QUEENSLAND WAGON LOADS & LOADING

By Peter Kennedy

Queensland Railways (QR) like most rail systems relies on freight traffic for most of its revenue and thus its existence. Freight traffic means loaded wagons and that's the topic of this presentation.

It is an extremely wide subject, and will be dealt with broadly, dealing generally with common user wagons and the loads generally seen thereon in Queensland.

There is a saying "horses for courses". It can also be applied to freight, i.e. "Wagons for loads". In other words different loads are best suited on particular wagons. When selecting suitable wagons for loads the QR officer would consider many factors including:-

(a) Safety
(b) Security,
(c) Commercial gain,
(d) Customer satisfaction
(e) Size and mass of the load,
(f) Wagon suitability.

These factors, however, are of little importance to modellers who wish to see their trains with loaded wagons, which look right and are historically and authentically correct. Most railways had certain distinctive loading characteristics. You too can load your wagons to bring individuality and uniqueness to your model railway.

In considering loading for wagons, then the era which you are modelling will determine the types of loads and rolling-stock needed to be historically correct, e.g. if you are modelling the 1950s you would see mixed 4 wheeled and bogie wagons filled with a wide range of loads. If you model the modern era you would see almost all bogie wagons of the container, hopper or bulk loading type.

I will discuss here general categories of loads carried by QR at some time.

APPENDEX A shows a breakdown of these types into specific commodities too numerous to include her, but may help you in the selection of a variety of loads for your trains.

General categories of loads carried on QR wagons

Timber	Machinery
Concrete	Livestock
Agricultural	Steel
Bulk Loading	Containers
Wheeled vehicles	Miscellaneous

PARCELS

For a breakdown of the above categories see Appendex A.

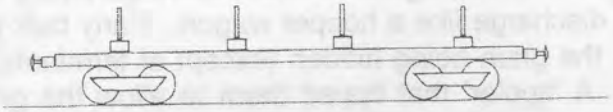
Having briefly looked at loads generally we should then look at the different types of general purpose common user wagons and which would be most suitable for the above loads. Time and space does not permit us to deal with the many specialised wagons used by Qld Rail.

The general types of wagons include: - flat, open, box, bulk, livestock, container, hopper, tank etc.

Each of the above type of general-purpose wagon and their role is described hereunder: -

FLAT WAGONS

Flat wagons are those having a flat floor and no sides, most have timber decking, a few were steel decked, some with removable stanchions, some double up as container wagons.
The M series etc. M, ML, MS, MTW etc were designed for lighter type loading particularly motor vehicles, farm machinery etc. MTW wagons were also used extensively for bagged wheat prior to bulk loading and occasionally for wool.
The P series of flat wagons included PWT, PE, PHO and QFC heavy duty flat wagons which were suitable for heavy and concentrated loading including steel plate, reinforcing rods, heavy tracked vehicles, concrete girders, poles etc.
Some flat wagons were fitted with fixed bolsters and moveable stanchions.

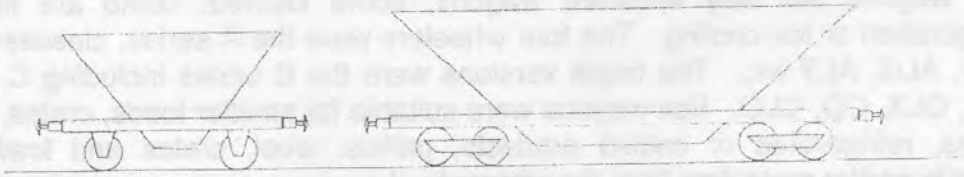


These wagons were of the S, SR, WR, and WS class and were used for long distributed loads, e.g. logs, poles, sawn timber, railway rails etc.

OPEN WAGONS

These wagons were of both 4 wheeled and bogie variety, having raised sides and ends. On QR most had drop doors except the HO that had swing out doors.
The four wheelers included T and F series F, FG, FJS etc, and the bogie versions included the U, UR and the H series H, HJ, HH, HJS, HSA, HWA, HWO, HO and HOA. Most had timber floors, the HOA had high gate sides.
Open wagons were suitable for smaller and mixed loads, e.g. drums, crates, bagged products, small light wheeled vehicles, pallets, bins, wool etc., whereas the larger and newer open wagons were suitable for heavier loading, e.g. steel bars and plate, freight forwarders loading, bulk or bags etc. The HOA wagons with high gate sides are suitable for light bulky products, e.g. polythene pipes.

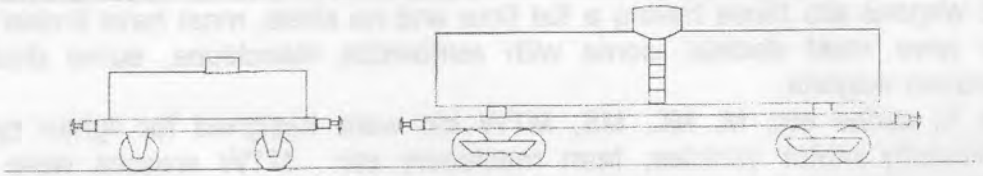
HOPPER WAGONS



Hopper wagons are bottom discharge wagons, the four wheelers were of the V series: V, VJ, VJM for coal, VTS, VTE for ballast. Eight wheeled hoppers included VBO for ballast and VH, VO, VHO and many others for coal and the QGX and others for bulk grain.

Other than the bulk grain hoppers most hoppers are open at the top, their loads of coal, ore, woodchip, ballast etc. are visible and suitable for modelling.
A 'tip' is to use a dummy floor of balsa or similar and only have a veneer of the product visible at the top when modelling these loads.

TANK WAGONS



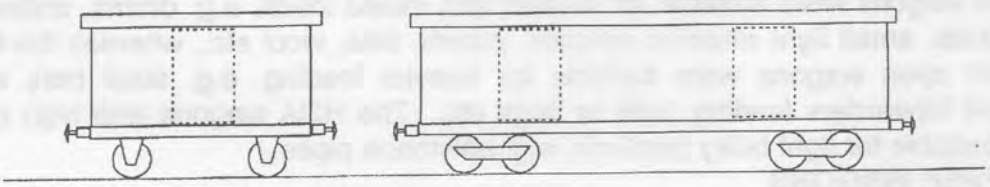
Tank wagons were used for the transport of bulk liquids including water, P.O.L, bitumen, etc. As their loads are not visible to the modeller then they are of little interest as loading is concerned, but can be placed in interesting terminals.

BULK WAGONS

The third sub type of bulk wagons is those used generally for bulk products but not having a bottom discharge like a hopper wagon. Early bulk grain wagons were WHA and WHE class, the grain being hidden (except at terminals) by tarpaulins supported on bow frames. A 'tippler' that tipped them to allow the grain to flow out unloaded them. The tarp support bows stayed in place, but when empty, sometimes the tarps were replaced, sometimes folded on the floor.
When superseded by QGX covered grain hopper WHA and WHE wagons became open goods wagons, fortunately they were built with swing-out doors, and most had tarpaulin supports removed.
Other bulk open wagons included WHO, G, GN and GO etc. and were loaded with various mineral products visible from the top and suitable for modelling.

LIVESTOCK WAGONS were of the four wheel and bogie type. The four-wheel wagons included IC wagons for cattle and horses, EIC for elephants, horses and cattle, L and MG for sheep, calves and pigs. The bogie livestock wagons included the K series for cattle and N series for sheep. The cattle wagons were open at the top on QR while the sheep were visible from the sides.

BOX WAGONS



Box wagons are fully enclosed wagons, some louvred; some are insulated for refrigeration or ice cooling. The four wheelers were the A series, classes included A, ABG, ALG, ALY etc. The bogie versions were the C series including C, CMI, CLC, BLC, QLX, CO, CLO. Box wagons were suitable for smaller loads, crates, boxes, and drums, refrigerated or cooled products, pallets, wool, crates and loads requiring security and/or protection from the elements etc.
Box wagonloads were not visible from the outside, thus of little interest to the modeller, but some interest can be created at terminals where box wagons doors cane be opened with loading inside visible. Also ramps can be placed in the open

doorways for barrow or forklift access. For many years QR ran with the doors on empty box wagons open, but the practise ceased in the 1980s.

QR CONTAINER WAGONS are generally of the B or P classification and are often called a one, two or three 'slot' wagon. A slot, being wagon space, for a 20 ft. (6.1m) long standard I.S.O container. Many containers conform to the International Standards (ISO) sizes being:- 40 ft (12.2m) long or 20ft (6.1m) long by 8ft (2.44m) wide and heights varying from the original 8 ft (2.44m) to 10 ft (3.05m) high.

There have been many increases in container lengths and heights, but I.S.O container bases are 8 ft (2.44m) wide, some in Australia re 8 ft 2 ½" (2.5m) wide.

There is now a multiplicity of container formats; these are listed in Annex A. In model form many containers are available in HO scale, a few in OO and N Scale from some Model Railway outlets.

Some containers are of the open type, some with side gates, these can carry a variety of loads and can easily be modelled and add variety to the modern container train. Flat rack containers are used on QR to convey items including bulk fruit bins, tractors, large rubber tyres, wool, steel products, drums of fuel, etc., some are covered by tarpaulins. QR also carries many non-standard containers, e.g. bulk cement bins, bulk sugar bins etc.

LOAD SIZES QR, like most railways, has a loading gauge.

APPENDEX B – within which loads must fit dimensionally.

Allowance must be made for varying floor heights of wagons.

Some station yards had fixed loading gauges through which the loaded wagon must pass.

The width of that part of long loads, that extend beyond the headstock (end) of the wagon must be reduced in width as the overhang increases. This is necessary to compensate for the outward swing of the end of the load on sharp curves.

Under certain circumstances loads are accepted for transport with dimensions that exceed the loading gauge.

Such loads are designated 'Out of Gauge' loads and may only be conveyed with special approval, often with route, speed or other restrictions to their travel.

To overcome over-height problems with high loads Qld Rail had several types of drop centre or low load wagons: -

These included four-wheeled PWE, eight-wheeled PJM, twelve-wheeled PJW and 2 x PWZ wagons with 16 wheels.

SECURITY OF LOADS on QR WAGONS

All loads on or in wagons must be secured to their carrying wagons: -

(a) To prevent loading from falling from the wagon

(b) To prevent movement on or in the wagon, that may cause the load or wagon to be damaged.

There are a wide variety of securing devices to restrain loads from movement during transit, too many to be dealt with in detail here, but the most common are chains, straps, frames, sleepers, timber dunnage, rope tarpaulins, bars etc.

Firstly chains, fixed to wagons by turnbuckles or load binders, are used to tie down a variety of heavier loads. Some chains come permanently fitted to the wagon, e.g. S,

SR, WR wagons while they are supplied separately to other wagons. Scale chains are sold as such in certain hobby shops and can also be purchased from variety stalls or jewellers.

APPENDEX'S C & D:- show methods of chaining loads on QR wagons.

TARPAULINS were prominent on QR wagonloads and look great on a model freight train. A few are still used on open containers. Tarpaulins were not used to secure loads, but as protection from the weather, the exceptions being for wool and fodder. Both wool and fodder are loaded so that the top and ends of the loads taper inwards. Many years ago wool was loaded in jute bales that were very square in shape and had a rough external surface. When the external cover was changed to a polythene type smooth rounded bale QR had a problem with bales sliding out of position in transit.

As a result wool diagrams were changed to slope in at the sides and ends or 'crowned' so that the tarpaulin/s held the load together more firmly than previously. Where two or more tarpaulins are required on longer wagons, care was taken to ensure the leading tarpaulin overlapped the next tarpaulin by at least a metre to prevent water entry and billowing in the wind.

There are many ways of modelling tarpaulins. They can be purchased, photocopied, made from cloth, tissues or foil. Some can be painted and lettered appropriately.

QR sometimes used collapsible frames to support tarpaulins on open sided wagons to allow water to flow off and prevent ponding on sagging tarpaulins.

Webbing straps were introduced to QR during the late 1980s to secure medium and smaller load, e.g. crates, bins, pallets etc. They can be easily modelled and look effective.

Ropes were used to secure light loading, e.g. cardboard cartons, and can be modelled using strong cotton thread.

Metal strapping was used to unitised sawn timber and same can sometimes be shown by drawing appropriate lines around bundles of timber or gluing thin strips of strong coloured paper around the load.

Sleepers were widely used to supplement the securing of wheeled and tracked vehicles and can be easily used on model wagons for the same purpose. The sleepers were held in place using timber chocks nailed to the timber deck of the wagons or on steel floored wagons, e.g. FJS and HJS where the sleepers were held in place by timbers that extended to the ends of the steel wagons.

QR also handled special loads on occasions, e.g. the 85 ton boilers and transformers for Gladstone Power loaded on PWZ drop centre or well wagons, other special loads, e.g. reels of cable and large crated machines etc. were also carried on drop centre wagons,. Long concrete girders, long poles and Gantry cranes etc. were sometimes carried on special swivel bolsters attached to QFC wagons, straddling two or three wagons.

Long loads, e.g. steel I beams, concrete or timber light poles and long logs may extend beyond the end or ends of the wagons. Flat runner wagons were used to protect the load. Care must be taken to ensure the width of the extended load is reduced to stay within gauge on curves and had sufficient clearance above runner wagons to allow for grade changes.

In summary there are many loads available from hobby and toy shops. Plastic I beams, angle beams etc. Logs can be found in your garden. Earthmoving

equipment, motor vehicles, caravans, army loads etc. can be selectively purchased from hobby and some toy shops
Coal, ballast and ore are readily available as well as fuel drums, crates, and tyres (off old toys).
The modeller's ingenuity and creativeness are the challenge to enhancing your railway with interesting and authentic loaded wagons on your freight train.
The ball is in your court, Railway Modellers, GO TO IT!

APPENDEX "A"

DETAILS of LOADING carried by QR at some time

TIMBER

LOGS
SAWN TIMBER
SLEEPERS
WOODCHIP
POLES
FIREWOOD
ROOF TRUSSES
PREFAB BUILDINGS

STEEL

RAW

FLAT PLATE
COILS
'I' BEAMS etc.
RAILS (RLY)
REINFORCING BARS

FABRICATED

GIRDERS
PIPES
GANTRY CRANES
TANKS (STEEL or G.I.)
STRUCTURAL STEEL
CABLES (REELS)

ARMY

TRACKED VEHICLES
WHEELED VECHICLES
BRIDGING, PONTOONS
STORE, CRATED & PALLETIZED
AMMUNITION

AGRICULTURAL

PRODUCTS

WOOL
GRAIN
FRUIT
FODDER
CANE

MACHINES

TRACTORS
HEADERS
PLOUGHS
MOBILE BINS

CONCRETE

BAGGED
BULK
GIRDERS
PIPES
CULVERTS
POLES

LIVESTOCK

CATTLE
SHEEP
HORSES
PIGS
ELEPHANTS

MACHINERY

BOILERS
GENERATORS
TRANSFORMERS
ENGINES

MOTOR VEHICLES

CARS
TRUCKS
CARAVANS
TRAILERS
BUSES
BOATS on TRAILERS

CONTAINERS

BOX
TANK TAINERS
TRANSIFLATS
FLAT RACKS
HALF HEIGHT
EXTENDABLE (to 18M)
LIVESTOCK (SHEEP)
NON-STANDARD (e.g. SUGARBINS)
REFRIGERATED
BULKTAINERS (e.g.) BULK CONCRETE)

MISCELLANEOUS or GENERAL

ROLLS of NEWSPRINT
BULKA BAGS
BOATS
CRATES
CIRCUS/SIDESHOWS
DRUMS
PRE-FAB BUILDINGS
ROOF TRUSSES
GAS BOTTLES
ANIMALS in CRATES
TYRES
PARCELS
MILK CHURNS

PALLETISED

BOTTLES
TILES
BRICKS
FRUIT
PARCELS
BAGGAGE
MAGAZINES

BULK

LIQUIDS
GRAIN
MINERALS
WOODCHIP
EARTH
STONE
GASES
FRUIT
LOCO ASH
BITUMEN

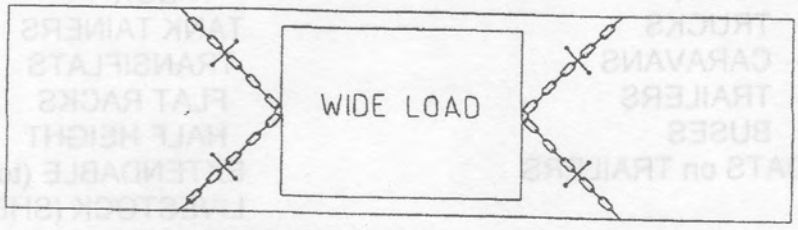
EARTHMOVING EQUIPMENT

BULLDOZERS
SCRAPERS
LOADERS
ROAD ROLLERS
GRADERS

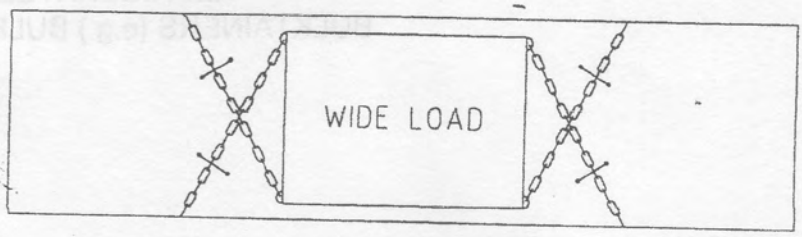
DANGEROUS GOODS

LIQUID FUELS
FUELS IN DRUMS
AMMUNITION
EXPLOSIVES

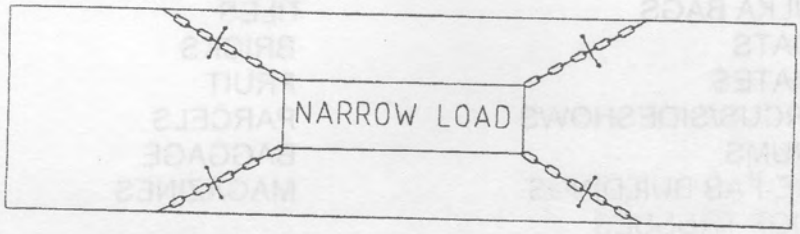
APPENDIX C



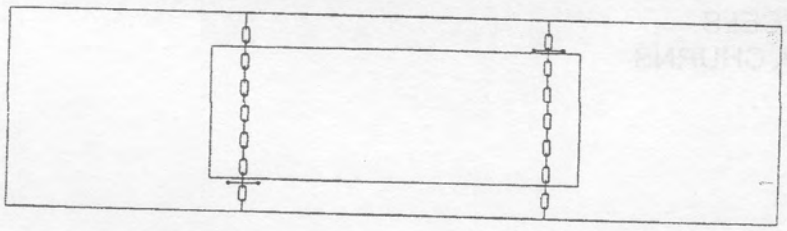
ATTACHING CHAINS TO CENTRE OF LOAD



ATTACHING CHAINS AT CORNERS OF LOAD



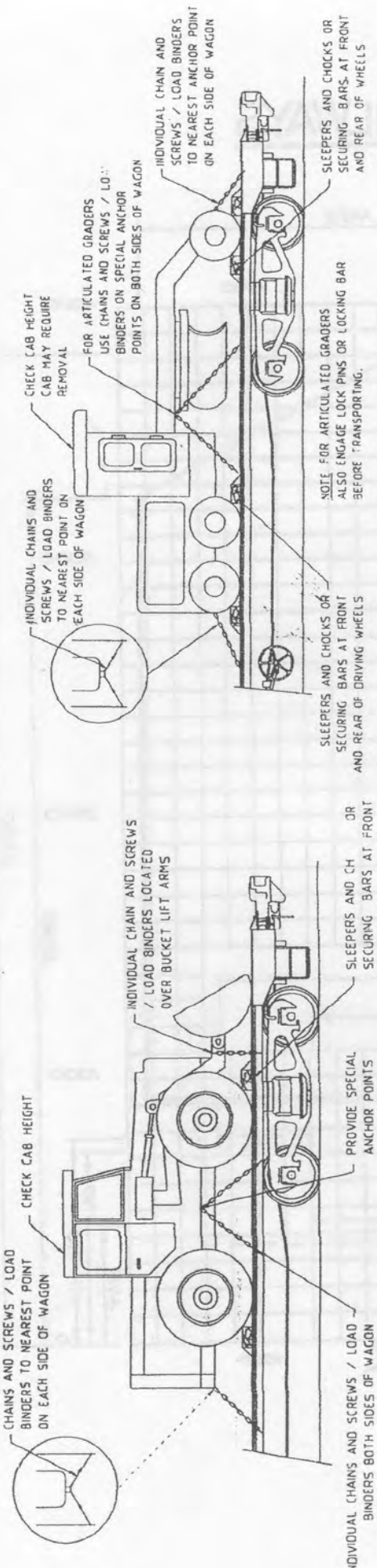
ATTACHING CHAINS AT CORNERS OF LOAD



LOAD WITH NO SECURING POINTS
e.g. BOX OR CRATE

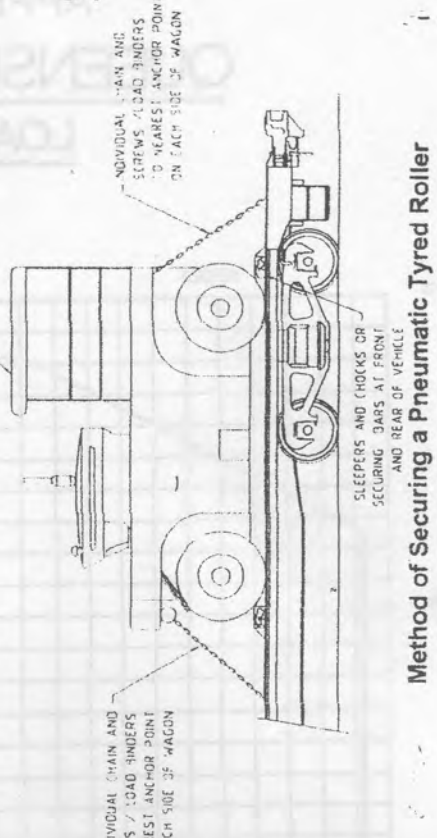
Recommended Positions For Chains

APPENDIX D 37

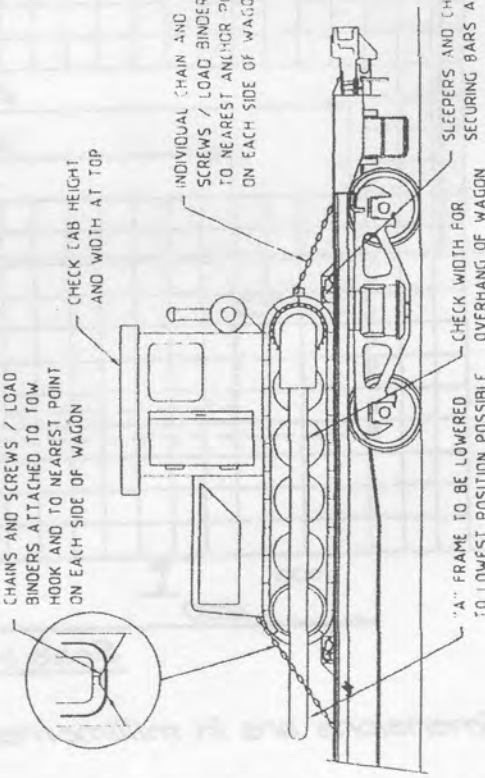


Method of Restraining a Pneumatic Tyred 4 - Wheel - Drive Loader

Method of Securing a Grader



Method of Securing a Pneumatic Tyred Roller

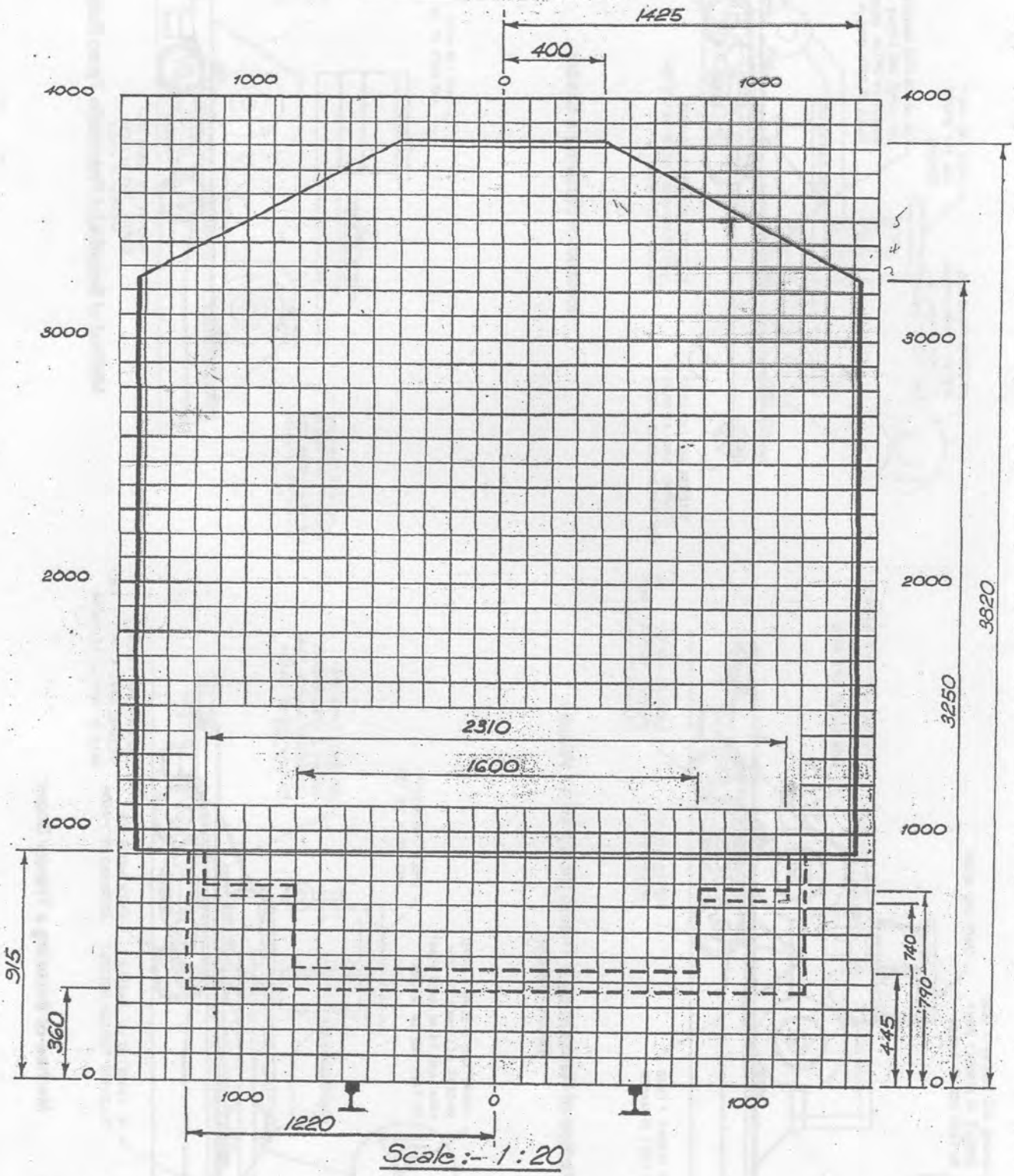


Method of Securing a Tractor Dozer

APPENDIX B

QUEENSLAND RAILWAYS

LOADING GAUGE



Scale :- 1 : 20

All dimensions are in millimetres

For loading which exceeds this diagram, contact 2251738 , public phone, or 81-1738 Dept. phone, Brisbane, or the General Manager in the division concerned.