

Addendum No. 4 August 13, 2021

Project Name/Description: RFP for Earth Works and Site Servicing

for 470,599,600,622 and 652 Tremblay Road

Location: Ottawa, Ontario

Owner: Canada Lands Company RFP Coordinator: Krisendat Sewgoolam

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RFP Number: 602199-02 RFP Issue Date: July 11, 2021

RFP Closing Date: August 27, 2021 at 10am EDT

Total number of pages

within this issued Addendum: 2 plus the following attachments:

- Revised Schedule 6

- Amended Tree Clearing Plan.

All Addenda shall form an integral part of the RFP and are to be read in conjunction therewith. The Addenda shall take precedence over the aforementioned RFP which may prove to be at variance or may otherwise be qualified in writing by authorized personnel.

This information shall be incorporated into and be read together with the relevant Sections of the Request for Proposal document.

Schedule 6 is hereby deleted and replaced with the attached Revised Schedule 6.

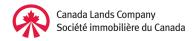
An amended Tree clearing Plan (Figure: 1) has been provided with Addendum #4 and can be downloaded.

Question 1:

What is the period of Validity of the Bid bond?

Answer

Please reference Section 2.12 Proposal Irrevocability.



Question 2:

Addendum No. 3 states the Excel Version of the Schedule of Items and Prices was provided with Addendum 3 and was available for download. We are unable to locate the Excel File for download. Please advise

Answer:

The Excel Version of Revised Schedule 6 has now been uploaded.

SUMMARY OF CONTRACT PRICING FOR 470 TREMBLAY ROAD

CITY OF OTTAWA

ITEM			IOUNT
CONTRACT I	Earthworks and Remediation Work	\$	
CONTRACT II	Underground Site Servicing to Base Course Asphalt including Stormwater Management Pond	\$	<u>-</u>
	SUB-TOTAL (LESS H.S.T.)	\$	
	Harmonized Sales Tax (13%)	\$	
	TOTAL TENDER PRICE	\$	-

SCHEDULE OF CONTRACT PRICING FOR 470 TREMBLAY ROAD

CONTRACT I: EARTHWORKS AND REMEDIATION WORKS

CITY OF OTTAWA

SUMMARY

A. SITE PREPARATION, TOPSOIL STRIPPING AND EARTHWORKS	\$ -
B. SCHEDULE OF ADDITIONAL UNIT PRICES	DO NOT EXTEND
SUB-TOTAL (LESS H.S.T.)	\$ -
Harmonized Sales Tax (13%)	\$ -
·	
TOTAL TENDER PRICE	\$ -

Note: Prices tendered in Contract I shall be valid for the years 2021 and 2022.

A. SITE PREPARATION, TOPSOIL STRIPPING AND EARTHWORKS

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL
	Supply all necessary materials, equipment, mobilization, demolition, traffic control and labour to perform the following work in accordance with the drawings and specifications and as directed by the Consultant. Unit prices shall include all items specified in the special conditions, specifications, project specifications, and the engineering plans.			\$	\$
1	Pre-construction structural survey, photo survey, and conditions report for existing building located at 466 Tremblay Road.	1	Lump Sum		
2	Preparation of Construction Schedule, and keeping updated for the duration of the contract. Poor weather conditions and Saturday work to be allowed for in schedule milestones.	1	Lump Sum		
3	All survey works required to complete the works within the contract, as outlined in contract specification and conditions: a) Construction Layout b) Topsoil Stripped grades c) Topsoil Stockpiles d) As-constructed Pregrade	1 1 1	Lump Sum Lump Sum Lump Sum Lump Sum		
4	Supply, install, maintain and remove (at the consultant's request) siltation control fence per OPSD 219.110 on drawing ESC4.	1,725	m		
5	Remove existing fence within the construction limit at the consultant's request: a) Existing black chainlink fence. b) Existing T-Bar and wire fence.	770 790	m m		
6	Decomission and remove offsite all existing monitoring wells in alignment with current MECP standards, including all permiting and coordination with MECP.	19	each		
7	Clear all trees and vegetation as identified on Figure CG1 - Clearing and Grubbing Plan. All material to be disposed of offsite, including grubbing all tree stumps. All vegitation outside of the construction limits are to be protected.	1	Lump Sum		
8	For the duration of the Contract, supply, maintain and install temporary metal mudloc fencing around the adjacent development boundary northeast of the construction zone.	720	m		
9	Construct, maintain and remove (at the consultant's request) temporary mud mat per City standards.	2	each		
10	Construct temporary sedimentation ponds as shown on drawings ESC1 and ESC2 including hickenbottom drain, outlet pipe and spillway. Maintain through the enitre duration of the contract, and ultimately remove and reinstate area to appropriate engineer-filled pregrade at the direction of the Engineer. Removal of sediment off-site.	1	Lump Sum		
11	Cut temporary diversion swales as per dwg. No ESC1, ESC2 and ESC3.	2,125	m		

A. SITE PREPARATION, TOPSOIL STRIPPING AND EARTHWORKS (CONTINUED)

ITEM 12	DESCRIPTION Supply, place and maintain rock check dams as per OPSD 219.210 on dwg no. ESC4.	ESTIMATED QUANTITY 34	UNIT each	UNIT PRICE	TOTAL
13	Construct, maintain and remove (at the consultant's request) temporary 20x10m sediment trap ditches per OPSD 219.220 on drawing ESC4, including hickenbottom drains as required.	3	each		
14	Supply install and remove (at the consultant's request) temporary: a) 500mm CSP culvert (Provisional) b) 600mm CSP culvert (Provisional)	21 28	m m		
15	Supply, install, maintain and remove (at the consultant's request) catchbasin sediment trap as per detail on drawing ESC4.	19	each		
16	Construct and maintain 0.3m plunge pool complete with 50mm dia. clearstone fixed on Geotextile 270R.	1	each		
17	Strip topsoil as per the specifications and in alignment with the Pregrade Plan Figure. Stockpile within Block 5 and/or Block 8 with a maximum stockpile height of 3.0m and maximum side slopes of 2:1. Stabilize the stockpiles as required and provide boundary siltation control fence.	11,700	m ³		
18	Strip topsoil as per the specifications within the construction limit and dispose off site. (Provisional)	5,000	m ³		NOT CARRIED
19	Excavate and remove offsite unsuitable material at the direction of the Consultant, including transportation and disposal of material at a suitable landfill location. (Provisional)	13,365	m ³		
20	Cut to fill site including transport and placement to pregrade (balance line) elevations within the limits of the site and compaction to engineered fill standards. Item to include Third Party Geotechnical Compaction Testing as mentioned in the Contract Specifications.	18,300	m ³		
21	Import geotechnically appropriate, suitable material for engineered fill from offsite including a provision for load and haul route restrictions and including a provision for certification of material indicating its suitablility. Material to be placed as fill and compacted to the recommendations of the Geotechnical Engineer and to the specified pregrade elevations. Import material to be sourced by the Proponent. Item to include Third Party Geotechnical Compaction Testing as mentioned in the Contract Specifications. (Provisional)	28,400	m ³		
22	Fill and compact topsoil within the park block, all 3:1 sloping areas, and where engineered fill is not required, at the direction of the Consulting Engineer. Item to include Third Party Geotechnical Compaction Testing as mentioned in the Contract Specifications. (Provisional)	4,200	m ³		

A. SITE PREPARATION, TOPSOIL STRIPPING AND EARTHWORKS (CONTINUED)

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL
23	Convert temporary sediment pond to ultimate pond design in pond block as shown on drawing ESC2 including hickenbottom drain, outlet pipe and spillway.	1	Lump Sum	TRIOL	TOTAL
24	Supply and install erosion protection blankets to stabilize temporary swales as directed by the consultant (Provisional) .	2,125	m		DO NOT EXTEND
25	Mud and Dust control for the duration of the Contract.	1	Lump Sum		
26	Topographic survey with tie-in perimeter grades a minimum of 10 m from area of work.	1	Lump Sum		
27	Hydroseed stripped ground to stabilize inactive areas after 30 days of inactivity (Provisional).	70,000	m ²		DO NOT EXTEND
28	Traffic Control - provide all necessary permits, traffic signage, traffic control devices, temporary line painting, delineators, and flag persons as required in accordance with the requirements of the City of Ottawa at all times during the duration of the Contract.		Lump Sum		
29	Remove existing asphalt pavement and curb.	1	Lump Sum		
30	Remove existing catchbasins and dispose off-site.	1	each		
31	Supply, install, and maintain temporary dead-end barricade as per OPSD 973.130 with no dumping signs.	2	each		
32	Remove temporary dead-end barricade as per OPSD 973.130 with no dumping signs.	2	each		NOT CARRIED
33	Supply, install, and maintain temporary concrete jersey barrier as per OPSD 911.180 for use as temporary sidewalk barricade.	2	each		
34	Remove temporary concrete jersey barrier as per OPSD 911.180 for use as temporary sidewalk barricade.	2	each		NOT CARRIED
35	For the duration of the Contract, provide a site trailer exclusively for the Client's use.	1	Lump Sum		
36	For the duration of the Contract, maintain and implement Health and Safety Measures in alignment with Provincial Standards throughout the duration of construction, including but not limited to site signage, wash stations, and site check-in protocol measures.	1	Lump Sum		

37	Construct a temporary parking lot and construction staging area that measures 50m x 50m:				
	 a) Grade and shape subgrade as specified by the Geotechnical Consultant. (Provisional) b) Provide, lay, and compact sub-base course of Granular 'B' over the area as specified by the Geotechnical Consultant, to a depth of 	2,500	sq.m		
	300mm. (Provisional)	750	cu.m		
	c) Provide, lay, and compact sub-base course of Granular 'A' over the area as specified by the Geotechnical Consultant, to a depth of 200mm. (Provisional)				
	200mm. (Provisional)	500	cu.m		
	SUB-TOTAL CARRIED FORWARD TO SUMMARY			9	\$

	SCHEDULE OF ADDITIONAL UNIT PRICES			
ITEM	DESCRIPTION	UNIT	UNIT PRICE	TOTAL
			\$	\$
	All items must be priced and requested percentages filled in. Failure invalidate the Pricing Schedule. Prices shall include all costs in carry prescribed in accordance with the Specifications and shall include of Provincial and Federal Sales Taxes in accordance with the directions	ving out the work		
	All items in this section are provisional and shall be carried out as di Consultant.	rected by the		
	Prices submitted shall be valid until the end of 2021 and 2022 unless and shall be applicable regardless of final quantity.	s otherwise noted		
	This schedule of additional unit prices may be used by the Consultar changes in the Work in accordance with items 12.1(b) and 12.1(c) of the General Conditions.			
1	Cut and place as fill topsoil from the stock pile	m ³		NOT EXTENDED
2 a)	Excavate soft, unacceptable native ground to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and replace with engineered fill from within the construction limit.	m ³		NOT EXTENDED
b)	Excavate soft, unacceptable native ground to any depth and spread to dry within 150 m at the direction of the Consultant and Geotechnical Consultant and replace with dried material within the construction limit to engineered fill standards.	m ³		NOT EXTENDED
C)	Excavate soft, unacceptable native ground to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and dispose material off-site and replace with engineered fill from within the construction limit.	m ³		NOT EXTENDED
d)	Description in the construction in the second to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and replace with imported engineered fill.	m ³		NOT EXTENDED
e)	Excavate soft, unacceptable native ground to any depth and spread to dry within 150 m at the direction of the Consultant and Geotechnical Consultant and replace with imported dried material to engineered fill standards.	m ³		NOT EXTENDED
f	Excavate soft, unacceptable native ground to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and dispose material off-site and replace with imported engineered fill.	m ³		NOT EXTENDED
3	Spread, place and compact suitable material imported by others as engineered fill at the request of the owner to assist completion of regarding in any location.	m ³		NOT EXTENDED
1	Excavate additional material at the direction of the	m ³		NOT EXTENDED
	Consultant and stockpile within the construction limit.	111		

E	Cumuly place and compact at any leastion as directed by the Consultants		
5	Supply, place, grade and compact at any location as directed by the Consultant: Granular A	tonne	NOT EXTENDED
	Granular B	tonne	NOT EXTENDED
			NOT EXTENDED
	50mm clear limestone	tonne	NOT EXTENDED
		tonne	NOT EXTENDED
	20 mm crusher run limestone	tonne	
	50 mm crusher run limestone	tonne	NOT EXTENDED
	150 mm Rip-rap stone	tonne	NOT EXTENDED
h)	300 mm Rip-rap stone	tonne	NOT EXTENDED
6	Dispose off-site rubble, garbage, debris, fencing and boulders at a location arranged by the contractor	tonne	NOT EXTENDED
7	Remove and dispose off site any field tile material that is encountered during the earthworks program	m	NOT EXTENDED
8	Hydroseed areas where requested by the consultant using "Soil Stabilizer" mix by Pickseed (include required topsoil):		
a)	Topsoil stockpiles	m ²	NOT EXTENDED
	Areas of exposed native clay	m ²	NOT EXTENDED
	Areas of exposed fill	m ²	NOT EXTENDED
9	Additional water for dust control	hr	NOT EXTENDED
10	Removal and disposal of large boulders offsite	tonne	NOT EXTENDED
11	Removal of non-contaminated mixed debris	m ³	NOT EXTENDED
12	Remove and dispose offsite material dumped by others	tonne	NOT EXTENDED
13	Installation of erosion control measures further to those specified in the contract		
	and drawings:		
	a) Repair and stabilization of eroded slopes	m ²	NOT EXTENDED
			NOT EXTENDED
	b) Installation of sod on slopes at the direction of the Consultant	m ²	_
	c) Installation of Terraseed slopes at the direction of the Consultant	m ²	NOT EXTENDED
	d) Supply, erect and maintain heavy duty siltation control fence	m	NOT EXTENDED
	e) Supply, erect and maintain .double siltation control fence	m	NOT EXTENDED
	f) Supply, place, maintain, and remove (at the consultant`s request) rock check dams	each	NOT EXTENDED
	g) Supply, place, maintain, and remove (at the consultant`s request) straw bale check dams	each	NOT EXTENDED
14	Repair of erosion and sediment control measures after completion of the contract		
	a) Replacement of sediment fence post	each	NOT EXTENDED
	b) Removal and replacement of damaged sediment fence	m	NOT EXTENDED
	c) Repair and stabilization of eroded slopes	m ²	NOT EXTENDED
	d) Installation of sod on slopes at the direction of the Consultant	m ²	NOT EXTENDED
	e) Installation of Terraseed slopes at the direction of the Consultant	m ²	NOT EXTENDED
15	Remove siltation control fencing and dispose offsite.	m	NOT EXTENDED
16	Repair temporary dead-end barricade as per OPSD 973.130 with no dumping signs.	each	NOT EXTENDED
17	Remove temporary concrete jersey barrier as per OPSD 911.180 for use as temporary sidewalk barricade.	each	NOT EXTENDED

В.	SCHEDULE OF ADDITIONAL UNIT PRICES (CONTINU	UED)				
18	Percentages to be applied to adjustments of					
	Additional Work valuated under Article GC12.2(c) of					
	the General Conditions:					
a)	Surcharge on net hourly labour cost to cover all					
,	payroll burden, overhead and profits					
b)	Surcharge on net material cost to cover all overhead					
. ,	and profit					
c)	Discount on equipment rental cost in accordance with					
- /	current OPSS 127 (Schedule of Rental Rates of					
	Construction Equipment)					
19	Price for equipment that may be used. Hourly price to inc	clude opera	ator and any suppli	es		
	(Attach an additional sheet if required)	<u> </u>				
			*OPSS discount			
			*Operator markup)		
			Rating/size	OPSS	Operator	Total Rate*
				Hourly		
	Equipment type			rate		
i	Scraper					
ii	Col apol					
 iii						
iv	Backhoe					
V	(hydraulic excavator)					
vi						
vii	Off-road Truck					
viii						
ix						
X	Front-end loader					
Α	Troncona ioddol					
xi						
xii						
,						
xiii	Bulldozer					
xiv						
XV						
xvi						
xvii	Compaction equipment					
xviii						
xix						
XX	Tandem Dump Truck					

SCHEDULE OF CONTRACT PRICING FOR 470 TREMBLAY ROAD

CONTRACT II: UNDERGROUND SITE SERVICING TO BASE COURSE ASPHALT INCLUDING STORMWATER MANAGEMENT POND WORKS

CITY OF OTTAWA

SUMMARY

ITEM		AMOUN	Γ
A.	SITE PREPARATION	\$	-
B.	SANITARY SEWERS AND APPURTENANCES	\$	-
C.	STORM SEWERS AND APPURTENANCES	\$	-
D.	WATERMAINS AND APPURTENANCES	\$	-
E.	STORMWATER MANAGEMENT FACILITY	\$	-
F.	ROADS TO BASE COURSE ASPHALT	\$	-
G.	SCHEDULE OF ADDITIONAL UNIT PRICES	DO NOT EXT	END
	SUB-TOTAL (LESS H.S.T.)	\$	-
	Harmonized Sales Tax (13%)	\$	-
	TOTAL TENDER PRICE	\$	-

Note: Prices tendered in Contract II shall be valid for the year 2021 and 2022.

A. SITE PREPARATION

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE \$	TOTAL \$
	Supply all necessary materials, equipment, mobilization, demolition, traffic control and labour to perform the following work in accordance with the drawings and specifications and as directed by the Consultant. Unit prices shall include all items specified in the special conditions, specifications, project specifications, and the engineering plans. All erosion and sediment measures to be functional and maintained until completion of Contract II.				
1	Traffic Control - provide all necessary permits, traffic signage, traffic control devices, temporary line painting, delineators, and flag persons as required in accordance with the requirements of the City of Ottawa at all times during the duration of the Contract.		Lump Sum		
2	Assume, maintain, and repair all siltation within the construction limits as per drawings ESC1 to ESC4 for the duration of the contract and including all warranty periods.	1,725	m		
3	Assume, maintain, and repair all other erosion protection within the construction limit as per drawings ESC1 to ESC4 including mud and dust control for the duration of the contract and including all warranty periods.	1	Lump Cum		
4	Remove and dispose offsite all fencing around perimeter of the site limit when works are completed and at the direction of the Consultant or City.	1 1,725	Lump Sum		
5	Preparation of Construction Schedule, and keeping updated for the duration of the contract. Poor weather conditions and Saturday work to be allowed for in schedule milestones.	1	Lump Sum		
6	All survey works required to complete the works within the contract, as outlined in contract specification and conditions: a) Construction Layout b) As-constructed base-course asphalt survey of roads c) Pregrade survey of development blocks following post-servicing lot cleanup restoration to pregrade. Elevations to be provided at all lot corners, changes in grade, on a maximum 15m by 15m grid and as required per the Special Conditions and Specifications.	1 1	Lump Sum Lump Sum		
7	Complete all as-builts per the City of Ottawa requirements, the Project Specifications, and Special Conditions.	1	Lump Sum		
8	Maintain and remove temporary mud mat per City standards.	2	each		
9	Maintain and remove temporary 20x10m sediment trap ditches per OPSD 219.220 on drawing ESC4, including hickenbottom drains as required.	3	each		
10	Maintain and remove at the Consultant's request temporary: a) 500mm CSP culvert (Provisional) b) 600mm CSP culvert (Provisional)	21 28	m m		

Supply, install, maintain and remove catchbasin sediment trap as per 19 11 each detail on dwg no. ESC4.
SITE PREPARATION (CONTINUED)

A.

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL
12	Mud and Dust control for the duration of the Contract.	1	Lump Sum		
13	For the duration of the Contract, provide a site trailer exclusively for the Client's use.	1	Lump Sum		
14	For the duration of the Contract, maintain and implement Health and Safety Measures in alignment with Provincial Standards throughout the duration of construction, including but not limited to site signage, wash stations, and site check-in protocol measures.	1	Lump Sum		
15	Supply and install temporary block drain as shown on drawing ESC3.	4	each		
16	Supply, install, maintain and remove (at the Consultant's request) catchbasin sediment traps as per detail on drawing ESC4.	34	each		
17	Construct concrete retaining wall complete with guide rail as specified by the Structural Engineer.	193	m		
	SUB-TOTAL CARRIED FORWARD TO SUMMARY			,	\$ -

B. SANITARY SEWERS AND APPURTENANCES

Supply all necessary materials, equipment and labour to perform the following work as per the drawings and specifications and as directed by the Engineer.

1 Construct the following sanitary sewers with storm sewers including all necessary excavation, bedding, backfill, compaction to 98% SPDD, with spacing as shown on the Engineering plans.

					Average	Estimated		Unit	
Street Name	Manh	ole No.	Pipe Dia.	Type/Class	Depth ⁽¹⁾	Length	Notes	Price	Total
	From	To.	(mm)		(m)	(m)	(1)	\$	\$
BLOCK 5	114A	113A	200	SDR-35	4.0	13.0	(1)		
STREET '2'	113A	112A	250	SDR-35	4.3	49.9	(1)		
STREET '2'	PLUG	112A	250	SDR-35	4.6	8.5	(1)		
STREET '2'	112A	111A	250	SDR-35	5.0	116.9	(1)		
STREET '2'	111A	110A	250	SDR-35	4.8	107.7	(1)		
STREET '2'	110A	EX MH SAN4	250	SDR-35	4.3	8.9	(1)		
STREET '1'	109A	108A	250	SDR-35	4.4	61.3	(1)		
STREET '1'	108A	107A	250	SDR-35	4.3	118.6	(1)		
STREET '1'	107A	EX MH SAN3	250	SDR-35	4.2	29.6	(1)		
STREET '1'	105A	104A	250	SDR-35	4.2	25.6	(1)		
STREET '1'	104A	103A	250	SDR-35	4.4	99.1	(1)		
STREET '1'	103A	102A	250	SDR-35	4.7	30.2	(1)		
STREET '1'	102A	101A	250	SDR-35	4.0	87.8	(1)		
STREET '1'	101A	100A	250	SDR-35	3.1	17.8	(1)		

⁽¹⁾ Average depth is measured from invert to finished road elevation.

2 Standard Manholes

Supply all necessary materials, equipment and labour to perform the following work in accordance with the drawings specifications, City Standards and as directed by the Consultant.

Construct the following **sanitary** manholes including, frames and covers, steps, benching, safety platforms and bulkheads in accordance with the drawings and specifications and as directed by the Consultant. For backfill and compaction, refer to Geotechnical report. Watertight joints per City standards.

Street Name	Manhole Number	Notes	Detail Drawing No.	Depth to Top ⁽¹⁾ of Concrete (m)	Chamber Size (mm)	Estimated Quantity	Unit	Unit Price \$	Total \$
BLOCK 5	114A	(1)	OPSD 701.010	4.0	1200	1	each		
STREET '2'	113A	(1)	OPSD 701.010	4.1	1200	1	each		
STREET '2'	112A	(1)	OPSD 701.010	4.7	1200	1	each		
STREET '2'	111A	(1)(3)	OPSD 701.010	5.3	1200	1	each		
STREET '2'	110A	(1)	OPSD 701.010	4.2	1200	1	each		
STREET '1'	109A	(1)	OPSD 701.010	4.1	1200	1	each		
STREET '1'	108A	(1)(3)	OPSD 701.010	4.6	1200	1	each		
STREET '1'	107A	(1)	OPSD 701.010	4.1	1200	1	each		
STREET '1'	105A	(1)	OPSD 701.010	4.3	1200	1	each		
STREET '1'	104A	(1)	OPSD 701.010	4.2	1200	1	each		
STREET '1'	103A	(1)	OPSD 701.010	4.6	1200	1	each		
EX. TREMBLAY ROAD	102A	(1)	OPSD 701.010	4.8	1200	1	each		
EX. TREMBLAY ROAD	101A	(1)	OPSD 701.010	3.2	1200	1	each		
EX. TRIOLE STREET	100A	(1)	OPSD 701.010	3.4	1200	1	each		

⁽¹⁾ Depth of manhole is measured from the lowest invert to top course asphalt elevation.

⁽²⁾ Include drop structure(s) per engineering drawings.

⁽³⁾ Include safety platform(s) per engineering drawings.

B. SANITARY SEWERS AND APPURTENANCES (CONTINUED)

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE \$	Total \$	
3	Connect new sewer into existing sanitary manhole and re-bench to City of Ottawa standards	3	each			
4	Supply and install 250mm dia sanitary plug for future sanitary connection Per City of Ottawa Standards.	1	each			
5	Flushing of all sanitary sewers. Re-flush of all sanitary sewers as necessary until free of debris. CCTV inspection to follow upon flushing. CCTV inspection to be redone once sanitary sewer is free of debris.	775	m	_		
	SUB-TOTAL CARRIED FORWARD TO SUMMARY			:	\$ -	_

C. STORM SEWERS AND APPURTENANCES

Supply all necessary materials, equipment and labour to perform the following work in accordance with the drawings and specifications as directed by the Consultant.

1 Construct the following **storm** sewers with sanitary sewers including all necessary excavation, bedding, backfill, compaction to 98% SPDD, with spacing as shown on the Engineering plans.

					Average	Estimated		Unit	
Street Name	Manh	ole No.	Pipe Dia.	Type/Class	Depth ⁽¹⁾	Length	Notes	Price	Total
	From	To.	(mm)		(m)	(m)		\$	\$
STREET '2'	112	111	375	SDR-35	1.6	10.0	(1)		
STREET '2'	111	110	600	CL-65D	2.6	95.5	(1)		
STREET '2'	110	109	750	CL-65D	3.4	115.9	(1)		
STREET '2'	PLUG	109	525	CL-65D	3.2	6.5	(1)		
STREET '2'	109	107	1,050	CL-65D	3.4	53.9	(1)		
STREET '2'	108	107	300	SDR-35	2.7	12.0	(1)		
STREET '2'	107	105	1,050	CL-65D	3.4	26.7	(1)		
EX. TREMBLAY ROAD	DCB 204	DCB 203	450	SDR-35	1.6	0.3	(1)		
EX. TREMBLAY ROAD	DCB 203	DCB 202	450	SDR-35	1.6	0.3	(1)		
EX. TREMBLAY ROAD	DCB 202	DCBMH 201	450	SDR-35	1.6	1.4	(1)		
EX. TREMBLAY ROAD	DCBMH 201	118	600	CL-65D	1.8	3.2	(1)		
STREET '1'	118	117	1,200	CL-65D	2.6	9.9	(1)		
STREET '1'	117	106	1,350	CL-65D	3.4	107.1	(1)		
STREET '1'	106	105	1,350	CL-65D	3.8	108.7	(1)		
STREET '1'	105	104	1,650	CL-65D	3.8	89.0	(1)		
STREET '1'	104	103	1,650	CL-65D	3.5	81.2	(1)		
STREET '1'	103	102	1,650	CL-65D	3.2	54.4	(1)		
STREET '1'	119	102	300	SDR-35	1.7	49.5	(1)		
BLOCK 7	102	HW1	1,650	CL-65D	2.3	24.1	(1)		
BLOCK 7	HW2	101	525	CL-65D	3.0	6.8	(1)		
BLOCK 7	101	HW3	525	CL-65D	3.3	28.2	(1)		

⁽¹⁾ Average depth is measured from invert to finished road elevation.

Storm Manholes - Construct the following storm manholes including, frames and covers, steps, benching, safety platforms and half-depth bulkheads in accordance with the drawings and specifications and as directed by the Consultant. For backfill and compaction, refer to Geotechnical report.

Street &	Mani	hole	Detail Drawing	Depth to Top ⁽¹⁾ of Concrete	Chamber Size	Est. Quantity	Unit Price	Total
Drawing No.	Number	Notes	No.	(m)	(mm)	Quantity	\$	\$
_								
STREET '1'	119	(1)	OPSD 701.010	1.8	1200	1		
EX. TREMBLAY ROAD	118	(1)	OPSD 701.013	2.4	2400	1		
STREET '1'	117	(1)	OPSD 701.013	3.0	2400	1		
STREET '2'	112	(1)	OPSD 701.010	1.5	1200	1		
STREET '2'	111	(1)	OPSD 701.011	2.0	1500	1		
STREET '2'	110	(1)	OPSD 701.012	3.4	1800	1		
STREET '2'	109	(1)	OPSD 701.013	3.5	2400	1		
BLOCK 5	108	(1)	OPSD 701.010	2.7	1200	1		
STREET '2'	107	(1)	OPSD 701.012	3.4	1800	1		
STREET '1'	106	(1)	OPSD 701.014	3.8	3000	1		
STREET '2'	105	(1)	OPSD 701.015	3.9	3600	1		
STREET '1'	104	(1)	OPSD 701.014	3.6	3000	1		
STREET '1'	103	(1)	OPSD 701.014	3.4	3000	1		
BLOCK 7	102	(1)	OPSD 701.015	2.9	3600	1		
BLOCK 7	101	(1)	OPSD 701.011	2.1	1500	1		
EX. TREMBLAY ROAD	DCBMH 201	(1)	OPSD 701.011	1.8	1500	1		

⁽¹⁾ Depth of manhole is measured from the lowest invert to top course asphalt elevation.

⁽²⁾ Include drop structure(s) per engineering drawings.

⁽³⁾ Include safety platform(s) per engineering drawings.

C. STORM SEWERS AND APPURTENANCES (CONTINUED)

SUB-TOTAL CARRIED FORWARD TO SUMMARY

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE \$	Total \$
3	Supply and install thermal insulation for storm sewers with less than 2m cover per OPSD 1109.030 as shown on dwg no. NT1.	390	m		
4	a) Install single catchbasin per most recent OPSD and OPSS requirements including lead (SDR-28), ICD	9	each		
	and risers as required, complete with: Frame and cover per City Std S19.1 (perforated) b) Install single catchbasin per most recent OPSD and OPSS requirements including lead (SDR-28), ICD and risers as required, complete with:	12	each		
	Frame and cover per City Std S22 and S23 (curb inlet) c) Install double catchbasin per most recent OPSD, and OPSS requirements including lead (SDR-28), ICD	4	each		
	and risers as required, complete with: Frame and cover per City Std S19.1 (perforated) d) Install double catchbasin per most recent OPSD, and OPSS requirements including lead (SDR-28), ICD and risers as required, complete with: Frame and cover per City Std S22 and S23 (curb inlet)	1	each		
5	a) Install DICB per most recent OPSD and OPSS requirements including lead (SDR-28) and risers as required, complete with:	5	each		
	Frame and cover per City Std S19.1 (perforated) b) Install temporary DICB per most recent OPSD and OPSS requirements including lead (SDR-28) and risers as required, complete with: Frame and cover per City Std S19.1 (perforated)	1	each		
6	Supply and install 525mm dia storm plug for future storm connection Per City of Ottawa Standards.	1	each		
7	Cut and cap existing 400mm dia. storm sewer on Ex Tremblay Road. Abandon existing 300mm dia. and 400mm dia. sewers, catchbasins and leads upstream of the cap.	1	Lump Sum		
8	Flushing of all storm sewers. Re-flush of all storm sewers as necessary until free of debris CCTV inspection to follow upon flushing. CCTV inspection to be redone once storm sewer is free of debris.		m		
9	Complete the grading of the bioswale within boulevard, per detail drawing D4. (Provisional)	118	m		

D. WATERMAINS AND APPURTENANCES

Supply all necessary materials, equipment and labour to perform the following work in accordance with the drawings and specifications and as directed by the Consultant.

		ESTIMATED		UNIT	
ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1	Construct watermain to the current City of Ottawa Standards and Specifications for Watermains, including fittings, blow-offs, reducers, thrust blocks, tracer wire, tie rods, sacrificial anodes, bedding and backfill, mechanical restraints on all joints and temporary plugs: a) 200 mm diameter b) 300mm diameter	228 630	m m	\$	\$
2	Supply and install main-line water valves per engineering drawings a) 200mm Valve & Box b) 300mm Valve & Box c) 400mm Valve & Box	2 6 1	each each each		
3	Supply and install hydrants complete with 150mm lead, shut-off valve and valve box, per City of Ottawa stds.	8	each		
4	Connect to existing watermain by others including restotration as necessary, per City of Ottawa standards as outlined on the Watermain Comissioning Plan: a) 400mm diameter watermain (St Laurent Boulevard) b) 300mm diameter watermain (Ex Tremblay Road)	1 2	each each		
5	Supply and install 150mm dia. water service connections c/w V&Bs and other appurtenances for Block 5 per City of Ottawa Standard	1	each		
6	Supply and install 300mm dia plug for future watermain connection per City of Ottawa Standards.	1	each		
7	Hydrostatic testing, disinfection, swabbing and flushing of all watermains to City of Ottawa standards and specifications.	1	Lump Sum		
8	Additional hydrostatic testing, disinfection, swabbing and flushing of all watermains to City of Ottawa standards and specifications.	25	m		NOT CARRIED
	SUB-TOTAL CARRIED FORWARD TO SUMMARY				\$ -

E. STORMWATER MANAGEMENT POND

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE \$	TOTAL \$
	Supply all necessary materials, equipment, mobilization, demolition, traffic control and labour to perform the following wo in accordance with the drawings and specifications and as directly the Consultant. Unit prices shall include all items specified in the special conditions, specifications, project specifications, and the engineering plans.				
1	Suply and install headwall for 1650mm dia. storm sewer as per OPSD 804.040 with grating as per OPSD 804.050 as shown on dwg no. SWM1.	1	each		
2	Suply and install headwall for 525mm dia. storm sewer as per OPSD 804.030 with grating as per OPSD 804.050 as shown on dwg no. SWM1.	2	each		
3	Construct 6m wide Overland Flow Route c/w 500mm of 300mm dia. riprap on Geotextile Terrafix 270R s per dwg no. SWM1.	22	m		
4	Construct 20m wide emergency spillway with geoweb or approved equivalent as per dwg no. SWM1.	55	m		
5	Construct 5m wide access road c/w cable concrete matting as per dwg no. SWM1 and SWM2.	130	m		
6	Construct and install retaining wall as per dwg no. SWM1 at the direction of the Structural Engineering Consultant.	21	m		
7	Construct 1.0m flat bottom outlet channel as per dwg no. SWM1.	65	m		
8	Install pond liner as per recommendations of Geotechnical Engineer.	3490	m ²		
9	Supply and install bollards as per dwg no. SWM1.	6	each		
10	Supply and install pond warning signage as per dwg no. SWM1.	1	lump sum		
11	Supply and install a double swing gate at the storm facility access road entry way as located on drawing SWM1 and detailed on drawing SWM2.	1	lump sum		
	SUB-TOTAL CARRIED FORWARD TO SUMMARY				\$ -

F. ROADS TO BASE COURSE ASPHALT

Supply all necessary materials, equipment and labour to perform the following work in accordance with the drawings and specifications and as directed by the Consultant.

	and specifications and as directed by the Consultant.	ESTIMATED		UNIT	
ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	PRICE \$	TOTAL \$
1	Fine grade to shape subgrade and boulevards over the width of the road allowance, and compact subgrade over the full pavement width plus 0.3 m beyond the back of curb on each side, unless otherwise specified by Geotechnical Consultant.			·	
	a) 18.0 m R.O.W.	221	m		
	b) 20.0 m R.O.W.	87	m		
	c) 26.0 m R.O.W.	492	m		
2	Provide, lay and compact sub-base course of Granular 'B' over the full pavement width plus 0.3m beyond back of curb as per City/Geotechnical recommendations				
	a) to a final compacted depth of 300mm (18.0 m R.O.W.)	2,130	m^2		
	b) to a final compacted depth of 300mm (20.0 m R.O.W.)	765	m^2		
	c) to a final compacted depth of 500mm (26.0 m R.O.W.)	5,550	m^2		
3	Supply and install 150mm dia. PVC subdrains with filter cloth per OPSD 216.021 & dwg. No. D2 beneath all curbs.	1,635	m		
4	a) Construct the base section of the two stage concrete curbs per OPSD 600.040.	1,725	m		
	b) Construct full concrete barrier curb for median per OPSD 600.110.	70	m		
	c) Construct depressed concrete barrier curb for median per OPSD 600.110.	25	m		
	d) Construct semi-mountable curb at lay-by parking locations per OPSD 600.060	90	m		
5	Regulate sub-base course to proper grade, supply, lay and compact base course of Granular 'A'				
	a) to a final compacted depth of 200mm (18.0 m R.O.W.)	1,865	m^2		
	b) to a final compacted depth of 200mm (20.0 m R.O.W.)	740	m^2		
	c) to a final compacted depth of 150mm (26.0 m R.O.W.)	5,250	m^2		
6	Raise frames and covers to base course asphalt level including step adjustments as required per City standards.				
	a) manholes	27	each		
	b) single catchbasins	21	each		
	c) double catchbasins	2	each		
	d) 200mm Valve and Box	2	each		
	e) 300mm Valve and Box	6	each		
	f) 400mm Valve and Box	1	each		
7	Provide, lay and compact HL8 asphalt base course in accordance with specifications over the full pavement width to a compacted depth as noted or as otherwise specified by the Geotechnical Consultant.				
	a) to a compacted depth of 50mm (18.0 m R.O.W.)	1,865	m^2		
	b) to a compacted depth of 50mm (20.0 m R.O.W.)	740	m^2		
8	Provide, lay and compact SP19 asphalt base course compacted in maximum 50mm layers in accordance with specifications over the full pavement width to a compacted depth as noted or as otherwise specified by the Geotechnical Consultant.				
		E 250	m^2		
	a) to a final compacted depth of 100mm (26.0 m R.O.W.)	5,250	Ш		

F. ROADS TO BASE COURSE ASPHALT (CONTINUED)

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	тот	AL
9	Match new asphalt to asphalt by others including saw cutting, grind a 0.30m wide strip to 40 mm depth lap joint and seal.	1	Lump Sum			
11	Permits for road occupancy from the City.	1	Lump Sum			
12	Supply and install all temporary traffic control signage on streest after construction of base asphalt, including removal. a) Stop Signs (Ra-1) b) Street Name Signs c) Unassumed Road Signs	4 5 3	each each each			
13	Provide and install 1.5m high black vinyl chain link fence as per the Engineering Drawings.	560	m			
	SUB-TOTAL CARRIED FORWARD TO SUMMARY				\$	-

G. MISCELLANEOUS

Supply all necessary materials, equipment and labour to perform the following work in accordance with the drawings and specifications and as directed by the Consultant.

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL
	DEGGINI FIGH	Q07	0	\$	\$
1	Construct concrete retaining wall c/w guide rail as specified by Structural Engineer. (Provisional)	193	m		
2	Prepare and provide a Traffic Control Plan in alignment with City of Ottawa specifications F-1010 and F-1012.	1	Lump Sum		
3	Prepare and provide a Construction Site Pedestrian Control Plan in alignment with City of Ottawa specifications F-1012 and F-1013.	1	Lump Sum		
4	Traffic Control - provide all necessary permits, traffic signage, traffic control devices, temporary line painting, delineators, and flag persons as required in accordance with the requirements of the City of Ottawa at all times during the duration of the Contract.	1	Lump Sum		
5	All survey works required to complete the works within the contract, as outlined in contract specification and conditions: a) Layout Survey b) Post Construction Survey, including roads and blocks.	1	Lump Sum		
6	Complete all as-builts per the City of Ottawa requirements, the Project Specifications, and Special Conditions.	1	Lump Sum		
7	For the duration of the Contract, provide a site trailer exclusively for the Client's use.	1	Lump Sum		
8	Police Assistance at Intersection as per City of Ottawa Specification F-1012 *	80	\$218.50/hr		
	* The hourly rate is subject to change and will be modified to comply with yearly rate increases as required and determined by the City of Ottawa and the Ottawa Police Services. Where a different configuration for Police Assistance is supplied by the Ottawa Police Services, the Contractor shall submit an invoice for payment based on the rates above and the Police Assistance requested by the City of Ottawa and the Ottawa Police Services.				\$ -

	SCHEDULE OF ADDITIONAL UNIT PRICES			
ITEM	DESCRIPTION	UNIT	UNIT PRICE	TOTAL
			\$	\$
	All items must be priced and requested percentages filled in. Failure invalidate the Pricing Schedule. Prices shall include all costs in carry prescribed in accordance with the Specifications and shall include of Provincial and Federal Sales Taxes in accordance with the directions	ving out the work		
	All items in this section are provisional and shall be carried out as di Consultant.	rected by the		
	Prices submitted shall be valid until the end of 2021 and 2022 unless and shall be applicable regardless of final quantity.	s otherwise noted		
	This schedule of additional unit prices may be used by the Consultar changes in the Work in accordance with items 12.1(b) and 12.1(c) of the General Conditions.			
1	Cut and place as fill topsoil from the stock pile	m ³		NOT EXTENDED
2 a)	Excavate soft, unacceptable native ground to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and replace with engineered fill from within the construction limit.	m ³		NOT EXTENDED
b)	Excavate soft, unacceptable native ground to any depth and spread to dry within 150 m at the direction of the Consultant and Geotechnical Consultant and replace with dried material within the construction limit to engineered fill standards.	m ³		NOT EXTENDED
C)	Excavate soft, unacceptable native ground to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and dispose material off-site and replace with engineered fill from within the construction limit.	m ³		NOT EXTENDED
d)	Description in the construction in the second to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and replace with imported engineered fill.	m ³		NOT EXTENDED
e)	Excavate soft, unacceptable native ground to any depth and spread to dry within 150 m at the direction of the Consultant and Geotechnical Consultant and replace with imported dried material to engineered fill standards.	m ³		NOT EXTENDED
f	Excavate soft, unacceptable native ground to any depth and spread to dry at the direction of the Consultant and Geotechnical Consultant and dispose material off-site and replace with imported engineered fill.	m ³		NOT EXTENDED
3	Spread, place and compact suitable material imported by others as engineered fill at the request of the owner to assist completion of regarding in any location.	m ³		NOT EXTENDED
1	Excavate additional material at the direction of the	m ³		NOT EXTENDED
	Consultant and stockpile within the construction limit.	111		

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5	Supply, place, grade and compact at any location as directed by the Consulta		NOT EXTENDED
	Granular A Granular B	tonne	NOT EXTENDED NOT EXTENDED
	20mm clear limestone	tonne	NOT EXTENDED
	50mm clear limestone	tonne tonne	NOT EXTENDED
	20 mm crusher run limestone	tonne	NOT EXTENDED
	50 mm crusher run limestone	tonne	NOT EXTENDED
	150 mm Rip-rap stone	tonne	NOT EXTENDED
	300 mm Rip-rap stone	tonne	NOT EXTENDED
,	occ min rup rup otomo	torino	
6	Excavate unsuitable native material under sewer bedding and cast on adjacent lots as directed by the Consultant and replace with material as per Geotechnical recommendation, compacted to 98% SPD.	m ³	NOT EXTENDED
7	Excavate unsuitable subgrade material in road area and dispose surplus material on adjacent lots as directed by Consultant.	m ³	NOT EXTENDED
8	Excavate unsuitable subgrade in road area and place on adjacent lots to dry. Load and place dry material back in roadway.	m ³	NOT EXTENDED
9	Install temporary Jersey barriers from streetline to streetline complete with reflective dead end sign. Price to include removal off-site when directed by the Consultant.	each	NOT EXTENDED
10	Dispose off-site rubble, garbage, debris, fencing and boulders at a location arranged by the contractor	tonne	NOT EXTENDED
11	Democra and disperse off site any field tile metarial that	m	NOT EXTENDED
	Remove and dispose off site any field tile material that is encountered during the earthworks program		
12	Hydroseed areas where requested by the consultant using "Soil Stabilizer" mix by Pickseed (include required topsoil):		
a)	Topsoil stockpiles	m ²	NOT EXTENDED
b)	Areas of exposed native clay	m ²	NOT EXTENDED
	Areas of exposed fill	m ²	NOT EXTENDED
	7 5	111	
13	Additional water for dust control	hr	NOT EXTENDED
14	Removal and disposal of large boulders offsite	tonne	NOT EXTENDED
15	Removal of non-contaminated mixed debris	m ³	NOT EXTENDED
16	Remove and dispose offsite material dumped by others	tonne	NOT EXTENDED
17	Installation of erosion control measures further to those specified in the contral and drawings:	act	
	a) Repair and stabilization of eroded slopes	m ²	NOT EXTENDED
	b) Installation of sod on slopes at the direction of the Consultant	m ²	NOT EXTENDED
	c) Installation of Terraseed slopes at the direction of the Consultant	m ²	NOT EXTENDED
	d) Supply, erect and maintain heavy duty siltation control fence	m	NOT EXTENDED
	e) Supply, erect and maintain neavy duty silitation control fence	m	NOT EXTENDED
	f) Supply, elect and maintain addition contain reflect f) Supply, place, maintain, and remove (at the consultant's request) rock check dams	each	NOT EXTENDED
	g) Supply, place, maintain, and remove (at the	each	NOT EXTENDED

	Repair of erosion and sediment control measures after			
	a) Replacement of sediment fence post		each	NOT EXTENDED
	b) Removal and replacement of damaged sediment fen	ce	m	NOT EXTENDED
	c) Repair and stabilization of eroded slopes		m ²	NOT EXTENDED
	d) Installation of sod on slopes at the direction of the Co	onsultant	m ²	NOT EXTENDED
	e) Installation of Terraseed slopes at the direction of the Consultant		m ²	NOT EXTENDED
19	Remove siltation control fencing and dispose offsite.		m	NOT EXTENDED
20	Repair temporary dead-end barricade as per OPSD 973.130 with no dumping signs.		each	NOT EXTENDED
21	Remove temporary concrete jersey barrier as per OPSD 911.180 for use as temporary sidewalk barricade.		each	NOT EXTENDED
22	Supply and place concrete sewer bedding including			
	brick support of sewers prior to placement.			NOT EXTENSES
	a) 0.4 MPa unshrinkable fill		m ³	NOT EXTENDED
	b) 20 MPa Concrete		m ³	NOT EXTENDED
23	Supply and place 150 mm to 300 mm thick Rip-Rap including filter fabric (Terrafix 300R or equivalent, maximum EOS 50), including pregrading as directed by Consultant.		m ²	NOT EXTENDED
24	Adjust hydrants as directed by Consultant			
	a) raise 150 mm		each	NOT EXTENDED
	b) raise 300 mm		each	NOT EXTENDED
25	Remove damaged asphalt off-site and supply and place base asphalt, including grinding or planing to match existing roads (where not included in pricing already).		tonne	NOT EXTENDED
26	Remove and replace damaged base from two-stage curb and gutter within development limit, including off-site disposal and restoration of boulevard and pavement.		m	NOT EXTENDED
27	Asphalt grinding to 40mm depth.		m	NOT EXTENDED
28	Flush and clean sewers prior to builder activity.		m	NOT EXTENDED
29	Clean and pump catchbasins.			
	a) single catchbasin		each	NOT EXTENDED
	b) double catchbasin		each	NOT EXTENDED
30	Repaint hydrants, at the end of maintenance period, to Municipal standards.		each	NOT EXTENDED
31	Provide and install new frame and grates as per applicable OPSD standards. a) Maintenance Holes (Provisional)		each	NOT EXTENDED
	b) Catchbasins (Provisional)		each	NOT EXTENDED
	c) Double Catchbasins (Provisional)		each	NOT EXTENDED
	d) Valve Boxes (Provisional)		each	NOT EXTENDED

B.	SCHEDULE OF ADDITIONAL UNIT PRICES (CONTINU	ED)			
32	Percentages to be applied to adjustments of				
02	Additional Work valuated under Article GC12.2(c) of				
	the General Conditions:				
a)	Surcharge on net hourly labour cost to cover all				
۵,	payroll burden, overhead and profits				
b)	Surcharge on net material cost to cover all overhead				
	and profit				
c)	Discount on equipment rental cost in accordance with				
	current OPSS 127 (Schedule of Rental Rates of				
	Construction Equipment)				
33	Price for equipment that may be used. Hourly price to include operator and any supplies				
	(Attach an additional sheet if required)				

	*OPSS discount				
			Operator markup Rating/size OPSS Operator		Total Data
		Raung/s		<u>Operator</u>	Total Rate*
	Foreign as and to man		<u>Hourly</u>		
	Equipment type		<u>rate</u>		
1	Scraper				
ii 					
iii					
i	Backhoe				
iv	(hydraulic excavator)				
v vi	(Trydraulic excavator)				
VI					
vii	Off-road Truck				
viii					
ix					
Х	Front-end loader				
xi xii					
XII					
xiii	Bulldozer				
xiv					
XV					
xvi					
xvii	Compaction equipment				
xviii					
xix					
	T				
XX	Tandem Dump Truck				

