This document contains **general** specifications for a Nedlaw living wall biofilter and should be taken as a guide only.

Detailed specifications are required and will be provided for each project.

General

1.1 RELATED REQUIREMENTS

.1 Section 04 22 00 – Concrete Unit Masonry

.2 Section 06 10 00.01 – Rough Construction

.3 Section 07 13 26 – Self-adhesive Waterproofing

.4 Section 22 11 16 Domestic Water Piping

.5 Section 22 13 17 Drainage Waste and Vent Piping

.6 Section 23 05 05 - Installation of Ductwork

.7 Section 26 05 00 – Common Work Results –Electrical/Controller

.8 The General Contractor shall provide the installer with scaffolding, boom lift or scissor lift for the installation of the waterproofing, the internal air diffusers and growth media.

.9 The General Contractor shall provide the installer with space adjacent the living wall to act as a staging area for the installation of the living wall.

.10 The General Contractor shall provide the installer power swing stage scaffolding, boom lift or scissor lift for the installation of the plants.

.11 The General Contractor/Owner will provide a system to access the biofilter after installation for routine maintenance.

.12 All utilities (electricity, water, lighting and heat) required by the Installer during this work shall be provided by the General Contractor.

.13 Unless otherwise agreed by both parties, the installation will occur during regular work hours. The General Contractor will provide the installer access to the site.

.14 Required dimensions of the system will be provided by the General Contractor with the acceptance of the offer.

.15 The installer will photograph the installation as part of normal record keeping and may use these and other photographs of the system for marketing purposes unless written notification is received from the General Contractor.

.16 Installation to be scheduled on dates to be mutually acceptable to the General Contractor and the installer.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-A Plumbing.

.2 CSA A Electrical

.3 CSA-A Mechanical

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation meetings: comply with [Section 01 31 19 - Project Meetings. Conduct pre-installation meeting [one week] prior to commencing [work of this Section] [and] [on-site installations] to:

.1 Verify project requirements, including mock-up requirements.
.2 Verify substrate conditions.
.3 Co-ordinate products, installation methods and techniques.
.4 Sequence work of related sections.
.5 Co-ordinate with other building sub trades.
.6 Review manufacturer's installation instructions.
.7 Review warranty requirements.
.8 Review maintenance terms/qualifications for biofilter training

.2 Aspects of this specification use proprietary technology. The installer/supplier must be provided verification of rights to use technology.

.3 Sequencing: sequence with other work in accordance with [Section [01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM).] [Comply with manufacturer's written recommendations for sequencing construction operations.

.4 Scheduling: schedule with other work in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM).

1.4 ACTION SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours.
.2 Provide [two] copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section [01 35 29.06 - Health and Safety Requirements.

.3 Samples:

.1 Provide samples as follows:
.1 Type of growth material specified, supplemented with specific requirements in Section 13.80.00 .
.2 List of plant material to be used along with photographic examples of the material alone and in representative biofilter.
.3 Typical internal air distribution system, described in section 13.80.00.
.4 Two of each type of masonry anchorage, supplemented by specific requirements.

.5 Samples: used for testing and when accepted become standard for material used.

.4 Shop Drawings:

.1 Provide drawings stamped and signed by professional engineer registered or licensed in [Province of Ontario, Canada.

.2 Submit shop drawings in accordance with Section 01 33 00

.3 The drawing will include a complete set of standard details for the waterproofing, internal diffuser systems, rooting material and mechanical components. The package will also include a plant list and a control sequence for BAS

1.5 INFORMATION SUBMITTALS

.1 Certificates: provide manufacturer's product certificates certifying materials comply with specified requirements.

.2 Test and Evaluation Reports:

.1 Test reports to certify compliance of growth media with specified performance characteristics and physical properties.

.3 Installer Instructions: provide manufacturer's installation instructions, including storage, handling, safety and site conditions.

.4 Manufacturer's Reports: provide written reports prepared by manufacturer's on-site personnel to include:

.1 Verification of compliance of work with Contract.

.2 Site visit reports providing detailed review of installation of work, and installed work.

.5 Written verification that the installer and manufacturer have rights to the technology. Failing to have these rights will expose the installer, General Contractor, other consultants and client to legal action.

1.6 CLOSEOUT SUBMITTALS

.1 Provide manufacturer's instructions for care, cleaning and maintenance of biofilter into manual specified in Section 01 78 00 - Closeout Submittals.

1.7 MAINTENANCE

.1 Provide manufacturer's instructions in accordance with Section 01 78 00 - Closeout Submittals covering maintenance requirements and parts catalogue, with cuts and identifying numbers.

.2 A system to allow maintenance workers safe access to biofilter must be provided by the General Contractor.

.3 Initial maintenance period of 12 months will commence with substantial completion of the building or installation of the plants whichever is later.

.4 The site will be visited at least 12 times during the first 12 month period. Included in these visits are the following; maintenance of water circulating system, replacement of dead plants, pruning of plants, control of pest insects and maintenance of plant nutrient status.

.5 Maintenance reports will be submitted to the General Contractor prior to substantial completion, outlining the actions carried out as per the maintenance requirements above, as well as dates, personnel at each visit, and notes on growing conditions.

.6 Prior to substantial completion, reports shall be signed by maintenance contractor and verified by Owner.

.7 Prior to substantial completion, copies shall be submitted to Owner and General Contractor.

1.8 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturer: capable of providing field service representation during construction and approving application method.

.2 Installer: experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

.3 Installers: company or person specializing in biofilter installations with [3] years [documented] experience with biofiltration work similar to this project.

1.9 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials in accordance with Section [01 61 00 - Common Product Requirements.

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.3 Storage of Plant Materials

.1 The General Contractor must provide an area where the Plant materials can be stored, near the biofilter, protected from outside conditions and maintained at a temperature of no greater than 26° C and no cooler than 8°C for a minimum of 5 days. Plants must be protected from direct sunlight. If the plants are to be stored for more than 3 days than the General Contractor must provide lighting (natural or artificial similar to 1.3.H.1.)

.4 Packaging Waste Management:

.1 In accordance with Section 01 74 19 - Construction/Demolition Waste Management.

1.10 SITE CONDITIONS

.1 Environmental Requirements:

.1 No installation of waterproofing shall be performed if surfaces to be treated are below 10°C

.2 No installation of waterproofing shall be performed if surfaces are not clean and dry.

.3 No installation of plants shall be performed if temperatures below 13°C or above 25°C

.2 The General Contractor must ensure the area to be waterproofed or treated is ready to receive treatment. Basin shall be clean of stains, debris and dirt, free from cracks in excess of 5 mm, and shall be free from protrusions, holes or uneven concrete or mortar greater than 10 mm. The wall shall be free of honey combing. Tolerance to imperfections in concrete work and structural wall must at least meet those outlined in Division 03 and Division 04.

.3 Protection: Temporary protection of the waterproofing shall be provided by the General Contractor to prevent mechanical damage or damage from spillage of oil or solvents until such time as permanent protection is provided.

.4 Post installation treatment of the plants

.1 After the plants are installed in the biofilter, the General Contractor must ensure the building temperature remains between 13°C and 25°C

.2 The installer may cover the biofilter with plastic for up to two weeks after installation of the plants is complete to facilitate establishment of plants.

.3 The General Contractor shall ensure that air is not drawn through the biofilter for 3 weeks after the installation of the plants

.5 The installation of the plants is to occur no earlier than 3 weeks before substantial completion of the building

.1 If the installation of plants occurs earlier than 3 weeks before the actual substantial completion of the building, the General Contractor agrees to pay the installer an additional $XXX per month or fraction thereof, for the additional maintenance of the system.

.1 This time will be calculated as the actual date of substantial completion of the building minus the date of completion of the planting of the biofilter minus 21 days.

.2 The biofilter is planted when 75% of the wall is covered with plants.

1.11 WARRANTY

.1 Installer warrants that the equipment manufactured and services furnished are free from defects in material and workmanship under normal use and service and, without charge, equipment found to be so defective in material or workmanship will be repaired or replaced, if written notice of failure is received by installer within one (1) year after substantial completion, provided said equipment has been operated in accordance with installer's instructions and provided such defects are not due to abuse, power failure, fire or decomposition by chemical or galvanic action.

.2 Biofilter Installer warrants all vegetation for one (1) year from the date of substantial completion provided all maintenance requirements have been conducted as per this specification and carried out by properly trained Biofilter Technician personnel under a maintenance service contract covering the maintenance requirements outlined in this specification and provided said plants has been maintained in accordance with Installer's instructions and provided such failure is not due to abuse, power failure, fire or decomposition by chemical action, extreme temperature or lack of light.

.3 The installer warrants the growing medium for five (5) years from substantial completion allowing for a 10% degradation of the material per year, provided all maintenance requirements have been conducted as per this specification and carried out by recognized personnel under a maintenance service contract covering the maintenance requirements outlined in this specification and provided said plants has been maintained in accordance with Installer's instructions and provided such failure is not due to abuse, power failure, fire or decomposition by chemical action, extreme temperature.

.4 In the event that any work is required on any component of the building under, behind or above the biofilter system, including the waterproofing, any removal and replacement of the biofilter system must be performed by approved personnel and will be an extra to the maintenance contract covering the maintenance requirements outlined in this specification.

Products

1.12 MANUFACTURERS

.1 Ensure manufacturer has minimum [5] years experience in manufacturing components similar to or exceeding requirements of project.

.2 The Manufacturer will submit documentation clearly indicating legal right to use proprietary technologies included in this project.

.3 APPROVED Manufacturer

Nedlaw Living Walls
232B Woolwich St. S
Breslau, On
519.648.9779

1.13 MATERIALS

.1 Biofilter materials are specified elsewhere in related Sections:

.1 Internal air Diffusers

.2 Growth Media

.3 Plants

Part 2 Execution

2.1 INSTALLERS

.1 Experienced and biofilter-trained qualified installers to carry out installation and planting of biofilter work.

2.2 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

2.3 EXAMINATION

.1 Examine conditions, substrates and material relevant to this Section.

.2 The installer of the biofilter will meet with the necessary parties at the jobsite to review and discuss project conditions and co-ordination of the placement of biofilter components and plant materials.

.1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.2 Proceed with installation after receipt of written approval from Departmental Representative.

.3 Verification of Conditions:

.1 Verify that:

.1 Substrate conditions which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of biofilters.

.2 The General Contractor must ensure the area to be waterproofed or treated is ready to receive treatment. Basin shall be clean of stains, debris and dirt, free from cracks in excess of 5 mm, and shall be free from protrusions, holes or uneven concrete or mortar greater than 10 mm. The wall shall be free of honey combing. Tolerance to imperfections in concrete work and structural wall must at least meet those outlined in Division 03 and Division 04.

.3 Field conditions are acceptable and are ready to receive work.

.4 Built-in items are in proper location, and ready for roughing into Biofilter work.

.2 Commencing installation means acceptance of existing substrates.

2.4 PREPARATION

.1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations.

.1 The General Contractor must ensure the area to be waterproofed or treated is ready to receive treatment. Basin shall be clean of stains, debris and dirt, free from cracks in excess of 5 mm, and shall be free from protrusions, holes or uneven concrete or mortar greater than 10 mm. The wall shall be free of honey combing. Tolerance to imperfections in concrete work and structural wall must at least meet those outlined in Division 03 and Division 04.

.2 Establish and protect lines, levels, and coursing.

.3 Protect adjacent materials from damage and disfiguration.

2.5 INSTALLATION

2.6 CONSTRUCTION

.1 Supply labour, materials, plants, tools and equipment to complete the work as shown on the drawings Architectural Division as specified herein including, but not limited to the following:

.1 Supply aluminum, non-corrosive basin if required

.2 Waterproofing of wall and basin

.3 Internal air diffuser and support system mounted to structural wall

.4 Connection to building return air system if required (return air system by Division 23 05 05)

.5 Supply built in fans to draw air through Biofilter (if required)

.6 Installation of growing medium TBS 19 mm

.7 Installation of aspects of water circulating system

.8 Installation of plant material

.2 Waterproofing of wall

.1 Wall onto which shingled Biofilters are mounted will be covered with water tight membrane by installer.

.3 Biofilter basin

.1 Basin (provided by Division 03 30 00) to be waterproofed by installer with liquid membrane in accordance with manufacturer's instruction

.2 Options:

.1 **Either**: Basin shall have two levels

.1 Immediately adjacent the structural wall (to +/- 800 mm in front of structural wall) shall be lower and act as a collection basin for the water circulating through system.

.2 Higher level (from +/- 800 mm to 1500 mm in front of structural wall) shall have drain connected to sewer by Division 22 13 17.

.1 Drain to sewer installed flush with bottom of raised section

.2 Sloped towards drain (+ 5%)

.3 To be confirmed by Architect and Mechanical Consultant

.3 Both levels of the basin shall be covered by entrance way grating by Division 09.

.2 **Or**: Single basin (to +/- 600 mm in front of structural wall)

.1 Basin shall act as a collection basin for the water circulating through system.

.2 This basin may be raised or level with finished adjacent flooring

.3 Area surrounding basin (c.a. 1.5 m) should be tolerant of moisture and slip resistant

.3 NOTE: Depth of these basin(s) is determined by placement of circulating pumps. Circulating pumps may be installed as follows:

.1 **Either**: Submerged within basin (by Division 22 10 10).

.1 Typically 350 mm of depth is required

.1 To be confirmed Mechanical and Installer

.2 A pit (typically 1000 mm long by 800mm wide by 350mm deep) may be installed to accommodate pumps rather than a single flat bottom

.2 **Or**: Installed in separate space, connected to Biofilter (by Division 22).

.4 Internal air distribution system

.1 A perforated internal diffuser shall be mounted as panels to structural wall with biological inert fasteners.

.1 The diffuser shall be perforated +/- XX mm holes with +/- XX mm spacing

.1 Perforations shall only be in the area between the vertical struts

.2 Perforation size and frequency shall be such that the biofilter shall have the prescribed air flow volumes with the prescribed pressure drops.

.2 The diffusers shall have vertical struts every +/- 400 mm

.1 The struts shall be 75 mm by 50 mm with the 50 mm face parallel the diffuser

.2 The struts shall be inert material such as marine grade aluminium.

.2 The perforated panels shall be mounted to the back wall of the biofilter by brackets.

.1 The bracket shall

.1 Create a space between the diffuser panel and the back of the biofilter which shall function as a plenum

.1 The dimension of that space shall be such that air shall flow evenly across the face of the diffuser panel and the connection point(s) of the HVAC (XXX mm)

.2 Be made of inert material such as marine grade aluminium

.3 Shall have the structural strength to support the functioning growth media and plants (70 Kg per square metre)

.4 Shall not interfere with the movement of air within the plenum space

.3 Biofilters connected to HVAC

.1 Connection points to the building's HVAC shall be installed connecting to the plenum space of the biofilter

.2 Moisture tolerant ducts from the return system of the building HVAC extending at least 150 mm from structural wall to be provided by Division 23 05 01

.1 Connecting ducts shall have a slope of at least -10º towards Biofilter

.2 Connection ducts shall be designed not to exceed air speeds of 5 m s^{-1}.

.3 Dimensions and placement of connection duct determined by Mechanical consultants and agreed to by installer.

.4 Stand alone Biofilters

.1 Air shall be drawn through Stand Alone Biofilter(s) by built in fan(s)

.1 Fans shall be mounted into horizontal manifold

.1 Used to create negative pressure within biofilter duct work

.2 Expel air into space surrounding wall

.3 No diffusing duct external to biofilter provide

.4 Typically install one FANTECH, Fade 12 fan for every 10 to 20 m^2 of biofilter

.1 To be conformed with biofilter installer and Mechanical consultant

.2 Speed controller for fan(s) to be provided

.3 May be controlled by BAS

.5 The size and spacing of the perforations will ensure even air flow through the face of the biofilter

.1 Maximum flow rate through biofilter will be 0.05 m s^{-1}

.2 Pressure drop between the interior of the manifolds and the room housing the system will not exceed 0.2".

.6 All manifolds and plenum must be constructed of inert material such as marine grade aluminium and must have structural strength to support the planted rooting media (+/- 70 kg per $metre^2$).

.5 Rooting media

.1 Rooting material used in this work will be TBS supplied by Nedlaw Living Walls Inc.

.2 The rooting media will be fixed to the crests the struts using suitable fasteners such as stainless steel pins or screws.

.3 The rooting material will be installed as two layers, each +/- 19 mm thick.

.6 Water system

.1 The biofilter will function as a vertical hydroponic garden.

.2 The basin will

.1 **EITHER**: Function as a collection pool for the circulating water.

.1 Water from this basin will flow to water reservoir located elsewhere.

.1 Connections and reservoir by Division 22

.2 Submersible or inline pumps will circulate the water (by Division 22 10 10).

.3 Overflow from reservoir shall be provided to sewer (by Division 22 13 17)

.4 Size of reservoir to be determine by Mechanical consultant and Installer

.2 **OR**: Function as a reservoir for the circulating water.

.1 Submersible or inline pumps (by Installer) will circulate the water

.3 Basin possess an overflow with stand pipe (WATTS FD-WD 100 or 200 or equivalent) (by Division 22 13 17) connected to the sewer.

.1 Location of the overflow to be confirmed with installer and Mechanical consultant.

.3 The higher section of the basin(s) (if present) will function as an overflow; an additional catchment for drips from the biofilter and a trap to prevent materials from adjacent floor from entering the biofilter as described in Section 1.3.C.2.a.2

.4 The circulating system will lift the water from base to trickle pipe at top of biofilter.

.5 An emitter-pipe, on top of the media, will deliver water evenly across the width of the rooting media,

.1 The water trickles down evenly the interior of the biofilter at a rate of ___litres per minute. (+/- 4 litres per minutes for each metre of horizontal width of the biofilter).

.6 The nutrients for the plants will be supplied via the circulating water.

.7 All plumbing must be inert.

.1 Copper piping and fittings are to be avoided for all components in within the Biofilter.

.2 Piping within the Biofilter and used in association with pumps and reservoirs will be IPEX schedule 40 CPVC with solvent welded joints and fittings.

.8 Water levels in reservoir

.1 **IF** basin is connected (by Division 22) to a reservoir located elsewhere.

.1 A system to provide make-up water to reservoir shall be provided (by Division 22)

.2 **ELSE** a system to provide make-up water to Basin(s) shall be provided by installer

.3 Water levels in the reservoirs (if present) and basins shall be monitored by the BAS using ultrasonic levels sensors or mechanical floats sensors (connected to BAS by Division 23).

.9 Two pumps will circulate the water in a lead-lag configuration.

.1 Pumps shall be provided by Installer unless located remotely

.1 To be confirmed by Mechanical, architect and installer

.2 Pumps shall have inert internal components such as stainless steel.

.3 Pump status sensors shall be installed by the installer.

.10 Water line connecting the pumps located elsewhere to the biofilter shall be PEX or equivalent and embedded in structural wall supporting biofilter (by Division 22)

.1 PEX shall terminate in the basin +/- XX mm from bottom of basin.

.1 Exact position and termination to be coordinated with biofilter installer

.11 Each system shall be serviced with a 19 mm inch domestic cold water line with the following:

.1 A backflow will be installed by Division 22.

.2 A shut valve in an easily accessible area adjacent the biofilter or water reservoir (if present)

.3 Capped with at least a 300 mm stub. Located within biofilter or adjacent water reservoir (if present).

.1 Location of termination to be confirmed by installer.

.12 Desalinating the water in each reservoir by one of the following approaches

.1 Activation of solenoid (installed by Installer) by BAS shall divert regulated amount of water from pump down sewer at variable intervals.

.1 The float valve will make up the loss volume.

.13 A water (DCW) line (installed by Division 22) is connected to the circulating pumps through an electron solenoid regulated by BAS. This solenoid will become active in case of failure of both pumps.

.1 Water line requires Backflow preventer

.14 All pipes and conduits which penetrate the base or the biofilter must be in place before the area is waterproofed.

.15 All valves and solenoids installed by installer will be identified with tags by Division.

.16 All pumps, electrical connection solenoids and controllers located outside the biofilter supplied by others unless noted within this scope of work.

.7 Cleaning indoor air

.1 Installer shall provide a biofilter with the following characteristics

.1 Air flow

.1 The wall shall have the capacity to move up to 20 cfm of air per square foot of biofilter (0.1 cubic metre of air per square metre of biofilter per second) with a pressure drop of 0.3”

.2 Typical flow of air through the biofilter 10 cfm of air per square foot of biofilter (0.05 cubic metre of air per square metre of biofilter per second) with a pressure drop of 0.1”.

.3 Flow of air across the face of the biofilter excluding areas adjacent horizontal manifolds shall not vary 20% from the prescribed rates.

.4 Target flow rates through the biofilters will be determined by the Mechanical consultants and confirmed by installer.

.2 Contaminant Removal

.1 The biofilter shall remove at least 50% of the air borne non-halogenated Volatile Organic Compounds per pass through the wall with air flux of 0.05 cubic metre of air per square metre of biofilter per second.

.2 Removed contaminants shall be biologically oxidized within the biofilter and shall not accumulate in the system.

.8 Plants

.1 The plants to be added will be pre-grown in pots (150 mm to 300 mm)

.2 Plants will be bare rooted and transplanted into the rooting matrix.

.3 The plants are selected for the following criteria

.1 Their ability to influence the performance of the biofilter

.2 Their tolerance of the growth conditions of the hydroponic biofilter

.3 Ability to match the indoor conditions housing the biofilter.

.4 The General Contractor is to provide the date for planting to the Installer, 4 weeks in advance of the event. The installer must be notified 3 weeks prior to the date, if the General Contractor needs to modify planting date.

.9 Lighting (By Division 26) (IF Required)

.1 Supplemental lighting shall raise the light level to 150 FC using metal halide (HID), fluorescent or LED lamps for a minimum of 18 hours per day.

.2 Lamps should be focused to give the desired light intensity +/- 700 mm in front of structural wall.

.1 Focus plan to be confirmed by installer.

.10 Lighting Controls (By Division 26) (IF required)

.1 **EITHER:** Supplemental lighting control shall be based upon DAY LIGHT INTEGRAL (DLI).

.1 The biofilter shall be divided into four zones, each controlled separately.

.1 Each zone shall be monitored by a Pyranometer located in mid section of wall and +/- 700 mm in front of structural wall.

.1 Position to be coordinated with Biofilter installer

.2 Each Pyranometer shall be individually interfaced with control system.

.3 Control system shall monitor daily accumulated light energy for each zone (DLI).

.4 If the daily value is below user input DLI value, supplemental lights associated with that zone shall be activated at a user defined time of day until target DLI is obtained

.2 **OR:** Supplemental lighting control shall be based upon time of day

.11 Finishing of adjacent areas (by Others)

.1 Finish of adjacent areas the biofilter shall be tolerant of moisture and humidity levels typically associated with interior plantscape

2.7 SITE TOLERANCES

.1 Tolerances in notes to CSA-A371 apply.

2.8 FIELD QUALITY CONTROL

.1 Site Tests, Inspection:

.1 Perform field [inspection and] testing in accordance with Section [01 45 00 - Quality Control.

.2 Notify inspection agency minimum of [72] hours in advance of requirement for tests.

.2 Manufacturer's Services:

.1 Have manufacturer of products supplied under this Section review work involved in handling, installation/application, and protection of its product[s], and submit written reports in acceptable format to verify compliance of work with Contract.

.2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.

.3 Schedule site visits to review work at stages listed:

.1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.

.2 Twice during progress of work at [25%] and [60%] complete.

.3 Upon completion of work, after cleaning is carried out.

.4 Obtain reports within [three] days of review and submit immediately to Departmental Representative.

2.9 CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

.1 Clean to consultant’s approval, soiled surfaces, spatters, and damage caused by work of this section.

.2 The General Contractor shall check area drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site prior to the commencement of work.

.2 Final Cleaning:

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 The installer shall check area drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site during work and after completion of work Waste Management: separate waste materials in accordance with Section [01 74 19 - Construction/Demolition Waste Management.

.3 Divert unused or damaged components from landfill as specified in Section 01 74 19 - Construction/Demolition Waste Management.

2.10 PROTECTION

.1 Temporary protection of the waterproofing shall be provided by the General Contractor to prevent mechanical damage to the biofilter or damage from spillage of oil or solvents until such time as permanent protection is provided.

.2 Air Temperature Protection: protect completed masonry as recommended in 1.10 SITE CONDITIONS.

END OF SECTION