

(No. 86.)



1891.

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PARLIAMENT OF TASMANIA.

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PROPOSED SANITARY WORKS AT ZEEHAN :

REPORT BY ENGINEERING INSPECTOR.

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Presented to both Houses of Parliament by His Excellency's Command.



## PROPOSED SANITARY WORKS AT ZEEHAN.

*The Honourable the Chief Secretary,  
President of the Central Board of Health.*

SIR,

I HAVE the honour to report to you that, in accordance with your instructions, I have visited Zeehan with a view to suggest how the most urgently needed of the sanitary work required there might be at once begun in such manner as to form part of the general scheme of works that will have to be eventually undertaken.

1. In connection with this Report I have to request your attention to the one made on the Sanitary Condition of Zeehan on the occasion of my visit of inspection in February, 1890, and especially to the paragraphs numbered 15, 19, 20, 21, and 22—(See Parliamentary Paper, House of Assembly, No. 34, 1890.) At the above date the population of the district was estimated to be 400; at my visit in February of this year it had probably increased nearly tenfold. The urgency of the necessity for sanitary work has increased in the same ratio.

2. The nature of the ground upon which the principal part of the population was resident is described in paragraph 15 of the 1890 Report, and it is on this ground that the population has continued to throng until it has become, comparatively speaking, thickly covered with buildings, and is daily becoming more so. The accompanying plan shows the houses built, or being built, upon it at the end of January, 1891. As this is the part of Zeehan that most urgently requires sanitation, I have limited my drainage proposals to it for the present, and I have marked on the plan the lines of sewers, and indicated the other necessary work that should be at once proceeded with.

3. One of the first points to be settled in connection with the provision of drainage is that of the disposal of the sewage. The natural outlet for the surface and other drainage of the site of the settlement under consideration is the Main Creek, and its affluent the rivulet flowing through the Mount Zeehan Company's claim. For the present it is proposed to discharge the sewage into these rivulets at the points marked A and E on the plan. Eventually the sewage of the whole district will have to be discharged much lower down into the North Henty River, either with or without some purification. When such extension has to be carried into effect the sewers now recommended will serve as part of the general drainage system. With respect to the immediate contamination of the water of the two rivulets that will result from this proposed discharge, it must be borne in mind that there are two sorts of contamination—one of which consists in poisoning the water without rendering it otherwise offensive or injurious to health, and the other in fouling it with animal and other matters which not only make the water deleterious when used for drinking, but give off noxious effluvia, causing disease. The water of the two streams is already subject to the former contamination, and when lead concentrating processes are being carried on will become quite unfit for human or animal consumption. This will be altogether unavoidable in such a locality, but the water so poisoned will not make the town through which it flows unhealthy by reason of noxious emanations. It would be otherwise if the portions of the rivulets flowing through the town were allowed to be fouled with sewage. The outlets of the sewers are, therefore, placed at a little distance from occupied sites for the present, with capability of prolongation to lower and more distant outfalls when necessary.

4. Another matter for consideration in connection with the sewerage of the district was the material to be used in its construction. The condition of the roads from Trial Harbour, and of the landing arrangements at that place, is such as not only to make the transport of all goods very costly, but the loss by breakage of all brittle goods so large as to be virtually prohibitory to their introduction. When the railway is completed earthenware drain pipes may be brought in, but for the present the only materials practicably available are wood or iron. It is therefore proposed, for the present, to construct the sewers of one of these materials. The local hardwood would last a long time; but the tendency of wooden drains to become foul is such that, though special and complete means of flushing are provided, much trouble is sure to occur with them. As wrought iron pipes coated with pitch would be cheaper, more durable, more cleanly, and more quickly laid, I recommend their adoption.

5. The settlement under consideration is practically, for drainage purposes, divided into two parts by the Zeehan Rivulet. The part to the west of the rivulet will be drained by a sewer having outlet at the point marked A on the plan, where it will be nine inches in diameter. At B on the plan it will receive a branch sewer, also nine inches in diameter, which will drain the houses on the south side of the main road. The main sewer will be continued from B behind the buildings on the north side of the road to a point near

the boundary of the Silver Queen claim, whence it will be taken along the road itself to receive the drainage of the houses on both sides. Advantage will be taken of the crossing of a small rivulet at N on the plan to construct a penstock chamber for the purpose of flushing this line of sewer: detail drawings show the construction of this penstock chamber. In the drawings the sluice-doors for impounding the rivulet water and for closing the access to the sewer are both shown shut so as to allow a head of water to be formed for the periodical flushing out of the sewer. At all other times a part of the rivulet water will be allowed to flow through the sewer by the arrangement indicated. From the penstock chamber to the head of the sewer at C on plan its size is reduced to six inches in diameter.

6. The part of the settlement to the east of the Zeehan Rivulet will be drained by a nine-inch sewer having outfall at E on plan. At F on plan it receives a six-inch sewer, bringing the drainage from some of the houses standing to the south side of the main road. The main sewer continues along the north side of the road till it approaches the rivulet, when it crosses the road, and at G receives through another branch sewer the drainage from the rest of the houses on the south side; thence it is continued as a six-inch sewer to the Mount Zeehan Mining Company's shaft, where arrangements will be made for sending through it a part of the water raised from the mine. This will insure a constant and very effective flushing out of this main sewer throughout its entire length.

7. Along the lines of the sewers provision is made for the insertion of junctions for house drains from every allotment or residence area. When the sewers are laid notice should at once be given to every occupier to construct a house drain in connection with them, and to provide for its proper ventilation, and for the making of proper sinks, traps, and other necessary drainage arrangements. And thenceforward no house slops ought to be allowed to be thrown on the ground, into the street gutters, or into the rivulets.

8. When the permanent scheme of drainage is laid out it will be quite practicable to suppress the outfall at A and continue the western sewer from near B across the Zeehan Rivulet to the eastern sewer at the bend, about 32 chains from E.

9. From the details given in paragraph 15 and the first part of paragraph 17 of the report of 1890 it is evident that to make the settlement healthy not only should the house sewage be carried off, but the ground drainage of the locality should be attended to. It is proposed to utilise for this purpose the trenches of the sewers above described by surrounding the pipes with broken metal and other permeable material. The watercourse mentioned in the above cited paragraph 17 should have a new channel cut (as shown from K to L on plan), and the material excavated should be employed in properly filling up holes and hollows in such wise as to allow all rain-water falling on the surface to flow off into the new watercourse. If further settlement be allowed on the north side of the main road the new channel should be continued from L to N as shown by dotted lines on the plan.

10. But the place will not be healthy until there is a possibility to cleanse and keep clean the surface of the roads and yards. At present the main road is roughly made with corduroy, covered with inferior stone for less than one quarter of its width, and the rest of the surface is that of the original swamp with the stumps of the cut down trees and scrub. At the edges of the made portion of the road, at the ends of the corduroy wood, a rough sort of table drain exists in some places; and in other places, in front of shops and inns, this rough table-drain has been covered with slabs so as to continue the level of the roadway up to the doors—only three or four inches in height of space being left, and the bottom remaining undressed and rough as before. These "culverts" will, of course, soon become choked up, and the road water has no means of running off, much less the house drainage. I would therefore propose that the main road should be at once properly made—at least through the portion of the settlement shown on the plan. A portion of the expense of doing this would be naturally borne by the Tramway Company should their proposal receive Parliamentary sanction.

11. The yards belonging to the most of the houses are also in a condition that makes cleaning an impossibility. The occupiers ought to be called upon to immediately alter this condition by levelling the ground so as to prevent the collection of stagnant water; by paving with wood or other material the portion immediately adjoining the houses and used as gangways; and by removing all refuse, whether house refuse or wood remaining from clearing operations. At present the immense quantity of the latter material lying in close proximity to the houses makes the risk of destruction of the whole place by fire a very imminent one. The action above advised to be taken is within the powers of the Local Board of Health under the provisions of the 121, 122, 136, and 138th Sections of the Public Health Act, 1885.

12. The sanitary condition of the place would be further improved by the proper cleansing out of the Zeehan Rivulet and the Main Creek so as to allow the water, especially in wet weather, to get away more rapidly, and to be confined to one channel instead of spreading over a wide surface. The level of the ground water of the district would thus be much lowered—a very important matter. A further great improvement would be the straightening of the course of the Zeehan Rivulet as shown on the plan. In connection with this, the alignment of the proposed street leading to the Mount Zeehan Mine and of the proposed prolongation of this street to the northward of the main road should be altered so as to form an esplanade on each side of the new channel of the rivulet. There would then be every chance of keeping the rivulet clear of offensive matter. At present it runs close by several dwellings, and is virtually made the ash and refuse pit of the inhabitants of them.

13. I have not included any proposal for a good water supply among the sanitary works urgently needed, as there are local schemes for effecting this desirable object with which it is not at present necessary to interfere. A company has been formed to bring to the settlement the water from a source on the claim of the Silver Queen Extended Company now held by the English Company. It is estimated that, after supplying the wants of the Company, more than 50,000 gallons a day will be

available to supply the district. A small open reservoir has been formed, and from it pipes will be laid along the Argent Company's tramway to the main road at the settlement. The Water Company has not for the present either the means or the intention of having a distributory pipe service, but will erect a standpipe and organise a service of water carts. The quality of the water appeared to be good. This supply, though inadequate, will for the present prevent the necessity of using foul water from creeks and waterholes during dry weather for drinking purposes. There is also a scheme under consideration for bringing a proper supply of water for all purposes into the district, with a distributory service that will be available for fire extinction and sanitary work as well as for domestic consumption. Under these circumstances I have not thought it necessary to suggest special work to the same end. I may mention that since my report of last year was written the development of mining in the district has been such as to make the source on the Queen Rivulet that I then proposed no longer available for a water supply, as the stream is being used for and polluted by mining work. I think it probable that the upper waters of the North Henty River will now be found to be the best source whence to supply the rapidly growing community of Zeehan.

14. A matter of great urgency in connection with the proper sanitary administration of the district is the organisation of a service for the periodical removal of all nightsoil and house refuse, and the provision of a suitable place for its deposit and treatment. The Local Board of Health of Zeehan at various meetings which I attended expressed its desire to immediately do all in its power to effect this end, but one great difficulty in its way is the finding of a suitable site for a depositing-place. I went with Mr. Evans, the Chairman of the Board, to inspect various sites, and the one that combined the most advantages and offered most facilities combined with fewest objections was the south-west corner of a claim leased to the Kudos Proprietary Association, and marked 87 m 970 on the plan of the Silver Sections at Mount Zeehan, dated December, 1890. This portion of the claim contains four or five acres; is completely separated from the rest of the claim by the North Henty River and the Main Creek, which nearly surround it on three sides; is also nearly surrounded by thick bush; is of suitable nature as regards soil and conformation; and, with reference to the prevailing winds, is on the lee side of any probable settlement. A roadway to it might be cheaply made along the reserved esplanade by the Main Creek. And, furthermore, there would be a sufficient area for the emplacement of the slaughter-yards referred to in the succeeding paragraph. I therefore recommend that the Mines Department should be asked to resume this portion of the claim, and that it should be granted to the Local Board of Health of Zeehan for public purposes. The road should then be at once made to it from the main road, and a proper service organised for the removal to it, and disposal on it by burial or burning of all refuse, according to its nature. This service would be self-supporting, as its cost would be quite covered by the payments of the householders beneficially served by it.

15. The slaughter-house mentioned in the fourth clause of paragraph 17 of my Report of last year has been removed, and the slaughtering of cattle is now carried on at yards near to the Main Creek at a short distance below the outfall marked E on plan. The sheds put up here are not properly built for slaughter-houses, and the yards are very foul. The place is not a good site for the purpose, and every day buildings are being put up nearer and nearer to it; and when the railway is completed the proximity of the station will cause additional settlement in the immediate vicinity. I therefore recommend that immediately on the resumption of the land mentioned in the preceding paragraph and the granting of it to the Local Board of Health, the western portion of it should be set apart as a slaughter-house site, and that the present slaughter-yard should be closed, and the site thoroughly cleansed. Care should be taken that at the new yards the buildings should be properly adapted to slaughtering purposes, and so built that they and the yards can be kept clean and wholesome.

16. The necessity having arisen for the immediate selection of a burial place, the most readily available site was on the claim of the Silver Prince Prospecting Association, marked 87 m 735 on the plan above mentioned. The ground is in many parts not very suitable in its nature, and, from its situation, it will probably become surrounded with settlement. I would, therefore, recommend that a site for a permanent cemetery for the whole district should be at once chosen. On my round of inspection with Mr. Evans above referred to, the most suitable site which we saw for this purpose was upon the lots of land marked U and L1 on the plan of the proclaimed township of Zeehan. These lots are well wooded, and would easily be rendered picturesquely beautiful by simply clearing off dead timber and leaving the living to grow in ornamental clumps except where paths and graves had actually to be made. The lot is nearly, and could easily be quite surrounded by other Government reserves; if there be any drainage from it it would flow into the Main Creek, whose water is already rendered unfit for use by lead-mining processes. A road could easily and cheaply be made to it from the main road and along the proposed Davis-street; and a cemetery in this situation would be nearly in the middle of the settled district from the Comstock Mine to Dundas. I accordingly would suggest that a Government reservation for the purposes of a cemetery should be proclaimed, and that such reservation should include the reserves marked U and L1 on the plan of the town of Zeehan, being an area of about two and a half acres. When this is done, and a cemetery trust formed, the bodies of the three persons who have been buried on the Silver Prince ground should be removed to the new cemetery.

17. The foregoing paragraphs indicate the work which should be immediately done to improve the sanitary condition of the more thickly inhabited part of Zeehan, and some of the general measures required for the whole district. Further drainage work will soon have to be done in other parts of the district, especially on the Silver King Claims which are getting occupied. In connection with some of the localities that are getting occupied, and that the Local Commissioner of Mines, Mr. Fowell, is being asked to issue permits for, he consulted me, and I suggested that on the portions of the land that required draining before any residences should be built on them a rule should be laid down that no permits should be granted except on the grantee undertaking to bear his share of the cost of drainage, to be done to the satisfaction of this Board. This necessitates that the applicants for residence areas upon the whole of each block should

come to an understanding to give such undertaking jointly. This has been done in the case of the applicants for areas in the street running parallel to and north of the main road and ending near to the post office, and marked on the plan by faint dotted lines.

18. Such arrangements are hardly satisfactory. In fact the nature of the tenure upon which property is held at Zeehan makes it very difficult to provide for the doing of the necessary sanitary work except at the expense of Government. As it is thought undesirable until the mines are further developed and the courses of the lodes accurately determined to deprive the lessees holding the various claims of their full mining rights, no action can be taken for proclaiming a town and forming a Town Board at the settlement, as such action would deprive the mining leaseholders of their right of surface mining. This condition of things is the result of the provisions of the 59th Section of "The Crown Lands Act, 1890," (54 Vict. No. 8), which enacts that the occupant, by virtue of a residence licence, &c. of any Crown land *in any town* who shall have built or made improvements to the value of fifty pounds thereon, shall be entitled to purchase the land occupied by him to the extent of a quarter of an acre, reserve being made of minerals beyond 50 feet in depth. With such an enactment, were a town proclaimed at the settlement under consideration a great portion of the mining claims there might be purchased and all surface mining stopped. As the effect that this enactment would have upon the sanitary administration of a district so exceptionally conditioned as this settlement could not have been foreseen, I would suggest that, in the proposed amendments to be made in sanitary legislation in the next Session of Parliament, power should be taken for the Governor in Council to specially exempt the land in certain towns that may be proclaimed, chiefly in view of the necessity of providing for their sanitary administration, from the operation of the above-cited section 59 of "The Crown Lands Act, 1890."

19. In the meantime it is necessary that something should be immediately done, and, having regard both to urgency and cost, I would suggest that action be taken as follows:—

- (a) That the land described in the 14th paragraph of this report should be at once resumed, and that a road should be immediately made to it. The expense of this should not exceed £100, as comparatively little work need be done, the ground being sound, except at the crossing of one or two little watercourses, and the bush very light. While this is being done, the Local Board of Health should call for tenders for the work of removing night-soil, manure, and house refuse from the settlement. In case no satisfactory tender were received, it might be necessary for the Local Board to employ a scavenging staff of its own, and probably another £100 might be necessary to procure the necessary means of conveyance. When the service is once organised it will be self-supporting, as the small payment required from each householder will be amply sufficient to pay all expenses. When the arrangements are made to do the work, either by contract or by the Local Board's own staff, notices should be given, under the 18th Section of "The Public Health Act, 1887," to all occupiers to close existing cesspools, and to construct earth-closets with movable pails, similar to one that should be provided as a pattern, and to comply with the requirements of bye-laws numbered 36, 42, 43, 45, 46, 49, 50, 51, and 52. The occupiers should at the same time be informed of the arrangements made by the Local Board, and the periodical payment that will be required of those taking advantage of them.
- (b) The construction of the sewers shown on the plan should be immediately undertaken. A specification of the work is appended. It is difficult to estimate the cost of work undertaken in the circumstances now existing at Zeehan; but, I think, £8 a chain would cover the cost of the 107 chains shown on the plan. As the work progresses the notices referred to in paragraph 7 of this Report should be given, and such notices should specify the construction of (1) a four-inch pipe drain, laid to a gradient in no part less than 1 in 200, and having a ventilating pipe carried up at least three feet above the house roof-ridge and finishing at least eight feet from any window, chimney, or other opening into the house; and (2) of an iron-trapped catchpit, with a grating set in a pavement of concrete, wood, or other hard material properly dished. These works should be done under the immediate supervision and to the satisfaction of the Local Board and its officers, or of the inspector charged with the superintendence of the work. Sinks, baths, and other such like fittings within houses should be made to discharge their water into the open air, so as to pass into the drains through trapped catchpits; and in no case should there be any uninterrupted communication between the drains and the interior of houses.
- (c) The course of the small watercourse, from K to L on plan, should be diverted and straightened. This would probably cost about £76, being at the rate of £7 a chain.
- (d) The main street through the settlement should be made as shown, and its making would probably cost £1600. None of the street drainage should be allowed to pass into the sewers, but should be drained off into ditches, as shown, taking it beyond the limits of the resumed land.
- (e) About £150 would have to be spent in making a roadway to, and a fence round three sides of, the new cemetery, immediately the reservation is made and a Trust formed.

20. All these works are absolutely necessary. If they be not all undertaken at once, I would suggest that they be taken in the order in which they are above referred to. The Zeehan Rivulet diversion and consequential work are not so pressing.

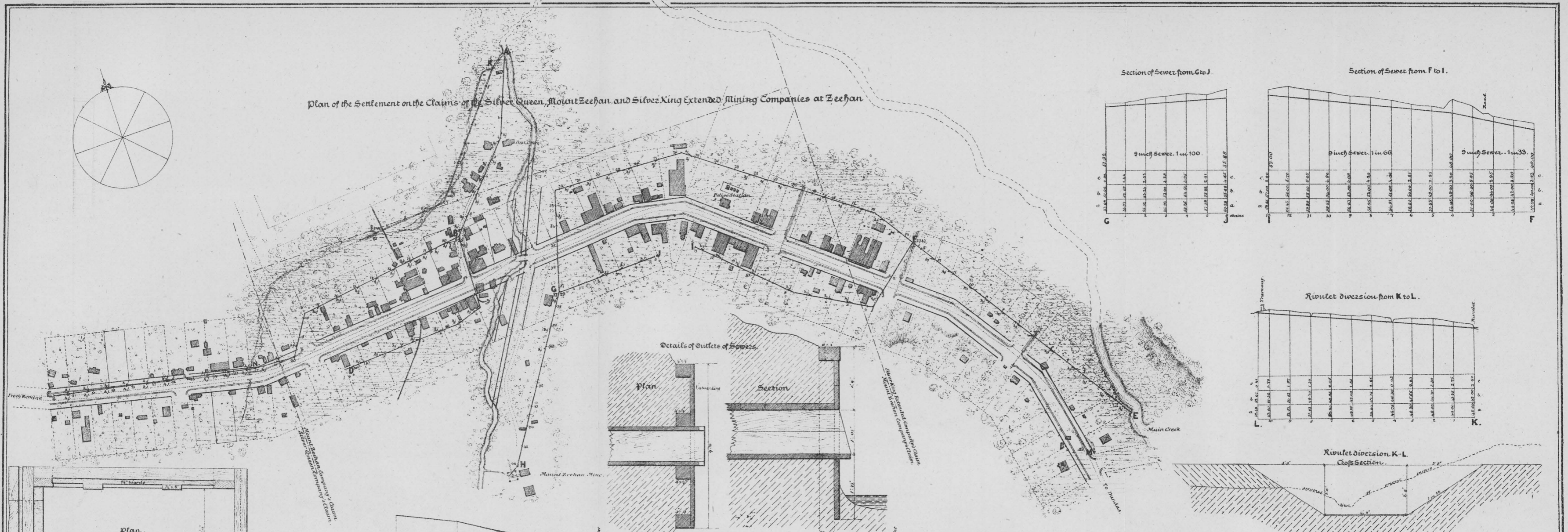
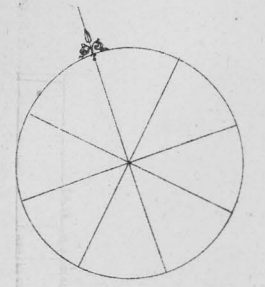
I have the honour to remain,  
Sir,

Your faithful Servant,

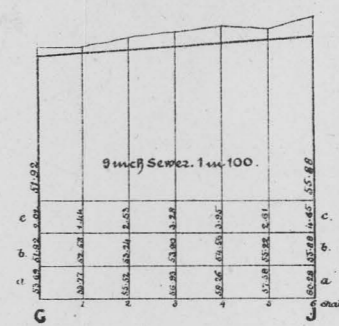
Hobart, 16th March, 1891.

A. MAULT, *Engineering Inspector.*

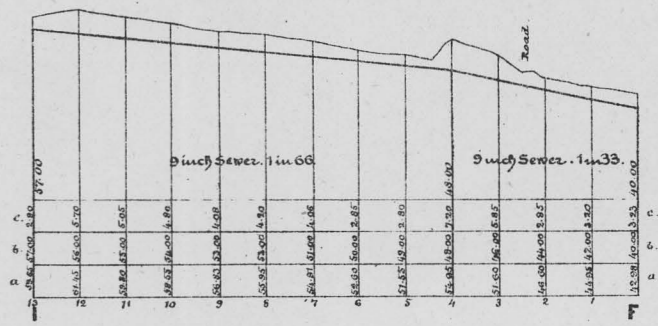
Plan of the Settlement on the Claims of the Silver Queen, Mount Zeehan and Silver King Extended Mining Companies at Zeehan



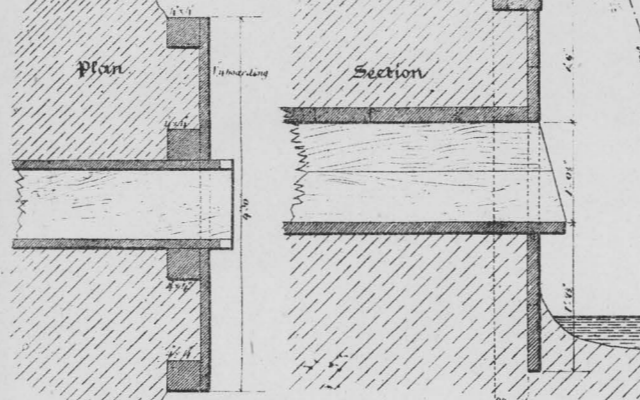
Section of Sewer from G to J.



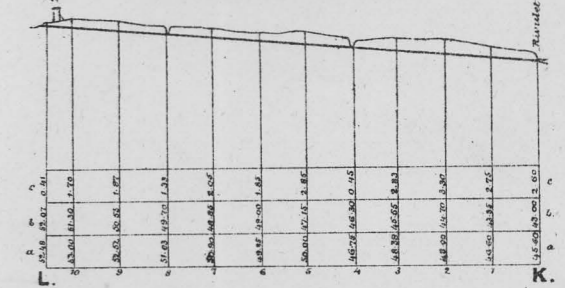
Section of Sewer from F to I.



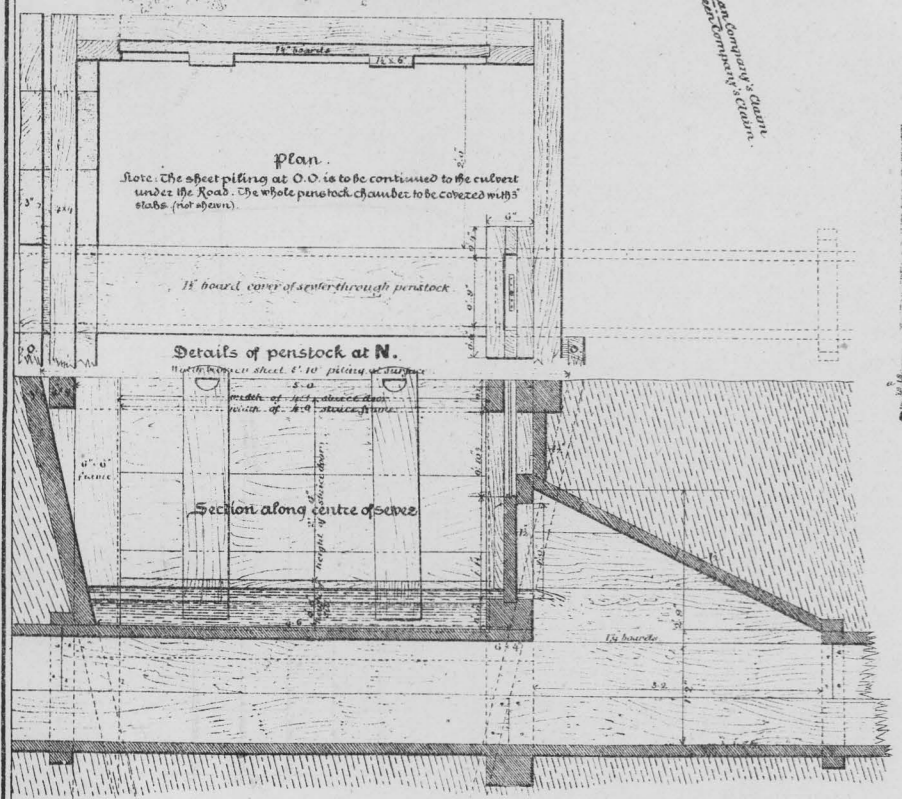
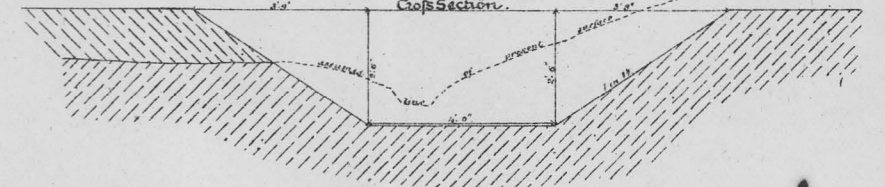
Details of Outlets of Sewers.



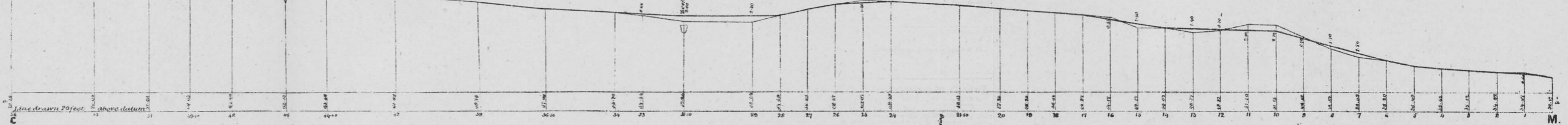
Rivulet diversion from K to L.



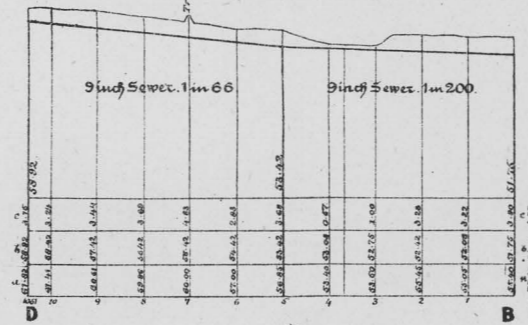
Rivulet Diversion K-L.



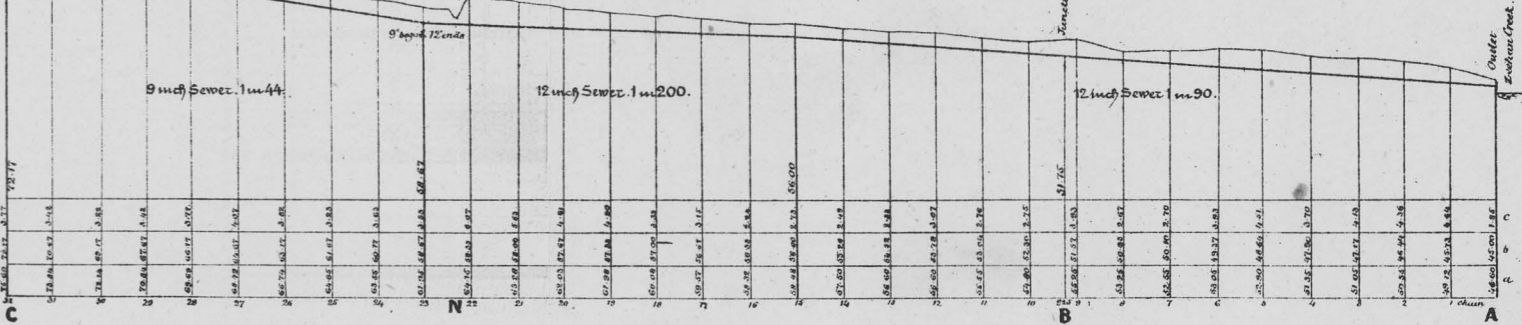
Section along Road from M to C.



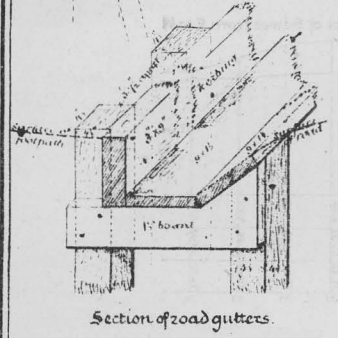
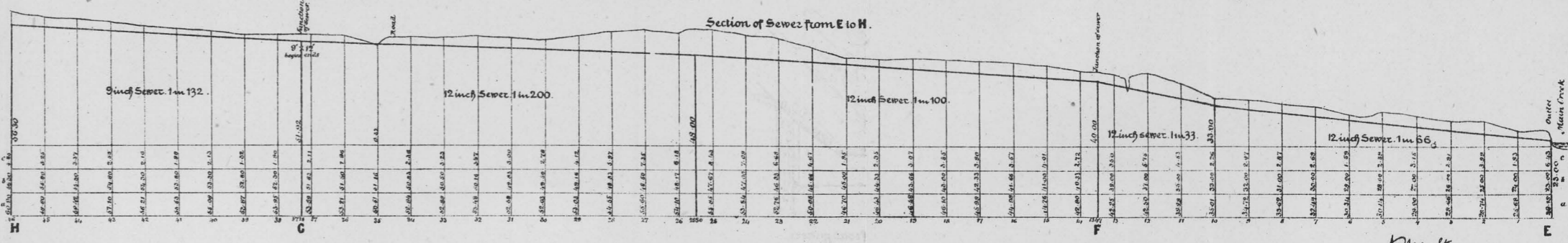
Section of sewer from B to D.



Section of Sewer from A to C.



Section of Sewer from E to H.



Plan Sections and Details to accompany Report on proposed Sanitary Works at Zeehan.

Longitudinal Scale of General Plan and of Sections.

Vertical Scale of General Sections.

Note: The Scales of the various Details are shown by the figured dimensions. The datum level is 50 feet below the bench mark on a tree stump near A on plan. The figures in the longitudinal columns of the sections marked a. a. show the heights of the present surface above datum; those in columns b. b. show the heights of the bottom of the excavations above datum; and those in columns c. c. the depths of the excavations. The general Sections are plotted from levels taken by Mr. G. Francis, C. E. of Zeehan. Junctions for house drains to be formed where marked B. a.

J. M. Munnell  
16th March, 1891.