Ministry of Defence

JSP 886
THE DEFENCE LOGISTICS SUPPORT CHAIN MANUAL

VOLUME 3
SUPPLY CHAIN MANAGEMENT

PART 6
EQUIPMENT FOR THE HANDLING, STORAGE AND TRANSPORTATION OF MATERIEL

VERSION RECORD		
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1.3	17 Jun 13	Change to POC details.

CONTENTS

CHAPTER 1: INTRODUCTION TO EQUIPMENT FOR THE HANDLING, STORAGE AND TRANSPORTATION OF MATERIEL

INTRODUCTION

1. This publication is intended as a guide for personnel who require and use storage media, Mechanical Handling Equipment (MHE) and minor handling aids. This publication does not cover storage and materials handling procedures in respect of explosives, Fuels and Lubricants (F&L), compressed gases or kitchens. Reference should be made to Control of Substances Hazardous to Health (COSHH) regulations, single service procedures and publications on storage and materials handling in respect of these items.

OWNERSHIP AND POINTS OF CONTACT

2. The ownership of ILS policy lies with ACDS LOG OPS.

3. The author of this policy is:

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4. Enquiries regarding the accessibility and presentation of this document should be addressed to the JSP 886 Editorial Team:

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GLOSSARY

5. A glossary of Support Chain terms is available in JSP 886 Volume 1 Part 1A.

PURPOSE

6. The purpose of this instruction is to describe the policies and processes:

a. For the safe use of storage media and minor handling aids.

b. For obtaining MHE, storage media and minor handling aids.

LINKED PUBLICATIONS

7. The following publications are linked to this instruction:

AP 119A-1501-1.	Storage Equipment Racking, Shelving, Binning and Pallets.
AP 119A-1501-5F.	Maintenance Schedule.
ISPM-15.	International Standard for Phytosanitary Measures-15.
JSP 336 Volume 3 Part 5 Pamphlet 1.	Packaging for the Handling, Storage and Transportation of Materiel.
JSP 422 Volume 5.	Tri-Service Ammunition Packaging, Configuration and Statistical Data.

8. This publication implements the following NATO Standardisation Agreements (STANAGs):

STANAG 2926.	Procedures for the Use and handling of Freight Containers for Military Supplies.
STANAG 2827.	Marking of Restraint Equipment for Road Movement.
STANAG 2828.	Military Pallets, Packages and Containers.
STANAG 2998.	Materials Handling Glossary of Terms and Definitions.

SUPERSEDED PUBLICATIONS

9. The following publications are superseded by this instruction:

JSP 336 (1st Edition) Pamphlet 11 (1991)	Storage and Materials Handling Equipment.
JSP 336 Volume 11 Part 6.	A Guide to Storage and Materiel Handling.
JSP 336 Volume 13 Leaflet C9/1.	Storage and Materials Handling.

CHAPTER 2: - BASIC FACTORS AND GENERAL PRINCIPLES APPLICABLE TO MATERIALS HANDLING

INTRODUCTION

1. Materials Handling involves equipment, manpower and space, each of which is an expensive commodity. Use of the correct materials handling equipment will often reduce labour costs and lead to a more cost-effective utilisation of space. Varying storage locations and distribution methods present different materials handling problems.

GENERAL PRINCIPLES OF MATERIALS HANDLING

2. In common with other practical subjects, materials handling is not a precise science. Theoretical consideration must give way to practicalities and local conditions. However, in most instances, the following general principles should be applied:

3. Wherever possible materiel should be handled in bulk as economy is generally directly proportional to the size of the load. Materiel should be handled as a *unit load* using the most appropriate of the following methods:

a. On a pallet.

b. Constrained on dunnage.

c. Contained in a crate on a pallet, on dunnage or on a stillage.

d. Contained in a box or post pallet.

e. Contained in a roll pallet.

f. Contained within an ISO container.

4. Movement of materiel should be from point to point via the shortest and most direct route possible. Double handling adds nothing to the value of any item, but adds to the overall cost of material.

5. It is essential that both manpower and equipment are available in the correct proportions.

6. The most efficient and economical method of handling is generally the simplest. The greatest possible use should be made of natural resources, such as gravity fed equipment, chutes and ramps etc.

7. When natural resources and manpower cannot be sufficiently utilised, Mechanical Handling Equipment (MHE) should be introduced with the object of saving time, space and manual handling effort. It reduces the risk of injury to manpower and damage to materials.

8. The correct equipment should be used for the task, ie a Fork Lift Truck (FLT) for lifting a pallet and a powered pallet truck for horizontal movement, particularly over longer distances.

9. It is preferable that, when designing a new materials handling system, room should be allowed for expansion, for increases in receipts or issues and for a change in storage patterns.

10. Related activities should be confined if possible in one building. The ideal is a combined processing building incorporating storage of fast moving items, and receipt and issue functions under one roof. Where this is not possible receipt and issue activities should be concentrated in two adjacent but separate areas. Where large bulk issues or receipts are being handled every effort should be made to operate at the storage area thus precluding a major double handling task.

PROVISION OF MHE FOR SERVICE UNITS AND DEFENCE STORAGE AND DISTRIBUTION AGENCY (DSDA)

11. All Service units who have a new requirement for MHE or require to change their current MHE holdings due to a change in role, including one off and temporary deployment should contact the SUV IPT (see Annex A to this Section).

12. An output fluctuation request (form TRIMIS 21) will be returned to be completed by the unit to facilitate a site survey to determine the correct type of MHE required.

13. DSDA and its sub-units who require the provision of new MHE or the change of current MHE are to initially contact:

Contract Management Team
Logistic Commodities and Services, Lower Arncott, BICESTER, Oxon. OX25 2LD.
Tel: Mil: 94240 Ext2352 / 3363 Civ: 01869 256352 / 258363
Fax Mil: 94240 Ext 2159 Civ: 01869 256159

14. The provision of MHE does not include an operator.

15. RAF units can also contact their OC MT Flight.

PROVISION OF STORAGE MEDIA

16. Provision of Storage Media for regular Royal Navy, Royal Marines, Army and RAF units and Reserve Forces is outlined at Annex B to this Section.

INSPECTION OF STORAGE MEDIA

17. To comply with Safety, Health, Environment & Fire (SHEF) requirements there is a need to carry out a periodic inspection of storage media particularly with regard to adjustable beam pallet racking (ABPR). The period between inspections can vary depending upon the amount of use that the installation undergoes. This is further detailed in Annex C to this Section. Further advice can be obtained from the Materials Handling Trials Unit (MHTU).

PROVISION OF MINOR HANDLING AIDS

18. Minor handling aids such as pallets, trucks, trolleys, steps, access platforms and scissor tables can be obtained via Technical Enabling Services (TES) Test and Measurement (T&M).

19. For items that are required that do not have an NSN a requirement can be generated by using the MHTU to justify and recommend the equipment for TES T&M to procure.

INSPECTION OF MINOR HANDLING AIDS

20. There is a need to carry out a yearly inspection of handling aids such as hand pallet trucks, scissor tables, steps etc. This should be carried out by a competent person; the inspection is to ensure that the equipment is safe to use. However, this does not remove the need for the user to ensure that any equipment is the correct one for the task to be carried out, and to notify the supervisor or responsible person should any damage be apparent. Information on this process can be found in Annex D to this Section. Advice can be obtained from the MHTU.

UNIT LOADS

21. Unit loads are to be designed for the transport of ammunition. These are to be built and tested in accordance with Annex D to STANAG 2828. These unit loads are to be given a unit load specification number, which is obtainable from the TES Defence Packaging Group (Def Pkg Gp) MHTU Tel: 94240 4658 Civ: 01869 875658, e-mail tim.simpkins466@mod.uk upon satisfactory completion of the tests. More information can be found at Annex E and in JSP 336 Volume 3 Part 5 Pamphlet 1 Section 5.

PALLETS

22. If ammunition is not to be transported or stored within a specially designed and tested unit load container (ULC) then it shall only be transported utilising the 1814 kg (4000 lb) wooden pallet (unless any alternative has passed the STANAG 2828 tests).

23. Most ABPR is designed to utilise the 1 tonne wingless pallet, which has been in service for a number of years. The Navy has continued to procure the predecessor, which is a 1 tonne winged design. No other pallets other than an 1814 kg NATO pallet shall be used on ABPR unless pallet support bars are supplied or specialist ABPR is provided.

24. Pallets shall not be repaired unless by a competent person and to the original design.

25. All wooden pallets now provided for Service use shall be heat treated and marked in accordance with ISPM-15. More information on ISPM-15 can be found at JSP 336 Volume 3 Part 5 Pamphlet 1.

26. More information can be found in Annex F to this Section.

TRAINING REQUIREMENTS FOR MECHANICAL HANDLING EQUIPMENTS

27. Operators of MHE are to be properly trained and hold a valid certificate of competence for the equipment that they are operating in accordance with Health and Safety at Work directives and as amended by the Approved Code of Practice (ACoP) and Supplementary Guide - Rider Operated Lift Trucks, Operator Training.

28. Each Service is responsible for training its own operators, instructors and supervisors. The policy of each is as follows:

a. Royal Navy.

(1) **The Fleet Air Arm**. Operator training is carried out at the School of Flight Deck Operations at RNAS Culdrose by its own instructors, who have themselves undergone appropriate training in instructional techniques and skills assessment through attending an approved course held under the auspices of the Road Transport Industry Training Board (RTITB). The regulations, which are at Annex A, are contained in BR 1029(4).

(2) **Royal Naval Bases**. Operator training is carried out under contract by the Base Logistics Department (Tel: Civ: 01752 553225 / Mil: 9375 53225).

b. **Army**. The Army trains its own instructors for Rough Terrain Fork Lift Trucks in accordance with the H&SW ACoP at DST Leconfield. Cascade instructors that have previously passed the instructors course at the MHE/MHTU Training School will continue to train their own unit personnel in the use of industrial FLTs. In due course this duty will be undertaken by contractors.

c. **Royal Air Force**. Instructor and Operator training is carried out at the Fork Lift Training School at DST Leconfield by its own instructors, who have themselves undergone appropriate training in instructional techniques and skills assessment through attending an approved course held under the auspices of the RTITB. Personnel who have successfully completed the Instructors course may be employed to train operators at any RAF Unit.

d. **Defence Storage and Distribution Agency**. Operator training is carried out at the MHE Training Centre at DSDC Bicester by its own instructors, who have themselves undergone appropriate training in instructional techniques and skills assessment through attending an approved course held under the auspices of the RTITB.

ANNEX A: TRI-SERVICE MATERIALS HANDLING SERVICE – CONTRACT BRIEF

(Introduced at Paragraph 3)

1. The Tri-service Materials Handling Service (TSMHS) is a Private Finance Initiative (PFI) which, via our commercial partners Barloworld, provides a World-wide materials handling service, that includes material handling equipment, repair, maintenance and a bespoke computer based Management Information System (MIS). The requirement has been translated into an output based specification based upon the needs and requirements that exist throughout the MOD, with the necessary flexibility to cater for the fluctuation anticipated with future requirements.

2. The contract offers significant improvements in both Value for Money (VFM) and in the technical delivery of the service, this results in a significant improvement in both availability and repair times.

3. Barloworld are contracted to provide equipment (not including operator) that is suitable in form for the function required and fit for role. They are responsible for compliance with all current and future industrial UK Statutory requirements and EC Directives, Council Directive 89/6555, EEC amended Council Directive 95/63/EC in respect of provision of services and articles and the relevant codes of practise and mandatory safety regulations of the Armed Services. Barloworld will refer to, and comply with, all relevant safety, operating and technical documentation, publications and other regulations. They will deliver the services in various different locations and shall ensure that all relevant local law is comprehended and complied with when doing so.

4. The service is provided on a 24 hour, 365 day basis, with a call out facility for use during silent hours; however, this will vary due to the unique operating environments of some theatres of operation. The contract is output and not asset based; this has implications when calling on the services of an engineer during silent hours, it must be ascertained that there is no under utilised asset in the vicinity to undertake the output. For example, should an asset fail during silent hours, the output should if possible be fulfilled by an under utilised asset on site, with the fault being reported during office hours. However, should an asset fail without the cover of an additional asset, the fault should be reported immediately invoking the call out procedure.

5. Barloworld currently have an obligation to restore an unserviceable asset to a serviceable condition within 12 hours, again depending on the availability of additional assets, coupled with the geographical location of the site. If this cannot be achieved Barloworld will, if the situation dictates, replace the asset wherever possible, however, failure to supply the services will ultimately lead to a financial penalty.

DEPLOYMENT

6. Units will be expected to deploy with MHE to achieve best VFM in consultation with operational theatre staff.

7. All deployments, including overseas, with fleet assets should be registered with the SUV IPT via a completed TRIMIS 08 (Equipment Movement Request) or a TRIMIS 04 (Short Term Hire Request) for deployment with hire equipment. All requests will require a comprehensive justification and where necessary a meeting will be convened to establish:

a. The Best VFM Option.

b. Points of Contact.

c. Preferred Methods of Communication.

d. Fault Reporting Systems.

e. Spares Ordering / Delivery.

8. Units requiring 'back fill' equipment to cover vacant output slots resulting from deployment should attach a completed TRIMIS 04, with the original TRIMIS 08 deployment request. TRIMIS forms are available from either the TSMH Standard Operating Procedures or electronically direct from the SUV PT.

DEPLOYMENT TO HOSTILE THEATRES

9. In the event of deployment to a hostile theatre of operations without host nation/contractor support a memorandum of understanding (MOU) will be drawn up by the SUV PT / Barloworld whereby the following will apply:

a. Units may deploy with assets, giving notice to MOD Contract Management Team and Barloworld as soon as Notice to Move (NTM) is given, via a completed TRIMIS 08 or 04 depending upon requirement.

b. A 30 days spares pack for deployed equipment will be provided by Barloworld, based on operational usage (rather than a peacetime usage) with replenishment after 14 days following deployment via the MOD Supply Chain.

c. Relevant maintenance publications and up to date workshop manuals will be provided if necessary by Barloworld.

d. Barloworld will provide, if necessary, a crash course in MHE service and repair to enable tradesmen to undertake routine maintenance tasks.

10. Additional information or clarification of any points can be obtained from SUV PT Tel: Civ: 01264 381245 / Mil: 94391 Ext 7245.

ANNEX B: PROVISION OF STORAGE MEDIA

(Introduced at Paragraph 8)

1. The provision for obtaining storage media via service sources is outlined at Appendices 1 to 7. There is a tri-Service enabling contract which shall be used whenever there is need for this type of equipment. This is to ensure that maximum value for money (VFM) is obtained, and will remove the time taken to advertise and for tender action to take place when equipment is required.

2. Funding can be via central funds or project sponsors can use their own funds. All projects can make use of this facility. All can also make use of the expertise incumbent within the MHTU.

3. While no formal agreement is yet in place for the Royal Navy or RFA establishments any unit which contact MHTU direct will be treated sympathetically.

APPENDIX 1 TO ANNEX B: ROYAL NAVY (INCLUDING RFA) STORAGE MEDIA PROVISION

1. The provision of storage media for the 3 main Navy Dockyards is now the responsibility of the contractors who operate each Naval Base as follows:

   a. **Portsmouth**: Fleet Support Ltd, Point of Contact (POC) Captain Base Logistics Organisation Tel: Civ: 02391 723491 / Mil: 9380 23491.

   b. **Devonport**: Devonport Management Ltd, POC Deputy Base Logistics Office (Intelligent Customer Office) Tel: Civ: 01752 557148 / Mil: 9375 67148.

   c. **Faslane**: Babcock Naval Services, POC Head of Supply Operation Tel: Civ: 01436 674321 / Mil: 93255 3557.

2. Each contractor is required to provide the infrastructure required to enable the base to store and issue goods in a safe and timely manner.

3. Royal Naval and RFA establishments other than above and the Royal Marines can make use of the advisory service available for the other 2 Services as and when required as detailed in Appendices 2 and 3.

APPENDIX 2 TO ANNEX B: ARMY STORAGE MEDIA PROVISION AND PROCUREMENT

1. The MHTU Advisory Officers possess a broad knowledge and experience of materials handling and storage media systems. On request they can visit on site to advise on related storage or handling problems. Alternatively, for minor storage media requirements, a catalogue of storage media equipment will be available for direct orders.

TASKING

2. Customer Service Agreements (CSA) will be required for most MHTU Advisory visits and Services. The majority of Land Sponsors and DG Log (Strike) already sign annual CSA agreements.

VISIT REQUEST PROCEDURE

3. Units should channel all Advisory visit requests through their QM or OC and then to the Equipment Table Sponsor on DPkg Form QM-D12 detailed at Appendix 7. In operational or overseas areas such as Germany, NI, Cyprus etc, requests may be routed through the relevant Log Sp Branch. If the Sponsor or Log Sp Branch endorses the request they should then forward it in writing to the Head of MHTU.

4. On receipt of a request MHTU will acknowledge the requesting unit in writing and raise an internal job card.

5. An Advisory Officer or contractor's representative will be appointed to the task. They will then contact the requesting unit POC to arrange a suitable visit date.

6. After the site visit a report containing recommendations and costs will be written. The report is advisory only and carries no guarantee that the recommendations will be implemented. However, such reports are normally accepted as justification for bids for the equipment recommended therein, subject to funding.

7. The report will be distributed to the necessary recipients and must be actioned by the unit and forwarded via their Sponsor or Log Sp Branch to the procurement co-ordinator at MHTU as per the procedure detailed in the report.

FUNDING

8. MHTU have an enabling contract arrangement for the supply of Non Inventory (NIV) storage media products. Dedicated funding is available on an annual basis for the procurement of such items for Land units, except Agencies such as DSDA who have their own funds.

9. Projects and units who have their own funds can make use of the optimum prices offered by the storage media enabling contract and place their orders via MHTU.

APPENDIX 3 TO ANNEX B: RAF STORAGE MEDIA PROVISION AND PROCUREMENT

1. The MHTU Advisory Officers possess a broad knowledge and experience of materials handling and storage media systems. On request they can visit on site to advise on related storage or handling problems. Alternatively for minor storage media requirements a catalogue of storage media equipment is available for direct orders.

TASKING

2. Customer Service Agreements (CSA) will be required for most MHTU Advisory visits and services. The majority of Land sponsors and DG Log (Strike) already sign annual CSA agreements.

VISIT REQUEST PROCEDURE

3. All requests should be via the Supply Officer or unit OC on DPkg Form QM-D12 as detailed at Appendix 7 and directed to the Head of MHTU in writing.

4. On receipt of a request MHTU will acknowledge the requesting unit in writing and raise an internal job card.

5. An Advisory Officer or manufacturer's representative will be appointed to the job and will contact the requesting unit POC to arrange a suitable visit date.

6. After visiting, a report containing recommendations and costs will be written. The report is advisory only and carries no guarantee that the recommendations will be implemented. However, such reports are normally accepted as justification for bids for the equipment recommended therein, subject to funding.

7. The report will be distributed to the necessary recipients and must be actioned by the unit and forwarded to the procurement co-ordinator at MHTU as per procedure detailed in the report.

ORDER DIRECT SYSTEM

8. This system is designed to provide a service that can satisfy simple low cost requirements for storage media via correspondence. For larger and more complex jobs MHTU can (by request) carry out a site survey by one of our Advisory representatives.

HOW TO ORDER

9. All requests should be submitted on the form detailed at Appendix 7. Accurate drawing(s) or sketches of the store(s) detailing the following should accompany this form:

a. Dimensions of the store.

b. Proposed layout of new and any existing storage media.

c. Positions of store fixtures, fittings and obstructions, in respect to the siting of storage media.

d. Ceiling height and the lowest point such as overhead lighting etc.

e. Building and room number or department and store name.

f. Type of equipment(s) to be stored.

10. On receipt of the request MHTU will examine its content. MHTU reserve the right to accept or deny the request with acceptance based on reasonable justification, cost and complexity of order. If accepted the order will be processed and procured by MHTU as funds permit. Units or sponsors with their own funds may also use this system and when priced the unit will need to provide written authority signed by the budget holder giving authority to spend against a specific UIN and Resource Accounting Code (RAC).

FUNDING

11. MHTU have an enabling contract arrangement for the supply of NIV storage media products. Dedicated funding is available on an annual basis for the procurement of such items for RAF Units.

12. Projects and units who have their own funds can make use of the optimum prices offered by the storage media enabling contract and place their orders via MHTU.

APPENDIX 4 TO ANNEX B: NEW BUILD PROJECTS

VISIT REQUEST AND / OR ADVICE PROCEDURE FOR NEW BUILDS AND PROJECTS - MOD AGENCIES

1. All requests should be via the Project Sponsor or a nominated member of the Project team on DPkg Form QM-D12 as detailed at Appendix 7 and directed to the Head of MHTU in writing. Any additional information such as architects' drawings, schedules of accommodation, timeframes etc should also be forwarded to MHTU.

2. On receipt of a request MHTU will acknowledge the request in writing and raise an internal job card. A tasking form will need to be raised and signed by both parties before work commences.

3. An Advisory Officer or manufacturer's representative will be appointed to the task and will contact the Project Sponsor or nominated POC to make suitable arrangements.

4. A Report containing a schedule of requirements for storage media recommendations and costs (at current enabling contract prices) will be produced and distributed to the necessary recipients. Broad specifications for the various types of storage media recommended will also be included.

5. The Project Sponsor has the option of procuring the equipment via MHTU at the current enabling contract prices or by competitive tender using the broad specifications and schedule of requirement. This enables a known quality of equipment to be provided at a competitive price.

6. If procurement is required by MHTU the Project Sponsor can action this by writing to the procurement co-ordinator MHTU giving authority to spend the agreed amount, giving details of the RAC against which it is to be charged.

7. It should be noted that whilst the enabling contract prices are available to the MOD they are not automatically available to nominated contractors. Generally, similar discounts will apply depending on other factors.

FUNDING

8. Whilst funding of storage media for Agencies and Projects is the responsibility of the relevant sponsor branch, the enabling contract prices are however available.

APPENDIX 5 TO ANNEX B: OTHER MOD DEPARTMENTS

VISIT REQUEST AND / OR ADVICE PROCEDURE - OTHER MOD DEPARTMENTS

1. All requests should be on DPkg Form QM-D12 as detailed at Appendix 7 and directed to the Head of MHTU in writing.

2. On receipt of a request MHTU will acknowledge the requesting unit in writing and raise an internal job card.

3. An Advisory Officer or manufacturer's representative will be appointed to the task and will contact the requesting unit POC to arrange a suitable visit date.

4. After visiting, a report containing recommendations and costs will be written. The report is advisory only and carries no guarantee that the recommendations will be implemented. However, such reports are normally accepted as justification for bids for the equipment recommended therein, subject to funding.

5. The report will be distributed to the necessary recipients and must be actioned by the unit to the procurement co-ordinator at MHTU as per the procedure detailed in the report.

FUNDING

1. MHTU have an enabling contract arrangement for the supply of NIV storage media products. They are designated funding on an annual basis for the procurement of such items. In some instances, departments' Sponsor Branches may however be responsible for providing funding.

APPENDIX 6 TO ANNEX B: RESERVE FORCES AND CADET ASSOCIATION (RFCA)

VISIT REQUEST PROCEDURE RFCA

1. Units should channel all Advisory visit requests through their QM or OC and then to the relevant Sponsor Branch on DPkg Form QM-D12 as detailed at Appendix 7. If the Sponsor Branch endorses the request they should then forward it in writing to Head of MHTU.

2. On receipt of a request MHTU will acknowledge the requesting unit in writing and raise an internal job card.

3. An Advisory Officer will be appointed to the task and will contact the requesting unit POC to arrange a suitable visit date.

4. After visiting, a report containing recommendations and costs will be written. The report is advisory only and carries no guarantee that the recommendations will be implemented. However such reports are normally accepted as justification for bids for the equipment recommended therein, subject to funding.

5. The report will be distributed to the necessary recipients and must be actioned by the Unit via their Sponsor Branch to the procurement co-ordinator at MHTU as per the procedure detailed in the report.

FUNDING

6. Whilst funding of storage media for RFCA is the responsibility of the relevant Sponsor Branch, the enabling contract prices are available.

APPENDIX 7 TO ANNEX B: REQUEST FOR MHTU ADVISORY VISIT

DPkg Form QM-D12

DETAILS OF APPLICANT

Name & Rank .....

Tel No. Mil/GTN: .....Tel No.Civ: .....

Fax No. Mil/GTN. .....Fax No.Civ: .....

Unit/Dept .....

Address .....
.....
.....
.....

Sponsor .....

Establishment Table No .. / .. / .. Dated P&W (Army only)

Unit UIN .....

Explanation of problem

Details of existing MHE and Scale (if applicable)

Details of areas requiring Storage Media

Qty of Small areas (eg offices / small stores)..... .....

Qty of Medium areas (eg stores) .....

Qty of Large areas (eg warehouse) ....

Any additional details (use additional sheet(s) if required)

Unit Approval (OC/CO)

Priority of task Operational / High / Medium / Low

Customer Funding Available? Yes / No

Name..... ..... Signature.....

Department .....

Post..... Rank .....

RAF CUSTOMERS SUBMIT THIS REQUEST DIRECT TO HEAD OF MHTU.

ARMY CUSTOMERS SUBMIT THIS REQUEST VIA RELEVANT SPONSOR / LOG SP BRANCH.

Sponsor or Log Support Branch Details

Name..... ..... Post.....

Signature.....

Request Approved Yes / No

SPONSOR NOW SUBMIT THIS REQUEST TO HEAD OF MHTU.

MHTU
Bldg 46
DLO Caversfield
Skimmingdish Lane
Caversfield
Oxon
OX27 8TS

ANNEX C: STORAGE MEDIA SAFETY INSPECTION

(Introduced at Paragraph 9)

INTRODUCTION

1. All storage media provided to the Services should have been from a manufacturer who is a member of the Storage Equipment Manufacturers Association (SEMA). This association lays out clear guidelines for the design, manufacture, assembly and inspection of its products. All inspections must be carried out in accordance with their guidelines in addition to any legislative requirements.

2. The objective of carrying out inspections on storage media is to be able to create, check and maintain records of inspection.

3. Safety inspections are required to be carried out, in order to comply with the requirements of:

   a. Workplace Health and Safety & Welfare Regulations (Regulation 5).

   b. The Provision and Use of Work Equipment Regulations (PUWER) 1998.

   c. The Secretary of State for Defence SHEF Policy Statement.

   d. They also help to:

   e. Prevent or minimise the likelihood of accidents.

   f. Provide a safe working environment and increase safety in the workplace.

TYPES AND FREQUENCY OF INSPECTIONS

4. **Daily Damage / Deficiency Inspection.** Carried out by operator or storeperson when using the equipment. Report all damage as it occurs. A file / record shall be kept with documented action points for serious damage found.

5. Weekly Inspection (Visual From Ground Level). Carried out by a supervisor.

6. **Annual Inspection (Detailed Examination).** To be carried out by a competent person. This may be increased or reduced depending upon usage and vulnerability.

ACTION ON DISCOVERY OF DAMAGE

7. Any damage should be placed into one of three of the following categories:

   a. **Green**: Superficial or cosmetic damage which will not affect the operation. Any interchangeable parts incorrectly located or incidents which can be solved immediately.

   b. **Amber**: Damage which renders the local area unfit for use and is in need of replacement or repair. If repairs are not effected within 4 weeks an amber risk becomes a red risk.

c. **Red**: - Damage which renders the greater area to be dangerous and in need of immediate attention to ensure safety.

8. Action should then be taken to deal with problems, as the degree of damage dictates.

MANUFACTURER'S RESPONSIBILITY

9. The manufacturer has a responsibility to ensure the design, manufacture and materials of the storage media are fit for purpose.

RESPONSIBILITY OF ALL PERSONNEL USING STORAGE MEDIA

10. It is the responsibility of all personnel to ensure that a system is in place to carry out regular, ie daily, visual checks, and any defects or deficiencies are recorded and reported for repair. It is not intended that the storage media be checked when not in use.

11. Within a high activity store the supervisor should carry out a general weekly walk-around to assure himself that damage has not occurred which has not been reported.

12. It is the responsibility of the owner of the storage media to ensure that an annual inspection is carried out. A one day course is available from the Def Pkg Gp that is aimed at SNCO level to enable personnel to carry out checks on short and long span shelving. For ABPR and Ground Equipment Flight (GEF) MHTU staff or a contractor will be required.

13. There should be a reporting procedure for accidents and any damage or significant defects to storage media should be logged immediately, with a system in place to effect repairs or replacement of damaged items. Advice on how to obtain replacement parts are detailed in Annex B to Section 2 or via MHTU for the Army and the RAF.

14. Items should be placed safely and securely on the storage media. All loads should be uniformly distributed across the load bearing area in accordance with the suppliers'/manufacturers' recommendations.

15. All personnel should be aware of the implication of any changes made to the storage media, to ensure that adequate safety margins are maintained.

16. Care should be taken not to lift, drop or side shift pallet loads into making contact with the uprights when loading ABPR.

DAMAGE PREVENTION

17. The following measures should be adopted to protect storage media:

a. Training Awareness.

b. Rack Protectors (ABPR).

c. Adequate Lighting.

d. Safety Rails to Segregate Pedestrians From MHE.

e. Use Only Serviceable Pallets (ABPR).

f. Shelves must not be used to access stores, use only safety steps available from Service sources.

SAFE ERECTION AND INSPECTION GUIDANCE

18. Erect the storage media in accordance with the manufacturer's instructions provided at the time of supply. Erection of ABPR when dealing with multiple bays should always be carried out by the manufacturer, qualified installations engineer, or with qualified supervision.

19. Short Span Shelving (SSS) consists of starters and extension bays.

20. A starter bay would typically be of 2 frame construction; these frames could be open or clad. When clad, this could be sheet steel, perforated, or mesh. These frames are fixed together either by beams alone, beams and back cladding or the top and bottom shelves.

21. An extension bay would typically be 1 frame adjoined to the starter bay in a similar manner used to join the 2 original frames.

22. The method for the construction of frames can vary between manufacturers, but is usually the generic method of shelving construction.

23. SSS should not have to be bolted down unless approached by Mechanical Handling Equipment (MHE), which is very unlikely, or more commonly, it exceeds the base to height ratio.

24. The height to depth ratio as laid down in the SEMA code of practice, states that a ratio of 4:1 exists. This relates to the height of the top most used (loaded) shelf in relation to the depth of shelf.

25. For height to depth ratios not exceeding 4:1, the shelving will be totally free standing without the need to be fixed to the floor.

26. For height to depth ratios exceeding 4:1 all uprights on single runs should be bolted to the floor, and all peripheral frames on back to back runs.

27. For taller structures exceeding this ratio, steps should be taken to secure uprights to supporting walls and/or floor fixed.

28. On no account are uprights to be drilled when fixing installations.

29. Depth to height ratio refers to:

a. Depth as the distance front to back, a back to back run of 500 mm bays when clipped together can be considered as 1000 mm.

b. Height is the distance from floor level to the topmost loaded shelf. For example, a 500 mm deep shelf or bay can be 2000 mm high to the topmost loaded shelf without the need to be bolted to the floor or any other structure.

30. Any storage media approached by MHE will require fixing to the floor.

31. When inspecting shelving for damage, uprights or frames should be checked, as should shelves which are often used as steps and suffer accordingly. Some types of SSS require the use of beams and / or shelf clips.

32. Basic checks should include the following:

a. Short / Long Span Shelving. Check:

(1) The SWL for a pair of beams or shelf is not being exceeded.

(2) Cross braces are in situ when required.

(3) Floor fixings are in place should the depth to height ratio exceed 4:1.

(4) Shelf clips are in place if required.

(5) Load notices are in place.

(6) Cladding is clipped into place.

(7) No major damage is present to shelves or uprights.

(8) Beam ties are in place if required.

b. Adjustable Beam Pallet Racking. Check:

(1) Beams are not deflecting under load beyond permitted limits ie 1:200, which equates to 13.5 mm in a standard 2700 mm long beam.

(2) Beam clips are in place.

(3) Load notices are present.

(4) Pallets are correctly positioned.

(5) Pallets are in good condition and are the correct type.

(6) Loose loads are restrained in pallet collars or retention cages.

(7) Floor fixings are fitted correctly.

(8) If damage is present it is within permitted limits.

(9) Correct type of pallet is used if pallet support beams are not in use.

ANNEX D: INSPECTION OF MINOR HANDLING AIDS

(Introduced at Paragraph 13)

1. A record book should be generated for each item of equipment. This should include the following information:

   a. Serial Number (if available).

   b. Manufacturer.

   c. Capacity or Safe Working Load, if applicable.

   d. Date of Issue.

   e. Date of Last Inspection.

   f. Any Additional Comments.

2. Proof load testing and periodic inspection of hand pallet trucks and similar equipment is to be carried out in accordance with EMER Test and Measurement A028 Chapter 650. All inspections are to be recorded on the appropriate form.

3. The equipment should be marked with the date of the next inspection.

ANNEX E: UNIT LOADS

(Introduced at Paragraph 15)

1. A unit load may be formed in the following ways:

   a. By Bonding.

   b. By Bonding and Banding.

   c. On Simple Dunnage.

   d. On a Stillage.

   e. On a Pallet.

   f. Within a Box Pallet.

   g. Within a Post Pallet.

   h. Within a Container.

2. A unit load does not have to be built on a platform but for ease of handling there must be access for the forks of MHE. STANAG 2828 covers NATO unit loads, which must be capable of safe stacking up to 4 units high.

3. The unit load concept ensures the following advantages:

   a. A decrease in overall handling costs by eliminating or reducing the handling of individual items.

   b. Improved use of warehouse storage space.

   c. Quicker turnaround of all forms of transport through faster loading and unloading.

   d. Reduced damage and pilfering.

4. Stacking of unit loads requires careful attention to the stability of the stack and the weight of individual loads to ensure that crushing does not damage lower unit loads.

PALLETISED UNIT LOADS

WITHIN THE SERVICES, A PALLETISED UNIT LOAD SHOULD GENERALLY NOT EXCEED THE DIMENSIONS AGREED IN STANAG 2828. EXCEPTIONALLY, LOADS HAVE TO BE DESIGNED WHICH EXCEED ONE OR MORE OF THE LIMITING FACTORS APPLICABLE TO A UNIT LOAD BUILD STANDARD (ULBS)[1]. SUCH EXCEPTIONS MAY BE DUE TO THE WEIGHT OR DIMENSIONS OF THE BASIC ITEM, OR STIPULATED BY THE DESIGN AUTHORITY AS ESSENTIAL TO MEET THE LOGISTIC REQUIREMENT. LOADS IN THIS CATEGORY WILL BE REGARDED AS 'SPECIAL' AND WILL BE CLEARLY TITLED AS SUCH ON THE DATA SHEETS.

[1] **NOTE**. Specification data sheets are known as ULBS in the RAF and Unit Load Specifications (ULS) in the other 2 Services. Details of all ammunition ULSs and ULBSs can be found in JSP 422 Pamphlet 5. Every new ammunition load introduced into Service shall be built and tested to STANAG 2828 and then be included in JSP 422 Volume 5.

ULS DATA SHEETS

1. Whilst ULS data sheets are available for the following, the main records are for ammunition and explosives:

   a. Ammunition and Explosives.

   b. General Stores.

   c. Petroleum, Oils and Lubricants.

   d. Mechanical Transport Stores.

   e. Technical Equipment Stores.

   f. Rations.

2. Each ULS data sheet includes the following information:

   a. ULS Serial Number.

   b. Detail of Load Content.

   c. Item Details.

   d. Primary Pack Content.

   e. ULS Pack Content.

   f. An Illustration, hen necessary.

   g. Method of Assembly.

   h. Method of Securing.

   i. Pallet Furniture Requirements.

   j. Tensional Steel Strapping: quantity required and tension to be applied.

   k. Weights.

   l. Dimensions.

ULS CONSTRUCTION

3. Pallet furniture is employed to locate and strengthen the items to be unitised. It is constructed so as to protect unit loads from crushing when stacked and to spread the point loading of tensional steel strapping to withstand the rigours of handling and movement, throughout the lines of communication, without damage to the contents. It may include:

   a. **Battens, internal and external.** These are of wood or other material placed between the layers of the load to ensure rigidity, or placed on the outside to produce a symmetrical shape. Battens may also be used to bond items together and to provide additional support for superimposed loads when stacked.

b. **Retaining blocks and boards.** These are nailed to the pallet and provide support.

c. **Formers.** These are shaped supports, usually of wood, which provide a seating for cylindrical items.

d. **Cross braces.** These are used to ensure that the battens, formers etc retain their position.

e. **Tensional Steel Strapping (TSS).** The ULS will invariably call for heavy duty TSS to be used. Applying the correct tension is important and is detailed in the ULS. The type, length and number of straps to be applied are also specified. Staples are used to secure the strapping to the pallet furniture to give stability.

f. **Edge protectors.** Used to provide firm edges to ease positioning of the TSS and to prevent crushing of individual packages when tension is applied.

g. **Labelling.** A cardholder with an insert label should be affixed to the ULS on one long and one short side. The label should show the ULS number, load content, the laden weight, the overall dimensions and volume in both metric and imperial measurements.

ADVANTAGES

4. The advantage of the unit load is that, if designed and tested properly, the contents should be fit for use at the point of issue, having been delivered in a manner that enables ease of use.

ANNEX F: LOAD BOARDS AND PALLETS

(Introduced at Paragraph 20)

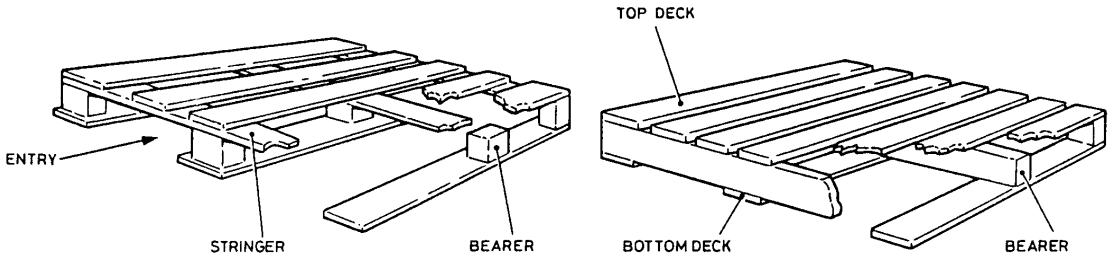
INTRODUCTION

1. Load boards include flat pallets, box pallets, post pallets and stillages. Though some flat steel pallets remain in service, the majority of flat pallets now in use are of wooden construction.

2. Pallets permit equipment loads to be moved by MHE. Palletised equipment may comprise single or multiple items which, due to their weight or bulkiness or a combination of both, cannot be easily manhandled.

3. **Wooden Pallet Construction – Components and Terminology.** (Figure 1) Pallets comprise: a deck (or decks) which can be solid or slatted, a space beneath the deck allowing entry of MHE forks and a method of ground support. The ground support may be in the form of bearers or a second deck separated from the first by bearers. The bearers may consist of longitudinal members or spacers in the form of blocks. Because the thickness of MHE forks is a nominal 50 mm (2 in), the gap between the top and bottom decks is approximately 100 mm (4 in).

Figure 1: Wooden Pallet Construction – Components and Terminology.



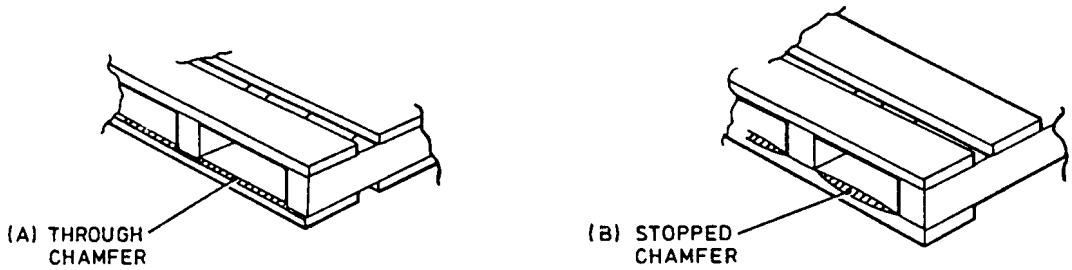
4. Pallets may also include some or all of the following:

a. **Stringers.** Horizontal members which connect bearer blocks and support the deck.

b. **Entry members.** Members forming the outside edges of the decks on the fork entry sides of the pallet.

c. **Chamfer.** A bevelled edge to the entry member, particularly on the bottom deck. This can be a <u>through</u> or a <u>stopped</u> chamfer (Figure 2). Its purpose is to assist the passage of the load wheels fitted to pallet truck forks.

Figure 2: Chamfers Through and Stopped.



d. **Entry**. The space between upper and lower decks which permits the entry of forks from a particular side of a pallet.

e. **Wings**. The parts of a pallet deck which project beyond the bearers. Pallets may be of a winged or a non-winged type.

f. **Two-way entry**. The bearers permit entry of forks or fingers from two opposite directions of the pallet only. The sides through which the forks enter are known as the entry side.

g. **Four-way entry**. The bearers or bearer blocks permit the entry of forks or fingers from all four sides of the pallet. The two sides through which the load wheels fitted to the forks of a pallet truck can pass without leaving the ground are known as free entry sides. The two sides where the load wheels have to pass over the bottom slats are known as restricted entry sides.

h. **Reversible**. Constructed with two similar decks, either of which can bear the load.

BOX PALLETS AND POST PALLETS

5. Various types and sizes of box and post pallets are used for a variety of purposes, such as accommodation stores, handleable equipment and technical assemblies. The items in common use are of steel construction with fixed posts and detachable side gates or rails. They give easy storage and transportation to small loose items and no load is transferred to the stored items.

6. Box type pallets can be designed with removable or collapsible sides to reduce the space and hence the cost taken up in transporting and storing them when empty.

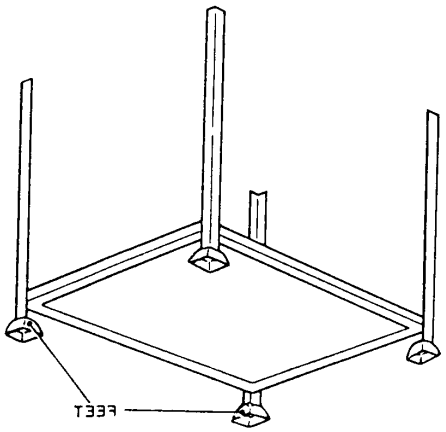
7. Aggregation containers are detachable frames, which fit to the sides of a flat pallet and allow for aggregation of many small items into a convenient load for transportation and permit stacking. The load retention cage type of pallet converter is for storage use only and does not allow other pallets to be stacked on top.

Components.

8. Box pallets are fitted with feet and solid or mesh panels (side and end). Post pallets are fitted with feet, posts, legs and rails in a combination of some or all of these components. They are described as follows:

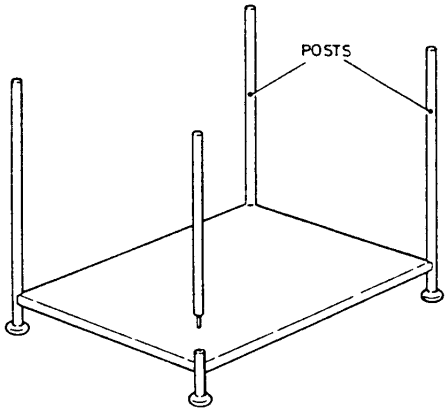
a. **Feet**. (Figure 3) Locating devices fitted to the base of the box or post pallets to facilitate stacking.

Figure 3: Box or Post Pallet Feet.



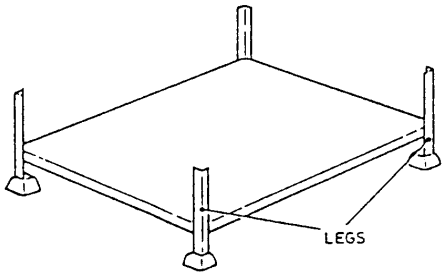
b. **Posts**. (Figure 4) Vertical members, fixed or detachable, positioned on a pallet to take the weight of superimposed pallets. Posts can be constructed of angled steel, square or round tube.

Figure 4: Pallet Posts.



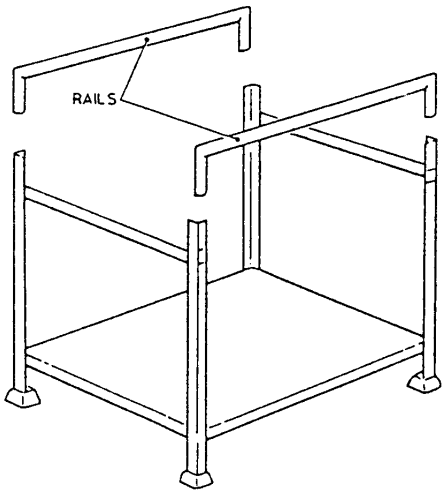
c. **Legs**. (Figure 5) Fixed members attached to the deck of a pallet and sometimes terminating in feet. Legs can be constructed of angled steel, square or round tube.

Figure4 5: Post Pallet Legs.



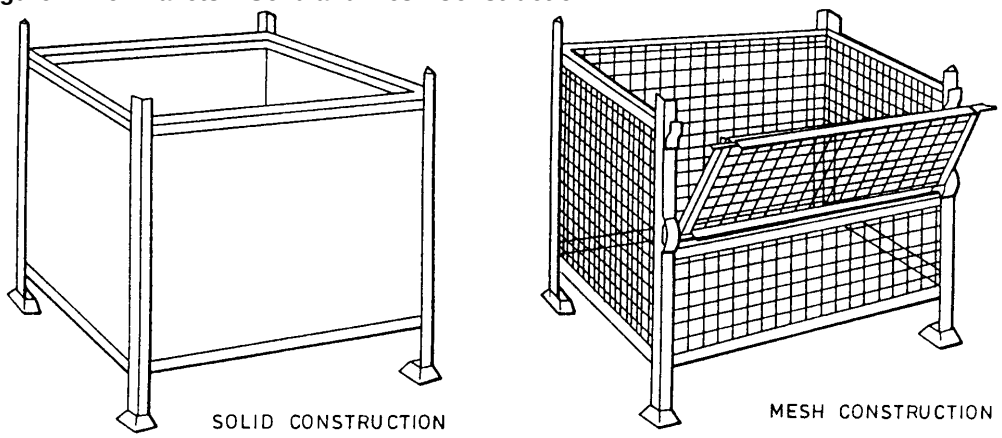
d. **Rails**. (Figure 6) Fixed or removable horizontal members connected to the posts of most pallets. Rails can be constructed of angled steel, square or round tube.

Figure 6: Post Pallet Rails.



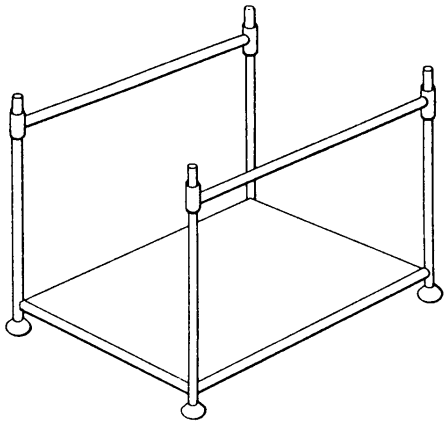
e. **Box Pallets – Solid and mesh Construction**. (Figure 7) Constructed from angled metal, square or round tube, a box pallet has a base and a superstructure of at least three fixed, removable or collapsible vertical sides which can be of solid, slatted or mesh construction. Feet attached to the base of the frame uprights permit positive location for stacking. A box pallet may be fitted with or without a lid.

Figure 7: Box Pallets – Solid and Mesh Construction.



f. **Post Pallets**. (Figure 8) Constructed from angled metal, square or round tube a post pallet comprises a base with a fixed or detachable post at each corner. Horizontal rails may be attached between the posts. A foot at the base of each post allows positive location for stacking.

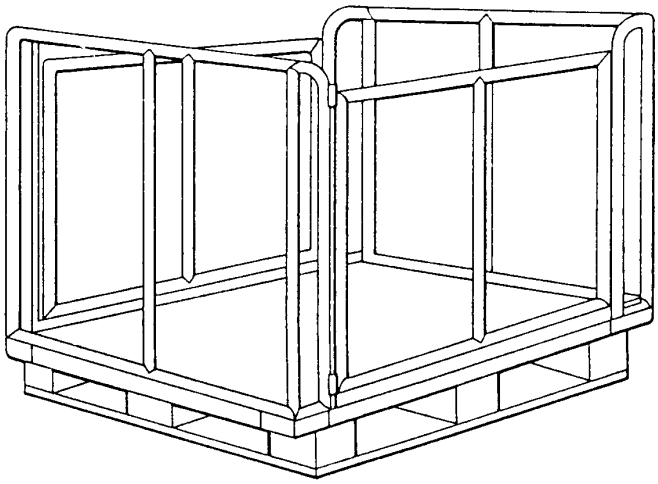
Figure 8: Post Pallet (Typical).



g. **Pallet Converters**. Pallet converters are supports fitted to flat pallets, enabling them to be stacked without the equipment loaded on the pallets bearing the load. They provide the same advantages as fixed post and box pallets with the added advantage that converters can be removed from empty pallets to occupy less space. Two types of pallet converter are in common use: the aggregation container and the load retention cage.

h. **Aggregation Container**. (Figure 9) A framework in four parts which attaches to the pallet and permits the aggregation of assorted loads. It may be of metal or wooden construction and the sides may be infilled with rods, mesh or panels. The In Service type can be capable of supporting 1814 kg and being stacked 2 high for transport when carrying 1 tonne. A lower cost version made from fibreboard or plastic is available and is intended for use with slow turnover items but its life expectancy is less than for wooden or metal designs.

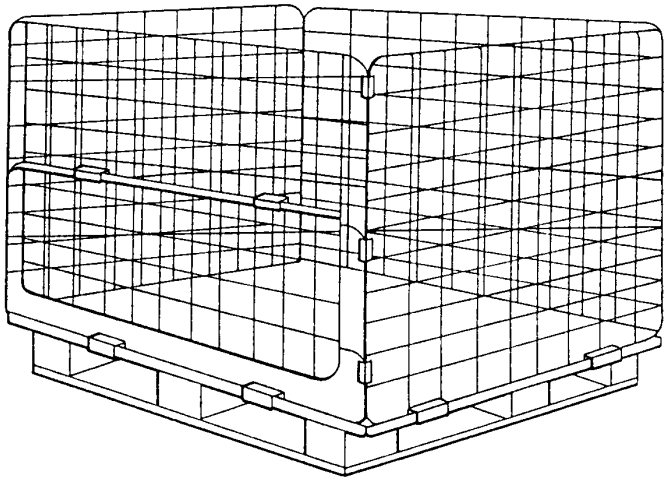
Figure 9: Aggregation Container – Typical.



i. **Load Retention Cage**. (Figure 10) Load retention cages are constructed from mesh panels fabricated from mild steel rod. Three sides are connected with hinges

and the fourth is attached with catches allowing it to be removed or part opened. The cage on the pallet is located by stops. It is used for the retention of individual unstable goods which are to be stored on racking. Opening front versions which aid equipment selection are also available. Load retention cages are not suitable for stacking.

Figure 10 - Load Retention Cage – Typical.



j. **Stillages.** A stillage is a load board comprising a single deck supported on bearers or legs, with an uninterrupted space between the bearers or legs for the entry of stillage trucks. Stillages are normally restricted to the horizontal movement of loads and generally need a minimum clearance below the load board of 152 mm (6 in). Their use in the Services is decreasing because they are less flexible than the pallet.

k. **Standard Sizes.** The MOD has selected the following plan dimensions for standard pallets: 1000 mm x 1200 mm (40 in x 48 in).

NATO STANDARD PALLET

9. The NATO standard pallet is a four way entry, winged 1814 kg (4000 lb) 1000 mm x 1200 mm wooden pallet for use in the handling and movement of equipment outside of national supply routes via NATO Lines of Communication (LofC), and for the storage and movement of stores palletised to ULBS eg explosives. The standard pallet is designed to meet the requirements of STANAG 2828 and the relevant British Standards concerning terminology, construction and testing. The standard pallet is fully detailed and specified on Drawing Number A0/11130. These pallets are now provisioned heat treated to ISPM-15, to allow safe transit between nations.

IN SERVICE 1 TONNE PALLET

10. For the storage, handling and movement of all commodities (other than stores in ULBS form), a wooden pallet of similar overall dimensions to the NATO standard pallet, but with a capacity of only 1 tonne, is used. This pallet has been designed, constructed and tested in accordance with the relevant British Standard and is fully detailed in the Drawing. Number, A0/11125 and A0/9916 for the wingless and winged pallets respectively. The winged version is in use only with the Royal Navy. It is being replaced within the Army and Royal Air Force by the wingless 1 Tonne pallet.

CARE OF WOODEN PALLETS

11. Care must be taken to prolong the life of wooden pallets which are an expensive resource. Damage can be avoided by the following:

a. Do not drop pallets from a height.

b. Ensure forks enter pallets correctly.

c. Ensure the finger rollers of pallet trucks are resting on the ground before lifting is commenced.

d. Ensure loads are evenly distributed across the deck of the pallet.

e. Ensure heavy boxes are carefully lowered to the top surfaces of the pallet.

f. Wherever possible, ensure pallets are protected from the elements.

12. Outer dimensions of the load should, in principle, not exceed the outer dimensions of the wooden pallet base. However the load may be permitted to exceed the outer pallet dimensions by 40 mm on each side of the short pallet dimension and 50 mm on each side of the long dimension. This permitted overhang relates only to floor stacked pallets. It is not permitted with ABPR because it would encroach into mandatory safety clearances between pallets and racking.

SAFE WORKING LOAD LIMITATIONS

13. The safe working load limitations which apply to pallets vary according to the design and type of material used in manufacture. Under no circumstances should any pallet be rated above the maximum working load.

14. The maximum number of pallets per stack is determined on the basis of both stability and the maximum crush load rating. To ensure stability, the stack height is generally limited to four times the length of the shortest side of the pallet base. If selections are to be carried out from pallets it is recommended that the pallet be brought down to floor level. Where extension pieces are fitted to post pallets the height/minimum base dimension rule still applies, and will reduce the tier quantity of pallets accordingly.

EXAMINATION OF 'IN USE' METAL PALLETS

15. Metal pallets within the RAF are classified as Minor Ground Support Equipment (GSE) and as such require a pre-use examination in accordance with AP100E-10 Paragraph 0816 each time the pallet is used. Metal pallets should only be stacked in tiers and used for storage when alternative pallet racking or shelving systems have been deemed inappropriate, or are unavailable in the short term. Stacking is to be in accordance with the safety plate attached and the storehouse supervisor is responsible for the safe use and stability of the installation.

REPAIR OF PALLETS

16. Repair of metal pallets is to be carried out in unit workshops as and when necessary. As a matter of policy all steel pallets are to be finished in aluminium paint (33A/9428419). Pallets damaged beyond the capability of unit workshops to repair are to be classified R/D

or 'Scrap Salvage' as appropriate. In instances where the quantity of pallets to be refurbished is beyond unit workshop capacity, advice is to be sought from MHTU.

17. When refurbishing metal pallets the relevant specification is to be followed for both materials and design in order to preclude the strength of the pallet being impaired. Where any structural refurbishment of a pallet is undertaken sample load testing is to be carried out in accordance with BS ISO 6780.

18. No repair or refurbishment of flat wooden pallets is to be undertaken without consulting the manufacturing drawing, if in doubt consult MHTU.

19. Since Feb 05 all pallets provided by MHTU and TES T&M have been heat treated in accordance with ISPM-15.

REFERENCES FOR TERMINOLOGY, CONSTRUCTION AND USE OF PALLETS

20. For fully detailed information concerning terminology, construction and the use of pallets, reference should be made to the relevant publications as follows:

BS EN 13382	Flat Pallets for Materials Handling – Principal Dimensions.
BS 6407-1	Cage Pallets for Retail Use. Specification for Collapsible Cage Pallets rated at 300 kg.
BS 6407-2	Cage Pallets for Retail Use. Guide to the Safe Handling and Use of Collapsible Cage Pallets rated at 300 kg.
BS 3810-1	Glossary of Terms used in Materials Handling. Terms used in Connection with Pallets, Stillages and Hand and Powered Trucks.
BS EN ISO 445	Pallets for Materials Handling. Vocabulary.
BS 1133-4	Mechanical Aids in Package Handling.
STANAG 2828 (MH)	Military Pallets, Packages and Containers.
STANAG 2829 (MH)	Military Handling Equipment for Use with Military Pallets.
BS ISO 18334	Pallets for Materials Handling. Quality of Assembly of New, Wooden, Flat Pallets.
BS ISO 15629	Pallets for Materials Handling - Quality of Fasteners for Assembly of New and Repair of Used Flat Wooden Pallets.
BS ISO 6780	General Purpose Flat Pallets for Through Transit of Goods. Principal Dimensions and Tolerances.
BS EN 13545	Pallet Superstructures - Pallet Collars -Test Methods and Performance Requirements.
BS EN 13698-2	Pallet Product Specification. Construction Specification for 1000mm x 1200 mm Pallet.
BS ISO 8611	General Purpose Flat Pallets for Through Transit of Goods. Test Methods.
BS EN 13626	Packaging. Box Pallets. General Requirements and Test Methods.