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London ON N6A 5J7

September 27, 2022

Project/File: 161413603

Jaime Chaves
The Corporation of the City of London
300 Dufferin Ave.
London, ON, N6A 4L9

Dear Jaime Chaves,

Reference: File #TS2022-002 – Savoy Street Extension, Colonel Talbot East SWM Brief

1 Introduction

Stantec Consulting Ltd. (Stantec) has been engaged by Auburn Development Inc. (the Client) to provide a Stormwater Management Brief for the Savoy Street Extension as part of the overall engineering services. The intent of this letter brief is to outline the stormwater management (SWM) strategy for the subject lands as shown on the attached Drainage Area Plan. The lands proposed for development consist of 4.3 ha of primarily agricultural land north of Savoy Street and west of Bostwick Road.

The following tasks are summarized in this report:

- A complete review of relevant, existing documents (listed in Section 2.0 Background);
- A drainage strategy to manage the post-development runoff; and,
- A confirmation of the stormwater management criteria and downstream receivers.

2 Background

In preparation of this brief, the following documents and reports have been referenced:

- Dingman Creek Subwatershed: Stormwater Servicing Study Environmental Assessment (DCEA). Aquafor Beech Limited, September 2020.
- City Reference Drawing T14052 – Foxwood Crossing Phase 3 Storm Drainage Plan.
- Foxwood Crossing Subdivision Phase 3 Functional Stormwater System Report. AGM, September 2015.

- Geotechnical Investigation. EXP Services Inc., January 2015, Updated August 2022.
- Hydrogeological Assessment Preliminary Report. EXP Services Inc., February 2022.
- Design Specifications and Requirements Manual (DSRM), City of London, October 2003 (Updated March 2022).
- Stormwater Management Planning and Design Manual (SWMPD Manual), Ontario Ministry of the Environment, Conservation and Parks, March 2003.

3 Stormwater Management Criteria

The SWM criteria for the site are established as per the City of London comments in conjunction with the SWM criteria and environmental targets identified in the relevant Sub-watershed Studies. The SWM design criteria for the proposed development are:

- **Water Quality** – Provide sufficient treatment measures to meet the Ministry of the Environment, Conservation and Parks, (MECP) *Enhanced* (80% TSS Removal) criteria and promote the at-source removal of potential contaminants.
- **Water Quantity** – Provide sufficient water quantity control to maintain post-development peak flow rates up to the 250-year storm event to the target discharge rates allowed for by the governing Storm Drainage Plan.
- **Erosion and Sediment Control** – Provide appropriate erosion and sediment control during construction/area grading to protect adjacent properties and downstream watercourses and SWM facilities (SWMF) from potential siltation.

4 Existing Conditions

The subject site consists of 4.3 ha of worked agricultural land bounded by the future Bostwick Road realigned right-of-way (ROW) to the east, the future Hayward Drive ROW to the north, an existing woodlot to the west and future residential development to the south. The site drains from north to south with a high point being at the northwest corner. No defined watercourses cross or are adjacent to the subject lands. A portion of the subject lands are currently drained by a ditch-inlet catchbasin located at the termination of Savoy Street, while the remainder drains east and south overland towards Bostwick Road.

Based on the Geotechnical Investigation of the site the soil conditions are layers of silt and silty sand over clayey silt which acted as an impermeable layer to hold a shallow perched water table. Seepage was observed in the test pits dug at depths ranging between 0.6m and 1.2m below existing grade. The deeper water table was found to be roughly 6.0 to 6.5 m below grade.

5 Proposed Conditions

The proposed plan of subdivision (draft plan attached) shows the extension of Savoy Street north to the future Hayward Drive with 28 single family lots and a 2.5 ha medium density block. Site drainage will be directed to Savoy Street which will drain from north to south as is intended and described in the governing SWM Report.

The subject site is accounted for in the downstream Lambeth Meadows Pond 1 Cell 2 at a C value of 0.55. The downstream SWMF is a quantity only facility and the site will need to provide its own quality treatment. Also, to be considered in the design is additional upstream external flows from the additional 3.0 ha of lands that may be routed this way.

5.1 Downstream Oil/Grit Separator

The quality treatment for the downstream lands is handled by an oil/grit separator (OGS), a Stormceptor™ STC6000, designed to handle 7.8 ha of contributing area at 52% impervious for a 71% total suspended solids (TSS) removal rate. This design did not factor in any external areas, including the interim external area being picked up by the DICB at Savoy Street and is not likely operating at its design range now. Consequently, this OGS will be very sensitive to any increase in flow introduced by the proposed subdivision.

5.2 Future External Lands

The proposed development is part of a 9.0 ha external land drainage area that is intended to be controlled by the downstream SWMF. As shown on the Proposed Drainage Area Plan included with this brief, 3.0 ha of that land is north of the proposed development and 1.6 ha consists of the proposed realignment of Bostwick Road.

Both of these areas may be directed to other SWMF's in the future, with the Bostwick Road area unlikely to be directed as currently shown.

6 Stormwater Management Strategy

The stormwater strategy for the subject lands is straightforward, should the problem of the downstream OGS be discounted. Quantity control for the Savoy Street extension and the single-family lots is accounted for in the downstream SWMF and a permanent private system (PPS) would be required on the medium density block to reduce flows to the target rate.

Quality controls would be accomplished on the medium density block as part of the PPS, likely in the form of an OGS. For the single-family lots and the municipal road we are proposing to use an offline point source treatment product called Envirobasin™. Further detail for the SWM strategy is outlined below.

6.1 Quantity Controls

The medium density block of the proposed development is assumed to have a C value higher than the 0.55 that has been designed for. Therefore, quantity controls may be required on the block in the form of a PPS. A Modified Rational Method calculation has been undertaken to estimate the amount of storage required to control the proposed runoff from the block assuming a post-development C value of 0.70. The pertinent details are tabulated below, and the calculations can be found attached.

Table 1 - Medium Density Block SWM Targets

Allowable 2-year Flow Rate	0.27 m^3/s
Allowable 100-year Flow Rate	0.62 m^3/s
Allowable 250-year Flow Rate	0.73 m^3/s
Storage required to control the Post-development 100-year event to the 2-year Allowable Flow	609 m^3

This storage requirement would be finalized as part of the site plan detail design and may be able to be reduced when accounting for additional external areas that may no longer be contributing to the pond. As mentioned above, the single-family portion of the development requires no quantity control.

6.2 Quality Controls

No quality controls exist downstream that account for the proposed development and as such, quality controls measures will need to be implemented as part of the design. For the single-family portion of the development Envirobasins™ are being proposed to treat flows from Savoy Street. Envirobasin™ is a modified catchbasin capable of achieving 65% TSS removal rates of the ETV particle distribution which translates to an 80% removal rate of the Fine particle distribution. The product brochure is attached with this letter for information. The benefit of these units is that if additional lands from the north ultimately pass through the storm sewer, it will not impact treatment rates.

The medium density block will require its own quality treatment unit, likely an OGS, to achieve quality targets. This unit will be sized as part of the PPS and would be part of the subsequent site plan application process.

6.3 Infiltration Measures

The DCEA requires a runoff volume control hierarchy of 25 mm to be applied utilizing mechanisms of infiltration, evapotranspiration and/or re-use to achieve water balance and erosion control requirements for this subdivision as included in the Section 6 of the City's Stormwater Management of the DSRM. The

Hydrogeological Assessment by EXP, 2022 indicates an infiltration shortfall of 55% post-development. To address these concerns the following is proposed:

- Infiltration measures may be included in the storage measures on the medium density block's PPS. The footprint of the storage can double as an infiltration gallery.

- Increased topsoil depth of 300mm be utilized through the development in all landscaped areas for both the single-family lots and the medium density block.

These measures will help address the above required targets.

6.4 Downstream OGS Considerations

The downstream OGS providing quality treatment for the Foxwood Crossing Subdivision was not sized to account for the ultimate drainage area and the flows from the proposed development will have adverse impacts to its function. From our initial review of the problem, three alternatives appear to be available to correct for the issue.

- **OGS Replacement** - The first option would be to replace the OGS unit with one appropriately sized for the ultimate catchment area. This may or may not be possible given the size and attributes of the ultimate catchment.

- **OGS Bypass** - Constructing a bypass around the OGS for higher flows is a possible solution that allows the current unit to remain in place. An orifice would control flows to the OGS to maintain its treatment levels. Space may be limited for this option.

- **Upstream Storage** - Provide storage for the proposed development to throttle flows back to a level that does not adversely impact the downstream OGS. This option would likely require more storage than would be possible to obtain under the Savoy Street extension as the allowable flow would be quite small.

The Developer has expressed that they should not be expected to incur additional design and construction costs including developable land incumbrance in order to address quality requirements for existing downstream development given the downstream system should have been designed with consideration for the ultimate catchment as identified in the Foxwood Crossing Subdivision Phase 3 Functional Stormwater System Report.

7 Erosion and Sediment Control Measures

This section describes the Erosion and Sediment Control Measures that will be implemented during and immediately after construction to reduce the possibility of sediment being deposited downstream.

7.1 Types of Selected Erosion/Sediment Control Methods

The details and locations of the proposed erosion and sediment control measures are shown in the submitted drawings package. The proposed erosion and sediment control measures include the following:

- Heavy-duty silt fencing to be erected on all Site boundaries where there is potential for runoff to be discharged offsite, to protect adjacent downstream lands from migration of sediment in overland flow. The location of this fencing will be adjacent to the limit of grading.
- Stabilize all disturbed areas where work will not take place for a period of 30 days or more according to OPSS 572.
- Perform street sweeping as necessary to remove soil accumulation caused by construction traffic.
- Install and maintain catchbasin inserts at all catchbasins to prevent sediment from entering the proposed storm sewer.
- Installation of a mud mat at the main entrance to site.
- Dewatering effluent discharge areas complete with sediment traps and energy diffusers shall be constructed, as necessary, within the proposed construction limits. Filter socks will be used where necessary to further filter the discharge.

The proposed temporary erosion & sediment control measures have been selected based on the site's susceptibility to erosion, sensitivity of the downstream environment, site slopes, and total drainage area. The proposed measures should provide adequate erosion and sediment control for the proposed project without the need for additional measures; however, the site should be monitored during construction, and additional measures may be added, if required. Such measures may include, but are not limited to, additional rows of silt fence or rock check dams in areas that are susceptible to erosion.

Reference: **File #TS2022-002 – Savoy Street Extension, Colonel Talbot East SWM Brief**

8 Conclusions

Based on the preceding documentation, the following conclusions can be drawn:

- **Water Quantity** – May be required for the medium density block and would take the form of a Permanent Private System. The downstream SWM facility is adequately sized for the single-family portion of the proposed development.
- **Water Quality** – At-source controls in the form of Envirobasins™ will treat the Savoy Street extension and the medium density block will have quality controls as part of its PPS. Quality controls shall be sized to provide an MECP *Enhanced* level of treatment.
- **Erosion and Sediment Control Measures** – Standard measures are proposed for the site including silt-fence, a mud-mat construction entrance, and silt sacks in the catchbasins.

As the site conforms to the assumptions in the proposed SWM strategy, we trust that this report is sufficient and meets your needs. However, should you have any questions, please do not hesitate to contact the undersigned at your convenience.

Regards,

STANTEC CONSULTING LTD.

Digitally signed by Adam Kristoferson
Date: 2022.09.27 15:19:56 -04'00'

Adam Kristoferson P. Eng.
Water Resources Engineer
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Attachment: Proposed Drainage Area Plan
SWM Calculations
Envirobasin™ Brochure

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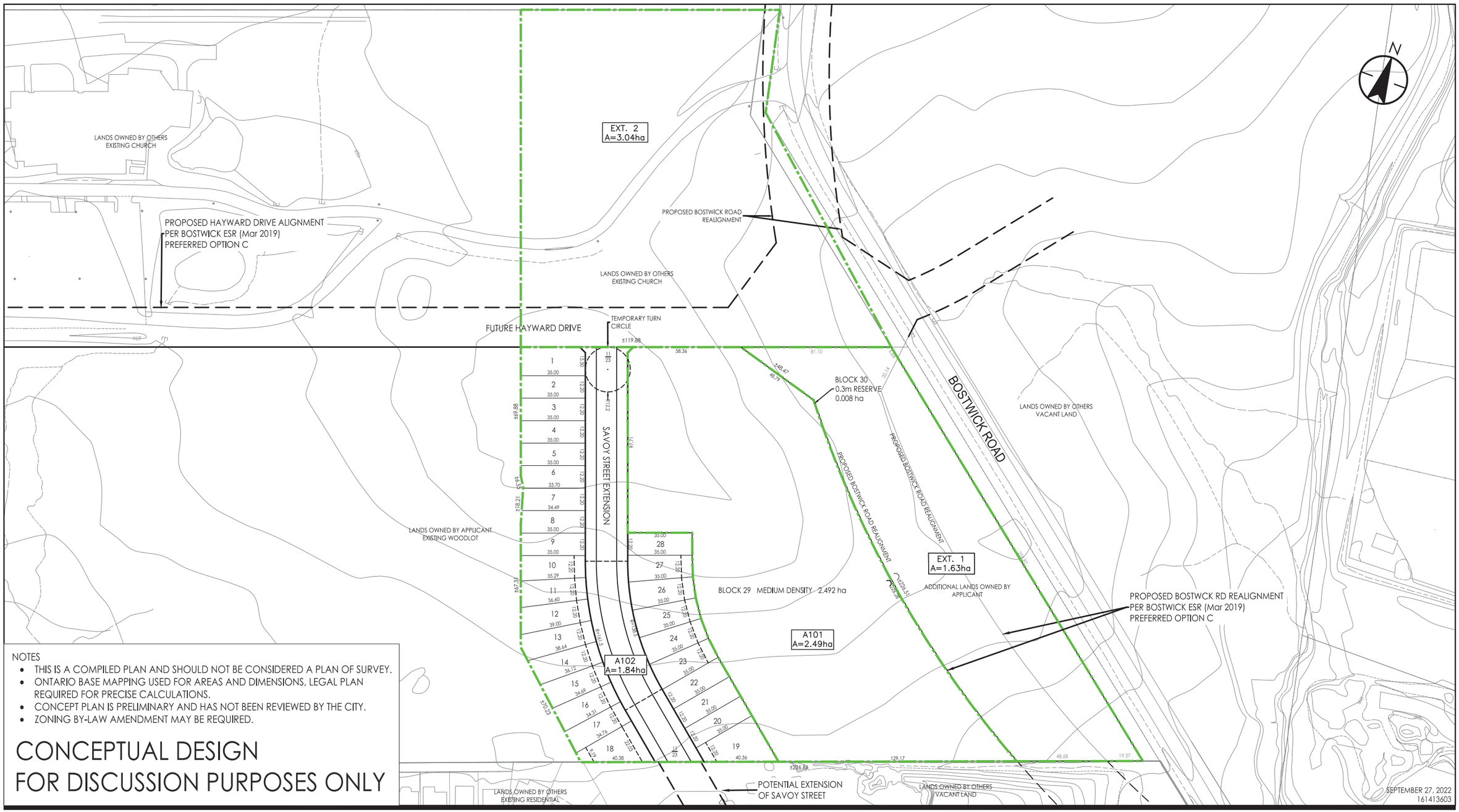

NOTES
- THIS IS A COMPILED PLAN AND SHOULD NOT BE CONSIDERED A PLAN OF SURVEY.
- ONTARIO BASE MAPPING USED FOR AREAS AND DIMENSIONS, LEGAL PLAN REQUIRED FOR PRECISE CALCULATIONS.
- CONCEPT PLAN IS PRELIMINARY AND HAS NOT BEEN REVIEWED BY THE CITY.
- ZONING BY-LAW AMENDMENT MAY BE REQUIRED.

CONCEPTUAL DESIGN
FOR DISCUSSION PURPOSES ONLY

SEPTEMBER 27, 2022
161413603

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LEGEND

SITE DRAINAGE AREA

AREA ID
AREA=X.XX ha
DRAINAGE AREA BOX

EXISTING CONTOUR

HORZ – 1 : 2000
20 0 40m

Client/Project
COLONEL TALBOT DEVELOPMENTS INC.
COLONEL TALBOT EAST
London, ON Canada

Figure No.
1.0

Title
PROPOSED AREA PLAN

Subject: **Target Flows**
Project: **Col Talbot East**
Project No.: **161413603**
Date: **September 20, 2022**

Total Drainage Area: 2.49 ha

Composite Runoff Coefficient: 0.55

$$I = A / (T + B)^C$$

I = Intensity of rainfall in mm/hour
T = Time of concentration in hours

$$Q = 0.0028CIA$$

Q = Peak Discharge
C = 0.55 Runoff Coefficient
I = Rainfall Intensity
A = 2.49 Area (ha)
tc = 12.5 min From Figure 5.3 of the DSRM

Design Storm Event	A	B	C	Rainfall Intensity (mm/hr)	Peak Discharge (cms)
2-year	754.36	6.011	0.81	71.0	0.27
100-year	2619.363	10.500	0.884	163.8	0.62
250-year	3048.22	10.03	0.888	191.8	0.73

Subject: **Modified Rational Method**
Project: **Col Talbot East**
Project No.: **161413603**
Date: **September 20, 2022**

Drainage Area

Total Drainage Area: 2.49 ha

Composite Runoff Coefficient: 0.70

Event Adjusted C: 0.88

(25% increase as per MTO guidelines for severe storm events 0.95 max)

Rainfall Intensity

$$I = A/(T + B)^C$$

I = Intensity of rainfall in mm/hour
T = Time of concentration in hours
A = 2619.363
B = 10.5
C = 0.884

Time Step 5 minutes

Storage Calculation 100-year

Target Release Rate: 0.27 m³/s Max Storage= 609

Time (min.)	Rainfall Intensity (mm/hr)	Peak Runoff Rate (cms)	Incremental Runoff Volume (cu. m)	Incremental Outflow Volume (cu. m)	Storage Volume (cu. m)
5	232.2	1.406	422	81	341
10	181.4	1.098	659	162	497
15	149.6	0.905	815	243	572
20	127.7	0.773	927	324	603
25	111.6	0.676	1013	405	609
30	99.4	0.601	1082	486	597
35	89.6	0.543	1139	567	572
40	81.7	0.495	1187	648	540
45	75.2	0.455	1229	729	500
50	69.7	0.422	1265	810	455
55	65.0	0.393	1297	891	407
60	60.9	0.368	1326	972	355
65	57.3	0.347	1352	1053	300
70	54.1	0.328	1376	1134	242
75	51.3	0.311	1398	1215	183
80	48.8	0.295	1418	1296	122

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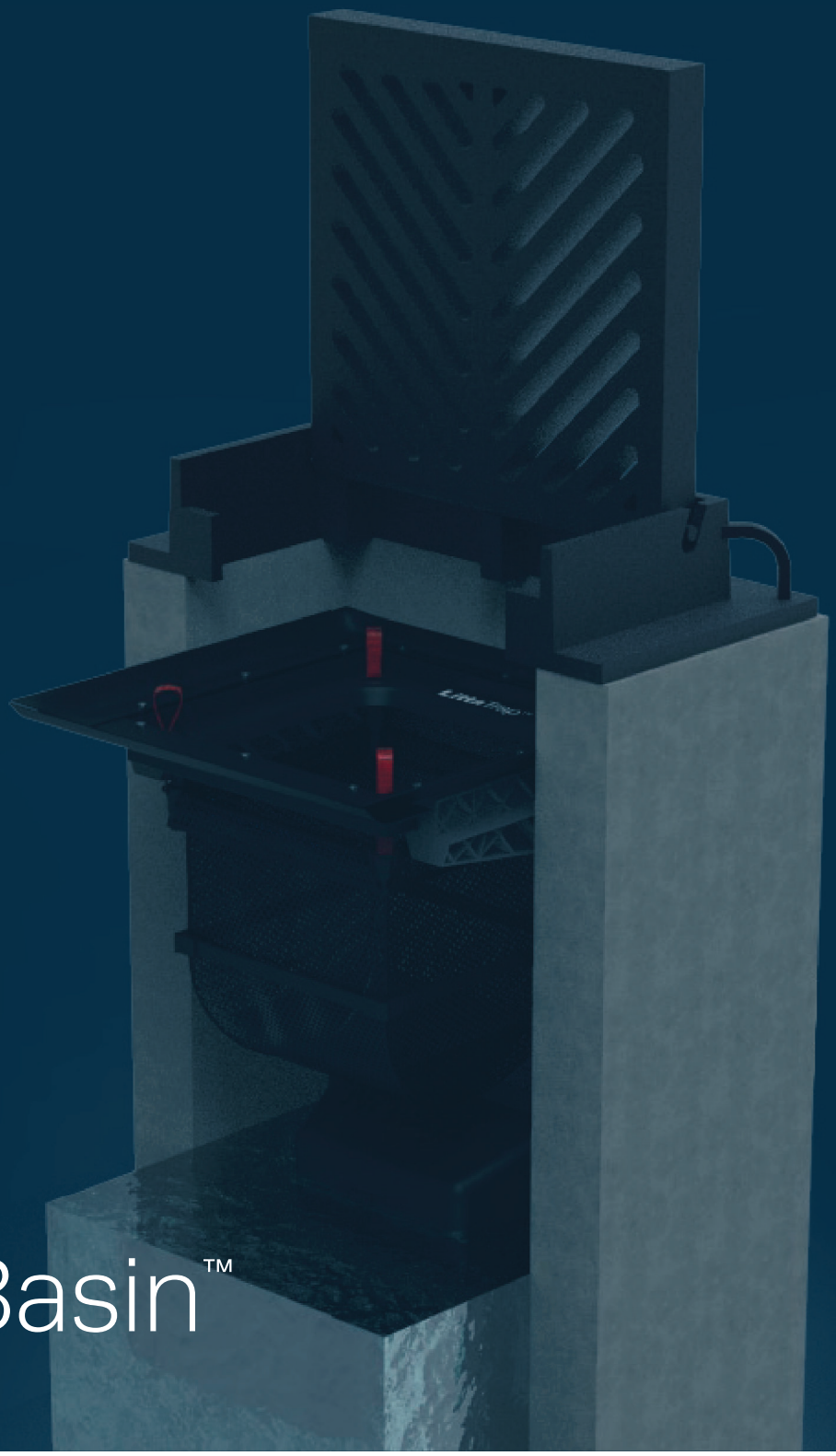

EnviroBasin™

At–Source Trash and Sediment Capture

ENVIROPOD™
A STORMWATER360™ COMPANY

The EnviroBasin™

EnviroBasin™
Grate Inlet

WHY ENVIROBASIN?

APPLICATIONS

Operation

FEATURES

Maintenance

LittaTrap™ Basket Hand Maintenance

It is recommended the LittaTrap™ basket be emptied when 75% full (generally every 3–12 months). To empty the basket, simply "Lift, Tip, Reuse". The following steps detail hand maintenance:

1. Establish a safe working area per typical catch basin service activity.
2. Remove grate/access cover.
3. Remove the basket with two lifting hooks or lift by hand through the loops on the top of the basket. Excess debris should be scooped out first if the basket is over half full.
4. Pour contents of the basket into a disposal container.
5. Replace grate.

EnviroBasin™ Sump Vactor Maintenance

Steps for vactor maintenance are as detailed below:

1. Establish a safe working area per typical catch pit service activity.
2. Remove grate/access cover.
3. Vacuum accumulated debris from the basket.
4. Vactor the contents from the sump of the catch basin (if required).
5. Inspect the Littatrap™ and EnviroBasin™ for any damage. Reinstall the LittaTrap basket.
6. Replace grate/access cover.

FREE DESIGN AND SIZING SERVICE

ABOUT ENVIROPOD

EnviroPod is the world's leading catch basin insert technology provider. The company has over 50,000 installations worldwide, including catchment wide retrofits. The EnviroBasin™ is a result of 26 years' of research, implementation and operation of source treatment solutions.

For further information please see www.enviropod.com

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