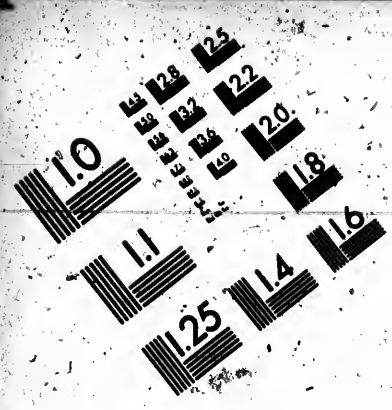

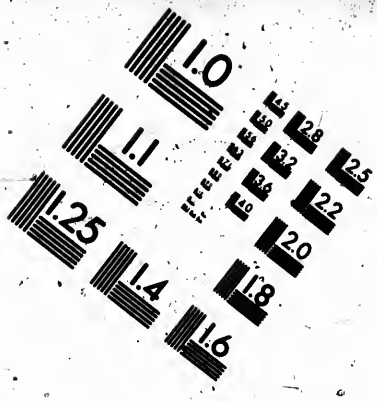

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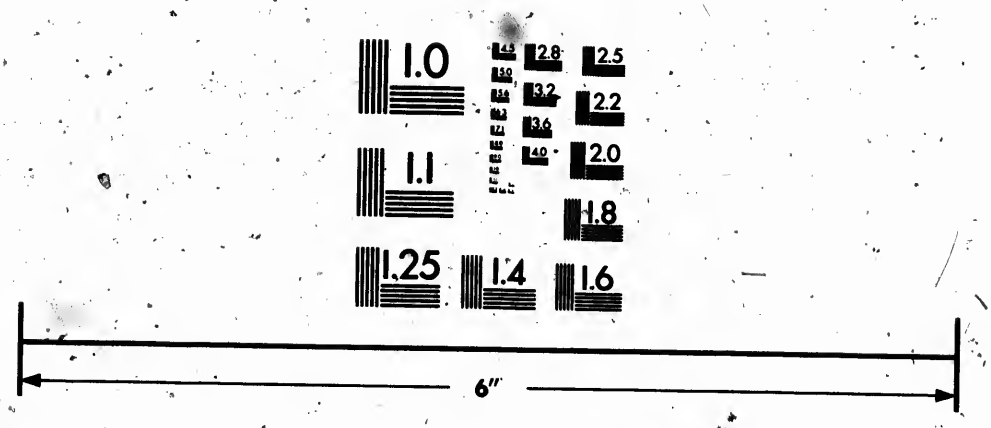

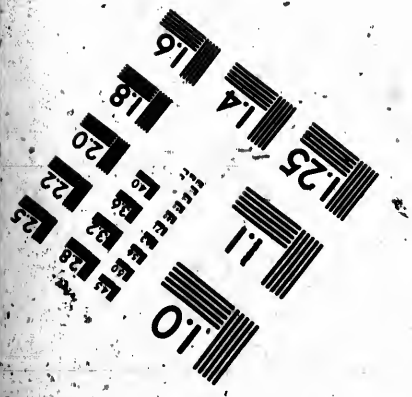

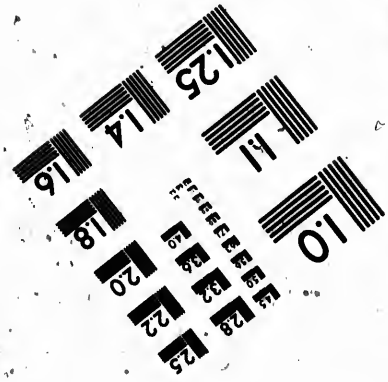

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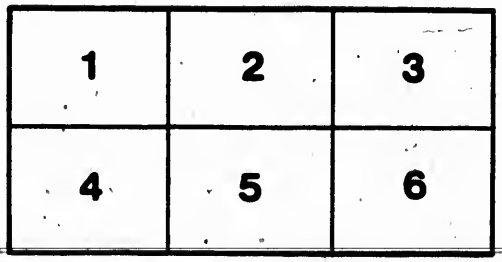

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Canadian Pacific Railway Co.

SPECIFICATION

FOR

STANDARD LOCOMOTIVE.

Eight Wheel Freight Engine, having Four Coupled Driving Wheels, with Four-Wheel Engine Truck, Tender carried on Eight Wheels.

GENERAL DESCRIPTION.

Cylinder 17 inches diameter, 24 inches stroke.
Gauge of track, 4 ft. 8½ in.
Driving wheels with tire, 62 in. diameter outside.
Driving wheel centres, 56 in. diameter.
Driving axles (steel), 7 in. diameter, finished.
Driving wheel base, 8 ft. 6 in.
Total wheel base, 23 ft. 1⅝ in.
Centre of driving axle to centre of cylinder, 11 ft. 9⅜ in.
Weight on driving wheels, about 48,000 lbs.
Total weight of locomotive in working order, about 74,000 lbs.
Level top boiler.

BOILER.

Made of steel. Cylinder part of boiler, ⅞ in. thick. Side sheets ⅞ thick. Throat and head sheets, ½ in. thick. Saddle Sheet, ½ in. thick. Dome sheet, ½ in. thick. All vertical joints to be single rivetted. All horizontal joints to be double rivetted with welts 7½ in. wide by ⅞ in. thick outside and inside. Caulking done with round pointed tools. Boiler to be stayed thoroughly in all its parts, provided with cleaning holes and hand-hole plugs of brass, one of 2 in. diameter at each corner of water leg, one in bottom of cylinder part of boiler about centre of forward sheet, also two cleaning holes on each side of boiler on the saddle sheet above level of crown sheet. These holes to be formed by attaching a brass counterflange to saddle sheet, having a 3¼ in. brass plug in it. Six 2¼ in. brass plugs to be placed in smoke box flue sheet and distributed thus, two over tubes, two at sides, and two at bottom below tubes. Three 2 in. brass plugs to be provided in head sheet above level of crown sheet.

SHELL.

Shell of boiler 52½ in. outside diameter at fire-box end. Made level top, with one dome 27⅛ in. inside diameter by 2 ft. 9 in. high, and placed on middle course of boiler. Dome cover to be provided with one whistle.

FIRE-BOX.

Made of steel, 5 ft. 11⅛ in. long by 2 ft. 11 in wide inside. Side and back sheets ⅜ in. thick. Water space on sides and back 3 in., on front 3½ in. Crown sheet ⅜ in. thick. Flue sheet, ½ in. thick. Stay bolts, best quality (Low Moor, Bowling' Sligo, or Globe) iron, ⅞ in. diameter, screwed through both sheets and rivetted to sheets both ends. Distance from centre to centre of stay bolts not to exceed 4½ in., and not more than 17 sq. in. area between four stays. To have 17 in. space from top of box to inside saddle plate.

SMOKE-BOX.

To be 4 ft. 6¼ in. diameter outside.

CROWN STAYS.

Crown sheet to be supported by direct vertical screwed stays, 4 in. from centre to centre. Stays to be 1⅛ in. diameter, having eleven threads to one inch. Saddle sheet and crown sheet to be tapped through with same tap to receive stay. Stays are to be made a steam-tight fit, and a projection of ⅞ in. inside the crown sheet and outside the saddle sheet is to be left for riveting over.

POP VALVES.

To be placed on dome cover. To be Crosby pattern. (See drawing.)

GUSSET STAYS.

The head sheets are to be stayed to cylinder part of the boiler by gusset stays. Two gusset stays required for front tube sheet, and four for back head sheet.

TUBES.

Of wrought iron, 1¾ in. diameter outside, with copper ferrules on fire-box end, 184 in number, 11 ft. 9⅝ in. long, lap welded, charcoal iron, special No. 12 tubes.

Boiler to be tested under steam to the satisfaction of the Mechanical Superintendent of the Company, or whoever he may appoint to inspect it.

GRATES.

Of cast iron. Rocking finger for burning coal connected so as to be opened from deck of engine in cab sufficiently wide to drop or clean fire. (See drawing.) Ash-pan with forward and back dampers arranged to be operated from the deck of engine, and fitted to close tight.

SMOKE STACK.

To be made diamond-pattern, with cast iron top. (See drawing.) Cone of chilled cast iron corrugated. Barrel of stack No. 10 steel. Top of stack from top of rail 14 ft. 6 in. Base of cast iron in two parts. (See drawing.)

THROTTLE VALVE.

Balance valve made of cast iron.

CYLINDERS.

Kingston pattern. Centre of Cylinder to centre of Boiler, 3 ft. 6¾ ins.

PISTONS AND RODS.

Piston head, follower, and rings to be made of cast iron, steam packing. Rods to be made of steel, 2¾ in. diameter, screwed into piston head and secured by screwed plug in threads. (See drawing.) To be keyed to crosshead with steel key.

Glands to be fitted with metallic packing from United States Metallic Packing Co.

GUIDES AND CROSSHEADS.

Made of steel. (See drawing.)

VALVE MOTION.

Shifting link graduated to cut off equally at all points of stroke. Links to be made of best hammered iron, double thimbled and case-hardened. Reverse shaft of wrought iron, forged solid. Lifters and other parts of valve motion having bearings to be double thimbled, and all wearing parts, including pins, to be case hardened.

ROCKER ARM.

Made of wrought iron.

DRIVING WHEELS.

Driving wheel centres to be made of cast iron with hollow spokes, turned outside on face, 56 inches diameter, edges faced and properly counterbalanced.

TYRES.

Of Krupp crucible steel, flanged. For driving wheels, 3 in. thick by 5½ in. wide, finished. For truck wheels, 2½ in. thick by 5 in. wide, finished.

TRUCK WHEELS.

Engine truck wheels, 28 in. diameter; centres, 28 in. diameter.

AXLES.

All axles to be made of steel. Driving axles to finish 7 in. diameter, journals 7 in. diameter by 8 in. long. Engine truck axle journals to finish 5 in. diameter by 8½ in. long, wheel fit 5 in. diameter, distance between hubs of wheels, 52 inches. Cast iron clamp collars on each axle.

CRANK PINS.

Pins to be made of wrought iron (see drawing), case-hardened, and ground up true and accurate.

CONNECTING AND SIDE RODS AND STRAPS.

Made from best hammered iron forged from No. 1 scrap, solid. See drawing.

DRIVING BOX.

Made of cast iron, and brasses pressed in. See drawing.

FRAMES.

Made of best hammered iron forged in two sections, each section being solid, and firmly bolted together and keyed forward of forward driving box pedestal. Pedestal jaws fitted with cast iron thimbles at bottom, secured with one 1½ in. bolt passing through jaws and thimble with jam nuts. Pedestal jaws cased with cast iron shoes and wedges.

ENGINE TRUCK.

See drawing. Swing beam.

FEED WATER.

Boiler supplied with water by two Gresham non-lifting injectors, class W. F., one No. 8, placed on right hand side of engine, and one No. 7 on left hand side, with feed cocks coupled on bottom of injectors. The supply pipes to have intermediate checks and pet cocks. Injector throttles in cab to have dry pipe connected extended up in dome of boiler. All arranged to be operated from deck of engine.

CAB.

Built of hard wood well fitted and braced, with angle irons in corners and bolted through. One of the sashes on each side to slide. Doors in front to open out, arranged with guide and thumb-screw so as to be held in any position desired.

PILOT.

Made of hard wood, firmly braced and bolted together, bottom of frame of pilot banded with wrought iron, and secured by means of lag screws, and secured and braced to front of engine with push bar, etc.

FURNITURE AND TOOLS.

Engine to be furnished with one alarm bell placed forward of the dome on top of cylinder part of boiler, arranged so as to be rung from cab. One signal bell in cab. Sand box placed back of dome. Steam gauge. Gauge cocks and dripper. Water gauge. Lamps and stands for steam and glass gauges. Two signal lamps. Head-lamp, with brackets and lamp board. Full set of wrenches to fit all nuts and bolts, including one 15-in. and one 12-in. monkey wrench, one hard and one soft hammer, two screw jacks and levers, one pinch bar and other tools that may be necessary, with substantial boxes made of hard wood to hold the same. Boxes to be supplied with substantial locks. One 10-lb. tallow can and one hand can for oiling.

GENERAL FINISH.

Boiler lagged with wood, and jacketed with Russia iron, held in place by means of iron bands. Cylinders lagged with wood and covered with No. 20 sheet iron, painted. Cylinder head casings of cast iron; see drawing. Steam chests fitted with cast iron casing on top (see drawing), and cased with No. 16 iron on ends and sides.

Iron moulding rivetted round bottom of casing. Dome lagged with wood and covered with No. 16 iron. Cast iron casing top and bottom. All painted.

TENDER AND TANK.

Truck. To be supplied by C. P. R.

Tank. Tank to be made of iron. Side and back sheets and top sheets ¼ in. thick. Bottom of tank ⅜ in. thick. Capacity of tank 2,600 U.S. gallons.

Tank Frame.

PAINTING.

Engine and tender to be well painted and varnished with two coats; colours desired will be given.

Tracings of details will be furnished to duplicate following parts, which are C. P. R. standard:—

Driving Axles and Boxes,
Truck do. do.
Crank Pins,
Connecting Rods,
Side Rods,
Crosshead,
Piston and Rod,
Cylinder Covers and Casings,
Steam Chest Covers and Casings,
Valve and Buckle,
Smoke Box, Door and No. — Plate,
T Pipe,
Engine and Tender Trucks complete,
Smoke Stack and Base,
Fire Door,
Blast Pipe Nozzles.
Springs and Hangers,
Pop Valves, Crossby pattern,
Mud Collector and Plugs,
Blow-off Cocks,
Cylinder Cocks,
Foot-steps,
Grates,
Eccentrics and Clips,

All material used in construction of locomotives and tenders to be of the best quality, and work well done. All parts to be interchangeable, and to be satisfactory to the Company's Mechanical Superintendent or his deputy.

Mechanical Superintendent.

OFFICE OF THE MECHANICAL SUPERINTENDENT.

MONTREAL,..... .....th, 18. .....