

No. 2.

BRITISH STANDARD
TRAMWAY RAILS AND FISH PLATES.

ISSUED BY

The Engineering Standards Committee.

SUPPORTED BY

THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

STANDARD SECTIONS
AND
SPECIFICATION.

LESLIE S. ROBERTSON, M.Inst.C.E.,
Secretary.

LONDON :

PRINTED AND PUBLISHED BY WILLIAM CLOWES & SONS, LIMITED,
23, COCKSPUR STREET, CHARING CROSS, S.W.,

AND TO BE PURCHASED FROM ANY BOOKSELLER OR DIRECT FROM THE OFFICES OF THE COMMITTEE,
28, VICTORIA STREET, WESTMINSTER, S.W.

July, 1903.

PRICE 1/- NET.

COPYRIGHT. ALL RIGHTS RESERVED.

BRITISH STANDARD
TRAMWAY RAILS AND FISH PLATES.

ISSUED BY

The Engineering Standards Committee.

SUPPORTED BY

THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

STANDARD SECTIONS
AND
SPECIFICATION.

LESLIE S. ROBERTSON, M.Inst.C.E.,
Secretary.

LONDON :

PRINTED AND PUBLISHED BY WILLIAM CLOWES & SONS, LIMITED,
23, COCKSPUR STREET, CHARING CROSS, S.W.,

AND TO BE PURCHASED FROM ANY BOOKSELLER OR DIRECT FROM THE OFFICES OF THE COMMITTEE,
28, VICTORIA STREET, WESTMINSTER, S.W.

July, 1903.

PRICE 1/- NET.

COPYRIGHT. ALL RIGHTS RESERVED.

BRITISH STANDARD SPECIFICATION
 AND
 SECTIONS
 OF
 TRAMWAY RAILS
 AND
 FISH PLATES.

RAILS.

1. The steel for the Rails shall be of the best quality, made by the acid Bessemer, basic Bessemer, or other approved process, and on analysis shall show that in chemical composition it conforms to the following limits:—

Carbon	...	from	0·40 to 0·55 per cent.	Chemical Composition.
Manganese	„	„	„	„	0·70 to 1·0 „	
Silicon	„	not to exceed	„	„	0·10 „	
Phosphorus	„	„	„	„	0·08 „	
Sulphur	„	„	„	„	0·08 „	

2. The Manufacturer shall make and furnish to the representative of the Engineer (or of the purchaser) carbon determinations of each cast. A complete chemical analysis, representing the average of the other elements contained in the steel, shall be similarly given for each rolling. Such complete analysis shall be made from drillings taken from the tensile test piece. When the rolling exceeds 100 tons, an additional complete analysis shall be made for each 100 tons or part thereof.

Should the Engineer desire to make independent chemical determinations, the necessary specimens and samples shall be furnished by the Manufacturer. For this purpose not more than two Rails in every hundred manufactured shall be selected by the Engineer and drillings taken therefrom, and if, upon being subjected to the specified tests, either fail to comply therewith, then all the Rails in the blow of which the test pieces form a part may be rejected.

In case of difference between the Engineer (or the purchaser) and the Manufacturer, as to the accuracy of an analysis, either party shall have the right to have samples of the steel analysed by an independent metallurgist, to be mutually agreed upon. The expenses attendant upon such independent analysis shall be borne by the party adjudged to be in the wrong.

Manufacture. 3. The materials used and the method of manufacture throughout shall be in accordance with the best current practice, and every ingot shall be of ample dimensions to permit of a length of crop of at least 18 inches being cut off each end of a Rail to ensure perfect soundness.

Section. 4. The Sections of the Rails for straight and curved track shall respectively conform to the "British Standard" (indicated by the Brand and the initials "B.S.") Sections No. and No. C, as recommended by the Engineering Standards Committee.

Weight of Rails. 5. For straight track the Rails of "B.S." Section No. shall weigh lbs. per lineal yard, and for curved track the Rails of "B.S." Section No. C shall weigh lbs. per lineal yard, those which either fall short of, or exceed, such weights by more than 1 lb. per lineal yard may be rejected.

General Dimensions of Rails.

6. TABLE OF GENERAL DIMENSIONS OF "B.S." RAILS.

No.	"B.S." Section	Height.	Width of flange.	Normal weight.
No. 1	"B.S." Section	6½ ins.	6½ ins.	90 lbs. per lin. yd.
"	1C	"	"	96
"	2	6½ ins.	7 ins.	95
"	2C	"	"	101
"	3	6½ ins.	7 ins.	100
"	3C	"	"	106
"	4	7 ins.	7 ins.	105
"	4C	"	"	111
"	5	7 ins.	7 ins.	110
"	5C	"	"	116

7. Rails shall be paid for according to actual weights before drilling or punching; such weights to be ascertained during the rolling, and computed by weighing sample rails not less than 30 feet long. Payment by Weight.

8. Before the general manufacture of the Rails is commenced the Manufacturer shall (if required by the Engineer or purchaser) supply two sets of templates, internal and external, of approved material, for each "B.S." Section of Rail. Templates.

Each template shall be suitably engraved with the purchaser's name, the "B.S." number of the Section, the weight of the Rail in lbs. per lineal yard, the Manufacturer's name and address, and the date of the contract, *e.g.*, SHEFFIELD CORP^N. - "B.S." No. 3 - 100 lbs. - WALTER SCOTT L^{TD}. LEEDS - 1903.

9. The Rails shall be of uniform section throughout, accurately rolled to conform to the template (with following proviso), and when finished shall be in every respect perfectly sound and free from twists, blisters, flaws, fins, and other defects. Rails to conform to Template and be free from defects.

Provided that a permissible variation in the total height (only) of one thirty-second of an inch ($\frac{1}{32}$ ") under or over shall be allowed, but in the distance between the fishing angles the variation shall not exceed one sixty-fourth of an inch ($\frac{1}{64}$ ") above or below the Standard dimensions.

10. The normal length of Rails for straight track shall be either 35 feet, 45 feet, or 60 feet. Length of Rails for Straight Track.

The maximum proportion of short lengths which shall be accepted is as follows :—

For 35 feet,

5 %	in number of the Rails to be accepted in lengths of 30 feet.	
2½%	" " "	25 "

For 45 feet,

5 %	in number of the Rails to be accepted in lengths of 40 feet.	
2½%	" " "	35 "
2½%	" " "	30 "

For 60 feet,

5 %	in number of the Rails to be accepted in lengths of 55 feet.	
5 %	" " "	50 "
2½%	" " "	40 "
2½%	" " "	30 "

11. The normal length of Rails for curved tracks shall be 35 feet.

5 %	in number of the Rails to be accepted in lengths of 30 feet.	
2½%	" " "	25 "
2½%	" " "	20 "

Length of
Rails for
Curved Track.

7. Rails shall be paid for according to actual weights before drilling or punching; such weights to be ascertained during the rolling, and computed by weighing sample rails not less than 30 feet long. Payment by Weight.

8. Before the general manufacture of the Rails is commenced the Manufacturer shall (if required by the Engineer or purchaser) supply two sets of templates, internal and external, of approved material, for each "B.S." Section of Rail. Templates.

Each template shall be suitably engraved with the purchaser's name, the "B.S." number of the Section, the weight of the Rail in lbs. per lineal yard, the Manufacturer's name and address, and the date of the contract, *e.g.*, SHEFFIELD CORP^N. - "B.S." No. 3 - 100 lbs. - WALTER SCOTT L^{TD}. LEEDS - 1903.

9. The Rails shall be of uniform section throughout, accurately rolled to conform to the template (with following proviso), and when finished shall be in every respect perfectly sound and free from twists, blisters, flaws, fins, and other defects. Rails to conform to Template and be free from defects.

Provided that a permissible variation in the total height (only) of one thirty-second of an inch ($\frac{1}{32}$ ") under or over shall be allowed, but in the distance between the fishing angles the variation shall not exceed one sixty-fourth of an inch ($\frac{1}{64}$ ") above or below the Standard dimensions.

10. The normal length of Rails for straight track shall be either 35 feet, 45 feet, or 60 feet. Length of Rails for Straight Track.

The maximum proportion of short lengths which shall be accepted is as follows:—

For 35 feet,

5 %	in number of the Rails to be accepted in lengths of 30 feet.	
2½%	"	25 "

For 45 feet,

5 %	in number of the Rails to be accepted in lengths of 40 feet.	
2½%	"	35 "
2½%	"	30 "

For 60 feet,

5 %	in number of the Rails to be accepted in lengths of 55 feet.	
5 %	"	50 "
2½%	"	40 "
2½%	"	30 "

11. The normal length of Rails for curved tracks shall be 35 feet.

5 %	in number of the Rails to be accepted in lengths of 30 feet.	
2½%	"	25 "
2½%	"	20 "

Length of Rails for Curved Track.

18. From each 100 tons of Rails the Manufacturer shall (if required by the Engineer) cut a test piece from any Rail selected as a sample Rail. Such test piece shall be prepared to a sectional area equal approximately to half a square inch and to a length of 2 inches between test gauge points, and stamped to correspond with the sample Rail. It shall be placed in a testing machine of approved pattern and shall show an ultimate tensile strength equivalent to not less than 40 tons per square inch, with an elongation of not less than 12 per cent. on a length of 2 inches.

Tensile Test.

If the Rail fractures under this test, all Rails from that cast may be rejected, unless it be shown, from a similar trial on two further pieces of Rail, that the first piece was not fairly representative of the quality of the steel.

Such piece of Rail shall then receive a blow, midway between the bearings, from a ball or tup weighing not less than 2,240 lbs., the striking face of which shall have a radius not greater than 9 inches; this tup shall have a fall of 15 feet for Rails less than 100 lbs. per yard, and of 18 feet for Rails of 100 lbs. and over per yard, and in such a manner that the stress from the blow shall be transmitted vertically through the web of the Rail.

17. Out of each 80 Rails one may be selected by the Inspector as a sample, and a length of 5 feet shall be cut therefrom; this shall be supported in a horizontal position, head uppermost, on solid iron or steel bearings, placed 3 feet 6 inches apart in the clear, on firm foundations.

Impact Test.

16. The Brand (see sketch) shall be rolled on the web of the Rail to show that the Rail is of British Standard Section and made under the conditions of this Specification; the No. of the "B.S." Section, the weight of the Rail in lbs. per yard, the Manufacturer's name, initials or other recognised mark, and the year of manufacture shall be rolled, in letters at least three quarters of an inch ($\frac{3}{8}$ " in size, on the web of each rail, e.g., No. 30-106 - BARROW STEEL CO. LTD., - 1903; and the number of the cast or blow from which it has been rolled shall be stamped on the end of each Rail.



Branding.

15. Each Rail shall, when cold, be made properly straight and true in all directions; such straightening shall be done by gradual pressure.

Straightening.

14. The Rails shall be sawn, or planed, true and perfectly square and all burrs removed before despatch from the Manufacturer's works.

Sawing.

13. All Rails shorter than the normal length shall have their lengths distinctly painted, in white paint, on each side of the web, and a length of about one foot at each end also painted white.

Short Rails to be distinguished.

12. In the Rails, both for straight and curved track, a variation of one quarter of an inch ($\frac{1}{4}$ "), under or over, from the lengths specified, shall be allowed.

Permissible Variation in length.

Should the test piece fail to fulfil these conditions, the Inspector may require the Manufacturer to test another Rail from the same cast in a similar manner, and if the second Rail fails to comply with the specified requirements, the whole of the Rails rolled from that cast may be rejected.

Should the Engineer desire to have independent tests made, the Manufacturer shall provide the necessary test pieces, properly shaped and prepared, as above described.

19. From each 100 tons of Rails, the Manufacturer shall (if required Bending. by the Inspector) test by bending, when cold, a Rail selected as a sample Rail. Such Rail shall be bent sideways, by pressure, to a curve of 30 feet radius, and shall not show signs of cracking; if it does, two further Rails shall be similarly bent, and should these also fail the Rails rolled from that cast may be rejected.

20. On the rejection of any cast of Rails, the acceptance of the Rails Acceptance of Rails. from the other casts, forming the lot of 100 tons from which the sample was selected, will depend upon the satisfactory passing of similar tests of a sample Rail selected from each cast.

21. The following holes shall (if required by the Engineer or purchaser) Holes in Rails. be made in each Rail without extra charge, all necessary templates and gauges being supplied by the Manufacturer.

22. For Fish Bolts, three round holes in the web of the Rail at each Holes for Fish Bolts. end, $1\frac{3}{8}$ inches in diameter; the centre of the hole nearest the end shall be 2 inches therefrom, the remaining holes shall be 4 inches pitch, centre to centre.

Vertically the centres of the holes shall be :—

$2\frac{3}{4}$ inches from the underside of flange of a Rail $6\frac{1}{2}$ inches deep.

3 inches from the underside of flange of a Rail 7 inches deep.

23. For Electric Bonds, two round holes in the web of the Rail at each Holes for Electric Bonds. end, three quarters of an inch ($\frac{3}{4}$ ") in diameter.

In a horizontal position the distance apart, centre to centre, for corresponding holes, when two Rails are butted close up to each other, shall be 2 feet 5 inches, the upper hole being $13\frac{1}{2}$ inches from one end of the Rail and $15\frac{1}{2}$ inches at the other, while the lower hole shall be $15\frac{1}{2}$ inches from one end of the Rail (where the upper hole is $13\frac{1}{2}$ inches) and $13\frac{1}{2}$ inches at the other (where the upper hole is $15\frac{1}{2}$ inches). In a vertical position the centres shall be respectively three quarters of an inch ($\frac{3}{4}$ ") above or below the horizontal centre line of the Fish Bolt holes.

Notice of
Rolling to be
given.

29. The Manufacturer shall give to the Engineer (or the purchaser), or his Inspector, at least 7 clear days' previous notice, in writing, before the rolling of the first lot of Rails, and at least 3 clear days' previous notice, in writing, before the rolling of any subsequent lot of Rails, is commenced, in order that arrangements may be made for the presence of the Inspector at the rolling.

Holes for Fish Bolts, maximum error permissible, one sixteenth of an inch ($\frac{1}{16}$ ") in position or diameter.
Holes for Electric Bonds, maximum error permissible, one eighth of an inch ($\frac{3}{8}$ ") in position, one thirty-second of an inch ($\frac{3}{16}$ ") in diameter.
Slots for The Bars, maximum error permissible, half an inch ($\frac{1}{2}$ ") in position, one quarter of an inch ($\frac{1}{4}$ ") in length, one eighth of an inch ($\frac{1}{8}$ ") in height.
Holes for Joint and Intermediate Plates, maximum error permissible, one sixteenth of an inch ($\frac{1}{16}$ ") in position, one thirty-second of an inch ($\frac{3}{16}$ ") in diameter.

28. Any error in the position, diameter, or size, greater than the following, will render the Rail wherein such error occurs liable to rejection:—
Holes, Dimensions of Error in Permissible

Method of Making Holes. 27. The slots for The Bars may be punched, but all other holes shall be drilled. All holes shall be perfectly square and clean cut, all burrs being thoroughly removed.

Holes for Intermediate Plates. 26. For Intermediate Plates, six round holes in the flange of the Rail midway between the ends, seven eighths of an inch ($\frac{7}{8}$ ") in diameter, 6 inches longitudinal pitch, and transversely at the same centres as for similar holes at the Rail ends.

Holes for Joint Plates. 25. For Joint Plates, six round holes in the flange of the Rail at each end, seven eighths of an inch ($\frac{7}{8}$ ") in diameter, of the same longitudinal pitch as for Fish Bolts and transversely at $4\frac{1}{2}$ inches centres in flange $6\frac{1}{2}$ inches wide, and at 5 inches centres in flange 7 inches wide.

Slots for The Bars. 24. For The Bars, one oval slot in the web of the Rail at each end, 3 inches long by 1 inch high, with half round ends, the centre of the slot to be 2 feet 6 inches from the end of Rail and at a vertical distance of two and three quarter inches ($2\frac{3}{4}$ ") from the underside of flange.

Additional Slots for The Bars shall be made, of such a number and at such a distance apart, as the Engineer (or purchaser) shall require.

30. All Rails shall be inspected for approval at the works of the Manufacturer. The Inspector shall have access, at all working hours, to those parts of the rolling mills where work under his inspection is being performed, and shall have all reasonable facilities afforded him to carry out his duties. Facilities for Inspection.

The Manufacturer shall provide and maintain in complete working order all necessary apparatus to enable the Inspector to make all tests named in this Specification, and he shall also provide, free of extra charge, all labour, and render all reasonable assistance in making such tests.


31. All Rails accepted by the Inspector to be stamped in his presence. Marking of Accepted Rails.

FISH PLATES.

32. The steel for the Fish Plates shall be in all respects similar to that used in the manufacture of the Rails, and all General Specifications as to manufacture, chemical and tensile tests, and the furnishing of templates, shall be equally applicable to both. Manufacture.

33. The Fish Plates shall conform to the template for "B.S." Section No. , as recommended by the Engineering Standards Committee, and shall be quite straight and smooth on all bearing surfaces, free from twists, cracks, blisters, flaws, or other defects, and shall have all fins and burrs carefully removed. Section.

The accuracy of fit between the Rails and the Fish Plates is to be regarded as a matter of special importance, and sample Rails shall be joined together at the works whenever the Engineer or Inspector desires to test the fitting of the Fish Plates.

34. The Brand (see sketch), the number of the "B.S." Section, the Manufacturer's name, initials, or other recognised mark, and the year of manufacture shall be rolled in raised letters, at least half an inch ($\frac{1}{2}$ " in size, on the outside of each Fish Plate, *e.g.*,  N^o. 3 - B.V. - 1903. Branding.



35. The Fish Plates shall, when cold, and before being punched, be capable of being bent to a right angle, round a bar 4 inches in diameter, without showing fracture on the outside. Bending.

Size and
Weight.

36. The Fish Plates shall be sawn square, in lengths of 24 inches, and weighed, before punching :—

						Weight of Inner Fish Plate.	Weight of Outer Fish Plate.
For Rails of No. 1 and No. 1C		" B.S."	Section	22½ lbs.	27½ lbs.
"	2	"	2C	"	...	22½ "	27 "
"	3	"	3C	"	...	22½ "	26½ "
"	4	"	4C	"	...	26 "	30½ "
"	5	"	5C	"	...	26 "	30½ "

Holes.

37. The Fish Plates shall have 6 holes punched in each, with centres in position to correspond exactly with the centres of the holes in the web of the Rails. The holes shall be punched clean and true and shall have all burrs carefully removed.

The holes in the outer, or large, Fish Plates shall be 1½ inches square, and the holes in the inner, or small, Fish Plates shall be round of 1½ inches diameter.

Permissible
Error in
Dimensions of
Holes.

38. An error greater than one sixteenth of an inch ($\frac{1}{16}$ ") in either position, or size, of any hole will render the Fish Plate wherein such error occurs liable to rejection.

Gauges to be
furnished by
Manufacturer.

39. All gauges for checking the size and position of holes shall be furnished by the Manufacturer.

Annealing.

40. If Fish Plates have been punched when cold, then they shall be afterwards properly annealed.

Straightening.

41. Any Fish Plates that require straightening shall, after the holes have been punched, be straightened in a machine with proper dies of exact section, and any bulge, caused by punching or otherwise, completely removed.

Rejected Fish
Plates.

42. Should any Fish Plates be rejected, they shall be destroyed.

Dipping and
Bundling.

43. All approved Fish Plates shall be dipped into hot boiled linseed oil, or other liquid approved by the Engineer, and shall, if required, be wired up in bundles.

Payment by
Weight.

44. Fish Plates shall be paid for according to actual weights.

NOTE.—Separate copies of each Standard Tramway Rail Section can be obtained from the Offices of the Committee, price 1s. 1d., post free.

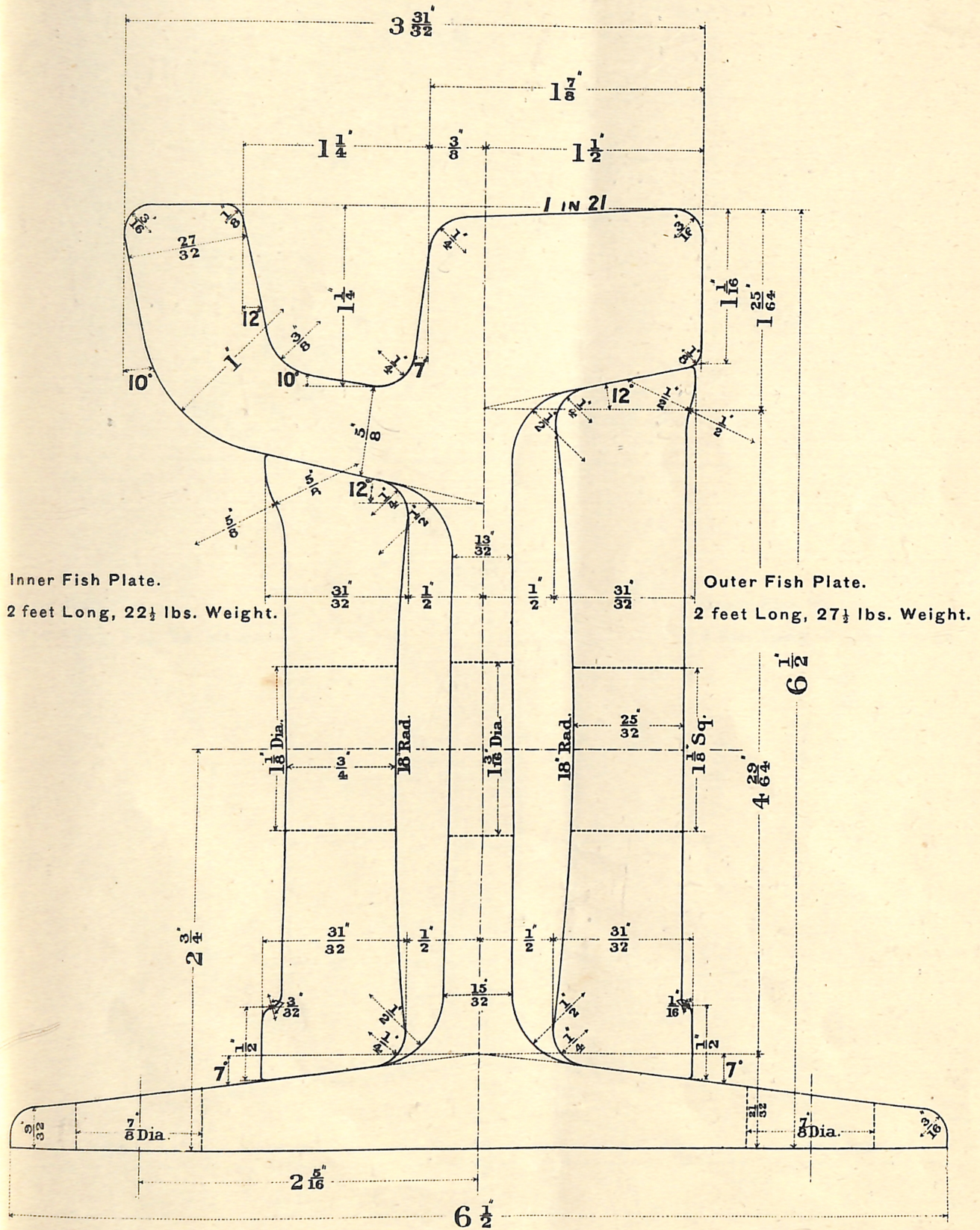
Sets of Templates of the various Standard Tramway Rail and Fish Plate Sections may also, if desired, be obtained from the Offices of the Committee.

BRITISH STANDARD TRAMWAY RAILS.

“B.S.” Section No. 1c.-96 lbs. per yard.

For use on Curves.

Full Size.



ISSUED BY

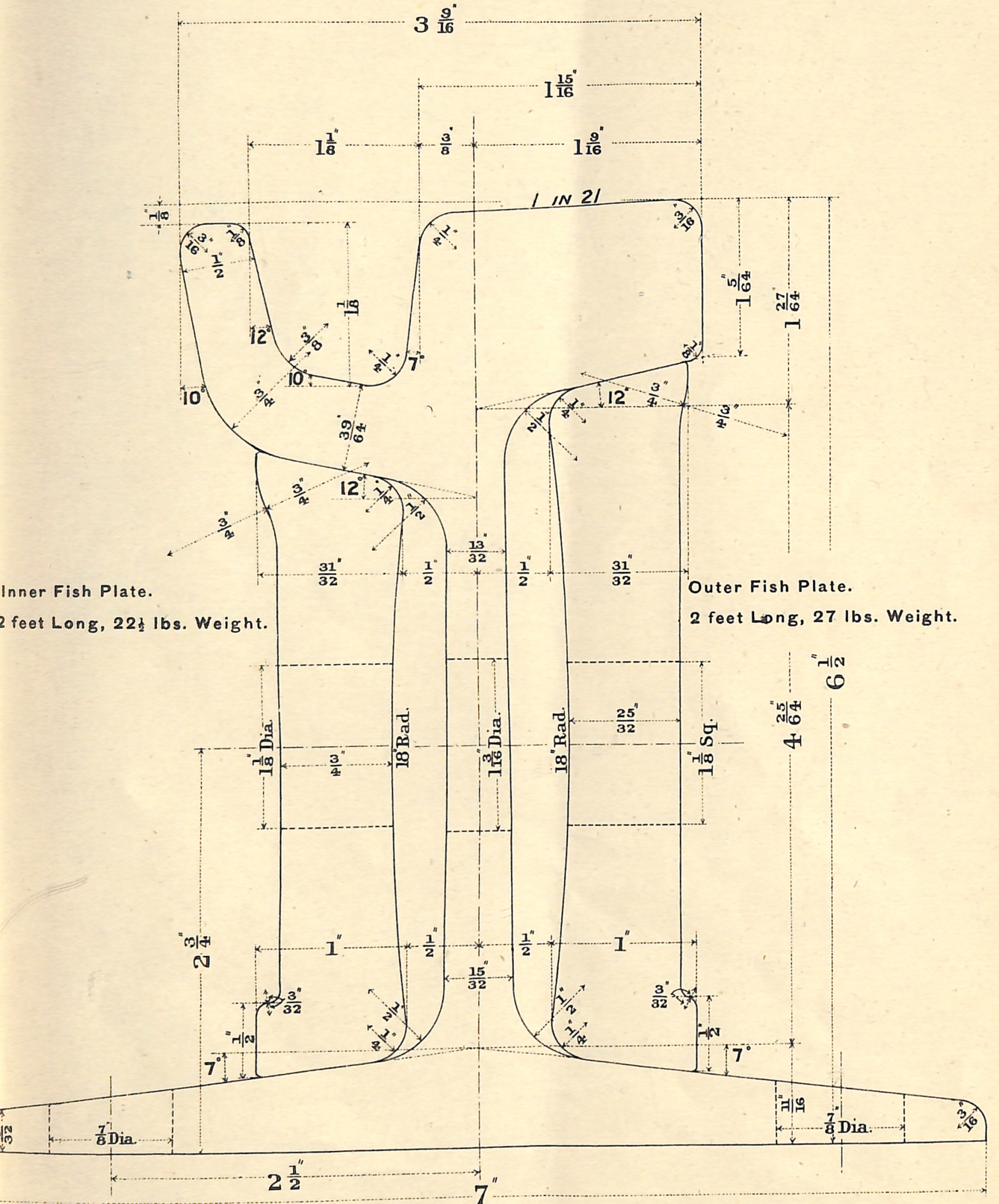
The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. **2.-95** lbs. per yard.

Full Size.



ISSUED BY

The Engineering Standards Committee.

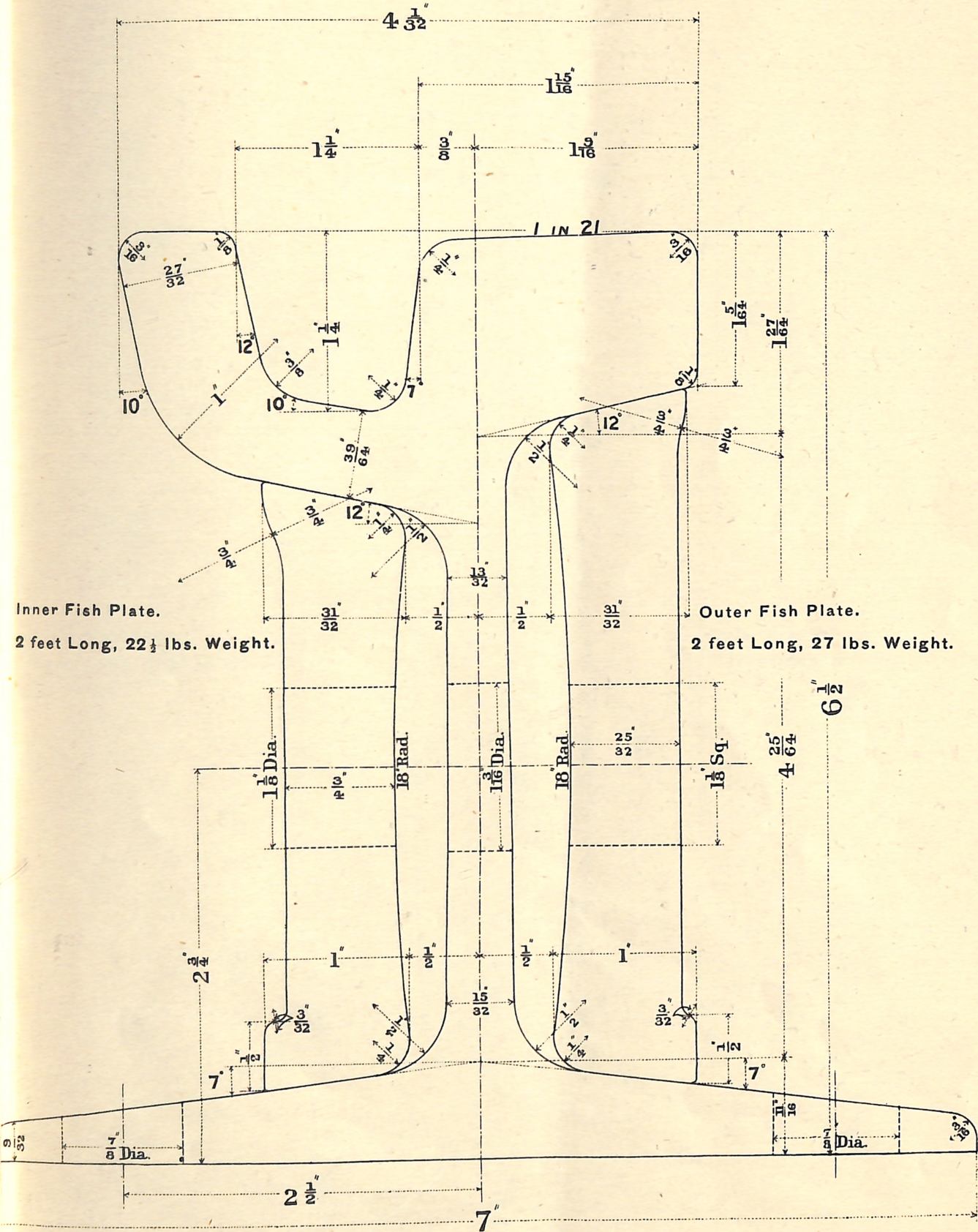
LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
 28, Victoria Street,
 Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. **2c.**-101 lbs. per yard.

For use on Curves.

Full Size.



Inner Fish Plate.
2 feet Long, 22½ lbs. Weight.

Outer Fish Plate.
2 feet Long, 27 lbs. Weight.

ISSUED BY

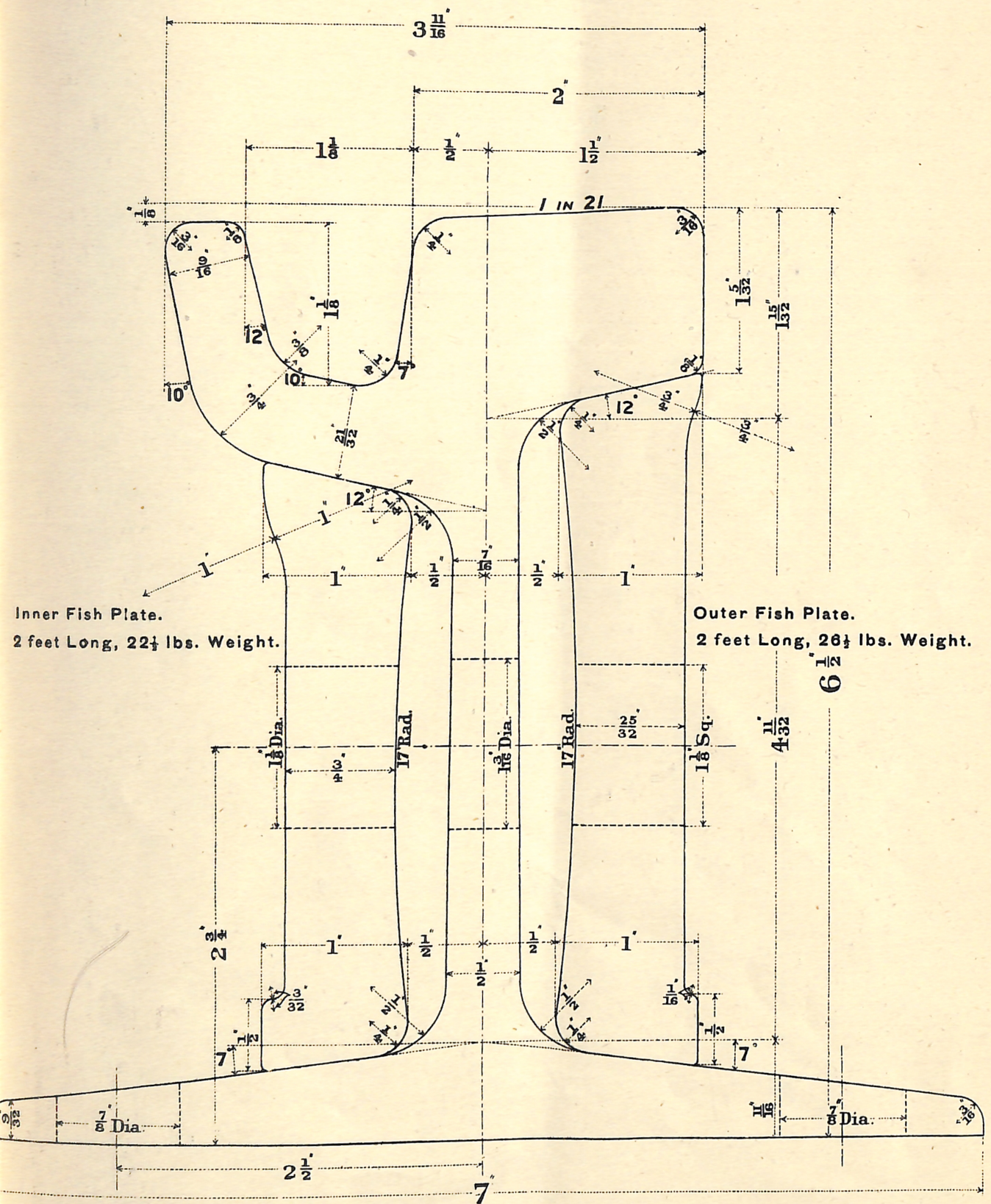
The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. 3.-100 lbs. per yard.

Full Size.



ISSUED BY

The Engineering Standards Committee.

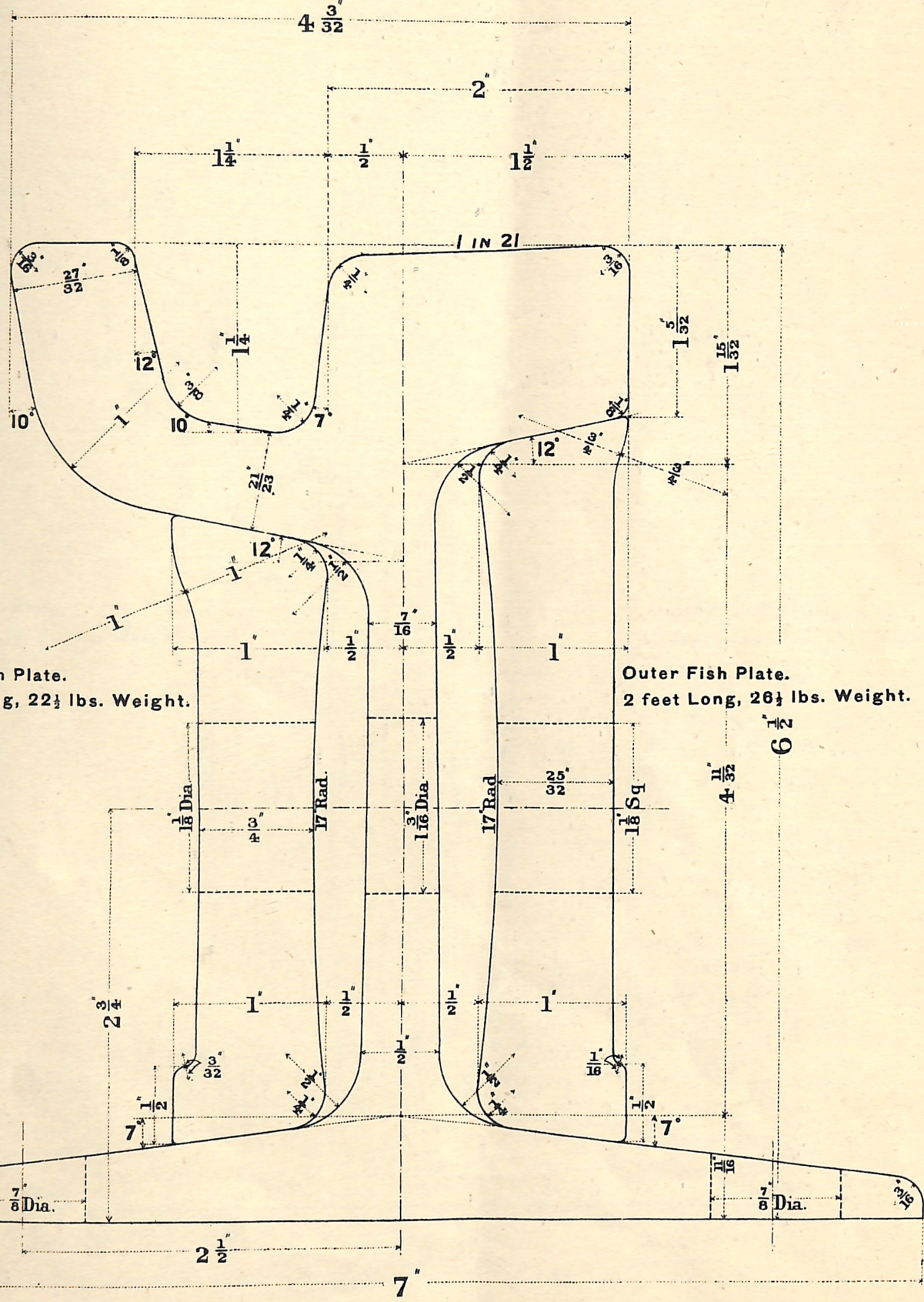
LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. 3c-106 lbs. per yard.

For use on Curves.

Full Size.



Inner Fish Plate.
2 feet Long, 22½ lbs. Weight.

Outer Fish Plate.
2 feet Long, 26½ lbs. Weight.

ISSUED BY

The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,

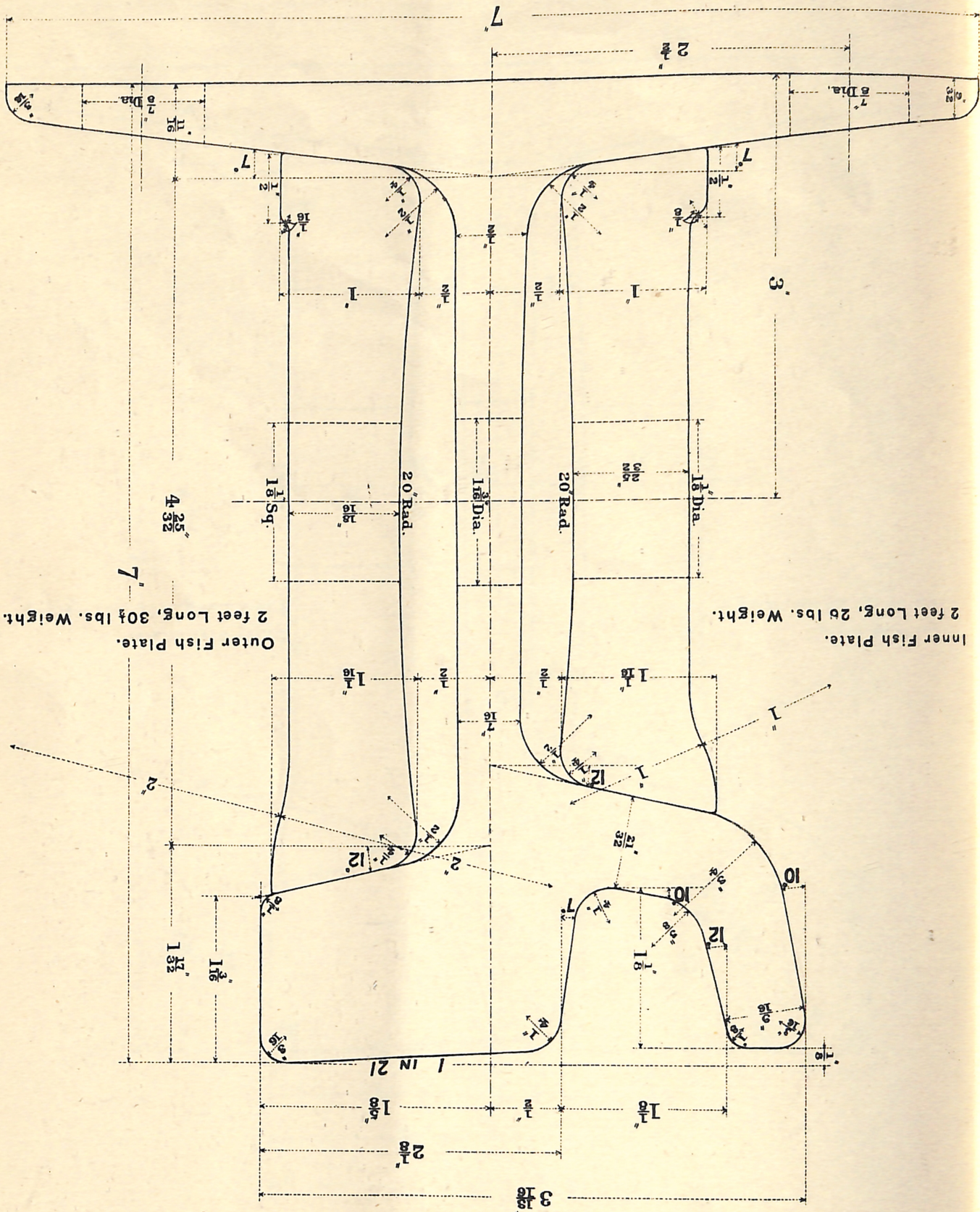
28, Victoria Street,

Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. 4-105 lbs. per yard.

Full Size.



The Engineering Standards Committee.

ISSUED BY

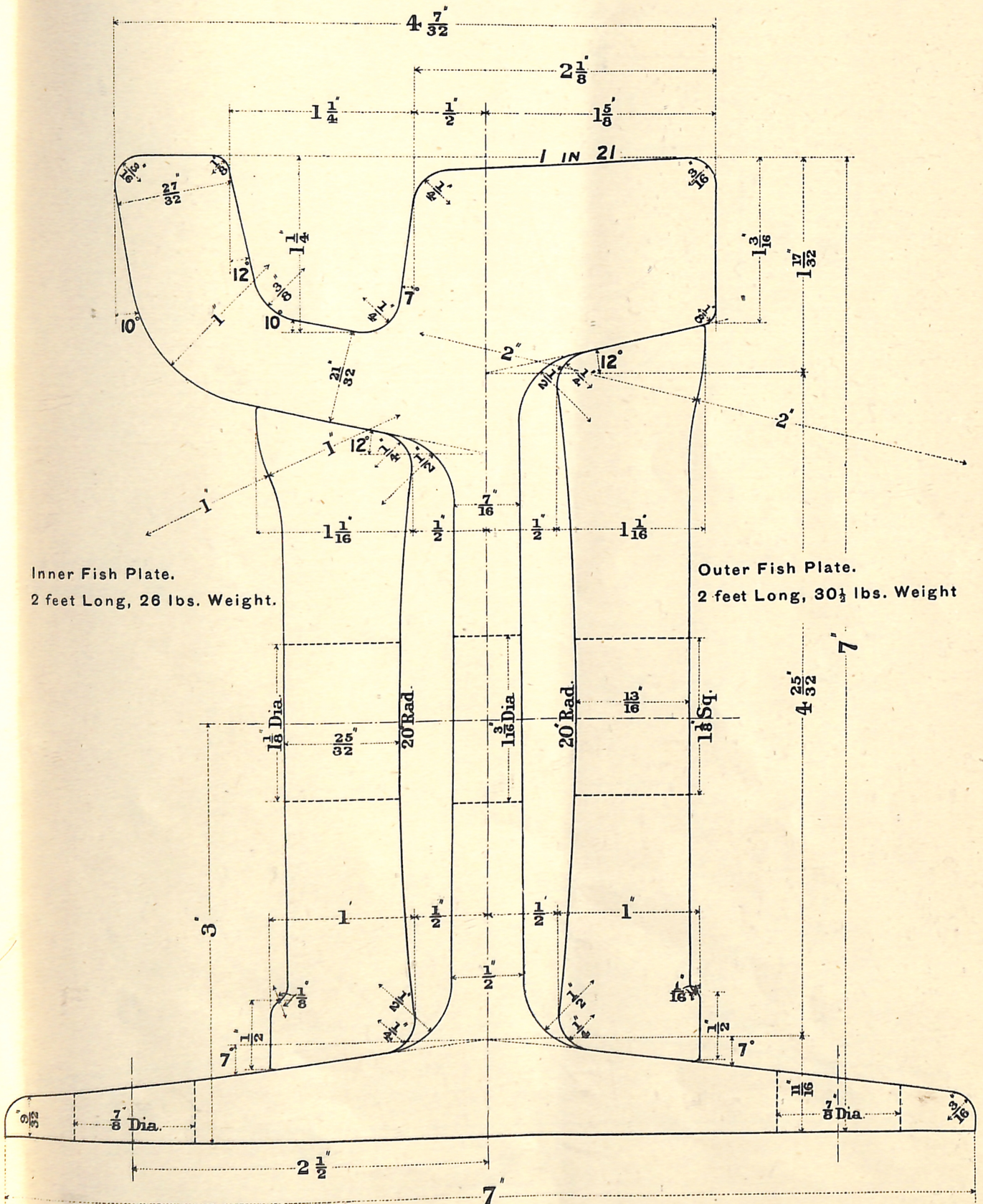
LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. 4c.-111 lbs. per yard.

For use on Curves.

Full Size.



Inner Fish Plate.
2 feet Long, 26 lbs. Weight.

Outer Fish Plate.
2 feet Long, 30 1/2 lbs. Weight

ISSUED BY

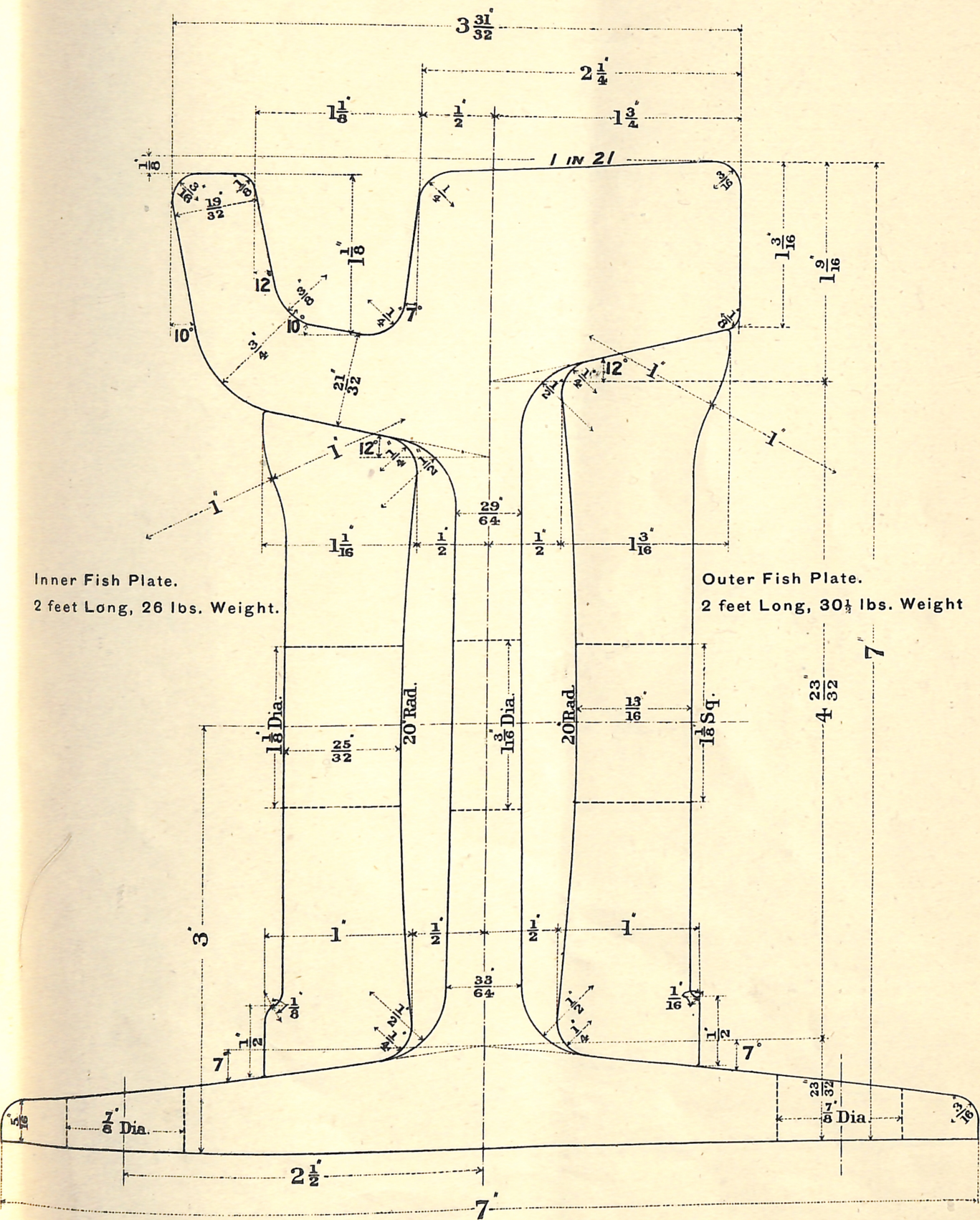
The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

“B.S.” Section No. 5.-110 lbs. per yard.

Full Size.



ISSUED BY

The Engineering Standards Committee.

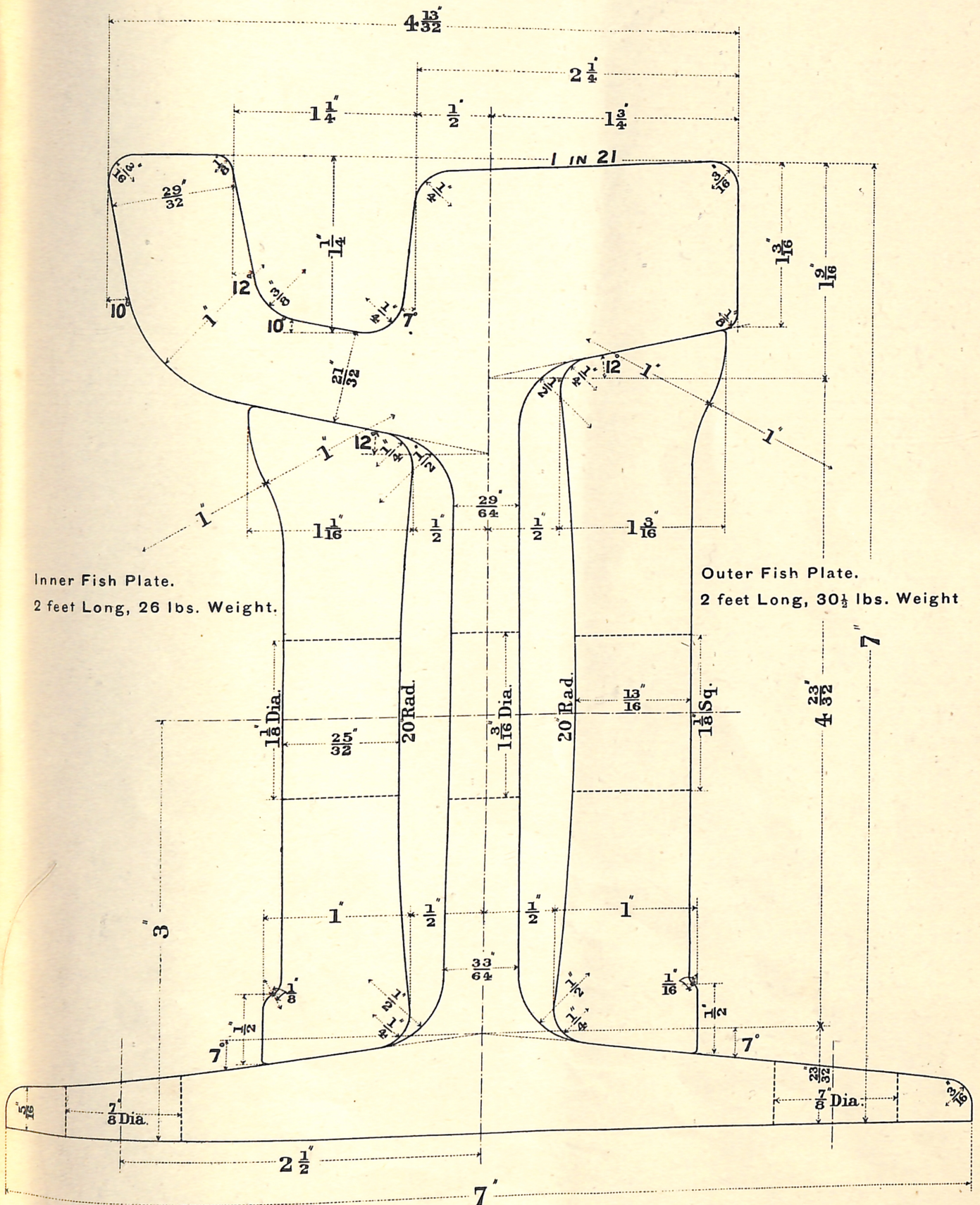
LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. 5c.-116 lbs. per yard.

For use on Curves.

Full Size.



Inner Fish Plate.
2 feet Long, 26 lbs. Weight.

Outer Fish Plate.
2 feet Long, 30 1/2 lbs. Weight

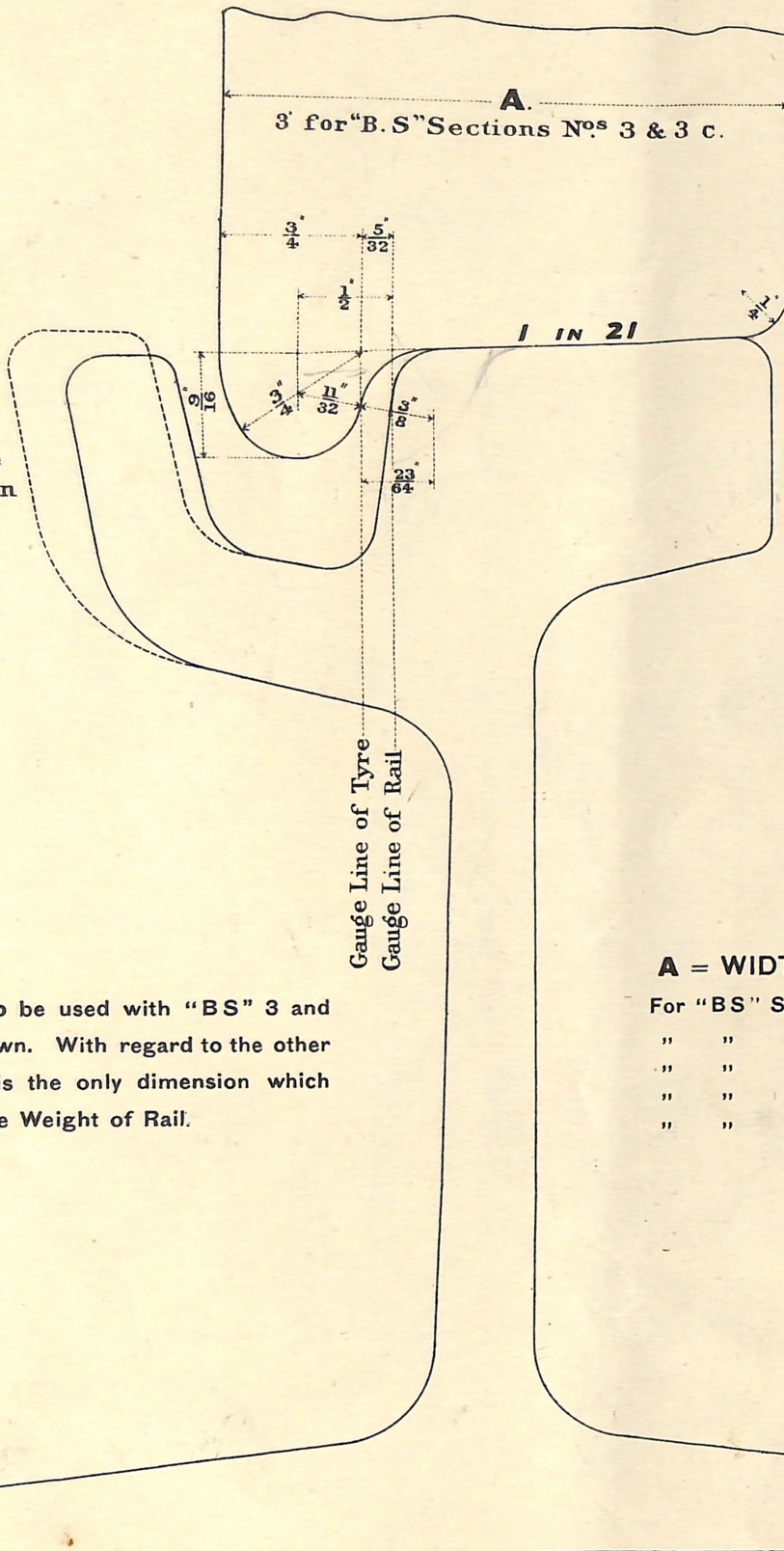
ISSUED BY

The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TYRE PROFILE FOR TRAM CAR WHEELS.

Full Size.



of Rail for use
curves is shewn
ed.

NOTE.

The Profile to be used with "BS" 3 and 3c is here shown. With regard to the other Sections, **A** is the only dimension which varies with the Weight of Rail.

A = WIDTH OF STANDARD TYRE.

For "BS" Sections Nos. 1 and 1c	A = $2\frac{7}{8}$ ins.
" " " " 2 " 2c	" = $2\frac{15}{16}$ "
" " " " 3 " 3c	" = 3 "
" " " " 4 " 4c	" = $3\frac{1}{8}$ "
" " " " 5 " 5c	" = $3\frac{1}{4}$ "

GAUGES.

With Track Gauge 4'-8 $\frac{1}{2}$ "	Wheel Gauge to be 4'-8 $\frac{3}{16}$ "
" " " 4'-0"	" " " 3'-11 $\frac{1}{8}$ "
" " " 3'-6"	" " " 3'-5 $\frac{1}{16}$ "

ISSUED BY

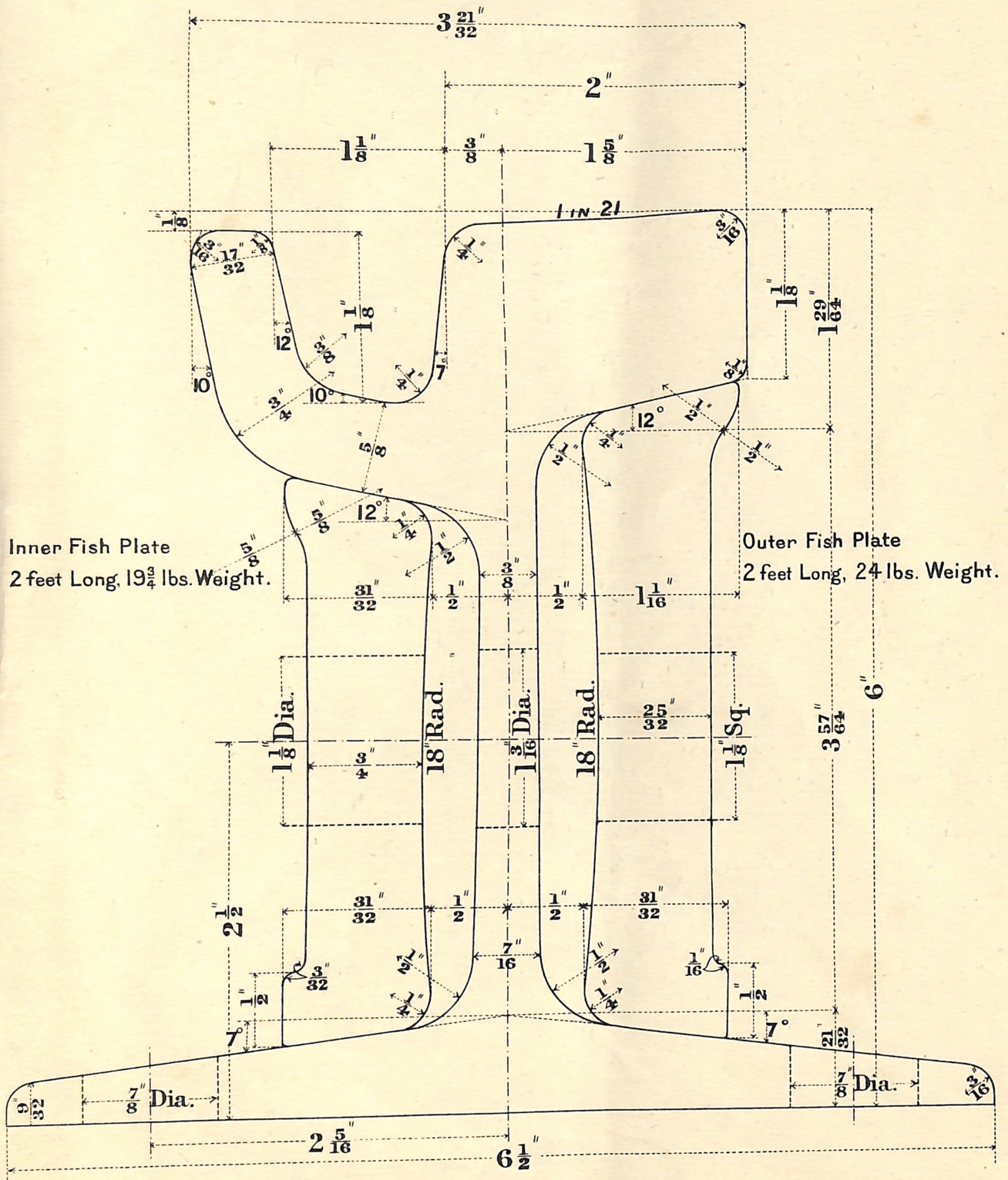
The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,
Westminster, S.W.

BRITISH STANDARD TRAMWAY RAILS.

"B.S." Section No. **0-90** lbs. per yard.

Full Size.



ADDENDUM TO
Report No. 2. British Standard Specification for Tramway Rails
ISSUED BY

The Engineering Standards Committee.

LESLIE S. ROBERTSON, M.Inst.C.E., Secretary,
28, Victoria Street,

Westminster, S.W.

March, 1911.

PUBLICATIONS OF THE BRITISH ENGINEERING STANDARDS ASSOCIATION.

PRICE LIST OF ENGLISH EDITIONS AND FOREIGN TRANSLATIONS OF BRITISH STANDARD SPECIFICATIONS AND REPORTS, MARCH, 1919.

(This list cancels all previous lists.)

A number of the Publications of the Association are being issued in French, Italian, Spanish and Portuguese. The majority of the English Editions and all the Foreign Translations (which also include the English Text) are being published in octavo form, and will be available at 1/- net per copy or its equivalent in Foreign moneys.

ENGLISH EDITIONS.

Report No.		Net.	Post free.	Report No.		Net.	Post free.
1-1914.	Rolled Sections for Structural Purposes, Lists of	1/-	1/2	43-1909.	Boiler Tubes, Specification for Charcoal Iron Lapwelded	1/-	1/2
2-1903.	Tramway Rails and Fishplates, Specification and Sections of	1/-	1/3	44-1909.	Cast Iron Pipes for Hydraulic Power, Specification for	1/-	1/2
3-1903.	Influence of Gauge Length and Section of Test Bar on the Percentage of Elongation, Report on, By Professor W. C. UNWIN, F.R.S.	1/-	1/2	45-1917.	Sparkign Plugs (for Internal Combustion Engines), Report on Dimensions for	1/-	1/2
6-1904.	Rolled Sections for Structural Purposes, Properties of	1/-	1/3	46-1909.	Keys and Keyways, Specification for	1/-	1/2
7-1910.	Copper Conductors, Tables of	1/-	1/2	47-1914.	Steel Fishplates for Bull Head and Flat Bottom Railway Rails, Specification and Sections of	1/-	1/3
8-1904.	Tramway Poles, Specification for Tubular	1/-	1/2	48-1909.	Wrought Iron of Smithing Quality for Shipbuilding (Grade D), Specification for	1/-	1/2
9-1909.	Railway Rails, Specification and Sections of Bull Head	1/-	1/3	49-1909.	Ammeters and Voltmeters, Specification for	1/-	1/2
10-1904.	Pipe Flanges, Tables of	1/-	1/2	50-1910.	Locomotives for Indian Railways, Third Report on (Superseding Nos. 5 and 26)		Under Revision.
11-1909.	Railway Rails, Specification and Sections of Flat Bottom	1/-	1/4	51-1913.	Wrought Iron for use in Railway Rolling Stock ("Best-Yorkshire" and Grades A, B and C), Specification for	1/-	1/2
12-1915.	Portland Cement, Specification for	1/-	1/2	53-1913.	Boiler Tubes for Locomotive Boilers, Specification for Cold Drawn Weldless Steel	1/-	1/2
13-1910.	Steel for Shipbuilding, Specification for Structural	1/-	1/2	54-1911.	Screw Threads, Nuts and Bolt Heads for use in Automobile Construction, Report on	1/-	1/2
14-1907.	Steel for Marine Boilers, Specification for Structural	1/-	1/2	55-1911.	Copper and Bronze Wire, Report on Hard Drawn	1/-	1/3
15-1912.	Steel for Bridges, etc., and General Building Construction, Specification for Structural	1/-	1/2	56-1911.	Yield Point and Elastic Limit, Definitions of	Gratis	-/2
16-1905.	Telegraph Material, Specifications for	1/-	1/3	57-1911.	Small Screws, Report on Heads for	1/-	1/2
18-1910.	Tensile Test Pieces, Forms of	Gratis	-/2	58-1912.	Cast Iron Soil Pipes, Specification for Spigot and Socket	1/-	1/2
19-1905.	Temperature Experiments on Field Coils of Electrical Machines, Report on	1/-	1/3	59-1912.	Cast Iron Waste and Ventilating Pipes (for other than Soil Purposes), Specification for Spigot and Socket	1/-	1/2
21-1909.	Pipe Threads for Iron or Steel Pipes and Tubes, Report on	1/-	1/2	61-1913.	Copper Tubes and their Screw Threads (primarily for domestic and similar work), Specification for	1/-	1/2
23-1905.	Trolley Groove and Wire, Standards for	1/-	1/2	62-1913.	Marine Boiler Stays, Screwing for	Gratis	-/2
24-1911.	Railway Rolling Stock, Specifications for Material used in the Construction of	1/-	1/2	63-1913.	Broken Stone and Chippings, Specification for Sizes of	1/-	1/2
	Part I. Locomotive, Carriage and Wagon Axles	1/-	1/2	64-1913.	Fishbolts and Nuts for Railway Rails, Specification for	1/-	1/2
	" II. Locomotive, Carriage and Wagon Tyres	1/-	1/2	65-1914.	Salt-Glazed Ware Pipes, Specification for	1/-	1/2
	" III. Laminated, Volute and Helical Springs, and Steel for Laminated Springs	1/-	1/2	66-1914.	Copper-Alloy Three-Piece Unions (for Low and Medium Pressure Screwed Copper Tubes), Specification for	1/-	1/3
	" IV. Steel Forgings, Blooms and Castings	1/-	1/2	67-1914.	Ceiling Roses, Specification for Two- and Three-Plate	1/-	1/2
	" V. Copper Plates, Rods and Tubes, and Brass Tubes	1/-	1/2	68-1914.	Steel Conductor Rails, Method of Specifying the Resistance of	1/-	1/2
	" VI. Steel Plates, Angles, etc., and Rivets for Locomotives, Carriages and Wagons	1/-	1/2	69-1915.	Tungsten Filament Glow Lamps (Vacuum Type) for Automobiles, Report on	1/-	1/2
27-1906.	Limit Gauges for Running Fits, Report on Standard Systems of	1/-	1/2	70-1915.	Pneumatic Tyre Rims for Automobiles, Motor Cycles and Cycles, Report on	1/-	1/2
28-1908.	Nuts, Bolt Heads and Spanners, Report on	1/-	1/2	71-1917.	Wheel Rims and Tyre Bands for Solid Rubber Tyres for Automobiles, Report on Dimensions of	1/-	1/2
29-1909.	Steel Forgings for Marine Purposes, Specification for Ingot	1/-	1/2	72-1917.	Electrical Machinery, British Standardisation Rules for	1/-	1/2
30-1907.	Steel Castings for Marine Purposes, Specification for	1/-	1/2	73-1915.	Wall Plugs and Sockets, Specification for	1/-	1/2
31-1910.	Steel Conduits for Electrical Wiring, Specification for	1/-	1/2	74-1917.	Charging Plug and Socket, for Vehicles propelled by Electric Secondary Batteries, Specification for	1/-	1/2
32-1907.	Steel Bars for use in Automatic Machines, Specification for	1/-	1/2	75-1916.	Steels for Automobiles, Specifications for Wrought	1/-	1/2
33-1906.	Carbon Filament Glow Lamps, Specification for	1/-	1/2	76-1916.	Tars, Pitches, Bitumens and Asphalts when used for Road Purposes, Report on Nomenclature of, and Specifications for Tar and Pitch for Road Purposes	1/-	1/2
35-1907.	Copper Alloy Bars for use in Automatic Machines, Specification for	1/-	1/2				
37-1919.	Electricity Meters, Specification for	1/-	1/2				
40-1908.	Cast Iron Low Pressure Heating Pipes, Specification for Spigot and Socket	1/-	1/2				
41-1908.	Cast Iron Flue or Smoke Pipes, Specification for Spigot and Socket	1/-	1/2				
42-1909.	Steam Engines for Electrical Purposes, Report on Reciprocating	1/-	1/2				

[Continued overleaf.]

ENGLISH EDITIONS—continued.

Report No.	Net.	Post free.	Report No.	Net.	Post free.
77—1916. Electrical Pressures for New Systems and Installations (Low and Medium Pressures)	Gratis	-/2	84—1918. Screw Threads, British Standard Fine and their tolerances (Superseding parts of Reports Nos. 20 and 38), Report on	1/-	1/2
78—1917. Cast Iron Pipes and Special Castings for Water, Gas and Sewage, Specification for	1/-	1/2	85—April, 1918. Steel for Aircraft for Government Purchases in the United States of America, Specifications for		Under Revision.
80—1917. Magnetos for Automobile and Aircraft Purposes, Report on Dimensions of	1/-	1/2	88—1919. Electric Cut-outs. Low Pressure (Type of), Specifications for	1/-	1/2
82—1919. Starters for Electric Motors, Specifications for	1/-	1/2	INTERIM REPORTS.		
83—April, 1918. Dope and Protective Covering for Aircraft, Standard of Reference for	1/-	1/2	C.L. 2582 Ball Journal Bearings for Automobiles. Interim Report on Sizes of Single Row	Gratis	-/2
			C.L. 3750 French Metric Screw Threads for Aircraft Purposes	-/6	-/8

FOREIGN TRANSLATIONS.

The following Foreign Translations of the Association's Specifications and Reports are now available.

Report No.	FRENCH.		Report No.	SPANISH.	
	Net.	Post free Abroad.		Net.	Post free Abroad.
72—1917. Electrical Machinery, British Standardisation Rules for	1/-	1/4	12—1915. Portland Cement, Specification for	1/-	1/4
ITALIAN.			13—1910. Steel for Shipbuilding, Specification for Structural	1/-	1/4
13—1910. Steel for Shipbuilding, Specification for Structural	1/-	1/4	14—1907. Steel for Marine Boilers, Specification for Structural	1/-	1/4
14—1907. Steel for Marine Boilers, Specification for Structural	1/-	1/4	15—1912. Steel for Bridges, etc., and General Building Construction, Specification for Structural	1/-	1/4
15—1912. Steel for Bridges, etc., and General Building Construction, Specification for Structural	1/-	1/4	24—1911. Railway Rolling Stock, Specifications for Material used in the Construction of		
29—1909. Steel Forgings for Marine Purposes, Specification for Ingot	1/-	1/4	Part I. Locomotive, Carriage and Wagon Axles	1/-	1/4
30—1907. Steel Castings for Marine Purposes, Specification for	1/-	1/4	„ II. Locomotive, Carriage and Wagon Tyres	1/-	1/4
43—1909. Boiler Tubes, Specification for Charcoal Iron Lapwelded	1/-	1/4	„ III. Laminated, Volute and Helical Springs, and Steel for Laminated Springs	1/-	1/4
45—1917. Sparking Plugs (for Internal Combustion Engines), Report on Dimensions for			„ IV. Steel Forgings, Blooms and Castings	1/-	1/4
51—1913. Wrought Iron for use in Railway Rolling Stock. ("Best-Yorkshire" and Grades A, B and C), Specification for	1/-	1/4	„ V. Copper Plates, Rods and Tubes, and Brass Tubes	1/-	1/4
53—1913. Boiler Tubes for Locomotive Boilers, Specifications for Cold Drawn Weldless Steel	1/-	1/4	„ VI. Steel Plates, Angles, etc., and Rivets for Locomotives, Carriages and Wagons	1/-	1/4
75—1916. Steels for Automobiles, Specifications for Wrought	1/-	1/4	29—1909. Steel Forgings for Marine Purposes, Specification for Ingot	1/-	1/4
			30—1907. Steel Castings for Marine Purposes, Specification for	1/-	1/4
			43—1909. Boiler Tubes, Specification for Charcoal Iron Lapwelded	1/-	1/4
			48—1909. Wrought Iron of Smithing Quality for Shipbuilding (Grade D), Specification for	1/-	1/4
			51—1913. Wrought Iron for use in Railway Rolling Stock ("Best-Yorkshire" and Grades A, B and C), Specification for	1/-	1/4
			53—1913. Boiler Tubes, for Locomotive Boilers, Specification for Cold Drawn Weldless Steel	1/-	1/4
			75—1916. Steels for Automobiles, Specifications for Wrought	1/-	1/4

NOTE.—The Inland Postage for the above translations is 2d. per copy.

28 VICTORIA STREET,
LONDON, S.W. 1.

C. LE MAISTRE,
Secretary.