Next Level Guide Note: This section follows the recommendations of the Construction Specifications Canada (CSC) Manual of Practice, for language, style and format including MasterFormat™, SectionFormat™, and PageFormat™.

It is assumed that the roofing system itself will be specified in another specification section within the Project and that this section is only specifying the vegetated roof covering and components above the actual roofing membrane.

This section complements requirements of CCDC 2 General Conditions and is written to complement Division 01 sections.

# General

## SECTION INCLUDES

#### Root Protection Layer.

#### Drainage Layer.

#### Water Retention Materials.

#### Growing Media.

#### Vegetation.

#### Irrigation System

#### Vegetated roofing accessories.

## REFERENCES

Next Level Guide Note: Edit this article after editing the rest of this section. Only list reference standards below, that are included within the text of this section, when edited for a project specification - delete other references that do not apply.

### ASTM International (ASTM).

#### ASTM D4632/D4632M – [2015], Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

#### ASTM E2399 - [2015] Standard Test Method for Maximum Media Density for Dead Load Analysis of Green Roof Systems.

#### ASTM E2400-[2015], Standard Guide for Selection, Installation, and Maintenance of Plants for Green Roof Systems.

### Canada Green Building Council (CaGBC).

#### LEED v4-[2014], LEED (Leadership in Energy and Environmental Design): Green Building Rating System.

### City of Toronto.

#### Toronto Municipal Green Roof Code-[2013].

### International Organization for Standardization (ISO).

#### EN ISO 10319-[2008], Geosynthetics - Wide-Width Tensile Test.

## ADMINISTRATIVE REQUREMENTS

Next Level Guide Note: In the following paragraph verify the number and title of the specification section that identifies project meeting requirements.

### Pre-installation Meeting: Conduct pre-installation meeting after Award of Contract and one week prior to commencing work of this Section in accordance with Section [01 31 19 - Project Meetings] to verify project requirements, substrate conditions and co-ordination with other building sub-trades, and to review vegetated roofing system supplier’s installation recommendations and warranty requirements.

#### Notify attendees two weeks prior to meeting and ensure meeting attendees include as minimum:

##### Owner;

##### Consultant;

##### Vegetated Roof System Provider;

##### Vegetated Roof System Installer;

##### Roofing Membrane Manufacturer’s Representative;

##### Roofing Membrane Installer;

Next Level Guide Note: If a complex irrigation system is required, it may be useful to also include the mechanical sub-contractor.

##### [Insert other if required].

#### Ensure meeting agenda includes review of methods and procedures related to installation of work of this Section including co-ordination with related work.

#### Record meeting proceedings including corrective measures and other actions required to ensure successful completion of work and distribute to each attendee within 1 week of meeting

### Sequencing: Schedule delivery of plants to ensure installation within 2 weeks of arrival at site.

#### Sequence work of this section in accordance with vegetated roof supplier’s written recommendations for sequencing construction operations and planting.

Next Level Guide Note: Retain and edit the following paragraph to suit Project schedule. Although the recommended schedule for planting vegetation is shown below, it is not always essential to plant during these times, and should take consideration of availability of plants, and building construction schedule.

### Scheduling: Recommended Schedule for planting of vegetation:

#### Spring planting between April 15th and June 15th.

#### Fall planting between September 1st and October 15th.

#### [insert other more suitable times when planting should occur].

## ACTION AND INFORMATIONAL SUBMITTALS

Next Level Guide Note: In the following paragraph verify the number and title of the specification section that identifies submittal procedure requirements.

### Make submittals in accordance with Section [01 33 00: Submission Procedures].

### Product Data: Product data for components of vegetated roof covering indicating compliance with specified requirements.

#### Submit plant list identifying species and vegetation.

##### Indicate planting method, and conditions for care during establishment period.

##### Where selected species are not indigenous provide justification for choice.

##### Include preparation instructions and recommendations, and storage and handling requirements.

##### Include contact information for manufacturer and their representative for this Project.

### Letters of Assurance and Certification:

Next Level Guide Note: For projects other than in the Province of Ontario, edit the following paragraph to suit the project location.

#### Submit letter from structural engineer registered in Province of [Ontario] verifying that roofing system can support weight of vegetated roof system when saturated.

#### Submit a project-specific letter from a professional engineer certifying that the green roof system is wind resistant.

#### Roofing membrane: Submit verification that roofing membrane meets minimum requirements for installation of roofing system by roofing system manufacturer

#### Submit letter from vegetated roof system sub-contractor verifying:

##### Each vegetated roofing system product, vegetation material, and component meet ASTM E2400.

##### Installer has reviewed and approved details of membrane roof system roof deck, flashings, penetrations and copings.

##### Installer has been approved by vegetated roof system Consultant.

##### Vegetated roofing system meets warranty requirements.

##### Succesful water leakage test has been conducted over the roofing membrane about to be covered by the vegetated roof system.

### Shop Drawings: Include on shop drawings:

#### Details of installation showing conditions at terminations, transitions, and penetrations.

#### Details of root protection layer at parapets and other roof appurtenances.

#### Schematic profile detailing thickness of vegetated roofing system materials.

### Installer’s Qualifications: Submit verification of experience.

### Samples: Submit growing medium samples as follow:

#### One 500 mL bag of growing media for initial testing by testing laboratory designated by Owner.

##### Samples will be tested for particle size range, calcium, N-P-K, iron, manganese, pH, organic content (by dry mass), heavy metals, saturated mass, dry mass and porosity.

#### One 5 kg bag as delivered upon delivery to roof.

### Test and Evaluation Reports: Submit evaluation service reports or other independent testing agency reports showing compliance with specified performance characteristics and physical properties as follows:

#### Submit test report for Maximum Water Capacity Test to ASTM E2399.

#### Submit maintenance evaluation report after each maintenance visit.

Next Level Guide Note: Retain the following paragraph for Projects in Toronto.

#### Submit verification of compliance with Toronto Municipal Green Roof Code.

### Vegetated Roofing System Installer’s Qualifications: Submit verification of experience.

### Irrigation System Installer’s Qualifications: Submit verification of experience

Next Level Guide Note: Retain the following only if specifying for a LEED project. Specify only the technical requirements necessary to achieve the credits desired for this Project.

In the following paragraph verify the number and title of the specification section that identifies sustainable design requirements.

### Sustainable Design Submittals: In accordance with Section [01 81 13: Sustainable Design Requirements]. Retain the following paragraph for LEED -C1 Credit MR 5.

#### Product Certificates for LEED Credit MR 5: For products and materials required to comply with requirements for regional materials.

Next Level Guide Note: Retain the following paragraph for LEED -CI Credit MR 5 Option 1.

##### Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.

## CLOSEOUT SUBMITTALS

Next Level Guide Note: In the following paragraph verify the number and title of the specification section that identifies closeout submittal procedure requirements.

### Make submittals in accordance with Section [01 78 00 ‑ Closeout Submittals].

Next Level Guide Note: Co-ordinate the following paragraph with the duration of the warranty period. Ensure that warranty period and length of maintenance agreement match. To meet the recommendations of Green Roofs for Healthy Cities, choose the 5 year option.

### Supply [1] [2] [5] year maintenance agreement with vegetated roofing system installer for care of vegetation included in Work of this Section.

Next Level Guide Note: In the following paragraph verify the number and title of the specification section that identifies operation and maintenance data manuals and requirements.

### Operation and Maintenance Data: Supply maintenance data for plants and other materials for incorporation into manual specified in Section [01 78 00 ‑ Closeout Submittals] [01 78 23 - Operation and Maintenance Data].

Next Level Guide Note: Retain the following only if specifying for a LEED project.

### Sustainable Design Closeout Documentation (LEED).

#### Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates for work of this Section demonstrating percentage of construction wastes which were recycled.

#### Submit verification from recycling facility showing receipt of materials.

Next Level Guide Note: In the following paragraph verify the number and title of the specification section that identifies project record documentation requirements.

### Record Documentation: In accordance with Section [01 78 00 ‑ Closeout Submittals] [01 78 39 - Project record Documents].

#### List materials used in vegetated roofing system including plants.

#### Show on roof plan locations of drains and extent of vegetated coverage with identification.

#### Warranty: Submit warranty documents specified.

## QUALITY ASSURANCE

### Vegetated Roofing System Installer’s Qualifications: Company or individual specializing in work similar to work of this section with three years minimum documented experience [and approved by vegetated roofing system supplier].

### Irrigation System Installer’s Qualifications: Company or individual specializing in work similar to work of this section with two years minimum documented experience.

### Maintenance Qualifications: Submit documentation showing qualifications of maintenance contractor’s horticulturalist.

Next Level Guide Note: Consultant may want to construct a Mock-up to establish quality of work for the Project. The Mock-up can be used as a standard to which work on the Project can be compared. Mock-ups can be expensive and should only be used for roofs greater than 1,000 m2 or when system complexity requires more detail. Verify the number and title of the specification section that identifies quality assurance and mock-up requirements.

### Mock-up: Construct mock-up in accordance with Section [01 43 00 ‑ Quality Assurance] and where directed by Consultant.

#### Construct 3 x 3 m mock-up of vegetated roofing system using proposed procedures, materials, vegetation and quality of work.

##### Ensure mock-up includes roof drain.

#### Purpose: To judge quality of work, vegetated roof system preparation, operation of equipment and material application.

#### Do not proceed with work prior to receipt of written acceptance of mock-up by Consultant.

#### When accepted, mock-up will demonstrate minimum standard of quality required for Work of this Section.

#### Approved mock-up will remain part of finished Work.

Next Level Guide Note: Retain the following paragraph for Projects in Toronto.

### Test roofing system in accordance with Toronto Municipal Green Roof Code and as directed by Consultant.

Next Level Guide Note: Retain the following paragraph for Projects in Toronto.

Water leakage testing of a roof is required by the Toronto Municipal Green Roof Code. Verify the number and title of the specification section that identifies quality assurance requirements.

### Water Leakage Test: Carry out water leakage testing of roofing system at request of and as directed by Consultant and in accordance with Section [01 43 00 ‑ Quality Assurance].

Next Level Guide Note: Verify that a cash allowance for this test is included in Division 01 of the Project manual and that the number and title of the specification section that identifies cash allowance requirements is correct.

#### Owner will pay for initial costs of water leakage testing under cash allowance identified in Section 01 21 13 ‑ Cash Allowances.

#### Do not conceal roofing membrane with vegetated roofing system until receipt of instruction to proceed has been received from Consultant.

Next Level Guide Note: The following Article although not part of Quality Assurance, can be used to enhance the quality of materials by ensuring that they are delivered and handled properly at the work site.

## DELIVERY, STORAGE AND HANDLING

### Delivery and Acceptance Requirements:

#### Deliver material in accordance with Section 01 61 00-Common Product Requirements.

#### Deliver materials and accessories in vegetated roofing supplier’s original packaging with identification labels intact and in sizes to suit project.

#### Deliver plant materials in manner which preserves quality of plants.

#### Protect vegetation from damage due to temperature and wind during transportation.

#### Use closed or open trailers for transportation times of 24 hours maximum.

#### Use climate controled trailer for transport durations greater than 24 hours.

### Storage and Handling Requirements: Upon arrival at site off-load vegetation and remove non-breathable wrappings if used.

#### Ensure vegetation is installed in accordance with sequencing requirements.

#### Establish holding area to store plants until installation if timely installation is not achievable.

##### Store plants until installation only after receipt of permission from Consultant.

##### Consultant has right to have plants removed and replaced with new plants if vegetation is damaged or degraded.

### Packaging Waste Management:

Next Level Guide Note: For smaller projects that do not have a separate Section for waste management and disposal, delete the following Paragraph.

#### Separate and recycle waste packaging materials in accordance with Section 01 74 19-Construction Waste Management and Disposal.

#### Remove waste packaging materials from site and dispose of packaging materials at appropriate recycling facilities.

## FIELD CONDITIONS

### Do not install vegetation if growing media or ambient conditions are less than 10 ºC.

## VEGETATION GUARANTEE

### Vegetated Roofing System Installer guarantees plant performance for the duration of the warranty period.

### Guarantee is in effect only if maintenance recommendations are followed.

## WARRANTY

Next Level Guide Note: Co-ordinate the following paragraph with the duration of the maintenance agreement. Ensure that warranty period and length of maintenance agreement match. To meet the recommendations of Green Roofs for Healthy Cities, choose the 5 years option.

### Issue Certificate of Warranty for [1] [2] [5] years from date of Substantial Performance.

# Products

## VEGETATED ROOFING SYSTEM SUPPLIER

### Next Level Stormwater Management™ Corporate Headquarters (416) 637-5772; [info@nlsm.ca](mailto:info@nlsm.ca); [www.nlsm.ca](http://www.nlsm.ca).

#### Ensure project superintendent has 3 years minimum experience in work similar to work of this Section and oversees critical aspects of installation and testing of Work.

## VEGETATED ROOFING SYSTEM

### Flora Garden over a Conventional Membrane Roof Assembly

## SINGLE SOURCE RESPONSIBILITY

### Co-ordinate installation of vegetated roof system components and vegetation.

### Components include but are not limited to:

##### Root protection layer;

##### Drainage layer;

##### Water retention materials;

##### Growing media;

##### Vegetation.

##### Vegetated roofing accessories.

Next Level Guide Note: In the following paragraph verify the number and title of the specification section that substitution procedures and requirements.

#### Substitutions: In accordance with Contractual Agreement General Conditions [and Section 01 25 00 ‑ Substitution Procedures].

## PROTECTION MATERIALS

### Root Barrier: Flexible 0.508 mm water-impermeable low-density polyethylene (LDPE) sheet.

#### Weight: 0.46 kg/m².

#### Width: 3.86 m

#### Length: 33.52 m

#### Roll length: 2.06 m

#### Basis of Design: Next Level Stormwater Management™, NL120 Root barrier

## DRAINAGE MATERIALS

### Reinforced Drainage System: Drainage composite consisting of 40 % post-industrial recycled polypropylene drainage core of fused, entangled filament, geo-composite fabric bonded to one side and extended 100 mm beyond edge of drainage core.

#### Thickness: 11.43 mm

#### Core material: Recycled polypropylene

#### Dry weight: 803.7 g/m²

#### Saturated weight: 1720 g/m2

#### Width: 0.99 m

#### Length: 30.5 m

Next Level Guide Note: Since this product exceeds 40% post-industrial recycled content, can help contribute up to 2 LEED points when used in conjunction with other recycled content products. NL310 can contribute towards additional LEED points when used with a green roof by reducing storm water runoff, heat island effect, and energy consumption.

#### Basis of Design: Next Level Stormwater Management™, NL310 Drainage Board

## WATER RETENTION MATERIALS/FILTER FABRICS

### Filter Fabric: Thermally bonded non-woven geo-textile fabric.

#### Thickness: 0.55 mm.

#### Weight: 100g/m²

#### Width: 2.28 m

#### Length: 109.75 m

#### Basis of Design: Next Level Stormwater Management™, NL400 Filter Fabric.

## EDGING STRIPS

### Semi-rigid, L-shaped metal strips specifically designed to contain vegetated roof components in straight runs and gentle curves, and, engineered to allow positive drainage.

#### Include edging strip connector plates and screws.

#### Basis of Design: Next Level Stormwater Management™, NL200 Edging.

### Drain Boxes: Square metal drain boxes with lids, flexible, multi-height, durable with slotted wall to allow for water runoff.

#### Basis of Design: Next Level Stormwater Management™, NL210 Drain Box.

## GROWING MEDIA

### Growing Media: Engineered blend of lightweight media rich in organic matter with balanced mineral based materials, formulated for vegetated applications.

#### Basis of Design: Next Level Stormwater Management™, NL630 Growing Media Intensive. for depths of 200mm +

## VEGETATION

### Plant Pots and Plugs: Young plants raised in small, individual cells, ready to be transplanted into growing media.

#### Plant types and planting density as indicated.

## IRRIGATION METHODS

Next Level Guide Note: The following information may be helpful in creating an irrigation schedule.

Irrigation Methods:

Automatic Irrigation System : Automated irrigation system reliable in supplying regular watering to plants during establishment period.

Irrigation: Regular means of supplying water to the roof with sufficient pressure. Irrigation is applied during re-establishment phase in order to support mature establishment of vegetated community. It is recommended that regular irrigation be applied during hottest months every year after installation. Method of supplying irrigation may vary with regard to removable or permanent piping, rotary heads, drip irrigation, or other approved irrigation technologies.

Retain and edit the following paragraph to meet the Project requirements.

These irrigation methods are the minimum requirement for vegetated roofing systems.

### Ensure irrigation method for vegetated roofing system is an automatic irrigation system appropriate for selected vegetation.

## ACCESSORIES

Next Level Guide Note: Retain the following paragraph if roof pavers are required. Verify the number and title of the specification section that identifies roof paver requirements.

### Concrete Pavers: In accordance with Section [07 76 00 - Roof Pavers].

# Execution

## INSTALLERS

### Use only supplier certified installers with three years minimum experience with work similar to work of this section and approved by vegetated roofing system provider.

## EXAMINATION

### Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for vegetated roofing installation in accordance with vegetated roofing supplier’s written recommendations.

#### Visually inspect substrate in presence of Consultant.

#### Ensure roofing structure has positive slope and no ponding water.

#### Verify with project structural engineer that roofing structure has been designed to incorporated additional structural loading of vegetated roofing system.

#### Verify water source for installation, irrigation and maintenance of vegetated roofing system.

#### Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

### Start of vegetated roofing installation indicates installer’s acceptance of substrate conditions.

## PREPARATION

### Clean surface of roof to receive vegetated roof system.

#### Remove screws, splinters and other excess materials from surface of roofing.

### Protect roofing membrane traffic areas including corridors for transporting vegetated roofing system materials using 25 mm extruded polystyrene horizontal protection board covered with 13 mm plywood.

### Ensure underlying roof components are installed and tested in accordance with manufacturer’s written recommendations.

### Ensure roof leakage test has been performed as directed by Consultant.

#### Consultant will advise if roof leakage test is not required.

## INSTALLATION - GENERAL

### Install vegetative roofing in accordance with supplier’s written recommendations.

### Ensure vegetative free zone around roof drains and other penetrations.

## INSTALLATION

### Install root barrier over roofing surface.

#### Overlap edges 300 mm minimum.

#### Stagger root barrier roll ends to avoid creating continuous perpendicular seam for adjacent rolls.

#### Ensure root barrier continues under non-vegetated areas of roof and up sides of walls and parapet walls.

#### Cut to fit tightly around roof penetrations.

#### Cut root barrier to prevent blocking at [overflow scuppers and] vegetated roof termination.

### Install drain box [and lid] with base flange flush on root barrier layer over drains.

### Edging:

### Install edge with base flange flush on root barrier layer along designated areas separating vegetated areas from non-vegetated.

### Face edging with bottom flange towards vegetated area to ensure edging is held in place by weight of vegetated system.

### Connect edging strips with connecting plates.

### Drainage Material: Install drainage layer with drainage core facing down and black filter with 100 mm extension, facing up.

#### Lay 100 mm extension over next row to cover joint between adjacent rows.

#### Start next row with shorter roll to ensure end joints are staggered.

#### Install drainage material over entire vegetated roof surface

#### Cut and fit along vegetated roof edge and around penetrations.

#### Cover immediately after installation to avoid damage from UV radiation or wind.

### Filter Fabric: Install filter fabric over drainage material.

#### Overlap edges 300 mm minimum.

#### Ensure filter material is taken to edge of vegetated roof to prevent loss of growing media.

### Growing Media:

#### Ensure structural integrity of roof by avoiding stockpiling large quantities of growing media on any single area of roof.

#### Spread growing medium onto filter fabric and thoroughly wetted for installation of plant plugs.

Next Level Guide Note: If depth of growing medium is not specified here it should be indicated on the drawings.

#### Growing medium depth: [As indicated] [300] mm.

#### Calculate quantities to allow for [30%] compaction.

#### Verify depth after compaction.

## VEGETATION

### Plug and Potted Plant Installation:

#### Dig hole in growing media wide and deep enough to accommodate plant’s root system.

#### Remove plant plug gently from pot and set plant in hole so base of stem is slightly above growing media level.

#### Replace growing media and press down firmly around stem of each plant to bring roots firmly into contact with growing media.

#### Plant in accordance with planting plan as indicated.

### After completion thoroughly water newly installed vegetation.

## ROOF EDGES, DRAINS, AND OTHER PENETRATIONS

### Maintain 300 mm minimum between vegetation and parapet, roof edge, drains, vents and other roof penetrations.

### Ensure vegetation and growing substrates have fixed boundary such as edging strip or concrete curb.

### Ensure all fixed boundaries must exceed height of vegetated roof system by 6 mm minimum.

### Distribute stone ballast or concrete paver blocks in non-vegetated border areas as indicated.

Next Level Guide Note: Retain the following paragraph if roof pavers are required. Verify the number and title of the specification section that identifies roof paver requirements.

#### Install concrete pavers in accordance with Section [07 76 00 - Roof Pavers].

## IRRIGATION

### Ensure appropriate irrigation method is provided to meet Project requirements.

### Use only irrigation system installers with minimum two years documented experience with work similar to work of this section.

## FIELD QUALITY CONTROL

### Field Inspection: Co-ordinate field inspection in accordance with Section 01 40 00 ‑ Quality Requirements.

Next Level Guide Note: Retain the following paragraph to specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation.

### Supplier’s Services:

Next Level Guide Note: Retain the following paragraph only when manufacture’s field services are provided and are required to verify the quality of the installed components. Establish the number and duration of periodic site visits required by manufacturer and specify below. Consult manufacturer for services required. Delete if field services are not required.

#### Co-ordinate supplier’s services with Section 01 40 00 - Quality Requirements.

##### Have supplier review work involved in handling, installation, protection, and cleaning of vegetated roofing and accessories, and submit written reports in acceptable format to verify compliance of Work with Contract conditions.

#### Supplier’s Field Services: Provide supplier’s field services consisting of product use recommendations and periodic site visits for vegetated roofing installation review in accordance with manufacturer’s instructions.

##### Report any inconsistencies from supplier’s recommendations immediately to Consultant.

#### Schedule site visits to review work at stages listed:

##### Upon completion of Work, after cleaning is carried out.

### Obtain reports within three days of review and submit immediately to Consultant.

## CLEANING

Next Level Guide Note: For smaller projects that do not have a separate Division 01 section that deals with cleaning, delete the following reference to Section 01 73 00 ‑ Execution in the following two paragraphs.

### Progress Cleaning: Perform cleanup as work progresses.

#### Leave work area clean at end of each day.

### Final Cleaning:

#### Remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 73 00-Execution.

### Waste Management:

Next Level Guide Note: For smaller projects that do not have a separate Division 01 section that deals with waste management, delete following paragraphs.

#### Co-ordinate recycling of waste materials with 01 74 19-Construction Waste Management and Disposal.

#### Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.

#### Remove recycling containers and bins from site and dispose of materials at appropriate facility.

## PROTECTION

### Protect vegetated roofing from damage during construction period.

#### Prevent deterioration of installed vegetated roof system by limiting use of vegetation surfaces for material and equipment storage, and walking surface.

### Repair damage to adjacent materials caused by vegetated roofing installation.

## MAINTENANCE

Next Level Guide Note: Co-ordinate the following paragraph with the duration of the warranty agreement. Ensure that length of maintenance agreement and warranty period match. To meet the recommendations of Green Roofs for Healthy Cities, choose the 5 years option.

### Conduct maintenance annually for [1] [2] [5] years to match length of warranty period.

### Maintain vegetated roofing system in accordance with vegetated roofing system supplier’s written recommendations.

### Intensive Roofing System Maintenance:

#### Initial maintenance: Conduct inspection of entire vegetated roof at least four times each month for first two months.

##### Perform weeding, irrigation system examination, debris removal, addition of growing media and plant replacement as required to ensure survival of vegetated roofing system and growing of newly transplanted vegetation.

Next Level Guide Note:

Intensive roof systems should be prepared by initially saturating the growing medium and the water retention layer.

Retention of growing medium moisture in intensive green roofs within the first six weeks following installation is critical to promote plant root establishment and maintain high water use efficiencies.

Typically, intensive green roofs with greater volumes of growing media have more available pore space for water storage and more aggregate surface area for the development of water films.

These two characteristics promote more water availability and encourage more diverse, branched root systems.

During more extreme climatic conditions such as prolonged, unusually hot temperatures or drought, a Next Level intensive system may require irrigation every two to three days to maintain adequate moisture levels in the deeper growing media profile.

Additionally, intensive plant species may have higher leaf area indices such that plant transpiration and water demand, therefore, is much greater than in an extensive green roof.

##### Irrigation: Ensure irrigation system and schedule are suitable for intensive vegetated roofing system.

###### Irrigate vegetated roofing system every two to three days during prolonged dry weather spells or when natural irrigation is inadequate.

###### Winterize irrigation system in late fall each year.

#### Regular maintenance: Conduct inspection of entire vegetated roof 1-2 times each month; varies seasonally.

##### In summer months conduct extra inspections during dry spells when irrigation requirements are greater.

##### Perform weeding, irrigation system examination, debris removal, addition of growing media and clippings as required to ensure survival of vegetated roofing system.

##### Add growing media and replace plants as required.

#### Ongoing Maintenance for Consecutive Years:

##### Fertilize in late spring with a controlled release fertilizer at an appropriate rate for the selected vegetation

##### Conduct inspection of entire vegetated roof once each month starting in spring until first frost.

##### Perform weeding, irrigation system examination, debris removal from roof surface and from drains, addition of growing media and plant replacement clippings as required to areas experiencing dieback.

### Reports: Keep maintenance log and submit quarterly maintenance reports to Owner and Vegetated Roof System Manufacturer to maintain warranty.

#### Reports should summarize dates, personnel at each visit, growing conditions and work done, in accordance with specification requirements and be signed by approved maintenance contractor’s representative.

### Responsibility: Maintenance contractor is responsible for replacing vegetation if maintenance is not carried out in accordance with vegetation roofing supplier’s written recommendations.

END OF SECTION