

UNITED STATES AIR FORCE ACADEMY

PURCHASE DESCRIPTION 945

SWORD AND SCABBARD, CADET

18 SEPTEMBER 2012

SWORD, SCABBARD AND COVER, CADET'S

1. SCOPE.

1.1 Scope. This purchase description covers the requirements for Sword, Scabbard and Cover, Cadet's, for the United States Air Force Academy.

1.2 Type and Classification. The Sword and Scabbard shall be of one of two types and five classes:

- Type 1 - Cadet Silver – This document is based upon the cadet silver
- Type 2 – Wing Commander Gold – The gold sword and scabbard shall have a gold in appearance pommel, cross guard, scabbard fitting and shoe.

1.2.1 Class - Schedule of Sword Lengths

- Class 1 - Extra Short
- Class 2 - Short
- Class 3 - Medium
- Class 4 - Long
- Class 5 - Extra Long

2. APPLICABLE DOCUMENTS.

2.1 The following documents of the issue in effect on the date of invitation for bids, form a part of this purchase description to the extent specified herein:

STANDARDS:

Federal

FED. TEST METHOD
STD. NO. 151
ANSI Z1.4

Metals; Test Methods
Sampling Procedures and Tables
for Inspection by Attributes

(Copies of purchase descriptions, standards, drawings and publications required by contractors in connection with a specific procurement function may be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other Publications.

2.2.1 For textile colors, the Pantone/Fashion and Home/Cotton Planner, 1.866.PANTONE' www.pantone.com.

3. REQUIREMENTS.

3.1. Sample. Samples are furnished as a guide only. Variations from this purchase description may appear in the sample, in which case this purchase description shall govern. Except for such variations, the design, appearance, quality and workmanship in all respects not covered by this purchase description shall be equal to the sample (See 6.2).

3.2 Preproduction sample approval. When required (See 6.2) before production is commenced, the contractor shall submit to the contracting officer for approval, a finished Sword, Scabbard and Cover conforming to the requirements for design, construction and workmanship of this purchase description.

3.2.1 The following shall be submitted along with preproduction sample:

3.2.1.1 One two-yard sample of basic fabric for Cover (full width).

3.2.1.2 Test results covering the physical characteristics of each metal and plating as specified in this purchase description.

3.3 Materials.

3.3.1 Sword Blade

3.3.1.1. Corrosion. The blade shall be made of a corrosion resistant, metal, or a metal plated with a corrosive resistant metal.

3.3.1.2. Bending. The blade must be able to tolerate a bending moment of approximately 85 N-m over the length of the blade.

3.3.1.3. Shape. The blade shall be tapered and have a straight diamond shape.

3.3.1.4. Finish. The surface of the blade shall be carefully polished to a bright finish.

3.3.1.5. Anchoring. The blade must be firmly secured to the handle assembly and not fail at the connection after being dropped 50 times from a height of 1 meter.

3.3.1.6 Dimensions. The finished dimensions of Sword blade and hilt shall be in accordance with this purchase description. The tip of all classes of swords shall be graduated the same from the tip upwards for 290 millimeters.

3.3.1.2 Length. -The finished blade length and overall length shall be in accordance with Table I.

TABLE I

SWORD MEASUREMENTS		
(All Measurements Shown are Expressed in Millimeters)		
CLASS	BLADE LENGTH (mm)	OVERALL LENGTH (mm)
EXTRA SHORT	660	785
SHORT	711	836
MEDIUM	762	887
LONG	813	938
EXTRA LONG	864	989
NOTE: The inside dimension of Scabbard shall be 4 millimeters longer than the blade length.		

3.3.1.3 Design. The finished design on blade shall be in accordance with Figure 1. The design shall appear on front side of blade only.

3.3.2 Sword Hilt Assembly. The Sword Hilt assembly shall appear to be one piece when assembled.

3.3.2.1 Pommel.

3.3.2.2 Material. The pommel shall be made from a metal.

3.3.2.3 Weight. The weight of the pommel shall be 97 gr \pm 5 gr.

3.3.2.4 Finish. The entire pommel shall be silver or gold in appearance and polished with the designs being oxidized and satin brush highlighted.

3.3.2.5 Anchoring. The pommel must be securely fitted to the rest of the handle assembly.

3.3.2.6 Shape. The pommel shall be shaped to resemble a world globe in raised relief. See Figure 2.

3.3.2.2 Grip.

3.3.2.2.1. Material. The grip shall be made of metal.

3.3.2.2.2. Character. The grip shall be grooved or have the appearance of being coiled with 18 gauge wire? The back of the grip at top shall be fitted to the pommel. See Figure 3.

3.3.2.2.3. Finish. The entire grip shall be silver in appearance and polished with grooves being oxidized and satin highlighted. The grip for the Wing Commanders Sword shall be silver.

3.3.2.2.4. Cross Guard.

3.3.2.3.1. Material. The cross guard shall be solid metal that can withstand impact from being dropped 50 times, without bending, from a height of 15 feet.

3.3.2.3.2. Finish. The entire cross guard shall be silver or gold in appearance and polished with the designs being oxidized and satin brush highlighted.

3.3.2.4 Assembly.

3.3.2.4.1. Component Anchoring. All component parts shall be accurately made for size and fit to assure a solid and proper assembly after vibrations test specified in appendix A.

3.3.2.4.2. Interchangeability. Parts shall be interchangeable in order to increase reparability.

Final Assembly. The finished assembly shall be clean, smooth and free from dents and other markings that may affect the appearance.

3.3.2.4.3. Weight. Total weight of the sabre shall be 454 gr \pm 110 gr.

3.3.2.4.4. Balance. The balance point shall be $\frac{2}{7}$ of the total length \pm 3.5 cm (measured from the tip of the blade to the tip of the pommel) measured from the tip of the pommel.

3.3.3 Scabbard. - The Scabbard shall have the appearance of one piece.

3.3.3.1 Scabbard Body. The scabbard body shall be made from steel, carefully polished and nickel-plated.

3.3.3.1.2. Weight. The weight of the scabbard body shall be 290gr \pm 30 gr. See Figure 3 & 4.

3.3.3.1.3 Sleeve Fitting. The top of the scabbard shall consist of a sleeve fitting with a hook, each made of metal. The entire top fitting shall be silver or gold in appearance and polished with the designs and grooves being oxidized and satin brush highlighted.

3.3.3.1.2 Dimensions. The dimensions shall be in accordance with the technical drawing. See Figure 4.

3.3.3.2 Shoe.

Material. The shoe shall be made from metal.

Finish. The entire shoe shall be silver or gold in appearance and polished with the designs and grooves being silver oxidized and satin brush highlighted. Basic materials shall not be visible through the finishes. The finish shall not separate from the basic material. See Figure 4.

3.3.3.3 Scabbard Liner.

3.3.3.3.1. Length. The liner inside the scabbard body shall cushion the blade and prevent rattling. The liners shall extend the total length of the scabbard body.

3.3.3.3.2. Design. The liner shall fit the inside dimensions of the scabbard body without being loose after 2000 draws and sheathings of the sabre. The liner shall fit such that the draw force to remove the blade is approximately $15\text{ N} \pm 5\text{ N}$.

3.3.3.4 Fittings.

3.3.3.4.1. Anchoring. The top fitting and shoe shall be secured to the scabbard body in a manner that will last the life of the product. Screws may be present pending they are silver or gold in appearance and remain in place after both lifecycle tests specified in appendix A are performed.

3.3.4 The finished scabbard shall be clean, smooth and free from pits, dents and any other imperfection that may affect the appearance. See Figure 5.

3.3.5 Washer Cushion.

3.3.5.1. Each sword shall have a washer cushion to act between the base of the cross piece and the mouthpiece of the scabbard.

3.3.5.2. The cushion must be waterproof and remain in place after 2000 draws and sheathings.

3.3.6 Cover.

3.3.6.1. Each sword and scabbard shall be provided with a Navy blue, cotton, flannelette, cover to fit the assembled sword and scabbard. The color number is 19-3938 TCX, from the Pantone/Fashion and Home/Cotton Planner.

3.3.6.2. The cover shall have a drawstring. See Figure 7.

3.4 Marking. Each Sword and Scabbard shall have a tag attached to the hilt showing the following information:

Class number of sword
Purchase description title, number and date
Contract number and date
Contractor's name and address
U. S. Air Force Academy

3.5 Workmanship. All etching, embossing, and art work shall be identical on like parts. The height of the bold letters of the inscription "U.S. Air Force Academy" is 6mm. The etching shall be not only superficial but tactile.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Supplier's Responsibility. The supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize their own or any other inspection facilities and services acceptable to the Government. Inspection records of the examination and tests shall be kept complete and made available to the Government as specified in the contract or order. The Government reserves the right to perform any of the inspections set forth in the purchase description where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements. All tests to be performed are attached in Appendix A.

4.2 Inspection for Purposes other than Acceptance.

4.2.1 Preproduction Sample. When required (See 6.2), the preproduction sample shall be inspected for compliance to design, construction, workmanship and appearance.

4.3.1 Sampling for Testing. The sample unit for testing of each component shall be the quantity necessary to perform all required tests one time each.

4.3.2 Examination of the End Item. The contractor shall inspect the finished swords for compliance with this purchase description prior to submitting them to the United States Government for final inspection and acceptance.

4.3.3 Final Inspection. The passing as satisfactory of the preproduction sample or any detail of construction or material shall not be construed as relieving the contractor of responsibility for faulty workmanship or material which may be discovered at any time prior to final acceptance.

4.3.3.1 The point of final inspection and acceptance of the finished articles shall be as specified in the contract or order. (See 6.2)

5. PREPARATION FOR DELIVERY.

5.1 Packaging. Each sword and scabbard shall be put into a flannelette cover and then packaged by inserting each one snugly in a spiral or convolute wound tube.

5.2 Packing. Unless otherwise specified in procurement documents (See 6.2), swords shall be packed in a manner which will insure acceptance and safe delivery at destination. As far as practicable, supplies of one type and class only shall be packed in containers which (together with packaging, wrapping and inner packing) conform to carrier rules and regulations as applicable to the mode of transportation selected.

5.3 Marking. Interior boxes and shipping containers shall be marked with the name of the commodity, type and quantity contained therein, as defined in the contract or order under which the shipment is made, the name of the contractor and the contract or order number. Shipping containers packed with swords of assorted classes shall be marked to show the quantity of each class packed therein.

6. NOTES.

6.1 Intended Use. The sword covered by this purchase description is intended for use by Cadet Officers of the United States Air Force Academy.

6.2 Ordering Data. Procurement documents should specify the following:

- a. Title, number and date of this purchase description.
- b. Sword, Class Number. (See 1.2 and 3.3.1.2).
- c. Availability of sample (See 3.1).
- d. Requirements for preproduction sample (See 3.2).
- e. Point of final inspection and acceptance (See 4.3.3.1).
- f. Packaging, packing and marking requirements if different from those specified herein (See 5.1, 5.2, and 5.3).

6.3 Design Data. The design of the Sword, Scabbard and Cover is shown in Figures 1 through 7.

6.4 Patent Notice. When Government drawings, specifications and other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

Custodian:

USAF Academy
Colorado Springs CO 80840

Preparing Activity:

Cadet Uniforms Section (10 LRS/LGRCU)
USAF Academy, CO 80840-8210

Reviewing Activity:

Cadet Logistics Chief (10LRS/LGRC)
USAF Academy, CO 80840-8210



FIGURE 1
Blade Etching Design and Dimensions



FIGURE 2
Pommel Design



FIGURE 3
Grip and Cross Guard

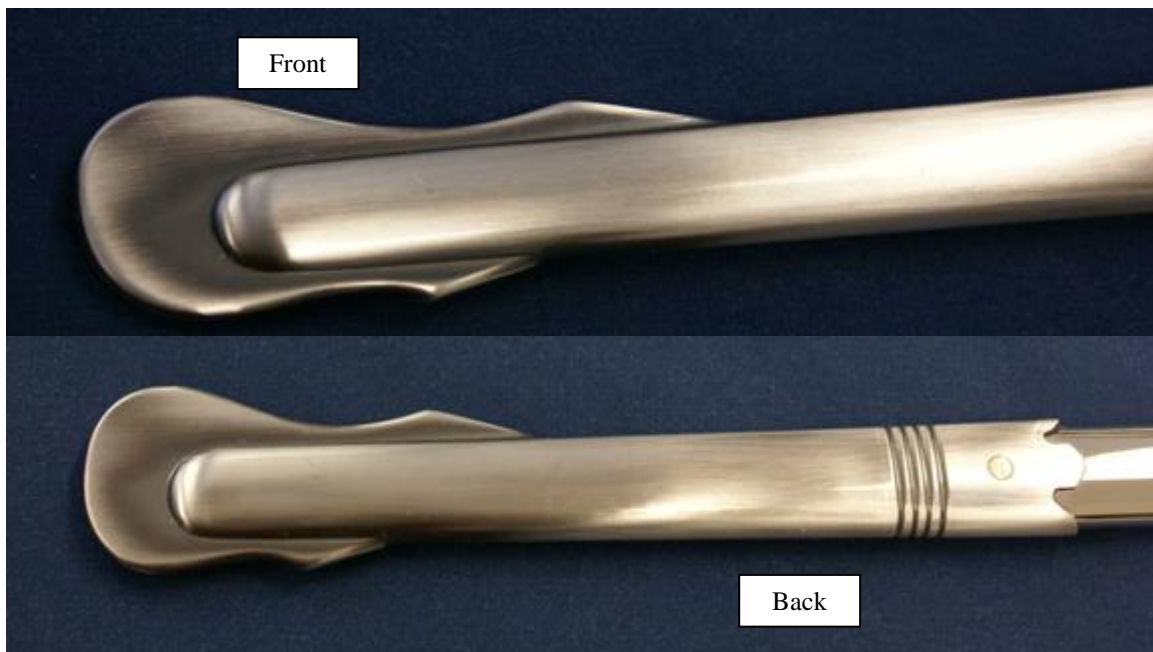


FIGURE 4
Scabbard Details

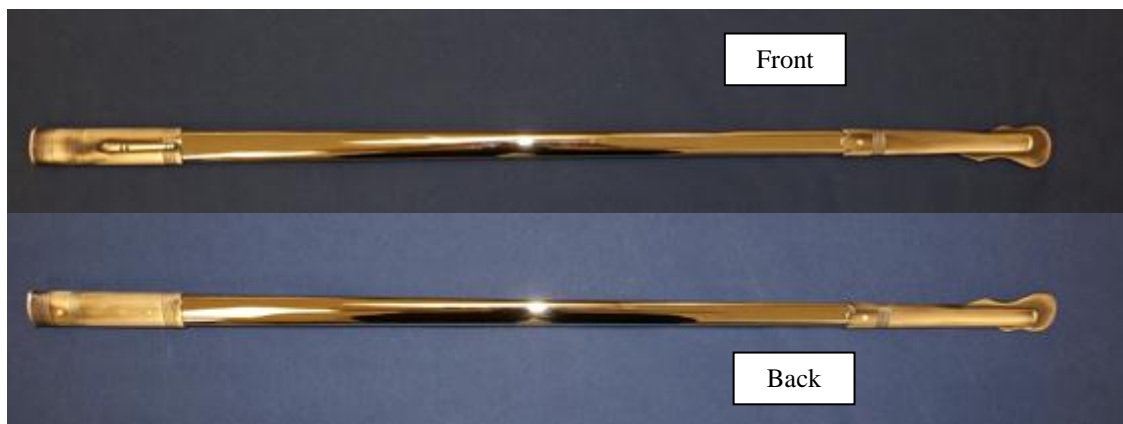


FIGURE 5
Finished Scabbard



FIGURE 6
Leather Cushion



FIGURE 7
Cover



TOP OF DESIGN

NOTE 1: Top of design will begin 110mm down on blade.

NOTE 2: Width of design will be 3mm less than width of blade.

NOTE3: This design will appear only on front side of blade.

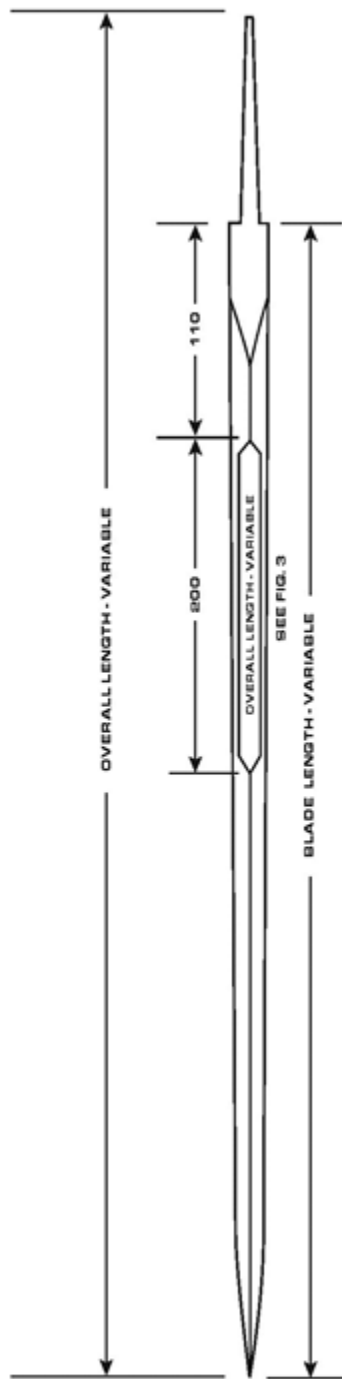
NOTE4: All dimensions are in millimeters.



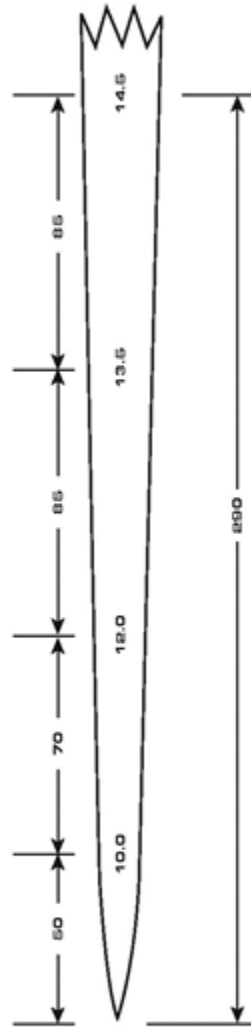
Figure 8



WING COMMANDER GOLD SABER
Gold pommel, cross guard, scabbard fitting and shoe.

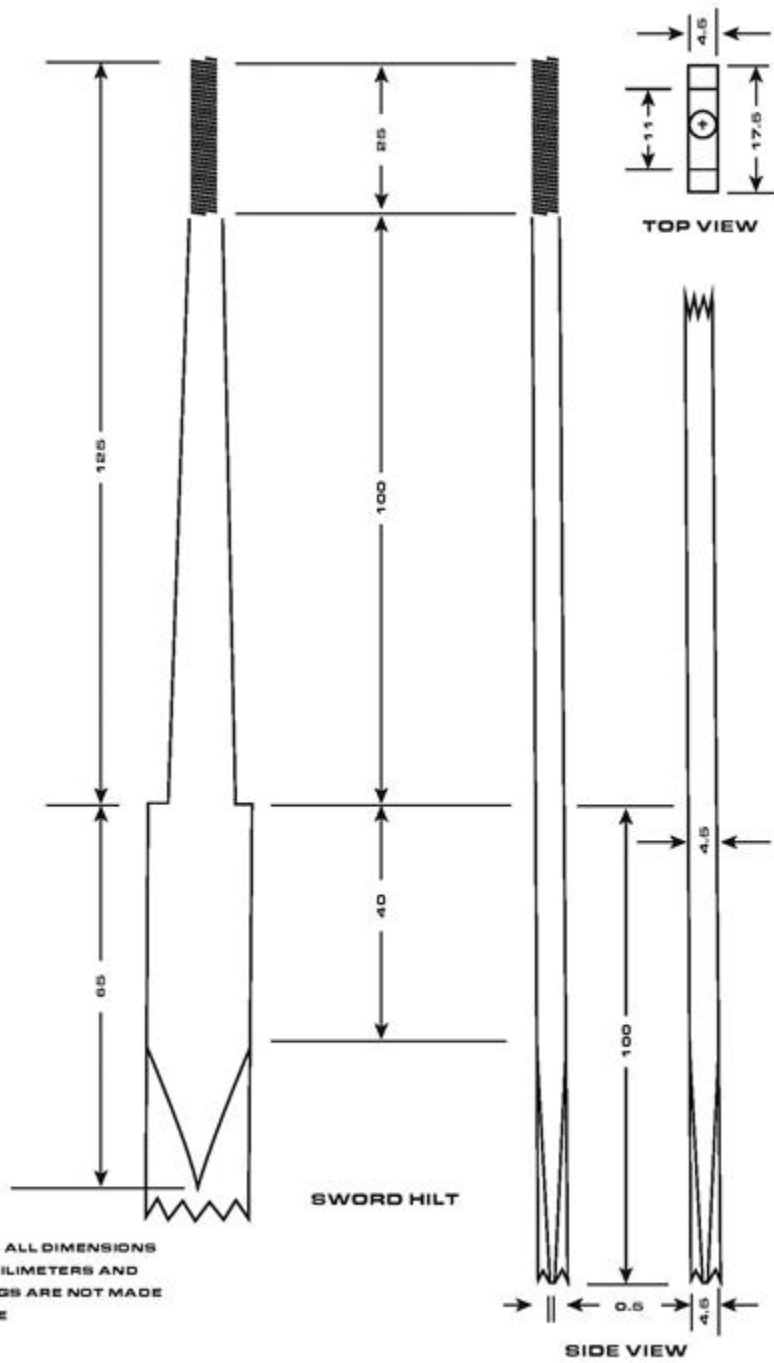


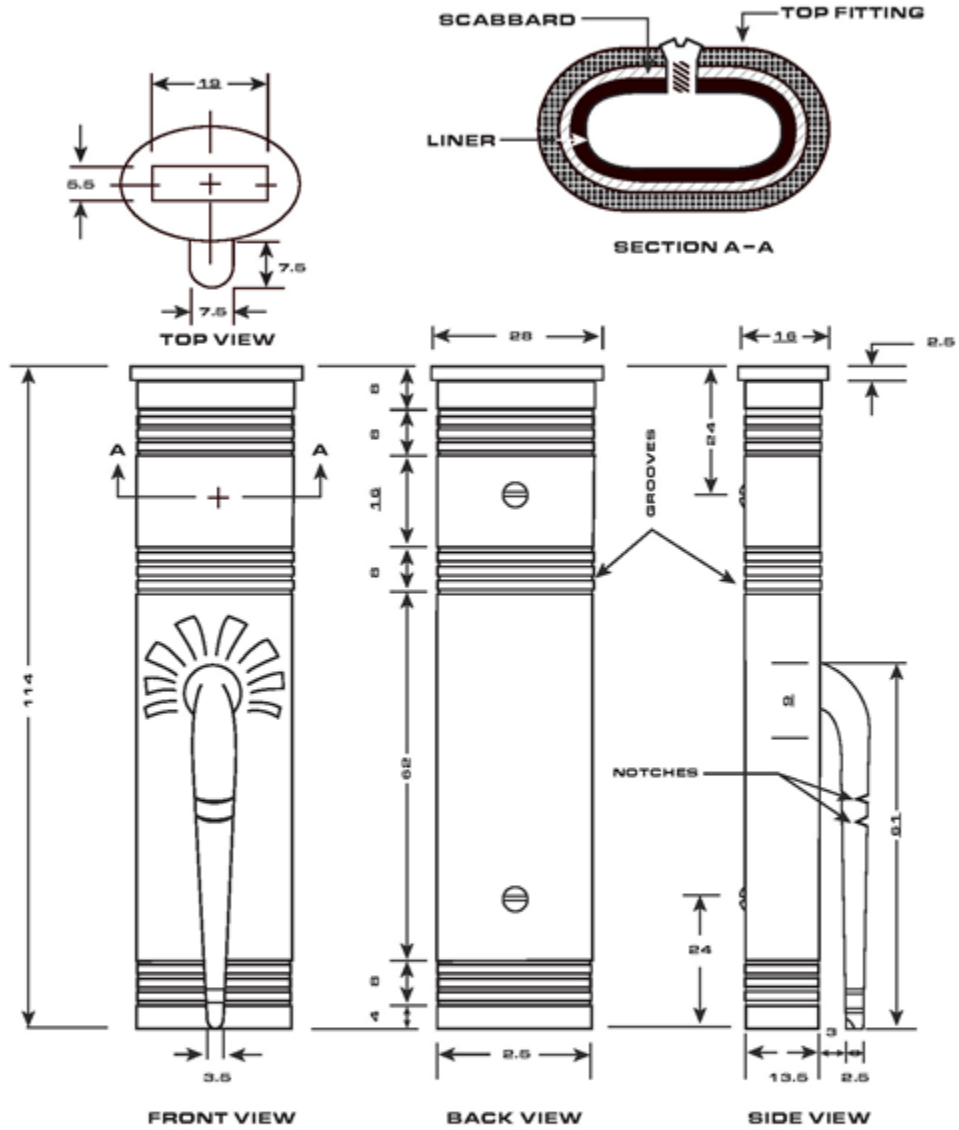
NOTE: ALL DIMENSIONS ARE IN MILLIMETERS AND DRAWINGS ARE NOT MADE TO SCALE



GRADUATION IN WIDTH OF BLADES FROM TIP UPWARD TO 290 MILLIMETERS

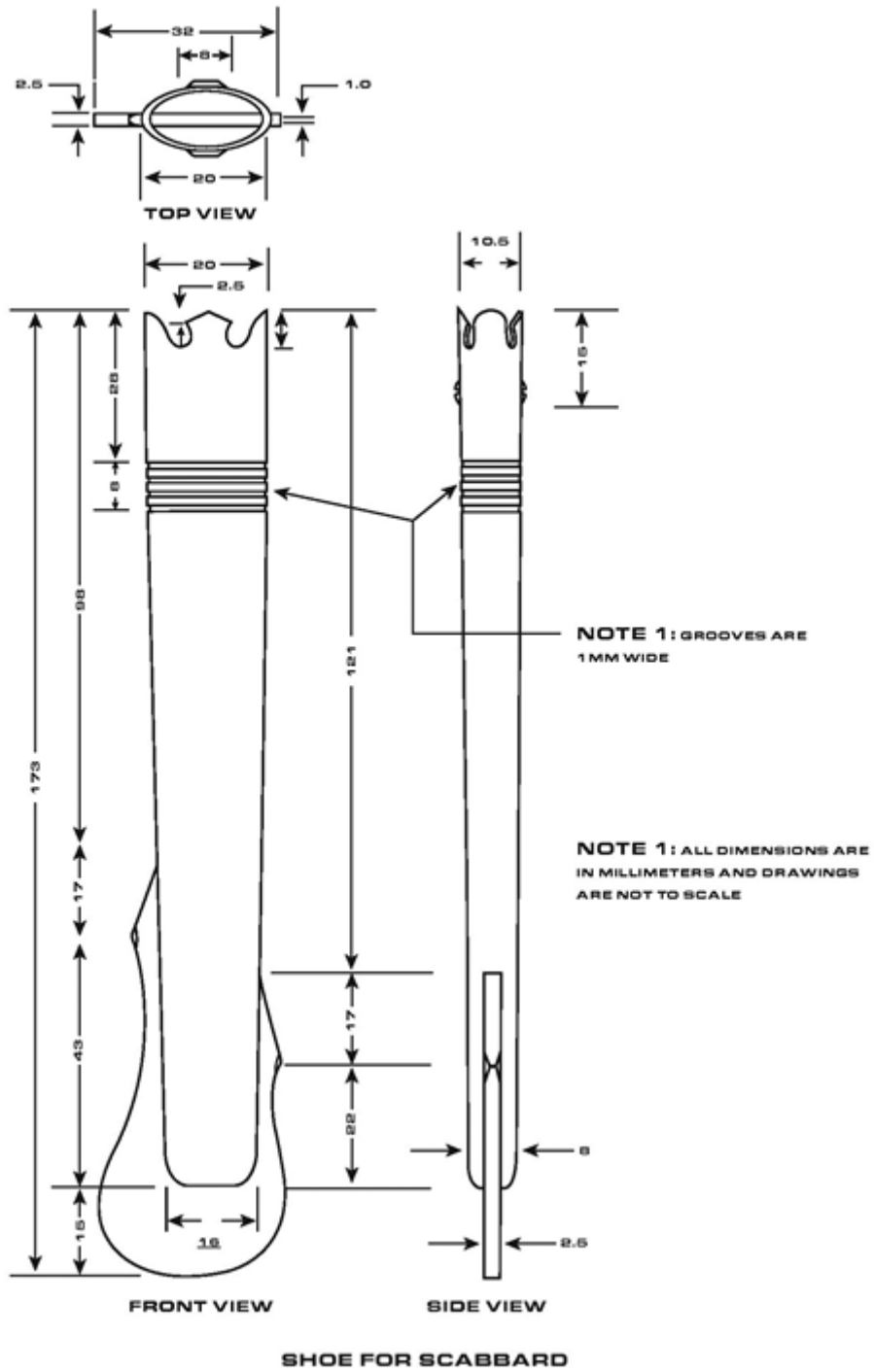
SWORD

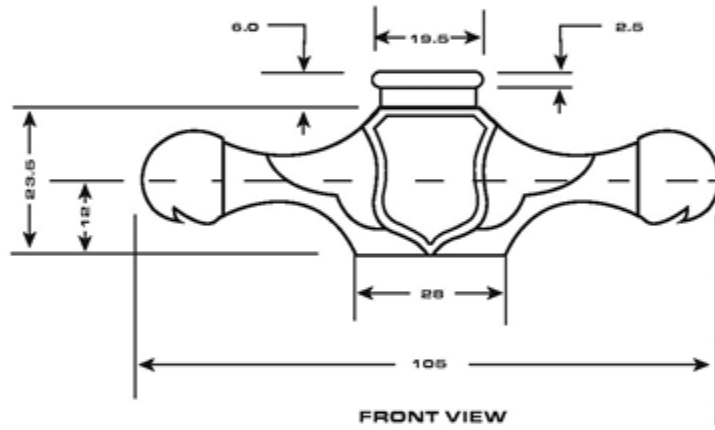
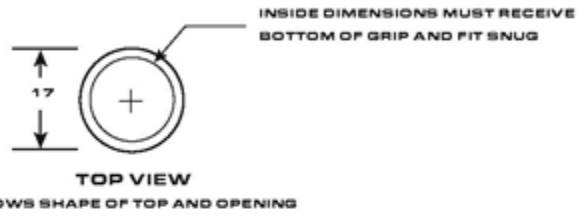




NOTE 1: GROOVES ON TOP FITTING AND HOOK ARE 1MM WIDE. UPPER NOTCHES ON HOOK ARE 2MM WIDE
NOTE 2: ALL DIMENSIONS ARE IN MILLIMETERS AND DRAWINGS ARE NOT TO SCALE

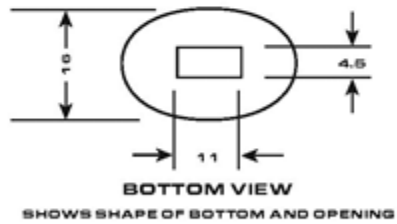
TOP FITTING FOR SCABBARD



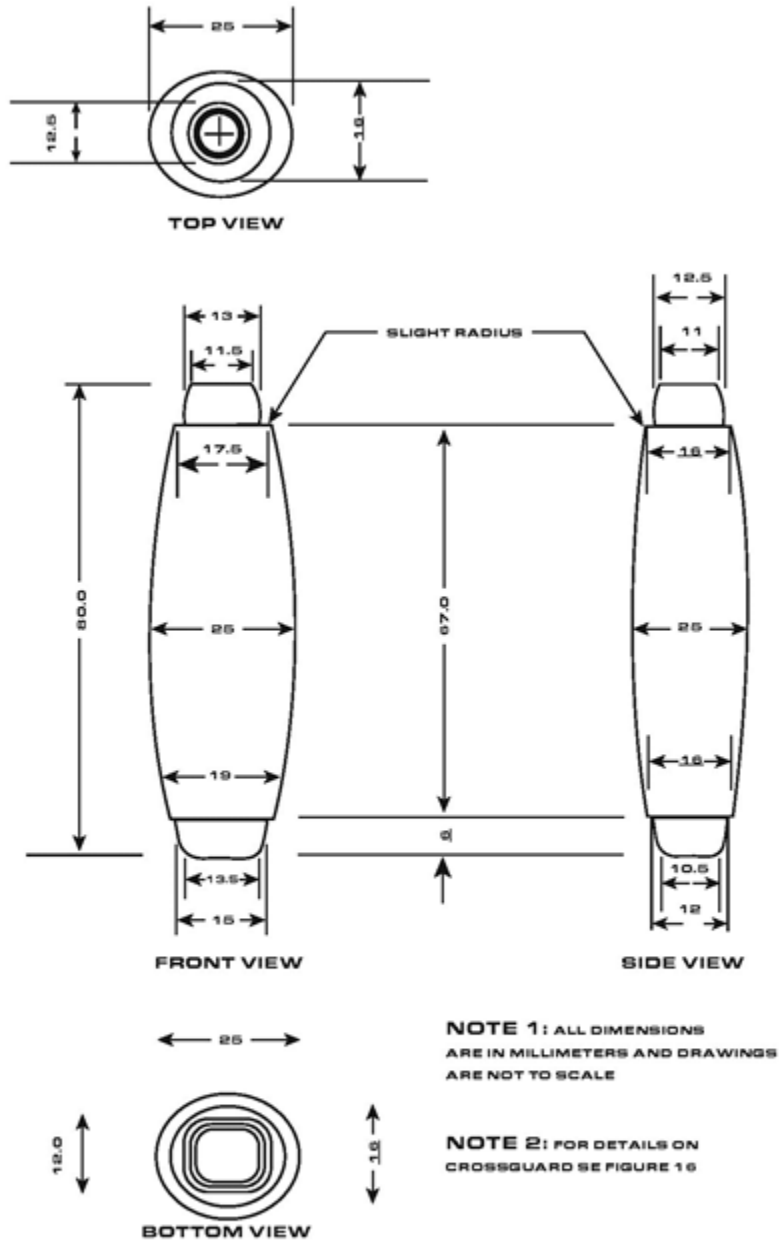


NOTE 1: FOR DETAILS ON
CROSSGUARD SEE FIGURE 16

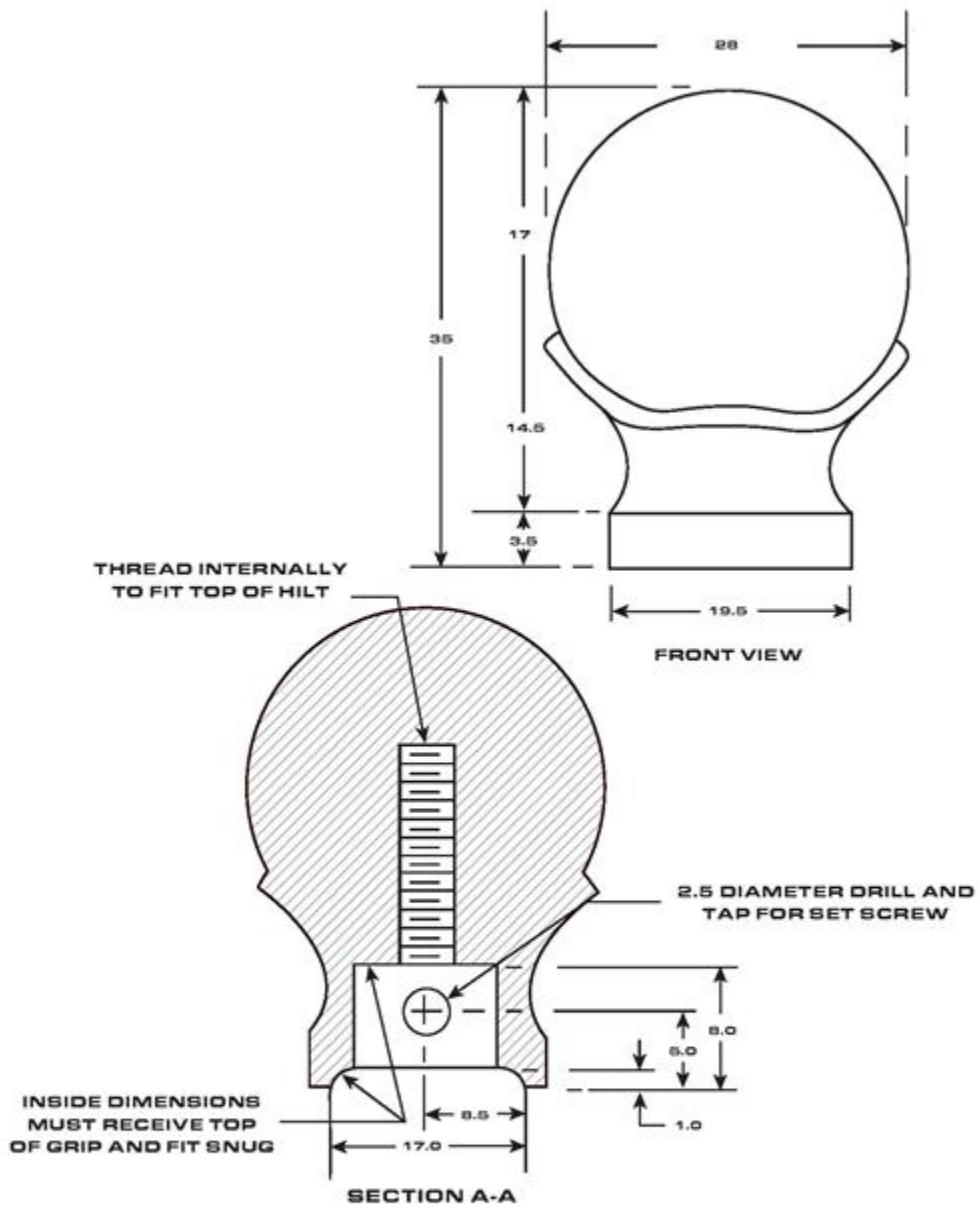
NOTE 1: ALL DIMENSIONS
ARE IN MILLIMETERS AND
DRAWINGS ARE NOT
TO SCALE



**SWORD
CROSS GUARD**



SWORD GRIP



NOTE 1: ALL DIMENSIONS ARE IN MILLIMETERS AND DRAWINGS ARE NOT TO SCALE

NOTE 2: FOR DETAILS ON POMMEL SEE FIG.12

POMMEL



TOP VIEW



FRONT VIEW



BACK VIEW



BOTTOM VIEW

**SWORD
CROSS GUARD**



BACK VIEW

SWORD GRIP



TOP VIEW



FRONT VIEW



BACK VIEW



LEFT - SIDE VIEW



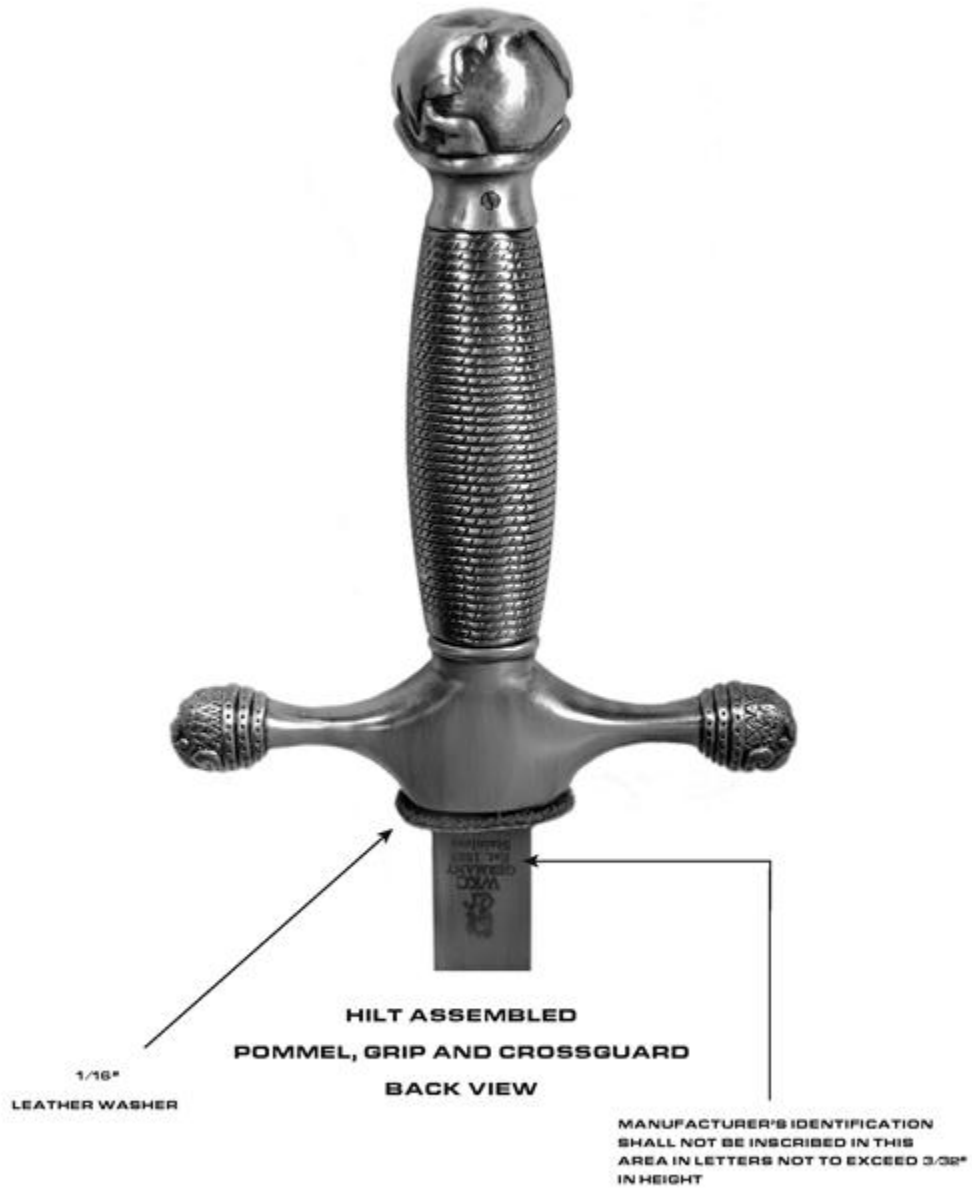
RIGHT - SIDE VIEW

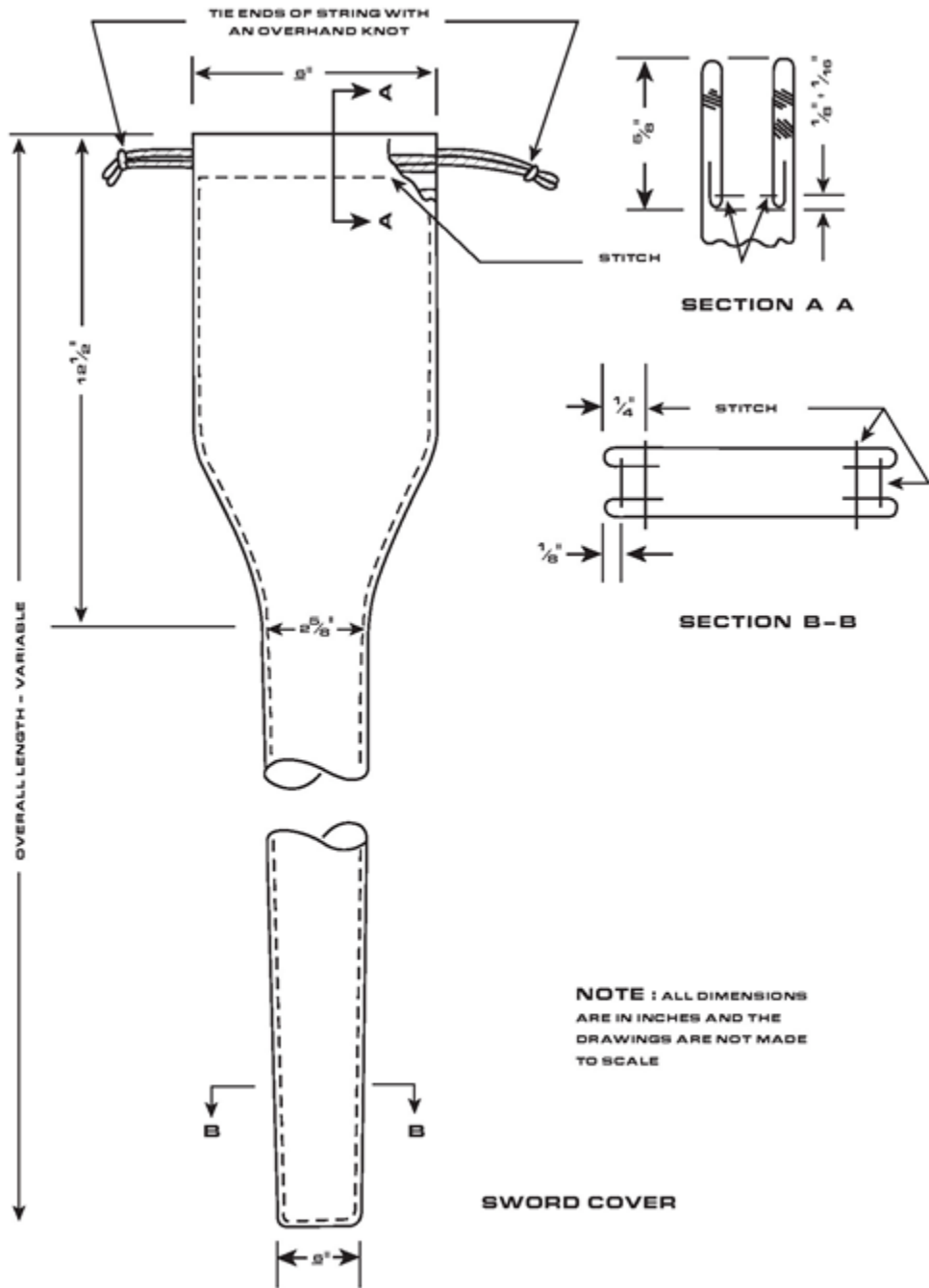


BOTTOM VIEW

**SWORD
POMMEL**







Appendix A Test Procedures

The purpose of this appendix is to describe the acceptance tests that will be used to evaluate cadet swords and scabbards.

A1. Bending test

A1.1 Test purpose - The purpose of this test is to demonstrate the strength and toughness of the sword blade.

A1.2 Test Setup – In this test, the sword blade will be placed in a three-point bending jig (figure 1) attached to a load frame and loaded in a quasi-static fashion until the deflection of the center actuator and roller reach 2.5 cm. Dimensions of the three-point bending fixture are shown in figure 1.

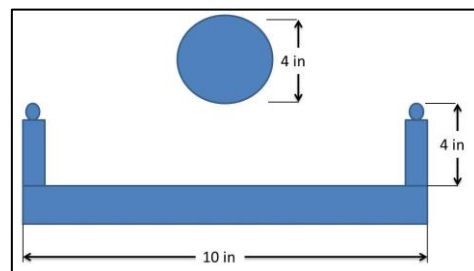


Figure 1. Three-point bending dimensions.

A1.3 Data Collected – Load and deflection data will be collected.

A2. Drop test

A2.1 Test purpose - The purpose of this test is to demonstrate the strength and toughness of the handle assembly and fastening.

A2.2 Test Setup – In this test, the sword blade will be supported at a height of one meter above a concrete floor (figure 2).

A2.3 - Test Execution - The sword will be dropped, hilt first, onto the floor fifty (50) times.

A2.4 - Data Collected - After each drop, the sword will be inspected for



Figure 2.

visible defects, loosening or separation of components, permanent deflection of the blade or handle.

A3. Vibration Test

A3.1 - Test purpose

The purpose of this test is to demonstrate the durability of the sword to withstand vibrations resulting day-to-day use over the life of the sword.

A3.2 - Test Setup –

In this test, the sword blade will be clamped at the center of gravity in an aluminum block mounted to a small shaker table as shown in Figure 4. The shaker will be programmed to run a repeating frequency sweep with a start frequency of 0.5 Hz, a stop frequency of 500 Hz, and a sweep rate of 0.05. The test was allowed to run for 96 hours.

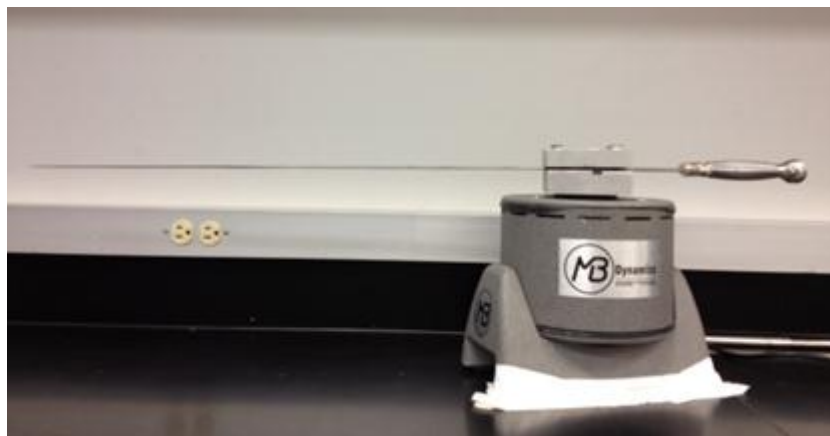


Figure 3. Vibration Test setup.

A3.3 - Data Collected - The sword will be inspected for loose or separated components.

A4. Sheathing Test

A4.1 - Test purpose - The purpose of this test is to demonstrate the durability of the sword and scabbard to withstand repeated pulling and sheathing actions over the expected life.

A4.2 - Test Setup - The vertical force required to pull the blade from the scabbard
During this test, a line will be drawn on the blade eighteen inches from the tip of the blade. The blade will be dropped into the scabbard from this height 2000 times in order to simulate the worst possible case of the sabre being sheathed into the scabbard. See Figure

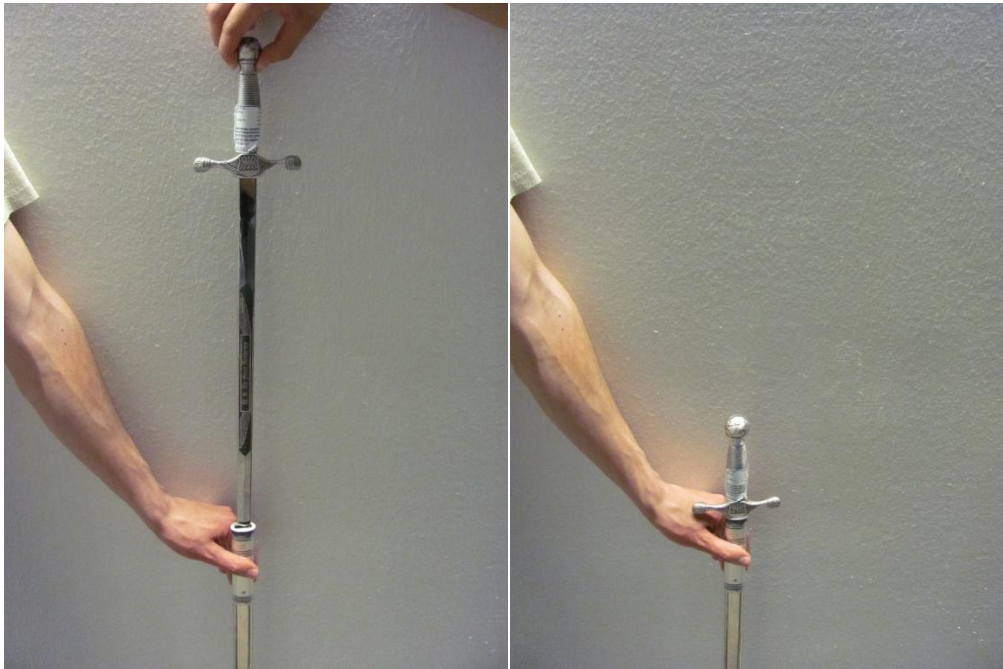


Figure 4. Sheathing test.

A4.3 - Data Collected - Every 100 cycles, the deflection of the crossguard will be measured using calipers and the vertical pull-force for blade will be measured using a spring scale. The sword will also be inspected for loose or separated components.