

# PROCEDURE

## CASING TRANSPORT, HANDLING AND STORAGE

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## CASING TRANSPORT, HANDLING AND STORAGE

### 1 Purpose & Intended Audience

This procedure outlines the requirements for handling, transport and storage of casing, pipe and tubular objects. The intended audience is truck drivers, yardmen, forklift drivers, rig crews and includes contractors and subcontractors who are involved in providing transport services for all deliveries of casing from port to storage yard or between storage and drilling rigs and return of excess materials to storage from the rig. The storage and handling procedures are for carbon steel tubulars only.

### 2 Responsibilities

The Contact employee with responsibility for Drilling Logistics **MUST** ensure that transport operators engaged and other relevant contractors are made aware of these procedures, and they **MUST** ensure all transport, handling and storage specifications are adhered to.

Truck drivers and yardmen loading trucks are responsible for ensuring loading and unloading procedure is followed.

### 3 Transport

When carrying out casing transport using truck and trailer, the following safe operating procedures should be followed, along with those set out in the New Zealand Truck Loading Code published by NZ Transport Agency.

#### 3.1 Loading

Have you considered the following?

- Load positioning on deck
- Is the restraint suitable?
- Are sharp edges protected by lashing protectors?
- Have chocks and dunnage been used and are they secure?
- Is the load over dimensional. If so does it have proper signage and permits in place?
- No loose items are on deck
- If there is a risk of fall from one level to another then please refer to Contact Energy's "Safe work at Heights procedure" and 'Life Saver' covering working at height for guidance
- Stand clear of moving machinery. Ensure the operator can see you during loading or you are standing in the designated safe area.

#### 3.2 Driving

- You **MUST** use a dogman when reversing on all Contact Energy sites.
- Check your load before moving off, periodically during the trip and after any sharp manoeuvre or emergency braking.
- Check restraints every time you remove or add an item.

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### 3.3 Unloading

- Wherever possible know the weight of your load in advance of lifting it. Use load books where available.
- Take care working around Cranes and Forklifts. Follow the instructions of the driver or dogman. Look up for hooks slings and chains.
- Only release your load from lashings when the vehicle is in its unloading position.
- Don't move your vehicle if any part of your load is not secure.
- Stand clear of moving machinery. Ensure the operator can see you during loading or you are standing in the designated safe area.

### 3.4 Designated Safe Area

This guidance outlines the principles for identifying safe and unsafe areas in relation to loading and unloading activities, and how they can be implemented. Circumstances and requirements will change from site to site. However, the principles of red and green zones **MUST** be implemented at every loading and unloading area.

#### 3.4.1 What is an Exclusion Zone?

An exclusion zone is an effective means of identifying safe and unsafe areas when loading or unloading is taking place.

**Red Zones** are those areas which nobody is allowed to enter during loading/unloading. Red zones may well vary during the loading process. Red zones are those areas where, if something goes wrong, someone could be crushed or killed by moving equipment or falling product.

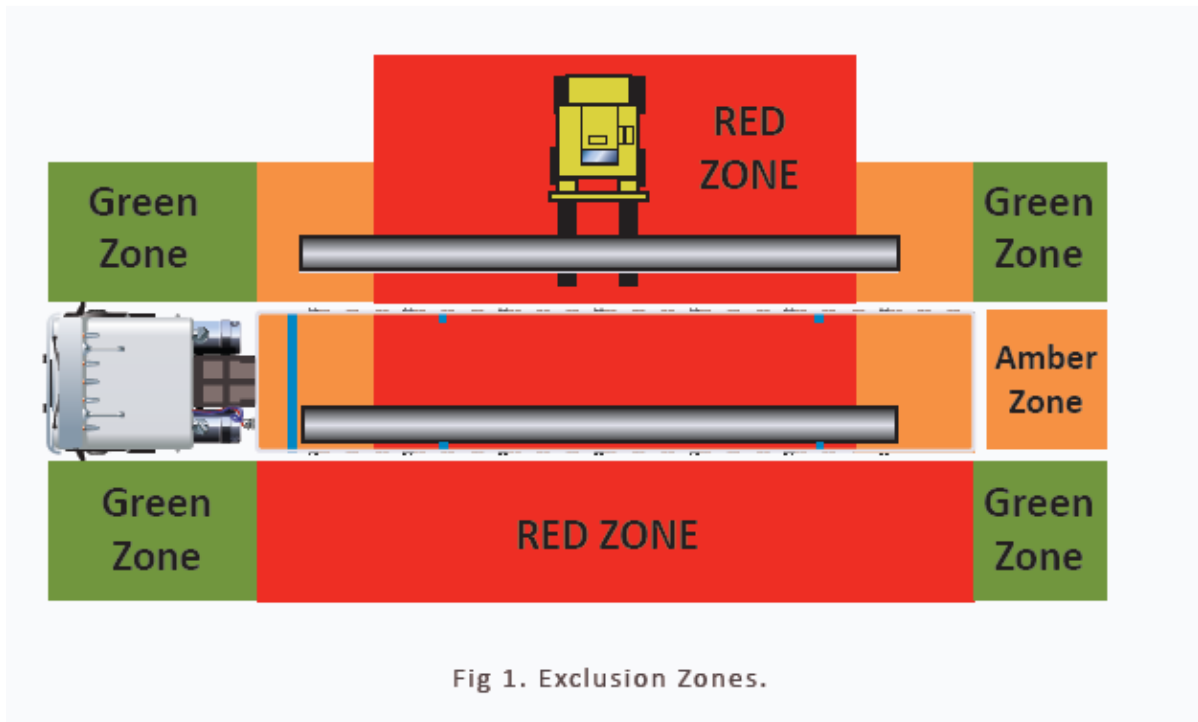
The Crane Driver or Forklift Driver is in charge of the Exclusion Zone. If anyone enters the red zone, the crane/forklift driver **MUST STOP** and instruct the person to leave the area. Loading **MUST** not continue until the person has retreated to a safe area (the green zone).

**Green Zones** are the safe areas where truck drivers, crane drivers or others involved in loading or unloading should be. All people in the green zone **MUST** be able to be seen at all times by the loader operator/crane driver.

In some circumstances **Amber Zones** may be necessary – areas where there is a small additional risk but which people need to access for “Operational Reasons”. Wherever possible, these should be avoided and the “Operational Reasons” engineered out. Extra caution needs to be taken and additional procedures may be required such as turning off or disabling loader/crane controls until the area is cleared.

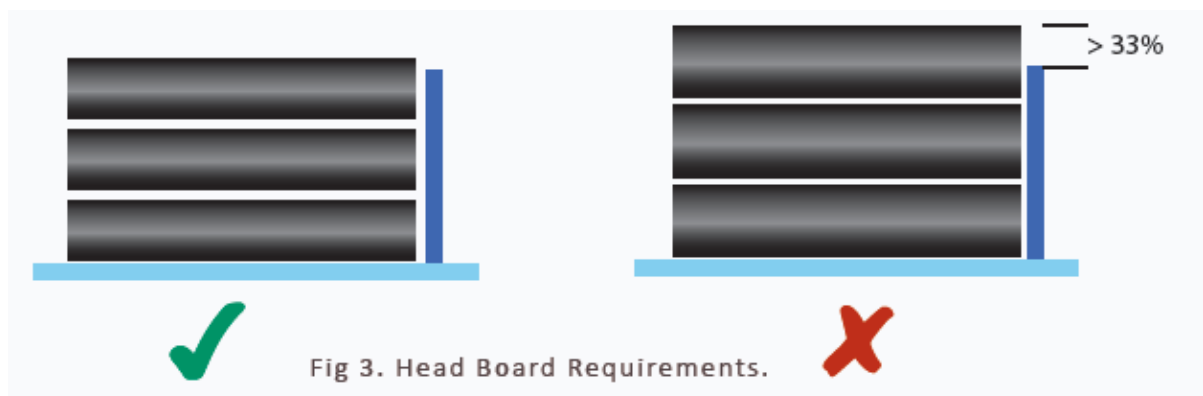
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### 3.5 Transport Procedure

1. All Truck Loading **MUST** be undertaken in accordance with “The official New Zealand Truck Loading Code”, 2008 and all subsequent updates.
2. All trailer units transporting casing **MUST** have a head-board of sufficient strength and height attached to prevent casing piercing or crushing the truck cab in the event of a load movement. The head-board **MUST** be attached to the trailer rather than the truck cab, as load movement with a backboard on the truck cab could render the truck immobile.



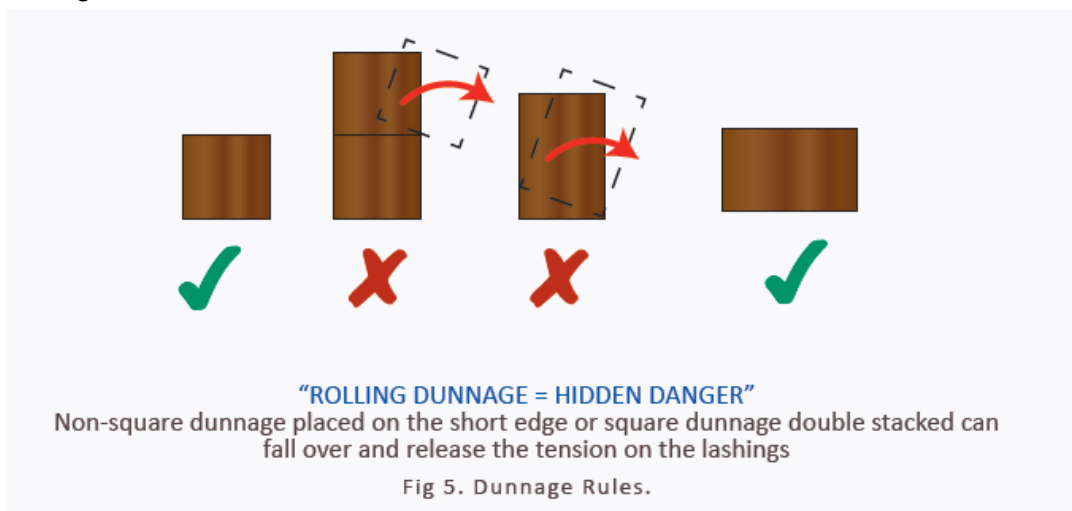
3. Casing joints should be placed near the headboard with pipes no closer than 25mm. The 25mm minimum gap is required to allow a smooth unloading by forklift. This gap should be no greater than 75mm. To prevent excessive movement in the event of emergency braking, unless load distribution makes this impractical.

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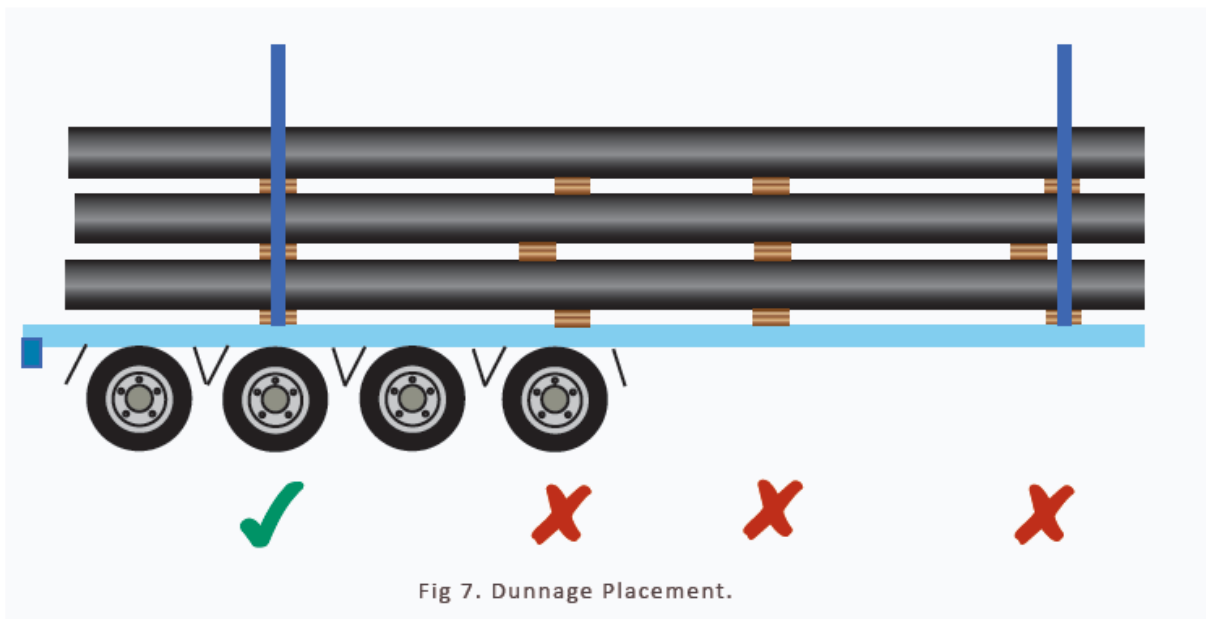
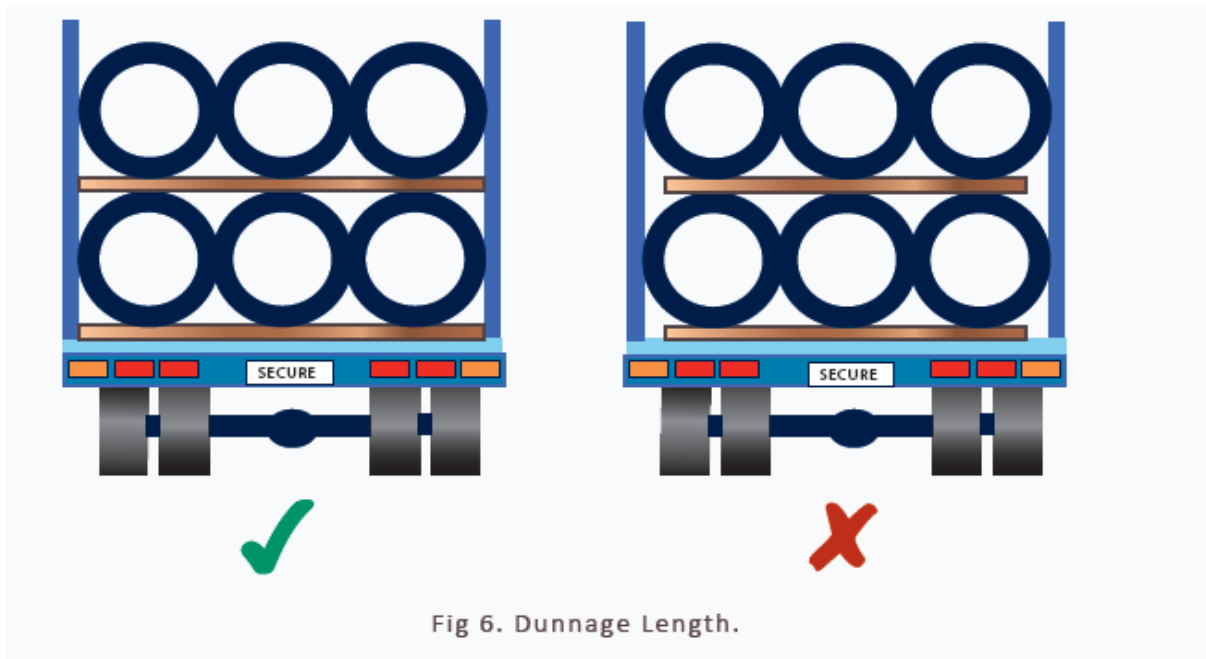
4. No loads are to exceed the height of the headboard by greater than 33% of the pipe diameter.
5. All thread protectors / caps **MUST** be in place prior to and during transport and are to be confirmed that these are secure by hand, prior to transport. This is best achieved from the space on the rear deck of the truck after loading. Loose or insecure thread protectors **MUST** be placed in a secure place e.g. Cab.
6. If more than one layer of casing is to be transported, stanchions **MUST** be used. Stanchions are to be attached to the vehicle and extend to the full height of the load.



7. Each Layer of casing being transported **MUST** have filleting (dunnage) underneath. Dunnage materials **MUST** be no less than 90mm high, to allow forklifts tines to fit between the layers and to meet strength requirements. Dunnage material **MUST** be wider than it is high and where practicable the minimum width should be 1.5 times the thickness.
8. Dunnage is to fit snug between stanchions. This is vital to prevent dunnage from sliding with the load.



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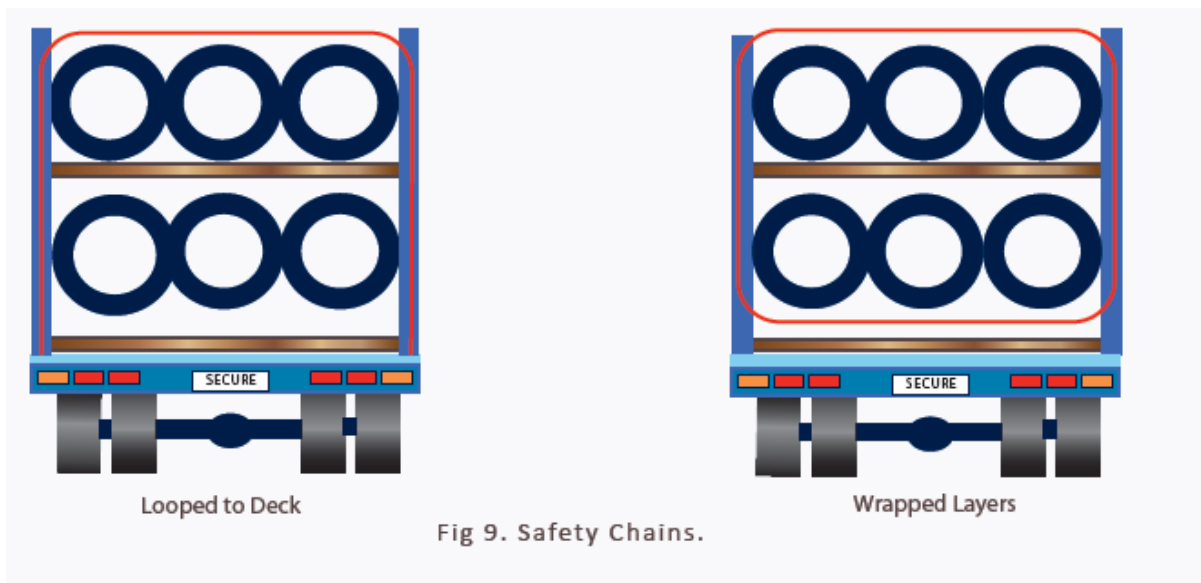
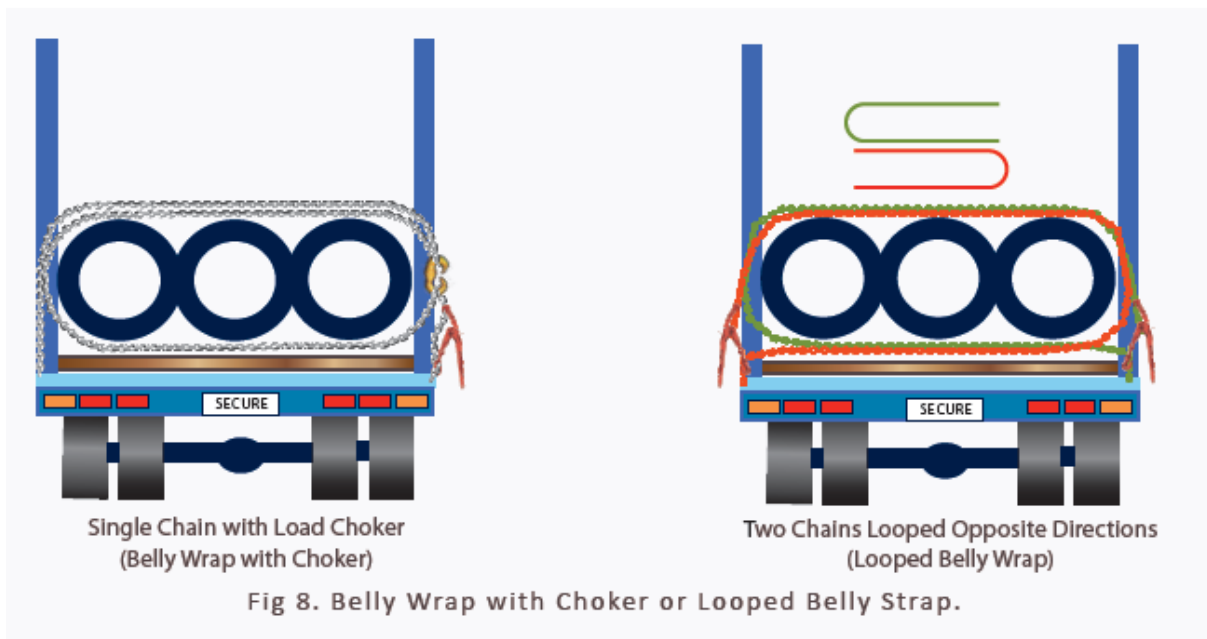
All dunnage is to be placed in line with Stanchions. Dunnage should be lined up. Stacked dunnage is to be tied or nailed together.

*Dunnage Recommendation: 140mm x 90mm H3.1 Treated Hardwood*

9. Casing should be transported with all joints in the same orientation (all pin or box pipe ends at the same end of the load). For pipe with couplings, the coupling end should preferentially be to the front.

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10. Casing **MUST** be tied down and secured so that no single part of the load is free to move in any direction independently of the rest. All loads of more than a single pipe **MUST** be:
- Belly Wrapped by two chains pulling in opposite directions or by using a single chain with a 'Load Choking' device near the stanchions.
  - The complete load is then to be secured together (wrapped) or secured to the deck by two looped chains front and rear of the load near the stanchions if more than one layer. This extra chain forms a safety chain should a choking chain fail.
  - No more than two layers of pipe may be Belly Wrapped together as one. See Load Sizes - Minimum Restraint.



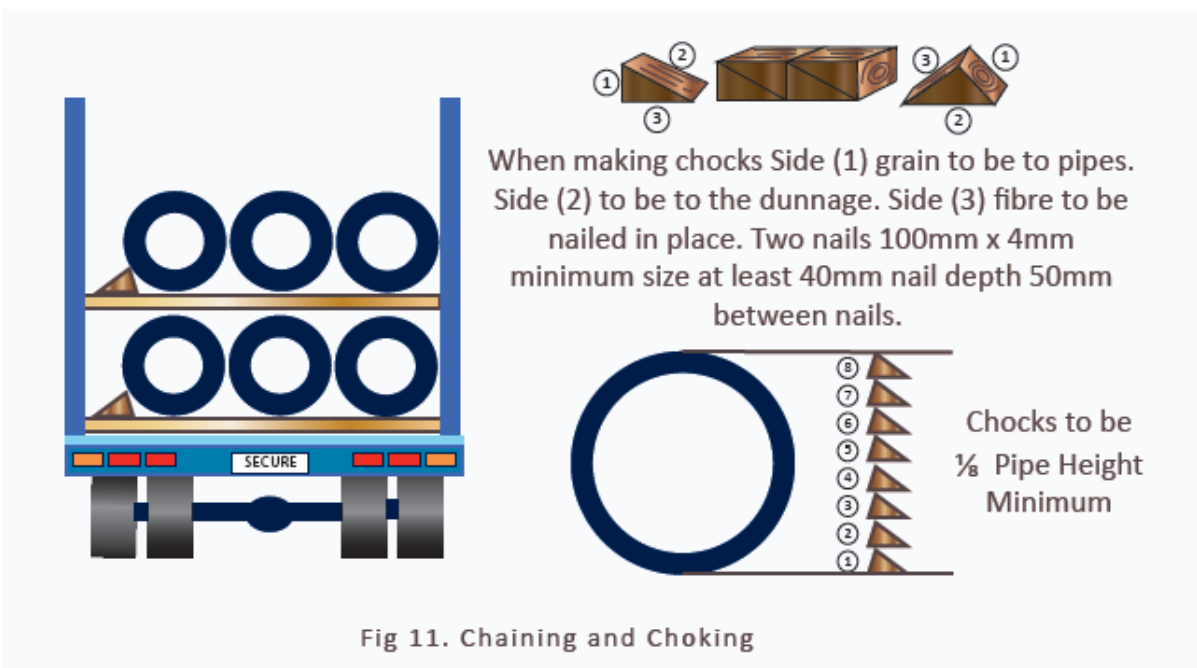


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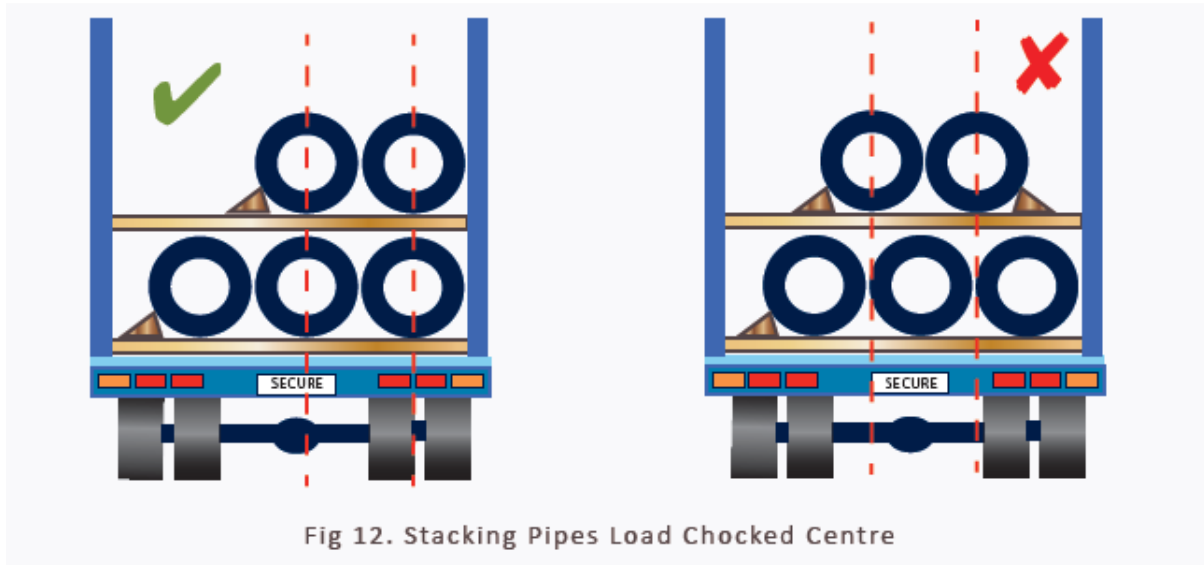
11. Only chains are to be used to tie down loads, to minimise the risk of casing damage. Chains **MUST** comply with AS/NZS 4344 or BS 4942 and be a minimum of 7.3mm diameter links. 8mm is the preferred diameter of links.
12. On all loads lateral restraint is to be provided by means of chocks on top of the dunnage with the load positioned hard against one side of the transporters stanchions for full layers. All chocks are to be fixed to avoid any chance of coming loose in transit. Chocks are to be of an appropriate size for the job.  $\frac{1}{8}$  pipe height minimum (40" casing = 127mm). When nailing to dunnage two nails minimum of at least 100mm x 4mm to a depth of 40mm into the dunnage with 50mm between nails. In the event nailing chocks is not feasible for the location the alternative fixing method **MUST** be sighted and signed off by an authorised person.



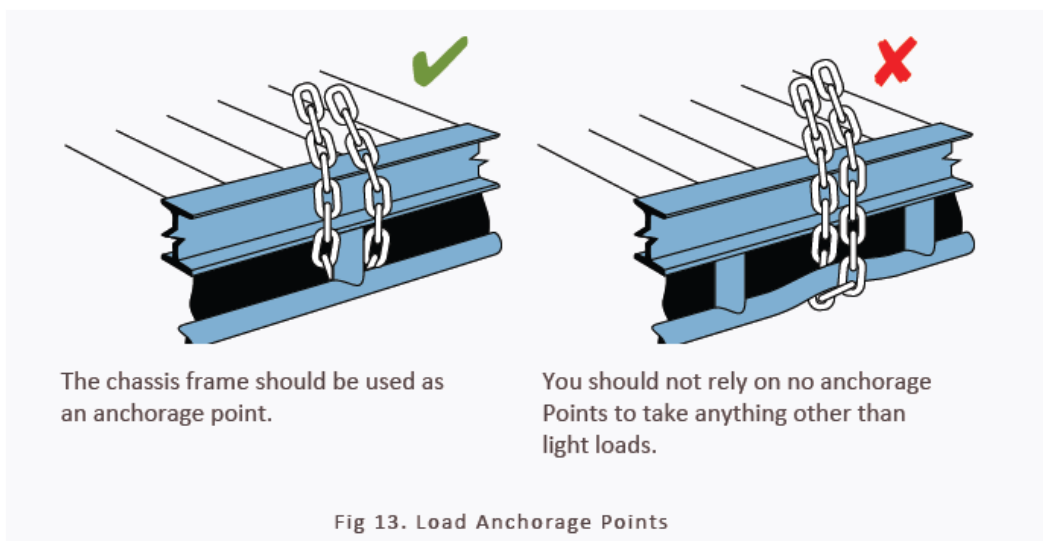


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13. On all loads when stacking pipes. Pipes **MUST** be directly above each other. Do not have the dunnage as the sole support for the load.



14. All Loads to be restrained using load anchorage points fixed to the vehicle so that the main chassis frame takes the force of the load.



15. Consignment dockets **MUST** be filled out for each load. These **MUST** state the size, weight and grade of the casing being carried, in addition to the number of units or lengths of pipe.
16. All Loads are to be checked at intervals during the journey
17. In the event that you are unable to meet the requirements of this procedure, due to unforeseen situations such as object dimensions, it is your responsibility to Eliminate, Isolate or Minimise the Hazard. Discuss options with your manager and then most importantly **document your strategy to address the Hazard on your Transport Docket before departure**. In the event that the hazard becomes a consistent issue

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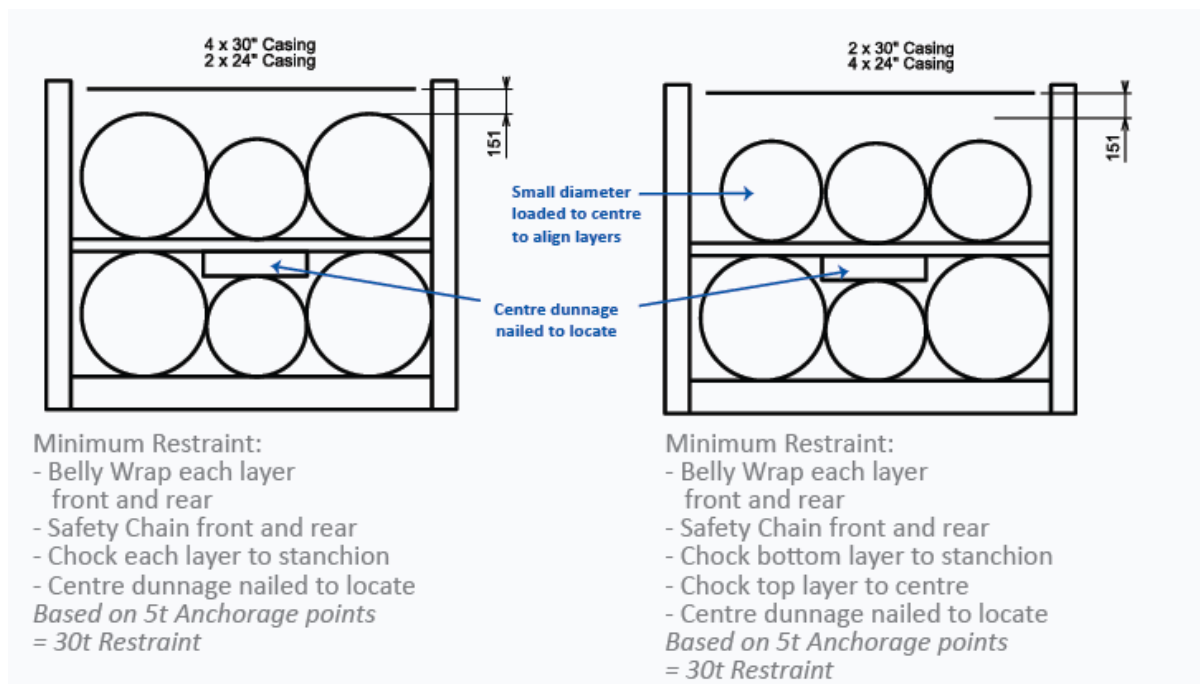
please email [mario.aranas@contactenergy.co.nz](mailto:mario.aranas@contactenergy.co.nz) so we can look at possible options to address.

### 3.6 Mixed Loads

In the event that casing is to be transported with other materials, the principles outlined in this document are to be followed for the casing or tubular objects that forms part of the load, and the New Zealand Truck Loading Code for all other objects.

For mixed casing loads, small diameter pipes can be loaded to the centre and heavier casing should be loaded to the bottom. The effect of casing load on dunnage **MUST** also be catered for in load restraints e.g. any additional dunnage **MUST** be nailed in place or otherwise secured.

Estimated Mixed Load Sizes  
(Examples of mixed Casing Loads. Max Load 23t)



### 3.7 Transport Dockets

Contact Energy also requires a transport docket to be completed for each load. As part of this docket drivers **MUST** sign off the load is secure. For casing further to the standard chaining down we are specifically signing to indicate chocks and caps are secure as marked in red. An example docket is shown below.



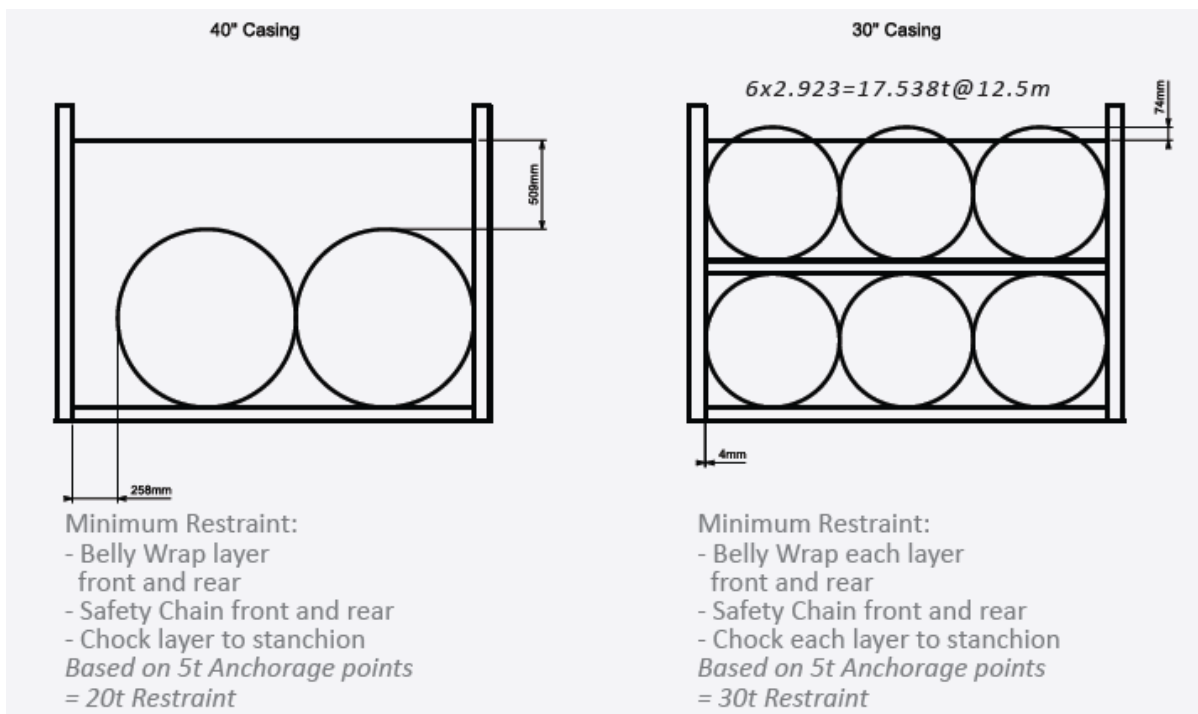
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b) Oilfield Casing is identified by the following data – arranged in the following order.

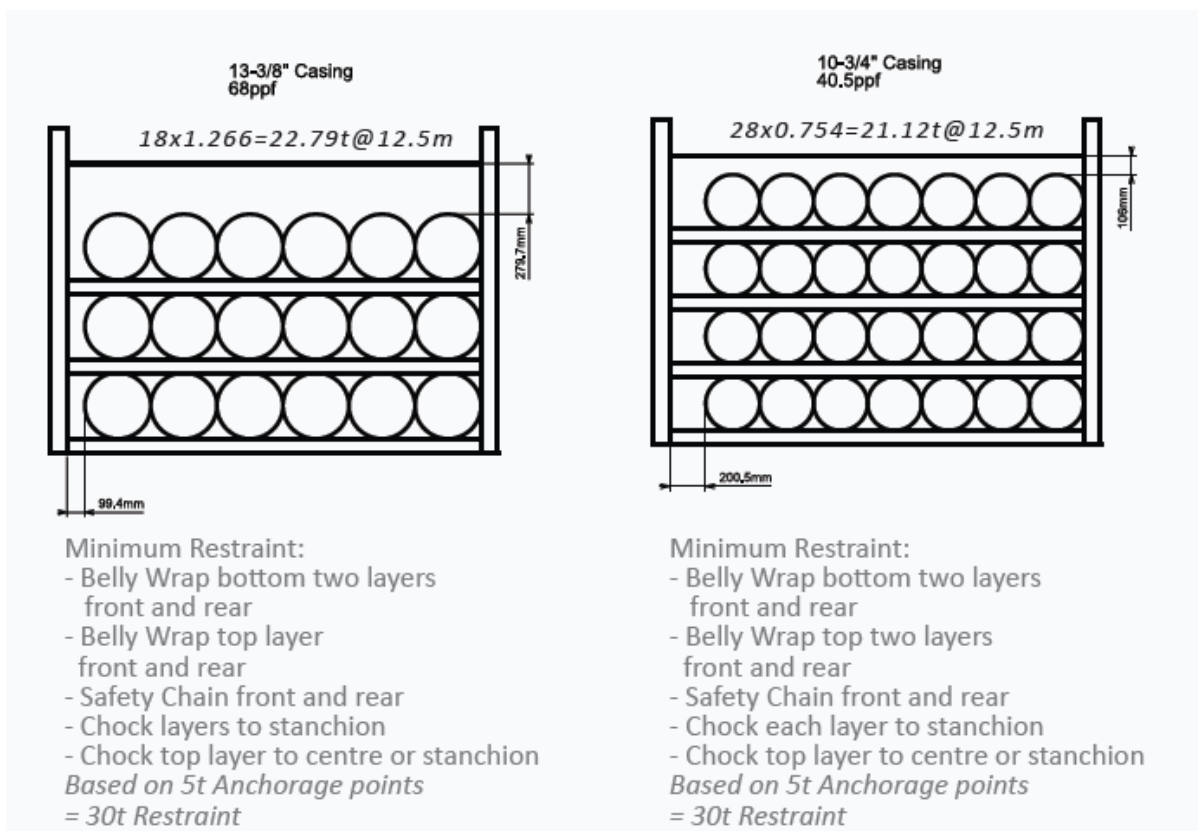
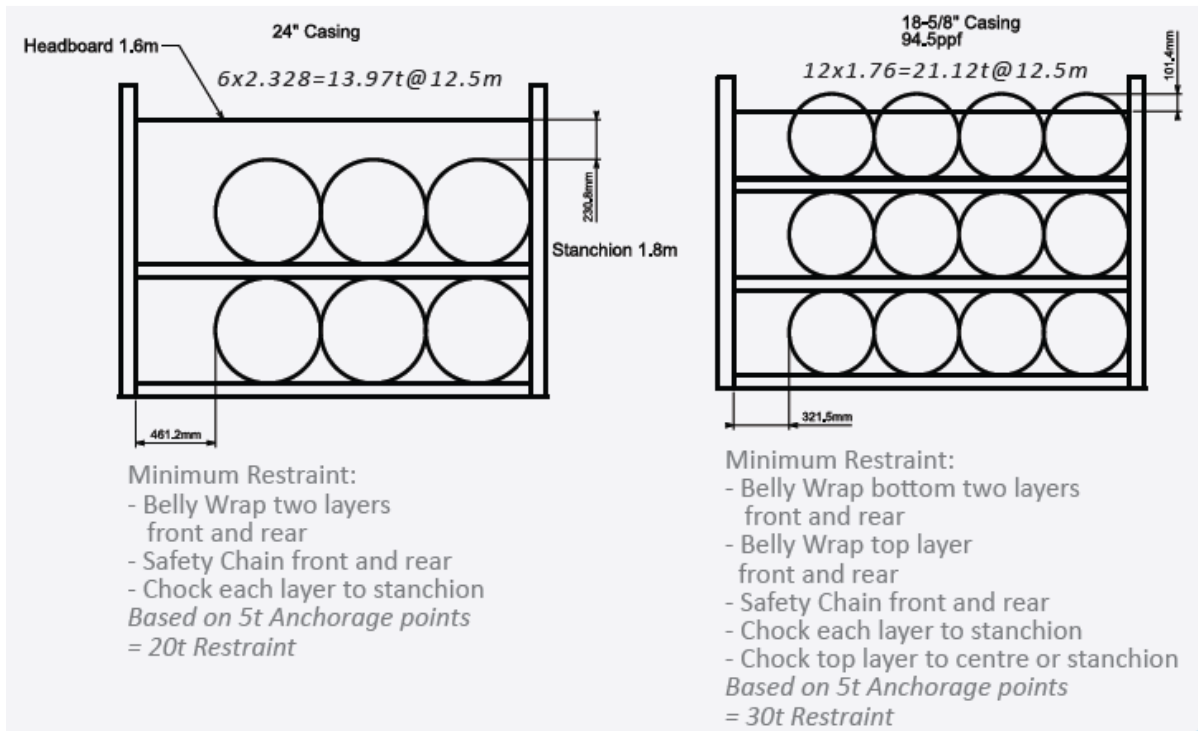
Size	Outside diameter of the casing in inches
Weight	Unit weight in pounds-per-foot (ppf). Alternative is wall thickness for linepipe
Grade	API-allocated Code to identify what material the casing is made from
Connection	The end connections / thread-type for the casing
Length	Length code = R1, Range 1 (4.88m-7.61m) , or R2, Range 2 (7.62m-10.36m) or R3, Range 3 (10.37m-14.63m)
Other	Used to identify other features such as perforation

### 3.9 Load Sizes

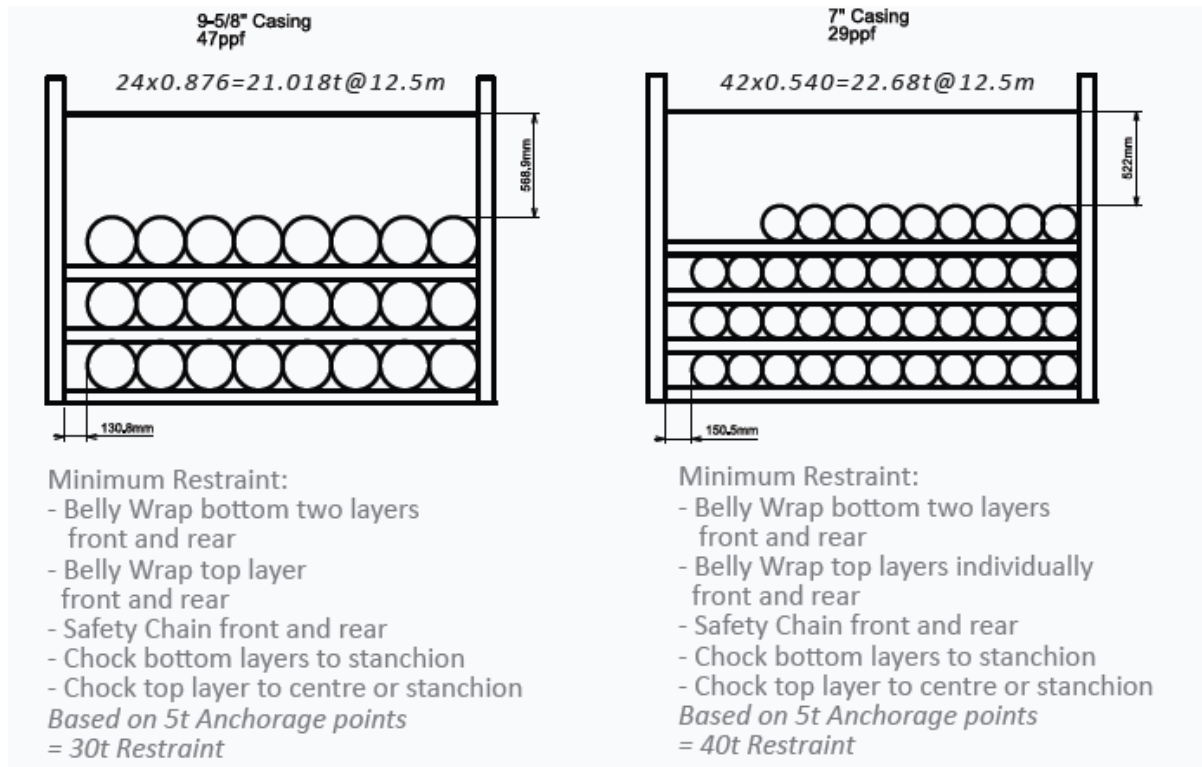
(Max Load 23t)



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### 3.10 Joint count required to reach load limit

Guidelines for the typical minimum number of joints that will reach the load limit is shown below. This is based on 14.63m lengths for R3, and 10.36m lengths for R2.

**Please note:**

Height or width restrictions are not considered here – the loads **MUST** still conform to dimensional limitations.

If the size and weight is not listed here, work out the unit weight of the whole joint as described in 6.11a) above.

Casing Size and Weight	Max jt weight (kg)	Joints to make a 23 tonne load	Joints to make a 25 tonne load	Joints to make a 27 tonne load
30" x 0.5" wall R3	3,421	6	7	7
24" x 0.5" wall R3	2,725	8	9	9
18-5/8" x 94.5ppf R3	2,060	11	12	13
13-3/8" x 68ppf R3	1,482	15	16	18
10-3/4" x 40.5ppf R3	883	26	28	30
9-5/8" x 47ppf R3	1,025	22	24	26

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Casing Size and Weight	Max jt weight (kg)	Joints to make a 23 tonne load	Joints to make a 25 tonne load	Joints to make a 27 tonne load
7" x 29ppf R3	632	36	39	42
4-1/2" x 12.6ppf R2	194	118	128	138
3-1/2" x 9.2ppf R2	142	161	176	190

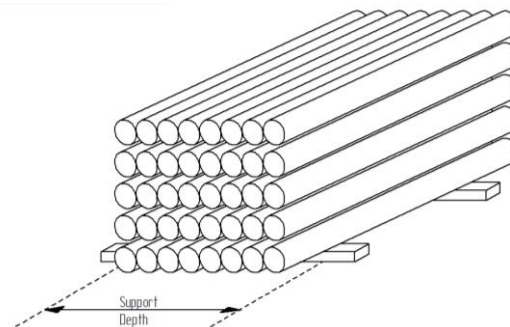
### 4 Handling

All handling of materials **MUST** be in accordance with "The Safety Code for Forklift Truck Operators" and all related Codes of Practice and subsequent revisions and updates and NZ/ANSI/ITSDF B56.1-2009 Safety Standard for Low Lift and High Lift Trucks.

### 5 Storage

1. Casing **MUST** be stored on firm, free draining, level ground with easy access by forklift and truck.
2. Casing **MUST** be stored with joints perpendicular to the fall of the ground, to prevent casing rolling downhill.
3. Casing **MUST** be held off the ground by wooden, steel or concrete supports. Such supports should spread the load evenly over the ground. Use of packers and wedges to level the supports is forbidden, as such elements can sink in or crush, leading to load movement and instability.
4. Full casing stacks can have a significant weight. This weight **MUST** be spread evenly over the ground surface to prevent settling. Surface stresses should be maintained below 200 kPa. To achieve this, the following load bearing areas are required:

Ground Supports	Load Bearing Area Required
2 supports	0.50 m <sup>2</sup> per metre of support depth
4 supports	0.25 m <sup>2</sup> per metre of support depth





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5. Each layer of casing **MUST** be separated by wooden filleting.
6. Stacking of casing should be limited to a stack no more than 2m high.
7. Filleting should use 4 rows of filleting per layer, spaced at approximately 20%, 40%, 60% and 80% of the width of the casing joints.
8. Storage filleting materials **MUST** be treated timber, and be no less than 50mm high, to allow forklifts tines to fit between the layers. Filleting material **MUST** be wider than it is high.
9. Casing should be arranged with all joints in the same orientation (all similar pipe ends at the same end of the stack)
10. Wooden wedges **MUST** be used to prevent end casing joints from rolling off the stack. These are to be firmly wedged in place to prevent them falling out. A minimum of two wedges per layer is required.
11. Casing stacks should be arranged so that access can be gained to all types of casing as required.
12. It is preferred that stacks are arranged in truck load sized lots with a minimum 1.5m space between lots.
13. Each stack of casing should contain only one type (size, weight, grade, connection, length and other) of casing.
14. Separation of different batches is encouraged so that older casing is used first.
15. Each pile of casing **MUST** be clearly identified as to what size, weight, grade, connection, length and other notes of the casing it contains.
16. Similar sized but non-identical types of casing **MUST** not be stored close together, in order to reduce the chances of mis-identification.
17. At least 1.5m **MUST** be between each pile of casing to allow access to the connections, and to allow counting.
18. All thread protectors **MUST** be kept on during storage.
19. If thread protectors are missing, exposed threads are to be treated with a thread-protection compound to prevent corrosion.

## 6 Related Documents

- The Safety Code for Forklift Truck Operators
- NZ/ANSI/ITSDF B56.1-2009 Safety Standard for Low Lift and High Lift Trucks
- The Official New Zealand Truck Loading Code
- Health and Safety at Work Act 2015.
- Land Transport Rule: Heavy Vehicles 2004
- Land Transport: An introduction to heavy rigid motor vehicle stability and dynamics,
- AS/NZ 4380:1996 Cargo restraint systems, Webbing load restraint systems,
- AS/NZ 4344:1995 Cargo restraint systems, Transport chain and components,
- NZS 3076: 1964 Short link chain for lifting purposes, and
- NZS 5444:1989 Load anchorage points for heavy vehicles.
- Crane Association Safety Manual