

Alaska Railroad Load Manual



2006

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Welcome to the Alaska Railroad Load Manual.

Over the last three or four months it has been a fun and exciting challenge for me to work with many of you putting this new load manual together. I have endeavored to include the most pertinent information without cluttering things up with too much technical over-complication. This first draft is a simplified version of the manuals you have worked with in the past and really doesn't cut too much new ground. I have mentioned the things that we see on a regular basis and have emphasized a few points of weakness. If there is a question that is not addressed here, I have the AAR Open Top Loading Rules manuals within easy reach and can research a more exacting response if needed. I have appreciated the input from our customers and have incorporated many of their ideas into the composition of this book. They have taught me much more than I could have imagined. My next step in the process is to get this into an electronic format that is readily accessible to all of you. At that time I will be able to come back and fine-tune, adjust, and expand on this initial offering. I would appreciate it if each of you could spend a few moments and critically review this work. Let me know what you think I could do to make it a better tool for us all. Suggestions and requests can be E-Mailed to me directly at TeeplesR@AKRR.com. I will do my best to see that your comments are addressed.

Thanks for the help!

R.A. "Spike" Teeples

Alaska Railroad Corporation

General Rules

General points to consider on load securement.

- #1 Safety to the Public, customer, shipment and ARRC is the most important subject to be considered in the application of these rules. When in doubt as to their interpretation, users must apply to a higher authority to insure the safest course is followed.
- #2 Mechanical Inspector may request additional securement at any time.
- #3 All dunnage must be wider than it is high and free from defects.
- #4 All decks will be free from ice and snow before loading.
- #5 All loose or unsecured items such as container locks, straps or unused dunnage will be removed or stowed prior to loading, securing and/or departure.
- #6 Placement of loads will not interfere with applicable safety appliance regulations.
- #7 All loads will be placed to the center of the car.
- #8 All containers and decks secured with twist locks must be down flat on all four corners with locks fully engaged.
- #9 Containers not secured with twist locks must be protected by the use of stub / pocket stakes and strapped securely to rail car.
- #10 Stub stakes will be located not more than four (4) feet nor less than three (3) feet from each end of container or platform and must be fully seated in stake pocket.
- #11 Twenty foot containers to Fairbanks require at least two straps.
- #12 Forty foot containers to Fairbanks require at least 2 straps with enough total straps to equal their weight.
- #13 Straps will be rated not less than 20,000 lb. strength and be free from cuts, holes, tears or other defects.
- #14 Stationary loads must be secured to meet or exceed their own weight.
- #15 Mobile loads such as vehicles, crawlers, trailers etc. must be secured to meet or exceed two times their own weight.
- #16 All multiple pieces of blocking or dunnage stacked in layers must be firmly nailed to each other. Dunnage on wooden decks must be nailed to the deck. Dunnage on

steel decks must be secured back to the load if possible, or cross braced to prevent dislodgement.

- #17 Dunnage should be of sufficient size and number to easily support the load.
- #18 Cross beams should be at least 8 inches inboard each end of the load and spaced equally along its length. Spacing should be not greater than 8 feet apart. Multiple layers of cross beams should be arranged in a vertical manner.
- #19 All products must be secured.
- #20 Bundles should be banded together before being stacked.
- #21 Loads of multiple bundles must be unit banded.
- #22 Chains and binders must be arranged with the hook back to the chain and the binders wired to prevent loosening. Turnbuckle style binders must also be wired.
- #23 Loads should be arranged with the larger pieces on the bottom and the smaller ones on top.
- #24 Center of gravity on all loads is not to exceed 56" including platform and dunnage.
- #25 Bands and straps must be free of defects and have softeners applied where passing over sharp objects or when clamping force will cause damage to the product.
- #26 Products equipped with pneumatic tires must have double cut wedge blocks secured against leading and trailing edges of tires. Product must be blocked in a manner that prevents securement from loosening in the event of tire deflation.
- #27 Loads of Pipe or similar products must have kickers nailed to the ends of all separators and separators should be arranged in a vertical manner.

Securement Equipment

Blocking.



- Blocks should preferably be made of hardwood such as Ash, Birch, Cypress, Elm, Maple or Oak.
- Blocks must be free of defects such as large knots and splits.
- Blocking must always be wider than it is high
- Blocking less than 5 inches tall must be solid
- Blocking greater than 5 inches tall may be constructed by securely nailing multiple pieces together
- Two nails should be evenly spaced, equal to the thickness of the blocking, from the end. Additional nails must be applied less than ten inches apart for the full length of the piece.
- Nails must be at least 1 1/2 inch longer than the thickness of the piece being added.

Double Cut Wedge Blocks



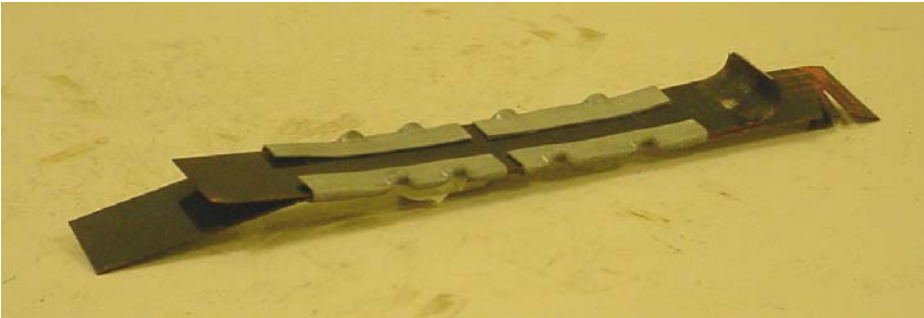
- Double cut wedge blocks are typically used as wheel chocks on vehicles and also for locating and securing large diameter pipe.
- Blocks should preferably be made of hardwood such as Ash, Birch, Cypress, Elm, Maple or Oak.
- Blocks should be free of defects such as large knots and splits.
- Blocks must be secured to deck with at least 4 nails widely spaced to resist twisting. Nails must be large enough to penetrate 1 1/2" into the deck.

Single Cut Wedges or “Kickers”



- Blocks should preferably be made of hardwood such as Ash, Birch, Cypress, Elm, Maple or Oak.
- Blocks should be free of defects such as large knots and splits.
- Blocks must be secured to deck with at least 4 nails widely spaced to resist twisting. Nails must be large enough to penetrate 1 1/2” into the deck.
- Wedges used for end blocking must have the long side against the deck.

High Tension Steel Bands



- All banding used in securement of open top loads must be AAR approved.
- The use of second hand or reclaimed bands is prohibited.
- A high tension band that has been tensioned, cut, or broken is considered second hand.
- Splicing of new banding is prohibited unless previously agreed to by the ARRC.
- High tension bands encircling pile must be machine tensioned and sealed toward the top of the load, in a location visible from the ground, when possible.
- High tension bands attached to side pockets or loops must be sealed no closer than 18 inches from loops or pockets.
- Free ends of bands must extend at least 2 inches from the seal, but not more than 12 inches.
- Tie down loops must be at least 3/8 inch in diameter and free of sharp edges.
- Metal band protectors are to be used at stake pockets and where bands contact sharp edges on equipment or lading.
- Metal protectors are required on sheet or plate steel. Composition material, treated hardboard, or “Hardcore Paper” protectors are acceptable in other areas.
- Protectors must be applied so as to prevent dislodgement.
- Two seals per band is preferred in most cases, and required when shipping pipe.
- Each seal clip must be crimped twice.

Nonmetallic Strapping



The use of nonmetallic strapping is “**NOT**” recommended for Securement on the Alaska Railroad.

All approved nonmetallic strapping will be assigned an ARR identification number or mark and applied in a manner, which makes the markings readily visible to the load inspector.

Table 19.5 Approved nonmetallic strapping manufacturers and assigned AAR identification markings

Name	Markings	Type Approved
Acme Packaging Corporation	AAR 30	IV
Caristrap Weatherguard	AAR CW	IA
Polychem Corporation	AAR 53	IV
Samuel Strapping Systems.	AAR 22	IV
Signode Packaging Sys.	AAR 11	IV
Signode/Delta	AAR 11	IV
Strapex	AAR 55	IV
Type IA – Strapping consisting of longitudinal polyester cords bonded with a plastic binder to form a nonwoven material or longitudinal polyester cords woven with a weft thread and treated with a plastic binder to form a woven material. Type IV – Strapping consisting of extruded, oriented polyester. Important—Strapping must be applied to packages and/or loads with markings facing outward.		

The above table lists currently approved manufacturers and markings.

Approved applications for nonmetallic strapping

- 5/8in. X .040in. nonmetallic strapping may be used for package bands on hardboard siding, oriented strand board, packaged lumber, landscape timbers, packaged redwood, or LVL, PSL, LSL engineered packaged I-Joists 48in. X 24in. or less.
- Nonmetallic strapping may be applied by the shipper to any load in addition to, but not in place of, previously recognized and / or required Securement. Such additional strapping will not be included in overall Securement computations.
- The mechanical department of the Alaska Railroad must approve other uses of nonmetallic strapping in advance.
- Experimental loads will be considered on a case-by-case basis.

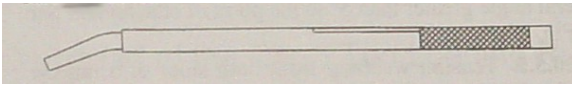
Synthetic webbing



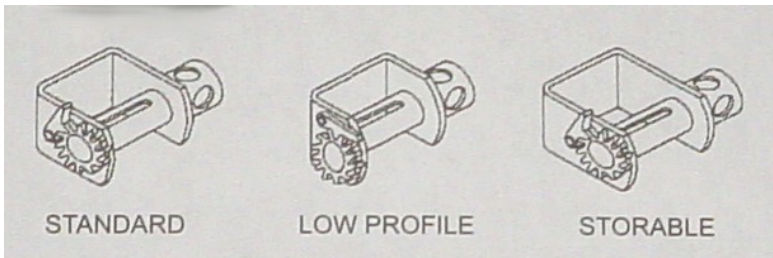
- Nylon webbing is Not Approved for securement in open top loading. Woven polyester webbing may be used.
- Woven polyester webbing must have a design safety factor of 3:1.
- Working load limit will be used to calculate number of straps required to ensure safety factor is maintained.
- Webbing must be applied without tears, holes, cuts, twists or kinks which degrade its working strength.
- Webbing must be applied within 5 degrees of perpendicular.
- Softeners must protect the webbing from any sharp points or edges.
- Unused webbing is to be secured or stored to prevent it from coming loose and hanging from railcar.

Winches and other components.

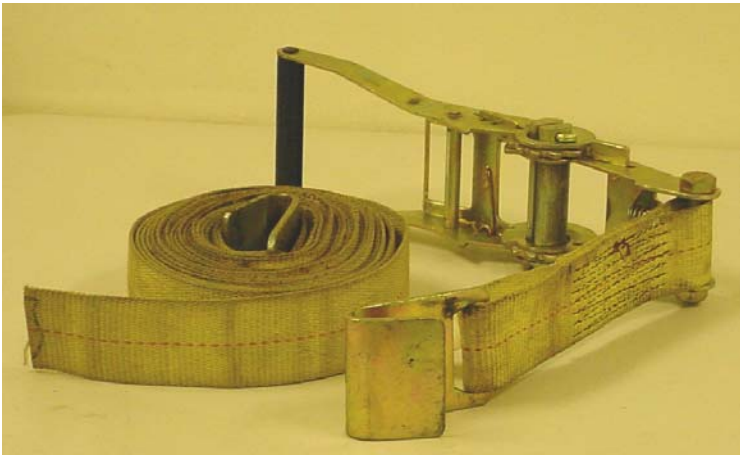
- Winches, ratchets, hook eyes, connecting chain etc. must equal or exceed minimum breaking strength of webbing being used.
- A winch bar such as the one illustrated below should be used. Cheater bars are prohibited.



- Winches should be in good working order with no sharp edges or defects that may harm the webbing.



- Portable web assemblies with ratchet buckle and end hooks are also acceptable on the ARRC.



Chains and Binders.



- Chains with grab hooks connected must have manufacturer's mark identifying grade of assembly.
- Chains must be free of cracks, bent or twisted links, gouges or pits, knots, or portions subjected to high temperature.
- Chains must always be hooked back to the chain.

Approved load binders.

- Binders must be marked with the rated capacity equal to their minimum breaking strength.
- The working load limit of the chain to be used should be equal to one quarter of the capacity of the binder.
- Binder must be equipped with two grab hooks.
- Grab hooks should be compatible with the size of chain being used.
- Welding of binders to chain is prohibited.



Ratchet Type



Lever Type

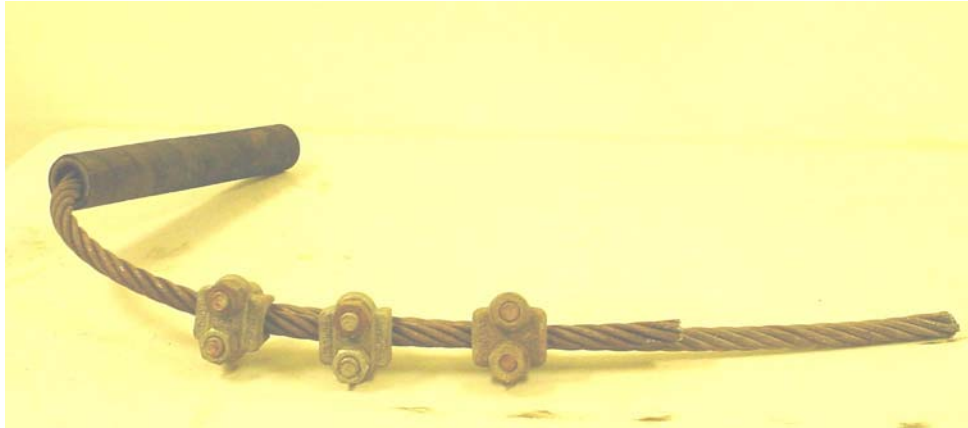
- Binders of the ratchet or lever type must be wired to prevent loosening in transit.



Turnbuckle Type

- Turnbuckle binders must be secured to prevent loosening during transit by using jam nuts on the shafts or using wire when there is a hole in the shaft for that purpose.
- Softeners should be used where chains may damage load or where load may damage chain.

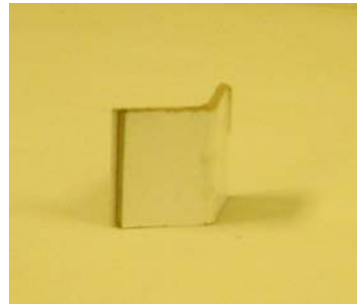
Wire Rope / Cable



- Where wire rope/cable is used, the ends must be overlapped a minimum of 12”
- The minimum number of clamps is as follows

3/8” cable	2 clamps spaced 2 1/4” apart
1/2” cable	3 clamps spaced 3” apart
5/8” cable	3 clamps spaced 3 3/4” apart
3/4” cable	4 clamps spaced 4 1/2” apart
7/8” cable	4 clamps spaced 5 1/4” apart
1” cable	4 clamps spaced 6” apart
- Cable clamps must be applied with the bolt assembly in contact with the short end of the rope.
- Wire rope/cable must be protected at all sharp corners and edges.
- Wire rope/cables should be positioned so as not to touch each other.
- Used rubber hose, carpet, and “Hardcore Paper” work well as softeners to protect cable at sharp edges.

Softeners



- Softeners can be made of used rubber hose, cardboard, old defective straps or carpet. Cardboard softeners must be of the treated type to avoid decomposition due to moisture. These softeners are often referred to as “Hardcore Paper”.
- Softeners are to be placed between, high tension steel bands, nonmetallic bands, synthetic web straps, wire rope/cable, chains and binders and other types of securement, and sharp edges or points to protect the load and securement pieces from damage.
- Softeners must also be placed between wire rope/cables where they intersect to avoid chaffing.
- Softeners should be secured in such a fashion as to avoid displacement should the load shift during transit.

Pocket Stakes

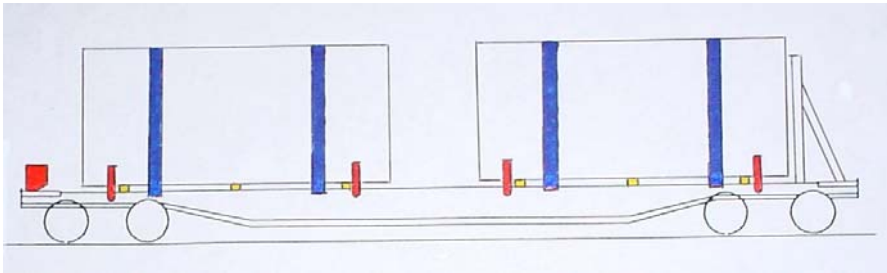


- Loads not secured in twist locks must be protected from lateral movement by the use of pocket or stub stakes.
- Pocket or stub stakes are to be made of metal and must be fully seated in the stake pocket.
- Pocket or stub stakes are to be employed when loading both platforms and containers on flat cars.
- Stakes are to be located not more than (4) feet nor less than (3) feet from the end of the container or platform.
- A sufficient number of pocket stakes must be applied to captured containers to prevent their movement off the side of the car should the load shift longitudinally.

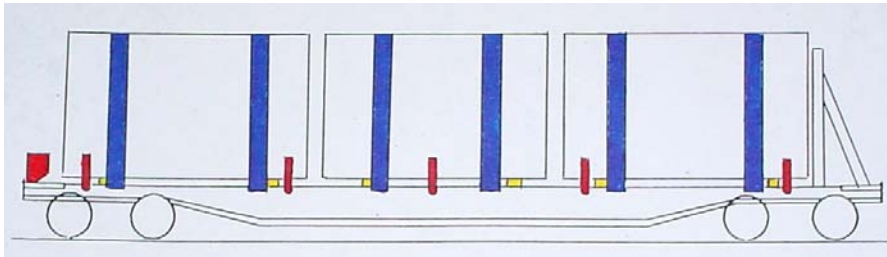
General usage of Pocket Stakes



Loads not secured with twist locks must be protected from lateral movement by applying stub stakes. Load must then be securely strapped to the rail car.



Loads should have four stakes each and non-bulkhead end of car must have two stakes applied.



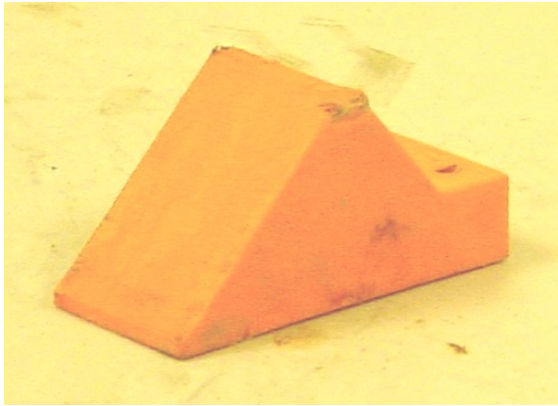
“Captured” center loads require two stakes located at center of bundle.

Pallets

As of January 15th, 2007 the Alaska Railroad will no longer accept pallets on open loads. Pallets cannot be used as any part of the securement package.



Chocks



- Plastic or wooden chocks are both acceptable for use on separators for pipe shipments.
- Wooden chocks should be made of hardwood and be free from all defects.
- Chocks must be positioned firmly against both sides of the load of pipe, top and bottom on all end separators.
- Chocks must be nailed to the separators with at least two nails each.
- Nails should be spaced as widely as practicable to resist twisting.

Button Cap Nails



Button cap nails are commonly used in the construction trade to secure styro-foam insulation to roof sheeting prior to putting down the tar paper and hot moping. They are also used to hold vapor barrier to wall panels before the siding is applied. These nails come with metal as well as plastic caps with the metal type being made for heavier duty applications.

- Button Cap nails are strongly recommended for use as additional securement on Tarps / Covers where wind exposure could cause a failure.

Intermodal Containers and Platforms



The three most common types of conveyances used in intermodal freight on the Alaska Railroad are

1. Platforms,
2. Post Platforms
3. Containers.

Containers and Platforms

All Containers and Platforms must conform to:

International Standards Organization ISO 668 circa 1988 sub section E.

or:

American Association of Railroads
AAR Spec M-930-90.

- Acceptable Container lengths are 20, 24, 40, 45, 48, and 53 feet.
- Acceptable Platform lengths are 20, 24, 40, and 53 feet.
- All Containers and Platforms must be free of defects.
- Door closure and locking devices must be fully operational with seals applied.
- Corner castings and locking pockets must be free of debris and corrosion.
- Containers and platforms must be clearly marked with appropriate Identification.
- Platforms with collapsible posts must have posts securely locked in place.

Inter Box Connectors

Commonly referred to as “Twist Locks”



“Semi-Automatic type”



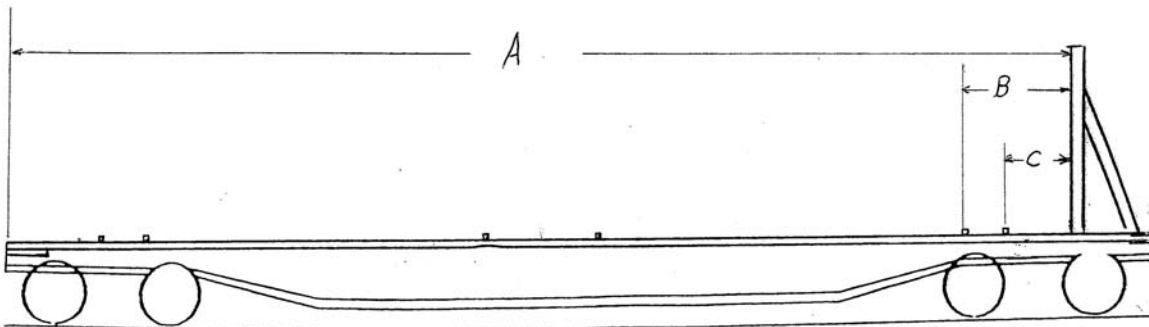
“Manual Locking Type”

- “Twist Locks” or (IBC’s) are the preferred method of securing platforms or containers to the rail car.
- “Twist Locks” must be free from defects such as cracks, chips, or excessive corrosion.
- “Twist Locks” must operate in the intended method as described by the manufacturer.
- Operating handles, cables, and fixtures should move freely and detents must function as designed.

Over length loads on Platforms

ARR 12900 series dimensions.

- Load must be centered longitudinally on platform.
- Over length loads should be arranged so as to allow platform to be secured onto twist locks.



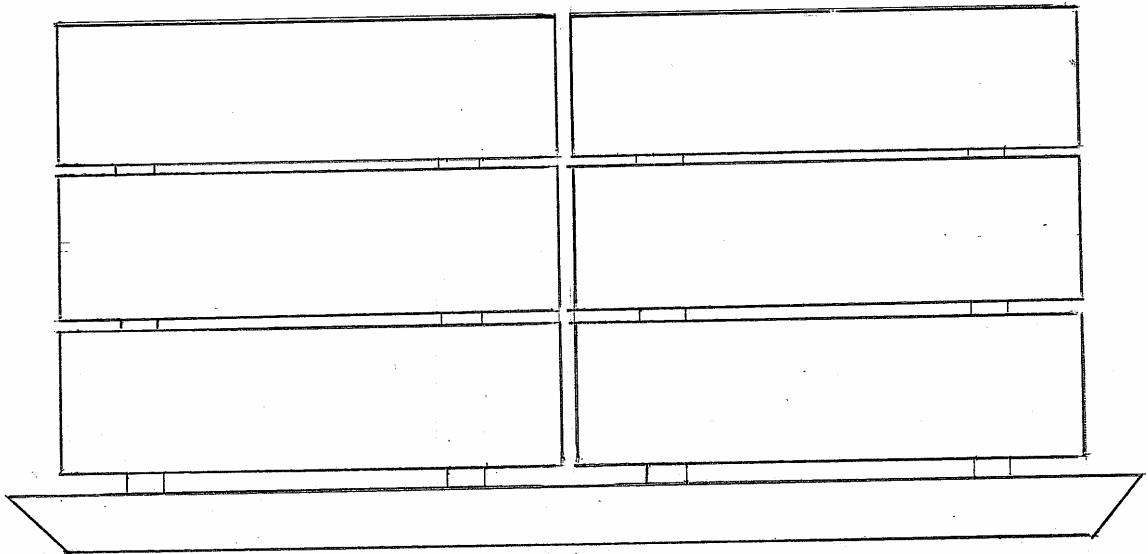
A---Maximum distance Bulkhead to End sill: 50' 8"

B---Maximum distance corner pocket to Bulkhead: 40' platform 4' 7"

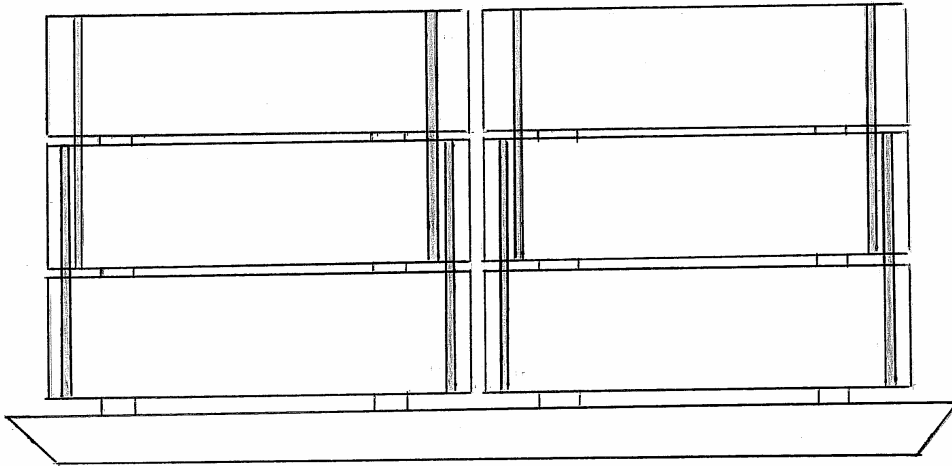
C--- Maximum distance corner pocket to Bulkhead: 20' platform 2' 9"

Recommended securement methods for individual commodities.

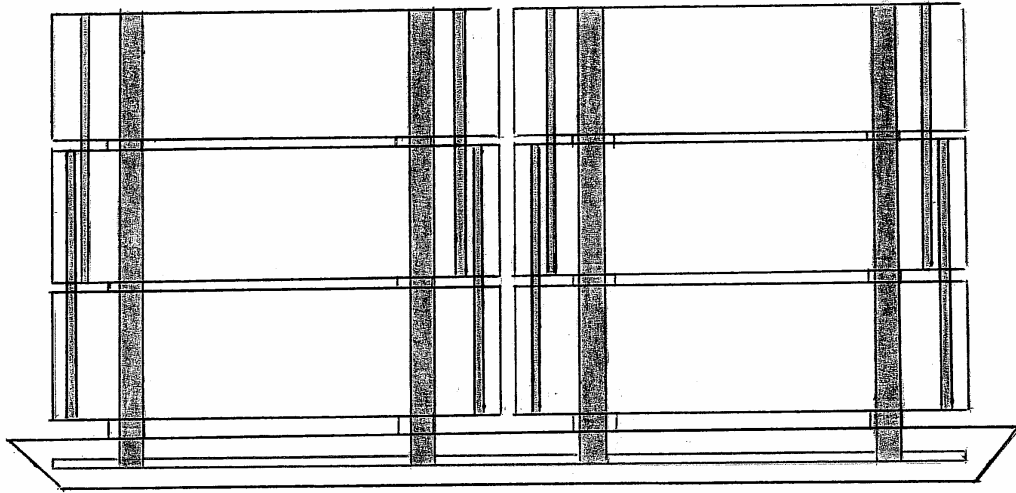
Unitized Banding



- Multiple layer loads require “Unitized Banding”
- Individual pieces of a load or separate Bundles of material must be stacked with blocking and separators arranged in a vertical pattern.



- A minimum of two “unitizing bands” must be applied to each bundle
- Banding must be arranged to secure the bottom layer of the load to the second layer, the second layer to the third and so on until entire load is one “UNIT”



- “Unitized” bundles must then have a minimum of two securement bands applied to each unit. Deck to Deck.

Building Materials

Tarps / Protective Coverings

- Tarps or protective coverings are not required by the railroad but are often applied at shipper's request. Securement of these coverings must meet industry standards.



- Corner and end protectors are highly recommended as they not only protect the product but greatly aid in the securement of the tarp.



- Loose tarps have recently been causing problems for the railroad.



In transit, when a tarp comes loose and extends beyond the top and or side of a car, it can be picked up by the high/wide load detectors located at various points along the rail belt. These detectors are positioned near the tracks to identify loads that have shifted out of position and when activated, the train is required to stop and the crew must inspect their train to discover the problem. In Alaska, this can become a two or three mile walk in sub-zero darkness to look at a flapping tarp.

This not only causes train delays, but also exposes the trainman to unnecessary dangers.

Button Cap Nails



Button cap nails are commonly used in the construction trade to secure styro-foam insulation to roof sheeting prior to putting down the tar paper and hot moping. They are also used to hold vapor barrier to wall panels before the siding is applied. These nails come with metal as well as plastic caps with the metal type being made for heavier duty applications.

- Button Cap nails are strongly recommended for use as additional securement on Tarps / Covers where wind exposure could cause a failure.

SBS Barge in Seward

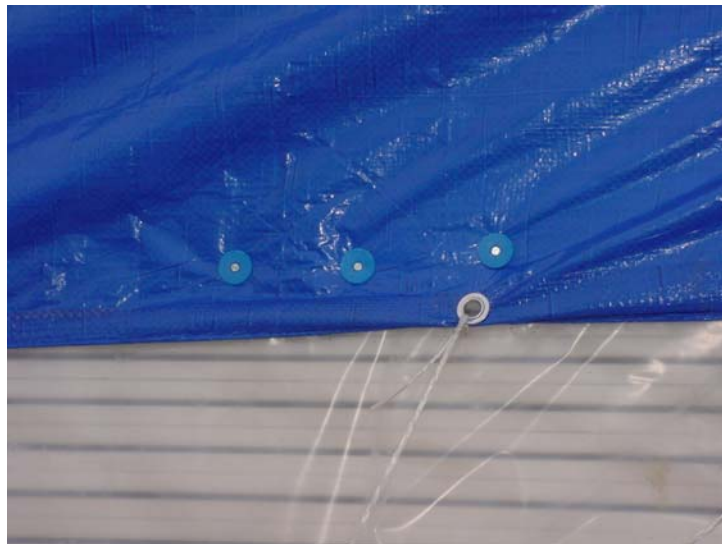


The second SBS barge this spring had a total of 423 open loads that were shipped on 4 separate trains. The weather when we loaded those trains was clear but had sustained winds of 35 miles per hour with gusts to around 50.



We had the same problems with the tarps blowing loose as we have in Whittier on a regular basis. Extra straps were applied but this didn't seem to solve the problem.

The crew from SBS that was securing the loads on the rail cars started applying button cap nails to the loose tarps in an effort to get them under control.



They applied them to loose corners and to the areas where the tie-down strings had failed, and also other areas where the wind was working its way under the tarps.



The corner protectors were vibrating out of position and many had failed even before being loaded to the rail cars.



A couple of the button cap nails were applied to each side of the band to keep the protector in place.



The bottom line of this story is that all 423 open loads on these 4 trains made it to past the detectors and into Anchorage with no delays of any kind. Success is hard to argue with.

Button Cap nails are inexpensive, quick to apply, and seem to be an easy fix for a problem that can, in certain situations, become quite serious. Their use is strongly recommended.

Dimensional Lumber



- Dimensional lumber must be banded in a unitized fashion with the bottom layer gut wrapped to the second layer of bundles which is gut wrapped to the third layer and so on.
- Two bands per bundle is mandatory.
- Four bands must connect the unitized load to the platform deck to deck.

Sheet Rock



- Product must be fully supported without overhang
- Product must be covered
- Covers must be firmly secured in a manner that will enable them to resist dislodgement under extreme wind conditions.
- Side corner protectors are preferred, and when applied, must have 2 bands each. All bands must be crimped twice
- Each stack must have at least 2 bands to the platform with appropriate softeners to prevent damage to product.

- Bundles set back from the ends of the platforms must be gut wrapped longitudinally at least twice with all appropriate softeners applied.

Styrofoam loads



- Product must be fully supported with no overhang
- Load must be shrink-wrapped
- Product must have at least two bands per stack, with appropriate softeners, connected to platform
- Top side softeners should link adjoining stacks
- Load must be end-banded at least twice with appropriate softeners
- All bands must be crimped twice

Bagged Concrete on Pallets

ARR 19129 Set Out at Talkeetna



This load was set out at Talkeetna because the securement on two pallets of bagged concrete failed enroute.



The bags of concrete were originally stacked in an interlocking fashion with plastic sheeting used to protect the them from moisture, then held onto the pallet with two 1” bands.

After loading on the trailer, all the pallets were secured in place with two synthetic web straps.



These pallets on the front of the trailer were close to failing. The bands were still intact and the straps were in place, but the bags of concrete were in the process of migrating out from under the securement.

This pallet on the opposite rear corner of the trailer is the one that failed.



The process of failure that was apparent on the front pallets continued until this was the end result. The bags of concrete migrated out from under the securement which then loosened the synthetic straps.

Method of repair and future load preparation.



- Pallet loads of bagged concrete should be stacked in an interlocking pattern.
- Shrink wrap the completed stack.
- $\frac{3}{4}$ " Plywood matching the outside dimensions of the pallet should be placed on top of the stack of bagged concrete with 4 ea. $1\frac{1}{2}$ " bands applied in two directions.
- By adding the plywood to the top, shrink-wrapping the bags and using banding in both directions, failure of this type of load should be avoided in the future.

Structural Steel

Structural steel is inherently a problematic type of load



Different shapes and sizes, along with the desire to keep a multiple piece “Building Kit” together on a single trailer or platform can create many challenges.

General Rules apply.

- All dunnage must be wider than it is high.
- Multiple pieces of blocking or dunnage stacked in layers must be firmly nailed to each other.
- Dunnage on wooden decks must be nailed to the deck. Dunnage on steel decks must be secured back to the load if possible, or cross braced to prevent dislodgment.
- Dunnage should be of sufficient size and number to easily support the load.
- Cross beams should be located at least 8 inches inboard each end of the load and spaced equally along its length.
- Cross beams should not be spaced greater than 8 feet apart.
- Cross beams should span the entire width of the load when possible.
- Multiple layers of cross beams should be arranged in a vertical manner.
- Stickers should be affixed to each end of cross beams to prevent migration laterally.

- All products must be secured.
- Bundles should be “package banded” before being stacked.
- Multiple layer loads must be secured in a “Unitized” manner.
- Chains and binders must be arranged with the hook back to the chain with the binders secured to prevent loosening.
- Softeners must be applied where sharp edges might cause damage to bands or straps.



Dunnage that is higher than it is wide is not acceptable.

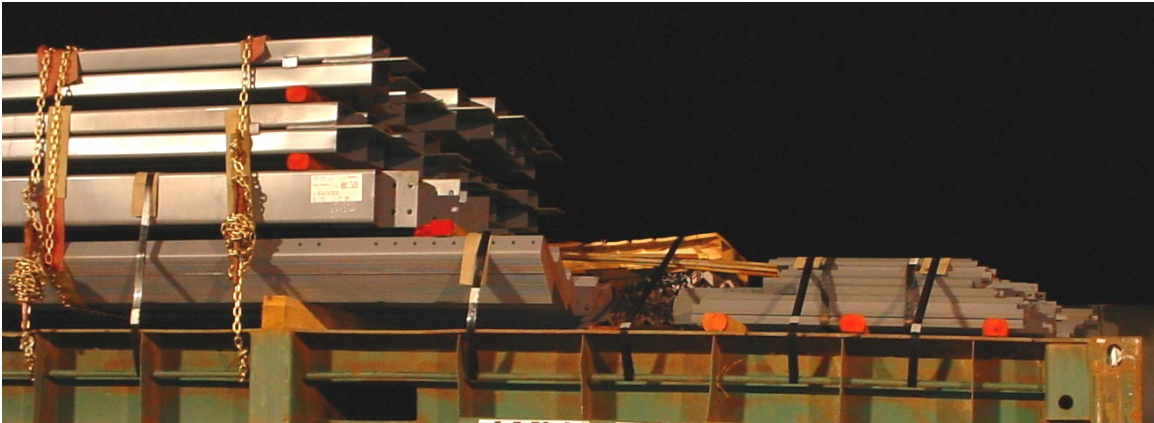


Pallets should never be used as dunnage.



This load failed when the pallets that were used for dunnage under the top bundles failed.





All products must be secured. Loose objects on top of I-Beam or tucked inside of square tubing is unacceptable.



Cord strap is not acceptable as securement

Heavy Equipment

Backhoe on Platform



At least 4 chains and binders must be applied.
Chains must be applied as close to 45 degrees from the platform as possible.
Chains must be hooked back to the chain and binders must be wired.
Combined chain strength must be equal to or greater than twice the weight of the machine.



Blocking must be placed under axles and or frame of machine to keep chains from loosening in the event of tire deflation.
Blocking must be nailed to the deck or otherwise secured to prevent migration.



Outriggers must be secured with locking pins or chained to prevent movement.



Bucket and boom must be cross chained to prevent swinging. The bucket should be lowered to the deck when possible.

Articulated Loader



- Articulating locking device must be engaged and secured
- Four chains and binders must be applied to each axle
- Chains must be applied as close to 45 degrees from the platform as possible
- Chains must be hooked back to the chain and binders must be wired
- Combined chain strength must be equal to or greater than twice the weight of the loader

Caterpillar on Platform



- Chains and binders must be hooked to solid points on the chassis of the machine
- Combined strength of the total number of chains must equal or exceed twice the weight of the machine
- Chains should be cross chained when possible. If this can not be achieved, blocking must be applied along the inside of the track assemblies, interconnected, and secured to the deck of the platform to prevent load from shifting laterally.
- Vertical hydraulic rams on the front of the machine need to be secured to prevent them from swinging out sideways.
- Binders must be wired.

Pipe

Corrugated Steel Pipe



- Pipe should have separators equally spaced along the length of the pipe
- Separators should be located at least 8 and not more than 18 inches from ends of pipe.
- Separators should be arranged in a vertical manner and less than 8 feet apart
- Chocks must be positioned firmly against both sides of the load of pipe, top and bottom on all end separators.
- Intermediate separators must have stickers applied to prevent them from migrating out of position.
- Load must be package wrapped and unit banded.
- Sufficient securement should be added across the ends of the large pipes to keep the smaller pipes inside from shifting longitudinally.

Small diameter, Long length steel pipe



- Bundles of pipe should be arranged with both ends as even as possible
- Pipe should have separators equally spaced along the length of the pipe
- Separators should be located at least 8 and not more than 18 inches from ends of pipe
- Separators and end wraps must be positioned to include all pipe in the bundle
- Separators should be arranged in a vertical manner and less than 8 feet apart
- Chocks must be positioned firmly against both sides of the load of pipe, top and bottom on all end separators.
- Intermediate separators must have stickers applied to prevent them from migrating out of position.
- Load must be package wrapped and unit banded.

Plastic pipe



- Bundle wraps should be arranged in a vertical manner
- Load must be unit banded
- At least four bands must connect product with platform
- Number of bands must equal or exceed the total weight of the load
- This is an excellent example of unitized banding.

Large corrugated plastic pipe



- Pipe should have separators equally spaced along the length of the pipe
- Separators should be located at least 8 and not more than 18 inches from ends of pipe
- Separators should be arranged in a vertical manner and less than 8 feet apart
- Chocks must be positioned firmly against both sides of the load of pipe, top and bottom on all end separators.
- Intermediate separators must have stickers applied to prevent them from migrating out of position.
- Load must be package wrapped and unit banded.
- This load has good separator placement and wedge blocks applied. Unit banding of the lower and upper bundles would greatly improve load's stability.

Vehicles

School bus on platform



- Vehicles with pneumatic tires must have blocking under the axles to prevent securement from loosening in the event of tire deflation
- Blocking must be securely nailed together and to the deck of the platform
- Combined strength of the total number of chains must equal or exceed twice the weight of the machine
- Chains must be connected to un-sprung chassis members
- Chains should be crossed when possible and angled 45 degrees from the deck.
- Binders must be wired.

Semi Tractor on platform

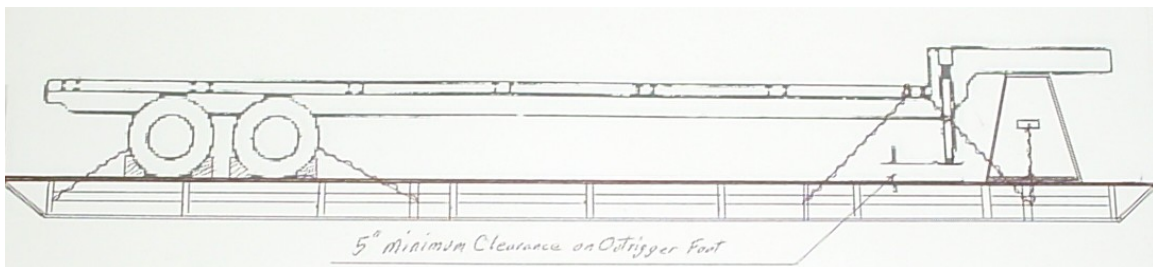


- Vehicles with pneumatic tires must have blocking under the axles to prevent securement from loosening in the event of tire deflation
- Blocking must be securely nailed together and to the deck of the platform
- Chains must be connected to un-sprung chassis members
- Chains should be crossed when possible and angled 45 degrees from the deck.
- Binders must be wired.

Semi Trailer on Platform

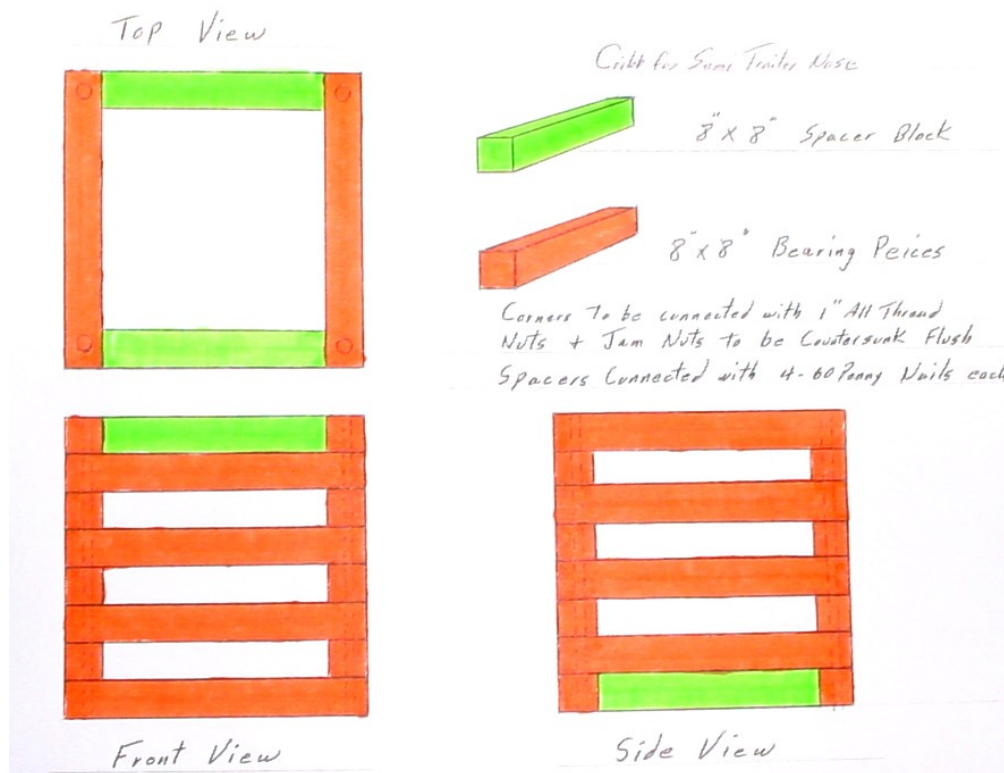


The above photos show a Semi Trailer on a platform. Close inspection reveals some basic problems. This trailer is secured to the platform while standing on its landing gear and the landing gear assembly was used as a point for securement. Landing gear assemblies are not strong enough to withstand the longitudinal forces encountered in rail transport. The required method for securement is illustrated below.



Trailers should have their axles blocked and be cross chained to at least double the overall weight of the trailer at the rear. The front of the trailer should be supported with a cone or crib assembly. A single cross chain through the cone or crib for securement will be satisfactory. The nose of the trailer should then be tied down using four chains to ensure a solid connection to the platform and the cone/crib. A minimum gap of 5" is required between the landing gear and the deck.

Cribb for Semi Trailer on platform



- Cribb must not be higher than it is wide.
- Bearing pieces to be constructed using 8" X 8" hardwood
- Spacers to be constructed using 8" X 8" hardwood
- Bearing pieces to be secured using 1" all thread connecting the corners.
- Flat washers with nuts and jam nuts must be counter sunk in all four corners, top and bottom.
- Spacers must be toe nailed to bearing pieces using 60 penny nails. 4 per spacer.

Small Truck on Platform



- Vehicles with pneumatic tires must have blocking under the axles to prevent securement from loosening in the event of tire deflation
- Blocking must be securely nailed together and to the deck of the platform
- Chains must be connected to un-sprung chassis members
- Chains should be crossed when possible and angled 45 degrees from the deck.
- Binders must be wired.

Empty Trailer Flats



- Empty trailer flats must not be stacked more than three high.
- Four crossed chains and binders must be used per level.
- Binders and tag ends of chains must be wired.
- Two straps must be used per level.
- Softeners under the straps are required for this type of shipment.

Miscellaneous Equipment

Small Boats



- Small boats should be securely cradled
- Cradle construction must be tied together both laterally and longitudinally
- Cradle must be securely constructed and nailed or bolted into one solid unit
- Boat must be banded or strapped to cradle as well as to the platform
- Single cut wedge blocks should be placed at all four corners or the cradling device
- These boats are well supported and strapped. The addition of wedges nailed to the corners of the cradle, then to the platform, would improve this load substantially.

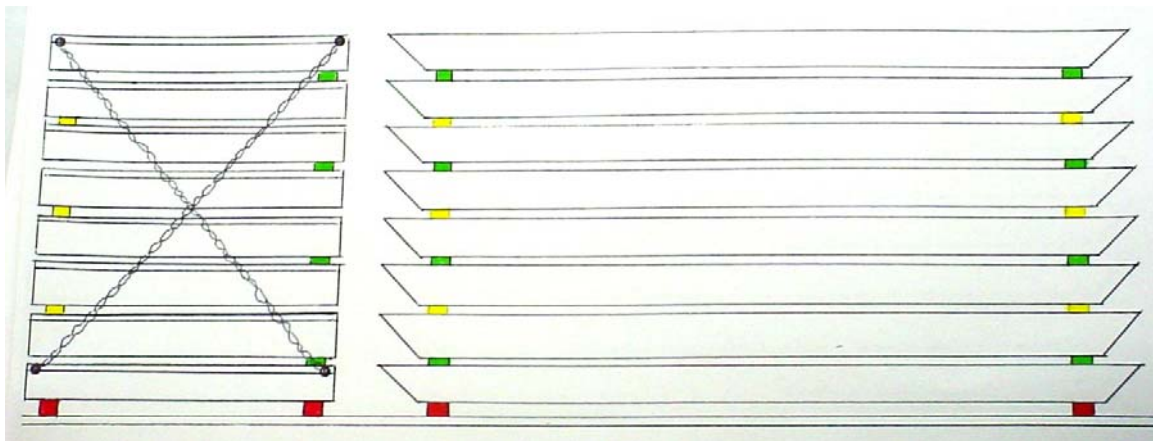
Misc. Small Equipment on platform



- Small equipment must have at least two bands or straps securing each individual item
- Softeners must be applied where bands contact sharp edges
- Items must be supported on dunnage. No metal to metal contact.
- Overall securement strength must equal total weight of the load

Empty Platforms on flat car

Fairbanks to Whittier



Twist locks Red Stacking Cones Yellow and Green

Procedures and requirements for shipping empty platforms in a stacked configuration.

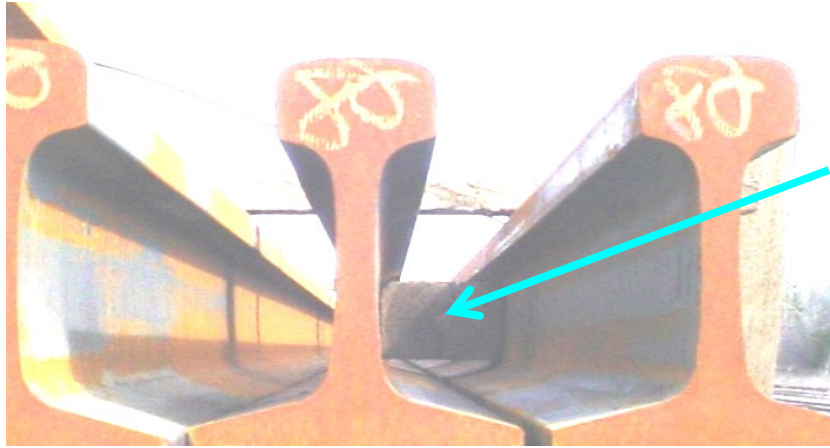
- Empty Platforms must be clear of ice and snow.
- Platforms must be tightly stacked to ensure full engagement of stacking cones.
- Two stacking cones are required on each level and must be arranged in an alternating manner.
- Crossed chains and binders or “hard chains” and turnbuckles must be applied to each end of the stack.
- Binders and/or Turnbuckles must be wired.
- Stacks must be firmly locked to the car deck using twist locks.
- When stacks are not locked to the deck with twist locks, the use of Stub stakes is required.
- On cars not equipped with twist locks, Stacks should be placed against the bulkhead when possible.
- Stacks consisting of 20’ platforms must have two straps applied deck to deck.
- Stacks consisting of 40’ platforms must have four straps applied deck to deck.

Rail loads on flat cars for revenue service



Flat cars without bulkheads:

- Bearing pieces must be 4" x 6" hardwood equal to the width of the car deck.
- Two bearing pieces must be located 5' from each end of the load, with five more evenly spaced between them. 7 pieces total.
- Separators must be 1"x 3" located between all levels directly above the bearing pieces. Separators should extend 2" beyond the load on each side.
- Banding must be 2", with the end two located approximately 5' from each end of the load, Five additional bands must be evenly spaced between them, encircling the entire load. Softeners must protect the bands at the bottom edges of the load.



- Filler blocks must be 3 ½ X 5 ¼ X 24” long, Center fillers in the top outside row at the point where the bands are located.



- Side stakes must extend 14” below the stake pocket and fully engage the uppermost rail on the side of the load.
- Side stakes must be firmly nailed in place to prevent dislodgment.



Flat cars equipped with bulkheads.

- Bearing pieces must be 4" x 6" hardwood equal to the width of the car deck.
- Two bearing pieces must be located 5' from each end of the load, with five more evenly spaced between them. 7 pieces total.
- Separators must be 1"x 3" located between all levels directly above the bearing pieces. Separators should extend 2" beyond the load on each side.
- Five or more 2" web straps must secure the load deck to deck.
- Four steel side stakes must protect the load from lateral movement.

Railroad Ties on Flat Cars for Revenue Service



- Tie loads must have three 3” straps on the end stacks and at least two 2” straps on all the other stacks.



- Each bundle must have two 1 ¼” bands. Each stack must have at least two 2”, or three 1 ¼” unitizing bands.



- Bundles should be built 5 ties wide by 4 ties high. Blocking should be 4" x 6" lumber, positioned so as to be wider than it is high. Hardwood should be used if possible. Multiple layers of blocking must be arranged in a vertical manner.

Canvas Sided Trailers



The Alaska Railroad Corporation does not accept canvas sided trailers for rail transport.

Military Equipment

Military Tie Down Procedures

Updated 4-08-05



For shipments inside Alaska only

General rules for Military shipments.

1. Safety to the Public, customer, shipment and ARRC is the most important subject to be considered in the application of these rules. When in doubt as to their interpretation, users must apply to a higher authority to insure the safest course is followed.
2. Mechanical Inspectors may request additional securement at any time.
3. All decks will be free from ice and snow before loading.
4. All loose or unsecured items such as container locks, straps or unused dunnage will be removed or stowed prior to loading, securing and/or departure.
5. Placement of loads will not interfere with applicable safety appliance regulations.
6. All loads will be placed to the center of the car laterally.
7. All items and methods used for securement must meet requirements listed in the ARRC Load Manual.
8. Stationary loads must be secured to meet or exceed their own weight.
9. Mobile loads such as vehicles, crawlers, trailers etc. must be secured to meet or exceed two times their own weight.

Key points to remember



- Chains must be hooked back to the chain.

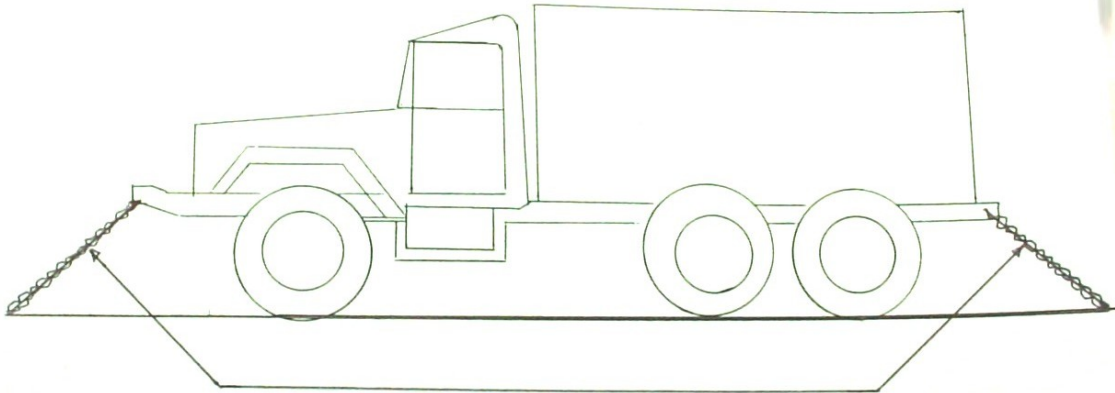


- Binders must be wired or secured with Zip-Ties.



- Tag ends of straps and chains must be firmly secured.

- All chains must be at least 3/8 inch with a working rating not less than 6,000 pounds.



- Chains on each end must be equal to the vehicle's weight. Chains should be positioned at a 45 degree angle to the deck and pull in opposite directions.



- Crossed chains that pull equally in opposite directions toward the center of the vehicle are acceptable.
- Vehicles should not hang over the end of the trailer flat or the end of a rail car if possible.



- Vehicles must be cross chained front and rear.
- Tie-down shackles should be employed when possible.
- Axle connections are acceptable.



- Vehicles with trailers must have separate securement for the vehicle and the trailer.
- One chain or strap must be used to secure the tongue of the trailer to prevent disconnection from the towing vehicle.



- A minimum of 6 inches should be kept between separate vehicles at all times.

Misc. Military loads



Hummer and trailer. Well done.



Medium truck and trailer. Well done.



**Medium truck and trailer. Overall good securement.
Needs strap on tongue of trailer.**



Good example of cross chaining to the center.



Good securement. Try to avoid any overhang if possible.



Good securement. Try to avoid any overhang if possible.

Mill Vans & Tri Cons



Standard 20' military vans loaded on 40' trailer.



Two Tri-Con packages loaded on 40' trailer.

- Each 20' container and 20' Tri-Con package must have at least 2 straps applied deck to deck.



- Hooks on the straps must be arranged in a hanging fashion so that if the strap loosens, it will still remain connected to the rub rail of the trailer.



- As a courtesy to our customer, softeners will **not** be required on this type of military load. If problems arise from this action, this requirement will be readdressed.



- Outside ends of both vans and Tri-Cons must be cross chained and bottom chained to the trailer.



- Hooks must always be hooked back to the chain.



- Where separate sections of a Tri-con package meet, Inter-box connectors must be applied to all four corners.



- Inter-box connectors must be in good shape and free from defects.

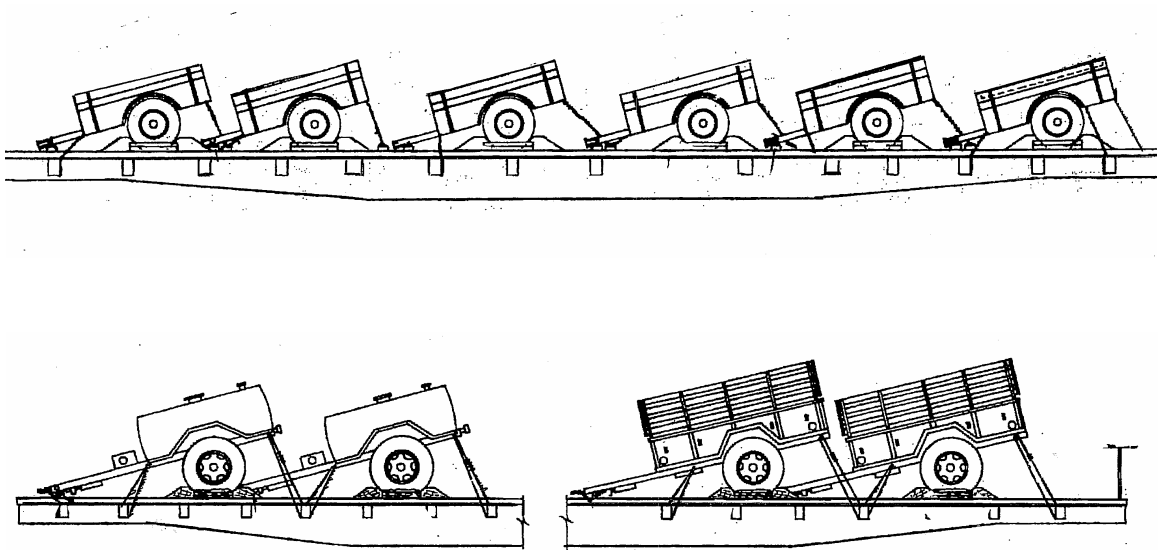


- Special care must be used to ensure that all Inter-box connectors are fully engaged and in a locking position.



- Where separate vans or Tri-con groups meet, the bottoms must be interconnected and secured back to the trailer.

Trailers



- Small single axle trailers must have chocks on both sides of each tire and four chains and binders to the deck.
- Trailers must be arranged with the tongue on the deck.
- Tongue jacks or landing gear are not to be in contact with the deck.



Medium trailers not connected to a prime mover must have chocks behind rear and ahead of front tires. Four cross chains and binders must be attached to the deck. These trailers may have their landing gear in contact with the deck. Landing gear must be pinned and wired in place.