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1883.

TASMANIA.

LEGISLATIVE COUNCIL.

PROPOSED RAILWAYS:

REPORT OF ENGINEER-IN-CHIEF, WITH ESTIMATES OF COST.

Laid upon the Table by Mr. Moore, and ordered by the Council to be printed,
September 18, 1883.



PROPOSED RAILWAYS.

Public Works Office, 7th September, 1883.

SIR,

I HAVE the honor to submit herewith some particulars as to the three Lines of Railway proposed to be constructed; viz.—the Derwent Valley Railway, the North-Eastern Railway (Launceston to Scottsdale), and the Fingal Railway; together with the Estimates of Cost in each case, according to the Plans and Sections laid upon the Table of the House of Assembly.

Plans.—The Plans indicate the centres of the Railways by a red line, upon which is marked the radius of each curve.

Sections.—The Sections indicate the profile of the ground traversed, and the gradients of the Railways; the excavations are shown in pink, and the embankments in green colour; the greatest depth in each being marked in feet.

Scales.—The Scales to which the Plans and Sections have been drawn are identical throughout, for the purpose of better comparison.

Cost of Survey.—The very moderate amount of money expended in obtaining these Plans and Sections will be all saved should permanent working surveys be required, for the exact locations of the lines can now be determined readily and with certainty where alterations might seem desirable in order to effect any minor improvements in direction or saving in construction; while the permanent bench-marks established will afford immediate check upon the levels for a working section.

DERWENT VALLEY RAILWAY.

SOUTH BRIDGEWATER TO HAMILTON, AND BRANCH TO MACQUARIE PLAINS.

Route.—The line follows the Main Road on south side of river until the Lachlan River at New Norfolk is crossed; it then turns off across the Main Road and over the River Derwent at a high level; follows the north side of river (intercepting traffic from Back Creek and neighbourhood), and crosses the River Derwent near Redlands; passes through Redlands, over Plenty River, through Ivanhoe, and across River Derwent into Macquarie Plains District; thence round a spur and bend in the river to 53 chains above the junction of the Styx and Derwent Rivers (at this point the junction with the Macquarie Plains Branch is proposed); the Derwent is again crossed, and a steady rise gained at back of Bushy Park and Glenora, until a saddle near Fenton Forest House is passed by a tunnel 440 yards long; a short descending grade with a bridge over the Russell's Falls River brings the line to a bend in the Derwent known as "Crone's Point," which is crossed by a tunnel 270 yards in length; the south side of the river is then followed through Meadowbank to the last crossing of the Derwent at Fairydale; the line then continues round the spur, between Derwent and Clyde Rivers crosses the River Clyde, and terminates at a point fixed with reference to future extension to the Ouse and country beyond.

Cost.—The two tunnels, numerous bridges, and the excavations in sandstone and trap rock have increased the estimated cost of this line as compared with the other two; but the facilities afforded by the navigation of the Derwent to New Norfolk, and the good roads on each side of the river above that place, would favourably affect the cost of the work. The bridging is rather a heavy item, and at first sight the five crossings of the Derwent seem objectionable, but they are justified in saving distance and expensive excavations round precipitous rocky banks, and, besides, by the line being alternately on each side of river, the interests of all are more equally served. The bridges will be so designed that they can readily accommodate road traffic should it be found necessary in the event of the connecting roads being constructed at any time.

Heights.—The elevation to be overcome (above junction with Main Line Railway at Bridgewater) is only 88 feet at New Norfolk, 214 feet at Glenora Tunnel, 249 feet at Crone's Point Tunnel, and 300 feet near Hamilton.

Permanent Way.—As the gradients are very favourable, I have proposed 40-b. steel rails, and have allowed some 30s. per ton above contract price of same kind of rails ordered for the Mersey Line.

Survey.—The Survey was effected by Mr. A. Mault, C.E.

ESTIMATED COST.

South Bridgewater to Hamilton—34 miles 40 chains.

	£	s.	d.
Clearing - - - - -	700	0	0
4841 Chains fencing - - - - -	4841	0	0
403,447 Cubic yards excavation in clay, sand, gravel, &c., including side cutting, at 1s. 6d.	30,258	10	6
111,538 Cubic yards excavation in sandstone rock, at 5s.	27,884	10	0
32,310 Ditto, ditto, trap rock, at 10s.	16,155	0	0
270 Lineal yards tunnel, at £15 - - - - -	4050	0	0
440 Ditto, ditto, (lined), at £25 - - - - -	11,000	0	0
2760 Chains ditching, at 8s. - - - - -	1104	0	0
2760 Ditto forming, at £1 - - - - -	2760	0	0
5704 Superficial yards rough-pitched apron along river, at 3s. 6d. - - - - -	998	14	0
Culverts - - - - -	3891	5	0
15 Bridges - - - - -	28,500	0	0
158 Chains road diversions, £10 - - - - -	1580	0	0
4 Main road crossings, at £60 - - - - -	240	0	0
5 Public ditto ditto, at £50 - - - - -	250	0	0
42 Private ditto ditto, at £20 - - - - -	840	0	0
34 Miles 40 chains permanent way (steel rails, 40-lb.,) at £1303 complete - - - - -	44,953	10	0
Telegraph - - - - -	500	0	0
Accommodation works - - - - -	2500	0	0
Stations and sidings - - - - -	10,500	0	0
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	£193,506	9	6

Branch to Macquarie Plains—1 mile 64 chains.

	£	s.	d.
292 Chains fencing - - - - -	292	0	0
24,950 Cubic yards excavation in sand, gravel, &c., at 1s. 6d. - - - - -	1871	5	0
14,530 Ditto ditto in trap rock, at 10s. - - - - -	7265	0	0
144 Chains ditching, at 8s. - - - - -	57	12	0
144 Ditto forming, at 20s. - - - - -	144	0	0
Culverts - - - - -	334	10	0
3 Chains road diversions and fencing, at £10 - - - - -	30	0	0
3 Private crossings, at £20 - - - - -	60	0	0
1 Mile 64 chains permanent way, at £1303 complete - - - - -	2345	8	0
Telegraph - - - - -	50	0	0
Station and sidings at Gretna, and sidings at Junction - - - - -	1500	0	0
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		13,949	15 0
		<hr/>	
Land, compensation, and legal charges - - - - -	..	£207,456	4 6
Rolling-stock - - - - -	..	12,000	0 0
Contingencies - - - - -	..	20,000	0 0
		10,543	15 6
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TOTAL - - - - -	..	£250,000	0 0

NORTH-EASTERN RAILWAY.

LAUNCESTON TO SCOTTSDALE.

Route.—The line leaves the Launceston and Western Railway near the bridge over the River Tamar, follows the river embankment for some half mile, crosses the Invermay road, passes in front of the Regatta Ground, and thence between the river and the main road until it touches the river opposite Freshwater Point; from this it follows the main road for about two miles, crosses it near Stony Creek, and rises to Doctor's Hill; from this, gradually rising, it again crosses the main road and runs along same past Mount Direction until the crossing of the Bangor Slate Company's tramway is reached on summit of the hill; from thence it follows the general course of the Back Creek road and Bangor Tramway until the valley of the Piper River is reached at Slaty Ford; follows down the Piper River for 8 miles, crossing same just below the township of Alford on the Lower Piper, follows up Paddy's Creek for some two miles, and then rises in about another two miles to a saddle on the Piper River watershed; from this the line descends for 1½ miles to the crossing of the Yarrow Creek, and bears easterly for 2½ miles until the Piper Brook is crossed;

from this rises generally in a south-east direction to a summit on Hall's Track, and descends for $3\frac{1}{2}$ miles to the Denison Huts; from here it follows the Denison Creek for one mile, then crosses the Lisle Creek, and, across fairly level country, reaches the forks of the Forester, ascends for some $3\frac{1}{2}$ miles, and then descends for 3 miles until the Brid River is reached; follows the Brid River for 4 miles, crosses the Little Brid River, the Springfield Road, and the Great Brid River near Watson's; thence round a spur by an ascending grade into the valley of Muddy Creek; Muddy Creek is then followed for about $3\frac{1}{2}$ miles, passing close to Gill's saw-mill, and terminating at the main road between Launceston and Scottsdale where the Muddy Creek crosses the main road.

There is no question but that this route is very circuitous, but, before final adoption, Mr. Climie tried twice to get a line through the Piper districts and on to Scottsdale without getting into the rough broken country formed by the spurs of Mount Arthur, and failed to find reasonably practicable gradients.

By your instructions I have employed Mr. W. P. Hales to try this route; he is now engaged upon it, and, so far, I understand he has obtained a line crossing the range between the Tamar and Piper River, at about 700 feet above sea level, passing near Turner's Marsh, through Upper Piper, and then through a saddle on the range between Piper River and Piper Brook, at an elevation of 1100 feet above sea level. Whether he will succeed in getting on to surveyed line, or have to avoid it all the way to Scottsdale, remains to be tested, and its cost then will have to be considered. In any case I apprehend the gradients will be much more severe than on surveyed line.

I append a statement showing the leading heights, with their positions, on the surveyed line, these heights compare very favourably with those referred to in the last paragraph.

An incidental advantage of the surveyed route is, that the railway would be brought comparatively near to the Lefroy mines; and it is sufficiently near to the Tamar for some miles below Launceston to allow of arrangements being readily made for landing passengers by steamer and taking them by rail into that city.

Cost.—The facilities for transport of materials and men during construction are not so great in the case of this Line as in that of the other two; a large extent of rough country with no roads having to be traversed (during surveys, the tents, instruments, and provisions for the party had to be carried on pack horses). The clearing will be a heavier item in this case, but the bridges will be inexpensive, and the permanent way will be more expensive owing to the stronger character of way proposed to be adopted, while I anticipate the costs of land and compensation for the first few miles from Launceston will be heavy.

Permanent Way.—Owing to the heavier character of the gradients I have proposed that 50-lb. steel rails be used.

Surveys.—These were effected under the general superintendence of Mr. J. C. Climie, C.E., who first examined the whole Line, and apportioned the work as follows:—Launceston to Mount Direction, Mr. W. P. Hales, C.E.; Mount Direction to Denison, Mr. J. Climie, C.E.; Denison to Scottsdale, Mr. F. A. Cutten, C.E.

Heights (above Launceston and Western Railway, at Launceston Station,) of some of the principal Points on Line between Launceston and Scottsdale.

m.	c.		Feet.
0	0	Launceston and Western Railway	0
8	0	At Nelson Creek near Police Station and Hotel	15
11	40	At Doctor's Hill	268
17	60	At Coward's Hotel, Mount Direction	370
18	60	At Bangor Tramway Crossing of Main Road	448
25	60	At Piper River (Slaty Ford)	232
33	20	At Piper River (McGillespie's, Lower Piper)	140
37	70	At Saddle	510
39	30	At Yarrow Creek	364
41	70	At Piper Brook	321
45	30	At Summit on Hall's Track	587
49	20	At Denison Huts	180
51	0	At Lisle Creek	163
52	60	At Forks of Forester River	150
56	30	At summit	554
63	40	At Brid River	259
66	65	At Scottsdale Station	612

ESTIMATED COST.

Launceston to Scottsdale, 66 miles 65 chains, *via* Mount Direction, Lower Piper, and Denison.

	£	s.	d.
Clearing (average rate per mile, £80) - - - - -	5345	0	0
10,700 Chains fencing, at 20s. - - - - -	10,700	0	0
364,100 Cubic yards excavation from cuttings—one-third at 5s., two-thirds at 1s. 9d. - - - - -	51,580	11	0
155,200 Ditto side cutting, at 1s. 6d. - - - - -	11,640	0	0
7000 Chains ditching, at 8s. - - - - -	2800	0	0
66 Miles 65 chains forming (per chain), at 20s. - - - - -	5345	0	0
Culverts - - - - -	7645	0	0
17 Bridges - - - - -	7859	0	0
35 Chains road diversion, at £10 - - - - -	350	0	0
10 Ditto street ditto, at £20 - - - - -	200	0	0
160 Ditto road diversion, at £5 - - - - -	800	0	0
2 Bridges on road diversions - - - - -	500	0	0
18 Tramway diversions - - - - -	200	0	0
3 Tramway crossings, at £25 - - - - -	75	0	0
5 Main Road ditto, at £60 - - - - -	300	0	0
15 Public ditto ditto, at £50 - - - - -	750	0	0
90 Private ditto ditto, at £20 - - - - -	1800	0	0
66 Miles 65 chains permanent way (50-lb. rails), complete, at £1735 - - - - -	115,919	13	9
Telegraph - - - - -	1500	0	0
Accommodation works - - - - -	3000	0	0
Stations and sidings - - - - -	8450	0	0
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	£236,759	4	9
Land, compensation, and legal charges - - - - -	15,000	0	0
Rolling-stock - - - - -	30,000	0	0
Contingencies - - - - -	18,240	15	3
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TOTAL - - - - -	£300,000	0	0

FINGAL RAILWAY.

Route.—The route between the Corners and Fingal is same as that referred to in my Report dated 25th June, 1881, (Paper No. 76, House of Assembly, 1881), but between Fingal and St. Mary's the line is kept on the opposite side of the Main Road from near Killymoon, passes at back of Killymoon House and traverses flat country and some marshes until Cullenswood is reached; the Break o Day River is crossed here, and an almost surface line is followed on same side of Main Road all the way to St. Mary's Terminus.

Cost.—This line is very favourably situated for cheap construction, has a good road alongside for transport of material, and abundance of good gravel ballast; the bridges are also remarkably few in number.

Permanent Way.—The gradients being very easy as a whole, I have proposed 40-lb. steel rails, but fixed a lower price per mile for the completed permanent way as compared with the Derwent Valley Line, on account of the abundance of gravel ballast.

Survey.—The Survey was effected by Mr. G. Innes, District Surveyor, Franklin, (Corners to Stony Creek); Mr. J. W. Hoyle, C.E., (Stony Creek to Fingal); and Mr. F. A. Cutten, C.E., (Fingal to St. Mary's).

ESTIMATED COST.

From Corners Station of Main Line Railway to St. Mary's—47 miles 7 chains.

	£	s.	d.
Clearing (light) - - - - -	500	0	0
7600 Chains fencing, at 20s. - - - - -	7600	0	0
230,000 Cubic yards excavation in sand, earth, and gravel, at 1s. 6d. - - - - -	17,250	0	0
10,000 Ditto ditto in sandstone or claystone, at 5s. - - - - -	2500	0	0
10,000 Ditto ditto in trap rock, at 10s. - - - - -	5000	0	0
3800 Chains ditching, at 6s. - - - - -	1140	0	0
3767 Ditto forming, at 20s. - - - - -	3767	0	0
Culverts - - - - -	4384	6	0
5 Bridges - - - - -	4600	0	0
66 Chains Road diversion, at £10 - - - - -	660	0	0

	£	s.	d.
11 Main Road crossings, at £60	660	0	0
3 Public road and street ditto, at £50	150	0	0
60 Private crossings, at £20	1200	0	0
47 Miles 7 chains permanent way complete (40-lb. rails), at £1171	55,139	8	4
Telegraph, connecting only to present line, and additional wire	200	0	0
Cattle-creeps and sundry accommodation works, say	1000	0	0
Stations and sidings	7000	0	0
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	£112,750	14	4
Land and compensation, and legal charges	10,000	0	0
Rolling-stock	20,000	0	0
Contingencies	7249	5	8
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TOTAL	£150,000	0	0
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With regard to the necessary engineering and office staff for carrying out these proposed Railways, I would strongly recommend (as suggested in my last Report on Public Works, and in reference to staff for roads, bridges, &c.) that the Legislature should be asked to provide a certain amount of money year by year for Special Railway Staff, and that as far as possible the engineers that would hereafter supervise the works be employed in the permanent location of the lines and in preparing the several contracts.

I have the honor to be,
Sir,

Your most obedient Servant,

JAMES FINCHAM, *Engineer-in-Chief.*

The Hon. NICHOLAS J. BROWN, M.H.A.,
Minister of Lands and Works.