GREEN WALL BENEFITS

Green Walls offer many public, private, and design-specific benefits.

Please note: while there are similarities among green walls, each installation is unique. Hence, all technical performance details provided will vary by region, climate, building, design, and green wall type. GRHC members are an excellence source of green wall expertise, and a resource manual is available from GRHC's Green Infrastructure Store.

PUBLIC BENEFITS

AESTHETIC IMPROVEMENTS

- Green walls can reclaim disregarded space by providing aesthetic stimulation where it would not otherwise be found. They can also serve to create privacy and a sense of enclosure while limiting the negative psychological effects associated with property demarcation.

REDUCTION OF THE URBAN HEAT ISLAND EFFECT

- The reintroduction of vegetation into urban environments promotes the occurrence of natural cooling processes, such as photosynthesis and evapotranspiration.
- With strategic placement of green walls, plants can create enough turbulence to break vertical airflow, which slows and cools down the air (Peck et al. 1999).

IMPROVED EXTERIOR AIR QUALITY

- Green walls mitigate air pollution levels by lowering extreme summer temperatures through photosynthesis, trapping particulate matter, and capturing gases.
- The ability of green walls to provide thermal insulation for buildings means less demand on power, and as a result, fewer polluting by-products are released into the air.

LOCAL JOB CREATION

- Green walls draw upon several disciplines for their design, installation, and maintenance
- Demand for a local supply of plant materials, blended growing media, greenhouse production, and fabrication of structural frames creates further business activity.

PRIVATE BENEFITS

IMPROVED ENERGY EFFICIENCY

- Green walls can reduce the temperature fluctuations at a wall's surface from a range of 10-60°C (50-140°F) to one of 5-30°C (41-86°F), in turn, limiting the movement of heat between building walls (Minke 1982). They cause this reduction by:
    - Trapping a layer of air within the plant mass.
    - Reducing ambient temperature via evapotranspiration and shading.
    - Creating a buffer against wind during winter months.
- Green walls can help lower the air temperature around intake valves, which means HVAC units will require less energy to cool air before being circulated around a building.

BUILDING STRUCTURE PROTECTION

- Temperature fluctuations over a building's lifetime can be damaging to organic construction materials in building facades. Green walls provide an additional layer of exterior insulation and thereby limit thermal fluctuations.
- Green walls protect exterior finishes and masonry from UV radiation and rain. They can also increase the seal or air tightness of doors, windows, and cladding by decreasing the effect of wind pressure (Peck et al. 1999).

IMPROVED INDOOR AIR QUALITY

- Most North Americans spend 80-90% of their time indoors (Jenkins et al. 1992) and as a result, are highly influenced by the effectiveness of interior air circulation systems. It has been estimated that problems associated with poor indoor air quality negatively affect workplace production by $60 billion per year in the United States (Reitze 1998).
- Air that has been circulated throughout a building with a strategically placed green wall (such as near an air intake valve) will be cleaner than

that on an uncovered building. The presence of vegetation indoors will have the same effect.
- These processes remove airborne pollutants such as toluene, ethyl benzene, xylene, and other volatile organic compounds.

NOISE REDUCTION

- The vegetated surface provided by strategic urban greenery such as green walls and roofs will block high-frequency sounds, and when constructed with a substrate or growing medium support can also block low-frequency noises.
- For over 30 years, plant life has been used to this end along freeways, arterials, and rail lines in North America and Europe.

MARKETING POTENTIAL

- Green buildings, products, and services now possess a competitive edge in the marketplace.
- Green walls are an easily identifiable symbol of the green building movement since they are clearly visible and directly impact the amount of green space in urban centers.

DESIGN SPECIFIC BENEFITS

INCREASED BIODIVERSITY

- Green walls can help mitigate the loss of biodiversity due to the effects of urbanization, help sustain a variety of plants, pollinators and invertebrates, and provide habitat and nesting places for various bird species.

IMPROVED HEALTH AND WELL-BEING

- Buildings that feature and promote access to vegetation have been documented as having a greater positive human health impact than those without (Honeyman 1987)
- Studies have shown that visual access to natural settings lead to increased job satisfaction and productivity (Kaplan 2001) and post-operative recovery rates in medical facilities (Ulrich 1983).

URBAN AGRICULTURE

- Green walls offer the opportunity for urban agriculture, such as vertical gardens of small fruits, vegetables, and herbs.

ONSITE WASTEWATER TREATMENT

- Several water-recycling systems can be applied to green walls. These systems pump grey water through a green wall, which then passes through filters, gravel, and marine plants.
- Treated water is then sent to a grey water holding tank for household or irrigation use or released into the public water treatment system (Shirley-Smith 2006). Some of these systems also collect stormwater, which is filtered for household use or irrigation purposes.