

---

Maintenance Dredging 2015 SPECIFICATION  
Wheatley, Ontario TITLE SHEET  
Locator Code 4873

---

Section 00 00 00  
Page 1  
2015-03-27

---

PROJECT TITLE Wheatley, Ontario  
Maintenance Dredging 2015

Locator Code 4873

DESIGN ENGINEER: Brian Riggs, P.Eng, Riggs Engineering Ltd.



<u>Section</u>	<u>Title</u>	<u>Pages</u>
<u>Division 00 - Procurement and Contracting Requirements</u>		
00 00 00	SPECIFICATION TITLE SHEET	1
00 01 07	PROFESSIONAL SEALS	1
<u>Division 01 - General Requirements</u>		
01 11 03	GENERAL INSTRUCTIONS DREDGING	5
01 35 30	HEALTH AND SAFETY REQUIREMENTS	5
01 35 44	ENVIRONMENTAL PROTECTION DREDGING	3
01 52 01	TEMPORARY FACILITIES DREDGING	2
<u>Division 35 - Waterway and Marine Construction</u>		
35 20 34	DREDGING	10
35 49 25	TURBIDITY CURTAIN (SILT CURTAIN)	5
Appendix A - Sediment Chemistry and Grain Size		

PART 1 - GENERAL

- 1.1 SITE .1 The site of the dredging work is located at the Wheatley Harbour on Lake Erie. Disposal of the dredgeate will be in the Lake Erie nearshore zone west of the harbour.
- 1.2 CONTRACT METHOD .1 Construct work under combined price contract. All costs for work not specifically identified as a unit price item shall be included in the lump sum arrangement.
- .2 Items measured for payment are in metric (SI) units.
- .3 Submit request for payment in metric units corresponding with items on the Unit Price Table.
- .4 Submit supporting documents in metric units. Perform all necessary conversions required.
- .5 Within 48 hours of bid acceptance submit a list of subcontractors and a detailed breakdown of costs associated with the lump sum arrangement.
- 1.3 EXAMINATION .1 Before submitting bid, examine existing site conditions and determine conditions affecting work, including potential inclement weather and sea conditions.
- .2 Obtain all information which may be necessary for proper execution of Contract.
- 1.4 EXISTING UTILITIES .1 Establish location, protect and maintain existing buried, submerged or above ground utility lines.
- 1.5 CONSTRUCTION AND STORAGE AREA .1 The limits of the Construction and Storage Area will be designated by the Departmental Representative prior to commencement of work unless otherwise shown on the Drawings.
-

- 1.5 CONSTRUCTION AND STORAGE AREA (Cont'd) .2 Confine work including temporary structures, plant, equipment, and materials to established limits.
- 1.6 MINIMUM STANDARDS .1 Execute work to meet or exceed:  
.1 National Building Code of Canada 2010, National Fire Code of Canada 2010, Ontario Building Code 2012, Canada Shipping Act and any other code of provincial or local application, including all amendments up to project date, provided that in any case of conflict or discrepancy, the more stringent requirements shall apply as directed by Departmental Representative.  
.2 Rules and regulations of authorities having jurisdiction.  
.3 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, O. Reg. 213/91 as amended by O. Reg. 631/94, R.R.O. 1990, Reg. 834.  
.4 Environmental Protection Act, O. Reg. 102/94 and O. Reg. 103/94.
- 1.7 TAXES .1 Pay applicable Federal, Provincial and Municipal taxes.
- 1.8 FEES, PERMITS AND CERTIFICATES .1 Provide authorities having jurisdiction with information requested.  
.2 Pay fees and obtain certificates and permits required.  
.3 Furnish certificates and permits when requested.
- 1.9 COMMENCEMENT OF WORK .1 Commence mobilization of plant and equipment to site immediately upon notification of award.  
.2 Commence dredging not later than four weeks after date of award.
-

- 1.10 WORKS SCHEDULE .1 Submit detailed schedule of dredging and disposal operations for Departmental Representative's approval within five days after contract award.
- .2 When schedule has been approved by Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's written approval.
- 1.11 CO-OPERATION AND PROTECTION .1 Execute work with minimum disturbance to public, other Contractors and normal use of site. Make arrangements with Departmental Representative to facilitate execution of work.
- .2 Provide necessary barriers, warning lights and signs. Protect work from damage.
- .3 Repair and clean existing structures, roads, beaches or other facilities damaged or fouled by the work or material lost through pipeline leaks. Complete repairs and clean up at no additional expense to Departmental Representative. Repairs made to damaged existing work to equal or better original.
- 1.12 PROJECT MEETINGS .1 Departmental Representative will arrange project meetings, set times, record and distribute minutes. Attend these meetings.
- 1.13 OVERLOADING .1 No part of Work shall be loaded with load which will endanger its safety or will cause permanent deformation.
- .2 Repair to original condition any part of work damaged due to overloading at no cost to Departmental Representative.
- .3 The east pier is limited to a live load of 20kPa.
- 1.14 DATUM .1 Chart datum for Lake Erie is 173.5 metres I.G.L.D.(1985). Water levels are subject to frequent fluctuations.
-

1.14 DATUM .2 Elevations and soundings shown on drawings are  
(Cont'd)

1.15 DOCUMENTS .1 Keep at job site, one copy of each of  
REQUIRED following:  
.1 Contract drawings.  
.2 Specifications.  
.3 Amendments and addenda.  
.4 Change orders.  
.5 Other modifications to Contract.  
.2 Maintain documents in clean, dry, legible  
condition.  
.3 Make documents available at all times for  
inspection by Departmental Representative.

1.16 ADDITIONAL .1 Additional drawings may be issued by  
DRAWINGS Departmental Representative to clarify work.  
.2 Such drawings become part of Contract  
Documents.

1.17 ELECTRONIC .1 Submit number of hard copies specified for each  
SUBMITTALS type and format of submittal and also submit in  
electronic format as pdf files. Forward pdf,  
NMSEdit Professional spp, MS Word, MS Excel, and  
Autocad dwg files; on USB compatible with PWGSC  
encryption requirements or through email or  
alternate electronic file sharing service such  
as ftp, as directed by Departmental  
Representative.

1.18 EQUIPMENT .1 Complete demobilization of equipment no later  
DEMOBILIZATION than four weeks after receiving Departmental  
Representative's written release from the work.  
Do not leave any equipment on site.

1.19 FLOATING PLANT .1 Submit with bid, the appropriate pages of the  
REQUIREMENTS Appendix to the Bid Form entitled 'Dredges and  
Other Floating Plant'. Complete this form in its  
entirety. Plant other than listed cannot be used  
without prior approval of the Departmental  
Representative.

---

1.19 FLOATING PLANT .2 Dredges or other floating plants to be employed  
REQUIREMENTS on this work, to be of Canadian registry, make  
(Cont'd) or manufacture, or, must receive certificate of  
qualification from Industry, Science and  
Technology Canada and this certificate to  
accompany Bid submission.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 REFERENCES .1 Province of Ontario:
- .1 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, O. Reg. 213/91 as amended by O. Reg. 631/94, O. Reg. 143/99, O.Reg. 571/99, O. Reg. 145/00, O. Reg. 527/00, R.R.O. 1990, Reg. 834, O. Reg. 278/05 (Asbestos - Construction), O. Reg. 845/90 (Silica) as amended by O. Reg. 521/92 and O. Reg. 391/00.
  - .2 Workplace Safety and Insurance Act, 1997.
  - .3 Municipal statutes and authorities.
- 1.2 SUBMITTALS .1 Make submittals in accordance with Section 01 11 03.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
  - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
  - .3 Measures and controls to be implemented to address identified safety hazards and risks.
  - .4 Provide a Fire Safety Plan, specific to the work location.
  - .5 Contractor's and Sub-contractors' Safety Communication Plan.
  - .6 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and may provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 10 days after receipt of comments from Departmental Representative.
- .4 Departmental Representative's review of Contractor's final Site Specific Health and Safety Plan should not be construed as approval and does not reduce the Contractor's

- 1.2 SUBMITTALS (Cont'd)
- .4 (Cont'd) overall responsibility for construction site health and safety.
  - .5 Submit records of Contractor's Safety Meetings when requested.
  - .6 Submit copies of the Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, when requested.
  - .7 Submit copies of reports or directions issued by safety inspectors of authority having jurisdiction.
  - .8 Submit copies of incident and accident reports.
  - .9 Submit Material Safety Data Sheets (MSDS) to Departmental Representative.
  - .10 Submit names of personnel and alternates responsible for site safety and health.
  - .11 Submit WSIB - Workplace Safety and Insurance Board, Experience Rating Report for Province of Ontario.
- 1.3 FILING OF NOTICE
- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- 1.4 DREDGING SCHEDULE RESTRICTIONS
- .1 Due to Fisheries' concern in this area, no dredging will be permitted at this location prior to July 1, 2015.
- 1.5 SAFETY ASSESSMENT
- .1 Perform site specific safety hazard assessment related to project.
- 1.6 MEETINGS
- .1 Pre-construction meeting: schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of work.
-

- 1.7 REGULATORY REQUIREMENTS
- .1 Comply with Acts and regulations of the Province of Ontario.
  - .2 Comply with specified standards and regulations to ensure safe operations at site.
  - .3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.
- 1.8 PROJECT/SITE CONDITIONS
- .1 Work at site will involve contact with sediment with bulk chemistry as shown in Appendix A.
  - .2 Sediment Sample Grain Size Analysis is attached to the end of the specification in Appendix B.
  - .3 Work on and around water (drowning hazard).
  - .4 Remote location (no direct access to emergency responders).
- 1.9 GENERAL REQUIREMENTS
- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
  - .2 Relief from or substitution for any portion or provision of minimum Health and Safety Guidelines specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing. Departmental Representative will respond in writing, where deficiencies are noted and request resubmission with correction of deficiencies either accepting or requesting improvements.
- 1.10 RESPONSIBILITY
- .1 Be responsible for safety of persons and property on site and for protection of persons off site and environment to extent that they may be affected by conduct of Work.
  - .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
-

- 1.10 RESPONSIBILITY (Cont'd) .3 Where applicable the Contractor shall be designated "Constructor", as defined by Ontario Act.
- 1.11 UNFORESEEN HAZARDS .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Act for the Province of Ontario.
- 1.12 POSTING OF DOCUMENTS .1 Provide documents as follow and post on site in a conspicuous location:
- .1 Contractor's Safety Policy.
  - .2 Constructor's Name
  - .3 Health & Safety Represent's Name
  - .4 Ministry of Labour Orders for Province of Ontario.
  - .5 Occupational Health and Safety Act for Province of Ontario.
  - .6 Material Safety Data Sheets.
  - .7 Site Specific Safety Plans.
  - .8 Notice of Project.
  - .9 Joint Health and Safety Committee Members(where required).
  - .10 Address and phone number of nearest Ministry of Labour office.
  - .11 Written Emergency Response Plan.
  - .12 Valid certificate of first aider on duty.
  - .13 WSIB "In Case of Injury At Work" poster.
  - .14 Location of toilet and cleanup facilities.
- .2 Comply with Provincial general posting requirements.
- 1.13 CORRECTION OF NON-COMPLIANCE .1 Immediately address health and safety non-compliance issues identified by Departmental Representative and regulatory agency having jurisdiction in the Province.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
-

- 1.13 CORRECTION OF NON-COMPLIANCE (Cont'd) .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.
- 1.14 BLASTING .1 Blasting or other use of explosives is not permitted.
- 1.15 POWDER ACTUATED DEVICES .1 Use powder actuated devices is not permitted.
- 1.16 WORK STOPPAGE .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 GENERAL .1 The material to be dredged is classified as marginally polluted according to the Ministry of the Environment Provincial Sediment Quality Open Water Guidelines.
- 1.2 DISPOSAL OF MATERIALS .1 Dispose of dredged material in the designated disposal site(s) as indicated and as specified.
- .2 The Contractor may be required to temporarily suspend dredging operations if the turbidity plume from dredging activities adversely affects the quality of water. Make no claim for delays resulting from the above.
- 1.3 DISPOSAL OF WASTES .1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 All waste materials including containers and waste fluids associated with vehicle maintenance should be disposed of in a legal manner at a site approved by Local Authorities.
- 1.4 FIRES .1 Fires and burning of rubbish on site not permitted.
- 1.5 DRAINAGE .1 Do not pump water containing suspended materials (or other harmful substances) into waterways, sewer or drainage systems.
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
-

1.6 POLLUTION  
CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Do not allow any debris, fill, deleterious material or other foreign material to enter the waterway.
- .5 Prevent spillage of gasoline, diesel fuel and other oil products into the waterways and on land. Clean up spills promptly at own cost in accordance with Provincial regulatory requirements. Report any fuel spills immediately to Departmental Representative and to the Ontario Ministry of Environment and Energy Spills Action Centre (1-800-268-6060).
- .6 Fuelling of machinery must take place at a safe distance from the waterway as designated by the Departmental Representative.
- .7 Do not cause excessive turbidity when performing in-water work.
- .8 Abide by local noise by-laws.

1.7 CLEANING

- .1 Maintain project free of accumulated water and rubbish.

1.8 SPECIAL  
PROTECTION AND  
PRECAUTIONS

- .1 Comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labelling and the provision of material safety data sheets acceptable to Labour Canada.

1.9 WATER QUALITY  
PERFORMANCE  
CRITERIA

- .1 Resuspension of particulate matter will be measured for compliance 100 m from the in-water work. The total suspended solids (TSS) will be measured during the first three days of production. A site specific correlation between turbidity and TSS will be established specifically for the dredge area. The
-

- 1.9 WATER QUALITY PERFORMANCE CRITERIA (Cont'd) .1 (Cont'd)  
Departmental Representative may enforce either the TSS criteria or turbidity based on the site specific relationship.
- .2 The maximum increase in TSS over background is 25 mg per litre.
- .3 The maximum increase in turbidity over background before a site specific relationship is developed is 25 NTU.
- .4 Comply with the performance criteria 100 metres from the dredge location and 100 metres from the disposal location.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 DEPARTMENTAL REPRESENTATIVE'S OFFICE
- .1 Supply one suitable weatherproof office for use by Departmental Representative. Furnish office with table, chairs, and adequate lighting, well ventilated with screened window openings and adequate air conditioning equipment. Maintain at minimum temperature of 20°C and to a maximum of 28°C during hours of work. Departmental Representative to approve location and suitability of office.
  - .2 Office on dredge to be a separate room dedicated to Departmental Representative's use. Machinery and crew lunch rooms are unacceptable.
  - .3 Provide one facsimile machine for use on site for the duration of the contract. Maintain machine in good operating condition with sufficient paper supply. Make machine available for Departmental Representative's use. No separate payment to be made for facsimile machine. Include costs in the Departmental Representative's office item.
- 1.2 SANITARY FACILITIES
- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
  - .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
  - .3 Provide sufficient supply of fresh drinking water daily for work force including PWGSC personnel.
- 1.3 REMOVAL OF TEMPORARY FACILITIES
- .1 Remove temporary facilities from site upon completion of work unless otherwise directed by Departmental Representative.
  - .2 When project is closed down at end of construction season keep facilities operational until close down is approved by Departmental Representative.
-

1.4 MEASUREMENT .1 Departmental Representative's office: include  
PROCEDURES costs in Lump Sum Arrangement.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 DEFINITIONS
- .1 The following defines the terminology used in this specification.
  - .2 Dredging: excavating, transporting and disposing of underwater materials.
  - .3 Class A material: solid rock requiring drilling and blasting to loosen, and boulders or rock fragments of individual volumes of 1.5 cubic metres or more.
  - .4 Class B material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay and sand, gumbo, boulders, till, debris or and material not specified under Class A.
  - .5 Obstructions: class of material greater than 1.5 cubic metres that is not included in this specification.
  - .6 Debris: pieces of wood, wood fibre, logs, wire rope, tires, scrap steel, pieces of concrete and other waste materials.
  - .7 Dredge Grade: plane above which all material is to be dredged.
  - .8 Side slope: inclined surface from grade depth at side limit of dredging area to intersect original ground line outside of dredging area and to be expressed as a ratio of horizontal to vertical.
  - .9 Estimated quantity:
    - .1 Volume of material calculated to be above grade and inside specified grade side slopes unless otherwise specified.
    - .2 Area in square metres of material calculated horizontally to exist above grade and within dredge limits, unless otherwise specified.
  - .10 Definitions:
    - .1 CMPM: cubic metres place measurement at dredging site.
    - .2 CMSM: cubic metres scow measurement.
    - .3 SQM: area in square metres projected on horizontal plane.
  - .11 Box cut: dredging channel area with vertical side slopes and allowing side slope of
-

1.1 DEFINITIONS  
(Cont'd)

- .11 Box cut:(Cont'd)  
excavation collapse to a natural equilibrium slope.
- .12 Cleared areas: areas of dredging accepted as complying with plans and specifications.
- .13 Mechanical sweep: clearing all the dredged areas to the grade depth using a mechanical device suspended from a barge.
- .14 Chart datum: permanently established plane from which soundings or tide heights are referenced.
- .15 Coordinates:
  - .1 U.T.M.: universal transverse mercator projection.
  - .2 U.T.M. Coordinates: plane rectangular coordinates used in grid system in which grid network is applied to U.T.M. projection.
- .16 Mechanical dredging plant: equipment that is comprised of the following - clamshell, dragline, dipper or backhoe dredge with dump scows.
- .17 Hydraulic dredging plant: equipment that uses the movement of water to excavate and transport underwater materials such as: cutter suction dredger, suction dredger or trailing suction hopper dredger.

1.2 LOCATION

- .1 Work comprises dredging of area as indicated and as specified herein.
  - .1 Dredge Area of 36,500 square metres.
- .2 Area measurements exclude side slopes.

1.3 INTERFERENCE  
TO NAVIGATION

- .1 Do not impede navigation during progress of work in accordance with the Collision Regulation with Canadian Modifications 1983.
- .2 Ascertain schedule of vessel movements in area affected by dredging and transportation of dredged material operations. The site is subject to heavy navigational traffic both commercial and recreational.
- .3 Plan and execute work in manner that will not interfere with fishing operations, marina

- 
- 1.3 INTERFERENCE TO NAVIGATION  
(Cont'd)
- .3 (Cont'd)  
operations, construction activities at wharf sites, or access to wharves by land or water.
- .4 Make no claim for delays resulting from the above.
- .5 Departmental Representative will not be responsible for loss of time, equipment, material or any other cost related to interference with moored vessels in harbour or due to other Contractor's operations.
- .6 Keep Operations Centre, Watchkeeper at 1-800-265-0237, Canadian Coast Guard, (CCG) Transport Canada, Prescott, Ontario informed of dredging operations in order that necessary Notices to Shipping and Notices to Mariners will be issued. Make arrangements with CCG to relocate and replace buoys for execution of work. Advise nearest Coast Guard Base of any requirements to relocate channel markers/buoys within dredging area.
- .1 Contact Information: Marine Communications and Traffic Services Notices to Shipping Series "C" Central and Arctic Region Canadian Coast Guard 401 King Street West, Prescott, ON K0E 1T0 Email NotshipC&A@DFO-MPO.GC.CA Toll Free: 800 265 0237 Tel: 613 925 0666 Fax: 613 925 4519
- 1.4 REQUIREMENTS OF REGULATORY AGENCIES  
AGENCIES
- .1 Mark floating equipment with lights in accordance with the Collision Regulations with Canadian Modifications, 1983, and maintain a VHF marine radio watch on board.
- .2 Hydraulic dredges deployed on this contract will require a Permit to Take Water from the Ontario Ministry of the Environment. Do not mobilize until this permit is in place.
- 1.5 SITE INFORMATION  
INFORMATION
- .1 Material to be dredged consists of Class 'B' material.
- .2 Sediment Sample Locations are indicated on drawings. Sediment bulk chemistry is attached to the end of the specifications in Appendix A.
- .3 Sediment Sample Grain Size Analysis is attached to the end of the specifications in Appendix A. Grain size analysis is limited to the depth of
-

- 
- 1.5 SITE INFORMATION (Cont'd)
- .3 (Cont'd)  
the core samples as specified and may not be indicative of the overall soil conditions.
  - .4 This area has been previously dredged to various grade depths. Drawings include survey results from 1981 for information purposes.
  - .5 Results of most recent soundings are shown on drawings. This data is made available for bidding purposes. This data may differ from present site conditions. A predredge survey will be taken prior to the commencement of dredging and will supersede the soundings shown on the drawings.
- 1.6 DREDGING SEQUENCE
- .1 Sequence of dredging will be in the following order:
    - .1 Dredge Areas A and B and the dredge sink first. Dredge remaining areas in the direction from east to west.
    - .2 Redredge Areas A and B and the dredge sink if infilling occurs. Then resume dredging from east to west.
    - .3 Departmental Representative reserves the right to alter the sequence or dredge grades in response to dredge volume increases in Area A, Area B and the dredge sink.
  - .2 Supply Departmental Representative with plan of dredging sequence and/or stages.
  - .3 Departmental Representative may direct Contractor to alter sequence of dredging areas.
- 1.7 DREDGE MATERIAL USE
- .1 Do not use, sell or dispose of dredge material for any other use except at the indicated location on Lake Erie.
- 1.8 MEASUREMENT PROCEDURES
- .1 Include all costs associated with mobilization and demobilization of dredging equipment in the Lump Sum Arrangement. Include in this item the costs of providing a duty boat for Departmental Representative's/Inspector's transportation.
  - .2 Dredging with disposal at the designated disposal area: to be measured in cubic metres, in-place measurement (CMPM), for classes indicated on Unit Price Table, determined from
-

- 
- 1.8 MEASUREMENT PROCEDURES  
(Cont'd)
- .2 (Cont'd)  
soundings taken by Departmental Representative before and after dredging. Only material excavated above dredge grade plane and within specified side slopes will be measured.
- .3 Include in the dredging payment item, all costs for disposal of dredged material at locations specified; maintenance of disposal site; site clean-up and mechanical sweeping of dredged areas;
- .4 Obstructions:  
.1 Removal of obstructions, authorized by Departmental Representative, will be measured in hours actually used in removal.  
.2 Dredging equipment used for removal of obstructions will be paid for at rate computed from average hourly earnings of equipment for preceding two weeks and negotiated in advance and authorized in writing by Departmental Representative.
- .5 All operations in connection with field positioning of dredging equipment, Contractor's survey vessel, equipment and crew or diving services will not be measured separately for payment but shall be considered included in the dredging item.
- .6 There will be no additional payment for delays caused by vessel traffic; downtime, or incurred during periods when no dredging is permitted.
- .7 Removal of infilling material in all areas except Areas A and B and the dredge sink will not be measured for payment but shall be considered included in the dredging item. Infilling in Areas A and B and the drdge sink will be paid based on progress soundings taken by the Departmental Representative.
- 
- 1.9 DREDGING PLANT
- .1 Dredging plant used in the work to be mechanical or hydraulic type of sufficient capacity and in good operating condition to satisfactorily complete the work, within the time schedule and in accordance with the specifications.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

- 3.1 LAYOUT OF WORK .1 Departmental Representative will meet with the Contractor and his survey staff to identify the established horizontal control consisting of a baseline, coordinate system with reference control monuments and vertical control consisting of water level gauges, to define the work and disposal areas.
- .2 Maintain the established horizontal and vertical control and lay out the work from these established references. Be responsible for the accuracy of work relative to established references. Provide and maintain electronic position fixing and distance measuring equipment as required for accurate dredging control. Provide, at own expense, survey vessel, equipment and crew to set up and maintain control for location of dredge limits.
- .3 Contractor's electronic positioning system must be made accessible to the Departmental Representative or his representative upon request. It must provide a continuous automatic update of position in all weather conditions. Minimum accuracy of positioning to be  $\pm 1$  metre. An on-line graphics display of position is required. Positioning system is subject to Departmental Representative's approval.
- .4 Install and maintain a water level gauges in vicinity of worksite in order that proper depth of dredging can be determined. Locate gauges so as to be clearly visible.
- .5 Establish and maintain additional temporary targets, markers and buoys for location and definition of designated dredge area limits as required. Remove on completion of work.
-

3.2 DREDGING  
DETAILS

- .1 Dredge area to a dredge grade as indicated on the drawings.
- .2 Dredge side slopes to four horizontal to one vertical.
- .3 Remove all materials above specified grade depths, within limits indicated. Material removed from below grade depth or outside specified area or grade side slope is not part of work. Do not over excavate.
- .4 Remove spillage or shoaling which occurs as a result of work. This quantity will not be measured for payment.
- .5 Do not cast-over material unless authorized in writing by Departmental Representative. Remove material cast-over on to surrounding area and dispose of it as dredged material.
- .6 Make provision for removal of debris in bid. Make no claims for delays attributed to debris.
- .7 Immediately notify Departmental Representative upon encountering an obstruction. By-pass the obstruction after clearly marking its location, move to another area and continue work. No related claim will be entertained if the foregoing procedure is not followed.

3.3 SOUNDING  
SURVEYS

- .1 Contract drawings are based on current soundings taken by the Departmental Representative. Contract quantity shown on the Unit Price Table are based on this survey and an adjustment for expected changes.
  - .2 A pre-dredging and post dredging sounding survey will be taken by the Departmental Representative.
  - .3 No area will be dredged prior to Departmental Representative's and Contractor's mutual acceptance of pre-dredge survey for that area.
  - .4 The Departmental Representative will conduct one post dredging survey of the dredging site at no cost to the Contractor. Any subsequent surveys as a result of finding high spots or incomplete dredging will be done at the Contractor's cost at a charge of \$1500/day of survey fieldwork and \$2000/day for standby.
-

3.3 SOUNDING  
SURVEYS  
(Cont'd)

- .5 Contractor will be notified of the post dredging survey results within four working days of survey completion and given subsequent release if he has successfully fulfilled the requirements of the work.
- .6 The final pay quantity will be calculated on the basis of the pre and post dredging surveys carried out by the Departmental Representative.

3.4 DISPOSAL OF  
DREDGED MATERIAL

- .1 Dispose of dredged material by depositing in in the designated open lake disposal site as indicated on drawings and in manner approved by Departmental Representative.
- .2 For hydraulic disposal maintain turbidity curtain for 50 metres to the west from point of discharge and 50 metres to the south from the west end of the curtain at all times during dredge disposal operations. Move point of discharge as required so that maximum depth of accumulation of dredged material does not exceed 0.5 metres.
- .3 Deposit dredged material evenly throughout entire disposal site. Do not concentrate in one area.
- .4 For mechanical disposal ensure dump scows are sealed and do not leak dredged material during transportation between dredging site and open lake disposal site. If spillage or leakage of dredged material occurs, stop work until remedial measures are taken.

3.5 DISPOSAL OF  
DEBRIS

- .1 Do not dispose of debris in open lake.
- .2 Dispose of debris in containment facility identified or at approved land disposal site.

3.6 SWEEPING AND  
ACCEPTANCE OF WORK

- .1 On completion of dredging, the Contractor will conduct in the presence of the Departmental Representative or his representative, a mechanical sweep of the dredged areas to confirm that grade depth has been achieved. Sweeping of Areas A and B is not required. Provide details of sweep system including horizontal and vertical control methods within 15 days after contract award.

- 
- 3.6 SWEEPING AND ACCEPTANCE OF WORK (Cont'd)
- .2 Sweeping equipment to consist of heavy steel beam suspended from a barge at required depth. Beam to be capable of adjustment and calibration.
  - .3 Upon successful completion of the mechanical sweep as determined by the Departmental Representative, provided that no high spots were encountered, the Departmental Representative will conduct a post dredging survey.
  - .4 Provide a minimum of 48 hours notice to Departmental Representative for commencement of the mechanical sweeping of the site.
  - .5 The post dredging sounding survey takes precedence over the mechanical sweep for pay quantity purposes.
  - .6 The Departmental Representative will sound Areas A and B and the dredge sink upon completion of those areas. Redreging may be required after the initial dredging related to infilling. The Departmental Representative will re-sound and accept Areas A and B up to four times for the duration of the contract.
- 3.7 RE-DREDGING
- .1 Re-dredge unsatisfactory work and verify depths with additional sounding or mechanical sweeping to approval of Departmental Representative.
- 3.8 CO-OPERATION AND ASSISTANCE TO ENGINEER
- .1 Cooperate with Departmental Representative on inspection of work and provide assistance requested.
  - .2 Furnish use of such boats, equipment, labour and materials forming ordinary and usual part of dredging plant as may be reasonably necessary to inspect and supervise work.
  - .3 Provide approved duty boat to transport Departmental Representative to and from the the dredge area and to and from the disposal site under the following conditions:
    - .1 At the beginning and end of each inspection shift which occurs between sunset and sunrise.
    - .2 During poor weather and any emergency situations affecting health and safety of personnel.
-

3.9 MONITORING OF .1 Contractor is responsible to monitor  
WORK effectiveness and productivity of his own work  
on an ongoing basis.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 American Society for Testing and Materials (ASTM)
    - .1 ASTM D4491-99a(2004)e1, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
    - .2 ASTM D4595-05, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
    - .3 ASTM D4716-04, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
    - .4 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
  - .2 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-4.2, Textile Test Methods.
    - .2 CAN/CGSB-148.1, Methods of Testing Geosynthetics.
      - .1 No.2-M85, Mass per Unit Area.
      - .2 No.3-M85, Thickness of Geotextiles.
      - .3 No.6.1-93, Bursting Strength of Geotextiles Under No Compressive Load.
      - .4 No.7.3-92, Grab Tensile Test for Geotextiles.
  - .3 Canadian Standards Association (CSA)
    - .1 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.
    - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .4 Ontario Provincial Standard Drawings (OPSD)
    - .1 OPSD 219.260 November 2006, Turbidity Curtain.
    - .2 OPSD 219.261 November 2006, Turbidity Curtain, Seam Detail.
  - .5 Ontario Provincial Standard Specification (OPSS)
    - .1 OPSS 577 November 2006, Construction Specification for Temporary Erosion and Sediment Control Measures.
-

- 1.2 SUBMITTALS
- .1 Submit details of the temporary silt curtain system to the Departmental representative prior to the start of the Work.
  - .2 Submit to Departmental representative details of geotextile material and seam at least 2 weeks prior to commencing work.
  - .3 Complete the submission of a Sediment Control Plan as described in the Ministry of Natural Resources Technical Note, TN-20, Sediment Control Plans: Reducing Sediment concerns at Water Crossings, dated 1992. Ensure compliance of the sediment control plan throughout the project.

- 1.3 DELIVERY AND STORAGE
- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

- 1.4 MEASUREMENT PROCEDURES
- .1 Supply and installation of silt curtain for environmental protection for all in-water work, maintenance of silt curtain during work, and removal of silt curtain after all in-water work is completed will be measured as part of the lump sum arrangement.

PART 2 - PRODUCTS

- 2.1 MATERIAL
- .1 Geotextile: woven synthetic fibre fabric, supplied in rolls.
    - .1 Width: as specified on Contract Drawings.
    - .2 Length: as specified on contract Drawings.
    - .3 Composed of: minimum 85% by mass of polypropylene polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 60 days.
  - .2 Physical properties:
    - .1 Thickness: to CAN/CGSB-148.1, No.3, minimum 0.8 mm.
    - .2 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 220 g/m<sup>2</sup>.
    - .3 Tensile strength and elongation (in any principal direction): to ASTM D4595.
      - .1 Tensile strength: minimum 1350N, wet condition.

- 2.1 MATERIAL (Cont'd)
- .2 Physical properties:(Cont'd)
    - .3 (Cont'd)
      - .2 Elongation at break: minimum maximum 25%.
      - .3 Seam strength: minimum 1350N equal to or greater than tensile strength of fabric.
      - .4 Mullen burst strength: to CAN/CGSB-4.2, method 11.2, minimum 4000N, equal to or greater than tensile strength of fabric.
    - .3 Hydraulic properties:
      - .1 Apparent opening size (AOS): to ASTM D4751.
    - .4 Securing pins and washers: to CAN/CSA-G40.20/G40.21, Grade 300W, minimum 30% recycled content, hot-dipped galvanized with minimum zinc coating of 600 g/m<sup>2</sup> to CAN/CSA-G164.
    - .5 Seams: sewn in accordance with manufacturer's recommendations.
    - .6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

PART 3 - EXECUTION

- 3.1 GENERAL
- .1 Complete the submission of a Sediment Control Plan as described in the Ministry of Natural Resources Technical Note, TN-20, Sediment Control Plans; Reducing Sediment concerns at Water Crossings, dated 1992. Ensure compliance of the sediment control plan throughout the project
  - .2 Supply, install, maintain and remove silt curtains when instructed by the Departmental representative.
  - .3 Monitoring of water turbidity at 100 metres from point of discharge will be done by the Engineer. Turbidity shall not exceed specified criteria for particulate matter.
- 3.2 INSTALLATION
- .1 Turbidity curtains shall consist of turbidity curtain geosynthetic, load line, flotation, ballast, anchors, mooring buoys, mooring lines, adjustment lines, and tie-downs.

3.2 INSTALLATION  
(Cont'd)

- .2 Design to conform to Ontario Provincial Standard Specification, OPSS 577 and Ontario Provincial Standard Drawings: OPSD 219.260 and OPSD 219.261 as a minimum.
- .3 Turbidity curtains shall be constructed as follows:
  - .1 The floatation shall provide support along the length of the turbidity curtain.
  - .2 A sleeve shall be formed and heat-sealed or sewn along the entire bottom edge of the turbidity curtain geosynthetic, to contain the ballast in the sleeve. Breaks may be made in the sleeve to facilitate pulling, provided they are a minimum 100 mm in size and spaced at minimum 3 m intervals.
  - .3 Where turbidity curtain geosynthetic is joined to provide a continuous run, the sections shall be connected to provide a continuous seal and prevent the escape of turbid water between the sections.
  - .4 The turbidity curtain, as prepared for installation, shall be of sufficient width to account for water depth and wave action.
  - .5 Adjustment lines shall be placed at maximum intervals of 10m, and are to encircle the turbidity curtain from top to bottom.
  - .6 The turbidity curtain shall be prepared for installation by furling and tying with furling ties every 1.5m for the entire length of the curtain.
  - .7 Anchor locations shall be established as is necessary to maintain the turbidity curtain in place and functioning.

3.3 OPERATION AND  
MAINTENANCE

- .1 Turbidity curtains shall be installed to prevent sediment passage, from the area enclosed by the curtain, to the remaining water body. Turbidity curtains shall be installed and maintained in a manner that avoids entry of equipment, other than hand-held equipment or boats, to the remaining water body.
- .2 Equipment is permitted in the work area enclosed by the turbidity curtain.
- .3 Turbidity curtains shall be operated and maintained in the specified location, with the entire top edge above the water surface.
- .4 The curtain shall be free of tears and gaps, and the bottom edge of the curtain is to be continuously in contact with the water course

3.3 OPERATION AND  
MAINTENANCE  
(Cont'd)

- .4 (Cont'd)  
bed so that sediment passage from the area enclosed is prevented.
- .5 Any folds in the turbidity curtain which form next to the floatation collar shall be regularly monitored and freed of collected sediment.
- .6 Monitor and maintain the silt curtains booms both during and outside normal working shifts as required. Provide all personnel, materials and equipment necessary to maintain, repair or relocate the silt curtain system.
- .7 Carry out construction operations to minimize impact on fish habitat from both disturbed sediments and fill materials.
- .8 Replace damaged or deteriorated geotextile to approval of Engineer.
- .9 Remove silt curtain when authorized by the Departmental representative after completion of the work.

Wheatley, Ontario  
Maintenance Dredging 2015

**Appendix A**  
**Sediment Chemistry and Grain Size**

**Table 1 Sediment Metals and Nutrients vs. MOE Provincial Sediment Quality Guidelines (PSQG)**

Parameter	Background	PSQG Lowest Effect Level	PSQG Severe Effect Level	Sample ID					
				1	2	3	4	5	6
<b>METALS</b>									
<b>Arsenic</b>	4.2	6	33	4	<b>7</b>	<b>7</b>	5	<b>11</b>	6
<b>Cadmium*</b>	1.1	0.6	10	<0.5	<0.5	<0.5	<0.5	0.6	<0.5
<b>Chromium*</b>	79	26	110	4	5	6	5	7	6
<b>Copper*</b>	29	16	110	5	7	8	6	12	7
<b>Iron*</b>	38200	20000	40000	5870	7500	7850	6320	9300	8300
<b>Lead*</b>	28	31	250	4	5	5	4	3	5
<b>Manganese*</b>	929	460	1100	280	315	388	303	305	343
<b>Mercury*</b>	0.08	0.2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
<b>Nickel*</b>	68	16	75	6	9	8	8	5	8
<b>Zinc*</b>	98	120	820	35	26	28	22	91	44
<b>NUTRIENTS</b>									
<b>TOC (%) **</b>	1.56	1	10	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
<b>TKN**</b>	2000	550	4800	364	271	280	235	577	420
<b>TP**</b>	1300	600	2000	203	616	654	842	1050	935
Notes 1. All concentrations in ug/g (ppm) unless otherwise specified. 2. For PSQG Table 1 parameters, a bolded result exceeds the higher of the LEL and background level * Thomas and Mudroch (1979) ** Kemp and Thomas (1976)									

**Table 2 Sediment Polycyclic Aromatic Hydrocarbon Concentrations  
vs. MOE Provincial Sediment Quality Guidelines**

Parameter	PSQG Lowest Effect Level	Sample ID		
		1	3	5
Anthracene	0.22	<0.05	<0.05	<0.05
Benzo[a]anthracene	0.32	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	0.24	<0.05	<0.05	<0.05
Benzo[a]pyrene	0.37	<0.05	<0.05	<0.05
Benzo[g,h,i]perylene	0.17	<0.05	<0.05	<0.05
Chrysene	0.34	<0.05	<0.05	<0.05
Dibenzo[a,h]anthracene	0.06	<0.05	<0.05	<0.05
Fluoranthene	0.75	<0.05	<0.05	<0.05
Fluorene	0.19	<0.05	<0.05	<0.05
Indeno[1,2,3-cd]pyrene	0.2	<0.05	<0.05	<0.05
Phenanthrene	0.56	<0.05	<0.05	<0.05
Pyrene	0.49	<0.05	<0.05	<0.05
Notes 1. All concentrations in ug/g (ppm)				

**Table 3 Sediment PCB and Organochlorine Pesticide Concentrations vs. MOE Provincial Sediment Quality Guidelines**

Parameter	PSQG Lowest Effect Level	Sample ID		
		1	3	5
Aldrin	0.002	<0.002	<0.002	<0.002
alpha - BHC	0.006	<0.005	<0.005	<0.003
beta-BHC (beta-HCH)	0.005	<0.005	<0.005	<0.005
BHC	0.003	<0.003	<0.003	<0.005
Chlordane (Total)	0.007	<0.007	<0.007	<0.003
DDT (Total)	0.007	<0.007	<0.007	<0.007
Dieldrin	0.002	<0.002	<0.002	<0.007
Endrin	0.003	<0.003	<0.003	<0.007
gamma-BHC (Lindane)	(0.003)	<0.003	<0.003	<0.005
Heptachlor		<0.005	<0.005	<0.005
Heptachlor Epoxide	0.005	<0.005	<0.005	<0.002
Hexachlorobenzene	0.02	<0.02	<0.02	<0.003
Mirex	0.007	<0.007	<0.007	<0.02
op'-DDT + pp'-DDT	0.008	<0.007	<0.007	<0.005
pp'-DDD	0.008	<0.005	<0.005	<0.005
pp'-DDE	0.005	<0.005	<0.005	<0.007
PCB (Total)	0.07	<0.05	<0.05	<0.05
Notes 1. All concentrations in ug/g (ppm)				

**Table 4 Grain Size Results**

Particle Size	Sample ID		
	1	3	5
Sand (%)	95	96	97
Silt (%)	2	<2	<2
Clay(%)	3	3	2
Texture	Sand	Sand	Sand