Appendix A 1. RAILS.

QUESTIONS.	AMERICA.						INDIA.	AUSTRALIA.
	CHESAPEAKE AND OHIO.	CHICAGO, BURLINGTON, AND QUINCY.	ILLINOIS CENTRAL.	LAKE SHORE AND MICHIGAN SOUTHERN.	NEW YORK CENTRAL AND HUDSON RIVER.	PENNSYLVANIA.	EAST INDIAN.	NEW SOUTH WALES GOVERNMENT RYS.
Weight of Rail per yard	75 lbs.	75 lbs.	Drawings dated 1894 show 70 lbs. and 75 lbs. per lineal yard. Previous dates show lighter sections.	71 lbs.	65, 70, 75, 80, and 100 lbs.	1875 Standard, 60 lbs. 1887 Standard, 85 lbs. 1889 Standard, 70 lbs.	85lbs.	Bull-headed Rails, 80lbs. Flat-bottomed, 80, 71½, and 60lbs.
Length	30 feet.	30 feet.	30 feet.	30 feet.	30 feet.	30 feet.	30 feet.	30 feet.
Holes for Fish Bolts—								
(a) Number	Six.	Six.	Four.	Four.	Six.	Six.	Four.	Four.
(b) Shape	Circular.	Circular.	Circular.	Circular.	Circular.	Circular.	Oval.	Circular.
(c) Distance apart from centre to centre of holes	5 inches.	5 inches.	4½ inches.	6 inches.	5 5/10 inches.	First to second 5 inches, second to third 6 inches.	6 inches.	4½ inches.
(d) Distance from end of Rail to nearest hole	1 1 3/16 inches.	2⅜ inches.	2 1 3/16 inches.	2 1 5/16 inches.	2 7/10 inches.	1 1/16 inches.	2¾ inches.	2⅜ inches.
Is Line relaid when Rails wear down to a minimum weight per yard?		No minimum weight.	No minimum weight.		No. It has not been found practicable with us to wear Rails down to the so-called Residual Section. We renew Rails whenever the surface becomes rough from uneven wear, and the Section not stiff enough for the Traffic Loading.	Yes		Yes
If so, give weight		.....	.....		.....	Varies.		80lb. Bull-headed. No information. 80lb. Flat-bottomed Rails to 70lbs. 71½lb. ,, ,, 65lbs. 60lb. ,, ,, 56lbs.
Is Line relaid when Rails wear down to minimum thickness of top flange or minimum depth over all?	Rails are renewed when necessary, in judgment of Engineer.	No minimum thickness or depth.	No minimum thickness or depth.	We relay when rails become too rough or too badly worn to make smooth track.	Three rates of wear are noted, "Minimum," "Medium," and "Maximum." Minimum wear is upon level, straight line, and with Rails of 65 lbs., 70 lbs., and 75 lbs. Sections become rough when the loss of metal reaches 6 to 8 per cent. per yard. Medium wear is upon gradient, straight lines, the Rails becoming rough, and are renewed when the loss of metal reaches 6 to 10 per cent. per yard. Maximum wear is upon gradients combined with curvature, and the Rails are renewed when the Outer Rail of the curve has from ⅜ to ½ inch side wear, while the vertical wear reaches hardly one-half as much.	Governed by wear of top of Rail.	With the Old Rails the ends go. No New Rails worn out yet. So far, therefore, we have not fixed any minimum weight.	General condition of Rails taken into consideration.
If so, give thickness and depth		.....	.....		From ½ inch to ⅝ inch on the head, and from 3/32 inch to 1/16 inch on the base.	.....		.....
Have you made use of Rails of unusual length, 60 feet or upwards?	No	No	No	No	Not as yet. The use of greater lengths than 30 feet is only in the experimental stage, and is under trial and consideration. 60 feet lengths seem to promise well, with prospect of substantial economy in Maintainence of Way Expenses.	Yes. We have used 60 feet Rails.	No	No
If so, state object and with what result	.....	.....	.....	.....	.....	To save joint material, but found them heavy to handle; if, however, difficulty of handling can be got over and improved service in the road can be proved, think 60 feet none too long.	.....	.....

Appendix A

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QUESTIONS.	CHESAPEAKE AND OHIO.	CHICAGO, BURLINGTON, AND QUINCY.	ILLINOIS CENTRAL.
Weight of Rail per yard	75 lbs.	75 lbs.	Drawings dated 1894 show 70 lbs. and 75 lbs. per lineal yard. Previous dates show lighter sections.
Length	30 feet.	30 feet.	30 feet.
Holes for Fish Bolts—			
(a) Number	Six.	Six.	Four.
(b) Shape	Circular.	Circular.	Circular.
(c) Distance apart from centre to centre of holes	5 inches.	5 inches.	$4\frac{1}{2}$ inches.
(d) Distance from end of Rail to nearest hole	$1\frac{15}{16}$ inches.	$2\frac{3}{8}$ inches.	$2\frac{13}{64}$ inches.
Is Line relaid when Rails wear down to a minimum weight per yard?		No minimum weight.	No minimum weight.
If so, give weight.....		.....	.....
Is Line relaid when Rails wear down to minimum thickness of top flange or minimum depth over all?	Rails are renewed when necessary, in judgment of Engineer.	No minimum thickness or depth.	No minimum thickness or depth.
If so, give thickness and depth		.....	.....
Have you made use of Rails of unusual length, 60 feet or upwards?	No	No	No
If so, state object and with what result	.....	.....	.....

1. RAILS.

MERICA. | INDIA. | AUSTRALIA.

	LAKE SHORE AND MICHIGAN SOUTHERN.	NEW YORK CENTRAL AND HUDSON RIVER.	PENNSYLVANIA.	EAST INDIAN.	NEW SOUTH WALES GOVERNMENT RYS.
w al w	71 lbs.	65, 70, 75, 80, and 100 lbs.	1875 Standard, 60 lbs. 1887 Standard, 85 lbs. 1889 Standard, 70 lbs.	85lbs.	Bull-headed Rails, 80lbs. Flat-bottomed, 80, 71½, and 60lbs.
	30 feet.	30 feet.	30 feet.	30 feet.	30 feet.
	Four.	Six.	Six.	Four.	Four.
	Circular.	Circular.	Circular.	Oval.	Circular.
	6 inches.	$5\frac{6}{16}$ inches.	First to second 5 inches, second to third 6 inches.	6 inches.	$4\frac{1}{2}$ inches.
	$2\frac{15}{16}$ inches.	$2\frac{7}{16}$ inches.	$1\frac{15}{16}$ inches.	$2\frac{7}{8}$ inches.	$2\frac{3}{8}$ inches.
		No. It has not been found practicable with us to wear Rails down to the so-called Residual Section. We renew Rails whenever the surface becomes rough from uneven wear, and the Section not stiff enough for the Traffic Loading.	Yes		Yes
pth.	We relay when rails become too rough or too badly worn to make smooth track.	Three rates of wear are noted, "Minimum," "Medium," and "Maximum." Minimum wear is upon level, straight line, and with Rails of 65 lbs., 70 lbs., and 75 lbs. Sections become rough when the loss of metal reaches 6 to 8 per cent. per yard. Medium wear is upon gradient, straight lines, the Rails becoming rough, and are renewed when the loss of metal reaches 6 to 10 per cent. per yard. Maximum wear is upon gradients combined with curvature, and the Rails are renewed when the Outer Rail of the curve has from $\frac{3}{8}$ to $\frac{1}{2}$ inch side wear, while the vertical wear reaches hardly one-half as much.	Varies.	With the Old Rails the ends go. No New Rails worn out yet. So far, therefore, we have not fixed any minimum weight.	80lb. Bull-headed. No information. 80lb. Flat-bottomed Rails to 70lbs. 71½lb. ,, ,, 65lbs. 60lb. ,, ,, 56lbs. General condition of Rails taken into consideration.
		From $\frac{1}{4}$ inch to $\frac{3}{8}$ inch on the head, and from $\frac{1}{8}\frac{1}{2}$ inch to $\frac{1}{16}$ inch on the base.	.....	.....	.....
	No	Not as yet. The use of greater lengths than 30 feet is only in the experimental stage, and is under trial and consideration. 60 feet lengths seem to promise well, with prospect of substantial economy in Maintainence of Way Expenses.	Yes. We have used 60 feet Rails.	No	No
	.....	.....	To save joint material, but found them heavy to handle; if, however, diffienlty of handling can be got over and improved service in the road can be proved, think 60 feet none too long.	.....	.....