

HEALTH AND SAFETY IN EMPLOYMENT ACT 1992

APPROVED CODE OF PRACTICE FOR SAFETY AND  
HEALTH IN FOREST OPERATIONS

# PART 5: TIMBER STACKING, PACKETING AND TRANSPORTATION



OCCUPATIONAL SAFETY  
& HEALTH SERVICE

DEPARTMENT OF  
**LABOUR**  
TE TARI MAHI

ISSUED AND APPROVED BY  
THE MINISTER OF  
LABOUR  
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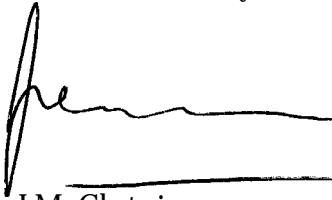
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# NOTICE OF ISSUE

I have issued this *Approved Code of Practice for Safety and Health in Forest Operations: Part Five Timber Stacking, Packeting and Transportation*, being a statement of preferred work practices or arrangements for the purpose of ensuring the health and safety of persons to which this code applies and persons who may be affected by the activities covered by the code.

A handwritten signature in black ink, appearing to read 'J.M. Chetwin', written over a horizontal line.

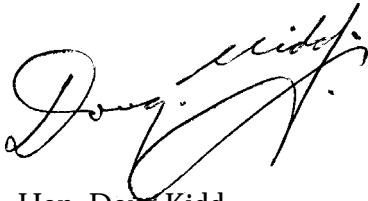
J.M. Chetwin

Secretary of Labour

August 1994

# FOREWORD

I have approved this statement of preferred work practices, which is an *Approved Code of Practice for Safety and Health in Forest Operations: Part Five Timber Stacking, Packeting and Transportation*, under section 20 of the Health and Safety in Employment Act 1992. When a code is approved, a Court may have regard to it in relation to compliance with the relevant sections of the Health and Safety in Employment Act. This means that if an employer in an industry or using a process to which an approved code applies can show compliance with that code in all matters it covers, a Court may consider this to be compliance with the provisions of the Act to which the code relates.

A handwritten signature in black ink, appearing to read 'Doug Kidd', written in a cursive style.

Hon. Doug Kidd  
Minister of Labour  
August 1994

# **SUMMARY OF THE HEALTH AND SAFETY IN EMPLOYMENT ACT 1992**

The principal object of the Health and Safety in Employment Act 1992 is to prevent harm to employees at work. To do this it imposes duties on, and promotes excellent health and safety management by, employers. It also provides for the making of regulations and codes of practice.

## **REGULATIONS**

Regulations are promulgated from time to time under the HSE Act. Regulations, among other things, may impose duties on employers, employees, designers, manufacturers and others relating to health and safety. These regulations may apply with respect to places of work, plant, processes or substances and may deal with particular problems that have arisen.

## **APPROVED CODES OF PRACTICE**

The Act provides for the development and approval of statements of preferred work practice or

arrangements that may be approved as “approved codes of practice”. These are recommended means of compliance with provisions of the Act, and may include procedures which could be taken into account when deciding on the practicable steps to be taken. Compliance with codes of practice will not be mandatory. However, they may be used as evidence of good practice in Court.

## **EMPLOYER’S DUTIES**

Employers have the most duties to perform to ensure the health and safety of employees.

If you are an employer, then you have a general duty to take all practicable steps to ensure the safety of employees while at work. (This is set out in section 6).

In particular, you are required to take all practicable steps to:

- Provide and maintain a safe working environment;
- Provide and maintain facilities for the safety and health of employees at work;
- Ensure that machinery and equipment in the place of work is designed, made, set up and maintained to be safe for employees;
- Ensure that employees are not exposed to hazards in the course of their work; and

- Develop procedures for dealing with emergencies that may arise while employees are at work.

## HAZARD MANAGEMENT

Employers must identify hazards in the place of work (previously existing, new and potential) and regularly review them to determine whether they are significant hazards and require further action. Where there occurs any accident or harm in respect of which an employer is required to record particulars, the Act (section 7(2)) requires the employer to take all practicable steps to ensure that the occurrence is so investigated as to determine whether it was caused by or arose from a significant hazard.

“*Significant hazard*” means a hazard that is an actual or potential cause or source of:

- Serious harm; or
- Harm (being more than trivial) the severity of whose effects on any person depends (entirely or among other things) on the extent or frequency of the person’s exposure to the hazard; or
- Harm that does not usually occur, or usually is not easily detectable, until a significant time after exposure to the hazard.

Where the hazard is significant, the Act sets out the steps an employer must take:

- Where practicable, the hazard must be *eliminated*;
- If elimination is not practicable, the hazard must be *isolated*;
- If it is impracticable to eliminate or isolate the hazard completely, then the employer must *minimise* the likelihood that employees will be harmed by the hazard.

Where the hazard has not been eliminated or isolated, the employer must, where appropriate:

- Ensure that protective clothing and equipment is provided, accessible and used;
- Monitor employees' exposure to the hazard;
- Seek the consent of employees to monitor their health; and
- With informed consent, monitor employees' health.

## **INFORMATION FOR EMPLOYEES**

Before an employee begins work, their employer must inform them of:

- Emergency procedures;
- Hazards the employee may be exposed to while at work;
- Hazards the employee may create while at work which could harm other people;
- How to minimise the likelihood of these

hazards becoming a source of harm to others;  
and

- The location of safety equipment.

The employer is also required to inform employees of the results of any health and safety monitoring. In doing so, the privacy of individual employees must be protected.

### **EMPLOYERS TO INVOLVE EMPLOYEES IN THE DEVELOPMENT OF SAFETY AND HEALTH PROCEDURES**

Employers need to ensure that all employees have the opportunity to be fully involved in the development of procedures for the purpose of identifying hazards and dealing with significant hazards or dealing with or reacting to emergencies and imminent dangers (section 14).

### **TRAINING OF EMPLOYEES AND THE SAFETY OF OTHERS**

The employer must ensure employees are either sufficiently experienced to do their work safely or supervised by an experienced person. In addition, the employee must be adequately trained in the safe use of equipment in the place of work, including protective clothing and equipment (section 13).

An employer is also responsible for the health and

safety of people who are not employees. An employer must take all practicable steps to ensure that an employee does not harm any other person while at work, including members of the public or visitors to the place of work (section 15).

### **EMPLOYEES' DUTIES**

If you are an employee, the Act gives you responsibility for your own safety and health while at work. You must also ensure that your actions do not harm anyone else.

### **SELF-EMPLOYED PEOPLE'S DUTIES**

Every self-employed person shall take all practicable steps to ensure that no action or inaction of the self-employed person while at work harms the self-employed person or any other person.

### **ACCIDENTS AND SERIOUS HARM: RECORDS AND NOTIFICATION**

The Act defines "accident" as an event that:

- Causes any person to be harmed; or
- In different circumstances, might have caused any person to be harmed.

This means that "accident" includes both near-misses and accidents that result in harm to a person or might have caused any person to be harmed.

Every employer is required to maintain a register of accidents and serious harm, and record particulars relating to:

- Every accident that harmed (or, as the case may be, might have harmed):
  - Any employee at work; or
  - Any person in a place of work controlled by the employer; and
- Every occurrence of serious harm to an employee at work, or as a result of any hazard to which the employee was exposed while at work, in the employment of the employer.

Where there occurs any serious harm or accident an employer must:

- As soon as possible after its occurrence, notify the Secretary of Labour the occurrence; and
- Within 7 days of the occurrence, give the Secretary of Labour written notice, in the prescribed form, of the circumstances of the occurrence.

The notification to the Secretary applies to:

- Every occurrence of serious harm to an employee at work, or the occurrence of serious harm as a result of any hazard to which the employee was exposed while at work, in the employment of the employer; and
- Accidents of a kind or description required by regulations.

# ABOUT THIS CODE

## ORIGINS

The *Safety Code for Bush Operations* was originally published in 1960 and has been revised and amended twice since then.

With developments in the industry, it was considered that a further revision was necessary to ensure recognition was given to changes taking place.

The code has been renamed *Code of Practice for Safety and Health in Forest Operations* and divided into five parts as follows:

- Part 1: *Forest Establishment and Silviculture*
- Part 2: *Cable Logging*
- Part 3: *Logging*
- Part 4: *Transportation*
- Part 5: *Timber Stacking, Packaging and Transportation*

## PURPOSE

This booklet has been prepared, following research, investigation and extensive tests, to publicise what have been proven to be the correct and

safest methods of stacking and packeting timber and securing it on vehicles in preparation for transportation.

The tests and investigations have shown the need for correct design requirements for the vehicles and the restraint equipment, and for minimum standard methods for securing a load on a vehicle.

This code should be read in conjunction with the Ministry of Transport's *Truck Loading Code*.

## **TERMINOLOGY**

A number of conventions are followed in the terminology of this code which are intended to aid clarity.

All specific recommendations are presented as numbered clauses within the booklet's different sections, while less specific background information that may of use to a reader is usually included as unnumbered paragraphs at the beginning of each section.

When reading the code, it should be remembered that:

- shall—denotes a mandatory requirement; and
- should—denotes an advisory recommendation.

## **LAYOUT**

This code contains four sections:

**Section 1: Design Requirements** stipulates the basic requirements which shall be met in designing securing devices. It is the designer's and manufacturer's responsibility to produce a vehicle and load restraint system capable of meeting the listed requirements.

**Section 2: Restraint Equipment** lists the basic components required to secure a load. It is the operator's responsibility to ensure the load is secured.

**Section 3: Timber Packeting and Stacking** covers yard operations and gives guidelines as to how a good, stable timber packet and stack shall be constructed.

**Section 4: Standard Methods** gives some working examples of the minimum requirements for load securing.

## **ACKNOWLEDGEMENTS**

The Occupational Safety and Health Service acknowledges the assistance given by industry in the preparation of this code. It thanks both the original committee members and the firms which provided the venues and equipment for tests and investigations.

## FURTHER INFORMATION

You can get further information on the occupational safety and health aspects of forest operations from your nearest office of the Occupational Safety and Health Service. There are branches in each of the following centres, with the locations of forest operations inspectors shown in **boldface** type:

|                  |                         |
|------------------|-------------------------|
| <b>Whangarei</b> | <b>Napier</b>           |
| Takapuna         | <b>Palmerston North</b> |
| West Auckland    | Lower Hutt              |
| Penrose          | Wellington              |
| Manukau          | Nelson                  |
| <b>Hamilton</b>  | <b>Christchurch</b>     |
| <b>Rotorua</b>   | Dunedin                 |
| Tauranga         | <b>Invercargill</b>     |
| New Plymouth     |                         |

In addition, from December 1994 there will be an inspector based in Gisborne.

# SECTION 1: DESIGN REQUIREMENTS

## 1.1 RESTRAINING THE LOAD

- 1.1.1 Any load carried on a vehicle shall be sufficiently restrained to prevent movement under the forces which arise from the vehicle passing over road undulations, when it changes direction, or when it is being braked or accelerated.

The forces involved in restraining the load in braking depend on the deceleration and the weight of the load, and are not dependent on the speed of the vehicle. If, however, a load does move at high speed, it will have more energy and hence it will cause more damage.

It requires much more force to stop a load which has started moving than it does to prevent the movement in the first place. It is essential, therefore, that the vehicle is loaded and the load restrained in such a way that no part of the load can freely move in any direction.

- 1.1.2 The total restraint required to accommodate the forces which arise will generally be obtained from a combination of the following:
- (a) Securing devices such as chains fixed to anchor points and suitably tensioned;

- (b) Restraining arrangements such as headboards and side posts;
- (c) Friction between the load and the vehicle platform.

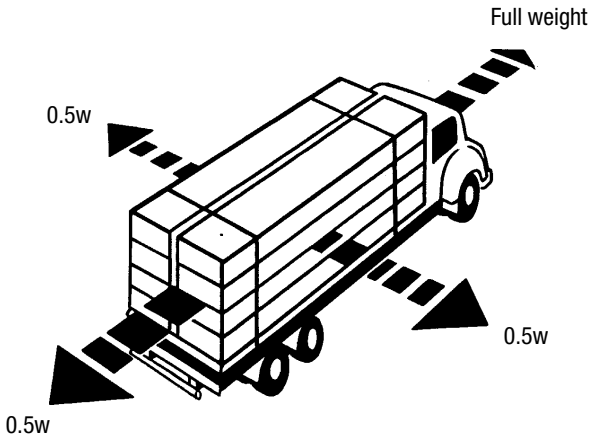
1.1.3 A load carried on a vehicle without restraining devices will not be secure because the frictional restraint between the load and the platform of the vehicle will be less than the dynamic forces which tend to move the load. It follows, therefore, that it is necessary to provide additional restraint to prevent the load moving.

## **1.2 RESTRAINT REQUIREMENTS**

1.2.1 The load restraint system shall be capable of preventing movement of the load under four particular conditions (see fig. 1):

- (a) Forward deceleration under emergency braking conditions, when the combined restraining forces shall be at least equal to the total payload weight;
- (b) Rearward deceleration when braking during reversing, when the combined restraining forces shall be at least 50% of the payload weight;
- (c) Sideways or lateral acceleration when cornering, when the combined restraining forces shall be at least 50% of the total payload weight.

*Fig.1 Payload forces*



The load restraint system must be able to withstand:

- (a) The full weight of the load forwards,
- (b) Half the weight of the load sideways,
- (c) Half the weight of the load backwards,
- (d) Appropriate vertical acceleration.

In certain circumstances, vertical acceleration may occur but this will be overcome if the restraints mentioned above are imposed by lashings placed over the load.

### **1.3 VEHICLE REQUIREMENTS**

1.3.1 In addition to meeting the statutory requirements applicable to the construction, equipment and loading of motor vehicles contained in the Heavy

Motor Vehicle Regulations 1974, the vehicle's load space and the condition of the platform shall be suitable for the type and size of the load to be carried. The manufacturer's gross vehicle weight ratings for the vehicle shall not be exceeded; nor shall individual axle weight be exceeded.

- 1.3.2 Unless the requirements of 4.1.1 are fully met, either a headboard or cab guard shall be fitted between the load and the cab.

#### **1.4 TRANSPORTATION ON AN OPEN PLATFORM**

The following sections (1.4.1 to 1.4.5) are specifically related to transportation using securing devices and an open loading platform. Any other load restraint system shall be certified by a person approved by MOT to undertake certification in accordance with NZS 5444: 1989 *Load anchorage points for heavy vehicles*.

- 1.4.1 A minimum of two securing devices shall be used to secure each section of the load. When a third device is required, it should be passed over the lower half of the load only. Subsequent devices should be over the complete load.
- 1.4.2 Care shall be taken to ensure that the securing devices are placed at points where the load is rigid, extending over the load to anchor points opposite each other.

- 1.4.3 Securing devices should be tightened at the start of a journey, checked after a few kilometres of travel, and then rechecked during the course of the journey as the timber settles on the vehicle. Steel corners help to protect the load and reduce slackening as the securing device cuts into the timber.
- 1.4.4 Uneven ends should, where possible, be at the rear of the vehicle. Any loose ends of timber should be secured, pulling them together to minimise whip.
- 1.4.5 When packets are not the total width of the truck deck, spacers should be placed in the centre of the load to extend the load widthways to get maximum effect from the securing system and minimise sideways movement of the load.
- 1.4.6 A slippery platform surface is always dangerous and the aim should be to obtain the maximum advantage from frictional restraint by keeping both the base of the load and the platform surface as clean, dry and free from grease as possible.
- 1.4.7 When the load is wrapped, timber bearers should be used to minimise movement on steel decks.

## **SECTION 2: RESTRAINT EQUIPMENT**

### **2.1 HEADBOARD**

2.1.1 A headboard, when fitted to the front of the platform of a vehicle, shall be capable of withstanding a horizontal force uniformly distributed over the vertical area, equal to half the rated payload capacity of the vehicle. Where possible, the load should be placed tightly against the headboard. If this is not possible, additional packing or chocks should be placed between the load and the headboard.

The headboard should meet with the following requirements:

- (a) The width should be at least equal to the width of the cab, and for preference should be equal to the width of the loading platform;
- (b) The height should be at least equal to the height of the cab.

### **2.2 CAB GUARD**

A cab guard will protect the driver in the event of a roll over and also absorb the impact of a load

moving forward. When fitted, they shall comply with the design requirements for logging trucks as out outlined in the *Safety Code for Forest Operations—Part 4: Transportation*.

### **2.3 SIDEBOARDS AND TAIL GATES**

Sideboards and tail gates, when fitted to the rear or the side of the vehicle platform and used as load restraint equipment, shall be capable of withstanding a horizontal force uniformly distributed over the vertical area equal to half the total payload weight.

### **2.4 SIDE AND CENTRE POSTS**

Side and centre posts, when fitted and used as load restraint equipment, shall be capable of withstanding a horizontal force uniformly distributed over the vertical area equal to half the total payload weight. Side posts should be arranged or braced so that the width of the vehicle when laden does not exceed legal limits. All posts shall be designed so that they cannot inadvertently become detached from the holders.

### **2.5 LOAD ANCHORAGE POINTS**

Load anchorage points shall comply with the requirements of NZS 5444: 1989 *Load anchorage points for heavy vehicles*. The number of anchor-

age points fitted and used and their strength shall be commensurate with the securing device to be used, and should be at least as strong as the securing device. For example, if two 5 tonne rated strength securing devices are used, the four anchor points shall each have a strength of 5 tonnes.

## **2.6 SECURING DEVICES**

The securing device and the tensioning device shall be maintained in a sound condition. Over-tensioning should be avoided as this could overload the system and weaken it.

## **2.7 TARPAULINS**

Sheets or tarpaulins should be regarded as providing no more than weather protection. The load shall be independently restrained against movement.

## **2.8 ROPE OR CORDAGE**

- 2.8.1 Sisal and manila ropes should be used only for securing tarpaulins or loads of less than 0.5 tonne. These ropes are easily damaged and constant examination is required to ensure they are serviceable.
- 2.8.2 Other ropes should comply with AS 1504: 1983 or BS 4928: 1984 and have a breaking strength of

not less than 1865 kg. Preferred ropes are of polypropylene, polyester or polyimide manufacture.

- 2.8.3 When purchasing, the buyer should ensure the supplier gives written information of the standards contained in Section 2.8.2, types of material and construction, and minimum breaking force.
- 2.8.4 Avoid contact with chemicals, oils and paints. Provide a suitable box for storage. To extend the rope's life, coil with the lay and avoid excessive knotting, sharp bends, chafing and passing over sharp or rough surfaces.
- 2.8.5 Regular detailed examination for wear and mechanical damage should be carried out. If there is any doubt about the ability of the rope to perform safely, it should be withdrawn from service.

## **2.9 CHAINS**

All chains shall be of short link and comply with NZS 3076: 1964 *Short link chain for lifting purposes*. Tensioning devices and fittings, which shall be identified with manufacturer's identity and rated load, shall be compatible in size and strength with the chain to which they are attached. All manufacturers and importers of tensioning devices and fittings to be used with such chain shall ensure that components carry a SWL identification.

- 2.9.1 The following safety precautions shall be taken when using and inspecting chains:
- (a) Chains securing loads shall be tightened and the tensioning device securely locked and all loose ends secured and all securing requirements met prior to the vehicle commencing its journey. The load should be checked at intervals during the journey.
  - (b) Care shall be taken to ensure that the chains and other devices are handled with regard to the safety of the user and other persons in the vicinity.
  - (c) Chains shall extend over the load, with each end attached to anchor points approximately opposite each other. The number of chains shall be sufficient to ensure the proper securement of all loading of the vehicle in accordance with the weight distribution of the load and the location and strength of anchor points.
  - (d) Chains shall be secured to anchor points by either a permanent attachment or by a suitable chain coupler. No chain shall ever be knotted.
  - (e) Care should be exercised not to over-strain chain systems.
- 2.9.2 Chain systems and anchor points shall be maintained in good condition. Chains or other com-

ponents shall be replaced if they show any of the following conditions:

- (a) Cracked welds or links in chains or load binder attachments;
- (b) Bent, twisted, stretched or collapsed links;
- (c) Gouges or pits in links, hooks, etc. reducing the diameter by 10% or more;
- (d) Chains repaired or joined by repair links of a type other than those designed for the purpose;
- (e) Links, hooks, etc. obviously worn and showing other visible evidence of loss of strength (wear 10% or more);
- (f) Knots in any portion of the chain;
- (g) Spread or distorted hooks;
- (h) Anchor points used in the securement of the load which are in a weakened condition or show evidence of loss of strength because of cracks, breaks, distortion or other deterioration.

Chains and hooks shall not be repaired by welding.

- 2.9.3 Claw hooks are preferable to grab hooks, as grab hooks reduce chain strength by approximately 25%.

## **2.10 WEBBING**

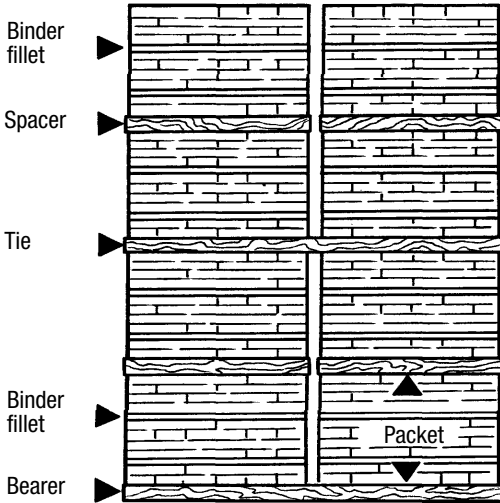
- 2.10.1 All webbing load restraint assemblies shall comply with NZS 5445: 1986 *Webbing load restraint assemblies for use in surface transport*, and shall be identified with the manufacturer's identity and rated assembly strength.
- 2.10.2 Webbing, winches and fittings shall be maintained in good condition and used in accordance with the manufacturer's instructions. Webbing shall be replaced if there is any sign of damage, chafing, fraying or stitching failure. Fittings, winches, etc. shall be replaced if bent, worn or faulty and shall not be repaired by welding.

# **SECTION 3: TIMBER STACKING AND PACKETING**

## **3.1 STACKING TIMBER**

The methods used for stacking and packeting timber depends on its end use and destination. Large quantities of timber are fillet stacked for both kiln and air drying. Under normal conditions, timber for air drying can remain for up to one year in this state. When kiln drying, the period is usually of shorter duration. When timber is to be stacked for any considerable period of time, the stacks shall be monitored by the yard proprietor or designated agent to ensure their continued stability.

- 3.1.1 The movement and stacking of timber shall be carried out in accordance with the Department of Labour's *Safety Code for Forklift Operators Part: 1 Front Loading Forklift Trucks* and *Part 2: Straddle Trucks*. Particular attention shall be given to section 5.5, Part 1, which states: "Only carry loads that are supported by their carriage or backrest extension."
- 3.1.2 Fig. 2 illustrates the parts of a timber stack.

*Fig. 2 Parts of a timber stack*

The rule is: height to be no more than four times the width of the base. If it is intended to exceed this, a tie is required.

### **3.2 STACKING AND SECURING TIMBER IN THE OPEN**

3.2.1 Before allowing stacks to be constructed in the open, a check shall be made by the yard proprietor or designated agent to determine if the ground is firm enough to support any load expected to be placed there. The existence of drains, water pipes or electric supply mains under the proposed site

shall be ascertained. Manholes, stop valves, cable chambers and fire hydrants shall not be built over. When timber is stacked adjacent to a boundary where there is public access, the stacks shall be end-on, at least 1 metre from the boundary, or alternatively, if stacked side on to the boundary, then restraining devices of calculated strength shall be provided to the full height of the stack.

- 3.2.2 The site for timber stacks should be selected for its ground stability, level and even contour, and its accessibility for whatever method is used to pile or unpile the stacks, for instance forklifts, side-loaders, hand stacking.
- 3.2.3 Solid foundations shall be provided, otherwise the stack will be faulty from the start. The following types of foundation are acceptable:
- (A) CONCRETE  
The foundations should consist of closely spaced piles down to solid ground, or a solid concrete wall reinforced with steel.
  - (B) WOOD  
The foundations should be constructed of sound timber down to solid ground. Broken, damaged or decayed timber shall be replaced.
- 3.2.4 Stack bearers or foundations shall be placed as evenly as possible, and shall be of an appropriate strength and size for the weight of the timber likely to be supported and to prevent sagging of the base packet.

- 3.2.5 Stacks shall not be located so that machines which work them are within 4 metres of any live power lines.
- 3.2.6 Even a relatively “light” wind can dislodge timber from a stack in the open. The timber often has sufficient weight and falls far enough to kill or cause serious injury.
- 3.2.7 Upper layers of stacks exposed to high winds should be restrained to prevent dislodgement. Generally, stacks should slope slightly along their length so that rain water will run off.
- 3.2.8 While tarpaulins can be used to protect timber from the weather, they should not be used as a means of securing the stack.

### **3.3 STACK CONSTRUCTION**

- 3.3.1 The key to good stack building lies in the use of “fillets”, which tie adjacent pieces together by friction. Those used to stabilise block-stacked packets are called “binder fillets”; those used to separate timber for drying are “separation fillets”.
- 3.3.2 Ties are equally important with stacks of packaged timber in that they stabilise adjacent packages and stacks.
- 3.3.3 Staggered plank ends protruding from stacks encourage people to use them for climbing and should be avoided where practicable.
- 3.3.4 No person shall climb up the side or ends of any timber stack. A ladder should be used to facilitate

stocktaking. Where a forklift is used for this purpose, a proper working platform shall be provided.

### **3.4 FILLETING TIMBER**

- 3.4.1 All timber shall be filleted and stacked with its greater dimension on the flat, and all fillets shall be of even thickness.
- 3.4.2 Fillets and spacers should be long enough for the width of the stack. Should shorter ones need to be used, they shall not be placed end to end but shall overlap each other so that at least two tiers of timber are supported on each side of the overlap.
- 3.4.3 Wherever possible, fillets should not be left protruding more than 50 mm beyond the edges of a stack to prevent danger to persons passing stacks.
- 3.4.4 Fillets shall be placed immediately above each other and also in relation to the stack bearers. In general, the narrower the dimension of the timber, the wider and/or more closely spaced the fillets should be. They should never be placed over 1 metre apart.
- 3.4.5 When completed packets are piled one on the other, any irregularity or unevenness such as sagging ends shall be corrected by packing with spacers that are placed between the packets.

### **3.5 PACKETING TIMBER**

- 3.5.1 The major cause of timber spillage has been the collapse of the base of the packets, imposing extreme force on the load restraint devices. As all types of packet binders are tensioned from the top and do not effectively consolidate the base, it is extremely important that when packets are being assembled and bound, the bottom layers are mauled up tightly.
- 3.5.2 The use and placement of binder fillets are important factors in creating a stable packet. Generally, they should never be more than 1 metre apart along the length of the packet. However, where an automated fillet system is used, a maximum spacing of 1.2 metres is allowable. Details of fillet position for various dimensions of timber are contained in section 3.10.
- 3.5.3 Clauses 3.4.2, 3.4.3 and 3.4.4 relating to fillets contained in Section 3.4 also apply to this section.
- 3.5.4 All timber is to be packeted with its greater dimension on the flat.
- 3.5.5 Packets of random-length timber shall be formed so that the short lengths are securely housed within the body of the packet. All outside pieces shall engage all of the fillets. Where short lengths are butted, extra care shall be taken to ensure that they remain secure.

### **3.6 BINDING PACKETS**

- 3.6.1 All packets of block-stacked timber shall be suitably bound at a point as near as possible to where they have been assembled. For transporting short distances on level ground about a timber yard to treatment plants, planing sheds or filleting bays, it is not considered necessary to bind the packets as effectively as for when they are to be transported greater distances and on public roads.
- 3.6.2 All binders shall be set square to the packet. Some packets will need to be rebound after drying, etc. should binders be found to have lost their tension.

### **3.7 BINDING PACKETS FOR TRANSPORTATION**

- 3.7.1 Packets to be transported shall be tightly put together, particularly at the base, and are to be bound with at least two strategically placed binders of equal or greater strength than 10-gauge 3.2 high-tensile wire, with a breaking strain of 661 kg, suitably tensioned and secured.
- 3.7.2 Packets shall be constructed and bound so they are able to withstand a horizontal acceleration equivalent to half the weight of the packet. If there is any doubt concerning this capability, then a simple tilt test can be carried out. The packet shall be able to withstand a sideways tilt angle of at least 26° before showing signs of any significant distortion.

### **3.8 BLOCK STACKING OF PACKETS**

- 3.8.1 Generally, block stacking consists of placing packets of timber already prepared one on the other.
- 3.8.2 Because fewer fillets are used to provide binding of the stack and to compensate for irregularities, block stacking shall never be higher than four times the width of the base. Where narrow packets are involved, they can be bound together to make one packet and then be stacked to four times the base width. This will help to retain storage capacity.
- 3.8.3 However, in storage sheds or where overhead cranes are used, packets may be stacked to 9.7 metres, provided a method of ensuring stability is used.
- 3.8.4 Packets stacked shall be compatible in size and structure. Packets of long-length timber shall not be stacked on top of single short-length packets. Any sag in packets should be corrected by the packing of the spacers between the packets.

### **3.9 BREAKING DOWN STACKS AND PACKETS**

- 3.9.1 If more than one person is concerned in this operation, one only shall be responsible for the manner in which the stack is reduced.
- 3.9.2 Binders shall not be cut unless everyone is in a position of safety in case any part of the stack

collapses or part of the binder flies back.

- 3.9.3 Binders shall not be cut by any person standing on a stack unless it is adequately supported on both sides.
- 3.9.4 If it seems apparent that any part of a stack or packet will collapse when the binder is cut, the packet shall be suitably stayed or held together by a forklift or other means.
- 3.9.5 The packet should be taken down layer by layer rather than tier by tier, ensuring that the remaining part is in a safe condition.
- 3.9.6 Fillets, spacers, wires and straps, etc. should not be left lying about as a tripping hazard.

### **3.10 MAXIMUM SIZES OF PACKETS FOR TRANSPORTATION**

Maximum sizes of packets for transportation are shown in figs 3-6.

### **3.11 PACKETING OTHER WOOD-BASED PRODUCTS AND NON-STANDARD TIMBER PACKETS**

It is difficult to identify all the different types and sizes of product under this title so it is understood that, in all cases, the spirit and intention of the preceding items in this code is followed by all concerned. Some of the more usual products are dealt with in the following paragraphs:

## EXPORT PACKETS OF TIMBER

The sizes of export packets of timber are determined by shipping and the requirements of the overseas buyer. These are too numerous to describe, however the spirit of sound packaging as set out in sections 3.7.1 and 3.7.2 applies.

- 3.11.1 Typical sheet wood products (e.g. plywood, particle board, veneer boards and hardboard)  
Usually 2400 x 1200 (some at 3600 x 1800)

### (A) PACKETS

Figs 7 and 8 are typical examples of a small packet and a large packet.

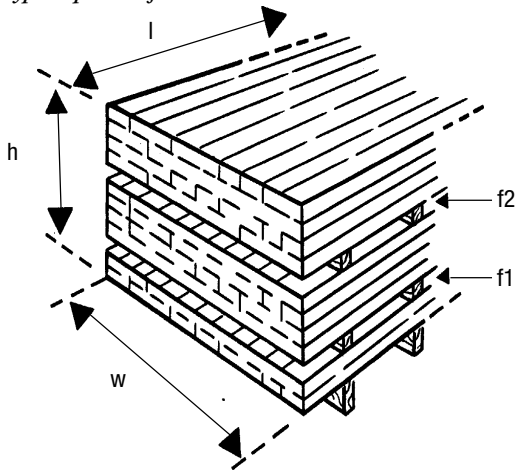
### (B) DECORATIVE BOARDS

Decorative boards that are slippery by nature should be encased in 7.5mm plywood or shrunk heavy-duty polythene before being secured with straps or wire. For convenience and minimal damage, bearers may be incorporated with the packet.

### (C) SMALL-PIECE TIMBER PRODUCTS

Small-piece timber shall be packeted such that under normal circumstances stacks and packets are self-supporting. Full use of cross-stacking and interlocking techniques shall be made (see fig. 9). Some packets may need binding in three directions (see fig. 10).

*Fig.3 A typical packet of timber*

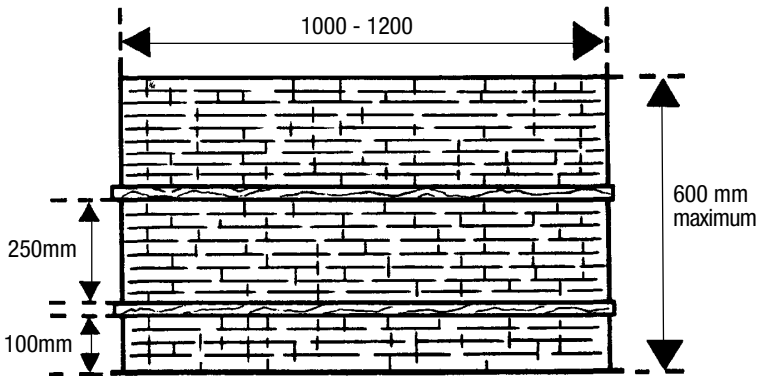


l = length  
w = width  
h = height

f1 = bottom fillet height  
f2 = subsequent fillet height

NOTE: The larger the cross section of the timber, the wider apart fillets can be placed.

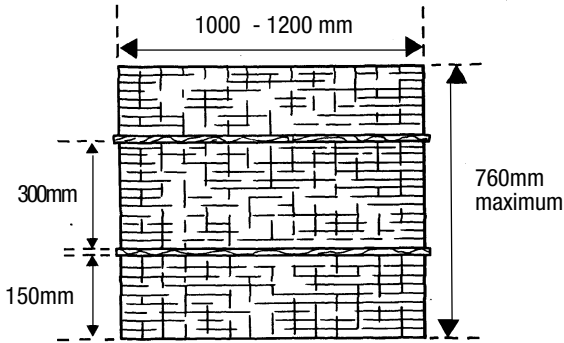
*Fig.4 Placement of fillets for timber width less than 76mm*



l = any length  
f1 = 100mm

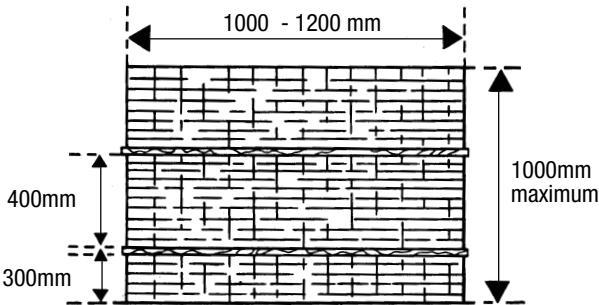
h = 600 mm max  
f2 = 200 mm

Fig.5 Placement of fillets for timber width between 76mm and 125mm



l = any length      f1 = 150mm  
 w = 1.0 - 1.2 metres      f2 = 300 mm  
 h = 760mm max\*

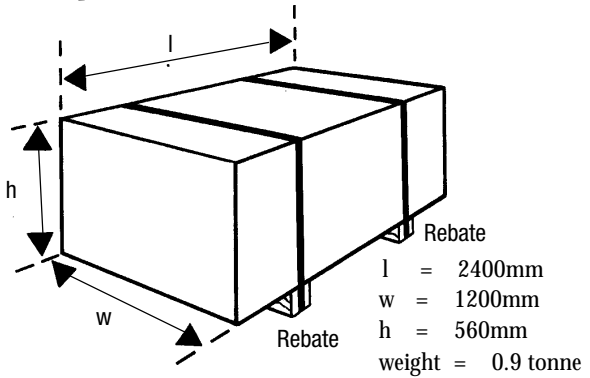
Fig.6 Placement of fillets for timber width greater than 125mm



l = any length      f1 = 300mm  
 w = 1.0 - 1.2 metres      f2 = 400 mm  
 h = 1metre max\*

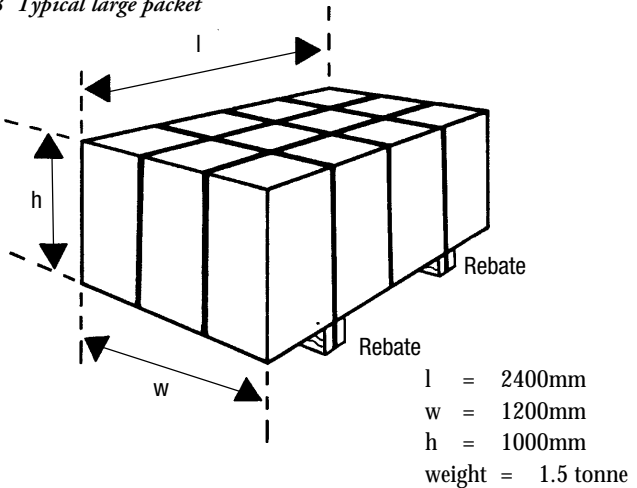
\* For heights in excess of these values, the packet shall be bound to form a main packet and additional height strapped or wired to this main packet.

*Fig. 7 Typical small packet*



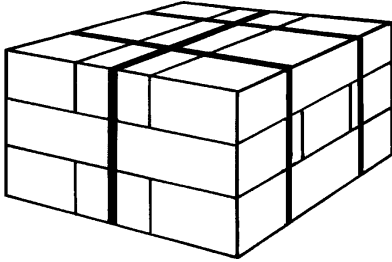
Securement of the above packet would typically be by metal straps across the width as shown.

*Fig. 8 Typical large packet*

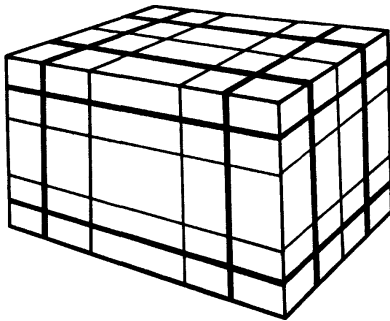


If bearers are to be an integral part of the packet, longitudinal straps shall be secured (and *not* passed round the bearers) before the rebated side straps are secured.

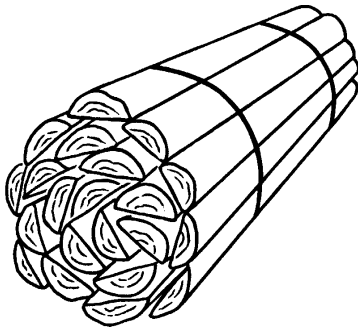
*Fig.9 Cross-stacking and interlocking*



*Fig.10 Three-directional binding*



*Fig.11 Half-round posts*



## **SECTION 4:**

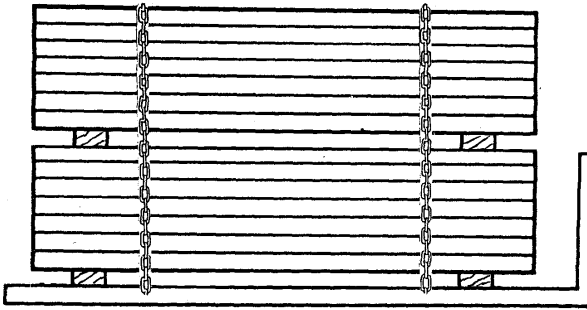
# **STANDARD METHODS**

### **4.1 SECURING DEVICES FOR PACKETS**

Packets of timber meeting the requirements of section 3 which are to be transported on a vehicle platform shall be secured by securing devices which pass from the deck on one side of the vehicle over the load to the anchor point on the other side of the deck.

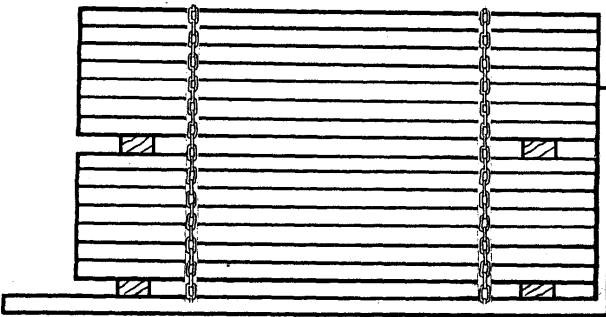
- 4.1.1 For packets which are not loaded against a headboard, the securing devices shall have a combined rated strength of at least twice the weight secured, e.g. a 10 tonne payload will require two chains each having a rated strength of 10 tonnes (see fig. 12).
- 4.1.2 For packets which are loaded against a headboard complying with section 2.1.1 so that the top packets are supported by at least 150mm, the securing devices shall have a combined rated strength of at least the payload secured, e.g. a 10 tonne payload will require two chains each having a rated strength of 5 tonnes (see fig.13).
- 4.1.3 For packets which are loaded such that the lower packets are supported by a headboard complying

*Fig. 12 Packets not loaded against a headboard*



Not loaded against headboard. Combined rated strength of at least twice the weight secured.

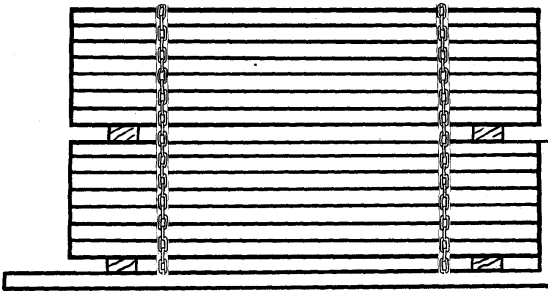
*Fig. 13 Packets loaded against a headboard*



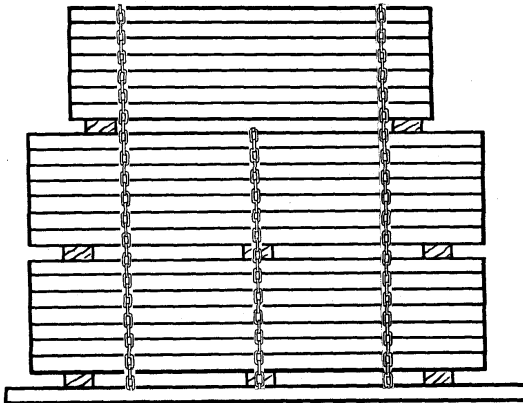
Bottom packet against headboard and top packet supported by at least 150mm. Combined rated strength of at least the payload secured.

with Section 2.1.1, but the upper packets are not supported, shall be secured by securing devices having a combined strength of at least 1.5 times the payload secured, e.g. a 10 tonne payload will require two chains each having a rated strength of 7.5 tonnes (see fig.14).

*Fig. 14 Bottom packet against headboard but upper packet not secured*



*Fig.15 Method of securing with three chains*



## 4.2 ADDITIONAL REQUIREMENTS FOR NON-PACKETED TIMBER

Timber or other timber products which are not packeted according to the requirements of section 3 shall be transported as if they were packeted timber, except that suitable centre or side posts or side gates shall also be used.

## 4.3 EXAMPLE OF CHAINS FOR SECURING A 10 TONNE PAYLOAD

8mm grade P chain rated strength 5.12 tonnes

10mm grade P chain rated strength 8.0 tonnes

8mm PWB Hi-65 chain rated strength 7.1 tonnes

(a) If the load is against the headboard, chains of 10 tonne rated strength are required, e.g.

2 x 8mm grade P chains, or

2 x 10mm grade P chains, or

2 x 8mm Hi-65 chains.

(b) If the load is not against the headboard, chains of 20 tonne rated strength are required, e.g.

4 x 8mm grade P chains, or

3 x 10mm grade P chains, or

3 x 8mm Hi-65 chains.

# GLOSSARY

## ANCHOR POINT

Device secured to the vehicle structure for the attachment of chains and other securing devices.

## ASSEMBLY

The complete restraint system in reference to webbing.

## BEARER

Larger section timber used to support the packets or stacks of timber.

## BINDER

Wires or straps tensioned around the packets of timber.

## BINDER FILLET

Fillets placed at set intervals to give stability to block-stacked timber.

## CAB GUARD

A guard provided at the back of the cab of a vehicle to protect the driver in the event of a roll over and also absorb the impact of the load moving forward.

## CLAW HOOK

Double-finger hook formed to the shape of the chain link, used for connecting chains.

**FILLET**

A small section of timber placed cross-wise on a packet at set intervals to tie adjacent pieces together by friction, or to facilitate drying.

**FOUNDATION**

Similar to a bearer, but of a permanent nature.

**GRAB HOOK**

A single-finger hook used for connecting chains.

**HAMMERLOCK**

A device for joining chains or fixing chains to an anchor point.

**HEADBOARD**

A device mounted at the front of a vehicle platform to restrain the load and protect the driver.

**PACKETING**

A quantity of timber bound together to form a transportable unit.

**PLATFORM**

The deck of a truck and/or trailer unit.

**RATED STRENGTH**

For chains, the rated strength shall be equivalent to not more than the specified minimum breaking force. For webbings, the rated (assembly) strength shall be equivalent to not more than half the breaking strength as specified in BS 5759: 1979 *Webbing load restraint assemblies for use in surface transport*.

#### RESTRAINT DEVICE

Includes all equipment such as headboards, side posts, tail gates, anchor points, webbing and chains used to restrain a load on a vehicle.

#### SECURING DEVICE

Includes chains, webbing, twitches and other components used for tying down a load.

#### SEPARATION FILLET

Small section timber used to separate layers of timber to facilitate drying.

#### SPACER

Large section timber used to separate individual packets.

#### TENSIONING DEVICE

Includes twitches, load binders, winches, etc., used to tighten securing devices to tie down a load.

#### TIMBER

Dimension wood prepared for building, carpentry, etc.

#### TIE

Dimension timber not less than 100mm x 50mm passing into adjacent stacks to provide stability.

#### TRANSPORTATION

Conveying raw materials, timber, wood and wood-based products from one place to another on a vehicle.

VEHICLE

A truck and/or trailer unit used for the transportation of timber.