KERR WOOD LEIDAL
consulting engineers

Greater Vancouver
200 - 4185A Still Creek Drive
Burnaby, BC V5C 6G9
T 604 294 2088
F 604 294 2090

Port Metro Vancouver
Supporting Documentation

Columbia Containers – Proposed Stormwater Management Plan – Transloading Facilities Project

October 20, 2014
KWL Project No. 2231.025

Prepared for:

Columbia Containers

Contents

List of Tables

Appendices

1. Introduction

Columbia Containers is planning on making improvements and modernizing their facility. The upgrades, which comprise four separate permit applications, involve the following project phases:

a) Move the retaining wall on the foreshore at the 'bight' approximately 20 feet to the north, accommodating PMV's realignment of Commissioner Street, part of the South Shore Corridor Project ("Retaining Wall Realignment" Permit Application).
b) Decommission and remove the secondary system, stores facility and workshop and excavate new loading pits ("System II Demolition and Pit Excavation" Permit Application).
c) Build a modern, efficient and compact transloading facility to replace the aging grain elevator at a new location slightly north (toward the water) and west of the current grain elevator; install nine silos ("New Grain Transloading Facility" Permit Application), and install service rail tracks for the new dumper building.
d) Construct a new two-storey office building at the west end of the property, to replace the current office trailers ("Modular Office Building" Permit Application - future).

This report presents Columbia Containers' proposed Stormwater Management Prevention Plan (SWMP) for the new transloading facility, storage silos, and associated conveyors and rail lines (items (b) and (c)). The SWMP provides information on the capture, conveyance, quality, and disposal of incident rainfall and overland flow on the Columbia Containers site. The first segment of the SWMP places focus on the management and prevention of stormwater pollution prevention during construction. The second segment of the SWMP pertains to stormwater management practices applied post construction when Columbia Containers will follow a regular operating schedule. This document was prepared in general accordance with the Port Metro Vancouver Stormwater Pollution Prevention Plans (SPPPs).

2. Site Description

2.1 Location and Operations

Columbia Containers is a container grain loading facility that provides containerization, transport and delivery of bulk grain products and is located at 2775 Commissioner Street, on Port Metro Vancouver's (PMV) South Shore. Columbia Containers is a leaseholder of PMV. The facility contains two separate loading systems and five container handling machines. The property borders a mix of residential and commercially zoned areas with a railroad adjoining along the south side of the property.

Columbia Containers' operations involves trans-loading of grains from rail cars to shipping containers. A depot on site manages and controls grain inventory and current operation permits the storage of up to 60 loaded railcars on the property. A container depot also provides storage, preparation and repairs of containers and equipment.

2.2 Site Plan

A site plan of the existing project area is provided in Appendix A. Readers should refer to the drawings contained in the Project Application for a drawing of Columbia Containers' complete site.

2.3 Proposed Construction Project

The proposed project is being undertaken as part of a modernization of Columbia Containers' transloading facilities. This project involves: the decommissioning and removal of the secondary system, stores facility, and workshop to excavate of new loading pits; construction of new transloading facilities to replace the existing facility; construction of rail lines through the area of the new facilities; and installation of nine grain storage silos and related conveying systems.

Plans of the proposed upgrades to the site are provided in Appendix B.

The new transloading facilities will be located slightly north and west of the current transloading facilities. These facilities will consist of a new car dumper building with an in-ground dumper pit and a new container loading facility. The conveying system of the loading pit is below ground within the pit, and equipment within the container facility is contained in an enclosed tower. Therefore, grain particles will be prevented from entering the stormwater system from these facilities. The nine storage silos will be installed to the east of the new transloading facilities. The silos and the related grain conveying systems are fully enclosed and dust tight to prevent grain from entering the environment. Rail lines will be constructed for the dumper building.

Stormwater from the transloading area will be directed to catch basins and gravity storm drains and will eventually be discharged to Burrard Inlet. Depending on the perceived risk of impacts, stormwater will either be treated by catch basins and trapping hoods (for the low-risk areas) or by an oil-grit separator (for the higher-risk areas).

2.4 Products Handled

Columbia Containers works with a number of materials onsite; these materials differ during regular operation and construction phase activities. Table 1 outlines the materials that are handled in the proposed construction area, both during regular operation and construction phases.

Table 1 - Material Identification for Regular Operation and Construction Phase Activities

REGULAR OPERATION	CONSTRUCTION PHASE
Grains	Wood
	Steel
	Aggregate and general fill
	Raw (uncured) concrete
	Asphalt paving

3. Hydrology and Treatment Works

3.1 Hydrology

Basic hydrological parameters of the site, along with intensity-duration-frequency (IDF) from local rain gauge stations were used to determine the appropriate design rainfall events and associated stormwater flows for the site.

3.1 Catch basins

Stormwater surface run off will be directed to catch basins that are located in the area of the new facilities. The general stormwater collection and conveyance systems are illustrated on the drawings contained in Appendix B.

The proposed transloading facility upgrades will result in two general stormwater catchment areas:

- Stormwater to on the west side of the proposed transloading facility and dumper building is considered at higher risk of being impacted due to an on-site fuel tank and higher traffic. Stormwater from this area will be directed to catch basins, and will flow through storm drains by gravity through an existing oil-grit separator and will then be discharged to Burrard Inlet. The oil-grit separator will provide protection from potential oil spills and higher grit loads in this area.
- Stormwater on the east side of the proposed facility is considered to be at a lower risk of being impacted. Stormwater on the east side of the facility will generally be directed to catch basins that contain trapping hoods. Stormwater will then be directed to Burrard Inlet. The trapping hoods will provide protection from potential minor oil spills and sediment loads in this area.

3.2 Oil-Grit Interceptor

The oil grit interceptor is a Stormceptor Model STC-1500 and is installed in Columbia Containers' underground storm drain network. The model is designed to remove sediment, Total Suspended Solids (TSS), hydrocarbons and free oil from stormwater runoff. These pollutants are confined within the Stormceptor and removed by a vacuum truck at a later date. The storage and treatment capacities of the Stormceptor Model STC-1500 are listed in Tables 2 and 3 below.

Table 2 - Stormceptor Model STC-1500 Storage Capacities (Stormceptor, 2015)

TREATMENT PARAMETER	CAPACITY (L)	MAINTENANCE FREQUENCY
Total Storage Volume	7270	*Recommended quarterly or as determined by experience.*
Hydrocarbon Storage Capacity	915	*Recommended after oil/fuel spill and quarterly or as determined by experience.*
Sediment Capacity	6205	-
Maintenance Sediment Capacity	1010	*Recommended quarterly or as determined by experience.*

The Stormceptor STC-1500 targets overall TSS removal. Table 3 illustrates the annual treatment capacity for removal of total suspended solids (TSS) by the STC-1500 model installed for an impervious drainage area using Vancouver rainfall gauging stations.

Table 3 - Annual TSS Removal of Stormceptor STC-1500, Maximum Impervious Drainage Area, Vancouver Rainfall Station (Stormceptor, 2010)

MAXIMUM IMPERVIOUS DRAINAGE AREA (ha)	TSS REMOVAL EFFICIENCY (%)
0.82	80
1.4	75
2.1	70

The catchment area that drains to the oil-grit separator is not expected to change as a result of the proposed new transloading facilities. The current impervious drainage area is estimated to be about 0.42 ha, which corresponds to a TSS removal efficiency of 80%. The existing oil-grit separator is thus considered capable of accommodating the flows expected from the transloading facility.

4. Pollution Prevention and Monitoring Plan

4.1 Pollution Prevention and Monitoring During Construction

The prevention and monitoring plan has the following four objectives:

1. Prevent loss of soil and paving materials during construction by stormwater runoff and/or wind erosion, including protecting soil by stockpiling (if needed) for reuse.
2. Prevent sedimentation entering the storm sewer or receiving streams and/or air pollution with dust and particulate matter.
3. Prevent the release of deleterious substances into the drainage system.
4. Prevent release of gasoline, diesel and other bulk fuels and oils.

Specifically, implementation of the Plan will:

- Minimize the amount of disturbed soil and paving materials;
- Prevent runoff from offsite areas from flowing across disturbed areas;
- Slow down the runoff flowing across the site; and
- Remove sediment from onsite runoff before it leaves the site.

4.1.1 Management of Stormwater and Groundwater During Construction

In August 2014, Hemmera completed a report "*Dewatering and Stormwater Plan for Excavation at Columbia Containers Ltd. Phase 2 Site Modernization at 2775 Commissioner Street, Vancouver, BC".* This report is considered the primary reference for the management of stormwater and groundwater from excavations during the construction phase of the project. Readers should refer to the Hemmera report for details of stormwater management during the construction phase of the project.

The Hemmera report also outlines proposed monitoring plans during the construction phase of the project.

4.1.2 Sediment and Erosion Control Practices

Sediment and erosion control practices will divert storm water flows away from exposed areas, convey runoff, prevent sediments from moving offsite, and can also reduce the erosive forces of waters.

Temporary controls provide a cover for exposed or disturbed areas for short periods of time or until permanent erosion controls are put in place. Permanent controls are used when activities that disturb the soil are completed or when erosion is occurring on a site that is otherwise stabilized. As needed, the contractor shall utilize the techniques and controls outlined by Hemmera in the *Dewatering and Stormwater Plan*. Other typical stabilization practices that may be applicable during construction of this project are outlined in Table 4.

Table 4 - Structural Erosion and Sediment Control Practices & Stabilization Practices

Structural Erosion and Sediment Control Practices	Stabilization Practices
Earth dyke	Temporary seeding
Drainage swale	Mulching
Interceptor dykes and swales	Geotextiles
Temporary storm drain diversion	Chemical stabilization
Pipe slope drains	Permanent seeding and planting
Subsurface drains	Buffer zones
Silt fence	Preservation of natural vegetation
Gravel or stone filter berm	Sod stabilization
Riprap lining of existing ditches	Soil retaining measures
Storm drain inlet protection	Dust control
Sediment trap	Store all grain in appropriate containers
Temporary sediment basin	Use a vacuum control system in all grain mixing areas to minimize fugitive emissions
Outlet protection	
Check dams	
Surface roughening	
Gradient terraces	

4.2 Pollution Prevention and Monitoring after Construction

When construction of the new Transloading Facility is completed and the facility is operational, Columbia Containers will strive to prevent pollution from being released from the new work areas that will be constructed during this project by implementing their current best practices to the new area including:

- Stocking, maintaining and using Spill Kits in the event of minor spills and releases;
- Reporting any spills or releases to Senior Management and/or regulatory officials as required;
- Monitoring the Stormceptor STC-1500 unit on a regular basis (quarterly or as determined through experience);
- Inspection of catch basins and outfall;
- Proper inspection and maintenance of facility vehicles; and
- Proper storage and handling of commodities (i.e. grains) and related materials, including collection of spilled grains before they are washed into catch basins, etc.

5. Closure and Report Submission

We trust that this information is useful to you. Please feel free to contact the undersigned with any questions regarding the information provided in this report.

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Prepared by:

PROFESSIONAL PROVINCE OF D.C. LUMB BRITISH COLUMBIA ENGINEER

Oct 20, 2014

David Lumb, P.Eng.
Project Manager

Allison Matfin
Project Assistant

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of Columbia Containers and Hemmera Envirochem Inc. for the Project Review Application for the Stormwater Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

Revision History

Revision #	Date	Status	Revision	Author
0	Sept. 19, 2014	DRAFT	Draft for Columbia Containers Review	DCL /AM
1	Sept. 23, 2014	Final	Final submission to PMV	DCL/AM
2	Oct. 20, 2014	Final	Site Plan drawings updated with revised silo arrangement.	DCL/AM

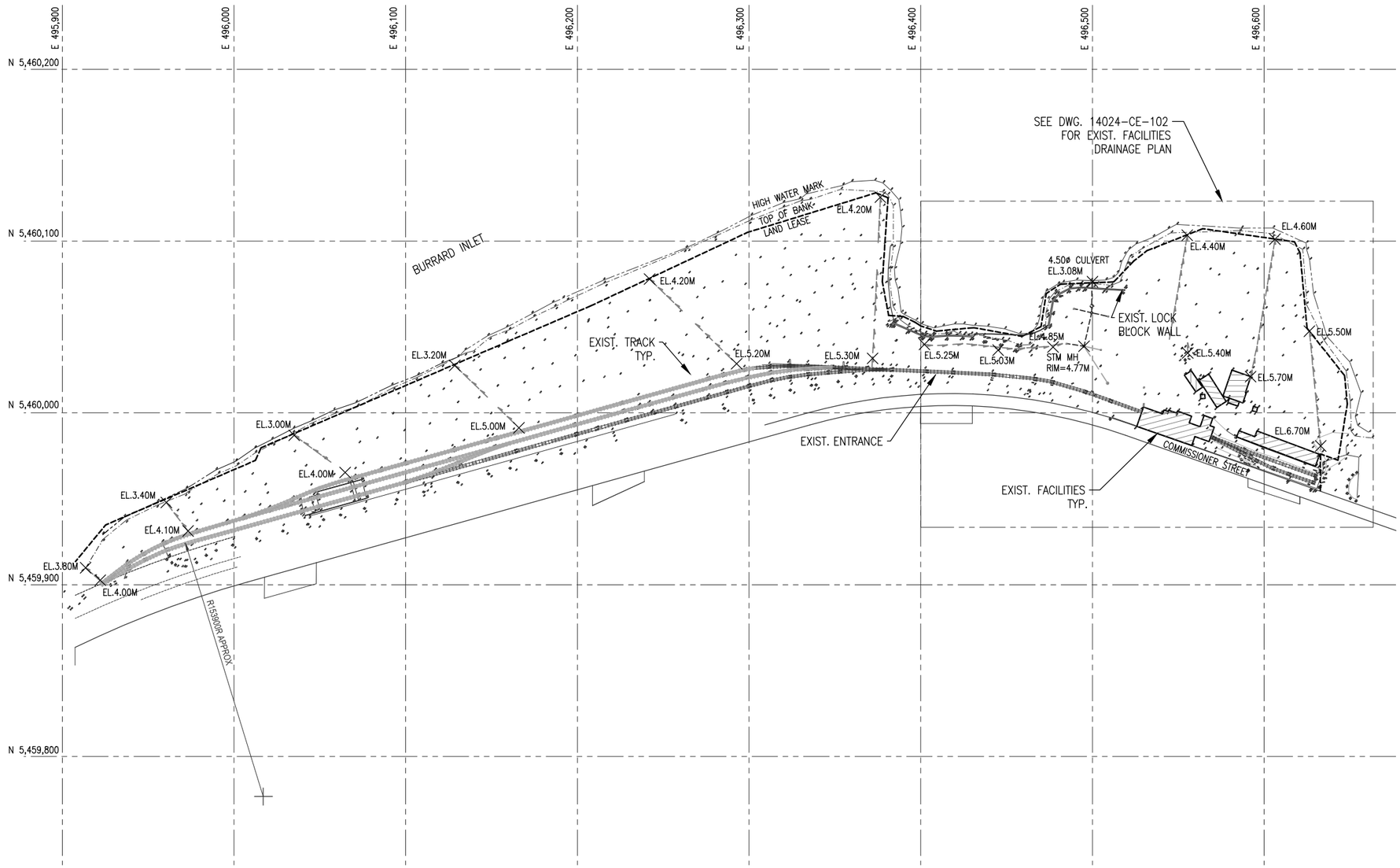
R:\3300-3399\3397-001\300-Report

KERR WOOD LEIDAL
consulting engineers

Appendix A

Existing Site Plan

D-Size



EXISTING SITE DRAINAGE PLAN

SCALE: 1:1200

PROJECT TRUE

ISSUED FOR PERMIT
October 16, 2014

— PRELIMINARY —
NOT FOR CONSTRUCTION
October 16, 2014

CONSULTANT

REV.	DESCRIPTION	DATE (YYYY/MM/DD)	BY	CHECKED
B	ISSUED FOR PERMIT	2014/10/16	AAS	CF
A	ISSUED FOR PERMIT	2014/09/16	FC	CF

NU WESTECH
ENGINEERED THINKING, EXPERT SOLUTIONS

NU WESTECH ENGINEERING LIMITED
300-13955 BRIDGEPORT ROAD, RICHMOND, B.C., CANADA V6V 1J6
TEL. (604) 270-8252 FAX: (604) 270-8271

SEAL:

DRAWN: FC	DESIGNED: CF
CHECKED: CF	CHECKED: TM
DATE: Aug 2014	

CLIENT:

COLUMBIA CONTAINERS

COLUMBIA CONTAINERS
2775 COMMISSIONER ST.
VANCOUVER, BC
V5K 1A1

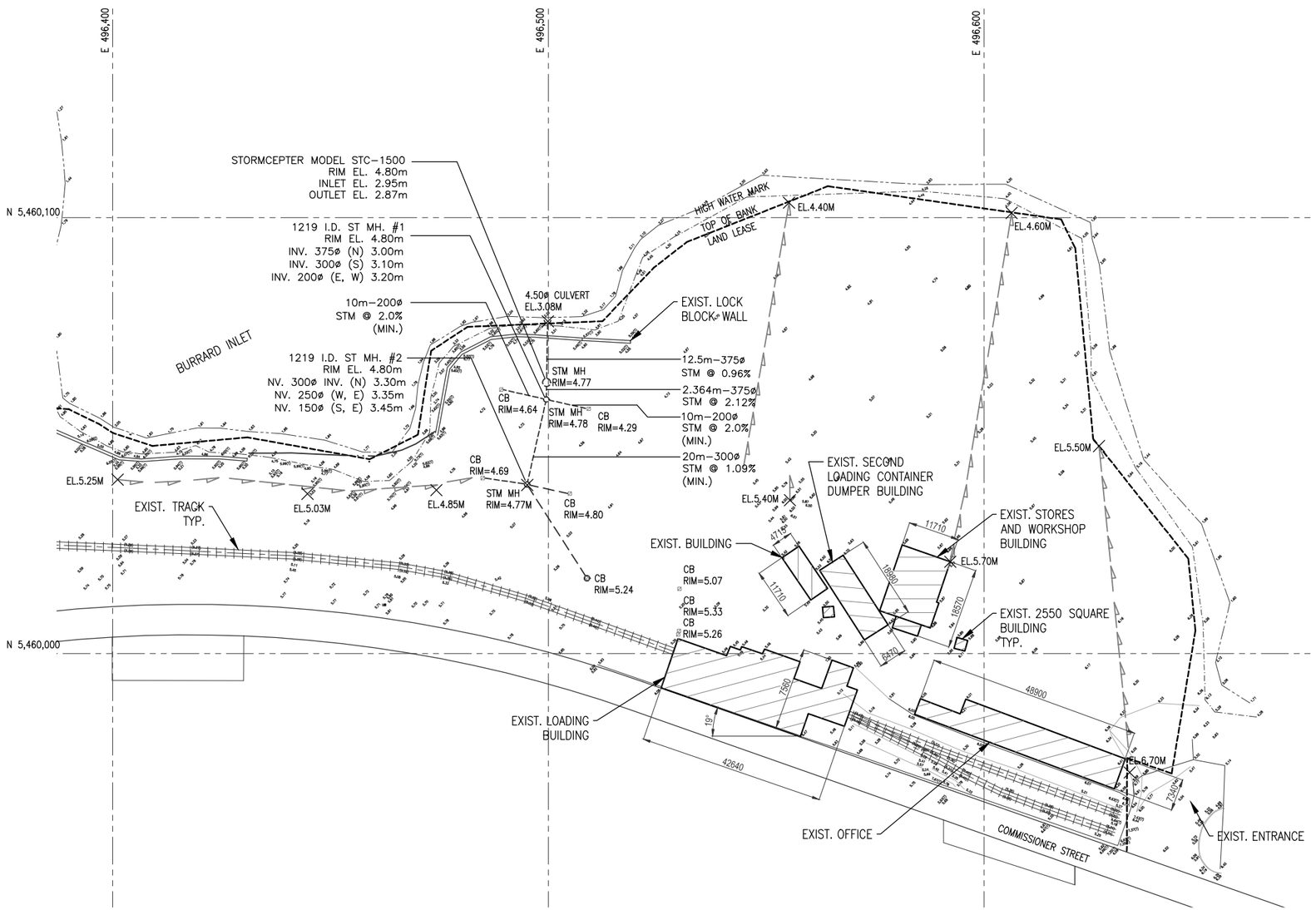
PROJECT:
TRANSLOADING FACILITIES

TITLE:
CIVIL
EXISTING SITE DRAINAGE PLAN

DRAWING No. 14024-CE-101

REV. B

D-Size



EXISTING FACILITIES DRAINAGE PLAN

SCALE: 1:500

PROJECT TRUE

ISSUED FOR PERMIT
October 16, 2014

— PRELIMINARY —
NOT FOR CONSTRUCTION
October 16, 2014

CONSULTANT

REV.	DESCRIPTION	DATE (YYYY.MM.DD)	BY	CHECKED
B	ISSUED FOR PERMIT	2014/10/16	AAS	CF
A	ISSUED FOR PERMIT	2014/09/16	FC	CF

NU WESTECH
ENGINEERED THINKING, EXPERT SOLUTIONS
NU WESTECH ENGINEERING LIMITED
300-13955 BRIDGEPORT ROAD, RICHMOND, B.C., CANADA V6V 1J6
TEL. (604) 270-8252 FAX: (604) 270-8271

SEAL:

DRAWN: AN | DESIGNED: RC/AN
CHECKED: CF | CHECKED: TM
DATE: Aug 2014

CLIENT:
COLUMBIA CONTAINERS
COLUMBIA CONTAINERS
2775 COMMISSIONER ST.
VANCOUVER, BC
V5K 1A1

PROJECT: TRANSLOADING FACILITIES

TITLE: CIVIL
EXISTING FACILITIES DRAINAGE PLAN

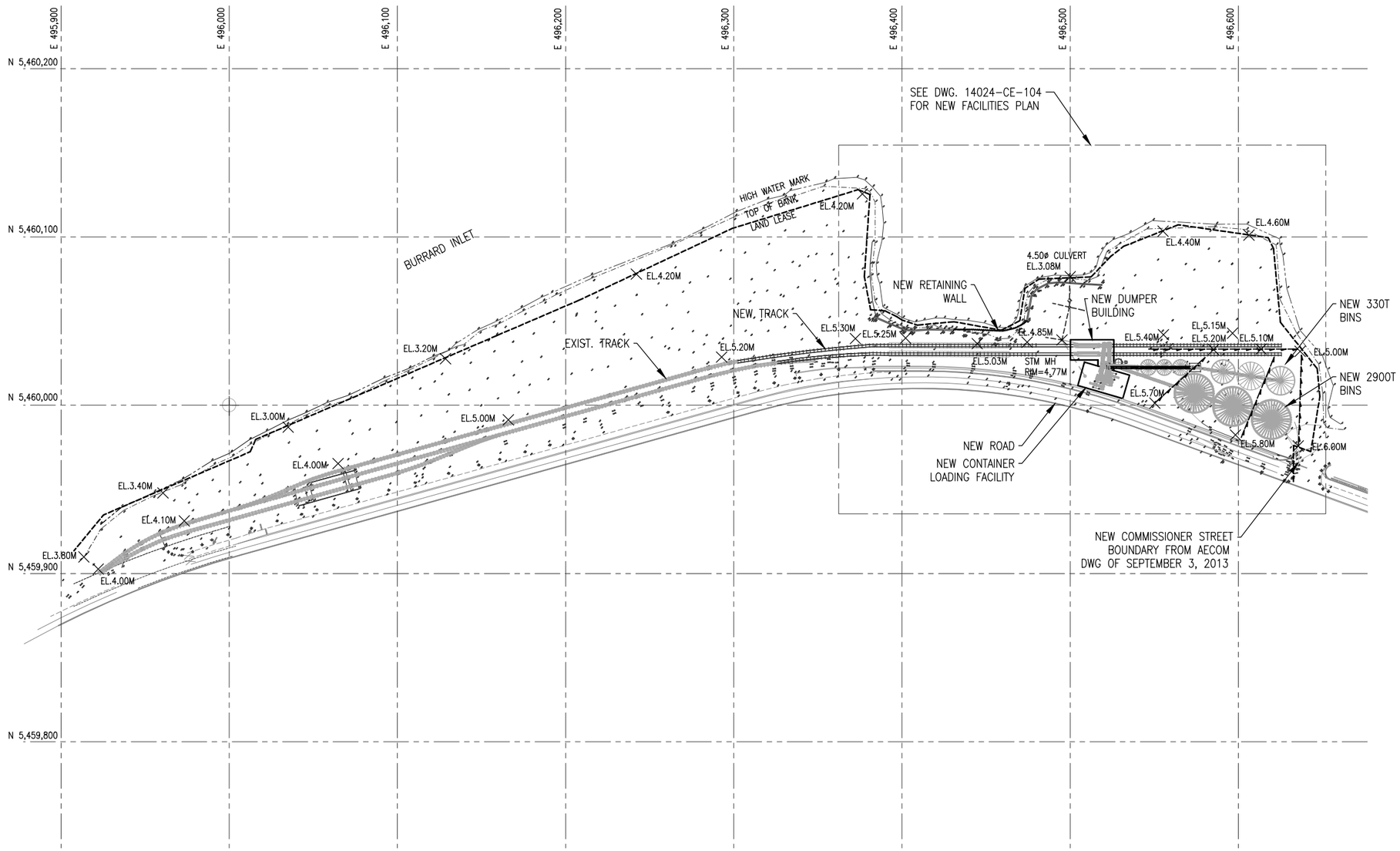
DRAWING No. 14024-CE-102 REV. B

KERR WOOD LEIDAL
consulting engineers

Appendix B

Proposed Site Plan after Construction

D-Size



NEW DRAINAGE SITE PLAN

SCALE: 1:1200

PROJECT TRUE

ISSUED FOR PERMIT
October 16, 2014

— PRELIMINARY —
NOT FOR CONSTRUCTION
October 16, 2014

CONSULTANT

REV.	DESCRIPTION	DATE (YYYY/MM/DD)	BY	CHECKED
B	ISSUED FOR PERMIT	2014/10/16	AAS	CF
A	ISSUED FOR REVIEW	2014/09/16	FC	CF

NU WESTECH
ENGINEERED THINKING, EXPERT SOLUTIONS

NU WESTECH ENGINEERING LIMITED
300-13955 BRIDGEPORT ROAD, RICHMOND, B.C., CANADA V6V 1J6
TEL. (604) 270-8252 FAX: (604) 270-8271

SEAL:

DRAWN:	AN	DESIGNED:	RC/AN
CHECKED:	RC	CHECKED:	TM
DATE:	Aug 2014		

CLIENT:

COLUMBIA CONTAINERS

COLUMBIA CONTAINERS
2775 COMMISSIONER ST.
VANCOUVER, BC
V5K 1A1

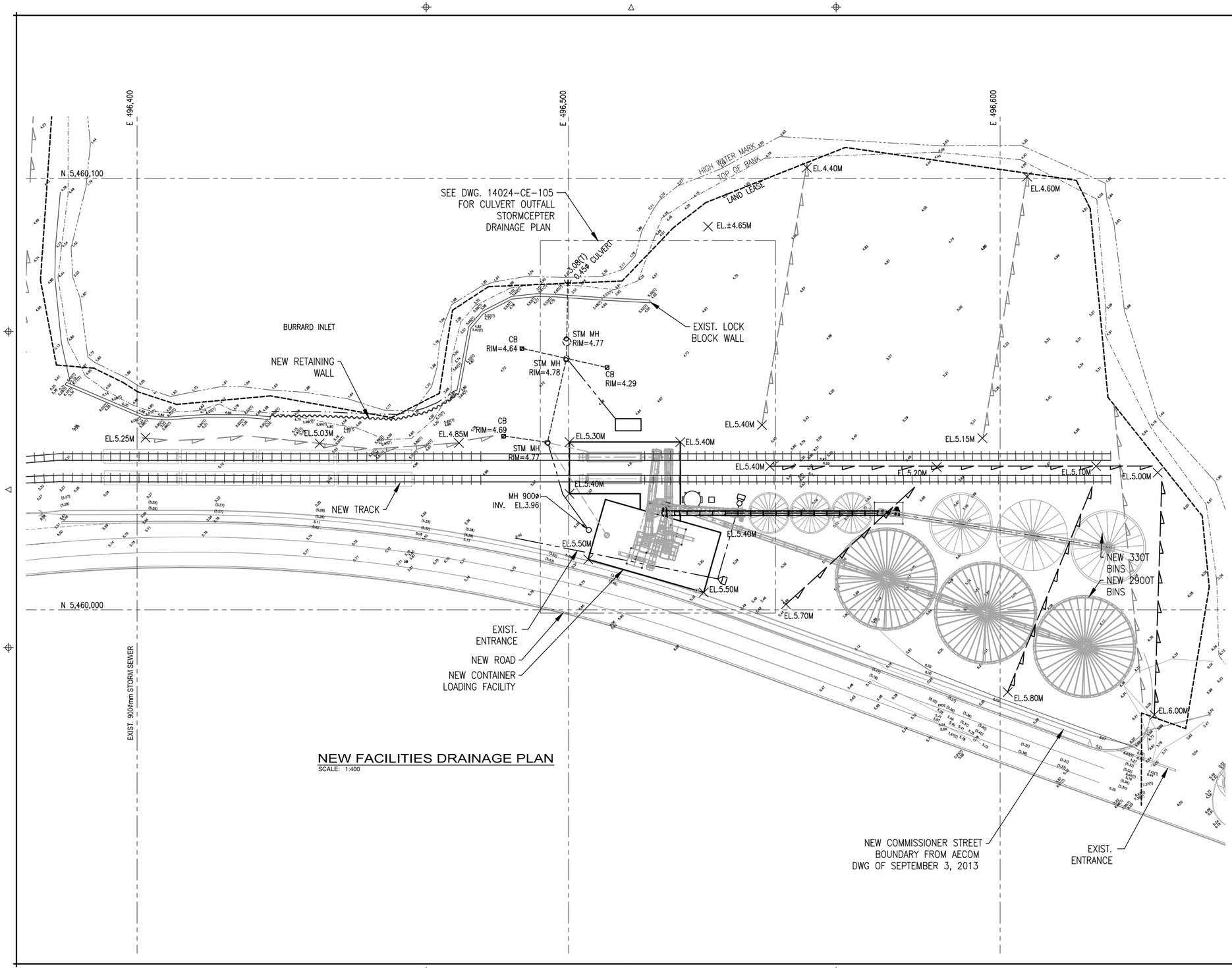
PROJECT:
TRANSLOADING FACILITIES

TITLE:
CIVIL
NEW DRAINAGE SITE PLAN

DRAWING No. 14024-CE-103

REV. B

D-Size



NEW FACILITIES DRAINAGE PLAN

SCALE: 1:400

PROJECT TRUE

ISSUED FOR PERMIT
October 16, 2014

— PRELIMINARY —
NOT FOR CONSTRUCTION
October 16, 2014

CONSULTANT

REV.	DESCRIPTION	DATE (YYYY-MM-DD)	BY	CHECKED
B	ISSUED FOR PERMIT	2014/10/16	AAS	RC
A	ISSUED FOR PERMIT	2014/09/16	FC	RC

NU WESTECH
ENGINEERED THINKING, EXPERT SOLUTIONS
NU WESTECH ENGINEERING LIMITED
300-13955 BRIDGEPORT ROAD, RICHMOND, B.C., CANADA V6V 1J6
TEL. (604) 270-8252 FAX: (604) 270-8271

SEAL:

DRAWN: FC	DESIGNED: CF
CHECKED: CF	CHECKED: TM
DATE: Sept. 2014	

CLIENT:

COLUMBIA CONTAINERS

COLUMBIA CONTAINERS
2775 COMMISSIONER ST.
VANCOUVER, BC
V5K 1A1

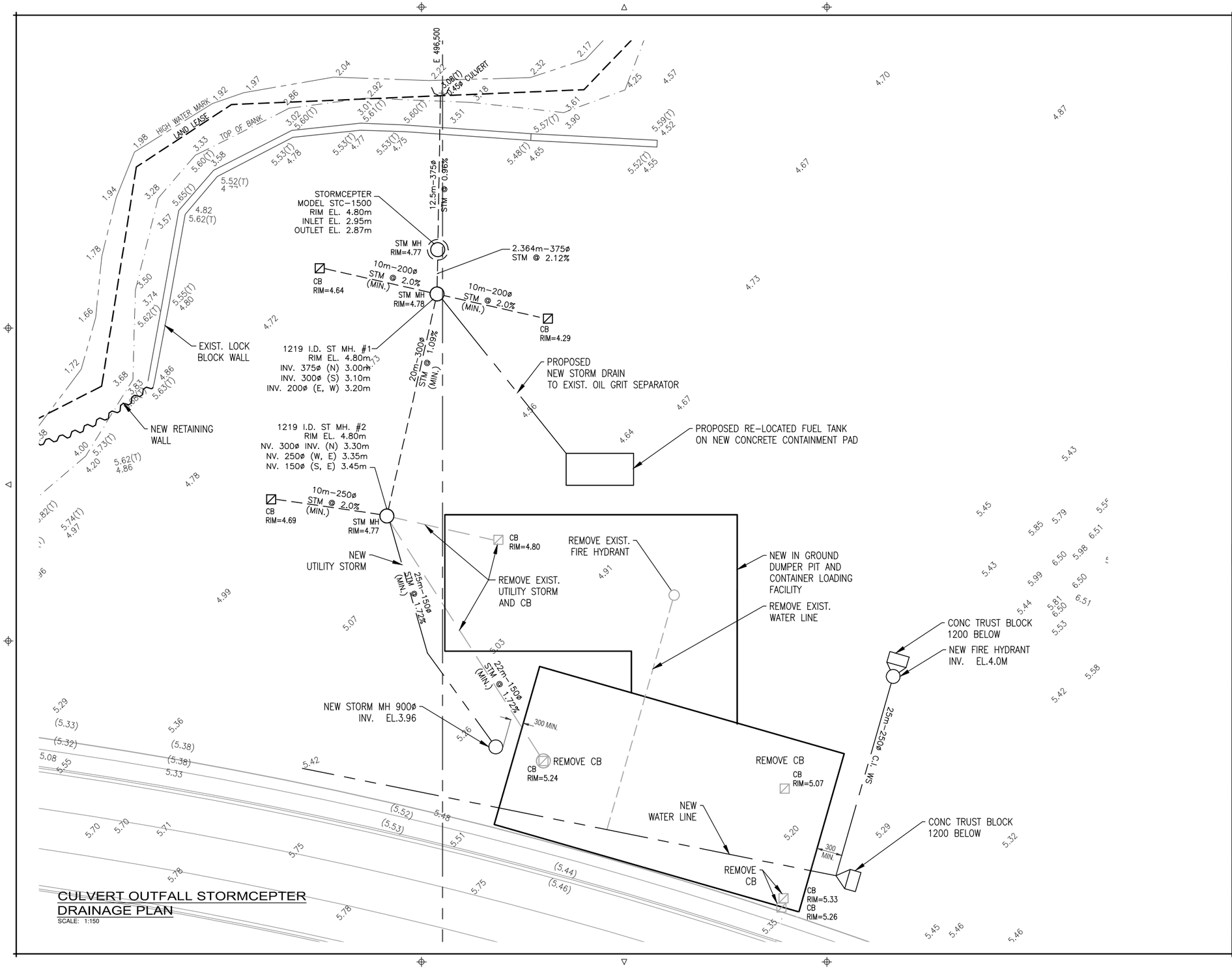
PROJECT:
TRANSLOADING FACILITIES

TITLE:
CIVIL
NEW FACILITIES DRAINAGE PLAN

DRAWING No. 14024-CE-104

REV. B

D-Size



CULVERT OUTFALL STORMCEPTER
DRAINAGE PLAN
SCALE: 1:150

PROJECT TRUE

ISSUED FOR PERMIT
October 16, 2014

— PRELIMINARY —
NOT FOR CONSTRUCTION
October 16, 2014

CONSULTANT

REV.	DESCRIPTION	DATE (YYYY/MM/DD)	BY	CHECKED
B	ISSUED FOR PERMIT	2014/10/16	AAS	RC
A	ISSUED FOR PERMIT	2014/09/16	FC	RC

NU WESTECH
ENGINEERED THINKING, EXPERT SOLUTIONS
NU WESTECH ENGINEERING LIMITED
300-13955 BRIDGEPORT ROAD, RICHMOND, B.C., CANADA V6V 1J6
TEL. (604) 270-8252 FAX: (604) 270-8271

SEAL:

DRAWN:	FC	DESIGNED:	CF
CHECKED:	CF	CHECKED:	TM
DATE:	Sept. 2014		

CLIENT:
COLUMBIA CONTAINERS
COLUMBIA CONTAINERS
2775 COMMISSIONER ST.
VANCOUVER, BC
V5K 1A1

PROJECT:
TRANSLOADING FACILITIES

TITLE:
CIVIL
CULVERT OUTFALL STORMCEPTER DRAINAGE PLAN

DRAWING No. 14024-CE-105
REV. B

KERR WOOD LEIDAL
consulting engineers

Appendix C

Stormceptor Owner's Manual

Stormceptor®

Owner's Manual

The Stormceptor® System is protected by one or more of the following patents:

Canadian Patent No. 2,009,208
Canadian Patent No. 2,137,942
Canadian Patent No. 2,175,277
Canadian Patent No. 2,180,305
Canadian Patent No. 2,206,338
U.S. Patent No. 4,985,148
U.S. Patent No. 5,498,331
U.S. Patent No. 5,725,760
U.S. Patent No. 5,753,115
U.S. Patent No. 5,849,181
U.S. Patent No. 6,068,765
Australia 693.164
Australia 707,133
New Zealand 314,646
European Paten Treaty 95 307 996.9

The Stormceptor System for Stormwater Quality Improvement

Congratulations!

Your selection of a Stormceptor® System means that you have chosen the most recognized and efficient stormwater oil/sediment separator available. Stormceptor is a pollution control device that protects our lakes, rivers and streams from the harmful effects of non-point source pollution. Please address any questions or concerns regarding the Stormceptor Systems to Stormceptor Canada Inc at 1-800-565-4801 or visit our website at *www.stormceptor.com.*

What is a Stormceptor?

Stormceptor is a patented water quality structure that takes the place of a conventional manhole with in a storm drain system. Stormceptor removes free oil (TPH) and suspended solids (TSS) from stormwater preventing spills and non-point source pollution from entering downstream lakes and rivers. Key benefits of a Stormceptor include:

- Capable of removing 50% to 80% of the total sediment load when properly applied as a source control for small areas
- Removes free oil from stormwater during low flow conditions
- Will not scour or re-suspend trapped pollutants
- Excellent spill control device for commercial and industrial developments
- Easy to maintain (vacuum truck)
- STORMCEPTOR *clearly* marked on the cover (excluding inlet designs)
- Engineered and continually tested
- Vertical orientation therefore resulting in a smaller footprint

Please Maintain Your Stormceptor

To ensure long-term environmental protection through continual performance, **Stormceptor must be maintained**. The need for maintenance is determined through inspection of the Stormceptor. Procedures for inspection are provided in this document. Maintenance of the Stormceptor is performed from the surface via vacuum truck. . If you require a list of contacts for cleaning your Stormceptor please call one of our Stormceptor offices or your nearest Stormceptor affiliate (affiliates listed in Appendix 1).

How does Stormceptor® Work?

Stormceptor can be divided into two components:

- Lower treatment chamber
- Upper by-pass chamber

Stormwater flows into the by-pass chamber via the storm drain pipe. Low flows are diverted into the treatment chamber by a weir and drop pipe arrangement. The treatment chamber is always full of water. Water flows up through the outlet pipe based on the head at the inlet weir, and is discharged back into the by-pass chamber downstream of the weir. The downstream section of the by-pass chamber is connected to the outlet storm drainpipe.

Free oils and other liquids lighter than water will rise in the treatment chamber and become entrapped beneath the fiberglass insert since the outlet pipe is submerged. Sediment will settle to the bottom of the chamber by gravity. The circular design of the treatment chamber is critical to prevent turbulent eddy currents and to promote settling.

During high flow conditions, stormwater in the by-pass chamber will flow overtop of the weir and be conveyed to the outlet storm drain directly. Water that overflows the weir creates a backwater effect on the outlet pipe (head stabilization between the inlet drop pipe and outlet riser pipe) ensuring that excessive flow will not be forced into the treatment chamber, which could scour or re-suspend the settled material. The by-pass is an integral part of Stormceptor since other oil/grit separators have been noted to scour during high flow conditions (Schueler and Shepp, 1993).

Stormceptor Models and Identification

Stormceptor is available in both concrete and fiberglass. There are currently nine different sizes available. A concrete Stormceptor is denoted by STC (e.g. STC6000) preceding the model number. A fiberglass Stormceptor is denoted by STA (e.g. STA6000) preceding the model number.

In the concrete Stormceptor, a fiberglass insert separates the treatment chamber from the by-pass chamber. There is three insert designs: the "spool", the "disc" and the "inlet". The different insert designs are illustrated in Figures 1, 2 and 3. These designs are easily distinguishable from the surface once the cover has been removed. In the "spool" design you will see one large 914 mm (36") opening in the center of the insert with two 200 mm (8") inspection ports located either vertically on the sides of the 914 mm (36") opening or horizontally on either side of the opening. There are three versions of the in-line disc insert: "single inlet/outlet", "multiple inlet" and "submerged". In the "disc" design you will be able to see the inlet pipe, the drop pipe opening to the lower chamber, the weir, a 150 mm (6") oil inspection/cleanout pipe, a large 610 mm (24") riser pipe-opening offset on the outlet side of the structure, and the outlet pipe from the unit. The weir will be around the 610 mm (24") outlet pipe on the "multiple inlet" disc insert. The "submerged" disc insert has a higher weir and a second inlet drop pipe. In the "inlet" design you will be able to see the 305 mm (12") inlet drop pipe and 100 mm (4") outlet riser pipe as well as a central 100mm [4"] oil inspection/cleanout port.

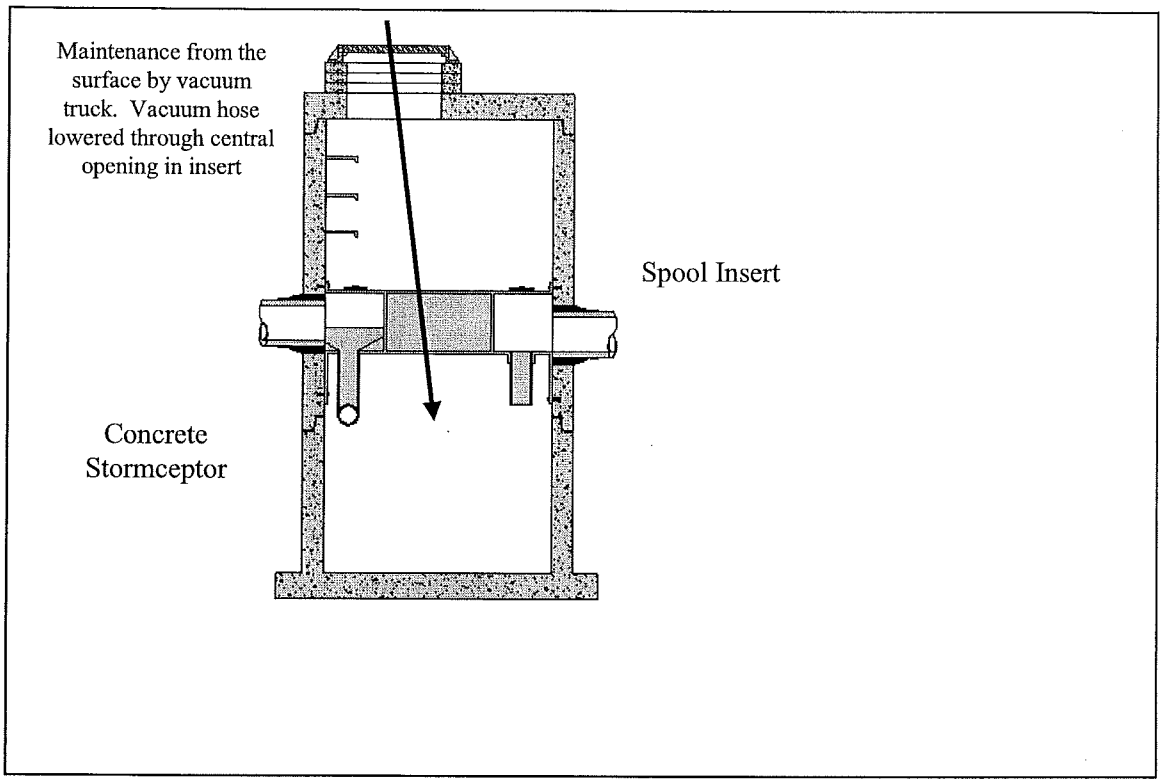


Figure 1 "Spool" Insert Concrete Stormceptor®

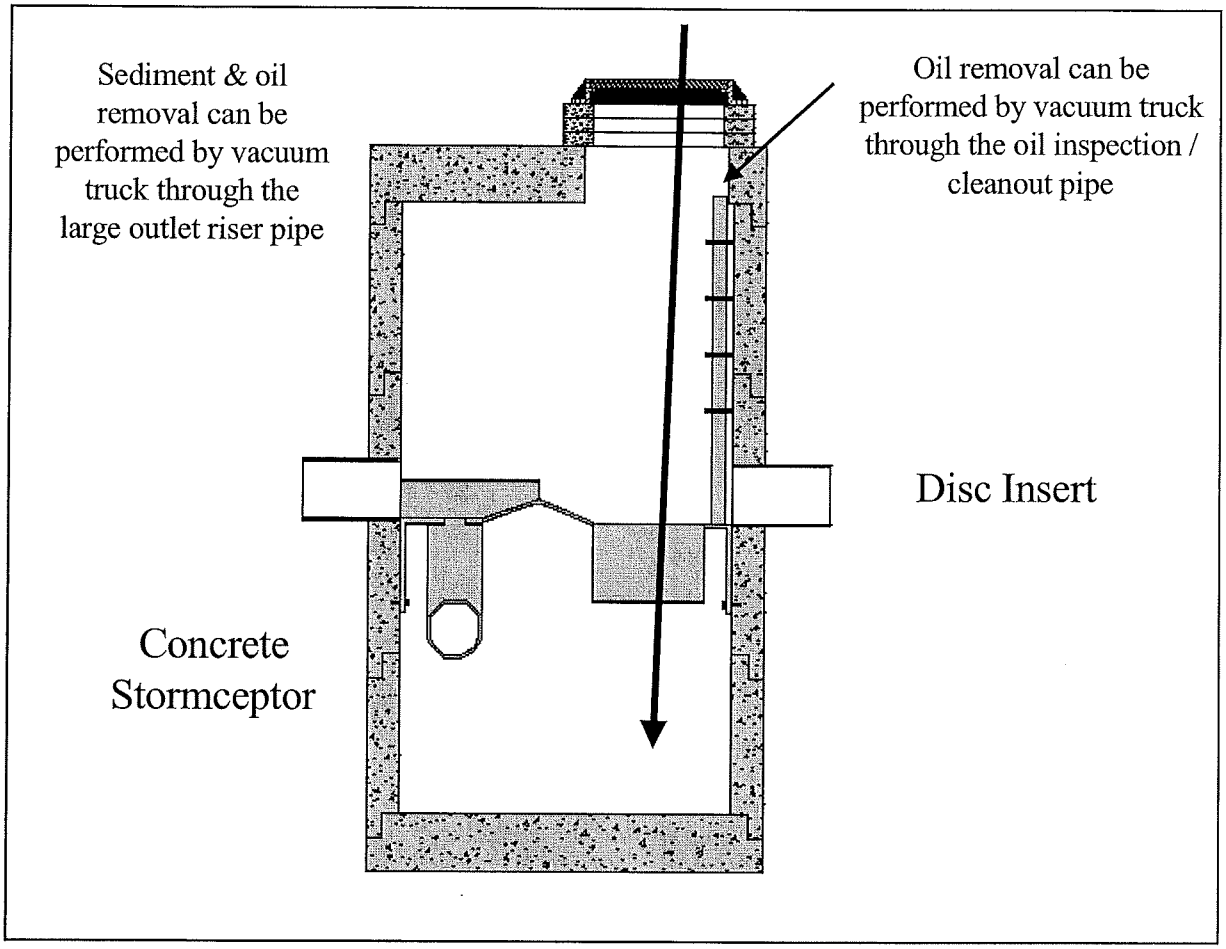
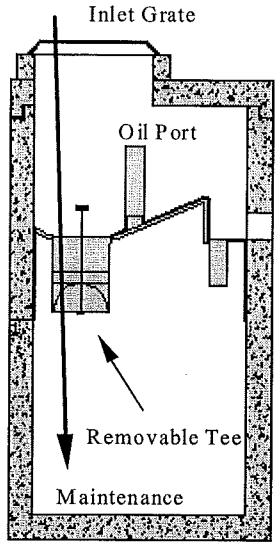


Figure 2 Single Inlet/Outlet "Disc" Insert Concrete Stormceptor®



Inlet Insert

Figure 3 STC 300/450 Inlet Insert

Sizes/Models

Dimensions of the fiberglass and concrete Stormceptor® units are provided in Table 1. Values of invert to grade are provided later in this document for your site. The total depth for cleaning will be the sum of the depth from invert to grade and invert to the bottom of the unit.

Table 1. Stormceptor Dimensions *

Model (Metric)	Model (US)	Pipe Invert to Bottom of STA Stormceptor m (in.)	Pipe Invert to Bottom of STC Stormceptor m (in.)
300	450	1.6 (64)	1.7 (68)
750	900	1.6 (64)	1.9 (74)
1000	1200	2.1 (81)	2.2 (86)
1500	1800	2.9 (115)	3.1 (122)
2000	2400	2.3 (89)	3.1 (122)
3000	3600	3.2 (127)	4.0 (158)
4000	4800	2.9 (113)	3.7 (146)
5000	6000	3.5 (138)	4.3 (170)
6000	7200	3.3 (128)	4.0 (158)

*** Depths are approximate**

The capacities of the different Stormceptor units are provided in Table 2.

Table 2. Stormceptor® Capacities				
Model (Metric)	Model (US)	Sediment Capacity L (US gal)	Oil Capacity L (US gal)	Total Holding Capacity L (US gal)
300	450	1275 (335)	325 (85)	1775 (470)
750	900	2460 (565)	915 (280)	4325 (950)
1000	1200	3260 (845)	915 (280)	5125 (1230)
1500	1800	5660 (1445)	915 (280)	7525 (1830)
2000	2400	6150 (1345)	2945 (880)	10925 (2495)
3000	3600	10415 (2600)	2945 (880)	15195 (3750)
4000	4800	14060 (3475)	3490 (1025)	20180 (5020)
5000	6000	18510 (4550)	3490 (1025)	24635 (6095)
6000	7200	23445 (5425)	4150 (1100)	31210 (7415)

Identification

Even if you do not have plans of your storm drain system you will be able to easily identify where the inline Stormceptor unit(s) (spool or disc insert) are since the name STORMCEPTOR is clearly embossed on the cover. You will be able to determine the location of "inlet" Stormceptor units with horizontal catch basin inlets by looking down the grate since the insert will be visible. The name Stormceptor is not embossed on the inlet models due to the variability of inlet grates used/approved across North America. Once you have found the unit, you may still be uncertain which model number it is. Comparing the measured depth from the water level (bottom of insert) to the bottom of the tank with Table 1 should help determine the size of the unit.

Starting in 1996, a metal serial number tag has been affixed to the inside of the unit. The serial number has the model number written on it. If the unit does not have a serial number, or if there is any uncertainty regarding the size of the interceptor using depth measurements, please contact Stormceptor at 1 800 565-4801 and we will help you determine the size of a particular unit.

What is the Maintenance Procedure?

Maintenance of Stormceptor is performed using vacuum trucks. No entry into the unit is required for maintenance of the spool insert, inlet insert or the smaller disc inserts. Entry to the level of the disc insert may be required for servicing the larger disc insert models. **DO NOT ENTER THE STORMCEPTOR CHAMBER** unless you have the proper equipment, have been trained and are qualified to enter a confined space, as identified by local Occupational Safety and Health Regulations (*e.g.* Canada Occupational Safety and Health Regulations – SOR/86-304). Without the proper equipment and training, entry into confined spaces can result in serious bodily harm and potentially death. Consult local, provincial, and/or state regulations to determine the requirements for confined space entry. Be aware that the insert may be slippery. In addition, be aware that some units do not have a safety grate to cover the outlet riser pipe that leads to the submerged, lower treatment chamber.

The Vacuum Service Industry is a well-established sector of the service industry that cleans underground tanks, sewers and catch basins. Costs to clean a Stormceptor® will vary based on the size of unit and transportation distances.

The depth of oil in the interceptor can be determined by inserting a dipstick tube in the 150 mm (6") oil inspection/cleanout pipe ("disc" design), or in the 914 mm (36") central access way ("spool" design), or in the 100 mm (4") cleanout pipe
("inlet" design).

Similarly, the depth of sediment can be measured from the surface without entry into the Stormceptor via a dipstick tube equipped with a ball valve (Sludge Judge). This tube would be inserted in the central opening ("spool" design) or in the 610 mm (24") opening ("disc" design), or in the 100 mm (4") cleanout pipe ("inlet" design). Maintenance should be performed once the sediment depth exceeds the guideline values provided in Table 3.

For the "spool" design Stormceptor maintenance is performed through the large central 914 mm (36") diameter opening for both the oil and the sediment. In the "disc" design, oil is removed through the 150 mm (6") oil inspection/cleanout pipe and sediment is removed through the 610 mm (24") diameter outlet riser pipe. Alternatively, oil could be removed from the 610 mm (24") opening if water is removed from the lower chamber to lower the oil level to the level of the drop pipes. For the "inlet" design, maintenance is performed through the 305mm (12") inlet drop pipe for the sediment, and oil can be removed from the 100 mm (4") oil/inspection cleanout pipe.

We recommend the following procedure to clean out the Stormceptor:

1. Check for oil (using a dipstick tube)
2. Remove any oil separately using a small portable pump
3. Decant the water from the unit to the sanitary sewer using a portable pump (**prior approval is required from the sewer authority/municipality**)
4. Remove the sludge from the bottom of the unit using a vacuum truck
5. Re-fill the Stormceptor with water where required by the local jurisdiction

How Often Is Maintenance Required?

Generally, annual maintenance is recommended but the required maintenance frequency will vary with the amount of pollution on your site (number of hydrocarbon spills, amount of sediment, etc.). It is recommended that the frequency of maintenance be increased or reduced based on local conditions. If the sediment load is high, maintenance may be required semi-annually. Conversely once the site has stabilized, maintenance may be required less frequently. Maintenance should be performed immediately after an oil spill or once the sediment depth in Stormceptor reaches the value specified in Table 3 based on the unit size.

In the "disc" design and "inlet" design, any potential obstructions at the inlet can be observed from the surface. The "disc" insert has been designed as a platform to facilitate maintenance of the Stormceptor and the storm drain system.

Table 3. Sediment Depths Indicating Required Maintenance		
Model (Metric)	Model (US)	Sediment Depth mm (in.)
300	450	200 (8)
750	900	200 (8)
1000	1200	250 (10)
1500	1800	375 (15)
2000	2400	300 (12)
3000	3600	425 (17)
4000	4800	375 (15)
5000	6000	450 (18)
6000	7200	375 (15)

What Should I do in the Event of an Oil Spill?

Stormceptor® is often implemented in areas where the potential for spills is great. Stormceptor should be cleaned immediately after a spill occurs by a licensed liquid waste hauler. You should also notify the appropriate regulatory agencies as required in the event of a spill.

Disposal of the Trapped Material Removed from Stormceptor

The requirements for the disposal of material from Stormceptor are similar to that of any other Best Management Practices (BMP). Local guidelines should be consulted prior to disposal of the separator contents.

In most areas the sediment, once dewatered, can be disposed of in a sanitary landfill. It is not anticipated that the sediment would be classified as hazardous waste. In some areas, mixing the water with the sediment will create a slurry that can be discharged into a trunk sanitary sewer. In all disposal options, approval from the disposal facility operator/agency is required. Petroleum waste products collected in Stormceptor (oil/chemical/fuel spills) should be removed by a licensed waste management company.

What if I see an oil rainbow or sheen at the Stormceptor outlet?

With a steady influx of water with high concentrations of oil, a sheen may be noticeable at the Stormceptor outlet. This may occur because a rainbow or sheen can be seen at very small oil concentrations (< 10 ppm). Stormceptor will remove over 95% of all free oil and the appearance of a sheen at the outlet with high influent oil concentrations does not mean that the unit is not working to this level of removal. In addition, if the influent oil is emulsified, the Stormceptor will not be able to remove it. The Stormceptor is designed for free oil removal and not emulsified or dissolved oil conditions.