

D-C. 35576-A

IA 1169 (m) (n)
Supersedes I.A. 726-K (n)

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LAND SERVICES

GENERAL SPECIFICATION TO GOVERN THE MANUFACTURE REPAIR AND QUALITY ASSURANCE OF WATERTIGHT AND NON-WATERTIGHT STEEL AMMUNITION PACKAGES AND THEIR COMPONENTS.

Approved 30 May 1978

Q. P. C. SECTION
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25-6-79
1068A(AMMUNITION)
1204898/DFKb
31-5-79, 478/200/1

5. Special attention is called to any notes on the drawing.
6. Any sample lent to the manufacturer must be taken as a general guide only.
7. Neither the stores nor any component part may be built up or repaired in any way not provided for by the drawing or this specification, unless authorised by the Quality Assurance Officer.
8. The Manufacturer must provide the Quality Assurance Officer with copies of all sub-orders in connection with his order as soon as they are placed.
9. The Manufacturer must notify the Quality Assurance Officer when he (or his Sub-Manufacturers) is in a position to start work. On receipt of this notification from the Manufacturer the Quality Assurance Officer may arrange to be represented at the Works of the latter or at those of his Sub-Manufacturers.
10. Where tests are laid down in this specification or elsewhere for any of the materials to be used, the Quality Assurance Officer may require that such materials shall not be taken into use until accepted by him as satisfactory for the purpose intended, and may require the bulk to be bonded or sealed until the results of the tests are known.
11. The Manufacturer will be required to supply, free of charge the necessary material for test and analysis. Such material will be selected by the Quality Assurance Officer or his representative. The Quality Assurance Officer will inform the Manufacturer to what extent testing of materials will be carried out. He may, if considered necessary during the progress of an order, vary the quantity of material taken for test.
12. Where component parts are issued to the Manufacturer, these will be in good condition and must, whilst in his possession be kept in that condition. The Manufacturer shall guarantee the due return of the component parts sent to him and shall be responsible to their full value for all loss or damage from whatever happening there to whilst in possession or control of himself, his servants or agents.
13. The Manufacturer will be required to carry out, free of charge, the work of assembly of the packages or component parts taken for test under the provisions of this specification, or otherwise as stipulated elsewhere as a condition of acceptance. He shall provide, free of charge, the sample welds referred to in para 5, section Four. The material so expended shall be held at the disposal of the Government as represented by the Quality Assurance Officer.

SECTION TWO — MATERIALS

1. Materials must conform to the requirements laid down in their relevant specification or as otherwise specified herein.
2. Sheet or strip steel employed is to be of a suitable quality to withstand breaking or cracking, the pressing, folding and assembling operations called for by the construction shown on the drawing. All sheets or strips shall comply with :-
 - (a) IS : ^{1079, 1958} 1079 Grade St. 34 hot rolled and annealed.
 - (b) IS : ^{S13, 1958} 513 Cold rolled and annealed.
Best surface type 'D'.
 - (c) BS : 1449 Pt. ^{3B} CS 4 Cold rolled and annealed.
 - (d) BS : 1449 Pt. 3A - ^{HS} 4A, hot rolled and annealed.
3. Bar steel employed in the Manufacture of parts such as handles, collars, tie-rods, etc. must conform to IS : 2073-(J). DES C20 or as quoted on the relevant drawings.

SECTION ONE — GENERAL

1. Any question relating to this specification, other specifications referred to herein, or to the drawings should be referred to CQA (A), Kirkee or other Quality Assurance Officer duly authorised to act on behalf of him hereafter called Quality Assurance Authority and Quality Assurance Officer respectively.

2. (a) Where specifications are quoted, the current issue is implied.

(d) Materials, their specifications and the office from which these specifications are obtainable are given below :—

Material	Specn No.	Obtainable from
(i) Steel Sheet or strips	IS : 1079 - 1973 IS : 513 - 1950 BS : 1449	Indian Standards Institution, Manak Bhavan, 9, Mathura Road, New Delhi - 1.
(ii) Bar Steel	IS 7203 : 1972 IS 2073	- do -
(iii) Spring Steel	IS 1079-1973 BS 1449 : 1955	- do -
(iv) Rubber	IND/ME/584 (S)	The Controller, Controllerate of Quality Assurance (Military Explosives), Aundh Road, Kirkee, Pune - 3.
(v) Timber	IA : 1001 (S)	CQA (A), Kirkee, Pune - 3.
(vi) Paint	IS : 168 - 1973 (amended upto date) (for air drying) JSS-16302 (for stoving)	ISI, New Delhi-1. CQA (ME), Kirkee, Pune-3.
(vii) Galvanising	BS : 729, Pt. I	ISI, New Delhi - 1.
(viii) Phosphating	JSS 0465-01-1988	CQA (A), Kirkee, Pune - 3.
(ix) Spray-d metal coating	BS : 2569, Pt. I	ISI, New Delhi - 1.
(x) Wire Steel	IS : 280 - 1978	ISI, New Delhi - 1.
(xi) Red Oxide Zinc Chrome Primer	JSS 1-63-05 (S)	CQA (ME), Kirkee, Pune - 3.

Note :— Reference in this specification to any other specification or documents means, in any tender or contract, the edition current at the date of such tender or order.

3. The dimensions, construction, assembling and marking of the ammunition packages or boxes (hereinafter referred to as packages) and their component parts are to be in accordance with the drawings issued to govern the supply of the stores.

4. Where the drawing or specification permits a choice of alternative materials or forms for particular components, the Manufacturer is required to notify the Quality Assurance Officer, in writing, which of the permitted alternative he chooses to produce. If the choice of alternative is changed during the course of the order the Manufacturer shall again notify the Quality Assurance Officer of such change.

4. Spring steel shall comply with all the requirements of BS 1449 En 42F unless otherwise specified on the relevant drawing.
5. Wire steel used in the manufacture of clips, catches, hinges etc. must conform to IS : 280 half hard bright.
6. Rubber sealing rings and pads are to conform to IND/ME/584 Class 'A' unless otherwise stated on the drawings or elsewhere and to be secured in the positions called for on the appropriate drawing in accordance with instructions on the drawings. Samples of adhesives to be used to secure rings/pads should be approved by CQA (ME), Kirkee.
7. Timber or plywood required for fittings shall conform to the requirements of specification IA 1001 where applicable. Timber components of non-water-tight packages shall be impregnated with approved preservative salts; components for water-tight packages shall not be impregnated.

SECTION THREE — MANUFACTURE AND ASSEMBLY

1. The various parts of the package are to be formed and assembled as shown on the drawing. The dimensions and methods of securing them in position as laid down in particulars shall be strictly adhered to.
2. The steel or metal fittings when called for, must be well finished and a good fit; the holes in the diaphragms of packages so fitted are to be well shaped and in correct alignment when assembled, and free from raw edges and burrs.
3. The corners and joints of boxes must be closed completely. Rivets must be a tight fit and rivetted to the satisfaction of the Quality Assurance Officer. Handle grips if present, must be in good condition when finally accepted. Steel handles shall move freely and shall fall flush with the sides of the package when not in use.
4. Any loose components which need selective assembly will be assembled by the manufacturer to the satisfaction of the Quality Assurance Officer.
5. Parts which are to be joined by welding are to be so formed that when assembled the surfaces to be welded are in close contact so that the welded joint is not under stress. Particular care will be taken that the nature number and size of welds are strictly adhered to.
6. Where a watertight lapped seam is to be made, width of overlap must be as shown on the drawing. When no dimension is laid down, care is to be taken that sufficient width of overlap is provided to ensure that the welded joint is watertight.
7. Spot welds, where called for, are to be correctly positioned as shown on the drawings. In particular, the distance of the welds from the edges of fittings etc. is to be strictly complied with.
8. Particular care is to be taken that the seling for lids of watertight packages is fixed truly at right angles to the axis of the body, so that the pressure on the securing device causes even pressure all round on the rubber seal.
9. The rubber sealing washer (where employed) is to be assembled in its supporting channel and efficiently secured as stated in the drawing or with the material called for in Section Two Para 5 of this specification.
10. Immediately prior to despatch, all rubber components should be given a light covering of french chalk or other approved material.

SECTION FOUR — WELDING

1. All metal surfaces to be welded must be thoroughly clean and free from scale, rust or oil.
 2. All welding machines employed must be equipped with a device giving fully automatic time control of the welding current under all workshop conditions and this device must be in use at all times when work on the order is proceeding. Means must also be provided for setting the welding pressure to a given value which is within the pressure range of the machine and for verifying that this pressure is maintained within $\pm 10\%$ during the working cycle.
 3. The manufacturer must make suitable arrangements to supervise his machines so that they are at all times maintained in such condition as will ensure the required standard of quality of welds.
 4. The manufacturer must supply his welding operators with a process schedule setting forth :—
 - (a) The manner and order of making the welds.
 - (b) Particulars of tip changing and maintenance.
 - (c) Particulars of preparation of routine tests and methods of recording results.
 - (d) A standard specimen for comparison purposes.
- A copy of the process schedule must be supplied to the QAO's representative, and any amendments thereto, which may subsequently be agreed as necessary. The manufacturer's records of tests must, at all times, be available for Quality Assurance by the QAO's representatives.
5. If required by the Quality Assurance Officer the manufacturer shall before beginning work or at anytime during which work on the order is proceeding, produce sample welds on strips of the correct material in order that the condition of the machine and reliability of the operator may be checked by examination and tearing apart of welds.
 6. Appendix hereto contains instructions for the guidance of manufacturers in controlling the technique and upkeep of equipments manufacturers will be deemed to have agreed to adopt the recommended procedure on any order governed by this specification, unless prior notice has been given to the Quality Assurance Officer in writing, of their intention to depart wholly or in part, from the procedure and giving full details of the alternative methods proposed to be adopted.

SECTION FIVE — MARKING

1. The packages are to be marked, by embossing or impressing with the particulars called on the relevant drawings. The positions of the marking must not depart from these shown on the drawing.

SECTION SIX — TESTING

1. The package will be tested by the application of a load equal to four times the mass of filled package, on each handle (when present), and must be capable of withstanding this test without showing any signs of defect either in the package or in the handles. Where no filled mass is shown on the drawing, the test mass shall be 160 kg.
2. A percentage of the completed packages may, at the discretion of the Quality Assurance Officer be taken for testing to determine that the welding is satisfactory.
3. Test welds (when routine or otherwise) from any particular machine shall be made under conditions approximating as closely as possible to those experienced in production.

4. Spring steel clips: The clips when manufactured from spring steel wire will be tested as follows for the quality of welding.

A percentage of the clips will be subjected to a minimum load of 35 kg for 30 seconds on the arms of the clips by any suitable method. The clips should not show any signs of failure.

5. On tearing open the test samples the welds will only be considered satisfactory if a slug or strip is torn from one of the components.

6. All lids for water tight packages must be pressure tested before painting. Those embodying a rubber sealing washer must be painted before assembly.

7. All bodies for watertight package must be pressure tested before painting; the sealing rings are to be removed before and replaced after painting the packages bodies.

8. A minimum of 5% complete watertight packages with their correct lids must be tested for leakage, after final painting and assembly by immersion in water heated to 333.15 K, for a period of not less than 90 seconds. The lid being closed and secured by normal method.

9. The pressure test for watertight packages is to be carried out by the Manufacturer's staff in the presence of a representative of the Quality Assurance Officer as follows :-

By an internal air pressure not less than 20.6 kPa not exceeding 34.3 kPa. For this test the lid will be replaced by a similar one which is fitted with an adapter to convey air under pressure into the package. The lid will be separately tested under similar pressure when held in suitable clamp. The test shall either be carried out under water or if loss of pressure can be observed on a mercury column, or other approved gauge. The test shall be applied for not less than 30 seconds during which period no loss of pressure shall be indicated.

$$psi = \frac{kPa}{6.89}$$

10. Under any one of these tests neither the body nor the lid shall shown any sign of leakage at any joint, and where lid and body are tested together a perfect seal shall be made on the sealing device.

11. Packages must be properly dried after immersion.

12. Package should be jolted for 8 hrs on a jolting machine having a lift of 50 mm and frequency of 60 jolts per minute. After jolt test packages will be drop tested. After drop test watertight packages should withstand leak proof test as per para 9 Section six...(k).

SECTION SEVEN — RUSTPROOFING AND PAINTING

1. Unless otherwise specified in order or elsewhere, the packages are to be delivered painted with paint specified in the order and will approximate to one of the following colours given in Indian Standard Schedule of colours No. IS : 5.

Olive Green	.. Colour No. 220
Light Brunswick Green	... Colour No. 225
Signal Red	... Colour No. 537

2. Before painting the Manufacturer shall arrange for the packages to be adequately treated to secure freedom from scale, rust or corrosion and no packages which fails to satisfy the Quality Assurance Officer in this respect or which is dirty shall be allowed to forward for rust proofing or painting. The package must not be contaminated with grease or oil.

WATERTIGHT PACKAGES (BOXES & CONTAINERS)

3. After closing and inspection the body and lid are to be galvanised or phosphatised or painted with red oxide zinc chrome primer or sprayed with aluminium (thickness of aluminium spray 0.15 mm) in accordance with specification BS : 729 Pt I or JSS 0465-01-1988 (class of phosphating is class II) or JSS 1-63-05 or BS : 2569 Pt I respectively.

NON WATERTIGHT PACKAGES

4. After cleaning and inspection the packages are to be galvanised or phosphatised or painted with red oxide zinc chrome primer or aluminium sprayed (thickness of aluminium spray 0.15 mm) in accordance with specification BS : 729 Pt I or JSS 0465-01-1988 (class of phosphating is class II) or JSS 1-63-05 or BS : 2569 Pt I respectively.
5. If galvanising is adopted, the package and all steel fittings are to be galvanised either before or after assembly, the stage at which galvanising is carried out being at discretion of the Manufacturer. If phosphating or aluminium spraying is adopted the package and all metal fittings are to be phosphatised or aluminium sprayed after assembly.

PAINTING PACKAGES

6. After test proofing and Q. A. the packages will be painted internally and externally with a coat of specified paint. The Paint must be applied evenly and each coat must be thoroughly dry before the application of the next coat.
7. Paint may be applied by Brushing, spraying or dipping, except that brushing or spraying is not to be used when the package is fitted with diaphragms or other fittings with concealed surfaces. As soon as the order is placed the Manufacturer must state the method he proposes to employ. When dipping is employed the Manufacturer must also state in the sub-order placed for paint the viscosity at which he intends to work his tanks, which must be maintained during use at the viscosity declared. The mixing of paints from different paint manufacturers will not be permitted.
8. The paint shall comply with the requirements of specn IS-168 (amended to date) or JSS : 46302 (for stoving). The paint is to be obtained from the Manufacturer in a consistency appropriate to the method of application employed, and no thinners are to be added for any purpose other than the replacement of evaporation losses or to produce the required viscosity of the dipping tanks. The thinners used must be those supplied by the paint manufacturer for use with each particular type of paint.
9. Immediately before use the paint must be thoroughly stirred and agitated (by any suitable means) in the containers so that all the pigment is uniformly dispersed throughout the medium and no sediments remain on the bottom of the container. Periodical stirring of the paint in the container must be carried out if necessary during the day to ensure that the material is maintained in a uniform consistency throughout painting operations.
10. If dipping is employed, care must be taken to ensure that the paint reaches all internal surfaces. Accumulation of paint due to faulty draining must be avoided.
11. Before despatch, the paint on the packages must be thoroughly dried and must be to the satisfaction of the Quality Assurance Officer.
12. Any screw threads or working parts of the hinges etc. must be free from paint and well greased.
13. The lids and any components not secured to the body by a fixed fastening are to be separately painted before assembly.
14. Sealing rings and sealing washers must not be shot blasted painted or subjected to the stoving temperature.

SECTION NINE — QUALITY ASSURANCE

1. The packages and components will be subject to Quality Assurance at any stage of the process of manufacture or repair and after delivery. Acceptance at an intermediate stage does not necessarily imply that the article is potentially acceptable in the finished state.
2. The Quality Assurance Officer may at his discretion, take during the progress of the order, samples of any of the materials used in manufacture for the purpose of analysis or testing.
3. Any package component or fitting, which at any stage fails to conform to the stipulated requirements and is not to the satisfaction of the Quality Assurance Officer will be rejected. Those stores in which departures can be rectified may be brought up to the approved design by the Manufacturer and be resubmitted for examination.
4. To permit of the foregoing Quality Assurance the Quality Assurance Officer, shall as a condition of the order, have a right of entry into the works of the Manufacturer and/or the works of any sub-Manufacturer where work on the order is in progress.
5. The manufacturer will submit for acceptance the material, components or assemblies called for in the order in suitably sized batches. The amount of material or number of units that comprise a batch will be decided by the Quality Assurance Officer after consultation with Manufacturer. If the QAO's examination of a proportion of a batch of material, components or assemblies submitted to him reveals departures from the drawings and/or specification the whole batch may be rejected. At the discretion of the Quality Assurance Officer a rejected batch may be resubmitted to him provided that the Manufacturer has examined all the units therein and eliminated any defective.

SECTION TEN — PACKING

1. The stores shall be packed for delivery in accordance with the terms of the order.
2. Notwithstanding the conditions for packing prescribed by the order, the Manufacturer shall be responsible that the stores are packed in containers which will prevent damage in transport or in storage and which are so marked that the stores may be readily recognised and identified with the order on which they are supplied.

Revised and approved

Sd/ x x x

(LH SHAW)

DSS

for CONTROLLER OF QUALITY ASSURANCE
(AMN)

Dated 30 May 1978

Notes :- (i) This specification is to be returned to the Controller, Controllerate of Quality Assurance (AMN) Kirkee, Pune-3, immediately on submission of tender or completion of order.

(ii) This specification only holds good for the particular order for which it was issued.

Correct copy of the sealed specification at this date.

Kirkee, Pune-411 003.

Dated 31 MAY 1979

A. M. Athale
(A. M. ATHALE)
BY ASSISTANT CONTROLLER
for CONTROLLER OF QUALITY ASSURANCE (AMN)

THIS DOCUMENT IS THE PROPERTY OF THE GOVERNMENT OF INDIA, MINISTRY OF DEFENCE. IT MUST NOT BE REPRODUCED DISCLOSED TO ANY THIRD PARTY OR USED FOR ANY CIVIL PURPOSE. IT MUST BE RETURNED TO THE ISSUING AUTHORITY WHEN THE PURPOSE OF ITS ISSUE HAS BEEN SERVED.

15. Air drying paints may be used for the purpose of 'touching up' small areas of damaged paint or surfaces which show slight discrepancies.

SECTION EIGHT — REPAIR OF PACKAGES

1. The provisions of all the foregoing Sections shall apply except in so far as they are clearly applicable to new manufacture only.
2. Packages shall be emptied of any containers or packing pieces, which shall be sorted, segregated and reported for disposal instructions.
3. The Manufacturer shall sort the packages and segregate those unsuitable for repair, which will be reported for disposal instructions.
4. The packages shall be cleaned, and all rust and water strains shall be removed, by an approved process. The Manufacturer must inform the Quality Assurance Officer of the process, he proposes to use and obtain his approval before commencing production. After cleaning and completely de-rusting inside and out, the packages shall be inspected by a representative of the Quality Assurance Officer before any further work is done.
5. All large dents and distortions shall be removed to the satisfaction of the Quality Assurance Officer. Complete removal of dents will not usually be necessary, but any small dents which remain must not interfere with the correct functioning of fittings, the opening, closing, and securing of the package or to the insertion and removal of the stores to be packed.
6. Cracks must be welded up, and punctures covered with plates welded on, to the satisfaction of the Quality Assurance Officer.
7. Broken or damaged fittings are to be removed and replaced. Missing components are also to be replaced. Components for repair will be obtained as far as possible from packages not worth repair.
8. Any new component supplied by the Manufacturer must conform to the relevant drawing, and be secured to the package in the manner laid down in the drawings.
9. Fittings which are broken away from their attachments are to be re-secured in a suitable manner to the satisfaction of the Quality Assurance Officer.
10. Rivets shall be tightened to the satisfaction of the Quality Assurance Officer or renewed; missing rivets shall be replaced.
11. New fittings are to be well finished and fitted, and where necessary are to be assembled in correct alignment. Raw edges and burrs from whatever cause are to be removed to the satisfaction of the Quality Assurance Officer.
12. All non-watertight packages are where called for, to be provided with drainage and ventilation holes drilled in the positions shown in the drawing.
13. Rubber sealing ring of watertight packages shall be removed and new ones provided. They shall be secured as shown in the drawing or with adhesive to the current approved specification.
14. The packages shall be rustproofed and painted, as provided in Section Seven. Brushing may be used as an alternative to dipping or spaying. If packages have been previously rustproofed and the metalized or phosphated surface is still maintained these packages shall be painted as provided in Section Seven. Air drying paints may be used to paint small areas after removal of patches of rust or seals, and to repair damaged paint.
15. The packages shall be tested as specified in Section Six of this specification.
16. The packages are to be stencilled with initials of the repairing Manufacturer and the year of repair, in a position agreed with the Quality Assurance Officer.

APPENDIX 1 TO SPECIFICATION 1A 1169

(See Section 4)

WELDING

1. SEAM WELDING

- (a) The working face of the electrode must be maintained flat, smooth and clean. The width must not be allowed to increase more than 20% above the initial width which the machine was set up to work. Filing of wheels is not permitted.
- (b) A gauge should be provided for checking the width of the electrode working face.
- (c) Test welds should be made as follows on strips of the material being used :—

At the commencement of each shift. Each time the electrodes are changed or dressed.
At two hourly intervals during each shift. Or as other agreed upon.

2. SPOT WELDING

- (a) The diameter of the electrode tips, or of the one tip in the case where a pad type of electrode is used must not be allowed to increase more than 20% above the initial value with which the machine was set up to work.
- (b) A gauge should be provided for checking this.
- (c) When the maximum permitted diameter has been reached, the tip or tips must be changed or dressed. Filing of the tips is not permitted.
- (d) Test welds should be made at the commencement of each shift and before and after tips have been changed or dressed.

APPENDIX 1 TO SPECIFICATION 1A 1169

(See Section 2, Clause 5)

Instructions for the use of rubber Resin Cement when sticking non-intercellular rubber and her rubber pads and packing strips to steel packages.

GENERAL

- (a) Cleanliness is essential at all times.
- (b) Surface to be stuck together must be clean and dry.
- (c) An even and adequate coat of cement must be used on each surface. The amount of surface which can be covered per litre is 2.2 to 2.4m². So far the two surfaces a litre is required for every 1.1 to 1.2m² of non-intercellular or other rubber.

INSTRUCTIONS

- (a) The temperature of the shop in which the work is carried out should not be less than 289.15 K.
- (b) The cement must be well stirred prior to use.
- (c) The cleanliness and dryness of the surface of the rubber and the metal will be ensured by wiping them thoroughly with a clean rag moistened with trichloroethylene.

Note :— To ensure that the rag is clean and free from grease, it will be changed.

- (d) Apply an even coat of the cement adhesive to both rubber and metal surface ensuring that the area of metal covered is slightly larger than that of the rubber.
- (e) Allow to dry. Drying time will depend on the shop conditions but should not be less than 15 minutes nor more than 35 minutes.
- (f) When the cement adhesive is properly dry the two surfaces should be pressed together and rolled to ensure that no air is trapped in the joint.

Note :— No stress should be applied to the joint for 24 hours.

AIDE MEMOIRE — P/11

Specification IA 1169 for steel boxes/carriers will be read in conjunction with the following : —

A Steel boxes (other than those which are air tight) and carriers packed as per service condition will be subjected to jolting and individually drop tested thereafter ... (k)

DROP TEST

One box/carrier per lot will be subjected to drop test from a height of 140 cms on to a concrete floor, successively on its base, top, side and any on corner/or any other position at the discretion of the Quality Assurance Officer with contents packed inside as per Service condition.

After drop test the box/carrier will be examined for the following :—

- (i) Catches, handles, hinges are not damaged to such an extent that they are beyond minor repairs by slight tapping with mallet.
- (ii) Welding should be intact.
- (iii) Boxes/carriers should be easy to open and close.
- (iv) Containers/Liners/Cylinders/Boxes and rounds packed therein should be easily removable.

B Hermetically sealed boxes with contents packed as per service conditions will be subjected to jolt and drop test (in their outer package as applicable)... (k) followed by leak test.

JOLT TEST

Boxes will be subjected to jolt test in a machine having a lift of 50 mm and frequency of 60 jolts per minute for 8 hours. The boxes after jolt test as above should withstand leak test in accordance with specification IA 1169. Section Six Clause 8.

Revised and approved

Sd/ x x x
(LH SHAW)

Dated 30 May 1978

for CONTROLLER OF QUALITY ASSURANCE
(AMN)

Certified correct copy of approved Aide Memoire at this date.

DATED :

for CONTROLLER OF QUALITY ASSURANCE (AMN)