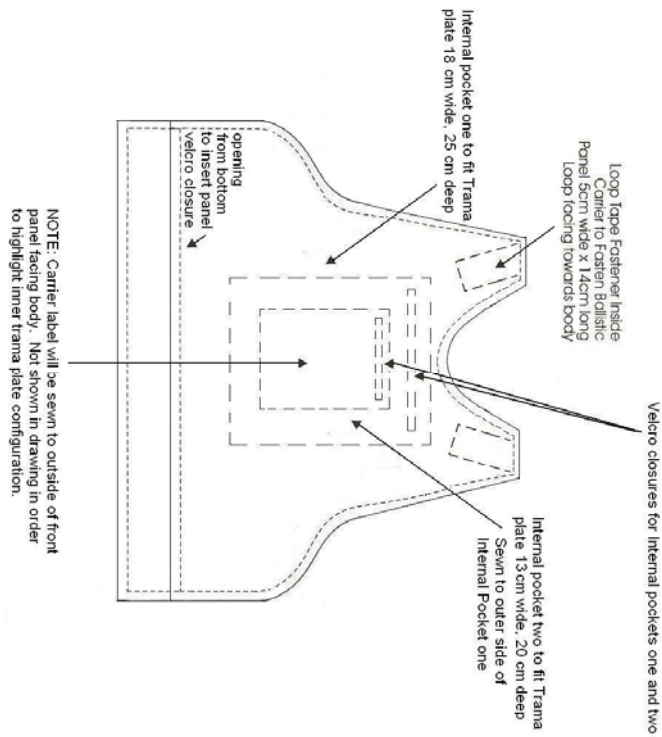
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Front External Carrier  
 Front View

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City of Winnipeg  
 External Carrier - Front  
 Dwg. 6

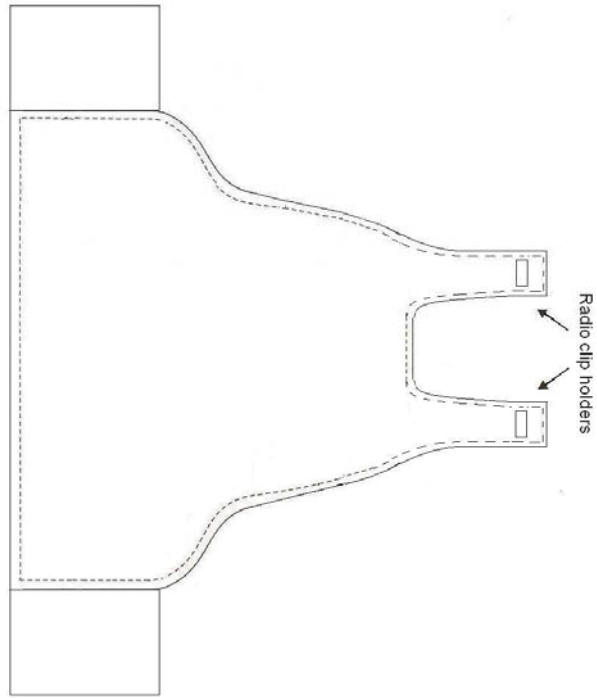


Front External Carrier  
 Rear View  
 (showing side against body)

NOTE: Carrier label will be sewn to outside of front panel facing body. Not shown in drawing in order to highlight inner trama plate configuration.

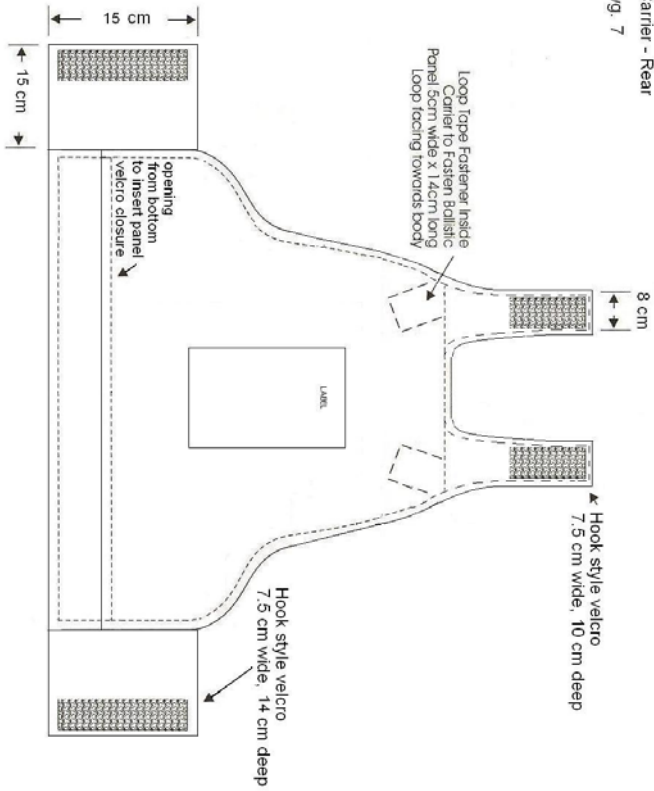
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Rear External Carrier  
Front View

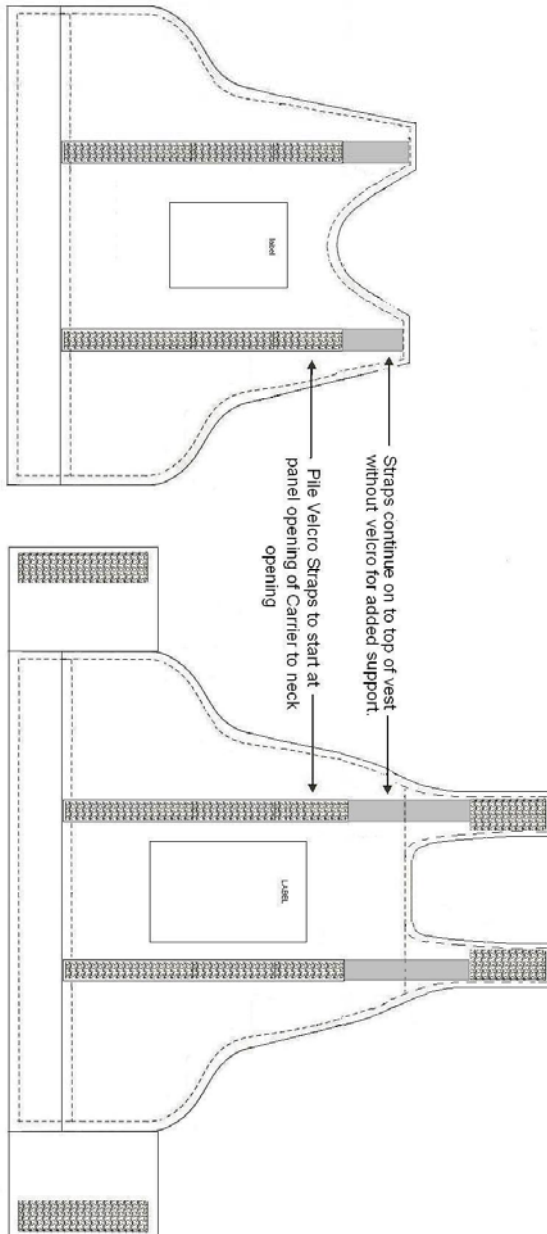


City of Winnipeg  
External Carrier - Rear  
Dwg. 7

Rear External Carrier  
Rear View  
(showing side against body)



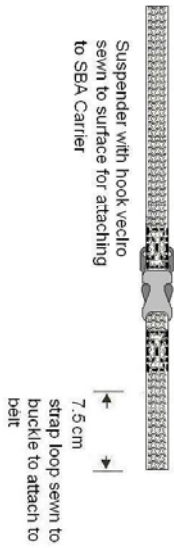
City of Winnipeg  
External Carrier - Suspender Configuration  
Dwg. 8



Front External Carrier  
Rear View  
(showing side against body)

Rear External Carrier  
Rear View  
(showing side against body)

NOT TO SCALE





## COMPANY IDENTIFICATION AND LOGO

|                   |                   |
|-------------------|-------------------|
| MODEL NO.         | DATE OF ISSUE:    |
| SIZE:             | OFFICER BADGE NO. |
| AGENCY:           | SERIAL NO:        |
| NIJ THREAT LEVEL: | LOT NO.:          |

## BODY SIDE - THIS SIDE TO FACE WEARER

### CARE AND CLEANING INSTRUCTIONS

NOTE: REMOVE ARMOUR PANELS BEFORE WASHING  
SEPARATE CLEANING INSTRUCTIONS LOCATED ON CARRIER

### ARMOUR PANEL CARE

- |  |                                   |
|--|-----------------------------------|
| - DO NOT DRY CLEAN OR MACHINE WASH     | - LAY FLAT TO DRY                 |
| - DO NOT BLEACH                        | - DO NOT MACHINE DRY              |
| - WIPE WITH CLOTH, MILD SOAP AND WATER | - DO NOT IRON                     |
| - MAKE SURE TO REMOVE ALL SOAP RESIDUE | - DO NOT STORE IN DIRECT SUNLIGHT |

COUNTRY OF MANUFACTURE

## LABEL FOR BALLISTIC CLOTH POUCH

