



The World Bank



Republic of Lebanon



Council for Development
and Reconstruction

**THE GREEN AGRI-FOOD TRANSFORMATION FOR
ECONOMIC RECOVERY PROJECT (GATE)**

**COMPLEMENTARY WORKS FOR THE EXPANSION OF
THE SEWAGE COLLECTION NETWORK TO CONNECT TO
THE ZAHLE WASTEWATER TREATMENT PLANT AND
AITANIT WASTEWATER TREATMENT PLANT**

ICB №: GC2W2C

VOLUME 3 – BILL OF QUANTITIES

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SEPTEMBER 2026



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PART 1 - ZAHLE

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
1	<u>Preliminaries</u>				
	The Contractor shall price the following selected General Preliminary Items as scheduled hereunder. All other Preliminary items of works shall be deemed included within his unit rates and lump sums for work items. If the Contractor fails to provide the prices required under this section, the cost of these selected items shall be deemed included within his unit rates and lump sums for work items.				
1.1	<u>Mobilization and Demobilization</u>				
	Include all necessary "Mobilization" to site and "Demobilization" on completion of the Works.	LS	0.50		
	<i>Unit Rate in Words for the Item:</i>				
1.2	<u>Insurance</u>				
	Provide from an approved insurance company all required "Insurances" described in the Contract.	LS	0.50		
	<i>Unit Rate in Words for the Item:</i>				
1.3	<u>Temporary Facilities and Services for the Engineer</u>				
	Provide, furnish, equip and maintain during and until completion of the Works, all "Temporary Facilities and Services for the Engineer", complete all as scheduled in the Contract.	LS	0.50		
	<i>Unit Rate in Words for the Item:</i>				
1.4	<u>Setting Out and Accuracy</u>				
	Include all necessary temporary survey works and tasks required for "Setting Out and Accuracy" described in the Contract.	LS	0.50		
	<i>Unit Rate in Words for the Item:</i>				
1.5	<u>Temporary Services</u>				
	Include all necessary and required "Temporary Services" to properly carry out all the works including water, electrical power, lighting, local phone charges and all other services of a temporary nature required and described in the Contract.	LS	0.50		
	<i>Unit Rate in Words for the Item:</i>				
1.6	<u>As-Built Drawings and Manuals</u>				
	Prepare and furnish to the approval of the Engineer all required "As-Built Drawings" on completion of the Works and "Manuals" in the type, number and presentation as described in the Contract.	LS	0.50		
	<i>Unit Rate in Words for the Item:</i>				
	Sub Total				
2	<u>Dayworks</u>				
	The Contractor shall comply with "Clause 53: Daywork Schedule" of the Conditions of Contract.				
2.1	<u>General:</u>				
	Amounts paid for work executed on a daywork basis shall be based upon the time that labour and plant are employed on the site for the daywork item. Payments for traveling time, standing time and idle time will not be allowed. Rates apply only to works classified by the Engineer as Dayworks.				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2.2	<u>Labour:</u>				
	Rates inserted for labour executed on a daywork basis shall be deemed to include for wages paid to work people and for all other costs including relevant and necessary tools and allowances in connection with labour, and for supervision, overheads and profit.				
2.3	<u>Equipment:</u>				
	Rates for equipment owned or hired shall include for the cost of maintaining in proper working order, attendance in starting up and shutting down, refueling and all fuel power, oils, grease and cleaning materials, replacement and/or sharpening of tools, provision of tools and all other ancillary items, profits and overheads, including consumable spares. Idle time in maintenance or traveling to the Site will not be allowed.				
2.4	<u>Materials:</u>				
	Materials for work executed on a daywork basis shall be paid for separately at the net invoiced prices including the cost of delivery to the site, plus the percentage addition inserted in the Bill of Quantities as described below.				
2.5	<u>Percentage Addition:</u>				
	Percentage addition to the Provisional Sum shown in the Bill of Quantities for materials shall include establishment charges, and overheads and profit, including, but not limited to, the following:				
	- Storage of materials including handling and waste;				
	- Contractor's supervisory and administrative arrangements				
	including on site and head-office charges;				
	- Contractor's equipment except those employed on dayworks;				
	- Contractor's facilities, and temporary works;				
	- Protection of material and finished work;				
	- Any other costs and obligations, for the purpose of Dayworks, whatever not specifically referred to.				
2.6	<u>Schedule of Daywork Rates</u>				
2.6.1	<u>Labour</u>				
2.6.1.1	Skilled craftsmen	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.2	Skilled electrical and mechanical engineering craftsmen	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.3	Semi skilled craftsmen	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.4	Laborers	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.5	Bar Benders	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.6	Concreters	Day			
	<i>Unit Rate in Words for the Day:</i>				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2.6.1.7	Carpenters	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.8	Masons	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.9	Transport drivers	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.10	Fitter / Mechanics	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.11	Gangers (in charge of laborers)	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.12	Foreman	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.13	Watchmen	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.1.14	Welders	Day			
	<i>Unit Rate in Words for the Day:</i>				
	Sub Total				
2.6.2	<u>Equipment</u>				
2.6.2.1	Compressor (working pressure 3.5 kg/cm²)	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.2	Tilting drum concrete mixer up to 200 liter wet capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.3	Lorry mounted concrete pump (with boom, piping & pipe cleaning equipment) up to 50m³/hr capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.4	Concrete vibrator poker, petrol driven	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.5	Mobile rubber tyred full circle slew crane, including all crane equipment, up to 25 tonne capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.6	Dumper trucks, up to 1000 kg capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2.6.2.7	Asphalt/coated macadam spreader, up to 56 kW capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.8	Asphalt cutter	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.9	Trucks, ordinary up to 16 tonne capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.10	Ditto, but up to 8 tonne capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.11	Roller, steel, 3-wheeled, up to 10.5 tonne capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.12	Roller, rubber tyred, up to 1.0 tonne/wheel capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.13	Ditto, but up to 3.0 tonne/wheel capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.14	Tractor (crawler) with bull or angle dozer, marker's rated flywheel, up to 100 kW capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.15	Motor grader, variable blade/flywheel, up to 110 kW capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.16	Mobile water tanker, up to 4450 liter capacity	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.17	Wheel loader (90 hp max. power, toothless shovel)	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.18	Backhoe loader (90 hp max. power, toothless bucket)	Day			
	<i>Unit Rate in Words for the Day:</i>				
2.6.2.19	Skid steel loader, similar to "Bobcat" (70 hp maximum power)	Day			
	<i>Unit Rate in Words for the Day:</i>				
	Sub Total				
2.6.3	<u>Materials</u>				
2.6.3.1	Include a Provisional Sum of USD 100,000 for materials related to dayworks.	PS			
	<i>Provisional Sum in Words:</i>				
	Two Hundred and Fifty Thousand Only				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2.6.4	Percentage Addition				
2.6.4.1	Add ten percent (10%) as a percentage addition to the Provisional Sum for "Materials" in Item 2.6.3.1.	USD	10%		
	<i>Percentage in Words:</i>				
	Ten Percent Only				
	Sub Total				
	Summary				
1.00	Preliminaries				
2.6.1	Labour				
2.6.2	Equipment				
	Grand Total Excluding Provisional Sum				
	Provisional Sum				
2.6.3	Material				
2.6.4	Percentage Addition				
	Grand Total for Provisional Sum				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539	<u>Sanitary Sewer Systems</u>				
2539.1	<u>Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces</u>				
	Cutting and breaking out existing paved surfaces in bituminous courses, concrete, or pavers of any type and of any thickness, and reinstatement to match previously existing, complete including removal and replacement of aggregate base and sub-base courses, bituminous courses, concrete surfaced roads, curbs, pavers, street lamps, roads signs, road marking, safety barriers, any form of structure and all other street furniture, etc., removing and disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Reinstated asphalt pavement shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick; Asphalt Binder Course: 45 mm thick; Asphalt Wearing Course: 45 mm thick.</i>				
	<i>It shall be noted that the width of the Trench shall be taken as shown on the drawings to calculate the area of road reinstatement except narrow roads not exceeding 3m wide which should be reinstated entirely. Any widening of the trench made by the Contractor without the approval of the Engineer shall be reinstated by the Contractor at no additional cost.</i>				
02539.1.1	Cutting, Breaking out and reinstatement of existing paved surfaces for all pipes and where directed and approved by the Engineer.	m ²	28,229.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.2	<u>Breaking Out and Reinstatement of Existing Unpaved Surfaces</u>				
	Breaking out existing unpaved surfaces in granular material, or in aggregate sub-base and/or base course, of any type and any thickness, and reinstatement to match previously existing, complete including removal of existing debris, vegetation and the like, removal and replacement of existing aggregate base and sub-base courses and any form of structure, foundation, etc. (if any), disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Reinstated unpaved surfaces shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick.</i>				
02539.2.1	Breaking out and reinstatement of existing unpaved surfaces for all pipes and where directed and approved by the Engineer.	m ²	1,940.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.3	<u>Trench Excavation for Gravity Sewer System</u>				
	Trench excavation in any type of soil including rock complete including, but not limited to the following:				
	- Grading, leveling and compacting bottom of excavation, and trimming sides of excavation;				
	- All necessary shoring;				
	- Keeping excavation free from all water sources;				
	- Protection of existing service utilities (if any) and provision of necessary temporary works to maintain utilities in use during and until completion of works;				
	- Backfilling with sand or selected fill materials (as indicated);				
	- Compacting in layers to required density;				
	- Removing and disposing off surplus materials to approved dumping area;				
	- and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Trench depth for pipes shall be measured from road formation level down to pipe invert level.</i>				
02539.3.1	<u>Trench Excavation for Gravity Sewer Pipes under Paved or Unpaved Surfaces (to Be Backfilled with Selected Fill Materials)</u>				
02539.3.1.1	Pipe diameter 150 mm, trench depth up to 2 m.	lm	1,796.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.2	Pipe diameter 200 mm, trench depth up to 2 m.	lm	2,226.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.3	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	3,200.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.4	Ditto, but trench depth exceeding 3 m and up to 4 m.	lm	824.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.5	Ditto, but trench depth exceeding 4 m and up to 5 m.	lm	330.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.7	Pipe diameter 250 mm, trench depth up to 2 m.	lm	500.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.8	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	514.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.9	Ditto, but trench depth exceeding 3 m and up to 4 m.	lm	180.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.12	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	808.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.13	Ditto, but trench depth exceeding 3 m and up to 4 m.	lm	960.00		
	<i>Unit Rate in Words:</i>				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.3.1.20	Pipe diameter 600 mm, trench depth up to 2 m. <i>Unit Rate in Words:</i>	lm	1,608.00		
02539.3.1.21	Ditto, but trench depth exceeding 2 m and up to 3 m. <i>Unit Rate in Words:</i>	lm	1,070.00		
02539.3.2	<u>Trench Excavation for Gravity Sewer Pipes under Paved Surfaces (to Be Backfilled with Sand Fill Materials up to Formation Level below Aggregate Sub-Base Course as per the Regulations of the Ministry of Public Works)</u>				
02539.3.2.1	Pipe diameter 250 mm, trench depth up to 2 m. <i>Unit Rate in Words:</i>	lm	357.00		
02539.3.2.2	Pipe diameter 315 mm, trench depth up to 2 m. <i>Unit Rate in Words:</i>	lm	827.00		
02539.3.3.5	Pipe diameter 315 mm, trench depth up to 2 m. <i>Unit Rate in Words:</i>	lm	335.00		
	Sub Total				
2539.4	<u>Pipes for Gravity Sewer Systems</u> Supply, lay, joint and test the following pipes for gravity sewer systems with all necessary fittings, jointing materials and fixing accessories, complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.4.1	<u>Pipes for New Gravity Sewer Network</u>				
02539.4.1.1	uPVC pipes, 150 mm diameter for house connection. <i>Unit Rate in Words:</i>	lm	1,796.00		
02539.4.1.2	uPVC pipes, 200 mm diameter. <i>Unit Rate in Words:</i>	lm	6,580.00		
02539.4.1.3	uPVC pipes, 250 mm diameter. <i>Unit Rate in Words:</i>	lm	1,551.00		
02539.4.1.4	uPVC pipes, 315 mm diameter. <i>Unit Rate in Words:</i>	lm	2,930.00		
02539.4.1.7	Ditto, but 600 mm diameter. <i>Unit Rate in Words:</i>	lm	2,678.00		
	Sub Total				
2539.5	<u>Sand Material for Pipe Bedding and Surroundings</u> Supply, install and compact to required density sand material for pipe bedding and surroundings of the following pipes complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.5.1	Pipe diameter 150 mm for house connection. <i>Unit Rate in Words:</i>	lm	1,526.60		

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.5.2	Pipe diameter 200 mm	lm	6,580.00		
	<i>Unit Rate in Words:</i>				
02539.5.3	Pipe diameter 250 mm	lm	1,551.00		
	<i>Unit Rate in Words:</i>				
02539.5.4	Pipe diameter 315 mm	lm	2,595.00		
	<i>Unit Rate in Words:</i>				
02539.5.7	Pipe diameter 600 mm	lm	2,403.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.6	<u>Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces</u>				
	Cast-in-place reinforced concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, reinforcement, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.6.1	Pipe diameter 150 mm for house connection.	lm	269.00		
	<i>Unit Rate in Words:</i>				
02539.6.7	Pipe diameter 600 mm	lm	275.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.7	<u>Concrete Encasement for Pipes in Water Course</u>				
	Cast-in-place concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.7.3	Pipe diameter 315 mm	lm	335.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.8	<u>Reinforced Concrete Manholes and Chambers</u>				
	Supply all required materials, equipment and accessories, and construct the following reinforced concrete manholes and chambers, complete including, but not limited to, the following:				
	- Breaking out and reinstatement of existing paved surfaces;				
	- Site clearing and all necessary excavation in any type of soil;				
	- Keeping excavation free from all water sources;				
	- Cast-in-place concrete using high sulphate resistant cement to ASTM C150, Type V, 14 MPa on cylinder (18 MPa on cube) for blinding, and 35 MPa on cylinder (44 MPa on cube) for reinforced concrete works, including all necessary formwork of any type and any shape, reinforcement and accessories;				
	- Concrete benching;				
	- Protective coating of external surfaces in contact with soil;				
	- Coal tar epoxy coating to internal surfaces in contact with sewer;				
	- Breaking into pipes;				
	- Backfilling with selected excavated or borrow fill materials;				
	- Compacting in layers to required density;				
	- Removing and disposing off resulting and surplus materials to approved dumping area;				
	- Covers and frames, steps, and all necessary accessories;				
	- And all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Manhole or chamber depth shall be measured from top of proposed cover level, down to outgoing pipe invert level.</i>				
02539.8.1	Cast in situ reinforced concrete chamber for house connection , internal size 600 x 450 mm, with medium duty ductile iron covers and frames, clear opening size 600 x 450 mm, chamber depth up to 2.0 m.	№	224.00		
	<i>Unit Rate in Words:</i>				
02539.8.2	Precast concrete manhole, circular chamber of diameter 1200 mm, or cast in situ reinforced concrete manhole, square chamber of size 1200 x 1200 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth up to 2.0 m.	№	180.00		
	<i>Unit Rate in Words:</i>				
02539.8.3	Ditto but, manhole depth from 2.0 m to 3.0 m.	№	242.00		
	<i>Unit Rate in Words:</i>				
02539.8.4	Precast concrete manhole, circular chamber of diameter 1500 mm, or cast in situ reinforced concrete manhole, square chamber of size 1500 x 1500 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth up to 2.0 m.	№	19.00		
	<i>Unit Rate in Words:</i>				
02539.8.5	Ditto but, manhole depth from 2 m to 3 m.	№	49.00		
	<i>Unit Rate in Words:</i>				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.8.6	Ditto but, manhole depth from 3 m to 4 m.	№	24.00		
	<i>Unit Rate in Words:</i>				
02539.8.7	Ditto but, manhole depth from 4 m to 5 m.	№	8.00		
	<i>Unit Rate in Words:</i>				
02539.8.9	Precast concrete manhole, circular chamber of diameter 1800 mm, or cast in situ reinforced concrete manhole, square chamber of size 1800 x 1800 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter. manhole depth up to 2 m .	№	5.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
	Summary				
2539.1	Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces				
2539.2	Breaking Out and Reinstatement of Existing Unpaved Surfaces				
2539.3	Trench Excavation for Gravity Sewer System				
2539.4	Pipes for Gravity Sewer Systems				
2539.5	Sand Material for Pipe Bedding and Surroundings				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
2539.7	Concrete Encasement for Pipes in Water Course				
2539.8	Reinforced Concrete Manholes and Chambers				
	Grand Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539	<u>Sanitary Sewer Systems</u>				
2539.1	<u>Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces</u>				
	Cutting and breaking out existing paved surfaces in bituminous courses, concrete, or pavers of any type and of any thickness, and reinstatement to match previously existing, complete including removal and replacement of aggregate base and sub-base courses, bituminous courses, concrete surfaced roads, curbs, pavers, street lamps, roads signs, road marking, safety barriers, any form of structure and all other street furniture, etc., removing and disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Reinstated asphalt pavement shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick; Asphalt Binder Course: 45 mm thick; Asphalt Wearing Course: 45 mm thick.</i>				
	<i>It shall be noted that the width of the Trench shall be taken as shown on the drawings to calculate the area of road reinstatement except narrow roads not exceeding 3m wide which should be reinstated entirely. Any widening of the trench made by the Contractor without the approval of the Engineer shall be reinstated by the Contractor at no additional cost.</i>				
02539.1.1	Cutting, Breaking out and reinstatement of existing paved surfaces for all pipes and where directed and approved by the Engineer.	m ²	8,853.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.2	<u>Breaking Out and Reinstatement of Existing Unpaved Surfaces</u>				
	Breaking out existing unpaved surfaces in granular material, or in aggregate sub-base and/or base course, of any type and any thickness, and reinstatement to match previously existing, complete including removal of existing debris, vegetation and the like, removal and replacement of existing aggregate base and sub-base courses and any form of structure, foundation, etc. (if any), disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Reinstated unpaved surfaces shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick.</i>				
02539.2.1	Breaking out and reinstatement of existing unpaved surfaces for all pipes and where directed and approved by the Engineer.	m ²	3,250.00		
	<i>Unit Rate in Words:</i>				
ail					
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.3	<u>Trench Excavation for Gravity Sewer System</u>				
	Trench excavation in any type of soil including rock complete including, but not limited to the following:				
	- Grading, leveling and compacting bottom of excavation, and trimming sides of excavation;				
	- All necessary shoring;				
	- Keeping excavation free from all water sources;				
	- Protection of existing service utilities (if any) and provision of necessary temporary works to maintain utilities in use during and until completion of works;				
	- Backfilling with sand or selected fill materials (as indicated);				
	- Compacting in layers to required density;				
	- Removing and disposing off surplus materials to approved dumping area;				
	- and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
	<i>Note: - Trench depth for pipes shall be measured from road formation level down to pipe invert level.</i>				
02539.3.1	<u>Trench Excavation for Gravity Sewer Pipes under Paved or Unpaved Surfaces (to Be Backfilled with Selected Fill Materials)</u>				
02539.3.1.1	Pipe diameter 150 mm, trench depth up to 2 m.	lm	1,236.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.3	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	925.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.7	Pipe diameter 250 mm, trench depth up to 2 m.	lm	1,933.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.8	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	867.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.11	Pipe diameter 315 mm, trench depth up to 2 m.	lm	270.00		
	<i>Unit Rate in Words:</i>				
02539.3.1.19	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	686.00		
	<i>Unit Rate in Words:</i>				
02539.3.2.01	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	165.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.4	Pipes for Gravity Sewer Systems				
	<i>Supply, lay, joint and test the following pipes for gravity sewer systems with all necessary fittings, jointing materials and fixing accessories, complete all as specified, shown on the drawings and to the satisfaction of the Engineer.</i>				
02539.4.1	Pipes for New Gravity Sewer Network				
02539.4.1.1	uPVC pipes, 150 mm diameter for house connection.	lm	1,394.00		
	<i>Unit Rate in Words:</i>				
02539.4.1.2	uPVC pipes, 200 mm diameter.	lm	925.00		
	<i>Unit Rate in Words:</i>				
02539.4.1.3	uPVC pipes, 250 mm diameter.	lm	2,800.00		
	<i>Unit Rate in Words:</i>				
02539.4.1.4	uPVC pipes, 315 mm diameter.	lm	270.00		
	<i>Unit Rate in Words:</i>				
02539.4.1.6	Concrete pipes, bituminous or coal tar epoxy coated internally, 500 mm diameter.	lm	686.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.5	Sand Material for Pipe Bedding and Surroundings				
	<i>Supply, install and compact to required density sand material for pipe bedding and surroundings of the following pipes complete all as specified, shown on the drawings and to the satisfaction of the Engineer.</i>				
02539.5.1	Pipe diameter 150 mm for house connection.	lm	1,184.00		
	<i>Unit Rate in Words:</i>				
02539.5.2	Pipe diameter 200 mm	lm	760.00		
	<i>Unit Rate in Words:</i>				
02539.5.3	Pipe diameter 250 mm	lm	2,499.00		
	<i>Unit Rate in Words:</i>				
02539.5.4	Pipe diameter 315 mm	lm	270.00		
	<i>Unit Rate in Words:</i>				
02539.5.6	Pipe diameter 500 mm	lm	556.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
	<i>Cast-in-place reinforced concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, reinforcement, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.</i>				
02539.6.1	Pipe diameter 150 mm for house connection.	lm	210.00		
	Unit Rate in Words:				
02539.6.3	Pipe diameter 250 mm	lm	301.00		
	Unit Rate in Words:				
02539.6.6	Pipe diameter 500 mm	lm	130.00		
	Unit Rate in Words:				
	Sub Total				
2539.7	Concrete Encasement for Pipes in Water Course				
	<i>Cast-in-place concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.</i>				
02539.7.1	Pipe diameter 200 mm	lm	165.00		
	Unit Rate in Words:				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.8	<i>Reinforced Concrete Manholes and Chambers</i>				
	Supply all required materials, equipment and accessories, and construct the following reinforced concrete manholes and chambers, complete including, but not limited to, the following:				
-	Breaking out and reinstatement of existing paved surfaces;				
-	Site clearing and all necessary excavation in any type of soil;				
-	<i>Keeping excavation free from all water sources;</i>				
-	Cast-in-place concrete using high sulphate resistant cement to ASTM C150, Type V, 14 MPa on cylinder (18 MPa on cube) for blinding, and 35 MPa on cylinder (44 MPa on cube) for reinforced concrete works, including all necessary formwork of any type and any shape, reinforcement and accessories;				
-	Concrete benching;				
-	Protective coating of external surfaces in contact with soil;				
-	<i>Coal tar epoxy coating to internal surfaces in contact with sewer;</i>				
-	Breaking into pipes;				
-	Backfilling with selected excavated or borrow fill materials;				
-	Compacting in layers to required density;				
-	<i>Removing and disposing off resulting and surplus materials to approved dumping area;</i>				
-	Covers and frames, steps, and all necessary accessories;				
-	And all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	<i>Manhole or chamber depth shall be measured from top of proposed cover level, down to outgoing pipe invert level.</i>				
02539.8.1	Cast in situ reinforced concrete chamber for house connection , internal size 600 x 450 mm, with medium duty ductile iron covers and frames, clear opening size 600 x 450 mm, chamber depth up to 2.0 m.	№	172.00		
	Unit Rate in Words:				
02539.8.2	Precast concrete manhole, circular chamber of diameter 1200 mm, or cast in situ reinforced concrete manhole, square chamber of size 1200 x 1200 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth up to 2.0 m.	№	111.00		
	Unit Rate in Words:				
02539.8.3	Ditto but, manhole depth from 2.0 m to 3.0 m.	№	64.00		
	Unit Rate in Words:				
02539.8.5	Precast concrete manhole, circular chamber of diameter 1500 mm, or cast in situ reinforced concrete manhole, square chamber of size 1500 x 1500 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth from 2 m to 3 m.	№	5.00		

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
	Unit Rate in Words:				
02539.8.6	Ditto but, manhole depth from 3 m to 4 m.	№	10.00		
	Unit Rate in Words:				
02539.8.7	Ditto but, manhole depth from 4 m to 5 m.	№	8.00		
	Unit Rate in Words:				
	Sub Total				
	Summary				
2539.1	Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces				
2539.2	Breaking Out and Reinstatement of Existing Unpaved Surfaces				
2539.3	Trench Excavation for Gravity Sewer System				
2539.4	Pipes for Gravity Sewer Systems				
2539.5	Sand Material for Pipe Bedding and Surroundings				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
2539.7	Concrete Encasement for Pipes in Water Course				
2539.8	Reinforced Concrete Manholes and Chambers				
2539.9	Backdrop Connections to Manholes				
	Grand Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539	<u>Sanitary Sewer Systems</u>				
2539.1	<u>Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces</u>				
	Cutting and breaking out existing paved surfaces in bituminous courses, concrete, or pavers of any type and of any thickness, and reinstatement to match previously existing, complete including removal and replacement of aggregate base and sub-base courses, bituminous courses, concrete surfaced roads, curbs, pavers, street lamps, roads signs, road marking, safety barriers, any form of structure and all other street furniture, etc., removing and disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Reinstated asphalt pavement shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick; Asphalt Binder Course: 45 mm thick; Asphalt Wearing Course: 45 mm thick.				
	It shall be noted that the width of the Trench shall be taken as shown on the drawings to calculate the area of road reinstatement except narrow roads not exceeding 3m wide which should be reinstated entirely. Any widening of the trench made by the Contractor without the approval of the Engineer shall be reinstated by the Contractor at no additional cost.				
02539.1.1	Cutting, Breaking out and reinstatement of existing paved surfaces for all pipes and where directed and approved by the Engineer.	m ²	2,177.00		
	Unit Rate in Words:				
	Sub Total				
2539.2	<u>Breaking Out and Reinstatement of Existing Unpaved Surfaces</u>				
	Breaking out existing unpaved surfaces in granular material, or in aggregate sub-base and/or base course, of any type and any thickness, and reinstatement to match previously existing, complete including removal of existing debris, vegetation and the like, removal and replacement of existing aggregate base and sub-base courses and any form of structure, foundation, etc. (if any), disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Reinstated unpaved surfaces shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick.				
02539.2.1	Breaking out and reinstatement of existing unpaved surfaces for all pipes and where directed and approved by the Engineer.	m ²	458.00		
	Unit Rate in Words:				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.3	<u>Trench Excavation for Gravity Sewer System</u>				
	Trench excavation in any type of soil including rock complete including, but not limited to the following:				
-	Grading, leveling and compacting bottom of excavation, and trimming sides of excavation;				
-	All necessary shoring;				
-	Keeping excavation free from all water sources;				
-	Protection of existing service utilities (if any) and provision of necessary temporary works to maintain utilities in use during and until completion of works;				
-	Backfilling with sand or selected fill materials (as indicated);				
-	Compacting in layers to required density;				
-	Removing and disposing off surplus materials to approved dumping area;				
-	and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	<i>Trench depth for pipes shall be measured from road formation level down to pipe invert level.</i>				
02539.3.1	<u>Trench Excavation for Gravity Sewer Pipes under Paved or Unpaved Surfaces (to Be Backfilled with Selected Fill Materials)</u>				
02539.3.1.1	Pipe diameter 150 mm, trench depth up to 2 m.	lm	192.00		
	Unit Rate in Words:				
02539.3.1.2	Pipe diameter 200 mm, trench depth up to 2 m.	lm	236.00		
	Unit Rate in Words:				
02539.3.1.3	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	540.00		
	Unit Rate in Words:				
02539.3.1.11	Pipe diameter 315 mm, trench depth up to 2 m.	lm	32.00		
	Unit Rate in Words:				
02539.3.1.12	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	140.00		
	Unit Rate in Words:				
	Sub Total				
2539.4	<u>Pipes for Gravity Sewer Systems</u>				
	Supply, lay, joint and test the following pipes for gravity sewer systems with all necessary fittings, jointing materials and fixing accessories, complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.4.1	<u>Pipes for New Gravity Sewer Network</u>				
02539.4.1.1	<i>uPVC pipes, 150 mm diameter for house connection.</i>	lm	192.00		
	Unit Rate in Words:				
02539.4.1.2	<i>uPVC pipes, 200 mm diameter.</i>	lm	776.00		
	Unit Rate in Words:				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.4.1.4	uPVC pipes, 315 mm diameter.	lm	172.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.5	Sand Material for Pipe Bedding and Surroundings				
	Supply, install and compact to required density sand material for pipe bedding and surroundings of the following pipes complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.5.1	Pipe diameter 150 mm for house connection.	lm	164.00		
	<i>Unit Rate in Words:</i>				
02539.5.2	Pipe diameter 200 mm	lm	524.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
	Cast-in-place reinforced concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, reinforcement, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.6.1	Pipe diameter 150 mm for house connection.	lm	28.00		
	<i>Unit Rate in Words:</i>				
02539.6.2	Pipe diameter 200 mm	lm	252.00		
	<i>Unit Rate in Words:</i>				
02539.6.4	Pipe diameter 315 mm	lm	172.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.8	Reinforced Concrete Manholes and Chambers				
	Supply all required materials, equipment and accessories, and construct the following reinforced concrete manholes and chambers, complete including, but not limited to, the following:				
-	Breaking out and reinstatement of existing paved surfaces;				
-	<i>Site clearing and all necessary excavation in any type of soil;</i>				
-	Keeping excavation free from all water sources;				
-	Cast-in-place concrete using high sulphate resistant cement to ASTM C150, Type V, 14 MPa on cylinder (18 MPa on cube) for blinding, and 35 MPa on cylinder (44 MPa on cube) for reinforced concrete works, including all necessary formwork of any type and any shape, reinforcement and accessories;				
-	Concrete benching;				
-	<i>Protective coating of external surfaces in contact with soil;</i>				
-	Coal tar epoxy coating to internal surfaces in contact with sewer;				
-	Breaking into pipes;				
-	Backfilling with selected excavated or borrow fill materials;				
-	<i>Compacting in layers to required density;</i>				
-	Removing and disposing off resulting and surplus materials to approved dumping area;				
-	Covers and frames, steps, and all necessary accessories;				
-	And all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Manhole or chamber depth shall be measured from top of proposed cover level, down to outgoing pipe invert level.				
02539.8.1	Cast in situ reinforced concrete chamber for house connection , internal size 600 x 450 mm, with medium duty ductile iron covers and frames, clear opening size 600 x 450 mm, chamber depth up to 2.0 m.	№	24.00		
	Unit Rate in Words:				
02539.8.2	Precast concrete manhole, circular chamber of diameter 1200 mm, or cast in situ reinforced concrete manhole, square chamber of size 1200 x 1200 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth up to 2.0 m.	№	36.00		
	Unit Rate in Words:				
02539.8.3	Ditto but, manhole depth from 2.0 m to 3.0 m.	№	32.00		
	Unit Rate in Words:				
02539.8.7	Precast concrete manhole, circular chamber of diameter 1500 mm, or cast in situ reinforced concrete manhole, square chamber of size 1500 x 1500 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth from 4 m to 5 m.	№	1.00		
	Unit Rate in Words:				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
	Summary				
2539.1	Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces				
2539.2	Breaking Out and Reinstatement of Existing Unpaved Surfaces				
2539.3	Trench Excavation for Gravity Sewer System				
2539.4	Pipes for Gravity Sewer Systems				
2539.5	Sand Material for Pipe Bedding and Surroundings				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
2539.7	Concrete Encasement for Pipes in Water Course				
2539.8	Reinforced Concrete Manholes and Chambers				
	Grand Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539	<u>Sanitary Sewer Systems</u>				
2539.1	<u>Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces</u>				
	Cutting and breaking out existing paved surfaces in bituminous courses, concrete, or pavers of any type and of any thickness, and reinstatement to match previously existing, complete including removal and replacement of aggregate base and sub-base courses, bituminous courses, concrete surfaced roads, curbs, pavers, street lamps, roads signs, road marking, safety barriers, any form of structure and all other street furniture, etc., removing and disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
<i>Note: -</i>	<i>Reinstated asphalt pavement shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick; Asphalt Binder Course: 45 mm thick; Asphalt Wearing Course: 45 mm thick.</i>				
	<i>It shall be noted that the width of the Trench shall be taken as shown on the drawings to calculate the area of road reinstatement except narrow roads not exceeding 3m wide which should be reinstated entirely. Any widening of the trench made by the Contractor without the approval of the Engineer shall be reinstated by the Contractor at no additional cost.</i>				
02539.1.1	Cutting, Breaking out and reinstatement of existing paved surfaces for all pipes and where directed and approved by the Engineer.	m ²	6,518.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
2539.2	<u>Breaking Out and Reinstatement of Existing Unpaved Surfaces</u>				
	Breaking out existing unpaved surfaces in granular material, or in aggregate sub-base and/or base course, of any type and any thickness, and reinstatement to match previously existing, complete including removal of existing debris, vegetation and the like, removal and replacement of existing aggregate base and sub-base courses and any form of structure, foundation, etc. (if any), disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
<i>Note: -</i>	<i>Reinstated unpaved surfaces shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick.</i>				
02539.2.1	Breaking out and reinstatement of existing unpaved surfaces for all pipes and where directed and approved by the Engineer.	m ²	1,300.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.3	Trench Excavation for Gravity Sewer System				
	Trench excavation in any type of soil including rock complete including, but not limited to the following:				
-	Grading, leveling and compacting bottom of excavation, and trimming sides of excavation;				
-	All necessary shoring;				
-	Keeping excavation free from all water sources;				
-	Protection of existing service utilities (if any) and provision of necessary temporary works to maintain utilities in use during and until completion of works;				
-	Backfilling with sand or selected fill materials (as indicated);				
-	Compacting in layers to required density;				
-	Removing and disposing off surplus materials to approved dumping area;				
-	and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Trench depth for pipes shall be measured from road formation level down to pipe invert level.				
02539.3.1	Trench Excavation for Gravity Sewer Pipes under Paved or Unpaved Surfaces (to Be Backfilled with Selected Fill Materials)				
02539.3.1.1	Pipe diameter 150 mm, trench depth up to 2 m.	lm	384.00		
	Unit Rate in Words:				
02539.3.1.2	Pipe diameter 200 mm, trench depth up to 2 m.	lm	1,080.00		
	Unit Rate in Words:				
02539.3.1.3	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	820.00		
	Unit Rate in Words:				
	Sub Total				
2539.4	Pipes for Gravity Sewer Systems				
	Supply, lay, joint and test the following pipes for gravity sewer systems with all necessary fittings, jointing materials and fixing accessories, complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.4.1	Pipes for New Gravity Sewer Network				
02539.4.1.1	uPVC pipes, 150 mm diameter for house connection.	lm	320.00		
	Unit Rate in Words:				
02539.4.1.2	uPVC pipes, 200 mm diameter.	lm	1,900.00		
	Unit Rate in Words:				
	Sub Total				
2539.5	Sand Material for Pipe Bedding and Surroundings				
	Supply, install and compact to required density sand material for pipe bedding and surroundings of the following pipes complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.5.1	Pipe diameter 150 mm for house connection.	lm	336.00		
	Unit Rate in Words:				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.5.2	Pipe diameter 200 mm	lm	1,658.00		
	Unit Rate in Words:				
	Sub Total				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
	Cast-in-place reinforced concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, reinforcement, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.6.1	Pipe diameter 150 mm for house connection.	lm	48.00		
	Unit Rate in Words:				
02539.6.2	Pipe diameter 200 mm	lm	242.00		
	Unit Rate in Words:				
	Sub Total				
2539.8	Reinforced Concrete Manholes and Chambers				
	Supply all required materials, equipment and accessories, and construct the following reinforced concrete manholes and chambers, complete including, but not limited to, the following:				
-	Breaking out and reinstatement of existing paved surfaces;				
-	Site clearing and all necessary excavation in any type of soil;				
-	Keeping excavation free from all water sources;				
-	Cast-in-place concrete using high sulphate resistant cement to ASTM C150, Type V, 14 MPa on cylinder (18 MPa on cube) for blinding, and 35 MPa on cylinder (44 MPa on cube) for reinforced concrete works, including all necessary formwork of any type and any shape, reinforcement and accessories;				
-	Concrete benching;				
-	Protective coating of external surfaces in contact with soil;				
-	Coal tar epoxy coating to internal surfaces in contact with sewer;				
-	Breaking into pipes;				
-	Backfilling with selected excavated or borrow fill materials;				
-	Compacting in layers to required density;				
-	Removing and disposing off resulting and surplus materials to approved dumping area;				
-	Covers and frames, steps, and all necessary accessories;				
-	And all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Manhole or chamber depth shall be measured from top of proposed cover level, down to outgoing pipe invert level.				
02539.8.1	Cast in situ reinforced concrete chamber for house connection, internal size 600 x 450 mm, with medium duty ductile iron covers and frames, clear opening size 600 x 450 mm, chamber depth up to 2.0 m.	№	48.00		
	Unit Rate in Words:				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.8.2	Precast concrete manhole, circular chamber of diameter 1200 mm, or cast in situ reinforced concrete manhole, square chamber of size 1200 x 1200 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth up to 2.0 m.	№	64.00		
	<i>Unit Rate in Words:</i>				
02539.8.3	Ditto but, manhole depth from 2.0 m to 3.0 m.	№	44.00		
	<i>Unit Rate in Words:</i>				
	Sub Total				
	Summary				
2539.1	Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces				
2539.2	Breaking Out and Reinstatement of Existing Unpaved Surfaces				
2539.3	Trench Excavation for Gravity Sewer System				
2539.4	Pipes for Gravity Sewer Systems				
2539.5	Sand Material for Pipe Bedding and Surroundings				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
2539.8	Reinforced Concrete Manholes and Chambers				
	Grand Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
3.2	Final Design Supply and Install the Following at Bridge Crossing:				
	Pipe supports as shown on the drawing at 2m intervals including drilling and installing anchor bolts in the bridge structure all in accordance with approved design and shop drawings.				
	Including the supply and installation of 30cm ductile cast iron pipe of approved specification including the supply of rocker pipe elements at manhole positions before and after.				
	Steel work to be sandblasted to SA2 ½ standards & painted with an approved four coat paint system.	LS	2.00		
	<i>Lump Sum in Words:</i>				
	Sub Total				
	Summary				
3.2	Final Design Supply and Installation at Bridge Crossing				
	Grand Total				

**Complementary Works for The Expansion of The Sewage Collection Network to Connect to The
Zahle Wastewater Treatment Plant and Aitanit Wastewater Treatment Plant**

**SUMMARY
PART 1 - ZAHLE**

BILL No	BILL NAME	AMOUNT (USD)
1	Premilinaries and Dayworks (Excluding Provisional Sum)	0.00
2.1	Zahle - El Ferzol	0.00
2.2	Saadnyael - Taalbaya	0.00
2.3	Quaa El Rim	0.00
2.4	Hezzerta	0.00
3	Additional Costs for Difficulties	0.00
Grand Total		0.00

PART 2 - AITANIT

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539	<u>Sanitary Sewer Systems</u>				
2539.1	<u>Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces</u>				
	Cutting and breaking out existing paved surfaces in bituminous courses, concrete, or pavers of any type and of any thickness, and reinstatement to match previously existing, complete including removal and replacement of aggregate base and sub-base courses, bituminous courses, concrete surfaced roads, curbs, pavers, street lamps, roads signs, road marking, safety barriers, any form of structure and all other street furniture, etc., removing and disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Reinstated asphalt pavement shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick; Asphalt Binder Course: 45 mm thick; Asphalt Wearing Course: 45 mm thick.				
	It shall be noted that the width of the Trench shall be taken as shown on the drawings to calculate the area of road reinstatement except narrow roads not exceeding 3m wide which should be reinstated entirely. Any widening of the trench made by the Contractor without the approval of the Engineer shall be reinstated by the Contractor at no additional cost.				
02539.1.1	Cutting, Breaking out and reinstatement of existing paved surfaces for all pipes and where directed and approved by the Engineer.	m ²	14,360.00		
	Unit Rate in Words:				
	Sub Total				
2539.2	<u>Breaking Out and Reinstatement of Existing Unpaved Surfaces</u>				
	Breaking out existing unpaved surfaces in granular material, or in aggregate sub-base and/or base course, of any type and any thickness, and reinstatement to match previously existing, complete including removal of existing debris, vegetation and the like, removal and replacement of existing aggregate base and sub-base courses and any form of structure, foundation, etc. (if any), disposing off resulting materials to approved dumping area, making good all disturbed surfaces, and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Reinstated unpaved surfaces shall have: Aggregate Sub-Base Course: 200 mm thick; Aggregate Base Course: 200 mm thick.				
02539.2.1	Breaking out and reinstatement of existing unpaved surfaces for all pipes and where directed and approved by the Engineer.	m ²	5,470.00		
	Unit Rate in Words:				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.3	<u>Trench Excavation for Gravity Sewer System</u>				
	Trench excavation in any type of soil including rock complete including, but not limited to the following:				
-	Grading, leveling and compacting bottom of excavation, and trimming sides of excavation;				
-	All necessary shoring;				
-	Keeping excavation free from all water sources;				
-	Protection of existing service utilities (if any) and provision of necessary temporary works to maintain utilities in use during and until completion of works;				
-	Backfilling with sand or selected fill materials (as indicated);				
-	Compacting in layers to required density;				
-	Removing and disposing off surplus materials to approved dumping area;				
-	and all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	<i>Trench depth for pipes shall be measured from road formation level down to pipe invert level.</i>				
02539.3.1	<u>Trench Excavation for Gravity Sewer Pipes under Paved or Unpaved Surfaces (to Be Backfilled with Selected Fill Materials)</u>				
02539.3.1.1	Pipe diameter 150 mm, trench depth up to 2 m.	lm	820.00		
	Unit Rate in Words:				
02539.3.1.3	Ditto, but trench depth exceeding 2 m and up to 3 m.	lm	1,880.00		
	Unit Rate in Words:				
02539.3.1.4	Ditto, but trench depth exceeding 3 m and up to 4 m.	lm	3,101.00		
	Unit Rate in Words:				
02539.3.2.00	Pipe diameter 200 mm, trench depth up to 2 m.	lm	1,100.00		
	Unit Rate in Words:				
	Sub Total				
2539.4	<u>Pipes for Gravity Sewer Systems</u>				
	Supply, lay, joint and test the following pipes for gravity sewer systems with all necessary fittings, jointing materials and fixing accessories, complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.4.1	Pipes for New Gravity Sewer Network				
02539.4.1.1	uPVC pipes, 150 mm diameter for house connection.	lm	820.00		
	Unit Rate in Words:				
02539.4.1.2	uPVC pipes, 200 mm diameter.	lm	6,081.00		
	Unit Rate in Words:				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.5	<i>Sand Material for Pipe Bedding and Surroundings</i>				
	Supply, install and compact to required density sand material for pipe bedding and surroundings of the following pipes complete all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.5.1	Pipe diameter 150 mm for house connection.	lm	700.00		
	Unit Rate in Words:				
02539.5.2	Pipe diameter 200 mm	lm	4,735.00		
	Unit Rate in Words:				
	Sub Total				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
	Cast-in-place reinforced concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, reinforcement, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.6.1	Pipe diameter 150 mm for house connection.	lm	120.00		
	Unit Rate in Words:				
02539.6.2	Pipe diameter 200 mm	lm	446.00		
	Unit Rate in Words:				
	Sub Total				
2539.7	Concrete Encasement for Pipes in Water Course				
	Cast-in-place concrete encasement to the following pipes, using ordinary Portland cement to ASTM C150, Type I, 30 MPa on cylinder (38 MPa on cube), complete including all necessary formwork, accessories and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.7.1	Pipe diameter 200 mm	lm	900.00		
	Unit Rate in Words:				
	Sub Total				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
2539.8	Reinforced Concrete Manholes and Chambers				
	Supply all required materials, equipment and accessories, and construct the following reinforced concrete manholes and chambers, complete including, but not limited to, the following:				
-	Breaking out and reinstatement of existing paved surfaces;				
-	<i>Site clearing and all necessary excavation in any type of soil;</i>				
-	Keeping excavation free from all water sources;				
-	Cast-in-place concrete using high sulphate resistant cement to ASTM C150, Type V, 14 MPa on cylinder (18 MPa on cube) for blinding, and 35 MPa on cylinder (44 MPa on cube) for reinforced concrete works, including all necessary formwork of any type and any shape, reinforcement and accessories;				
-	Concrete benching;				
-	<i>Protective coating of external surfaces in contact with soil;</i>				
-	Coal tar epoxy coating to internal surfaces in contact with sewer;				
-	Breaking into pipes;				
-	Backfilling with selected excavated or borrow fill materials;				
-	<i>Compacting in layers to required density;</i>				
-	Removing and disposing off resulting and surplus materials to approved dumping area;				
-	Covers and frames, steps, and all necessary accessories;				
-	And all other related works, all as specified, shown on drawings and to the satisfaction of the Engineer.				
Note: -	Manhole or chamber depth shall be measured from top of proposed cover level, down to outgoing pipe invert level.				
02539.8.1	Cast in situ reinforced concrete chamber for house connection , internal size 600 x 450 mm, with medium duty ductile iron covers and frames, clear opening size 600 x 450 mm, chamber depth up to 2.0 m.	Nº	90.00		
	Unit Rate in Words:				
02539.8.2	Precast concrete manhole, circular chamber of diameter 1200 mm, or cast in situ reinforced concrete manhole, square chamber of size 1200 x 1200 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth up to 2.0 m.	Nº	71.00		
	Unit Rate in Words:				
02539.8.3	Ditto but, manhole depth from 2.0 m to 3.0 m.	Nº	66.00		
	Unit Rate in Words:				
02539.8.6	Precast concrete manhole, circular chamber of diameter 1500 mm, or cast in situ reinforced concrete manhole, square chamber of size 1500 x 1500 mm, with heavy duty ductile iron manhole covers and frames, clear opening size 600 mm diameter, manhole depth from 3 m to 4 m.	Nº	101.00		
	Unit Rate in Words:				

Item	Description	Unit	Quantity	Unit Rate (USD)	Amount (USD)
02539.8.7	Ditto but, manhole depth from 4 m to 5 m.	Nº	13.00		
	Unit Rate in Words:				
	Sub Total				
2539.9	Backdrop Connections to Manholes				
	Supply, install and connect the following backdrop connections to manholes complete including all necessary pipes, pipe fittings, jointing materials, accessories, and all other related works, all as specified, shown on the drawings and to the satisfaction of the Engineer.				
02539.9.3	Backdrop connections to manholes, drop depth greater than 3.0 m to 4.0 m.	Nº	5.00		
	Unit Rate in Words:				
	Sub Total				
	Summary				
2539.1	Cutting, Breaking Out and Reinstatement of Existing Paved Surfaces				
2539.2	Breaking Out and Reinstatement of Existing Unpaved Surfaces				
2539.3	Trench Excavation for Gravity Sewer System				
2539.4	Pipes for Gravity Sewer Systems				
2539.5	Sand Material for Pipe Bedding and Surroundings				
2539.6	Reinforced Concrete Encasement for Pipes under Paved or Unpaved Surfaces				
2539.7	Concrete Encasement for Pipes in Water Course				
2539.8	Reinforced Concrete Manholes and Chambers				
2539.9	Backdrop Connections to Manholes				
	Grand Total				

**Complementary Works for The Expansion of The Sewage Collection Network to Connect
to The Zahle Wastewater Treatment Plant and Aitanit Wastewater Treatment Plant**

**SUMMARY
PART 2 - AITANIT
BILL NO. 1**

BILL No	BILL NAME	AMOUNT (USD)
1	Baaloul - Qaraaoun	0.00
Grand Total		0.00

ITEM NB.	DESCRIPTION	UNIT	Quantity	UNIT RATE (USD)	Amount (USD)
4.000	Supply of all the mechanical and electric equipment and accessories for the hybrid solar system				
4.001	High Voltage 3 Phase Hybrid Inverter 60 KW	Nr.	2		
4.002	Lithium Battery Bank 200 KWh with required clusters and BMS system and Battery Racks.	Nr.	1		
4.003	Manual Transfer Switches 250 A with Rotary Handle, MCCB 125 A in suitable IP55 Enclosures and DC breakers 1KV including suitable enclosure IP55 and Bus Bar link	L.S.	1		
4.004	DC cables 6 mm ² , High current DC cables for batteries connections and clusters to inverters, and AC cables 4x70 mm ² for EDL and Generator	L.S.	1		
4.005	Earthing system including earth rods and surge arrestors 100 KA Nominal Discharging Current in 8-20 micro seconds with 125 A Fuse with indicator and 35 mm ² cable in a suitable chassis and enclosure IP66	L.S.	1		
4.006	All required mechanical and electric accessories necessary for the proper installation of the system including and not limited to lugs, conduits, cable trays, bolts and nuts, numbering, ;labeling and fittings,etc...	L.S.	1		
4.007	Supply of a 100 KVA full automatic 3 phase servo electrical stabilizer (voltage regulator)	Nr.	1		
4.008	Supply of a High wall Inverter mini Split AC unit 18,000 BTU/hr including copper pipes, drain pipe and electric connections	Nr.	2		
	Sub-Total 4.000				
5.000	Installation of a complete hybrid solar system				
5.001	Dismantling, transportation and handing of the old existing inverters to the dedicated authority.	L.S.	1		
5.002	Installation of the hybrid solar system including but not limited to programming, testing and commissioning	L.S.	1		
5.003	Installation of batteries, cables and earthing system	L.S.	2		
5.004	Installation of a 100 KVA electrical stabilizer (voltage regulator)	Nr.	1		
5.005	Installation of a High wall Inverter mini Split AC unit 18,000 BTU/hr including copper pipes, drain pipe and electric connections	Nr.	2		
	Sub-Total 5.000				

ITEM NB.	DESCRIPTION	UNIT	Quantity	UNIT RATE (USD)	Amount (USD)
6.000	Generating Set				
	Supply, install, Connect and Commission the following Low Voltage Diesel Generator Sets, Prime Rated, including main circuit breakers, load priority function, protective relays with all interfaces, enclosed in weatherproof and soundproof canopy to acheive 70 dBA at 1 meter, including set mounted engine instruments, Fuel supply system and all fuel installations with all safety and isolation valves, Fuel drip tray, and generator annunciator panel with all wiring and conduiting, and remote control panel with On-Off and fault visual status, as specified.				
6.001	Generator , 400V, 3 Ph, 50 Hz, 120kVA Prime Power with 10% overload capacity,	Pcs	1		
	Sub-Total 6.000				
	Grand Total				-

**Complementary Works for The Expansion of The Sewage Collection Network to
Connect to The Zahle Wastewater Treatment Plant and Aitanit Wastewater**

**SUMMARY
PART 2 - AITANIT
BILL NO. 2**

BILL No	BILL NAME	AMOUNT (USD)
2	El Qaraaoun Pumping Station (P.S. 7 Existing)	0.00
Grand Total		0.00

**Complementary Works for The Expansion of The Sewage Collection Network to
Connect to The Zahle Wastewater Treatment Plant and Aitanit Wastewater**

**SUMMARY
PART 2 - AITANIT**

BILL No	BILL NAME	AMOUNT (USD)
1	Baaloul - Qaraaoun	0.00
2	El Qaraaoun Pumping Station (P.S. 7 Existing)	0.00
Grand Total		0.00

**Complementary Works for The Expansion of The Sewage Collection Network to Connect to The Zahle
Wastewater Treatment Plant and Aitanit Wastewater Treatment Plant**

General Summary

Description	AMOUNT (USD)
Part 1 - Zahle Area	0
Part 2 - Aitanit Area	0
* Total Amount of Bill of Quantities excluding the PS	0
* Discount by Tenderer (_____ %)	
* Total Amount of BOQ after Discount and excluding the PS	0
* PS (from Part 1 - Zahle Area)	
* Total Amount of BOQ after Discount and including the PS	
* Total Amount of BOQ after Discount and including the PS in Words: 	