

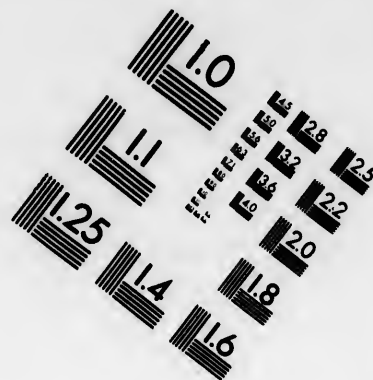
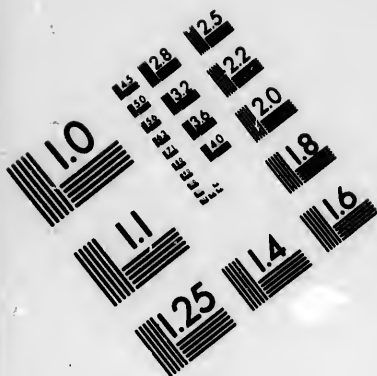
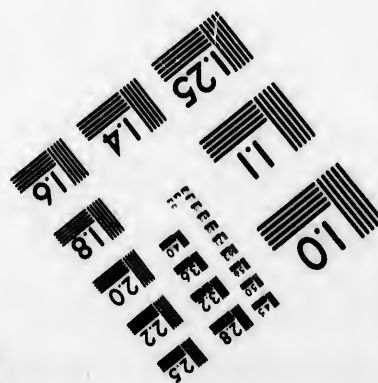
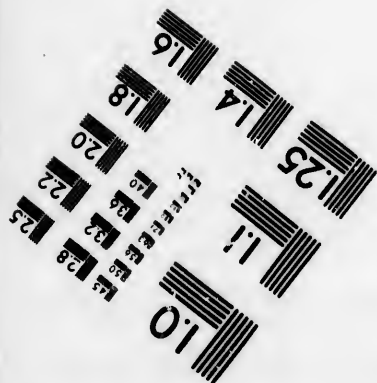
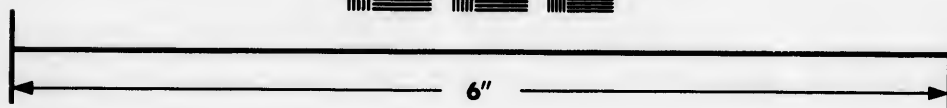
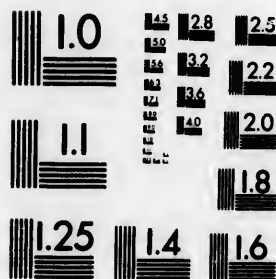


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic
Sciences
Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1984

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

- ☐ Coloured covers/
Couverture de couleur
- ☐ Covers damaged/
Couverture endommagée
- ☐ Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/
Le titre de couverture manque
- ☐ Coloured maps/
Cartes géographiques en couleur
- ☒ Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- ☐ Bound with other material/
Relié avec d'autres documents
- ☐ Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure
- ☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- ☐ Additional comments:/
Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- ☐ Coloured pages/
Pages de couleur
- ☐ Pages damaged/
Pages endommagées
- ☐ Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- ☒ Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- ☐ Pages detached/
Pages détachées
- ☒ Showthrough/
Transparence
- ☐ Quality of print varies/
Qualité inégale de l'impression
- ☐ Includes supplementary material/
Comprend du matériel supplémentaire
- ☐ Only edition available/
Seule édition disponible
- ☐ Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
										☒	

The co
to the

The im
possible
of the
filming

Origina
beginn
the las
sion, o
other o
first pa
sion, a
or illus

The las
shall c
TINUE
whiche

Maps,
differen
entirely
beginn
right a
require
method

The copy filmed here has been reproduced thanks to the generosity of:

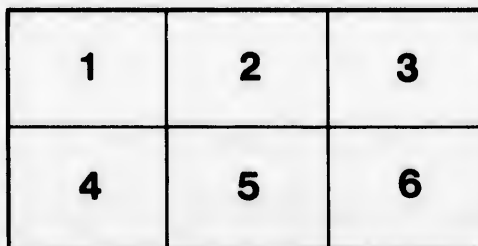
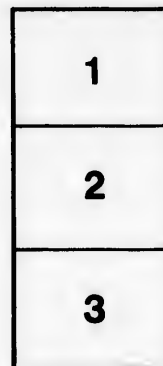
Library of the Public
Archives of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol → (meaning "CONTINUED"), or the symbol ▼ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

La bibliothèque des Archives
publiques du Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole → signifie "A SUIVRE", le symbole ▼ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

Canadian Pacific Railway Company of Canada.

SPECIFICATION

OF

33-FOOT BOX CAR.

GENERAL DIMENSIONS.

Length of Car outside of Sills, 33 feet.

Width of Car outside of Sills, 8' 6".

Height of Car from bottom of Sill to top of Plate 7' 3".

" " Posts between shoulder, 6' 3".

2 Side Sills, White Oak, Tamarac or Georgia Pine, 5" x 9" x 32'-7".

2 Intermediate Sills, " " " 4½" x 9" x " "

2 Centre Timbers, " " " 4½" x 9" x " "

2 Top Plates, " *heavy pine* 3" x 5" x 33'-0".

2 Headstocks, " " 5" x 9" x 8' 6".

2 Transoms, " " 1" x 8" x 8' 6".

2 Body Bolsters, " " 14" x 5" x 8' 6". } See Drawing of Iron Bolster.

4 Corner Posts, " " 3" x 5" x 6' 7½"

4 Door Posts, (Side) " " 3½" x 5" x 7' 2"

4 Posts, (Side) " " 2" x 4" x 6' 7½"

4 " " " 2½" x 4" x 7' 2"

4 End Door Posts, " " 4" x 3½" x 7' 2"

12 Side Braces, " " 6" x 2"

4 End Braces, " " 4" x 2"

2 Arch Rails, " " 3" x 12" x 8' 2"

4 Carlines, " " 2" x 11" x 8' 2"

2 Purlines, " *heavy pine* 3½" x 2½" Full length of car.

1 Ridge Rail, " " 4" x 3½" " " "

Side Belt Rail, 4" x 3"

End Belt Rail, 5" x 3"

BODY SHEETING.

The body sheeting is of first quality clear white pine battens, tongued and grooved, matched and banded, 3½" to 4½" wide by ¾" thick, the battens run vertically, their length being the full depth of car side, and they are secured by heavy clinch nails 2½" long, these being about 5 in sill, 3 in belting, 2 in braces and 3 in plate.

INSIDE SHEETING.

Inside sheeting to be clear, put on horizontally, to be nailed with 2½" nails, two nails in each post, a space of 2 inches to be left between floor and lower edge of sheeting (a bevelled strip to be fastened on top of floor and fitting against inside of outside sheeting).

The lining to be 3' 2" high from floor to top of Bolt Rail. Bolt Rail to be well fitted to posts and braces and fastened by ½" Carriage Bolts and 2 screws at each end. No. 18.

TIE RODS.

- | | | |
|---|---|-------------|
| 4 | Tie Rods through outside sills and intermediate pillars and top plates, | ½" x 7' 6½" |
| 4 | " through outside sills, corner pillars and top plates, | ½" x 7' 6½" |
| 4 | " through outside sills, side door pillars and top plates, | ½" x 8' 1½" |
| 4 | " through headstock and arch rails, | ¾" x 7' 11" |
| 4 | " from end corner post to first post on side, | ½" x 5' 1½" |
| 2 | " through side plates along car-lines, dividing the car into three equal spaces | ½" x 8' 7½" |
| 2 | " through end corner posts, and pass across end of car, along belt rail | ½" x 8' 7" |

Rods passing vertically through the top plates on side, also archrails, and through side sills and headstocks, to be put in to form a truss by bringing them flush with outside face of belting.

TRUS

FRAM

Corne

**TRUSS ROD
FRAME.**

Two wrought-iron bent truss rods $1\frac{1}{2}$ in. diameter, each in two pieces, with screwed ends $1\frac{1}{2}$ in. diameter, are on outside of intermediate timbers. The ends of each half of truss at centre of car to be connected by a double-headed nut or turn-buckle at least nine inches long, and at alternate ends screwed with right and left hand thread. In the course of rods from the centre towards end of car, they pass under east-iron shoes on under side of transoms, then over shoe on top of packing-pieces on top of bolster (so as to be close to floor) and then through the head stock, which is provided with east-iron washers $7'' \times 4'' \times \frac{7}{8}''$ thick, having inclined faces to give proper bearing to face of truss nuts. All shoes for rod are secured in place by the pups or pins cast on them being tightly driven into shallow holes drilled in timber. The packing-piece, $4'' \times 6'' \times 1' 9\frac{1}{4}''$ long, over bolster extends only from side-sill to intermediate, and is secured to bolster by $\frac{3}{4}''$ wrought iron spikes.

FRAMING.

Side sills, centre floor and intermediate timbers framed to headstock by double tenons $2\frac{1}{2}''$ long as follows: Commencing at top $1\frac{3}{4}''$ shoulder, $1\frac{1}{2}''$ tenon, $2\frac{1}{2}''$ space, $1\frac{1}{2}''$ tenon, and $1\frac{3}{4}''$ shoulder. Headstock fastened to side sill at each corner by one $\frac{3}{4}''$ joint-bolt $12''$ long. Headstock fastened to centre floor timbers by two $\frac{3}{4}''$ joint bolts $12''$ long. Headstock, centre and intermediate timbers placed as shown in drawing.

Centre of Bolster $4' 10\frac{1}{2}''$ from outside of headstock. The distance from outside of headstock to centre of transoms, $13' 6''$.

The headstock and side sill to be secured at each corner on inside by inside corner castings, which are fastened on by four $\frac{3}{4}''$ bolts at each corner; outside casting will be high enough to clip the corner-post, as shown in drawing.

Transoms to be gained $1''$ for side-sills, centre and intermediate floor timbers, and fastened to intermediate and centre floor timbers with one $\frac{5}{8}''$ bolt, $1' 4\frac{3}{4}''$ long, to each timber.

Door, end, and intermediate posts framed with tenons, $2''$ long at top and $2\frac{1}{2}''$ at bottom, all $1''$ thick and of the full width of each of the various posts, and to have $1''$ shoulder on outside, fitting tightly into their various mortices, set perfectly vertical and parallel with each other and with king-posts, end and side door-posts; end, king-posts, and side door-posts to project $\frac{1}{4}''$ outside of framing, and flush with sheeting, king-posts with $\frac{1}{2}''$ rebate, and door-posts with $\frac{3}{4}''$ rebate, for sheeting; king-posts having square bearing, and being checked for outside lip of brace shoe.

Top plates secured to Archrails by one wrought-iron knee strap at each corner made out of $2'' \times \frac{3}{8}''$ iron, each secured by two $\frac{1}{2}''$ bolts, $4\frac{3}{4}''$ long, one on each side, which also go through top inside corner casting and secure the same.

Archrails and Carlines to be framed into top plates by double tenons $1''$ long, as follows, flush with bottom of top plates. Commencing at bottom, $1''$ shoulder, $\frac{7}{8}''$ tenon, $1\frac{1}{4}''$ space, $\frac{7}{8}''$ tenon, and $1''$ shoulder, each end secured to plates by one $\frac{1}{2}''$ joint bolt $9''$ long.

The belt rail which runs all round car, except past the side doors, is secured to posts by one, and to braces by one $\frac{1}{2}''$ cup headed bolt; all nuts under sheeting; belt rail also to be fastened to ~~the~~ posts by one $\frac{1}{2}''$ joint bolt $9''$ long; also short $\frac{3}{4}''$ rod from corner post to first post on side, as specified; belt rail to be framed as follows: checked for posts $1\frac{3}{4}''$, and checked for braces $1\frac{3}{4}''$, and brace checked for belt rail $\frac{1}{4}''$, the posts being checked for belt rail $\frac{1}{4}''$. Braces to be furnished with east-iron shoe or pocket, which allows end of braces to be cut square, as shown in drawing.

Corner

WOODEN I
BOLSTER

IRON BO
BOLSTER

CENTRE F

DRAW BA

**WOODEN BODY
BOLSTER.**

The wooden body bolster, if used, will be checked for centrals and intermediates $\frac{1}{2}$ ", they being checked for bolster $1\frac{1}{2}$ " and secured to all longitudinals by two bolts $\frac{5}{8}$ " dia., except at centre, where they are $\frac{3}{4}$ "; the heads of these latter bolts will be flush with top of floor and received in cast-iron socket washers $1\frac{3}{4}$ " high $\times$ $2\frac{1}{2}$ " diameter.

Each bolster is strengthened by two bent truss rods, $\frac{5}{8}$ " dia. wrought iron. They pass inclined upwards through casting and bolster ends, and when clear of bolster through intermediate longitudinals and then over cast iron brackets, taking bearing on top of central timbers and king-pin packing piece. These four cast-iron brackets are set close to the outside of each central, the base resting on the bolster, and are kept in place by two $\frac{5}{8}$ " bolts passing through king-pin block. Instead of separate washers for each nut of ~~truss~~ ^{truss} rod, their place is occupied by cast iron plate covering the bolster end, having a lip on under side and inner edge to clip the bolster, a bead moulding on outer surface, two holes cast through for passage of rod ends, and raised inclined faces around the holes to give square bedding face for truss nuts.

**IRON BODY
BOLSTERS.**

Wrought iron bolster, if used, will consist of two plates, top plate $7'' \times 6'' \times 8' 6''$ long, and bottom plate $7'' \times 6'' \times 8' 2''$ long.

	No.	Size.
Friction castings.....	4	See drawing.
Pillar " (short)	4	" "
" " (long).....	4	" "
Distance " forming shoe for draw bar timbers, (not required for long draw bar timbers).....	4	See drawing.
Top crown plates	2	" "
Bolts through side sills	8	$\frac{3}{4}$ " dia. $\times$ $11\frac{3}{4}$ " long.
" " intermediates.....	4	$\frac{3}{4}$ " dia. $\times$ $11''$ long.
" " crown plate distance casting and central timbers.....	8	$\frac{3}{4}$ " dia. $\times$ $17\frac{1}{2}$ " long.
Cast iron washers for these bolts.....	8	$1\frac{3}{4}$ " high $\times$ $2\frac{1}{2}$ " dia.

CENTRE PINS.

Centre pins to be made of $1\frac{3}{4}$ " round iron, $2' 5''$ long under head, with good solid heads partially sunk in floor and covered by a $5''$ square plate $\frac{3}{16}$ " thick, flush with top of floor, plate to be secured by four $1\frac{1}{2}''$ No. 18 screws.

	No.	Size.
DRAW BARS. Drawheads of cast iron, holds to be drilled not cored out.....	2	$2'' 5\frac{3}{4}''$ long.
Spring straps or tail plates, of wrought iron.....	2	$3'' \times 1''$ section.
Strap rivets, per car.....	6	$\frac{7}{8}''$ diam.
Spiral or coiled steel springs.....	2	$6''$ dia. $\times$ $7''$ long.
Coils in each spring.....	3	{ section of metal in each, $\frac{1}{16}'' \times 1\frac{1}{8}''$, $\frac{1}{16}'' \times \frac{1}{2}''$, $\frac{1}{8}'' \times \frac{3}{8}''$
Spring plates with centre paps, of wrought iron.....	4	$6\frac{1}{2}'' \times 6\frac{1}{2}'' \times 1\frac{1}{8}''$ thick.
Cast iron shoulder brackets bolted to oak guides.....	8	$1\frac{1}{2}'' \times 6\frac{1}{2}'' \times 7\frac{1}{4}''$



	No.	Size.
Bolts, per car, for shoulder brackets	24	$\frac{3}{4}$ " dia. x $6\frac{1}{2}$ " full long.
Plate guides from back to front shoulders, of wrought iron.....	8	$1\frac{3}{4}$ " x $\frac{1}{2}$ " x $1'$ $2\frac{1}{2}$ " long.
Bolts for plate guides to shoulder brackets.	8	$\frac{3}{4}$ " x $9\frac{1}{8}$ " full long.
Guides bolted to centrals, of white oak, (for iron bolster with cast iron shoes).....	4	$4\frac{1}{2}$ " x $7\frac{1}{2}$ " x $4'$ $9\frac{1}{8}$ " long.
Thrust keys for guides, of cast iron.....	12	$3"$ x $1\frac{1}{2}"$ x $4\frac{1}{2}"$ hollow box
Bolts for guides, with double nuts, heads flush with top of floor	12 6	$\frac{7}{8}"$ dia x $1'$ $7\frac{1}{4}"$ long.
Cast iron washers for these bolts.....	12 6	$1\frac{3}{4}"$ high x $2\frac{1}{4}"$ dia.
Guides bolted to centrals, of white oak. } For iron	4	$4\frac{1}{2}"$ x $7\frac{1}{2}"$ x $6'$ $7\frac{1}{8}"$ long.
Bolts of same, with double nuts, heads } bolster	4	$\frac{7}{8}"$ dia x $1'$ $4\frac{1}{2}"$ long.
flush with top of floor..... } without	4	$1\frac{3}{4}"$ high x $2\frac{1}{4}"$ dia.
Cast iron washers for these bolts..... } cast iron shoes.	4	
Coupling pins, wrought iron, with rivet in end.....	2	$2"$ x $1\frac{1}{2}"$ oval section x $9"$ long from shoulder.
Coupling link.....	1	$1\frac{1}{4}"$ x $1\frac{3}{4}"$ D section x $11"$ long inside.
Strap for draw bar and brake shaft bracket.....	1	$3"$ x $\frac{7}{8}"$ x $2'$ $5\frac{1}{4}"$ long.
" " "	1	$3"$ x $\frac{7}{8}"$ x $1'$ $4"$ long.
Draw-bar strap bolts which pass through bunter heads and guides bolted to centrals.....	4	$\frac{7}{8}"$ dia. x $1'$ $6"$ long, double nuts.
Draw-bar strap bolts through bunter heads.	4	$\frac{3}{4}"$ dia. x $1'$ $5\frac{3}{4}"$ long, double nuts.
Bunter heads, of white oak	2	$9"$ x $5"$ x $2'$ $3"$ long.
Long bolts for bunter heads to bolsters, hooked round top plate of iron bolster, and other end secured to bunter head with nut.....	4	$1"$ dia x $6'$ $2"$ long.
Short bolts for bunter heads to headstocks.....	4	$\frac{3}{4}"$ dia. x $1'$ $0"$ long.
Plates for these bolts on bunter heads.....	4	$9"$ x $2"$ x $\frac{1}{4}"$ thick.
Height from rail to centre of draw bar.....		$2'$ $10"$

BRAKES.

Brakes are carried from frame of car, are on outside of wheels, and are used on one truck only of each car.

	No.	Size.
Sling supports, wrought iron bolts, which pass through side sills and intermediates.....	4	$1\frac{1}{8}"$ dia.
Washers on same for safety links, cast iron.....	4	See detail.
Ferrules or distance brackets for same, of wood.....	4	
Slings, of wrought iron, with bent eyes.....	4	$1"$ dia.
Safety links, of wrought iron	4	$\frac{3}{4}"$ dia.
Toggle pins in beam, of wrought iron.....	4	$\frac{7}{8}"$ dia. x $10"$ long.

FLOORING.

ROOF.

	No.	Size.
Beams, of white oak.....	2	3 $\frac{1}{2}$ " x 7" x 5' 8" long.
Brake heads, of cast iron.....	4	3" x 15"
" shoes, " " with three holes for bolts in each.....	4	3 $\frac{1}{4}$ " x 1 $\frac{1}{4}$ " x 15"
Bolts for heads, with countersunk heads.....	4	$\frac{5}{8}$ " dia. x 3 $\frac{1}{2}$ " long. } <i>with collar hole</i>
" " " " ".....	4	$\frac{1}{2}$ " dia. x 7" long. } $\frac{3}{16}$ " dia blind rivet
" " square heads.....	8	$\frac{5}{8}$ " dia.
Lever, of wrought iron.....	1	3" x 2 $\frac{1}{2}$ " x 2' 6" centres.
Lever crutch, of wrought iron.....	1	3" x 2" with end $\frac{1}{2}$ " dia x 14" long. } 10 $\frac{1}{2}$ "
Horizontal brake rods, of wrought iron.....	2	3" dia.
Large washers, of cast iron, for lever crutch.....	2	
Small " " " for beam ends.....	8	
Beam stirrup, of wrought iron bent, with two holed wrought iron plate.....	1	$\frac{5}{8}$ " dia. x 8 $\frac{3}{4}$ " long inside.
Upright shaft, of wrought iron.....	1	1 $\frac{1}{2}$ " dia. and 1 $\frac{1}{2}$ " dia. at bottom.
Brake wheel, of cast iron, with curved spokes.....	1	15" dia. 1 $\frac{1}{8}$ " rim.
Ratchets for each shaft, with pull.....	1	4 $\frac{3}{4}$ " dia. x 1" deep.
Bolts for top bracket for shaft.....	2	$\frac{5}{8}$ " dia.
Cast iron bracket on headstock, supporting brake shaft.....	1	
Top bracket for shaft, of cast iron, which is secured on top of roof, pull is secured to this bracket by wrought iron stud.....	1	
Lower bracket for shaft is formed by the projection of the draw-bar strap.....		

FLOORING.

Georgia pine flooring 1 $\frac{3}{4}$ " thick, not over 6" wide, planed, tongued and grooved $\frac{1}{8}$ " from face; tongue $\frac{3}{8}$ " x $\frac{3}{8}$ ", edge rounded.

Floor to be nailed with twenty-penny cut nails, 4 $\frac{1}{2}$ " long, two in each floor timber. The floor to be put down crosswise of car, and all pieces to be of full length. It is to be tightly fitted around posts and braces; at side doorways the floor is protected by wrought iron plates 3 $\frac{3}{4}$ " x 4" x 5' 0 $\frac{1}{4}$ " long, having their ends mitred $\frac{1}{4}$ " into door posts, and at end doors by cast iron door stop as shown on drawing.

ROOF.

The roof is "hipped" form and covered with two thicknesses of first quality clear white pine sheathing, $\frac{3}{4}$ " thick and about 5" wide, the upper course breaking joint with the lower, and having two grooves $\frac{1}{2}$ " wide x $\frac{1}{16}$ " deep, and $\frac{3}{4}$ " clear from edge of board, cut in each board, viz., on the upper side of the lower course and upper side of upper course, to act as water channels; lower course to be tongued and grooved, great care to be taken to make good joints at point of roof; all joints and bedding surfaces to be thickly coated with white lead paint; the upper surface of lower sheathing and lower surface of upper sheathing to be painted with thick white lead before upper sheathing is nailed down in place; wrought

S.

END

2' 1 1/2" wide and to be made of three planks of clear red pine 8 1/4" x 1 1/4" well length of car with 3/8" space between each and to be secured on ten blocks cut to fit roof of car as shown in drawing

iron nails to be used, 2 1/2" in lower course and 3" in upper course. Running board to be 26" wide and to be of two courses of first quality sheeting, similar to roof, with grooves, and laid crossways of car. Ends of running board are to project over car 6", the projecting portion to be well and strongly secured by two stout wrought iron brackets 1 1/2" wide x 1" thick, bolted through sheeting to arehrail, as shown in drawing.

Roof of roof to have four coats of white lead paint under cornices, which is 1 1/2" wide and nailed on, Cornices to be well painted with white lead on outside

Roof cornice as shown in drawing.

S. E. SLIDING DOORS.

One on each side of car. Door frame timber of white ash.

	No.	Size.
Door opening.....		5' 0" wide.
Size of Door Frame outside.....		6' 4" x 5' 2".
Top Rails	2	6" x 1 3/4".
Centre Rails.....	2	6" x 1".
Bottom Rails.....	2	6" x 1".
Stiles or Uprights.....	4	5" x 1 3/4".
Pine Sheeting, tongued and grooved, rebated 3/4" x 3/4" into top rails and stiles on outside and placed vertically.....		3/4" thick x 4 1/2" to 5" wide.
Door-step, of ash or oak	2	2 1/2" x 15".
“ “ secured by.....	4	4 1/2" x 1/2" coach screws.
“ slides of wrought-iron	2	2" x 1/2" x 10' 5" long.
“ “ carrying brackets of cast-iron	14	See detail.
Bolts for “ “ square heads.....	14	1/2" dia. x 8" long.
Slide brackets for doors, cast-iron	4	
Screws for same.....	16	No. 18, 1 1/2" long.
Joint bolts for same, for top corners.....	4	1/2" dia. x 9" long.
Rods for same, for bottom ends	2	1/2" dia. x 5' 4" long.

In door frame rails are morticed into stiles by 1/2" tenons, 2" long, tenons on top and bottom rails being checked down 1 1/4" clear of edge. Rails and stiles are rebated on outer edge 3/4" x 3/4" to receive sheeting, which is secured by 1 1/2" pressed nails. Sheeting put on outside of doors vertically.

Facia-board of cornices overhangs side doors 1" forming upper slide, and is strengthened where door slides by five button castings secured by five bolts 1/2" dia. x 8" long passing through facia-board, blocking-piece, sheeting and top plate.

END DOORS.

Each end of car to be fitted with an upper and lower door, for loading rails and lumber; these doors to be fitted with all necessary fastenings, etc., upper doors to be framed similarly to side sliding doors. Bottom door to be fitted in rebate on posts and belt rail, and will answer as grain door. Slide and casting as per drawing for top end door.

DOOR
FASTEN

GRAIN DOOR

Door frame timber, white ash.

	No.	Size.
Upper Door opening		2' 0" wide x 2' 11 $\frac{1}{4}$ " high.
Size of Upper Door		2' 2" wide x 3' 0 $\frac{1}{2}$ " high.
Top Rails	2	6" x 1 $\frac{3}{4}$ ".
Bottom Rails.....	2	6" x 1".
Stiles or Uprights.....	4	5" x 1 $\frac{3}{4}$ ".
Pine Sheeting, tongued and grooved, rebated into top rails and stiles $\frac{3}{4}$ " x $\frac{3}{4}$ " on outside and placed vertically		$\frac{3}{4}$ " thick x 2 $\frac{1}{2}$ " to 5" wide.
Door-stops, of ash or oak.....	2	2 $\frac{1}{2}$ " x 1 $\frac{7}{8}$ ".
" secured by	3	4 $\frac{1}{2}$ " x $\frac{1}{2}$ " coach screws.
" Slides, of wrought-iron	2	2' x $\frac{1}{2}$ " x 4' 4 $\frac{1}{2}$ " long.
Carrying brackets, for slide, cast-iron.....	6	See detail.
Bolts for same, with square heads.....	6	$\frac{1}{2}$ " dia. x 6" long.
Slide brackets, for doors, cast-iron	4	See detail.
Screws for same.....	16	No. 18, 1 $\frac{1}{2}$ " long.
Joint bolts for same, for top corners	4	$\frac{1}{2}$ " dia. x 9" long.
Rods for same, for bottom ends		$\frac{1}{2}$ " dia. x 2' 4" long.
Wrought-iron sill plates in door-way, mitred $\frac{1}{2}$ " into door-posts	2	3 $\frac{3}{4}$ " x $\frac{1}{4}$ " x 2' 0 $\frac{1}{4}$ " long.

Tops of upper doors slide under wooden cornices, each of which are each secured to car by four bolts $\frac{1}{2}$ " dia. by 8" long, having button-castings under heads, which come flush with bottom of fascia-board of cornice.

Sheeting 5 $\frac{1}{8}$ " wide x $\frac{7}{8}$ " thick to be nailed on outside of belt rail between end door posts. (See drawing.)

Lower doors as follows:—

To be made of 2 thicknesses of $\frac{7}{8}$ " sheeting, tongued and grooved, outside laid vertically, inside horizontally, outside sheeting 2' 0" wide x 2' 8" high, inside sheeting 2' 1 $\frac{1}{2}$ " wide by 2' 9 $\frac{3}{8}$ " high. Both thicknesses of sheeting nailed together with clench nails 2" long.

Outside sheeting to be placed so as to form $\frac{3}{4}$ " rebating on sides and top of door and $\frac{5}{8}$ " on bottom of door, side posts and belt rail to be rebated $\frac{3}{4}$ ". (See drawing.)

Door to be hung from belting with two two 12" T hinges to each door, and outside sheeting to stop against wood stops $\frac{7}{8}$ " thick nailed on belt rail, and wrought iron stops 2 $\frac{1}{2}$ " x $\frac{1}{4}$ " screwed on door posts.

See detail on drawing for 12" T hinges for drawing
As shown on drawing, with hooks, pins and chains for the same.

DOOR FASTENERS.

Properly forged, bent wrought iron fastenings 1 $\frac{1}{2}$ " x $\frac{1}{2}$ " in section for locking the doors are stoutly secured by rivets to door frame. (See drawing.)

One bent wrought iron back door stop, and one with eye for fastener, each 2' x $\frac{1}{2}$ " in section are secured to each car side and car end by one $\frac{1}{2}$ " bolt 5 $\frac{1}{8}$ " long, passing through belt rail.

Bottom end doors to have wrought iron bars 2" x $\frac{3}{8}$ " x 2' 6" long screwed across inside of door 4" from bottom edge, with slots for coach screw eye-bolts, to act as fastener. Eye-bolts to be placed so that when pins are in place the door will be tight. Two similar eye-bolts to be placed in posts above door to keep door in position when lifted wide open.

GRAIN DOORS. As shown on drawing.

STEPS
H.

TRUCK

WHEEL
and

1/8" low centre is centre of holes

STEPS AND HANDLES.

Each end of car to be furnished with five wrought iron steps of $\frac{3}{8}$ " round iron, secured to posts with $2\frac{1}{2}$ " x $\frac{1}{2}$ " coach screws, the bottom step to have an off-set of three inches, and to be placed as shown in drawing, corners of car at steps to be furnished with two wrought iron handles on side of corner post 14" from centre to centre of holes, distance from bottom of sill to ^{corner} of handles 2' 5 $\frac{1}{2}$ ", and with two wrought iron handles on corner post and belt rail, 1' 9" centre to centre of holes; each handle secured by two $2\frac{1}{2}$ " x $\frac{1}{2}$ " coach screws.

Each corner of Car at steps to be furnished with 2" x $\frac{1}{2}$ " wrought-iron strap step, 1' 10" centre to centre of holes, 1' 3" on footing, and 9 $\frac{1}{2}$ " deep inside, placed lengthways of Car under side sill and headstock, and secured by two 3" x $\frac{5}{8}$ " coach screws. (See drawing.)

TRUCKS.

Trucks are of the four-wheeled lateral-motion type, with swing bolster, having the "master car builders' standard" (M.C.B.S.) axle-box and bearing.

WHEELS and AXLES.

The wheels supplied with these cars are to comply with all the requirements of the separate drawings and standard wheel specification under which all car wheels are now being supplied to this Company; the date to be properly cut on each wheel and axle when the car is complete and ready to be turned out of the shop. The axles are to be the Master Car Builders' Standard, and to be sound, clear forgings of approved metal and manufacture, carefully turned so that it will require a hydraulic pressure of not less than thirty-five tons, or more than fifty tons, to force them into the wheels. Each pair of wheels must be of exactly the same circumference, and each must be of equal distance from the edge of its nearest journal, so as to give each wheel flange $\frac{3}{8}$ " clearance from the inner edge of rail head when it is running on the track. The bars in the side frame to be carefully bent to gauge, and all holes drilled to gauge, so that when put together the various holes will be perfectly in line and the whole interchangeable. The ends of bent and straight bars to be neatly finished flush with each other. In addition to the double nuts on the axle-box bolts, they are further secured by a $\frac{3}{8}$ " round split pin passing through below the nuts. The screwing on bolt is not to run more than $\frac{1}{8}$ " up into the lower bar of side-frame. Before truck staples and axle-box nuts are put on, a piece of sheet iron will be put on bolts long and wide enough to turn up on side of nuts to secure them against working off.

	No.	Size.
Distance of wheel centres apart.....		1' 10"
Top bars for side frames, of wrought-iron.....	4	1 $\frac{1}{2}$ " x 3" x 5' 11"
Second " " " " ".....	4	$\frac{3}{4}$ " x 3" x 5' 11"
Third " " " " ".....	4	1" x 3" x 5' 11"
Fourth " " " " ".....	4	$\frac{3}{8}$ " x 3" x 5' 9 $\frac{3}{4}$ "
Extreme length when bent with ends flush.....		5' 9 $\frac{3}{4}$ "
No., diameter and tread of cast-iron wheel.....	8	33" x 4'

	No.	Size.
Axles of wrought-iron, size of journals 7" x 3 $\frac{3}{4}$ " x 6' 3" centres		M.C.B.S.
Wheel-seat, middle diameter and total length.....		M.C.B.S.
Axle-box wedges and covers, of cast-iron		See drawing.
Composition bearing, approved mixture (weight 10 lbs.)	8	6 $\frac{3}{4}$ " x 1" thick, lead lined.
Bolts for axle-box with double nuts and split pin	16	1" dia. x 15 $\frac{1}{4}$ " long.
Bolts for top-bars to cross-frame.....	8	3" x 14" long.
Stirrup-bolts for side-frame to cross-frame, bent.....	8	3" x 1' 7 $\frac{1}{4}$ " inside.
Stirrup-blocks, grooved at sides, of white oak.....	8	4 $\frac{3}{8}$ " x 4" x 3"
Washer plates for stirrup, of wrought-iron	8	6" x 8" x 3" { Sheet iron under nuts, edges to be turned up when nuts are tight.
Number, size and centres of holes in same.....	3	1 $\frac{1}{8}$ " dia. x 1 $\frac{1}{8}$ " centres.
Brackets to connect side and cross-frame, of cast iron....	4	1' 11" x 9" x 1" thick.
Cross or transverse frames, of white oak.....	4	4 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ " x 7' 3" long.
End distance-pieces for same, of white oak.....	4	12 $\frac{3}{4}$ " x 8 $\frac{1}{8}$ " x 3".
Checks on same running into transverse.....	2	2" wide x $\frac{1}{2}$ " deep.
Bolts for same	4	$\frac{3}{8}$ " dia. x 1' 10 $\frac{1}{4}$ " long.
Shoes for swing-pins, of cast iron (recessed).....	8	6" x 3 $\frac{3}{4}$ " x $\frac{5}{8}$ ".
Conch screws for these shoes	16	$\frac{1}{2}$ " dia. x 3" long.
Rubbing-pieces on cross-frame, of cast iron.....	8	4" wide x $\frac{1}{2}$ " thick.
Bolts with countersunk heads for same.....	16	$\frac{1}{2}$ " dia. x 5 $\frac{7}{8}$ " long over head
Swing-beams or trackbolsters, of white oak.....	2	10" x 10" x 5' 9" long.
Centre-castings.....	2	1' 3" x 9" x $\frac{7}{8}$ " flange.
Bolts for same, with double nuts	8	3" x 15" long.
Side-rubbing pieces at centre, of oak, well nailed.....	4	1' 6" x 9" x $\frac{1}{2}$ " thick.
End rubbing-pieces with double lips, of cast iron.....	8	4" wide x $\frac{1}{2}$ " thick.
Wood screws for same	32	No. 18 x 2" long.
Friction rollers, as shown in drawing.....	4	
Bolts securing chair and rubbing-piece.....	8	$\frac{3}{8}$ " dia. x 12" long.

PAINTI

	No.	Size.
Coil springs, 4 each	12	1 1/2" dia. x 1' 5 1/4" long. <i>See 1st</i>
Spring seat castings.....	8	1 1/2" dia. x 1' 5 1/4" long. <i>Keystone</i> See drawing. <i>Spring</i>
If elliptic springs are used, they will be 23" centres, 11" over buckles, having five leaves each, 4" wide, and kept in place by 16 wrought-iron clips 1 1/2" x 1" thick. (See drawing.) The underside of swing-bolster and top of spring-board are slightly checked for spring-buckles and spring-clip, also the underside of spring-board is checked to keep lower swing-pin in place.		
Top swing-pins, of wrought iron.....	4	1 1/2" dia. x 1' 5 1/4" long.
Lower swing-pins, size at centre, square section.....	4	1 3/4" sq. x 9 1/2" between shoulders.
Lower swing-pins, round ends, total length.....		1' 2 1/4" long, ends 1 1/2" dia.
Swing-links, of wrought iron, solid forged.....	8	2' 0" full length inside of links. Section 1" sq.
Swing-links are bent out of 1" square iron, and at end or centre of curve, where welded, are increased to thickness of about 1 1/2".		
Centres of swing-links, measured transversely.....		3' 10" apart.
Split-pins for lower swing-pin.....	8	1/2" dia. x 3 1/2" long.
Washers for lower swing-pin, of wrought iron.....	8	3" dia. x 1" thick.
Spring-boards, of white oak.....	2	5' 7" x 9 3/4" x 3"
Flat truss rods to trucks.....	4	3" x 1/2"

Truss to be set down in centre 4 1/2". Distance between lugs inside 6' 6" when bent. Ends to be turned over and welded to form the lugs. Length of lugs, 1 1/2"; 4 truss bolts, 5 1/2" over heads, 1" diam., with double nuts; 8 castings for the same as shown in drawing.

Strip of sheet-iron between the check nuts, one end turned up and nailed to the truck timber, the other end turned down over check nut to secure the same in position.

When the trucks are turned out of shop, their axle-boxes must be carefully packed with cotton waste, fully saturated with best petroleum or other good lubricating oil.

At all points where timber is bedded against timber or iron, the two surfaces are to be thickly coated with white lead. All tenons and mortices to be thickly painted with stiff white lead before being framed together.

PAINTING.

Outside of frame of car is to have four coats of best oil paint, two being of white lead and two of permanent buff colour. All the iron work is to have one coat of good black paint, and the wood of truck two coats of approved colour. The car is to be weighed and the tare painted on both sides of car at lower right hand corner in 2 1/2" letters and figures, as "Tare 22,250 lbs."

GENERAL
CONDIT

**GENERAL
CONDITIONS.****GENERAL CONDITIONS OF CONTRACT.**

The cars and trucks are to be made exactly to the dimensions and conditions given in the specification, according to the drawings, and exactly similar and equal in all respects to the samples and models supplied. Each variety of timber used is to be of first quality of its kind, dry, sound, free from large knots, shakes, or any sign of decay, well and fully seasoned, and accurately fitted and joined together. The wrought iron is to be of "Best Staffordshire," or of equal and approved quality; all welds and joints to be carefully made, the forgings to be made sound and neatly finished. The ordinary castings to be made from tough grey pig iron; they are to be sound, smooth, free from sand holes, blow holes or scoria, and perfect in shape, size, and every other respect. All the bolts and nuts used are to be of full diameter, screwed to "Whitworth's standard thread;" all the threads to be clean and full, so that the nuts will not shake; all bolt holes to be fair, opposite and perfectly circular, the bolts to be a tight driving fit through all timber, and, wherever possible, bolt heads are to be on outside, and on top of the material through which they pass.

The contractor is to find, provide, fix and perform, with the best materials of their several kinds, all and every part of the works herein specified, or represented on the drawings, or that may not be indicated but is generally implied and understood in the full equipment of Railway Box Cars and Trucks, and are to be fitted and finished in the most complete manner, to the entire satisfaction of the Company's Mechanical Superintendent, or his appointed Agent or Inspector, all of whom shall be allowed to inspect the work during working hours, and shall have the power to reject the whole or any part found to be defective in quality of material or workmanship, or not in accordance with the specification, the drawings, and the samples and models supplied. And should there, by oversight, be any error or discrepancy between the various drawings, models, samples and the specification, the Mechanical Superintendent is to decide what is the correct reading and original intention of the same, his decision to be final and binding on both parties of the contract.

All metal work, including the springs, axles and wheels, are to be warranted for twelve months after being set to work, any failure during that period—except such as results from accident—must be made good by the contractor.

C. P. RAILWAY,
Office of the Mechanical Supt., }
Montreal.

Mechanical Superintendent.



FORM OF TENDER FOR BOX CAR FRAMES AND TRUCKS.

_____ do hereby agree to supply the

CANADIAN PACIFIC RAILWAY COMPANY

with _____

Box Car Frames on _____

Trucks with _____

in accordance with the Specification and Drawings, &c., free of all claim

for Patent-Right Royalties, &c., for the sum of

per Car, with its Trucks, &c., all complete.

(Signed,)

Witness.

To be all delivered on the C. P. R. Track at _____

free of all transit charges on or before _____

Tenders to be addressed _____

and endorsed "Tenders for Box Cars and Trucks."

CKS.

ply the

Y

all claim

ucks."

CANA

PE

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
Pref
classes A

NUMB

Es

229 to 27
273, 30

of all claim

d Trucks."

of all claim
ANY
supply the
RUCKS.

CANADIAN PACIFIC RAILWAY COMPANY

PREFIX LETTERS FOR PATTERNS.

A	.....	Freight Trucks.
B	.....	Flat Car Body.
C	.....	Box " "
D	.....	Cattle " "
E	.....	Passenger Car Trucks.
F	.....	Bodies of Vans, &c.
G	.....	Miscellaneous Car Patterns.
H	.....	Bodies of all Passenger Car Stock.
I	.....	
J	.....	
K	.....	
L	.....	
M	.....	
N	.....	
O	.....	
P	.....	
Q	.....	
R	.....	Cranes and Hoists.
S	.....	Standard Engine and Tender Castings.
T	.....	Water Service, Pumps, &c.
U	.....	Permanent Way.
V	.....	Machinery and Shafting.
W	.....	Stationery Engines, Boilers, &c.
X	.....	Tenders (Miscellaneous.)
Y	.....	Engines (Miscellaneous.)
Z	.....	Miscellaneous.

Prefix letter S will be used in numbering all patterns in engine classes A to G, inclusive.

NUMBERS OF STANDARD ENGINES, CLASSES A TO G.

EASTERN DIVISION.	WESTERN DIVISION.
229 to 233, 256 to 270, 271, 272, 273, 305.	20 to 44, 93, 97, 98, 99, 120 to 130, 131 to 147, 148 to 157, 106 to 109.

