

PART E
SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS.

The City of Winnipeg Standard Construction Specifications in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

Division 2 – General Requirements of The City of Winnipeg Standard Construction Specifications shall apply to the Work.

Further to GC:2.4(d), Specifications included in the Tender Package shall govern over The City of Winnipeg Works and Operations Division Standard Construction Specifications.

The City of Winnipeg Standard Construction Specifications and the General Requirements are available in Adobe Acrobat (.PDF) format at the City of Winnipeg, Corporate Finance, Materials Management internet site <http://www.city.winnipeg.mb.ca/matmgt/info.stm>.

E2. HOURS OF WORK

The Contractor will normally carry out the Work on weekdays (Monday through Friday). Whenever, in the judgement of the Contract Administrator, it is necessary or expeditious to do Work at night or on weekends or holidays, the Contractor will carry out such overtime Work at no additional cost to the City.

The Contractor will obtain the necessary permission and permits from the governing body to work on Sundays, nights or statutory holidays, when this is necessary.

The Contract Administrator will determine the schedule of the City's operations and advise the Contractor of the same. The Contractor will have input into the scheduling but the Contract Administrator will have final authority for scheduling.

E3. LICENSES AND PERMITS

Prior to commencing any Work, the successful bidder shall obtain and furnish the City with copies of all necessary approvals and permits, including but not limited to approvals and permits for equipment and the land application operation required by all governmental units and regulatory agencies.

E4. METHOD OF MEASUREMENT

The hauling and land application of biosolids will be measured on a wet tonne-kilometre, wet tonne, dry tonne-kilometre and dry tonne basis as noted in the Form B: Prices. The quantity to be paid for shall be total number of tonnes of biosolids that are hauled, applied or incorporated onto the land as indicated by the waybills and transaction records.

Loaded distances (i.e. one way) to a particular farm will be agreed through discussions between the Contractor and the Contract Administrator, at the commencement of deliveries to that farm. The distances will be based upon measuring the distance from the NEWPCC Biosolids Dewatering Facility to the staging area plus 0.5 kilometres for field access. Once determined this will be the distance used in determining the kilometres (km) of the tonne-km measurement. Where disputes arise as to determining the correct distance to a particular field or the route to be taken, the Contract Administrator shall have the final decision. The Contractor shall furnish transaction records to the City on a daily basis for comparison and control purposes generally in accordance with the system described in E16 though E20.

E5. BASIS OF PAYMENT

Further to GC.12.7, hauling and land application of biosolids will be paid for at the Unit Prices listed on Form B: Prices and measured as specified herein.

The unit prices tendered in these schedules, shall include the supply of all labour and equipment, the cost of temporary work, and all risks and contingencies whatsoever, and no claim for any extra payment, including delays on the work, will be recognized under any circumstances.

The Contractor shall invoice the City on a calendar month basis within fourteen days (14) of the last day of the month. Documentation accompanying this invoice will be based on the successful Contractor's Form B: Prices and shall be prepared by the Contractor in consultation with the Contract Administrator.

E6. QUANTITIES

The annual production of biosolids from the NEWPCC dewatering facility is shown in the following table:

YEAR	TOTAL BIOSOLIDS PRODUCED	DIRECT TO FIELD FROM NEWPCC		DIRECT TO STORAGE PAD & THEN TO FIELD	DIRECT TO BRADY ROAD LANDFILL
	Wet Tonnes	Wet Tonnes	Dry Tonnes	Dry Tonnes	Wet Tonnes
1998	47151.36	36425.33	9725.56	2660.66	761.01
1999	51911.99	41771.80	11069.53	2687.15	1770.39
2000	51110.08	32658.62	8382.29	1515.87	13206.96
2001	49605.06	38857.03	10203.57	1177.33	6884.45
2002	50525.59	37928.28	9485.86	1359.68	7813.73
2003	49554.98	42432.56	11362.93	260.54	6258.26

The monthly breakdown of the hauling is shown in the following table:

MONTH	WET CAKE direct to:				DRY CAKE direct to:				% SOLIDS	DRY CAKE from PAD:	DAYS HAULED			from PAD
	BRADY	PAD	FIELD	TOTAL	BRADY	PAD	FIELD	TOTAL			BRADY	PAD	FIELD	
Jan(98)	0	0	3540	3540	0	0	755	755	21	0	0	0	21	0
FEB	0	0	2971	2971	0	0	729	729	25	0	0	0	17	0
MAR	0	374	3418	3792	0	113	1035	1148	30	0	0	2	18	0
APR	0	3637	0	3637	0	1184	0	1184	33	0	0	17	0	0
MAY	0	1974	2164	4137	0	643	698	1342	32	1225	0	10	11	7
JUN	0	1822	2546	4369	0	531	783	1314	30	715	0	8	12	7
JUL	0	272	4105	4377	0	78	1204	1282	29	464	0	2	21	13
AUG	0	0	3955	3955	0	0	1046	1046	26	145	0	0	18	2
SEP	0	0	4390	4390	0	0	1044	1044	24	0	0	0	22	0
OCT	763	476	3215	4455	180	111	777	1069	24	111	4	3	14	3
NOV	0	0	3519	3519	0	0	819	819	23	0	0	0	19	0
DEC	0	0	4010	4010	0	0	910	910	23	0	0	0	21	0
JAN(99)	0	0	3362	3362	0	0	728	728	22	0	0	0	20	0
FEB	0	0	2456	2456	0	0	638	638	26	0	0	0	18	0
MAR	0	848	3381	4229	0	253	962	1215	29	0	0	5	23	0
APR	0	3540	1035	4575	0	1090	336	1426	31	37	0	14	5	1
MAY	536	2626	1883	5046	161	827	599	1586	31	25	2	10	8	1
JUN	0	361	4674	5034	0	109	1364	1474	29	1158	0	1	23	10
JUL	0	446	4623	5069	0	150	1343	1493	29	869	0	3	22	12
AUG	0	207	4453	4660	0	55	1214	1270	27	395	0	1	22	8
SEP	1237	764	2509	4511	322	203	655	1181	26	203	6	3	11	3
OCT	0	0	4300	4300	0	0	1030	1030	24	0	0	0	20	0
NOV	0	0	4364	4364	0	0	979	979	22	0	0	0	22	0
DEC	0	0	4307	4307	0	0	919	919	21	0	0	0	21	0
JAN(00)	0	0	3626	3626	0	0	762	762	21	0	0	0	19	0
FEB	0	0	4204	4204	0	0	1004	1004	24	0	0	0	21	0
MAR	570	250	3908	4728	172	72	1131	1375	29	0	3	2	17	0
APR	2906	0	386	3291	879	0	99	978	30	72	16	0	3	2
MAY	0	640	4571	5211	0	174	1223	1397	27	174	0	3	21	6
JUN	0	3248	1291	4539	0	946	357	1303	29	0	0	13	7	0
JUL	2737	315	254	3306	840	95	73	1007	30	0	15	3	1	0
AUG	0	411	4863	5274	0	116	1314	1430	27	727	0	1	21	13
SEP	2553	382	2657	5591	705	114	711	1529	27	0	9	3	9	0
OCT	0	0	4748	4748	0	0	1171	1171	25	545	0	0	22	9
NOV	3600	0	0	3600	957	0	0	957	27	0	19	0	0	0
DEC	841	0	2151	2992	221	0	536	757	25	0	5	0	12	0
JAN(01)	0	0	3471	3471	0	0	801	801	23	0	0	0	19	0
FEB	0	0	3398	3398	0	0	773	773	23	0	0	0	19	0
MAR	0	0	4540	4540	0	0	1117	1117	25	0	0	0	23	0
APR	1879	790	781	3450	603	234	227	1064	31	234	11	4	4	4
MAY	3984	0	0	3984	1298	0	0	1298	33	0	23	0	0	0
JUN	311	1186	2719	4216	96	376	854	1327	31	40	2	6	17	1
JUL	0	1275	3426	4701	0	382	1056	1438	31	364	0	7	17	9
AUG	710	613	2985	4308	211	184	842	1238	29	539	3	3	16	13
SEP	0	0	3703	3703	0	0	991	991	27	0	0	0	15	0
OCT	0	0	5729	5729	0	0	1514	1514	26	0	0	0	22	0
NOV	0	0	4168	4168	0	0	1046	1046	25	0	0	0	22	0
DEC	0	0	3937	3937	0	0	981	981	25	0	0	0	19	0
JAN(02)	0	0	3847	3847	0	0	883	883	23	0	0	0	22	0
FEB	0	0	3454	3454	0	0	781	781	23	0	0	0	20	0
MAR	0	0	3366	3366	0	0	814	814	24	0	0	0	20	0
APR	4361	0	0	4361	1243	0	0	1243	28	0	21	0	0	0
MAY	3452	0	1192	4645	983	0	347	1330	29	0	17	0	8	0
JUN	0	1205	3088	4293	0	372	961	1333	31	162	0	4	13	4
JUL	0	1467	3387	4854	0	434	943	1377	28	490	0	7	18	9
AUG	0	1063	3778	4841	0	267	959	1226	25	250	0	5	17	6
SEP	0	887	3478	4364	0	247	939	1187	27	418	0	4	16	12
OCT	0	162	4497	4659	0	39	1065	1104	24	39	0	1	21	2
NOV	0	0	4051	4051	0	0	903	903	22	97	0	0	20	0
DEC	0	0	3790	3790	0	0	890	890	23	95	0	0	20	0
JAN(03)	0	0	4726	4726	0	0	1069	1069	23	93	0	0	22	0
FEB	0	0	3668	3668	0	0	858	858	23	91	0	0	18	0
MAR	1619	0	2705	4324	545	0	706	1251	29	88	6	0	15	0
APR	3962	0	0	3962	1271	0	0	1271	32	86	20	0	0	0
MAY	677	362	3317	4356	210	110	1047	1366	31	84	3	2	16	2
JUN	0	240	3769	4009	0	74	1164	1238	31	82	0	2	17	2
JUL	0	0	4742	4742	0	0	1414	1414	30	79	0	0	22	0
AUG	0	262	3886	4148	0	77	1134	1211	29	77	0	1	19	1
SEP	0	0	4216	4216	0	0	1212	1212	29	75	0	0	21	0
OCT	0	0	3782	3782	0	0	946	946	25	73	0	0	22	0
NOV	0	0	3812	3812	0	0	903	903	24	71	0	0	19	0
DEC	0	0	3810	3810	0	0	910	910	24	68	0	0	21	0

The actual daily production of biosolids varies greatly, from month to month and season to season. For bidding purposes a figure of 145 wet tonnes per day with a solids concentration of 26% was used in determining the estimated quantities shown in Form B: Prices. This translates into an average production rate of 38 dry tonnes per day from the dewatering facility. The quantities listed in Form B: Prices are based on this production rate for a 365 day year for a total annual production rate of approximately 53,000 wet tonnes. Since haulage is expected to be a five (5) day per week activity (260 days per year), the average volume will be 204 wet tonnes per day. However, due to varying flow and production rates, peak daily volumes for hauling can reach up to 445 wet tonnes.

Quantities utilized for payment purposes shall be solely determined by the electronic loading scale at the dewatering facility. This equipment will be recalibrated a minimum of once per year. The Contractor may be present during recalibration.

The Contractor may, at any time request a scale recalibration. Scale accuracy shall be taken at $\pm 3\%$, the City will adjust the volume of biosolids hauled in the previous six months as well as pay for the equipment recalibration costs. If the scale is found to be within tolerance, the Contractor will pay for the recalibration costs. The time taken to load a truck and the amount loaded into each truck will vary depending on percent solids content of the biosolids and the volume in the storage bin. The Contractor is paid only for the actual weight loaded.

E7. HAULING LOCATIONS AND DISTANCES

Hauling vehicles are specified in E22. The distances used to calculate the units for biosolids hauling on a tonne-km basis in Form B: Prices are as follows:

	Haul Distance (one way)
1.. From Dewatering Facility to Agricultural Lands	75 - 85 km
2. From Dewatering Facility to Storage Pad	8 km*
3. From Storage Pad to Agricultural Lands	65 - 75 km
4. From Dewatering Facility to Brady Road Landfill	55 km*

*These are fixed distances and for the purposes of payment will not change.

E8. TRUCKING ROUTES

When transporting biosolids the Contractor shall comply with all Federal and Provincial Statutes, Acts, By-laws and regulations.

The Contractor shall be responsible for determining and complying with all load restrictions, i.e. spring road restrictions and other such regulations that may be in force time to time on the trucking routes utilized in the course of this Contract. No additional payment will be made as a result of complying with these restrictions.

The routes used by the Contractor to transport biosolids shall be as follows:

- (a) from the NEWPCC Dewatering Facility to the Perimeter Highway (Highway #101) - Use Main Street
- (b) from the NEWPCC Dewatering Facility to the Storage Pad and the City of Winnipeg Brady Road Landfill - Use Main Street and the Perimeter Highway
- (c) the route from the NEWPCC to the application site and back to the NEWPCC Dewatering Facility, other than that specified in Part (a) of this clause, will be designated by the Contract Administrator.

Under no circumstances shall the Contractor use any other route unless prior written approval to do so has been obtained from the Contract Administrator.

The Contractor will not be paid for any load transported along an alternate route if prior written approval was not obtained.

E9. MAINTENANCE OF HAUL ROADS

Road restoration and general road upkeep for damage caused by the Contractor's equipment shall be the whole responsibility of the Contractor. Such upkeep will be mainly on the municipal roads used.

The Contractor shall supply gravel for road repairs, at a price specified on Form B: Prices, whenever the Contract Administrator requests such work. The gravel must be supplied within 24 hours of being ordered.

The Contractor shall supply a price, as specified on Form B: Prices for the periodic application of a dust palliative for dust control as requested by the Contract Administrator. Typical application requirements would be 100 metres either side of a farm entrance on 7.3 metre wide gravel roads at an application rate of 1.36 litres (0.30 imperial gallons) per square meter.

The price for both gravel and dust palliative shall be included in the total tendered price and shall include hauling and application costs, as well as any grading required.

The Contractor shall be responsible for the clearing of snow from municipal roads when the Rural municipality either has not or cannot clear the snow in a timely manner so as to not affect the biosolids disposal program. The cost of this snow clearing operation shall be incidental to the Contract and shall not be paid for separately.

E10. DITCH CROSSINGS

If the crossing of any ditch is necessary the Contractor shall obtain permission from the adjacent property owner and proper authorities in writing. Materials used to construct roadways across ditches shall be as approved by the Contract Administrator but will in no case consist of the biosolids destined for land application.

The Contractor shall supply a price, as specified on Form B: Prices, for the construction and subsequent removal of ditch crossings (including culverts) for such occasions when roadways are necessary to access agricultural lands, only as requested by the Contractor Administrator. The price supplied shall be included in the total tendered price.

Assume for the purpose of costing that ditches will be 7 metres wide by 1.5 metres deep with a 6 metre wide approach and will require a 450 millimetre diameter corrugated steel culvert.

E11. DITCH CLEANING

The Contractor shall supply a price, as specified on Form B: Prices, for ditch cleaning services. These services shall consist of regrading ditches in the fall. This helps to ensure good land drainage in the spring thereby preventing flooding of lands. In the spring further cleaning may be required for those fields to which biosolids were applied during the winter months because of drifting of snow and ice blocking or restricting the flow of runoff water.

Only those ditches so specified by the Contract Administrator shall be cleaned.

E12. ON-SITE RESTRICTIONS

The Contractor and his employees are prohibited from entering the premises of North End Water Pollution Control Centre other than to perform this Work unless accompanied by plant

staff except as allowed for in E16 and E17. The Contractor or his personnel will not be allowed to operate equipment other than as described in this Contract.

E13. BLOCKAGE OF ENTRANCE ROADWAYS

The City will not be responsible for any delays incurred by the Contractor because of blockage of the roadways at the loading and unloading sites caused by snowfall.

The City will attempt to keep the roadway at the NEWPCC open at all times and the truck doorways to the Dewatering Facility clear of snow.

It is the Contractor's responsibility to keep the access and service roads to the application site and the storage pad clear at all times.

E14. PARKING AT NEWPCC

The Contractor may park the in-use hauling trailers only inside the truck loading area of the Dewatering Facility during cold weather periods. The tractor units shall not be parked in the loading area at any time. No other equipment shall be parked at the NEWPCC unless approved by the Contract Administrator. Maintenance of the Contractor's equipment, other than minor repairs shall not be performed at the NEWPCC.

E15. BIOSOLIDS CHARACTERISTICS

WINGRO is the name for the City of Winnipeg's biosolids utilization program. Treated and dewatered biosolids from Winnipeg wastewater treatment plants are applied to agricultural land near the City.

Biosolids shall herein be defined as the material processed by centrifuges containing 20-30 percent solids, at the City of Winnipeg North End Water Pollution Control Centre Dewatering Facility. The density of the biosolids is approximately 1000 kilograms per cubic metre. The City makes no guarantee as to the density, content, quality or other characteristics of this material.

With specific reference to the NEWPCC dewatered biosolids quality, it should be noted that after centrifuge dewatering, the biosolids will be conveyed to the storage hoppers by piston type pumps (Schwing Manufacture). Conveying biosolids in this way does not affect the moisture content but does affect the consistency of the material.

Typical Biosolids Analysis

The following is a typical analysis of the biosolids to be hauled and applied:

Parameter		mg/kg Year 2002
Cadmium	(Cd)	12.6
Zinc	(Zn)	1,794
Copper	(Cu)	987
Nickel	(Ni)	64
Lead	(Pb)	152
Chromium	(Cr)	493
Total Kjeldahl Nitrogen	(TKN)	35,315
Ammonia Nitrogen	(NH3)	10,781
Phosphorus	(P)	15,888
Conductivity		10,752 Umhos/cm
PH		8.1

Possible Health Risks

Studies in Canada and the U.S.A. have shown that when appropriate precautions are followed there are no significant health problems for personnel in regular contact with biosolids. Since biosolids do contain some disease-causing organisms, it is **EXTREMELY** important for workers at the wastewater treatment plant, dewatering facility, storage beds, agricultural fields, landfill site or in the transportation of the biosolids to practice proper personal hygiene. Experience at the North End Water Pollution Control Centre has demonstrated that minor health complaints can be virtually eliminated by improving personal health practices.

Personal Health Safeguards

ALL personnel in the WINGRO program **MUST** follow proper hygiene procedures to safeguard their own health. The following recommendations are consistent with proper hygiene procedures.

1. Illness can spread through ingestion, direct contact through cuts or through inhalation. Avoid ingestion, direct contact with open cuts or inhalation of biosolids as illness does spread through any of these methods.
2. Exercise good **PERSONAL HYGIENE**. Always **WASH** your hands with soap before eating, drinking or smoking. Avoid touching your face, mouth, eyes or nose before washing your hands. Special cleaning kits can be used when water is not available. A shower after each day of work is recommended. In general wash frequently.
3. Wear boots and outer clothing which are reserved for biosolids related work, and which stay at the workplace. Remove them before entering non-work areas, particularly where food is present. Wear rubber gloves when your hands may come into contact with biosolids, particularly if you have any cuts. Be sure to remove the gloves before touching your steering wheel, pen, record book, etc.
4. If you are inadvertently sprayed with biosolids, change your clothes and take a shower.
5. Have regular medical checkups. Report any unusual illnesses to your physician who should be made aware of the work you do and the material you work with.

E16. PARTIAL LOADS

The majority of time the Contractor will be able to load and transport full loads. On certain occasions it may be necessary for the City to request the transporting of partial loads. The City reserves the right to this request. No additional compensation will be given to the Contractor for the hauling of partial loads.

E17. LOADING FACILITIES

Dewatered biosolids will be stored in three, 165 tonne nominal capacity dual outlet bins installed overhead in a two-lane truck bay in the dewatering facility. One outlet (four discharge gates) from each bin is positioned over each of the truck lanes so that each bin can load trucks in either lane.

Drivers will gain entry to the correct lane in the truck bay by means of automatic entry doors. Opening is initiated by a card reader which is located on the south side of the main plant access road.

Refer to Figure 4 in Appendix B for the Contractor's access route to the Dewatering Facility at the North End Water Pollution Control Centre.

The truck loadout sequence is as follows:

- truck arrives at the outdoor entry control station and the driver exits truck and walks to the station.
- driver inserts magnetic card which contains truck identification and associated truck data in the card reader.

- computer searches its database and returns a message to the local display indicating destination information related to truck lane and bin number.
- the door for the appropriate lane opens automatically and the truck proceeds into the loading bay. The door closes automatically.
- a yellow light illuminates indicating the appropriate bin and the driver positions his truck under that bin. Proper positioning is confirmed by a green indicating light and a mark on the floor.
- the driver exits his truck and lowers the 4 chutes into the tapered receptacles on the lid of the trailer. The driver shall ensure that each chute is properly placed into the tapered receptacle to ensure splash control.
- the driver pulls out red interrupt button.
- the driver proceeds to the loadout control room where he enters his personal identification number (PIN) on the keypad unit. Following entry of the PIN the computer will prompt with "Load truck to XT". (The weight to be loaded will be specified by the Contractor for the trailers used.)
- if the driver wishes a maximum load he presses F1; otherwise F2. If F2 is pressed then the computer prompts "ENTER WEIGHT IN TONNES". The driver would then enter the desired weight.
- after the desired weight to be loaded has been established the driver would press ENTER.
- driver can abort operation in which case he must reinitiate entire load request sequence or if he accepts the weight entered he would return to his truck to monitor the loading process.
- loading cycle completes, the computer assigns a destination for the truck, initiates printing of a 2 ply weight ticket and updates its database.
- data printed on the ticket will include the following:
 - City and Department logo and North End Water Pollution Control Centre
 - Time in and time out
 - Truck Number
 - Net weight (Wet Tonnes)
 - Driver initials
 - General haul destination (field, landfill, storage pad)
 - Field location data including location code
- the Driver pushes in red interrupt button and returns to the load control room and takes the weight ticket leaving a copy in the room and returns to his truck.
- the truck proceeds to the exit door which will open and close automatically.

Note: The above control sequence describes system operation as it presently works and may be subject to minor changes during the contract. The card reader may be replaced by a keypad.

Overhead door warning lights have been installed outside and inside the loading bay. When the red light is on, the door is opening or closing. When the door is completely open the green light is on and the driver can enter or leave the loading bay. When the door is closed the red light is on. With the door open, the opening is 3.56 metres wide by 3.65 metres high.

The driver, upon completion of loading of each and every truck, shall secure a cover over the loaded biosolids in such a manner that no biosolids are exposed and no spillage, blowing off, leakage or shaking off of the material is possible.

The City will provide initial training to the Contractor's drivers in using the loading equipment in the Dewatering Facility. Thereafter, it will be the Contractor's responsibility, throughout the duration of the Contract, to ensure that each of his operators is properly trained in the operation of the City's equipment and facilities. The Contractor's Project Manager will personally ensure that all new drivers have been properly trained. Washroom facilities are provided in the Dewatering Facility for the Contractor's use.

The Contractor should be aware that the loading of biosolids from the storage bins into the trucks is by gravity feed only. Therefore, the amount loaded into each truck and the time to load each truck will vary. Both the volume loaded and the time to load are dependent upon the level of biosolids in the storage bin and the solids content of the biosolids that is, the lower the level of biosolids in the bin, the slower the truck will be loaded. As well the higher the solids content, the slower the biosolids flow through the openings. Payment will be made only for the volume of biosolids loaded and there will be no payment for waiting time. Occasionally, trucks will be loaded manually by City personnel when deemed necessary by the Contract Administrator.

E18. STORAGE PAD OPERATION

E18.1 General

The hauling and land application of biosolids will involve the use of a paved storage pad located in the Rural Municipality of West St. Paul. Dewatered biosolids will be temporarily stored on the pad during the warmer months (March 15 to October 31), when agricultural land is too wet and/or inaccessible. The biosolids will be removed from the storage pad and applied to land as soon as the land becomes accessible.

The storage pad will be kept empty during the winter. The decision to haul the biosolids to or from the storage pad is the responsibility of the Contractor Administrator.

E18.2 Operation

The hauling truck will deliver dewatered biosolids to the storage pad from the dewatering facility and dump the load onto the pad. Each load of biosolids will be dumped such that a separate pile is formed. The biosolids will not be disturbed until it is time to haul the biosolids to agricultural land. The biosolids will be loaded into trailers with a rubber wheeled front end loader. Once loaded the biosolids will be taken to agricultural land for application.

The trailers used for hauling from the pad can be the same trailers used for hauling from the Dewatering Facility or they can be end dump trailers with tarpaulin covers and hand locks on the tailgates.

The Contractor will have to supply up to 10 tractors and trailers at certain times to clean out the storage pad in a reasonable time. The Contract Administrator will decide when extra trailers are required. These trailers must be on the job site within 24 hours of such a request.

Upon completion of loading the stored biosolids and prior to leaving the storage pad, the front end loader shall be thoroughly cleaned of all biosolids by the use of portable pressure washing equipment.

E19. SPREADING AND INCORPORATION OF BIOSOLIDS

E19.1 Staging Area

The hauling truck shall deliver biosolids to designated agricultural land and dump the load into a metal container at the staging area. A backhoe shall be used to load the biosolids from the metal tank onto the biosolids applicator vehicle for land application.

The staging area is the location agreed to by the Contractor and the Contract Administrator where the hauling trucks shall be unloaded. The size and configuration of each staging area will be site dependent.

The Contractor shall provide a gravel pad at the staging area to allow room for the hauling trucks to be backed in off the road or be driven in and turned around. The gravel pad shall prevent the trucks from sinking into the mud and also stop material from sticking to the tires and tracking onto the road. The Contractor shall provide two watertight metal containers into which the hauling trucks will dump the dewatered biosolids. One metal container shall be counter sunk into the ground, no closer than 18 metres to the road ditch, to allow the trucks to dump into it. The second container shall be used as a back-up or to establish a secondary staging area. The Contractor shall ensure that these metal containers remain watertight at all times. All leaks shall be repaired within 24 hours of a request for such repairs.

The size of the metal container is not specified but it should be able to hold the contents of at least 3 trucks and be movable from one location to another.

All costs associated with establishing the staging area including widening of approaches, removing and cleaning up staging areas, obtaining and maintaining the 2 metal containers shall be part of the prices listed on Form B: Prices.

A backhoe shall be used to move biosolids out of the metal containers and fill the applicator. The backhoe and applicators are specified in E22.

The Contractor shall spread biosolids, using the applicator, as uniformly as possible as directed by the Contract Administrator, but in no case shall the quantity of biosolids applied to any parcel of land exceed 56 dry tonnes per hectare unless otherwise directed by the Contract Administrator. It has been found that targeting for 54 dry tonnes per hectare has resulted in meeting the 56 dry tonne per hectare limit.

The percentage of dry solids in the biosolids will vary, therefore adjustment of the spreading rate shall be made by the Contractor. The Contract Administrator will determine the spread rate on land based on the solids content of the biosolids as obtained by laboratory analysis.

Application of biosolids on agricultural land is regulated by Environment Act Licence No. 1089ERR. The application rate as well as setback distances from waterways, residences, etc. are specified in this licence. The City shall stake the boundaries imposed by these limits and conditions and the Contractor shall not apply biosolids outside the established boundaries.

Biosolids hauled to agricultural land shall be spread the same day. Under no circumstances shall biosolids be left overnight without being spread unless otherwise directed by the Contract Administrator.

Excessive rutting or compaction of the soil shall be avoided at all times. If in the Contractor's opinion, excessive rutting is taking place, he shall notify the Contract Administrator immediately.

The Contract Administrator shall determine when it is necessary to halt land application. The Contractor shall haul biosolids to the storage pad or to Brady Road Landfill as directed by the Contract Administrator. The Contractor shall not apply biosolids on land against the owner's wishes or against the wishes of the local Rural Municipal Council.

E19.2 Biosolids Application Sites

The City will develop hauling and application schedules and advise the Contractor of same. The City reserves the right to amend or revise these schedules at any time. The Contractor shall apply the biosolids in accordance with the schedules developed by the City.

Under no circumstances shall the Contractor haul biosolids to any location not scheduled by the Contract Administrator.

E19.3 Incorporation

Biosolids shall be incorporated into the land after application. Incorporation shall take place within 4 hours of application in Spring, Summer and Fall. Equipment utilized for this purpose shall include a tracked tractor, farm disk and/or a farm cultivator. The equipment shall be as specified in E22. Biosolids shall not be applied to land if the land cannot be tilled immediately.

Biosolids applied to land in the winter shall be incorporated as soon as practical in the Spring. The timing of this operation shall be determined through communication between the farmer and the Contract Administrator. The Contractor shall commence incorporation in the Spring within 24 hours of such a request from the Contract Administrator. The objective of the early Spring incorporation is to limit odours and to have the land available to the farmer as soon as possible.

Local farming practices, land characteristics and specific farmer input shall be considered each and every time incorporation is undertaken. Any discussions between the farmer and Contractor shall be reported to the Contract Administrator.

E19.4 Project Manager and Application Foreman

The Project manager must be in charge of the entire hauling and disposal operation with authority to order required equipment repairs. The Project Manager must be at the field site whenever an old staging area is being dismantled and a new staging area is being set up.

The Contractor shall designate a person at the field site as an Application Foreman. The person designated shall be at the site whenever biosolids are being applied and shall cooperate with the City's Contract Administrator. This person may be one of the regular staff members who operates equipment at the site, but shall also have the authority to direct the work of other Contractor employees as it relates to the field operations including the dumping of hauling trucks. This person shall have with him at all times a cellular telephone.

E19.5 Alternative Methods

The City is open to possible alternative methods for hauling, spreading and incorporating the biosolids at the farms. Any ideas or alternative methods that the Contractor would like to utilize shall be submitted to the City in writing for their review and comments. If, in the City's opinion, the alternative methods offer advantages over existing methods, the Contractor will be allowed to utilize them but only after receiving written approval from the Contractor Administrator where necessary, pilot testing may be requested by the City prior to issuing final approval.

Any alternative method used shall be at no additional cost to the City.

E19.6 On Site Equipment Storage

The Contractor shall supply a storage facility for the biosolids applicator. This storage facility shall be heated during cold weather to prevent residual biosolids in the applicator from freezing. The storage facility shall be self-contained and portable such that it can be readily moved from site to site. This storage facility **MUST** be located directly at the active field site. The Contractor should note that electricity will not be available at every site.

The Contractor shall provide a cellular telephone for the foreman's use and sanitary facilities for all employees. The sanitary facilities shall include a toilet and washing area.

E20. CO-DISPOSAL OF BIOSOLIDS

Landfill co-disposal of biosolids is used as a back-up option at all times. All biosolids that are to be co-disposed shall be hauled to the City of Winnipeg's Brady Road Landfill.

Biosolids hauled to Brady Road Landfill shall be hauled with the ejector type trailers only. All loads shall be conveyed along designated truck routes. Biosolids shall be dumped in a location as directed by landfill personnel. Landfill tipping fees will be paid directly by the City.

E20.1 Backhoe

The Contractor shall supply a backhoe at the landfill site, whenever biosolids are being co-disposed. This backhoe shall be on site at Brady Road Landfill within 24 hours of such a request by the Contract Administrator. The backhoe will be used to bury the biosolids as directed by landfill personnel.

The Contractor shall supply a price as specified on Form B: Prices (3.1.b), for co-disposal operation. The Price for the backhoe shall be included in the total tendered price for hauling to Brady Road Landfill.

E21. CLEAN-UP

E21.1 General

Experience has indicated that the success of any biosolids utilization program is dependent on a number of factors. Not the least of these is a public perception that such a program is a clean, sanitary operation. Accordingly, it is mandatory that the Contractor make every effort to generate a perception, on the part of the public, that the Contractor's operations are well organized and that his equipment and work areas are clean. This includes the staging area at the field sites. There should not be any garbage laying around the site and all used oil, hydraulic fluid, etc. and their associated containers shall be collected and properly disposed of.

All costs associated with any clean-up work shall be included in the prices listed on Form B: Prices.

E21.2 Loading Facility

It shall be the responsibility of the Contractor to ensure proper housekeeping of the loading area at the Dewatering Facility. The housekeeping shall consist of washing down of any spillage whenever it occurs. At least on a weekly basis, a thorough cleaning of the floor and lower portion of the walls to 1500 millimetres above floor level will be undertaken by using suitable cleaning agents and tools.

The City will make available a water supply at the location. Cleaning tools shall be supplied by the Contractor. Cleaning shall be done at the request of the Contract Administrator. If the Contractor fails to clean-up the loading areas to the satisfaction of the Contractor Administrator, the City will do the clean-up and the cost will be deducted from the Contractor's monthly payment.

The Contractor shall keep his equipment clean and presentable and shall ensure that his vehicles are free of any spilled biosolids at all times. Truck washing facilities are available in the truck bay. The City will supply the soap for the truck washing facilities. The Contract Administrator will be the sole judge as to the necessary cleanliness of the Contractor's equipment. The biosolids applicators and the incorporation tractor can also be washed when convenient to do so in the Dewatering Facility truck bay.

E21.3 Storage Pad

Upon completion of the removal of biosolids from the storage pad in the fall of each year, the Contractor shall clean-up the site to its original condition to the satisfaction of the Contract Administrator.

Clean-up of the storage pad may include, but will not necessarily be limited to, removal of all remaining biosolids on the storage pad to the farm lands and washing down of the pad of any remaining residue. It may be necessary to use a street sweeper to clean the storage pad. All costs associated with the clean-up of the storage pad including the use of the street sweeper are to be part of the prices listed in Form B: Prices.

E21.4 Agricultural Lands

Following land application, agricultural farm lands shall be restored to their original condition (i.e. repair of rutting and the like) to the satisfaction of the Contract Administrator. This includes general clean-up and removal of gravel at the staging area.

E22. EQUIPMENT**E22.1 General**

All materials and equipment under this Specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection by the Contract Administrator as to suitability, mechanical condition and compliance with the conditions stated herein. Performance specifications for all equipment utilized in the course of carrying out this Contract shall be submitted along with Form E: Equipment in the tender submission. Performance specifications shall include dimensions, capacities, standard features, etc. Manufacturer's sales literature shall be considered acceptable for this purpose.

The Contractor shall have available twenty-four (24) hours a day, including weekends and holidays, the necessary equipment and manpower to carry out the work specified herein. Should the primary equipment or manpower not be available for any reason, they shall be immediately replaced from reserve equipment and manpower.

Primary equipment utilized on this Contract shall be dedicated to this Contract and shall not be used for any other purpose than that specified in these documents without prior written approval from the Contract Administrator.

Bidders who propose to use equipment other than that specified in these documents shall submit suitable information to request an equal or alternate status in accordance with BP:6.

The equipment to be utilized on this Contract can be used equipment except for one biosolids applicator which shall be new. Used equipment, however, shall be in first class working condition such that this equipment can satisfactorily perform the Work of the Contract. The City reserves the right to inspect the equipment with its own staff or its own agent (including an equipment appraisal consultant) during the award period or prior to the commencement of Work and randomly thereafter at the discretion of the Contract Administrator to ascertain the condition of the equipment and its suitability to perform the Work of the Contract. The City's determination of the equipment's condition and suitability to perform the Work shall be final and binding.

E22.2 Equipment Requirements

Minimum equipment required for use on this contract includes:

- | | |
|--|-----|
| - Triaxle ejector trailers for hauling biosolids (Primary) | 5 |
| - Tractors properly equipped to handle ejector trailers (Primary) | 6 |
| - End dump trailers for cleaning the storage pad | 4-6 |
| - Backhoe for use at the staging area (Primary) | 1 |
| - Biosolids applicators (one new, one used) (Primary) | 2 |
| - Rubber tired front end loader for use at the storage pad when hauling from the storage pad | 1 |
| - Tracked agricultural tractor (Primary) | 1 |
| - Agricultural discer (Primary) | 1 |
| - Agricultural cultivator (Primary) | 1 |
| - Insulated, heated, portable storage shed for the applicator at the staging area (Primary) | 1 |
| - Steel tanks to be used at the staging area (Primary) | 2 |
| - Road grader for road maintenance and snow removal when necessary | |

The amount and uniformity of equipment available to the Contractor will be considered by the Contract Administrator when evaluating the tender bids. If, in the opinion of the Contract Administrator, the Contractor does not have the necessary equipment available to undertake

the Contract, this will be reflected in a fail rating in the Bid Evaluation Criteria pertaining to equipment availability.

E22.3 Maintenance of Equipment

The Contractor shall have in his employ a mechanic with a fully equipped truck such that repairs can be done in the field. This mechanic shall be on call whenever biosolids are being hauled and be at the field within 2 hours of any repair being required.

The Contractor shall maintain the functional condition and aesthetic appearance of his equipment in a manner acceptable to the City. Vehicle cleanliness, particularly hauling trucks, is very important and will be strongly enforced by the City. Disabled tractors and/or equipment shall be repaired or replaced within 24 hours if they are necessary to allow dewatering equipment to run continuously.

At least twice a week, the Contractor shall utilize the truck washing equipment located in the Dewatering Facility truck bay to clean the exterior of the hauling tractors and trailers.

The Contractor shall provide at no additional cost to the City any additional equipment (road graders, gravel hauling, snow removal) necessary to ensure passage of trucks into farm staging areas and for minor road maintenance to repair damage caused by Contractor's hauling vehicles.

The Contractor is expressly forbidden from leaving any foreign material on the privately owned lands or municipal roads, or on City owned land except as hereinafter provided.

The Contractor shall equip hauling vehicles with two-way radios or cellular telephones facilitating communication either between the Contractor, his application foreman and drivers or between the foreman and the City.

E22.4 Identification

The ejector trailers and tractor units and the biosolids applicators shall be painted white with green pin striping for easy recognition by the public. They shall also have WINGRO signs provided by the Contractor.

Every tractor/trailer unit shall have painted thereon, or on a sign fastened thereon, on both sides of the vehicle, in a conspicuous place or manner, the name of the registered owner, the gross vehicle weight of the unit to authorized capacity, the tare vehicle weight, the net capacity weight, and the unit identification number on all four sides. All other pieces of equipment shall be similarly identified but will not need to be identified as to capacity or weight. Haul trailer data shall be provided to the City in order to receive magnetic cards for accessing the Biosolids Dewatering Facility.

E22.5 Hauling Trailers

The ejector trailers utilized in the course of carrying out this Contract shall be uniform in size and capacity as described herein and conform to Province of Manitoba, Department of Transportation and Government Services regulations.

The end dump trailers used for hauling from the storage pad do not have to be painted a specific colour and do not have to be uniform in size or capacity.

The ejector trailers shall incorporate the following features:

- (a) Ejector type.
- (b) Sealed and gasketed tailgate to prevent leakage of water and biosolids.
- (c) Triaxle with a minimum capacity of 21 tonnes.
- (d) Provided with a rigid cover. This cover shall incorporate four recessed loading chute ports such that the existing loading chutes make a positive contact with the cover. The purpose of this cover is to contain splashing during truck loading in the truck bay.

- (e) Provided with a secondary cover for the loading ports and prevent biosolids blow-off or spill-over during transport.
- (f) Insulated to retain heat and reduce freezing of biosolids to the sides and bottom.
- (g) Hydraulically operated end gate with a minimum of four hydraulic closure points spaced evenly across the bottom of gate.

E22.6 Hauling Tractor Units

Hauling tractor units utilized in the course of carrying out this Contract shall generally be as described herein and conform to Province of Manitoba, Department of Transportation and Government Services regulations.

The six primary tractor units shall incorporate the following:

- (a) Hydraulic system with a wet tank large enough to operate the ejector system of the hauling trailer.
- (b) Controls located in the cab of the tractor for the operation of the hauling trailer hydraulic systems.
- (c) Equipped with a two-way radio or cellular telephone.
- (d) Equipped with air conditioning and a radio.

E22.7 Front End Loaders

The front end loaders utilized in the course of carrying out this contract shall generally be as described herein and conform to Province of Manitoba, Workplace, Safety and Health requirements for industrial requirements.

One loader shall be utilized at the storage pad site and for snow clearing when required.

The front end loader to be used at the storage pad will be equipped with rubber tires, air conditioning and a bucket capacity of 2.5 - 3.5 cubic metres.

E22.8 Biosolids Applicator

The applicators utilized in the course of carrying out this Contract shall generally be as described herein.

The biosolids applicator shall be a severe service, high flotation, off-road, four-wheel articulated vehicle with articulated steering and selectable two or four-wheel drive equipped with a spreader box capable of surface spreading dewatered biosolids. The units shall be suitable for field operation in all weather and soil conditions with minimum soil compaction and rutting. Equipment to be AG-Chem Terra-Gator Model #004 or #3104 as supplied by AG-Chem Equipment Co., Minneapolis, Minnesota or approved equal.

Spreader box to transport biosolids with a unit weight of 1000 kilograms/cubic metre (1685 pounds/cubic foot) and moisture content of 78 percent without leakage or spillage. Capable of spreading sludge in an even pattern 3660 millimetres (12 feet) wide with provisions for varying spreading rate.

- (a) 9.2 cubic metres (12.0 cubic yards) minimum struck capacity.
- (b) Spreading Rate: 0-4.6 cubic metres/minute (0-6 cubic yards/minute).
- (c) Reinforced steel tubular frame construction.
- (d) Full width and height of box push blade.
- (e) Main tailgate to completely seal the rear of the box to prevent spilling of contents.
- (f) Beater assembly to pulverize and disperse biosolids uniformly. 762 millimetre (30 inch) diameter rotary steel tube to encompass full width of box side walls.

Biosolids will be dewatered by centrifuge and pumped by Schwing piston pumps to hoppers for storage until unloaded into hauling trailers for application at either agricultural lands or disposal

at a landfill. The nature of the biosolids coming out of the piston pumps and into the storage hoppers will be that of an extruded core similar in form to "toothpaste". It is this form of biosolids that will be ultimately spread by the applicator.

E22.9 Tractor, Discer Unit and Cultivator Unit

The tractor, discer and cultivator unit utilized in the course of carrying out this Contract shall generally be described herein.

The tractor, discer and cultivator for incorporating the biosolids shall be selected by the Contractor with the objective of minimizing actual time spent on farmer's fields.

- (a) Tractor:
 - (i) Tracked agricultural tractor with a nominal rating at 270 horsepower (Caterpillar Challenger Model No. 65 or approved equal) and equipped with air conditioning and a radio.
- (b) Discer:
 - (i) The discer shall be of an offset design with notched front and smooth rear features. Blade size to be 610 millimetres (24 inch). Unit width to be nominally 3.66-4.27 metres (12-14 feet).
- (c) Cultivator:
 - (i) The cultivator shall be a nominal width of 3.66-4.27 metres (12-14 feet).

E22.10 Backhoe

The backhoe utilized in the course of carrying out this Contract shall generally be described herein. The backhoe shall be equivalent to a Caterpillar Model 225.

The backhoe shall be selected by the Contractor with the objective of loading the biosolids onto the applicator and having the ability to move steel tanks described in E22.11.

The backhoe shall be equipped with air conditioning and a radio.

The backhoe shall be equipped with a propane heater to ensure that it will start in the winter months.

The backhoe may be used at Brady Road Landfill to dig trenches for co-disposal.

E22.11 Steel Tanks

The two steel tanks utilized in the course of carrying out this Contract shall generally be described herein.

Each steel tank shall have a capacity to hold at least three (3) truckloads of biosolids.

Each tank shall be watertight at all times.

Each tank shall be transportable such that they can be readily moved from site to site by the Contractor.

E22.12 Grader

The grader utilized in the course of carrying out this Contract shall generally be described herein.

The grader shall be equivalent to a Caterpillar Model 14G or Model 140G.

E23. MANPOWER REQUIREMENTS

The manpower requirements for carrying out this work are expected to be as follows:

(a)	Hauling	
(i)	Drivers	2-10
(b)	Storage Pad Operation	
(i)	Front End Loader Operator	1
(c)	Application Operation	
(i)	Application Foreman (can be one of the equipment Operators)	1
(ii)	Applicator Operator	1-2
(iii)	Backhoe Operator	1
(c)	Landfill Operation	
(i)	Backhoe Operator (can be one of the field equipment operators or the application foreman)	1
(d)	Office	
(i)	Project Manager	1
(ii)	Clerical	1
(e)	Maintenance	
(i)	Mobile Mechanic	1
(ii)	Shop Mechanic(s)	1-3