



VACVERTICAL GARDEN

An example of an indoor vertical garden, similar in aesthetic to our proposition.

CU Boulder, March 2011: Sustainable Project Proposal

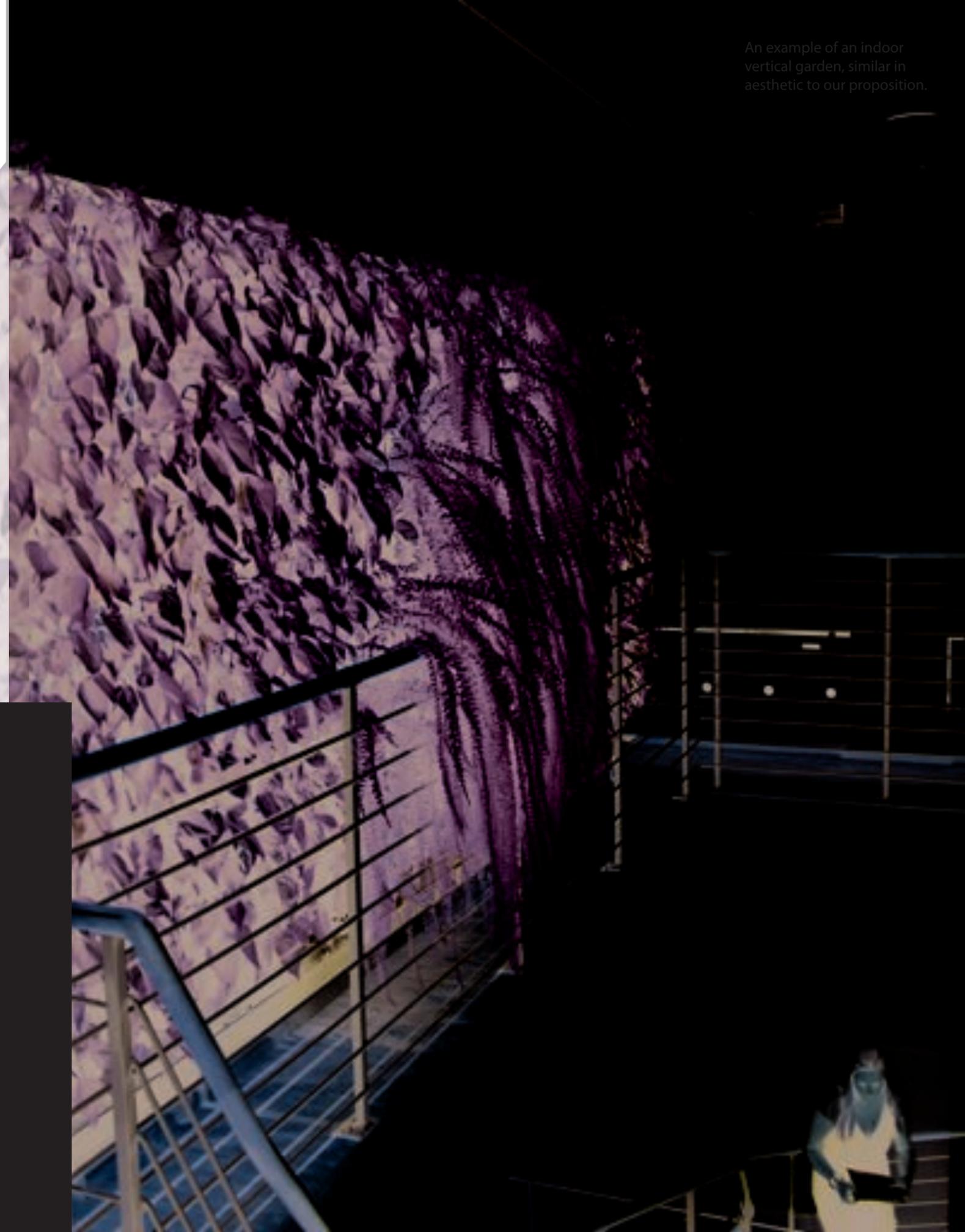
VACVERTICAL GARDEN

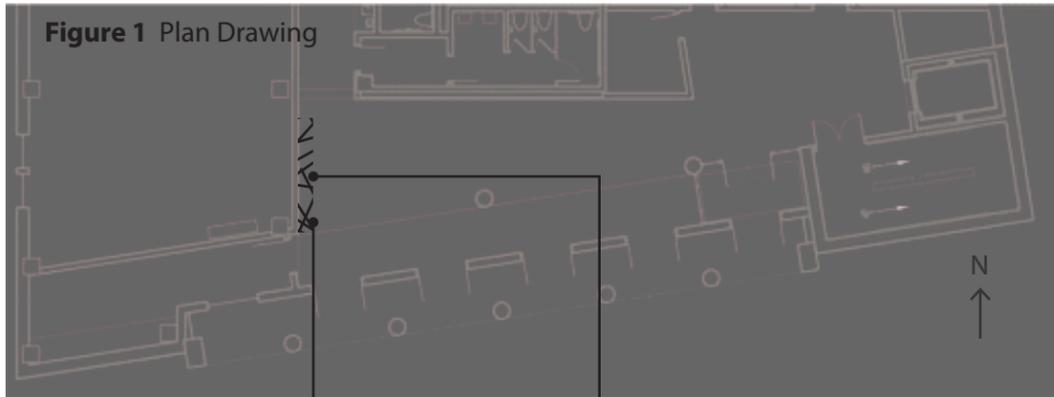
I. PROJECT DESCRIPTION

AN EDIBLE, WALL GARDEN TO BE INSTALLED IN THE VISUAL ARTS CENTER

A living wall is a simple vertical growing structure for plants, either decorative or edible. Our proposed wall would be a simple framework of wooden studs bordered on one side with a small diameter PVC pipe, drip tubes running from the pipe horizontally, and layered synthetic felt. The piping and drip tubes allow for the dispersion of nutrients to the plants on the wall, while the felt provides a structure and growing medium for the plants to adhere to. Excess moisture drains into a concealed collection channel

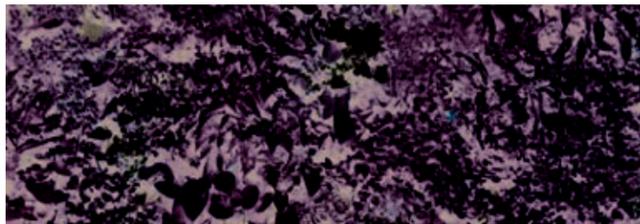
at the base of the wall. Waterings run on an automatic valve timer. The synthetic felt is a superior wicking material that will not degrade over time despite being wet nearly constantly. The nutrients fed through the hoses will be organic so that the plants will be considered organic as well. A track of lighting hangs from the ceiling aimed at the wall to provide lighting to the plants. Plants are arranged from top to bottom with the most light intensive plants at the top closest to the lights.





Placement of Vertical Garden:
VAC, First Floor,
East Facing Wall

Surface Condition



PROBLEM AND SOLUTION

There is a lack of arable land in high density urban or semi-urban environments and typically what is available is too expensive for agricultural uses. Further anyone with the available space may not have enough time or energy to devote to caring for and maintaining a raised bed organic garden in their yard.

One solution is the edible living wall. A simple, compact, clean, vertical garden that can exist indoors or out, requiring little maintenance and offering decorative appeal.

II. SUSTAINABILITY

Environmental Protection: By providing more food at a local level, more precisely at a proximity that is available within or around the home, we can lessen the reliance on our high input, highly pollutive food system. The edible living wall is low input, not requiring many of the inputs that industrial agriculture requires. Inputs such as transportation, distribution, heavy pest control, heavy fertilization, and refrigeration. Also, by using organic growing methods and efficient use of water, the impact to the greater environment can be further lessened.

Economic Benefit: Growing food is cheaper for the homeowner than it is to buy at a grocery store. Seeds are very inexpensive and once the seedlings are established they require little maintenance because the watering and feeding is taken care of automatically. Indoors, the food can be grown year round, providing cheap food to its patron.

Social Equity: This technology is highly democratic. The materials to build the living wall are all available 'off the shelf' and are relatively inexpensive. The assembly doesn't require too much knowledge of carpentry or skill either. It is relatively low maintenance so it doesn't require as much attention as a raised bed organic garden, which is a benefit to people who work full time jobs.

III. STUDENT IMPACT

The students to interact with this wall will be primarily within the Art and Art History College. However, there are also a great number of students from other colleges who pass by this wall, will ask questions, and be able to learn from it. Colleges outside the Art and Art History Department, like the Architecture and Planning College, use the basement lecture room. Also, students from other colleges who take art or art history electives also become familiar with the building. The main draw however, might be to prospective students and parents, who are attracted to the new construction. A vertical wall on the first story, directly in front of the main entrance, could stand as a statement and strong testament to the sustainable initiative at CU.

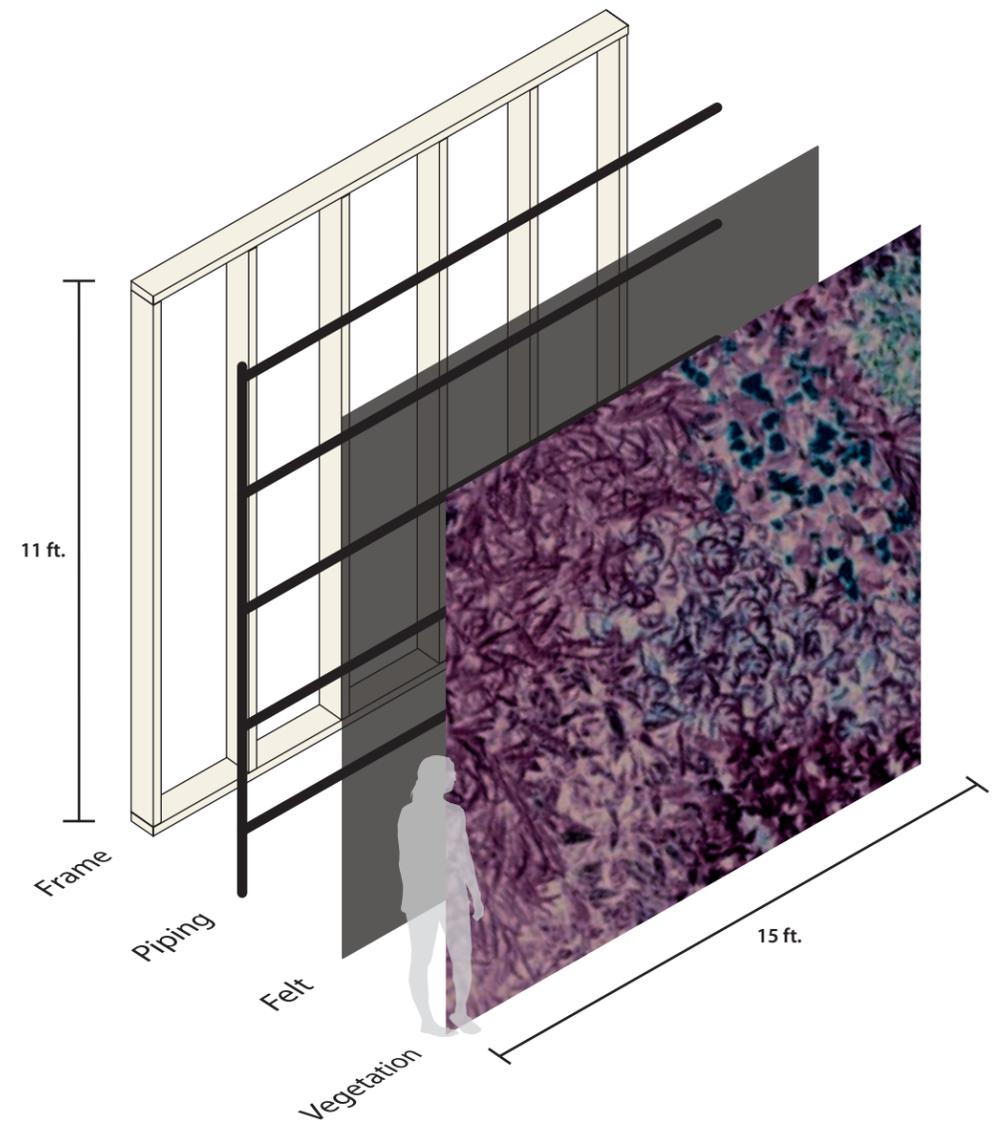


Figure 2 A material composite of the Vertical Garden

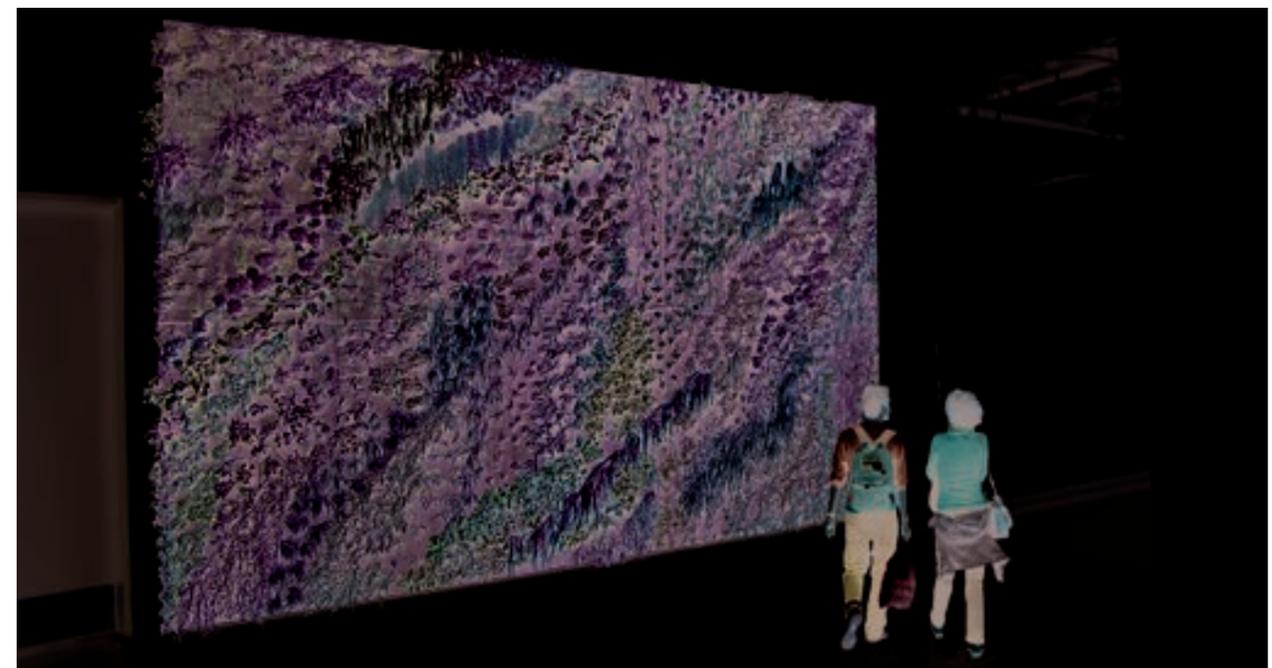


Figure 3 Aesthetic rendering of Vertical Garden

Another component of student impact related to the vertical garden is its effect on the art student's exhibition space. Currently, there are strict guidelines as to who can use the wall and for how long. Although we are proposing an architectural piece, through the art college- to which this space belongs, and their artistic lens, it is viewed as an installation and installations are usually temporary. To respect their perspective and their position as a stakeholder, we propose an attractive compromise. A system of discreet pulleys and wires will be strung in front of the vertical garden, so art students may still hang their art in this space. They will not have to suffer from a loss of exhibition area and their agenda to display student work is still respected. The art will also become the focus, as it is positioned in front of the vertical garden, and the green wall behind may fade into the background as an architectural component. Refer to Figure 4 as a case study in which this resolution was employed. A retail store in Italy, which constructed a vertical garden, also wanted wall space to display their clothing. A pulley system was devised so that they could integrate their display agenda with their existing vertical garden. We envision a similar proposition.

IV. STUDENT INVOLVEMENT

During the building process of the project, we will pull together a "Wall Garden Club", which will be responsible for maintaining the garden. They will decide what to do with the food- whether to donate it to a Community Food Share, sell it at the Farmers Market, or use it with the Cooking Club- who's focus is also in sustainable and organic growing. This vertical garden, within the context of our greater vision, could be one of a series of wall gardens installed throughout campus. The club could be in charge of running all of these, popularizing this sustainable practice. It will also appear a more feasible option and one of our goals is to make sustainable gardening a more approachable idea.

VII. INNOVATION

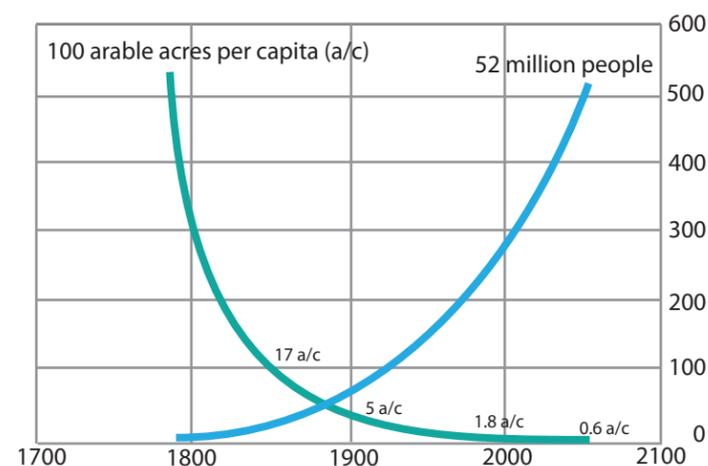
Indoor, wall gardens and vertical, edible gardens are becoming increasingly popular solutions. However, it is a rare synthesis to combine an indoor, vertical garden with an edible component. Potentially, this project exists as a future prototype for urban gardening practices. As the building trends of the last century saw a large propagation of the suburbs and rapid departure from the cities, there has been a drastic decrease in the amount of available, agricultural land. Figure 5 shows the trend of arable acres related to the increase of population and the problematic ends to which they are heading. The next century will see a build up, rather than out, as it remains the lasting, sustain

able solution. This indoor, vertical garden could prove a feasible answer to localized, urban gardening in the face of population growth. We also made an objective of our project to buy all materials locally. The budget details show the specific, local vendors we will approach.

Figure 4 Vertical Garden in Replay store. Florence, 2009



Figure 5 Executive Summary Released November 21, 1994 by David Pimentel of Cornell University and Mario Giampietro Istituto of Nazionale della Nutrizione, Rome



VI. BUDGET DETAILS

Item	Units	Unit Cost	S&H	Sales Tax	Total	Where
Lumber	24	\$2.11	\$0	\$4.21	\$54.85	Homedepot
PVC Piping (10 ft)	2	\$1.73	\$0	\$0.29	\$3.75	Homedepot
Drip Tubes (50 ft)	2	\$7.97	\$0	\$1.32	\$17.26	Homedepot
Felt (yd)	100	\$1.49	\$0	\$12.38	\$161.38	E.N. Murray Co
Steel Gutter (10 ft)	1	\$7.47	\$0	\$0.62	\$8.09	Homedepot
Flora Grow Nutrient Solution (6 Gal)	1	\$140	\$0	\$11.63	\$151.63	Boulder Grow
Flora Micro Nutrient Solution (6 Gal)	1	\$170	\$0	\$14.13	\$184.13	Boulder Grow
Flora Bloom Nutrient Solution (6 Gal)	1	\$140	\$0	\$11.63	\$151.63	Boulder Grow
Orbit Water Valve Timer	1	\$29.98	\$0	\$2.49	\$32.47	Homedepot
Pump (400 Gal)	1	\$20.95	\$0	\$1.74	\$22.69	Boulder Grow
Reservoir (40 Gal)	1	\$83.83	\$0	\$6.97	\$90.80	Boulder Grow
Filter	12	\$1.95	\$0	\$1.94	\$25.34	Boulder Grow
Pump Timer	1	\$13.95	\$0	\$1.16	\$15.11	Homedepot
Light Timer	2	\$165	\$0	\$27.42	\$357.42	Boulder Grow
Plant Plugs	2	\$14	\$0	\$2.33	\$30.33	Boulder Grow
Plug Tray	2	\$2	\$0	\$0.33	\$4.33	Boulder Grow
Humidity Dome	2	\$2.50	\$0	\$0.42	\$5.42	Boulder Grow
Light Kit (1KW)	2	\$436.02	\$0	\$72.47	\$944.51	Boulder Grow
Plant Seeds	27	\$2.29	\$0	\$5.14	\$66.97	Beauty Beyond Belief Wildflower Seed
Incidentals	1	\$170	\$0.00	\$0.00	\$170	N/A
Sales Tax	8.31%					
Total	N/A	\$1,413.24	\$0.00	\$178.62	\$2,498.11	
Remainder					\$1.89	

V. TIMELINE



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