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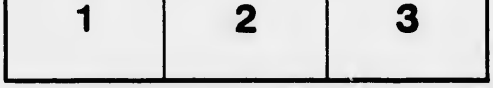

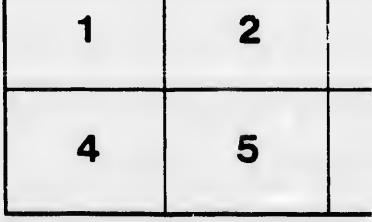

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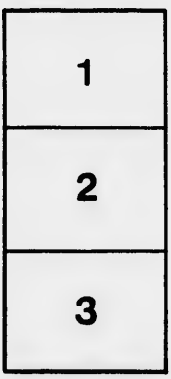

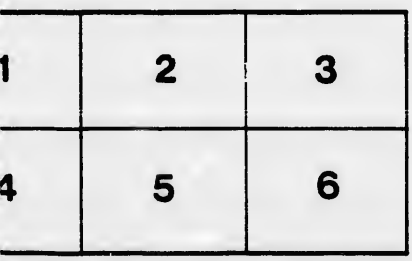

ATLANTIC AND NORTHWEST RAILWAY.

GENERAL SPECIFICATION

Extent of the work.

1. This specification refers to all works required for the construction of the above Railway

Work to be done.

2. The works to be done comprise clearing, close-cutting, grubbing, fencing, earth excavation, rock excavation, masonry, rip-rap, farm crossings, cattle-guards, and all other work necessary to fully complete a first-class single track railway up to sub-grade between the above-mentioned points, except the construction and erection of the iron superstructure of the Bridges.

CLEARING, CLOSE-CUTTING AND GRUBBING.

Clearing.

3. Where the line passes through wooded land, the entire right of way must be cleared of all the timber brush, stumps, etc., which must be either burned or removed from the right of way. No timber, brush, stumps or roots shall in any case be piled upon adjacent lands.

Close cutting

4. Where embankments are less than four feet and more than 18 inches, all trees and stumps are to be cut off close to the ground.

Grubbing.

5. In excavations less than three feet and embankments less than 18 inches, all trees and stumps must be grubbed out within the limits of such cuttings, ditches, drains or embankments, but in no case shall grubbing be paid for in borrow-pits.

Crossaying

6. In swamps or soft places, if so directed by the Manager, a cross-way of such breadth as he may direct shall be constructed of a depth of one foot or such greater depth as may be considered necessary. Said logs to be placed close together and to be not less than six inches in diameter and finally closely covered with brush. No ditches to be made on either side of such cross-way, unless with the permission of the Manager. This work will be paid for at so much per acre on a basis of one foot in depth of timber.

FENCING.

7. The entire line may be fenced with barbed wire fence of the best class in every respect, and is to be left by the contractor on the completion of the line in a state of thorough repair.

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Posts.

8. The posts are to be of round cedar, not less than five inches at the small end, they are to be straight and neatly dressed, with the bark all removed, they are to be placed four feet in the ground with the large end down and *not pointed*, except in soft ground, and then only with the Manager's consent in writing. They are to stand four feet six inches above the ground, to be placed eight feet, centre to centre, and to have the tops cut off at an angle of 45°.

Board.

9. Two boards 16 feet in length by six inches in width and 1¼ inches in thickness, are to be securely nailed at the top of the posts, as shown in the plans, with six four inch cut nails in each board.

Brace-posts.

10. Brace-posts must be placed at distances not exceeding 300 feet apart, as per detail plans to be furnished.

Wire.

11. There will be four-rows of barbed wire of No. 12 steel, to be of the best quality and of approved pattern, with barbs not less than six inches apart, to be fastened to the posts with staples of approved pattern, after having been stretched out.

Gates.

12. Gates to be made as per drawing shewn, with hinges, fastenings, &c., 14 feet in width and 4′ 6″ in height; the gate posts are to be well set and braced, and of the dimensions shewn on the drawing——

Grading.

Time of commencement.

13. No grading shall be commenced upon any cutting or embankment until the clearing, close-cutting and grubbing required shall be completed to the satisfaction of the Manager.

Responsible for damage to crops.

14. The Contractor for grading, will, in most cases, require to commence work before the fencing is built and it is clearly understood that he is to be responsible for all damage to crops on adjoining land, by reason of any damage that may be caused by the fences being removed or thrown down, either by men in his employ or by any one else in the employ of the company.

Extent of work.

15. The work to be done consists of all excavation and formation of embankments necessary for the construction of a single track railway and includes all sidings, road diversions, farm crossings, levelling of station grounds, &c., &c.

Width of cuttings and embankments.

16. The general width of cuttings shall be 22 feet at sub-gdade, b... when material is required to make fills, the cuttings must be widened for this purpose as required by the Manager before borrowing from any other source. All embankments shall be at east 16 feet in width at sub-grade.

17. All side ditches are to be graded so that no water will stand in them, they are to be executed in strict accordance with the lines and grades to be given, they are to be properly sloped and left clean and free from all obstructions. The tops of these ditches are in no case to be nearer the foot of the slopes of the embankments than five feet.

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Underdrains

18. All side-hill ground that is wet or spongy or likely to be affected by water, must be thoroughly underdrained, so that no water will lodge between the new bank and the old. The drains are to be put in as directed by the Manager, trenches will be cut longitudinally and transversely to a depth of about four feet and eighteen inches in width, in the bottom of these trenches, tiles of such dimensions as the case may require, or from three to six poles, averaging about five inches in diameter, will be laid breaking joint, these are to be covered with brush and, where possible, with 12 inches of gravel or small stones and then filled in with the earth taken out of the excavation. Similar drains to these are to be put in wet cuttings where directed by the Manager, they will be paid for at so much per lineal foot, the Contractor to find all the materials for the same.

Catch-water drains.

19. Catch-water ditches must be made along the tops of the excavation where required to keep water from flowing into the cuttings.

Berm.

20. In cuttings partly earth and partly rock, a berm of three feet will be left on the surface of the rock, unless otherwise directed by the Manager.

Precaution on side-hill grounds.

21. Where embankments are to be on side-hill grass land upon which the new work would, in the opinion of the Manager, have a tendency to slide, the Contractor shall have the surface broken up by deep ploughing before commencing the embankment.

Materials in embankments.

22. The materials to be placed in embankments must be approved by the Manager. All materials found in excavation, whether in road bed cuttings, ditches, water channels, road crossings or elsewhere, must be deposited in such places as the Manager may direct.

Borrowing.

23. In cases where the road-bed excavations are insufficient to form embankments, the deficiency will generally be made by widening the cuts and by putting ditches through them, but there will be special cases where other means of obtaining earth for embankments may be permitted by the Manager, but in no case will the Contractor be allowed to borrow without the consent in writing of the Manager.

Wasting.

24. No wasting on the sides of the cuttings or on the sides of the ditches will be allowed; where there is an excess of excavation, this surplus must be used for widening the embankments or for such other purposes as the Manager may direct.

Classification.

25. Excavation will be classed under three heads, viz.: *Solid Rock*, *Loose Rock* and *Earth*, and will be paid for according to the following definitions.

Solid rock.

26. All stone and boulders found in excavation, measuring more than 27 cubic feet, and all solid quarry stone requiring blasting in order to remove it, shall be termed solid rock.

Loose rock.

27. Loose rock shall include all kinds of shale, soapstone and other rock which, in the judgment of the Manager, can be removed with pick and bar without blasting, also detached stones of less than one cubic yard and more than three cubic feet.

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Earth.

28. All other excavation of whatever kind shall be termed *Earth Excavation*.

Extra haul.

29. The contract prices for the several classes of excavation shall be taken to include the cost of depositing the material in the embankment and all other expenses connected therewith, except extra haul, which will only be paid for where it exceeds 1,000 feet as so much per yard per additional 100 feet.

Rock outside of limit of lines or slopes.

30. No rock excavation will be allowed for beyond the limits of the base and slopes as specified. All rock loosened by explosives beyond the slope must be removed at the expense of the contractor, but if required to make up the embankment, will be paid for as earth.

Building materials in excavations.

31. In case where pitching or rip-rapping will be required for the protection of embankments contiguous to streams, all stone suitable for this work found in excavations may be removed and deposited in some convenient place until required, and all good building stone which may happen to be found in rock excavations, may, with the approval of the Manager, be preserved and used in masonry.

Service roads.

32. Roads constructed to and from any point on the line of railway for the convenience of the contractor, for the conveyance of material or otherwise, must be at his own risk, cost and charges, but the Company will provide the necessary land for the right-of-way and borrow pits.

Land.

Road crossings.

33. Wherever the line is intersected by public or private roads, the contractor must keep open, at his own cost, convenient passing places, and he shall be held responsible for keeping all crossings, during the progress of the works, in such condition as will enable the public to use them with perfect safety, and such as will give rise to no just ground of complaint. Contractors will be held liable for any damages resulting from negligence on their part or that of their men.

Ballast.

34. Whenever any material is met with in the excavations which the Manager shall consider suitable and required for ballast, the same shall, at his discretion, be reserved for that purpose.

Slips.

35. When slips occur in cuttings, after they are properly formed, the material must be immediately removed by the contractor, the slopes reformed, and such precautions adopted as the Manager may deem necessary. The contractor will be paid for the removal of slips at his schedule price.

Loose stone backing to walls.

36. In forming embankments, great care must be taken to place against the backs of all walls exposed to the action of frost, rip-rap backing, consisting of small stones blinded with spawls or coarse gravel, to prevent the retention of moisture and the action of frost thereon, the Manager to decide in each case the depth and thickness of such rip-rap. And in forming embankments between wing walls, against abutments of bridges, viaducts or culverts, and over arches, the earth-filling must be carefully packed or punned in thin layers, and a proper quantity of material must be carefully placed equally against each side of and over all bridges, culverts or other work, before the embankment approaches it,—and in forming embankments, the greatest care must be observed, and every precaution must be taken to load the masonry of structures evenly. The price for excavation must be considered sufficient to cover the cost of punning. The loose stone backing, to walls above referred to, will be paid for as rip-rap.

Measurement in excavation.

37. The measurement of quantities shall invariably be made in excavation, unless in special cases where this may be found impossible; in such cases the Manager shall determine the quantities in embankment, after making all proper allowances for shrinkage, of which he shall be the judge.

Prices to cover every contingency.

38. The prices stipulated for excavation of the several denominations, together with the price for haul, shall be the total prices for excavating, loading, removing and depositing all the material—in a word, the rates and prices stipulated in the contract must be understood to cover every contingency: the furnishing of all labour, material, power and plant, the cost of finishing up cuts and embankments, the dressing and draining of borrowing pits when required, the dressing of slopes to the required angle, and the completing of everything connected with the grading of the road-bed in a creditable and workmanlike manner, in accordance with the directions and to the satisfaction of the Manager.

Timber Work.

Quality of timber.

39. The timber used in all truss or trestle bridges, culverts or cattle-guards, must be of the very best description of the kind required, free from all loose, large or unsound knots, sap, sun cracks, shakes, wanes more than one inch across, or other imperfections; it must be sawn or hewn square and out of wind, and when delivered, must in every way conform to the specification. Sawn ties must be used on all bridges.

40. The stringers must be of the best class of white pine or tamarac, and must, in addition to the requirements above mentioned, be free from all sap, knots, wanes or anything else that would impair their transverse strength.

Inspection.

41. Inspection will be made when delivered on the Company's ground, or other place pointed out by the Manager.

Alterations in bills of timber, etc.

42. The Company retains the right at any time to change the bills of timber, vary the dimensions, substitute one kind of structure for another, or increase the number of the same (providing always, that none of the material has been cut at the mill or delivered on the ground), without the contract price being thereby effected, or in any way rendering void the contract for the original figures.

Mode of delivery.

43. In delivering timber, it must be piled or placed in such a manner that no trouble will be experienced when inspecting or measuring it.

Timber in trestles, etc.

44. Mud-sills in all cases to be of cedar. The timber for cattle-guards and culverts will be of cedar (except the cattle-guard stringers, which must be of pine, white oak or rock elm). All timber must come fully up to the dimensions called for in the bills and drawings.

Pins.

45. White oak or rock elm pins of such dimensions, of such shape, and in such numbers as deemed necessary by the Manager, shall be used in pinning in a proper manner the timbers in all culverts and cattle-guards.

Framing.

46. All framing must be made to fit closely, and must be done in a thorough and workmanlike manner; no open joints or filling pieces will be allowed. All surfaces, where wood touches wood, in trestles and bridges, must be thoroughly painted, before being put together, with a good coat of white lead.

Protection from moisture.

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Supervision.

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Protection from moisture.

47. Mortices and tenons to be well and truly made, and all bedded in white lead; all ends of timber to be painted with white lead.

Supervision.

48. Each structure must be under the supervision of a first class practical bridge foreman; and any foreman or workman who, in the opinion of the Manager, is not competent, must be at once discharged.

Price to cover all cost

49. The price per lineal foot, or per thousand feet, board measure, is understood to cover all expenses incurred in teaming and completing the structures to the satisfaction of the Manager.

Piles.

50. Piles will consist of white oak, tamarac, oak elm, or other approved timber; must be straight and sound throughout, and not less than ten inches in diameter at the small end, not including the bark. Where required, a detailed plan will be furnished by the Manager, showing their position and method of tenoning, bolting, etc., and they shall be driven to such a limit of resistance as the Manager shall determine. The contractor must properly point each pile for driving, and supply and fix all rings for heads, also shoes where necessary.

Broken piles.

51. Should any pile be broken in driving, another sound pile must be driven in its place at the expense of the contractor. During the progress of the driving, wrought iron bands must be supplied by the contractor.

Piles, how measured.

52. The piles to be paid for as so much per lineal foot, measured in the finished structure, which will include all work in connection therewith, including cutting off, squaring, and lining up, tenoning, etc., etc.

Iron in Timber Work.

Wrought iron.

53. All wrought iron used in the construction of the bridges, trestles or other work or foundations, to be of the very best quality, to stand a tensile strain of 55,000 lbs. per square inch, and to stand bending over around its own diameter without shewing signs of any flaw or crack.

Cast iron.

54. All castings to be made of best grey iron, and, when finished, to show a clean, smooth surface, free from holes, cinders, or other imperfections. All iron

Price.

will be paid for at so much per pound in the work.

Foundations, Cofferdams, &c.

Cofferdams and caissons.

55. When the foundations of any structure are on rock, the Contractor will be allowed to adopt any plan for his cofferdams that he may desire, providing he is able to lay the foundations dry, so as to properly level off the rock to receive the masonry. He will also be allowed, in building piers on rock bottoms, and where the rock is considered suitable by the Manager, to sink a bottomless caisson, fitted closely to the rock, into which he can deposit Portland cement, concrete, to a depth not exceeding one-third of the depth of the foundations from the surface of low water. When this concrete is properly set, the caisson may be pumped out, and the masonry commenced from its surface, after it has been properly levelled and prepared.

Surface of rock where it is inclined.

56. Where the surface of the rock is smooth and inclined, so that the piers would, in the opinion of the Manager, have a tendency to slide upon it, the Contractor will be required to level, step, or roughen, as the Manager may consider

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necessary, the surface of the rock, so as to make it a secure and safe foundation on which to deposit the concrete or build the masonry.

Mode of depositing concrete.

Where bottomless caissons are used, particular care must be taken in depositing the concrete, so that it will not fall any distance through the water. It must be deposited in a covered box, of approved pattern, holding about two cubic yards, and when the box of concrete is placed in the bottom the box must be drawn up from the concrete. Care must be taken that no hollow places are left in any portion of the caisson, and divers must be sent down, to see that all angles and spaces around timbers, are properly filled and packed.

Piles.

58. In soft ground where piles are required they are to be driven with such weight of hammer and to such a depth as the Manager may require, they are then to be sawn off square below water, at a uniform level, and capped with 12" by 12" timber, concrete will then be placed as directed between the piles and capping and rammed so as to fill all spaces. Masonry may be commenced upon this as soon as the cement has set and after it has been approved by the Manager. In no case must any masonry be commenced till the foundation has been approved by the Manager.

Cost of work on foundation.

59. It is to be understood that the cost of all caissons and cofferdams, or other modes of putting in the foundations of the piers and abutments, as well as all pumping and bailing, and all dressing or preparing the surface of the rock or the surface of the concrete or masonry, or any other work or material that may be required in connection with the foundation, is to be included in the price of the masonry, and that nothing whatever will be paid on account of any labour or material put in cofferdams or caissons, or on account of removing boulders or any other material from the surface of the rock or on account of any plant, labour or material, required to place the dams or caissons in position, or to keep them dry, except the schedule price for the earth or rock excavated in, or removed from, the foundation and the schedule price for the timber, piles, the capping of the piles and the concrete filling between the piles and the capping.

Soundness not guaranteed.

60. The soundings and borings, shown on the plan exhibited with the specification, are believed to be accurate, but should any errors be found hereafter during the prosecution of the work, the Company will not be liable for any extras or claims on account of increased or diminished work. The Company will only pay the respective schedule rate for the amount of earth or rock excavation that may be necessary to prepare a suitable foundation, and will not allow any extras, on account of increased or diminished depth of water, or on account of an increased or diminished quantity of excavation, or increased or diminished quantity of masonry, that may be required to bring the piers or abutments up to the required height.

Concrete.

61. The concrete must be composed of Portland cement, that will stand the prescribed test, of good, clean, sharp, river sand, and broken stone that will pass through a two-inch mesh, in the proportion of one part of cement, one part of sand, and as much stone as the above mortar will take, so as to completely fill all the voids in the stone. This concrete must be thoroughly mixed till each stone is thoroughly coated with mortar, and then allowed to set to a slight extent before being deposited in the caissons. Concrete will be paid for at so much per cubic yard, measured in the work.

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First-Class Masonry.

Class of masonry.

62. This masonry will be of the class known as Rock-faced Ashlar, and must be first-class in every respect.

Quality of stone.

63. The stone to be used in the abutments, piers, arches, etc., must be approved by the Manager, and must be of the best quality, and in every way suitable for the purpose for which it is to be used. It must be sound and durable, free from all drys, shakes, or flaws of any kind whatever, and must be of such character as to withstand the action of the weather. No stone of an inferior quality will be accepted, or even permitted to be delivered upon the ground.

Dressing beds and joints.

64. The beds of all stone for face work, and the backing where required to receive headers, must be dressed parallel throughout, so as to form quarter-inch joints, and the vertical joints of the face stones must be dressed back square for nine inches, so as to form quarter-inch joints.

Coping to be chisel-dressed.

65. The coping stones, chamfers, arrises and cutwaters, must be neatly chisel-dressed, as shown in the detailed plans, and as directed during the progress of the work.

Arch stones.

66. In all arches, the arch-stones must be cut so that, when laid, their ends will radiate truly from the centre of the circle, they must be dressed to the full depth of the bed, so as to give truly radiated joints, so that when set, no joint will exceed one-quarter of an inch. All end joints must be dressed square, arch stones must not have a less length than 27 inches, and must break joint by at least 10 inches. Their thickness at the soffit must not be less than 12 inches, and the soffit must be neatly dressed to the circle, or at least 1½ inch on each side the longitudinal joints. The outer ring stones must be neatly worked with a chamfer and chisel draft around their edges.

Arch centres

67. The centres of the arches must in all cases be well formed, of ample strength, and securely placed in position. The ribs must not be further apart than three feet, and the lagging must be three inches squares. The supports of the centres must be strong and substantial, and they must be provided with proper wedges for easing the centres when required.

Headers.

68. Headers must be built in every course not more than six feet apart, and so arranged with the adjoining courses as to leave them equally distributed over the faces of the structure. They must have a length, in the face of work, of not less than 24 inches, and a depth of a least 2½ times their height, unless the wall will not allow this proportion, in which case they must pass from front to back. In the abutments, where the headers do not pass through the wall, they must be built in from the back and front alternately.

Stretchers.

69. Stretchers must not be less than 30 inches, nor more than 72 inches, in length, and their breadth must be at least 1½ times their height. The vertical joints must be so arranged as to overlap those in the course below, at least 10 inches, for the 15 inch courses, with one inch additional lap for each three inches increased thickness of course.

Cut-waters.

70. The cutwater stones must be arranged as shewn in the detailed plans. The vertical joints must all be dressed back square to the full depth of the

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stone. Iron clamps of the required dimensions with bolts passing through from, down through one course and one-half of masonry, must be let into the stones in the manner shewn in the plans, and the holes filled in with neat cement.

Backing beds and joints.

71. The beds of the backing must be pointed off where headers are to be placed. The vertical joints of the backing will generally be left as they come from the quarry, unless they should be found of such a nature as to make the joints average more than two inches in which, in which case they must be hammered off, so as to make the joint of the required width. Care must be taken in arranging the backing, so as to afford proper ties for the headers, and to get the stones as close together as possible.

Size of backing.

72. The backing, generally, must have an area of bed of at least four superficial feet. In every case, the beds under headers must make joints equal to the face work and no pinning of any kind will be allowed under bottom beds. Where headers do not come, the courses need not be levelled off, but may project into the course above.

Face of work.

73. The work must be left with a clean quarry face, free from all rust or stain, or marks of any kind, and in no place must the rock face project more than four inches beyond the line of pitching.

Time when work may be commenced.

74. No masonry shall be commenced before the Manager shall have examined and approved of the foundations, nor until the contractor shall have provided appliances and material of such a kind and in such quantities as shall be approved of by the Manager.

Grouting.

75. Every stone must be laid with a full bed of cement mortar, and beaten solid. Spaces in the vertical joints, large enough to be built, must be built up and all other vertical joints must be thoroughly grouted and each course finished off perfectly solid.

Pointing.

76. All the work must be carefully pointed with neat cement, and at the completion of the contract, the work must be left in neat, clean and workmanlike condition, to the satisfaction of the Manager.

Removal of coffer dams.

77. All coffer dams, outer caissons, and other materials (of such a nature as to obstruct the flow of water), that have been put in the river by the Contractor, shall be removed at his expense, as soon as the structure for which it was used has been completed.

Fillinground abutments.

78. No earthwork shall be filled around the abutments till at least two weeks after the masonry has been laid, and the earth must be carefully punned in thin horizontal layers around the walls.

Coping stones.

79. The coping of all piers and abutments shall be of the best stone to be found in the quarries, and shall not be less than twenty-four inches in thickness; it shall be dressed square throughout to quarter inch joints, and shall be laid perfectly level.

Girder beds.

80. The girder beds shall be twenty-four inches in thickness, and for the piers shall, if possible, be through stones; they shall not be less than thirty-six inches in width, and shall be so arranged that the girders shall set fairly on the middle of the stones.

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Price of masonry.

81. It is understood that the price for masonry put in the schedule is to cover the cost of all materials, plant and workmanship necessary for the construction of the masonry, as well as for the construction of the coffer dams, or caissons, and all pumping or bailing, and any other work required to found the piers, abutments, &c., in a sound and substantial manner and that no extra price will be paid for any work that may be required to secure this object. The profiles of the bottom of the river crossings have been prepared from soundings, but the Company will not be responsible for their accuracy. The Contractor must satisfy himself on this point, and it is to be fully understood that no claims for extras will be permitted on account of any inaccurary in the plans and that the Contractor shall have no claim for extras on account of any increased or diminished quantities of masonry in any pier or abutment, or on account of any increased or diminished depth of water on the site of any of the piers or abutments, he shall only be paid for the actual quantities at the schedule rate.

Second class Masonry.

82. This masonry will be similar in all respects to the First class Masonry, except that broken courses will be allowed, and that stones eight inches in thickness may be used, the stones must be of as large area as first class stone, that is, the width of the headers and stretchers will be based on a thickness of 15 inches, that is, stretchers must have a width of bed of 22 inches and headers a width of 37 inches.

83. This masonry may be used in the cross and wing walls of abutments, where buried in the earth, and in other places where required by the Manager.

Culvert Masonry.

Where used.

84. Masonry of this class will only be used in box culverts.

Stone.

85. The stone to be used must be good and sound laid on its natural bed, and must not have a thickness of less than 10 inches, and an area of bed of not less than three superficial feet.

86. The courses may be broken, joints must be hammer-dressed or pointed down so as to make them not more than half an inch in thickness.

Headers.

87. Headers must be built in every course not more than six feet apart, and in the side walls must run through the wall from front to back.

Stretchers.

88. Stretchers must have a depth in the wall of 1½ times the thickness. The stone in the ends of culverts must be uniform on each side of the opening.

Backing.

89. The backing must be built of good large flat bedded stone, well tied into the face stone, and thoroughly flushed up full and solid with mortar.

Mortar

90. The mortar must be made of Portland cement in the proportion of one of cement to three of good, clear, sharp coarse-grained sand.

Bedded.

91. The foundation course, except where on rock, will be built solid from outside to outside of culvert, and will be made of good, large, flat stone, flushed solid with cement mortar. Under the side walls, the foundation course must be pointed off, so as to make half-inch joints with the dressed stone in the work above.

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92. Box culverts may also be laid dry, but in this case, the stone must be of a superior class, approved of by the Manager as suitable for this work; the stone in the bottoms and side walls must all be dressed to half-inch joints. The top course under the covers must be all through stone. No course must be less than 12 inches in thickness, unless specially permitted in writing by the Manager.

Cement.

Quality of cement.

93. All masonry, where required, shall be laid in freshly ground Portland cement of approved brands. It shall not weigh less than 110 lbs. to the struck bushel, nor shall less than 80 per cent pass through a sieve containing 2,500 meshes per square inch, and the tensile strength of neat cement kept in water at a temperature of 60° Fah., at the end of seven days, shall not be less than 250 lbs. to the square inch. It shall be tested by the Manager on delivery, and shall be kept in a dry place, in as good order as when delivered, till used. Rosendale cement may be used when permitted by the Manager.

Proportion of sand to cement.

94. The cement must be thoroughly mixed with good clean, sharp, coarse-grained river or washed sand, generally in the proportion of one part of cement to two parts of sand by measure. The cutwater stones and coping shall be laid with mortar in the proportions of one part of cement to one of sand.

Mixing cement.

95. The cement shall only be mixed as required; any cement mortar left over at noon or at night shall not be used,—and it must be prepared by the Contractor's men under the supervision and to the satisfaction of the Inspector, failing which, the Inspector, with the sanction of the Manager, may employ men to prepare the mortar, and the expense incurred shall be charged to the Contractor and deducted from his estimate.

Rip-Rap, Etc.

Rip-rap hand-laid.

96. Embankments, at such points as may be designated, will be protected with hand-laid rip-rap, which is to have a thickness of three feet at the ground and two feet at the top; the stones are to be placed on edge, at right angles to the slope of embankments; no stones are to be used having a less depth than 18 inches. The top of the work is to be finished with a coping two feet deep, having a face width of nine inches, and to be not less than three feet long.

Rip-rap at certain piers.

97. Such piers as the Manager may direct are to be surrounded with ordinary loose rip-rap, to such a height and width as he may consider necessary. The same class of rip-rap will be used behind walls of abutments, etc.

General.

Alterations.

98. The Manager shall, at any time, either before the commencement or during the construction of any portion of the work, be at liberty to make any alteration or change that he may deem advisable either in the grades or alignment, the width of cuttings or embankments, the dimensions or character of structures, or in any other things connected with the works, whether the same increases or diminishes the quantities,—and the Contractor shall only be allowed at the same rate as in his schedule of prices attached, and no extras of any description will be allowed. The rates and prices in the schedule must be understood to include not only the particular work or material mentioned, but

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also all and every kind of work, labor, tools, plant, and materials, of whatsoever kind, necessary for the full execution and completion, ready for use, of the respective portions of the works, to the satisfaction of the Manager.

Manner of carrying on the work.

99. The Contractor shall carry on the works at such places and in such a manner as he shall be directed, from time to time, by the Manager.

Slips in earth-work.

100. The Contractor will be held responsible for all work that may prove defective, owing to bad material or workmanship, supplied by him, or through want of proper precaution, previous to the granting of the final certificate.

Insufficient workmen or material.

101. If at any time the number of workmen or horses, or the amount of material or other plant shall, in the opinion of the Manager, be insufficient for the due completion of the works in the time specified, or that the works are, or some part thereof, is not being carried on with due diligence, then, in every such case, the said Manager shall have the power to notify the Contractor in writing to employ or provide such additional workmen, horses, material or plant as the said Manager may think necessary; and in case the said Contractor shall not thereupon, within three days or such longer time as may be fixed by any such notice, in all respects comply therewith, he, the said Manager, shall have power to provide any workmen, horses, material or plant he may think proper; and all moneys so expended by the Company shall thereupon be paid by the Contractor, or may be deducted or retained out of any moneys due or to become due to the Contractor,—and should these moneys be insufficient, the balance shall be recoverable in the usual way as a debt due by the Contractor to the Company.

Removal of condemned material.

102. In case any material is, in the opinion of the Manager, not in accordance with the terms of the Contract, and is condemned as unsuitable or inferior, it shall at once be removed by the Contractor from the works, or should this not be done, the Manager may, on giving three days' notice, cause the same to be removed, and the cost of such removal shall be deducted from any moneys due or to become due to the Contractor.

Work not mentioned in schedule of prices.

103. If any work or service be required to be done which is not named in the "Schedule of Prices," the Manager shall be at liberty to direct the Contractor to perform the same, paying him the actual cost of any such work or material, with an addition of ten per cent. to cover the use of tools and profit.

Contractor's representative.

104. In the absence of the Contractor, a competent agent or foreman shall represent him on the works, who shall be considered the lawful representative of the Contractor, and any orders given to such agent or foreman shall be deemed given to the Contractor.

Land by whom provided.

105. The Company will provide the necessary land for the right of way of the Railway, and borrow pits, but the Contractor will have to provide, at his own cost, any land required for procuring material or conducting his operations.

Detailed drawings of structures.

106. When considered necessary by the manager, detailed drawings of the different structures will be furnished to the Contractor from time to time as the work progresses.

Mode of payment.

107. Cash payments, equal to 90 per cent. of the value of the work done and material delivered, approximately made up from returns of progress measurements, and computed at the schedule prices, shall be made to the Contractor monthly, on the written certificate of the Manager, that the work, on account

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of which the certificate is granted, has been executed to his satisfaction. The remaining ten per cent. shall be retained until the final completion of the whole work to the satisfaction of the Manager, and shall be paid within two months after such final completion, but such progress, measurements or certificates shall not in any respect be taken as an acceptance of the work or release of the Contractor from responsibility in respect thereof, but he shall, at the conclusion of the work, deliver over the same in good order.

Payment of wages.

108. The wages of all persons, of any class, employed upon or in respect of any of the said works, shall be paid at least once a month; if possible, said payment shall be made upon the works or some point convenient to the same, but in no case at a tavern or other place where liquors are sold.

Selling of liquor by Contractor.

109. The Contractor, or any person directly or indirectly employed by him, shall in no case establish any tavern, or store, or other place for the supply of liquors or other intoxicating drinks.

Power to enter upon works.

110. The Company retains the right to enter upon the works at any time, and to carry on any work that may be considered necessary by the Manager, in order to erect the iron superstructure of the bridge or any other work that may be required by the Company, and it is to be understood that this taking possession of the piers and abutments as they are ready for the superstructure, or other portions of the work, is not to be considered a final acceptance of the work thus taken possession of.

Damages to adjoining property.

111. The Contractor will be held responsible for any damage done by himself or parties in his employment to property adjoining the railway.

Employees.

112. The Contractor shall employ mechanics for every species of mechanical work. No stone work of any quality shall be laid by other than regular masons who have served their time as such. The employees of the Contractor shall at all times obey the directions of the Manager or his deputies with respect to the work; and if any overseer, agent or workman of the Contractor shall be found unfaithful or incompetent by the Manager, or shall neglect or refuse to obey all reasonable orders of the Manager or his deputies, or shall have promoted disturbance upon the work, the Contractor shall, on being required so to do by the Manager, at once discharge said person, and shall no longer employ him upon the work.

Extra work.

113. No allowance will be made for extra work, except upon a written agreement signed by the Contractor and the Manager, or under the written order of the Manager. All claims for extra work so ordered must be made to the Manager in writing before the payment of the next succeeding estimate after the work was performed, and failing to make such claim, the same shall be considered as abandoned by the Contractor.

Sub-letting.

114. The Contractor will not be permitted to sub-let any portion of this work without the consent of the Company, and their approval of the sub-Contractor; which consent or approval, however, shall by no means be considered a recognition of such sub-Contractor. The Contractor shall be bound at all times to have an office on the works, where, by himself or some authorized agent, all notices or requisitions from the Company or the Manager may be received and acknowledged.

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Stakes and bench marks

115. All grades, dimensions, etc., will be given by the proper stakes and bench-marks, such stakes and bench-marks must be preserved by the Contractor until the prosecution of the work requires their removal. If the Contractor, in a careless or wilful manner, removes or causes the removal of any of said stakes or bench-marks before the prosecution of the work requires it, the expense of replacing them will be charged to the Contractor, and the amount deducted from the amount due on his final estimate.

Right of way

116. The Company will use due diligence in securing the right of way, but will not be responsible for delays in this connection. All such delays shall only have the effect of entitling the Contractor to additional time for the completion of his work. The Manager to be the judge as to the loss of time and the additional time to be allowed the contractor for the completion of his contract.

Manager to be sole judge of the work.

117. All works are to be done to the entire satisfaction of the Manager. He is to be the sole judge of work or material, in respect both of quality and quantity, and his decisions on all questions of dispute, with regard to the work or materials, or as to the meaning or interpretation of the plans or specifications is to be considered final and binding on all parties.

118. The word "Manager," shall mean the Manager of construction, for the time being, having control over the work on behalf of the Company, or as the case may be, any person specially authorized by him to perform any of the functions or exercise any of the powers hereby allotted to or conferred upon him as such Manager.

JAMES ROSS,

Manager,

SHERBROOKE, P. Q.

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