

30

Madras Drainage.

SPECIFICATION

OF

BLACK TOWN BRANCH SEWER,

AND

WORKS IN CONNECTION THEREWITH.

MADRAS :

PRINTED BY H. SMITH, AT THE FORT SAINT GEORGE GAZETTE PRESS.

XXIII

Articles of Agreement entered into the
day of _____ in the year one thousand eight hundred
and sixty _____ Between

_____ of the one part, and

_____ of the other part.

WHEREAS the said

_____ (hereinafter called Contractor)

proposed to the said

in consideration of the payment of the sum of Rupees

to be made to _____ as hereinafter mentioned, to execute the works,
to abide by the forms, and fulfil the terms, agreements, conditions, and
provisions hereinafter set forth, (that is to say):

Madras Drainage.

BLACK TOWN BRANCH SEWER.

Specification of Works to be done in constructing, completing, and maintaining in perfect repair for twelve calendar months from the date of completion of the whole thereof, the following works, that is to say—certain intended sewers 2 miles 750 ft. in length, or thereabouts, with other works in connection therewith, from a point a few yards to the West of the Tannah near Vurdah Mooteapen Street and Govindapa Naidoo Street, in Black Town, to a point North of the Government Distillery and South of the Madras Railway.

DRAWINGS.

1. The works comprised in this contract are to be executed according to the following drawings:—

- No. 1. Index Plan and Index Section,
- „ 2. Detail Plan,
- „ 3. Detail Section,
- „ 4. Details (Man Holes, Side-Entrances, Ventilators, and Flushing Reservoirs),
- „ 5. Borings,

and according to any other drawings which may hereafter be furnished to the Contractor, subject to any modifications, whether these consist of additions or deductions, which the Engineer may, during the execution of the works, think necessary to make.

WORKS.

2. The sewer begins at a point in the street to the North of the Route of sewer. Tannah near Vurdah Mooteapen Street and Govindapa Naidoo Street, in Black Town. It runs under this Street up to the South end of Popham's Broadway, and passes through Black Town under Popham's Broadway. It issues out of Black Town under Monegar Choultry gate, and then takes a turn to the west, passing under open ground lying to the north of the Rampart. It crosses Trivatoor High Road, and thence continues its course up to a point 250 ft. from its junction with the Main Sewer.
3. CONSTRUCT IN OPEN CUTTING, with an inclination of 1 in 960, Sewers. 7,235 ft. run of egg-shaped sewer, 3 ft. by 2 ft. (internal measurement), of the form and dimensions shown in Cross Section in Drawing No. 3, Sheets Nos. 1, 2, 3, 4, and 5, from a point near the Tannah near Vurdah Mooteapen and Govindapah Naidoo Streets, to the Monegar Choultry gate to Black Town.
4. CONSTRUCT IN OPEN CUTTING, with an inclination of 1 in 1,173, in continuation from the last mentioned point, 4,075 ft. run of egg-shaped sewer, 3 ft. 6 in. by 2 ft. 4 in. (internal measurement), of the form and dimensions shown in Cross Section in Drawing No. 3, Sheets Nos. 5, 6, and 7, to a point North of the Government Distillery and 250 ft. from the point of junction between the Main and Black Town Branch Sewers.
5. Both the abovementioned sewers, to be constructed partly of Sewer, of what brick in hydraulic cement, and partly of concrete, in accordance with materials to be the Cross Sections shown in Drawing No. 3. Both sewers to have throughout their entire length their internal surfaces coated with a coating of asphalte not less than a quarter of an in. thick. built.
6. A Head Wall, 9 ins. or one brick thick, with an exterior wall Head Wall. of concrete 6 ins. thick, to be built at the beginning of the sewer.
7. The Sewer to be connected with the Royapooram Branch Bell-mouth Junc- Sewer by a Bell-mouth Junction, in accordance with the Plan and tion. Sections shown on Drawing No. 1.
8. To construct 93 ft. run of the Royapooram Branch Sewer, the Part of Royapoo- length to be measured from the point of junction with the Black Town ram Branch to Branch along the centre line of the Royapooram Branch. be built.
9. The Bell-mouth Junction to be built partly of brick in Bell-mouth Junc- hydraulic cement, partly of concrete, and partly of granite, of the tion how to be form and dimensions shown on Drawing No. 1. built.

10. To construct 10 Man-Holes, each with a Ventilator and Man-Holes. Flushing Reservoir, in the positions marked in the Drawings, or where the Engineer may direct, and generally of the form, dimensions, and materials shown in Drawing No. 4.

11. To construct 24 Side-entrances, each with a Ventilator and Side-Entrances. Flushing Reservoir, in the positions marked in the Drawings, or where the Engineer may direct, and generally of the form, dimensions, and materials shown in Drawing No. 4.

12. The quantities of materials for the Man-Holes (each with a Ventilator and Flushing Reservoir), and for the Side-Entrances (each with a Ventilator and Flushing Reservoir), shall be taken from Drawing No. 4, the form and dimensions shown in which shall be considered as an average of the whole, although the particular dimensions in each instance may vary from those in the Drawing. Any variation in excess or deficiency to be considered as extra or diminished work, to be adjusted according to the Schedule of Prices attached.

Quantities of materials for Man-Holes and Side-Entrances.

GENERAL INSTRUCTIONS.

13. The whole of the brickwork executed under this Contract Bricks. shall consist of machine-made steam-pressed bricks, laid in the best hydraulic cement, with a coating of asphalte to be laid on as hereinafter described.

14. The whole of the brickwork executed under this contract Brickwork. shall be built in blocks above ground previously to being put into position in the sewers and other works. Each block shall be at least 18 inches long by 12 inches high, and there shall be a sufficient number of boxes provided by the Contractor, to admit of the blocks remaining in the boxes for at least two days. As soon as each block has been built, the joints on that side of it which shall correspond with the internal surface of the sewers, or other works, shall be scraped and kept open to the depth of not less than one inch. After the Asphalte. block has been removed from the box and after the hydraulic cement has become perfectly hard and set, that side of it which shall correspond with the internal surface of the sewer, or other work, shall be coated with a coating of asphalte not less than a quarter of an inch thick. The asphalte shall be poured in a melted state into the joints, so as completely to fill them, and the coating when finished and dry shall be perfectly smooth and even. The asphalte coating shall in no case be laid on until three days have elapsed from that on which the block was removed from the box. The asphalte shall be boiled with linseed oil in proportions to be decided by the Engineer, and no sand or other material shall be mixed with it.

15. The brickwork shall be executed in the best manner, the Brickwork how blocks laid evenly and uniformly to the curvature of the moulds and to be executed. centres, in neat, close, and regular joints, kept straight or regularly curved as the case may be, with the direction, and parallel with the rise of the sewer. The brickwork in the blocks generally to be in Old English or other bond as may be ordered, and to break joint correctly with the bricks underneath. The joints of the blocks with each other on the internal surface of the sewer, or other work, to be finished off smooth with melted asphalte to the depth of at least one inch. The joints of the bricks with each other or of the blocks with each other shall not exceed 3-16ths of an inch in thickness.

16. The bottom of the inverts of the sewers, except at the Invert Blocks. Bell-mouth Junction, and at the Man-holes and Side-entrances, shall be built with earthenware invert blocks set in the best hydraulic cement. At the Bell-mouth Junction and at the Man-holes and Side-

entrances, and for the lengths and in the manner shown in Drawings Nos. 1 and 4, the bottom of the inverts shall be built with Palaveram granite 3 line dressed, cut perfectly smooth, and even with the sides and curvature of the sewer.

17. The ground along the line of proposed works shall be Excavation. excavated in such lengths at one time as the Engineer may direct, and to the depth of the bottom of the concrete foundations of the sewers, as shown in Drawing No. 3, or to such depth as may be required to obtain a secure foundation; the sides of the excavation shall be supported by suitable timber, and close-timbered wherever the Engineer may consider necessary. Any additional depth of excavation, and any additional concrete, to be paid for as extra according to the Schedule of Prices attached. Where directed, and this is possible, the ground shall be cut for the reception of the invert of the sewer, to the exact form and depth required.

18. Upon the completion of each length of sewer and of the concrete filling round it, and after the same have been approved in writing by the Engineer, the trench shall be filled to the original height of the surface of the ground with the best of the excavated materials in layers, not more than six inches thick, and each layer shall be carefully rammed down with iron punners of not less than lbs. in weight. Filling in of trenches and punning.

19. The Contractor shall provide a sufficient amount of Centering. centering to admit of the centers remaining in till the work has set, and the ground has been filled in over the arch. The centers shall be renewed as often as the Engineer may consider necessary.

20. The Contractor shall fill in all irregular and vacant Irregularities to be filled up. spaces with concrete, clay, gravel, or other material firmly rammed in, wherever he may be required so to do by the Engineer.

21. The Contractor shall find all necessary shoots for, and Superfluous earth, &c., to be removed. shall remove from the works with all convenient speed, all superfluous earth, and all rubbish, materials, and other matters which the Engineer shall direct to be removed, and shall at their completion leave the entire line of works clear as before commencement.

22. But no sand or gravel will be allowed to be carted off the Sand and Gravel not to be removed. works without the express sanction of the Engineer, such material being the property of the

23. Existing old sewers, drains, or tunnels and other works in, Existing old sewers to be filled in or reconstructed. across, or along the streets, roads, and places which may be wholly or partly destroyed in the construction and during the progress of the

works shall be filled up or reconstructed according to their original form, dimensions, and position, as the Engineer shall direct, and any sewers or drains shall be lengthened and connected with the new sewers the subject of this contract when and as the Engineer shall direct.

24. The Contractor shall pump out all water which may arise during the progress of, and thoroughly drain the works, and he shall provide, form, fix, and maintain all necessary pumps, engines, apparatus, dams or other works necessary for keeping the line of sewer clear of water during the progress of the works. Works to be kept clear of water.

25. Timber, the quality and scantling of which is to be approved by the Engineer, shall be left in the trenches whenever and wherever directed, and all timber so left shall be paid for as extra according to the Schedule of Prices hereunto annexed. Timber to be left in trenches.

26. All the old bricks and materials arising from the breaking up of any old sewers, drains, tunnels, or other works, shall become the property of and be forthwith cleared away at the expense of the Contractor : and none of the old bricks or materials will be allowed to be used in any part of the works except by the special permission of the Engineer in writing. Removal of old bricks and materials.
Old bricks and old materials not to be used in the works.

27. Should running sand or other bad or treacherous ground be met with, the Contractor shall proceed with the works day and night, without intermission, until their completion, should the Engineer so direct; but no work shall be carried on during the night, or on Sundays, without the permission of the Engineer. Work to be carried on without intermission if required.

28. Should the ground in any part of the lines of the sewers or works, below the intended level of construction, be found faulty, the same shall be removed to such depth as shall be required by the Engineer, and the excavation made good to the required form and level with concrete or other material, as may be directed, in order to get a sound and solid foundation for the invert. Such extra depth of digging is to be paid for as extra according to the Schedule of Prices annexed. The concrete is included in the provision made in Clause 34. Removal of faulty ground.

PROVISIONS.

29. The Contractor to erect and fit up as directed one proper Moveable office, moveable office for the use of the Overseer during the progress of the works, so that it shall be habitable at all times. At the completion of the works it shall become the property of the Contractor, and shall be removed by

30. The Contractor shall include in tender the sum of Rs. _____ Rupees to meet the expenses of extra works beyond those referred to in this specification. Should the expenses incurred exceed this sum the Contractor shall be allowed the difference according to the Schedule of Prices attached, but if they fall short of this sum, the difference shall be deducted from the amount of _____ Contract.

31. The Contractor shall supply and lay at any depth, and where and as may be directed, and completely finish _____ Earthenware pipes.
 _____ ft. run of 12 in. pipe,
 _____ ft. run of 9 in. pipe,
 _____ ft. run of 8 in. pipe, _____ ft. run
 of 6 in. pipe. All the pipes to be of stone-ware and jointed with the best hydraulic cement.

32. The Contractor shall provide and fix in the sides of the sewer :— Curved Junctions.

12 in.	}	Two Feet Curved Junctions.
9 in.		
8 in.		
6 in.		

the mouth of each pipe drain to be stopped up with a stone-ware disc jointed with tempered clay.

33. The Contractor shall provide
 cub. yds. of brickwork in cement and
 cub. yds. of brickwork in mortar for unforeseen works, and to be
 used as the Engineer may direct.

Quantity of brick-
work to be pro-
vided.

34. The Contractor shall provide
 cub. yds. of concrete to be used where directed by the Engineer, and
 for the removal of the material of whatever-kind from the spaces
 where the concrete may be used.

Quantity of con-
crete to be pro-
vided.

MATERIALS.

35. The bricks to be used in these works shall be of the best Bricks. description, and shall be approved by the Engineer. They shall be what are usually known in Madras as "Machine-made steam-pressed bricks," *i. e.*, bricks not made by hand, but by steam power, and fully equal to the sample which may be seen at

36. No broken, or unburnt, or underburnt bricks shall be brought on the works, and all bricks disapproved by the Engineer shall be immediately removed from the work. All bricks shall be well soaked with water before they are used. No broken or unburnt bricks to be brought on the works.

37. Should the Contractor fail to supply such bricks as the Engineer approves, the latter shall have full power, after due notice in writing has been given, to substitute others at the expense of the Contractor. Engineer may, remove inferior bricks.

38. The sand shall be clean, sharp river sand, and, if considered necessary by the Engineer, it shall be well washed. Sand dug from the trenches, which is clean and sharp, and of which the Engineer approves in writing, may be used in the works. Sand.

39. The lime to be stone lime, well burnt, brought on the works fresh from the kilns. No shell lime shall be used on the works. Lime.

40. If any mortar be used on these works, it shall consist of one proportion of stone lime to of sand. No more shall be mixed each day than can be used in the day. It shall be well tempered and thoroughly mixed and ground in a mill. The mill to be of the kind generally used in Madras;—a stone roller drawn by bullocks through a circular groove of granite stones. Mortar.

41. The hydraulic cement in which the brickwork of the sewers and other works is to be set, shall be made as follows:— Hydraulic cement

42. The asphalt with which the internal surface of the sewers and other works is to be coated shall be approved by the Engineer, and be of the kind which may be seen at

43. The concrete shall be made as follows, and it shall be thrown in the trenches from the greatest practicable height:—

44. All the stone used in these works shall be Palaveram granite.

45. All the pipes, bends, elbows, curves, junctions, drain mouths and invert blocks, shall be of the best stone-ware, well burnt, well glazed, circular, perfectly true in bore free from all flaws, blisters, cracks, and other defects. All bends and junctions shall be made with a true and proper curve.

Stoneware pipes
and invert
blocks.

46. The pipes shall be of the kind known as

and the invert blocks of the kind known as

47. All the cast iron used in the works shall be of the very best Cast Iron. description, free from cracks, sand-holes, air holes, porous places, and other imperfections, and finished off in the best and most workman-like manner.

48. The whole of the wrought iron to be of the best quality and Wrought Iron. workmanship.

49. All the iron-work, after being fixed in position in the works, Coating for Iron. shall be covered with two coats of coal tar, and linseed oil, mixed in proportions to be decided by the Engineer.

GENERAL CONDITIONS.

50. In this Specification the word
shall be held to mean the
and the word Engineer shall be held to mean

Construction of
terms.

or other the Engineer for the time being duly authorized by the
to act as Engineer in the construc-
tion of the intended Sewers and works.

51. The Drawings and Specification are to be considered as
explanatory of each other. Should anything, however, appear in
the one that is not described in the other, no advantage shall be
taken of any such omission, and the Contractor so to consider in
forming estimate. Should any discrepancies, moreover,
appear, or should any misunderstanding arise as to the meaning and
import of the said Specification, or Drawings, or about the quality or
dimensions of the materials, or about the due and proper execu-
tion of the works, or as to the measurement or quality and valuation
of the works executed under this contract, or as extras thereupon, or
as deductions therefrom, the same shall be explained by the Engineer,
and this explanation shall be final and binding upon the Contractor ;
and the Contractor shall execute the work according to such expla-
nation, and without charge or deduction to or from the contract as
the Engineer shall assess.

Drawings and
Specification
explanatory of
each other.

52. The levels from which the sections of the ground are made
are supposed to be correct, but the Contractor to verify the
same should think fit so to do, as will be held
responsible for the consequences of any error contained therein or
omission therefrom.

Levels.

53. The written dimensions on the Drawings are in all cases to
be preferred to the Scales in computing the quantities.

Computation of
quantities.

54. The borings shown on the drawings have been made along
the intended line of sewer ; but the Contractor must satisfy
as to the correctness of this information ; and should the
ground turn out different to what might be expected from these
results, the Contractor shall make no claim in respect thereof.
Samples of the borings can be seen at

Borings.

55. The works hereinbefore specified and provided for, or that may be necessary to be done, in order to form and complete any part thereof, to be executed in the best and most substantial and most workmanlike manner, with materials of the best and most approved quality of their respective kinds, agreeably to the particulars contained in or implied by the Specification, as referred to and represented by the Plans and Sections upon the Drawings hereunto annexed, or to such other additional particulars, explanations, and drawings, as may be found requisite to be given during the carrying on of the works, or to the full and entire satisfaction of the said
 and their Engineer.

General explanation of Contract

56. The Contractor to set out and keep correct the works in every particular according to the Drawings herein specified, or that may be supplied, or the directions that may receive from time to time, and to be held responsible for the correctness of the same throughout the whole term of this contract.

Setting out works.

57. The Contractor to provide and be at the expense of all materials, labour, carriage, implements, and other matters and things of every description, that may be requisite for executing, constructing, carrying on, and completing the works; and to pay the wages of all persons employed on the works.

Providing materials, labour, &c.

58. The Engineer and every person authorized by him shall have access at all times to all factories and places where materials are kept or prepared for the several works comprised in this contract, and the Contractor shall afford every facility for the inspection of materials prepared, or being prepared, for the use of the said work.

Engineer to have access to all materials.

59. In order to ensure that the works referred to in this Specification are constructed in the best and most workmanlike manner, and with materials of the very best quality of their respective kinds, they are to be subjected to tests from time to time during the execution of the works by such machines, instruments, appliances, or means, as the Engineer may direct, and the Contractor shall give every facility for the application of such tests.

Testing of works and materials.

60. The Contractor shall commence the works and carry them on at whatever point or points along the line or lines of Sewers or works the Engineer may point out; but none of the works are to be commenced without a written order signed by the Engineer.

Commencement of works.

61. Should any materials which the Engineer shall deem of an inferior description, or improper to be used in the works, be brought on the ground, the same shall be removed entirely away therefrom

Bad materials to be removed.

within twenty-four hours after orders have been given by the Engineer to that effect. In case of non-compliance with any such orders, the Engineer may cause the said inferior or improper materials to be taken away at the Contractor expense, and the Contractor shall forthwith pay to the _____ the amount of such expense, and also at the rate of _____ Rupees per day for every day subsequently to the expiration of the twenty-four hours during which the materials shall not have been removed, such sum of _____ Rupees to be deemed liquidated damages.

62. The Contractor shall remove all offensive matter from the works immediately it is taken out of the trenches, and with such precautions as may be directed by the Engineer. Removal of offensive matter.

63. If, in the opinion of the Engineer, any person or persons employed by the Contractor on the works be deemed incompetent, or act in an improper manner, the Engineer shall be at full liberty to discharge him or them, or order him or them to be dismissed forthwith, and the Contractor shall not employ him or them on the works again without the permission of the Engineer. Dismissal of incompetent persons employed on works.

64. The Contractor to provide at _____ own expense, make, and maintain all necessary fences, hoardings, strutting, shoring, bridge-ways, dams, and other matters, or things, as may be necessary for, or in consequence of, any of the works; and all enclosures for materials, or works for the protection of the public, and of all buildings and property whatsoever, near to, or liable to be affected by, the works, and to sufficiently watch and light the same when necessary; and when any shoring or other precautionary works or measures may be necessary for the protection or security of buildings, the Contractor in no case to call upon or require the owners or occupiers of such buildings to shore up or otherwise secure the same, or to pay the expense of such shoring or other works, but _____ to do all necessary works for the purpose specified at _____ own sole cost and expense. Fencings, Hoardings, &c.

65. In any case in which works of shoring, or other works for the protection or security of buildings and structures, are necessary, the Contractor shall, within a reasonable period before the execution of such works, serve notices both in English and in Tamil on the occupiers of the buildings or structures intended to be shored up or otherwise secured, apprising them respectively that such works Shoring.

are necessary, that _____ about to execute the same, and will, at a time to be specified in such notice, enter upon the premises for the purpose of executing such works.

66. The Contractor shall not commence any work in, or upon, under, or across, or through, any house, building, shed, road-way, canal, railway, garden, field, or any other place being private property, until _____ shall be authorized in writing by the Engineer so to do. Contractor not to commence works on private property until authorized.

67. The Contractor shall give due and sufficient notice to all authorities and persons having charge of the roads, streets, foot, and carriage-ways, bridges, canals, and the like, previous to and at the completion of any work, in order that the proper persons, in respect of the matters aforesaid, may be enabled to attend and see that the roads, streets, foot, and carriage-ways, and the like, and other things incident and appertaining thereto, are secured, relaid, or reinstated in a proper and satisfactory manner; and also in order that the proper persons having charge of the canals, railway, and other works, may be enabled to attend and secure them: the Contractor nevertheless to be held chargeable and responsible for the proper protection and restoration at _____ own expense of all and every the matters and things herein referred to. Notice to all authorities and persons in charge of roads, &c.

68. The Contractor shall pay all fees and compensations, and make good at _____ own expense, all damage of every kind which may occur by reason of the execution of the several works; for the performance of which the Contractor _____ bound, whether the said damage may occur to any public or private ways, roads, gardens, walls, foundations, buildings, or any other property, work, or thing whatsoever, that may be damaged, removed, disturbed, or injured; and the Contractor shall deliver to the Engineer certificates in writing from the proper authorities, that all public and private ways, and all property, works, or things that may have been disturbed or injured by the said works have been properly made good, and all expenses and demands in respect thereof paid by the Contractor before payment shall be made of the amount of _____ per cent. on the cost of the works executed due to _____ for the works under this contract as hereinafter mentioned. Payment of fees and compensation, and making good damage, &c.

69. The care of the entire line of works, until their completion, is to remain with the Contractor and the Contractor and _____ sureties shall be jointly and severally held responsible for all accidents Responsibility for accidents, damage, &c.

arising from the inclemency of the weather, land springs, floods, inundations, or any other cause whatsoever, and chargeable for anything that may be stolen, removed, or destroyed, and shall also be held responsible for the making good of all damage and defects occasioned by carelessness, deficiency in strutting, fencing, watching, or lighting, whether to the said sewers and the works connected therewith, or to the adjoining buildings and premises, from bad or insufficient materials, bad workmanship, or any other cause whatsoever, and whether such damage or defects may be, or might have been, discovered during the progress of the said works, or in consequence thereof, or shall appear, or be known, after the completion thereof, or whether payment may wholly or partially have been made, or the works approved as supposed to have been properly done; and no certificate or approval of any work by the Engineer or by any officer of the shall affect or prejudice the right of the said against the Contractor, or be considered or held as at all conclusive as to the sufficiency of any works or materials.

70. And in case of any action suit or proceeding being brought Indemnification or taken against the or any of of their officers or servants in respect of any such damage or defects, or any loss, damage or injury, by reason thereof, or consequent thereupon, the Contractor or sureties shall fully indemnify them and each of them therefrom, and forthwith pay to him or them all costs, charges, damages, and expenses which he or they shall or may have been put to or have incurred in reference thereto. And the said may, if they shall see fit, compromise any such action, suit, or other proceeding, or any claim in respect of any such damage as aforesaid, on such terms as they shall think fit; and the Contractor shall thereupon forthwith pay to them the sum or sums paid by upon the occasion thereof, and shall in every case pay to them such sum or sums as shall fully indemnify them according to the present stipulation.

71. The Contractor shall not assign or make over this contract Contract not to be assigned or underlet. to any other person, nor underlet, nor make a sub-contract with any workman or workmen for the execution of any part of the brickwork, groundwork, masonry, or any other work appertaining thereto: but he is to employ his own workmen for the labour thereof, who are to be paid by him, in wages, by the day; and in case the Contractor, assign or make over this Contract, or underlet or make a sub-contract contrary to this agreement, he shall forfeit to the said

the sum of

Rupees, which shall be deemed liquidated and ascertained damages, and may be recovered by action, or deducted by the said _____ from any sum or sums due or to become due to the said Contractor under this contract or otherwise, howsoever.

72. Should the Contractor or _____ agent give any gratuity No gratuities to be given. to any officer or servant of the _____ the said _____ shall be at liberty to determine this contract, and the Contractor shall forfeit to the said _____ the sum expressed in _____ bond, as liquidated damages, for the non-performance of this contract.

73. The Contractor shall afford the utmost facility for public Transit. and private transit, in respect of any roads or rights of way, or rights of navigation, which may be interfered with by the execution of the works, and shall give all proper notices to, and, as far as practicable, make arrangements with, the owners and occupiers of the aforesaid properties which may be prejudiced by the execution of the works.

74. After the completion of the sewers and works, should the Engineer require it for his more perfect satisfaction, the Contractor Openings after completion. shall make such openings, and to such extent through any part of the said sewers or works, as the Engineer may direct, and which shall make good again to the satisfaction of the Engineer. Should the works be found faulty in any respect, the whole of the expenses thereby incurred shall be defrayed by the Contractor, but, if otherwise, by the _____

75. No part of the work shall be altered from that shown on Specification and Drawings to be adhered to. the drawings, or described in this Specification, without the express sanction of the said _____ or their Power to alter work, &c. Engineer in writing; but should it be deemed expedient by the said _____ or by their Engineer, at any time while the works are in hand, to increase or diminish, the dimensions, quality of material, or work, alter the situation or vary the form of dimensions or any part of the said work, he shall have full power so to do, and to order and direct any such increase, diminution, or alteration to be made, and that without in any way vitiating or affecting this contract: and the Contractor shall in pursuance of Written orders for Extras. such order and directions as _____ may receive in writing, but not otherwise, execute the works thereby ordered and directed, and

in conformity therewith; and the difference of expense occasioned by any such increase, diminution or alteration, so ordered and directed, shall be added to or deducted from the amount of this Contract, agreeably to the rates specified in the Schedule of Prices, for regulating such extra or diminished works, hereto attached: and when the rates are not contained in the Schedule of Prices, the Engineer shall ascertain the amount of such additions or deductions; but if any extra, additional, or different works be proceeded with, or executed by the Contractor, without previous orders given in writing under the hand of the Engineer, no charge for the same will be allowed.

76. The Contractor shall deliver to the Engineer a weekly account of such extra or omitted work duly ordered or directed in the manner hereinbefore mentioned, and no claim will be entertained for works not included in such weekly accounts. Weekly account of extras.

77. Any increase or diminution in the quantity of work or materials herein specified or provided shall be considered as extra or diminished work, and shall be added to or deducted from the amount of this Contract agreeably to the rates specified in the Schedule of Prices attached. Extra and diminished work.

78. The Contractor shall commence and carry on the works with due diligence, and with as much expedition as the said Expedition in carrying on the works. or their authorized Officers shall require; and in case the Contractor shall fail to do so, or shall neglect to provide proper and sufficient materials, or to employ a sufficient number of work people to execute the works which shall be ordered to execute with due diligence, or the despatch required, then the said or their Engineer, or other their authorized Officer shall be at liberty, and they are hereby authorized to employ other Contractors or work-people, and to provide the necessary materials, and to charge the extra expenses incurred thereby, to the account of the Contractor, and deduct the same from any sum or sums due, or to become due to under this or any other Contract with the said

79. If at any time the works or any part thereof, are in the judgment of the Engineer, not executed, or not being executed in a sound and workman-like manner, and in all respects in strict conformity with this Contract, and to his satisfaction, the same shall be intimated to the Contractor in writing or otherwise; and in case On neglect of Contractor may do works. refuse to take down, re-build, repair, alter, or amend any defective or unsatisfactory work, or comply with any order

may so receive to that effect, or in case the works, from the want of sufficient or proper workmen or materials, are not proceeding with all the necessary despatch, then the said

shall, after giving three days' notice thereof in writing to the Contractor, agent or foreman, have full power, without vitiating this Contract, to take the works wholly or in part out of the hands of the said Contractor, and to engage or employ any other person or work-people, and procure all requisite materials and implements for the due execution and completion of the said works, and the costs and charges incurred by them in so doing shall be ascertained by the Engineer, and paid for or allowed to the said

by the Contractor: and it shall be competent to the said to deduct the amount of such costs and charges out of any moneys due or to become due from them to the said Contractor under this or any other Contract.

80. The Engineer shall have full power, should he see fit, upon giving notice in writing to the Contractor, to suspend the execution of the works, or any portion of them on account of the inclemency of the weather, or any other cause whatsoever, and no extra charge shall be allowed to the Contractor in respect thereof.

Suspension of works.

81. The Contractor shall not deposit any earth, rubbish, or materials upon any foot-way to the hindrance, obstruction, or annoyance of foot passengers, except where this is unavoidable. In case of any breach of this stipulation shall pay to the for every day while any such hindrance, obstruction, or annoyance shall exist, the sum of Rupees as liquidated damages, and indemnify them as hereinbefore stipulated.

Non-obstruction of foot-ways, &c.

82. In the absence of the Engineer, the Overseer or any other person or persons whom the Engineer shall appoint to superintend the work is to have full power to decide as to the manner of conducting and executing the said works, and the Contractor shall follow in these particulars the instructions or orders of the persons so appointed.

Superintendence in absence of Engineer.

83. All coins or other articles of antiquity or value which may be discovered in the course of these works, are to be immediately delivered into the custody of the Engineer on behalf of the said.

Coins, &c.

84. The Contractor shall complete the whole of the above works within from the date of the Engineer's order to commence them, and shall

Completion of works.

pay Rupees as liquidated damages or each and every day that any part of the said works shall remain unfinished after that time. But in the event of delay to the works Strikes. by reason of strikes or combinations on the part of the work-people employed, or by reason of the inclemency of the weather, or by reason of any difficulties, impediments, obstructions, oppositions, doubts, disputes, or differences whatsoever and howsoever occasioned, the Engineer will allow such additional time as he may deem fair and reasonable.

85. All moneys payable to by the Contractor under any stipulations herein, may be recovered ^{Recovery of} moneys payable ^{to} by action by the parties for the time being entitled to sue on this Contract; or the same may be retained out of any moneys then due, or which may hereafter become due, from the said to the Contractor under this or any other contract or otherwise howsoever: and the shall have power to withhold payment of any moneys to the Contractor after circumstances shall have arisen which may give rise to such retention as aforesaid, until after the settlement of such circumstances, though the sum to be retained may be unascertained at the time of such withholding.

86. The Contractor shall find two responsible Sureties to the Sureties. satisfaction of the who are to be bound with him jointly and severally in the sum of Rupees for the due and satisfactory performance of the whole of the foregoing works; and the names and abodes of such Sureties, and a consent in writing signed by them to become sound as such Sureties shall accompany the Contractor tender for the said works.

87. Advances of money at the rate of per cent. Payments. on the value of the works executed, as certified by the Engineer (whose certificate shall be final and binding for the purpose of determining the amount of the advances to be from time to time made under this clause, but shall not affect or prejudice the right of the against the Contractor, or be considered or held as at all conclusive as to the sufficiency of any works or materials) will be made to the Contractor as the works proceed, until the whole of the works are completed; but such advances are in no case to be made at more frequent intervals than monthly, and they are in no way to affect any question in the ultimate settlement of the accounts,

or to be considered as proof or admission of any particular work or amount of work having been executed. A further advance of

per cent. on the value of the works executed will be made at the expiration of three calendar months from the date of completion of the works on the Engineer's certificate of the completion of such works to his satisfaction, provided the Contractor shall within such period of three calendar months from the date of such completion have delivered at the Office of the Engineer, all certificates in writing from the proper authorities, that all public and private ways, and all property, works, or things that may have been disturbed or injured by the said works have been properly made good, and all expenses and demands in respect thereof paid by the said Contractor. A further advance of two and a half per cent. at the expiration of six months will be made, and the final balance will be paid twelve calendar months after the completion of the works, provided that within three calendar months from the date of such completion, the Contractor shall have delivered to the Engineer a full account in detail of all claims on the said

in respect of such works, and that the Engineer shall give a certificate in writing of the correctness of such claim, and provided also that the Engineer shall certify that such works have been inspected by him, since the expiration of the said period of three calendar months, and found to be in good and substantial order; and that the said Contractor duly delivered to him certificates in writing from the proper authorities, that all foot and carriage ways, whether public or private, and all property, works, or things that may have been removed, disturbed, or injured, in consequence of the said works, have been properly made good, and all expenses and demands in respect thereof, paid by the said Contractor, and that he also certify that all claims and demands which have been made for or in respect of damage or loss, by, from, or in consequence of, the said works, have been satisfied agreeably to this Contract, and that he has no reason to believe that any other such claim exists.

88. The valuation of the works upon which the aforesaid payments are to be based is to be made by the Engineer to the Valuation of works., and his valuation of the works for such purpose is to be deemed final and conclusive.

89. The Contractor shall maintain in good working order, and complete repair the whole of the works above described, and that may be executed under this Contract, for twelve calendar months from the date of the Engineer's certificate of completion of the whole Works to be maintained in complete repair for twelve calendar months.

thereof; the nevertheless to have full power, during the said period of twelve calendar months, to use the works for all purposes of drainage, and to connect or cause to be connected therewith, all drains or sewers that they may deem it requisite and proper so to be connected.

90. The Contractor shall return to the custody of the Engineer, at the time of the delivery up of the works to the
 Drawings to be returned.

and before he receives the instalment payable thereon, all plans, drawings, writings, papers, specifications, and documents which may be delivered to him or for his use, and in the meantime the Engineer, and such person as he may appoint, shall have full access thereto at all times and for all purposes, and the same shall be kept at or near the site of the works.

91. All payments to the Contractor are to be made out of the funds under the control of
 Payments to be made out of Public Funds.
 in their public capacity, and no member of the said

whether or not a party to this agreement, is to be personally responsible to the Contractor .



D 28-211-10

N12

SCHEDULE OF PRICES

REFERRED TO, AND FORMING PART, OF THE FOREGOING SPECIFICATION AND CONDITIONS.

It is to be distinctly understood that the prices in all cases include the cost of cartage of materials to the works, and that *all* expenses are to be taken as included in each of the several items of this Schedule, whether or not expressly mentioned, except when such expenses are clearly opposed to the spirit of the context.

It is also to be distinctly understood that proportionate rates are to be charged for less quantities than are hereinafter specified.

Description of Works.	Per	Prices.
Digging, at any depth, and in any description of soil, including every expense of strutting, fencing, shoring, lighting, watching, pumping, keeping the works clear of water, filling in, punning in thin layers, making good all carriage and footways, carting away superfluous earth and every other expense whatsoever... ..	Cubic Yard.	
The same without expense of cartage of superfluous earth... ..	do.	
Filling in earth, in layers not exceeding 6 inches thick, including punning... ..	do.	
Filling and carting away earth, rubbish or other material, to any distance, including shoots and every expense... ..	do.	
TUNNELLING		
In every description of soil, including soundly filling in, ramming the sides of and over the brickwork, raising the superfluous earth to the surface, carting away the same, and including expenses of all necessary shafts, headings, observatories, instruments, apparatus and appliances, and including fencing, lighting, watching, making good and reinstating everything disturbed or damaged, and every other expense whatsoever... ..	do.	

Description of Works.	Per	Prices.
<p style="text-align: center;">CONCRETE.</p> <p>Concrete composed of</p>		
<p style="text-align: center;">BRICKWORK.</p> <p>Brickwork consisting of</p> <p>Brickwork consisting of</p>		

Description of Works.	Per	Prices.
Fixing cast iron doors over openings to manholes and side-entrances... ..	Each door of two flaps.	
Fixing ladder irons in manholes and side-entrances... ..	Each.	
Fixing sluice valves, pipes, sluice gates, ball valves for flushing purposes complete.	For each Reservoir.	
STONEWARE.		
<i>(All to be glazed with Felspar.)</i>		
Twelve inch stoneware pipe sewers, provided and laid complete, at any depth, in any description of soil, including digging, watching, lighting, fencing, shoring, pumping, keeping the works clear of water, reinstating, and every expense whatsoever.	Foot run.	
Nine inch... do. do.	do.	
Eight inch do. do.	do.	
Six inch do. do.	do.	
Five inch do. do.	do.	
Four inch do. do.	do.	
Three inch do, do.	do.	
Junctions to new brick sewers inserted during the construction of the latter, and built in hydraulic cement in brickwork:—		
Two feet of twelve inch pipe, straight, curved or splayed, built in brickwork...	Each.	

Description of Works.	Per	Prices.
Two feet of nine inch pipe, straight, curved or splayed, built in brickwork... ..	Each.	
Two feet of eight inch do. do. ...	do.	
Two feet of six inch do. do. ...	do.	
Invert blocks for 4½ inch brickwork... ..	Foot run.	
Do. for nine inch brickwork... ..	do.	
STONWORK.		
Three inch thick Palaveram granite one line dressed, squared and laid complete... ..	Foot Superficial.	
Do. two line dressed do. ...	do.	
Palaveram granite three line dressed for invert blocks and other parts of bell-mouth junctions... ..	Cubic Foot.	
Palaveram granite, any thickness, for any purpose one line dressed and laid complete	do.	
Do. two line dressed and laid complete... ..	do.	
Do. three line dressed and laid complete... ..	do.	
WOODWORK.		
Teak planks one inch thick... ..	Foot Superficial.	
Do. one and a half inches thick... ..	do.	
Do. two inches thick... ..	do.	
Do. three inches thick... ..	do.	

Description of Works.	Per	Prices.
Teak, except as above, in planks	Cubic Foot.	
Mangoe planks one inch thick... ..	Foot Superficial.	
Do. one and a half inches thick... ..	do.	
Do. two inches thick	do.	
Do. three inches thick... ..	do.	
Mangoe wood, except as above, in planks ...	Cubic Foot.	
Poles, six inches diameter... ..	Foot run.	
Do. four inches diameter	do.	
Black wood	Cubic Foot.	
Red wood... ..	do.	
Errool wood... ..	do.	
IRON.		
Six inch cast iron sluice valves with gun-metal slides, stops, and seatings... ..	Each.	
Cast iron work in pipes, sluice gates, doors to manholes and side-entrances, and in all other work... ..	Cwt.	
Wrought iron work in ladder irons... ..	do.	
Wrought iron work in all other work excepting in bolts, nuts, screws, &c.	do	
Wrought iron work in bolts, nuts, screws, &c.... ..	do.	
DAY LABOUR.		
Bricklayer... ..	Per day of hours.	
Carpenter... ..	do.	
Smith... ..	do.	
Cooly (man)... ..	do.	
Do. (boy)... ..	do.	
Do. (woman)... ..	do.	

Description of Works.	Per	Prices.
Stone-cutter... ..	Per day of	
	hours,	
Watchman... ..	do.	
SUNDRIES.		
Bricks, machine-made, steam pressed, of the best description and thoroughly burnt.	Thousand.	
Hand-made bricks thoroughly burnt... ..	do.	
Hydraulic cement... ..	Cwt.	
Stone lime... ..	do.	
Shell lime... ..	do.	
Asphalte... ..	do.	
Gravel... ..	Cubic Yard.	
Broken laterite	do.	
Do. granite	do.	
Do. brick... ..	do.	
Clay, common... ..	do.	
Do. tempered for use... ..	do.	
Turf... ..	Square Yard.	
Candles... ..	lb.	
Oil... ..	do.	
Thread... ..	do.	

And whereas the said

ha accepted the said proposal, the said

executors, administrators, or assigns, being to be paid for the said works as hereinbefore mentioned: **Now these Presents Witness**, that in consideration of such acceptance as aforesaid, and of the payment to be made for the execution of the said works as aforesaid, the said

do hereby
for heirs, executors, and administrators, covenant
and agree with the said
that the said

heirs
executors or administrators, will execute the works mentioned in the said Specification in all respects in strict conformity therewith, and in all things, fully, completely and faithfully regard, observe and perform the said Specification and all the terms, agreements, conditions, provisions thereof and therein, on their part to be regarded, observed and performed; and that all powers, liberties, rights and privileges hereinbefore mentioned shall and may be exercised and enjoyed according to the true intent and meaning thereof. In witness whereof, the said

hereunto set hand and seal, and the said
affixed the seal of
office, the day and year first above written.

Signed, sealed, and
delivered by the said

