# Operation Manual for OUTDOOR STRUCTURES



STOP Please DO NOT ASSUME that your experience as a landscaper or gardener has prepared you to care for plants in a vertical garden.

Growing Plants in the LiveWall system is different, and while it is relatively easy—you must follow the methods described in this manual to be successful.

Be dedicated to documentation and require it of your maintenance provider.

Accountability raises everyone's interest in doing things right and it hastens learning.

Here is what should be documented.

Name of Person	Date	Activity	Observations
		Assessment of moisture content of the soil—your index finger is all you need. The soil should be consistently "moist", not wet, boggy or dry.	
		Irrigation duration and frequency, refer to irrigation chart on page 6.	
		Pruning and primping.	
		Fertility— Type and rate Osmocote granular fertilizer (if watered with mist nozzles) or liquid fertilizer (if watered with drip tubes) applied by hand or with an injector.	



LiveWall, LLC A Subsidiary of Hortech, Inc.

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# **Watering Instructions**

90% OF YOUR SUCCESS (OR FAILURE) WITH THE LIVEWALL SYSTEM WILL COME FROM PROPER (OR, IMPROPER) WATER MANAGEMENT. The key is to keep the soil moist but not too wet, and not too dry—in ALL SEASONS (whenever the soil is not frozen). The remainder of success comes from pruning and fertilizing at the right time (and in the correct manner), and using the right type of soil.

#### SETTING IRRIGATION CONTROLS

Regardless of which plants are used in your LiveWall system, they require regular watering during the growing season.

#### HOW MUCH/HOW OFTEN

In a perfect world, irrigation would be applied just as the soil begins to dry out, before the plants begin to wilt—with just enough water to moisten the soil, but not so much as to cause runoff. This is the goal, but not always the reality.

The key is to keep the soil moist, not wet or boggy and not dry—and the optimal irrigation duration and frequency will vary based on season, temperature, plant type and size, wind, and wall orientation.

Practically speaking, you will start slow in spring, increase as you move into summer, reduce during fall, and water only occasionally during winter—but monitor (the need to irrigate) each week of the year. If you do this, and follow the charts provided in the following pages, you will find that it is really quite easy.

See irrigation chart for recommended control settings (based on wall orientation, average high temperature and plant maturity).

In Michigan, for example, a typical south-facing wall with standard size planters, spray irrigation and perennial plants might receive the following regimen:

January - Soil is usually frozen solid.

February - Soil is usually frozen solid.

March – We expect to water – maybe 1 or 2 times during the month when the soil thaws out. Be sure to blow system out after use as there is still a chance of freezing. Alternatively water with a hose and sprayer.

April – We expect to water - maybe 2 or 3 times during the month. Be sure to blow system out after use as there is still a chance of freezing until early May. Alternatively water with a hose and sprayer.

May – We irrigate with automatic irrigation (freeze danger is past), typically 1 minute every 1 to 2 days.

June – August - Automatically watered every day for 1 or 2 minutes.

September - Automatically watered every 2 days for 1 minute.

October – Automatically watered every 5 to 7 days for 1 minute.

**November** – Only as needed, probably with a hose due to freezing temps. If watered with irrigation system, be sure to blow out the system after use.

December - Soil is usually frozen solid, but should be monitored when thawed out..

Naturally this varies with temperature, humidity, wall orientation, plant maturity, etc.

Please consult the irrigation charts on the following pages as a general guideline for proper irrigation, but use your own good sense and adjust as needed. The goal is not too much water (minimal runoff) but not too little, either.





### **Suggested Approximate Irrigation Times**

Taking into account Daily Average High Temperature, Direction of Wall, and Plant Maturity

Based on our experience at LiveWall LLC, the following charts serve as a general guideline for annuals, vegetables, perennials, and herbs. And if succulents are grown, about one half of this frequency should suffice.

### **STANDARD Size Planters & Spray Irrigation**

Avg Daily High Temp	Wall Direction and Maturity of Plants					
30°F (-1°C)	Blow-Out System with 20psi Compressed Air prior to Freezing*					
	System is Run Only as Needed, then Blown-Out if Danger of Freezing					
40°F (4°C)	North	East	West	South		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 6 or 7 days	Every 6 or 7 days	Every 5 or 6 days	Every 5 or 6 days		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute		
50°F (10°C)	Mature Plants	<b>Mature Plants</b>	Mature Plants	<b>Mature Plants</b>		
	Every 5 or 6 days	Every 4 or 5 days	Every 3 or 4 days	Every 3 or 4 days		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute		
	<b>New Plants</b>	New Plants	<b>New Plants</b>	<b>New Plants</b>		
	Every 5 or 6 days	Every 5 or 6 days	Every 4 or 5 days	Every 4 or 5 days		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute		
60°F (16°C)	<b>Mature Plants</b>	Mature Plants	Mature Plants	<b>Mature Plants</b>		
	Every 4 or 5 days	Every 3 or 4 days	Every 2 or 3 days	Every 2 or 3 days		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 4 or 5 days	Every 4 or 5 days	Every 3 or 4 days	Every 3 or 4 days		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute		
70°F (21°C)	Mature Plants	<b>Mature Plants</b>	Mature Plants	<b>Mature Plants</b>		
	Every 3 or 4 days	Every 2 or 3 days	Every day or two	Every 1-2 days at 1PM		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	for 1 to 2 minutes		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 3 or 4 days	Every 3 or 4 days	Every 2 or 3 days	Every 2 or 3 days		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute		
80°F (27°C)	<b>Mature Plants</b>	Mature Plants	<b>Mature Plants</b>	<b>Mature Plants</b>		
	Every 2 or 3 days	Every 1 or 2 days	Every day at 1PM	Every day at 1PM		
	at 1PM for 1 minute	at 1PM for 1 minute	for 1 to 2 minutes	for 2 to 3 minutes		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 2 or 3 days	Every 2 or 3 days	Every day	Every day		
	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 1 minute	at 1PM for 2 minutes		
+90°F (32C)	<b>Mature Plants</b>	<b>Mature Plants</b>	Mature Plants	<b>Mature Plants</b>		
	Every 1 or 2 days at 1PM	Every day at 1PM	Every day at 1PM	Every day at 1PM		
	for 1 to 2 minutes	for 1 to 2 minutes	for 2 to 3 minutes	for 3 to 4 minutes		

<sup>\*</sup>Note: Walls running on hose timers do not need to be blown-out. Simply disconnect the hose when temperatures fall below freezing.

### **Suggested Approximate Irrigation Times**

Taking into account Daily Average High Temperature, Direction of Wall, and Plant Maturity

Based on our experience at LiveWall LLC, the following charts serve as a general guideline for annuals, vegetables, perennials, and herbs. And if succulents are grown, about one half of this frequency should suffice.

### **LARGE Size Planters & Spray Irrigation**

Avg Daily High Temp	Wall Direction and Maturity of Plants					
30°F (-1°C)	Blow-Out System with 20psi Compressed Air prior to Freezing*					
	System is Run Only as Needed, then Blown-Out if Danger of Freezing					
40°F (4°C)	North	East	West	South		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	New Plants		
	Every 6 or 7 days	Every 6 or 7 days	Every 5 or 6 days	Every 5 or 6 days		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes		
50°F (10°C)	<b>Mature Plants</b>	<b>Mature Plants</b>	Mature Plants	Mature Plants		
	Every 5 or 6 days	Every 4 or 5 days	Every 3 or 4 days	Every 3 or 4 days		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 5 or 6 days	Every 5 or 6 days	Every 4 or 5 days	Every 4 or 5 days		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes		
60°F (16°C)	<b>Mature Plants</b>	Mature Plants	<b>Mature Plants</b>	Mature Plants		
	Every 4 or 5 days	Every 3 or 4 days	Every 2 or 3 days	Every 2 or 3 days		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 4 or 5 days	Every 4 or 5 days	Every 3 or 4 days	Every 3 or 4 days		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes		
70°F (21°C)	Mature Plants	Mature Plants	<b>Mature Plants</b>	Mature Plants		
	Every 3 or 4 days	Every 2 or 3 days	Every day or two	Every 1-2 days at 1PM		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	for 2 to 4 minutes		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 3 or 4 days	Every 3 or 4 days	Every 2 or 3 days	Every 2 or 3 days		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes		
80°F (27°C)	<b>Mature Plants</b>	<b>Mature Plants</b>	<b>Mature Plants</b>	<b>Mature Plants</b>		
	Every 2 or 3 days	Every 1 or 2 days	Every day at 1PM	Every day at 1PM		
	at 1PM for 2 minutes	at 1PM for 2 minutes	for 2 to 4 minutes	for 4 to 6 minutes		
	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>	<b>New Plants</b>		
	Every 2 or 3 days	Every 2 or 3 days	Every day	Every day		
	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minutes	at 1PM for 2 minute		
+90°F (32C)	<b>Mature Plants</b>	<b>Mature Plants</b>	<b>Mature Plants</b>	<b>Mature Plants</b>		
	Every 1 or 2 days at 1PM	Every day at 1PM	Every day at 1PM	Every day at 1PM		
	for 2 to 3 minutes	for 2 to 3 minutes	for 3 to 4 minutes	for 4 to 5 minutes		

<sup>\*</sup>Note: Walls running on hose timers do not need to be blown-out. Simply disconnect the hose when temperatures fall below freezing.

# **Fertility Management**

#### FERTILIZATION INSTRUCTIONS (TYPICALLY CONDUCTED IN SPRING TIME)

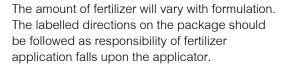
#### **Granular Fertilizer:**

For LiveWall installations without a fertilizer injector (and with spray nozzles, not drip emitter assemblies), a granular slow release fertilizer can be applied with a teaspoon. The preferred product is Scotts Osmocote®, which releases nutrition slowly for the entire growing season. This product is available from most garden centers. Follow the label directions; typically applying one to two teaspoons of fertilizer distributed evenly across the soil surface of each standard sized planter during spring (half size planters require only half as much fertilizer).



#### Automatic Fertilization (Liquid):

Some LiveWall installations will have an automatic fertilizer injector as part of the system design —typically, those with drip stakes. These walls are fed by injecting or siphoning a soluble fertilizer concentrate into the water supply line—at dilute concentration, such as 50 to 75 parts per million Nitrogen (PPM-N). LiveWall recommends and supplies Nature Source (contact us at 877-554-4065 to place an order).







#### Performing a Soil Test to Check Fertility

To test soil, gather a two cup sample by digging soil out in small quantities (using a tablespoon) from at least 10-15 separate places throughout the affected area of the wall. Combine these small samples ("sub-samples") in a labelled, sealed, plastic bag, or test kit from your desired testing lab. LiveWall, LLC recommends the following laboratory and test procedure.

#### WHAT TO DO WITH SOIL TEST RESULTS

The soil report will indicate if there is a Low (L), Moderate (M), or High (H) amount of each nutrient in the soil. It will also list micronutrient content such as Zinc, Iron, Sulphate, and others. The most important of these, in terms of plant vigor and color, are Nitrogen and Iron. If your soil contains less than a Moderate (M) amount of Nitrogen or Iron, the plants may appear yellow and lack vigor. If this is the case, it is advisable to apply supplemental fertilizer.

All fertilizers are labelled with three numbers, which indicate the % weight of Nitrogen (N), Phosphorus (P), and Potassium (K), in the fertilizer. Common formulations are 18-6-12 or 14-14-14. In some communities, Phosphorus-containing fertilizers are prohibited due to the potential for creating algae growth in waterways. If in doubt, check with your local co-operative extension agency (csrees.usda.gov/Extension/).

A&L Labs
1311 Woodland Ave, Suite 1
Modesto, CA 95351
209-529-4080
www.al-labs-west.com
Recommended Test
Nursery Growing Media Test S7A
Cost: appx. \$45.00

In the event that your soil is lacking in a particular micronutrient, it may be due to using an incomplete fertilizer. Good quality fertilizers typically have a full complement of micronutrients.

To correct nutrient deficiencies, source a specific <u>container plant</u> <u>fertilizer</u> product from your local garden center or horticultural distributor.

When applying fertilizer, it is always advisable to be sensitive to runoff potential. Ask yourself, where is the runoff water going, and what might it affect (e.g., fish, frogs, etc.)? It is best to use a "slow release" fertilizer rather than conventional fertilizer and we recommend Osmocote fertilizer, typically one to two teaspoons spread evenly across the soil surface of each planter. Osmocote is covered with a resin that allows the nutrients to release into the soil over time, rather than all at once. Such fertilizers are more readily absorbed by the plants, and therefore less likely to damage the plants or contaminate runoff water.

# **Spring Maintenance**

#### COLD WINTER CLIMATES: LATE WINTER/EARLY SPRING MAINTENACE

#### Perennial Plants

**REMOVE PROTECTIVE COVER:** If a vinyl cover was used to protect perennials from drying out during winter, remove cover when temperatures warm up above freezing, usually around Mar. 15-30. Clean, dry and store cover for reuse in November. Then, water and wait on pruning (see below).

WATERING: During late winter and early spring, your LiveWall plants will begin growing sooner than your landscape plants (that are in the ground)—because the soil warms faster in the wall planters. For this reason, you must check the soil moisture and irrigate (if using perennial plants) during late winter and early spring when the soil is not frozen. A simple weekly check is required.

When should you irrigate? You should add water <u>only</u> if the soil is relatively dry. The soil should not be wet and boggy, just moist. Moist soil will allow your plants to grow during early spring and it will keep them from drying out and dying.

IMPORTANT: DO NOT COUNT ON THE RAIN TO WATER YOUR PLANTS as rainwater typically trickles down only 3 or 4 rows.

How should you irrigate during early spring? You can use a hose, or you can activate the LiveWall system and then blow it out with compressed air afterward (to prevent the lines from cracking during the next freeze cycle).

WAIT TO PRUNE: Do not prune dried stems and leaves until you see significant new springtime growth occurring—and not until the danger of a hard frost has passed. In west Michigan, we prune around May 1st. SELECTIVELY PRUNE OFF BROWN GROWTH ONLY - DO NOT PRUNE ANYTHING THAT IS NOT BROWN OR DRY.

#### IRRIGATION INSPECTION AND REACTIVATION OF IRRIGATION SYSTEM

In cold climates, after the danger of freezing has passed, the irrigation system (which was blown out in the fall) should be reactivated and inspected to be sure it is ready for use. Always do the following:

- Replace irrigation controller batteries, and activate fertilization system (if present).
- Check for proper water flow and pressure.
- Clear irrigation nozzles of obstructions. The dissolved minerals in the water tend to flake off the pipes during periods of non-use, so this step is very important. Simply turn the system on and mark any nozzles that are plugged. Then remove them with a 7/16 inch wide, deep socket, and use a stiff wire or paperclip to clear any mineral deposits from their orifices.
- Mineral precipitation can be greatly minimized with the addition of a descaling cartridge. If used to treat hard water, check levels of descaling cartridges and replace if needed. LiveWall sells replacements, call 877-554-4065 to order.
- Watering regimen: At least every 2 weeks (during spring), adjust your watering regimen in accord with the irrigation charts on pages 3-4, accounting for average high temperature, orientation of the wall, and maturity of the plant material.

<u>IMPORTANT</u>: If additional freezing temperatures are expected, after you have activated your system, blow out the lines with compressed air, not to exceed 20 psi, same as done for fall winterization.

#### STRUCTURAL INSPECTION

As with all siding products, it is wise to perform a seasonal inspection to ensure that the wall behind the LiveWall system is free of moisture and condensation. To do this, simply remove some of the WallTer planters and inspect for signs of moisture. If there is any moisture, check the top, bottom and sides of the LiveWall installation to ensure that there are no impediments to air movement. If so, clear any obstructions.

WHEN TO PRUNE: Dead stems should be trimmed from Perennial plants, <u>ONLY AFTER</u> <u>DANGER OF LATE SPRING FROST</u>. These dried stems (from the previous year) help protect the new growth from frost and freezing.



# **Spring Maintenance**

#### **REPLANTING**

The need to replant during spring depends upon the type of plant material used and how effectively it survived the winter.

**Perennial Plants:** When grown in the ground, perennial plants (including tropical perennials), have the potential to last for many years. But, when grown in a container on a wall, their life expectancy is much shorter and varies with climate, exposure, management (especially water, pruning and fertility) weather events, and suitability to container growing. All perennials can eventually become root-bound, and thereafter will become stunted and in need of replacement or dividing and replanting. Others succumb to the ravages of winter—with losses varying greatly based upon climate, exposure and maintenance (particularly important is water management and timing of pruning). Please consult our climate-specific plant recommendation and design guides for the best results.

In Michigan, we have experienced winters where we have lost only 5% of the plants and others that were so severe that we lost 90%. On average, in west Michigan, we get about 3 years out of our perennials.

As stated previously, one of the most critical times (in cold climates) is late winter/early spring, when the plants want to grow and they need water – before the irrigation system is active. That's when one must be committed to watering by hose or blowing out the system with air (after using the automatic irrigation system to do the watering). We can't overemphasize the importance of attending to moisture needs, regardless of time of year.

The keys to success, regardless of where you live, are consistent moisture management, spring, summer fall and winter, delaying pruning until after danger of spring freeze, proper soil and plant selection, and timely fertilization.

**HOW YOU KNOW THAT IT IS TIME TO REPLANT A PERENNIAL:** When the plant has died or become so root-bound that the growth is stunted or the soil has decomposed more than 1/3 of the planter height, it is time to replant. Simply contact your favorite grower and have them start some new plants in the WallTer inserts (which you can clean and reuse or acquire from LiveWall, LLC). Replacement should be done during spring or summer so the plants become well established prior to winter.

**SOIL TYPE IS IMPORTANT:** You must always use a high quality well-draining potting soil. For perennials, we recommend a peat or coconut coir based lightweight mix containing composted pine bark for longevity and perlite for drainage. Our preferred product is Sunshine Horticulture's Mix # 52. This mix is suitable for a broad range of perennial plants including Sedums and Succulents.

Annual Plants: Annual plants require replacement at the beginning of every growing season. Therefore, if you would like to begin with well-established plants, you should make plans with your local grower to pre-grow them in the LiveWall inserts, in their greenhouse—this takes about 6 to 8 weeks if they start with actively growing starter plants from 72 or 36 cell plugs. Alternatively, you can replant the inserts and grow them to maturity in the wall. In any event, it is important to thoroughly wash out and disinfect the WallTer inserts and start with fresh peat or coconut coir based, well-draining potting soil.

CONTACT LIVEWALL TO ORDER EMPTY INSERTS: 877-554-4065



### **Summer Maintenance**

#### WATERING DURING SUMMER - HOW MUCH/HOW OFTEN?

Watering during summer is usually very steady and predictable—often just one or two minutes per day, for the duration of summer. But...consult the irrigation chart below, and use this as a general guide (then fine tune according to your own observations and experiences). Maintain your soil in a moist, but not wet or boggy or dry condition—influenced by temperature, humidity, wind, orientation of the wall, plant types and maturity of the plants.

#### **PRUNING**

During summer, your plants will produce lots of flowers and stems, and from time to time you may wish to prune the plants to neaten them up, and to prevent one plant from overrunning another.

Annuals, Vegetables, and Tropicals: Annuals, vegetables, and tropical plants only need to be trimmed back if they overgrow their desired allotment of space.

*Herbs:* Herbs, medicinal, and fragrance plants can be trimmed or harvested as their stems and leaves are needed for their intended uses (seasoning, poultices, potpourri, etc.).

**Perennials:** Perennials should be trimmed back if they overgrow their desired allotment of space and sometimes they can be enticed to flower a second time if their spent flowers are trimmed off.

Succulents: Succulents need to be trimmed back only if they overgrow their desired allotment of space. "

#### **WEED CONTROL**

One of the best things about growing in LiveWall is the near absence of weeds. Even so, weed seeds can blow in on the wind, and therefore you may encounter occasional weeds. These can be removed by hand, sometimes requiring a ladder, but always carefully and safely.

#### STRUCTURAL INSPECTION

As in other seasons, during summer it is recommended that you remove a few WallTer planters and check behind the system to ensure that there is no accumulation of moisture behind the system.

#### **PESTS AND DISEASES**

Because the LiveWall® system creates a healthy growing environment, there should be relatively few pest and disease problems with your LiveWall plants. However, if a pest or disease should occur, it should be properly identified and an appropriate organic control employed.

If you exercise the fertility practices as outlined in Spring Maintenance, your plants should have adequate nutrition for the season, however every soil, water, and plant combination yields different results and telltale signs of potential fertility problems include yellowing leaves, leaf drop, lack of flowering, or poor vigor or fruit production.

Should you observe any unusual plant problems, first make sure you are not overwatering. The soil should be consistently moist, never wet and boggy or overly dry. If the soil is not too wet, then look for disease and pests, and be sure to check the roots which should be white and fibrous.

Should you find no signs of overwatering and no pests or disease problems, you should consider testing the soil.

# **Fall Maintenance**

#### WATERING DURING FALL - HOW MUCH/HOW OFTEN?

Watering during fall involves scaling back the irrigation frequency and duration as the temperatures progressively drop. Consult the irrigation charts on pages 3-4. Remember, you want the soil to be slightly moist, not wet or boggy or dry. If the plants are overly wet or dry during fall, they will not survive winter as well as if the soil moisture had been properly maintained.

#### FALL STRUCTURAL INSPECTION

As is the case during other seasons, it is recommended that you remove a few planters and check behind the system to ensure that there is no moisture behind the system. If you see signs of moisture, you should prune away any plant overgrowth from the sides of the system which should increase air flow and dry things up.

#### **PLANT REMOVAL**

**Annual Plants:** After a few hard frosts, your annual plants will have died. They can be left in all winter or they can be removed during fall, and the plant matter and soil can be composted. The planter inserts may be disinfected and saved for the next season's plantings, or you can recycle them and start over with new inserts next spring.

#### DO NOT PRUNE

**Perennial Plants:** Do not trim back perennial plants during fall—at least not in cold climates. Winter survival is far better if you wait to prune until after danger of spring frost (due to the insulating effect of the plant matter).

Note: if there are grasses or other plants in the system that will have dry, flammable organic matter, you should remove these unless you are certain there is no risk of ignition from careless disposal of cigarettes or other flammable agents.

#### **INSTALL WINTER COVER**

In cold winter climates, winter survival can be improved by protecting the planters from drying out with a vinyl cover. In November, water the planters thoroughly and place vinyl cover over the structure.

The biggest challenge to winter survival is desiccation (generally affected by wind and sun), and secondarily cold (on the roots of the plants). If the winters tend to be long and intense with lots of wind, then survival will be lower than if the winters are short and comparatively mild. For most cold climates, LiveWall considers it *essential* to use a vinyl protective winter cover—which we can provide. This material is non breathable vinyl, printed with pleasing foliage graphic, and grommeted every 12 inches, for easy attachment.



Vinyl Protective covers are easy to use; the plants should not be pruned in fall (to help conserve moisture), and they should be thoroughly watered (making sure the soil is moist throughout the soil profile) shortly before sustained freezing temperatures arrive (in Michigan this usually means Nov 25 –Dec 5). The protective cover is then attached over the LiveWall, usually with zip ties, and left in place through winter. During late winter, when temperatures warm up above freezing, usually around Mar. 15-30, the cover is removed, and the plants are watered completely—and watered as needed thereafter. Pruning should not occur until May. While we have not observed much drying out under the vinyl covers, we recognize that in very windy winter conditions, even with a protective cover, it may be needed to irrigate during winter, and therefore we recommend evaluating soil moisture during periods of winter thaw.

#### WINTERIZING THE SYSTEM TO PREVENT FREEZE DAMAGE

In northern climates, deactivate the system in fall by gently blowing out the irrigation lines with compressed air, <u>NOT TO EXCEED</u> 20 PSI, then turning the irrigation controller off. This should be done by an experienced contractor and emphasis should be put on regulating the air pressure to 20 PSI. Empty lines and valves are required to avoid freeze thaw damage.

## **Winter Maintenance**

#### **IRRIGATION**

In warm climates, or <u>even some cold climates</u>, you must water perennial plants occasionally but infrequently during winter - in order to keep the soil from drying out. If you have perennial plants in your wall, we recommend thoroughly watering the soil before it freezes solid in early winter and placing a protective vinyl cover over the wall.

Throughout winter, the soil should be checked during periods of thawing to ensure proper moisture. The soil should be moist, not wet or boggy, or dry, whenever the soil is not frozen solid. It is not uncommon to need to irrigate a few times during wintertime warm ups. If needed, you can water with a hose and hand-held sprayer or use the built-in system, then blow it out afterward until the danger of freezing has passed.

#### SNOW REMOVAL AND DEICING COMPOUNDS

During winter, avoid throwing snow onto your LiveWall plantings. The salt or other deicing compounds in the shoveled snow can damage or kill your LiveWall plants.

**Have Maintenance Questions?** 

Give Us a Call! 877-554-4065