

Waterproofing:

Track allowance, membrane and mastic, sq. yds.	1,306
Roadway, felt and waterproofing compound, sq. yds.	2,578
Back of retaining wall, sq. yds.	460
Granite bearings for 190-ft. span, cu. ft.	455

¹Of this total 228 cu. yds. is in footings for east abutment, 970 cu. yds. is in body of abutment and wing walls, 221 cu. yds. is in north longitudinal walls and 324 cu.

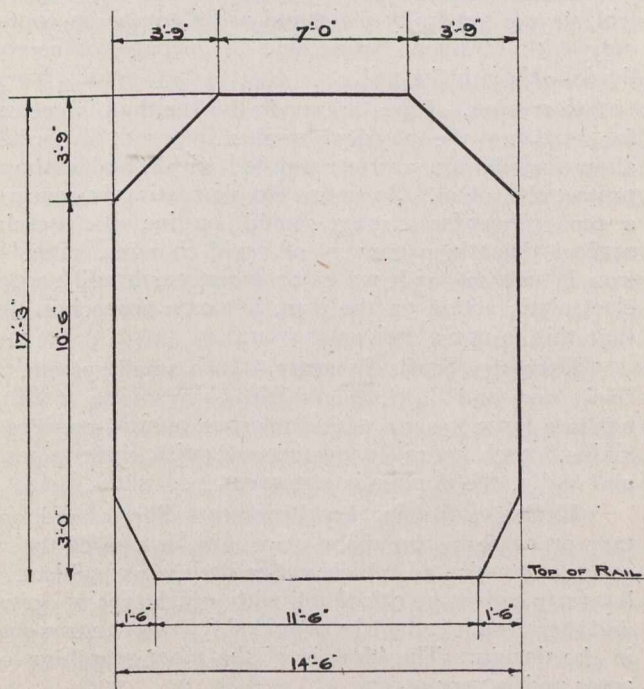


Fig. 4.—Clearance Diagram for Lower Deck (contemplated for the future).

yds. in a cross-wall above footings. ²This includes 620 cu. yds. in body of west abutment, 320 cu. yds. in longitudinal walls, 190 cu. yds. in soffit of 80-ft. span and 284 cu. yds. in side walls of 80-ft. span. ³Of this 1,257 cu. yds. is floor slab.

The material required for the lower deck includes the following:—

Steel in stringers, floor-beam stiffeners and anchor bolts, lbs.	352,000
Concrete in slabs, cu. yds.	316
Steel reinforcement in slabs, lbs.	32,300
Hook bolts in slabs, lbs.	550
Cast iron gullies and shoes, lbs.	11,800
Waterproofing, membrane and mastic, sq. yds. ...	510

Tenders for the Rosedale section were advertised for early in November and will be received up to December 21st, 1914. As in the case of the Don section, bids for steel will be accepted on the plan of the Department of Works, as described herein, and also on a reinforced concrete structure, in which case the tenderer will submit his own plans and specifications.

Among the latest incorporations is that of the Walkerville Roofing Mfg. Co., Limited, capitalized at \$60,000. Messrs. J. T. Sullivan, L. H. and C. J. Cheesement are associated with the new concern.

FLOW OF STEAM THROUGH PIPES.

There is perhaps no phase of power-plant design in which the rule-of-thumb methods are still adhered to so commonly as in the determination of the proper size of steam pipes.

Several reasons are attributed by "Power" to this: The commonly accepted formulas are complex, are not any too well substantiated by experimental data nor based on sound theory; the tables given by various writers are incomplete and inconvenient. The engineer who installs pipes which are too large will seldom be criticized, for the mistake shows but slightly in the first cost of the entire plant and the large radiation losses remain unnoticed. Many designers overestimate the importance of keeping the pressure drop in the lines low. Loss of pressure in a pipe line carrying any fluid is due to friction, and results in the transformation of energy of motion of the fluid as a whole into molecular energy or heat. In a water line this heat is usually a total loss, but with steam flowing in well covered pipes most of this heat is carried on with the steam, raising its temperature or its quality. Thus, instead of being able to figure the percentage loss of power as being equal to the percentage of pressure, as is usually true for water or electricity, the loss is materially reduced by the return of the heat to the steam. Or, the total energy of each pound of steam just after entering the pipe is, heat energy + pressure × volume energy + energy of velocity along the pipe.

Before leaving the pipe the heat energy has been drawn upon to increase the volume and also to increase the velocity of the steam, while at the same time the friction has been absorbing a part of the energy of velocity and returning it in the form of heat energy. So, if the pipe could be perfectly insulated all the energy entering the pipe would be delivered at the other end.

CANADIAN PATENTS OWNED BY GERMAN AND AUSTRIAN SUBJECTS.

The following is a list of Canadian patents issued to German and Austrian subjects during August, 1914. For the import of this information our readers are referred to *The Canadian Engineer* for October 29, 1914, page 589. In connection with the following list it is essential to note that the Commissioner of Patents will not void any of these patents, but will grant licenses under the same when the applicant can show that he is willing and intends to manufacture the invention in Canada, and that it is in the interest of Canada, part of Canada, or a particular trade that a license be granted. The applicant will also be required to pay a royalty to the government of probably about 5 per cent. of the selling price of the article.

- 157216, Aug. 4, 1914—Friction coupling. (Hungary.)
- 157219, Aug. 4, 1914—Fuse.
- 157221, Aug. 4, 1914—Type setting and distributing machine.
- 157236, Aug. 4, 1914—Iron manufacture.
- 157246, Aug. 4, 1914—Bicycle alarm.
- 157396, Aug. 18, 1914—Acid converting process.
- 157402, Aug. 18, 1914—Method of producing chemical reactions in gases.

We are indebted to Ridout and Maybee, Toronto, for the above list.