

Mount Tabor Meadows Common Space Conceptual Master Plan

Blacksburg, Virginia



Prepared for Mount Tabor Meadows Home Owners Association
August 2010



The Community Design Assistance Center (CDAC) is an outreach center for the College of Architecture and Urban Studies and Virginia Tech that assists communities, neighborhood groups and non-profit organizations in improving the natural and built environment, through design, planning and research. Through the integration of the learning and working environment, the Center will execute projects that link instruction and research and share its knowledge base with the general public.

CDAC Project Team Members:

Elizabeth Gilboy, Director

Kim Steika, Landscape Architecture Project Coordinator

Kaitlyn Illmensee, Undergraduate Student, Landscape Architecture

Ashleigh Marshall, Undergraduate Student, Landscape Architecture

William West, Graduate Student, Urban Forestry

Community Design Assistance Center

101 South Main Street. Blacksburg, VA 24061

p. 540.231.5644 f. 540.231.6089

<http://cdac.arch.vt.edu>

Acknowledgements:

The CDAC team would like to thank the members of the Mount Tabor Meadows Community, Town of Blacksburg employees, and Virginia Tech faculty for their support and feedback throughout the course of this project.

The CDAC team would like to give special recognition to the following individuals for their help on this project:

Bryant Altizer, *President, Altizer, Hodges, and Varney, Inc.*

John Boyer, *Assistant Director, Public Works, Field Operations, Town of Blacksburg*

Justin Boyle, *Green Valley Builders*

Susan Day, *Forest Resources & Environmental Conservation, Department of Forestry,
Assistant Professor Virginia Tech*

Jerry Ford, *Mount Tabor Meadows Community Member*

James Higgins, *Water Resource Inspector, Town of Blacksburg*

Lee Hixon, *Stormwater Engineer, Town of Blacksburg*

Beth Lohman, *Mount Tabor Meadows Community Member*



Support for this project was provided, in part, by the Virginia Department of Forestry through an Urban and Community Forestry Grant

Table of Contents:

Introduction.....	01
Design Process.....	02
Inventory and Analysis.....	04
Vision.....	10
Conceptual Layout.....	15
Conceptual Development.....	21
Final Conceptual Master Plan.....	24
Site Sketches.....	26
Planting Options.....	28
Creek Bed Construction Details.....	37
Conclusion.....	39
Appendices.....	40

Introduction

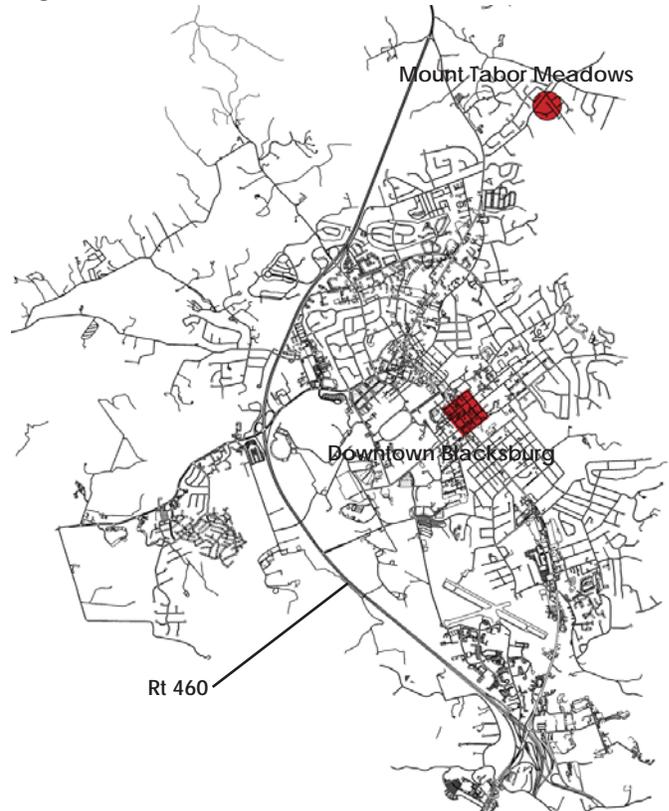
The Community Design Assistance Center (CDAC) worked with the Mount Tabor Meadows (MTM) community to develop a conceptual master plan of their vision for a new and sustainable use for the community's underutilized common space.

Mount Tabor Meadows is a neighborhood located in Blacksburg, Virginia developed by Green Valley Builders. All of the homes are EarthCraft certified and Energy Star Rated. In the heart of the development, a community open space – MTM Commons – has been preserved. Currently, the Commons is an open field mowed seasonally for hay, and in part serves as a stormwater basin. After months of consideration, the homeowners developed a list of desired uses for the space, including a playground, community shelter/gathering space, a spot for community gardens, and an urban forest to increase opportunities for stormwater infiltration and carbon sequestration on site.

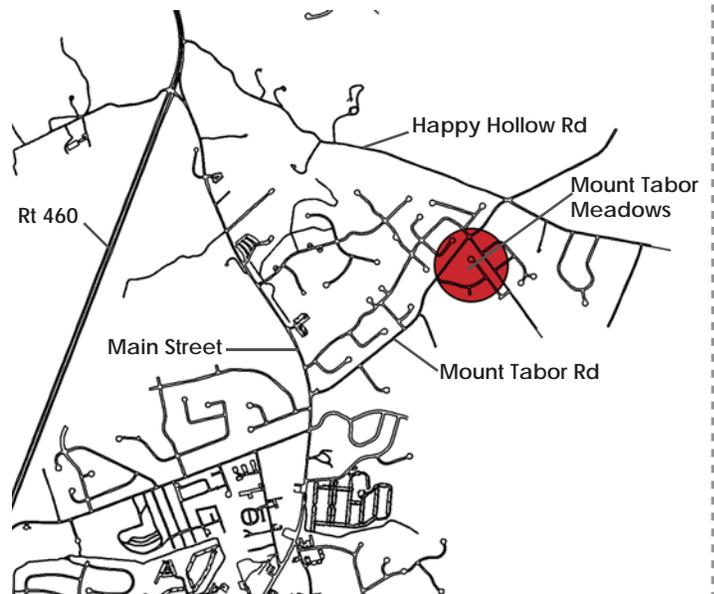
In March of 2010, MTM began working with the CDAC to develop conceptual plans for the common space. In conjunction with the community's sustainable mission, it was the desire of the home owners association to develop a plan for their new common space that was not only a place for recreation and community development, but also provided a service to the natural systems of the site. All of the listed ideas carry the community members' aims of sustainability and stewardship into the Commons.



Location of Blacksburg and Montgomery County within Virginia.



Location of Mount Tabor Meadows within Blacksburg



Location of Mount Tabor Meadows within Blacksburg

Design Process

MTM community members held a series of brainstorming meetings prior to contacting CDAC to help with the project. During these meetings, the community members developed a list of desired amenities and functions they would like to see incorporated into the Commons.

An initial site visit was conducted by the CDAC team in mid March, with Justin Boyle, resident and Green Valley Builders co-owner and Jerry Ford, MTM resident. The team walked the site and discussed site conditions, ideas for placement of proposed amenities and the overall vision for the space.

After collecting base map information and developing a set of site inventory and analysis maps, the CDAC team prepared four preliminary concept diagrams that examined various options for stormwater management and site layout for the Commons. The analysis and concepts were presented at an HOA meeting in April 2010, where residents provided feedback and chose two concept options to be further developed.

CDAC incorporated the feedback received from the community members and developed two refined conceptual master plans. While developing these plans, the CDAC team assisted MTM in an online grant contest hosted by Kaboom.org called the Promote Your Project Design Contest, in which the Grand Prize was a \$5000 grant toward playground equipment. The Kaboom contest was not only a way for the community to raise money for the project but also served as an excellent tool for communication between residents and raised awareness in the surrounding communities about MTM's overall vision.

The two revised conceptual master plans were presented at a later meeting where residents gave additional comments



Photo from: <http://greenvalleybuildersinc.com/>



Team member Ashleigh Marshall views existing site conditions on initial site visit in March.



Community members, and William West (far right) discuss initial site analysis and concepts at April 22 meeting.

towards the ideas they would like to see on the final plan.

The CDAC team also sought feedback from Blacksburg Town staff Lee Hixon, James Higgins, and John Boyer and Virginia Tech Professor Susan Day regarding ideas for planting and stormwater management. Comments from community members and Town and Virginia Tech consultants were incorporated into the final design for the Commons. The final plan was presented at the MTM HOA meeting held in June 2010.



CDAC team members Ashleigh Marshall (left) and Kaitlyn Illmensee present the final concept to the HOA.

Inventory and Analysis

Through the site inventory and analysis the CDAC team was able to identify opportunities and constraints on the site as well as analyze the site conditions based on some specific requests made by the community. See the Site Inventory and Analysis Maps on the following pages for more information.

Hydrology and Vegetation

The primary goal of this project was to create a more efficient stormwater basin that also functions for recreation. It was necessary to understand the topography and direction of water flow on the site in order to retrofit the basin. In addition there are some existing trees on site that will remain, which are represented by green circles on the map on the following map.

Underground Utilities

The underground utilities created parameters that the CDAC team had to work within. First, the storm drains and their outfalls were identified (denoted with blue dashed lines). The community expressed an interest in planting a large amount of trees in the space and mature root systems can be detrimental to underground pipes. A small network of sanitary sewer and storm drains intersect the site. The CDAC team was advised that a 15 foot easement is required around all underground utilities. Existing utilities and their easements are shown with a smaller dashed line and the areas acceptable for planting are highlighted.

Soils

The Mount Tabor Meadows soil quality is optimal for the creation of the common space urban forest, playground, and dry creek bed. A suitable soil compaction reading is anywhere under 200; however under 100, which is where our soils rank, is ideal. The compaction rating break down as follows: <100= little to no compaction, 100-200= moderate compaction, 200-300= severe compaction. Based on the prior use of the site, one may assume there are likely no



Justin Boyle points out site boundaries to Ashleigh Marshall (left) and Kaitlyn Illmensee on the initial site visit.

dangerous soil contaminants.

Critical Connections

It was important to study access points for the space as well as pedestrian flow through the site. The only place for public entry to the Commons is located at the corners of Mount Tabor Road and Petra Pass. The CDAC team was aware that pedestrians from the eastern side of the development will probably not walk all the way around to the public access; rather they will make their own entrances through other properties. The purple arrows denote potential access zones. The eastern-most zone is the best place to create an entrance easement since the lot is currently not owned by an individual homeowner.

View Sheds

It was expressed by some residents, whose homes do not have a direct view to the Commons, that creating focal points in the space that were visible from their properties were desired. CDAC studied the views from homes on the back lots and were able to determine the best placement for a point of interest based on the largest amount of overlap.

Existing Barn

The community decided that they wanted to tear down the existing barn structure, so the barn was not included in any design concepts.

Hydrology & Vegetation

Mount Tabor Meadows Commons

Blacksburg Virginia



-  Existing 2' Contours
-  Existing 10' Contours
-  Existing Contours (proposed from initial site development)
-  Drainage Outlet/Inlet
-  Existing Trees
-  Hydrologic Flow



cd community design
ac assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Initial base map information provided by Altizer, Hodges, & Varney, Inc.

Underground Utilities

Mount Tabor Meadows Commons
Blacksburg Virginia



-  Sanitary Sewer
-  Stormwater
-  Acceptable Planting Zones
-  Stormdrain Inlet/Outlet



NOT TO SCALE

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Solis

Mount Tabor Meadows Commons

Blacksburg Virginia



Soil Ph

- Area 1- 7.4
- Area 2- 7.3
- Area 3- 7.8
- Area 4- 7.3

Strength/Compaction

- Area 1- 75
- Area 2- 90
- Area 3- 100
- Area 4- 125



NORTH

NOT TO SCALE

cd community design
ac assistance center

College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.



Connections and Solar South

Mount Tabor Meadows Commons

Blacksburg Virginia

-  Key Entry Points
-  Solar South
-  Potential Access Routes
-  Existing Sidewalk

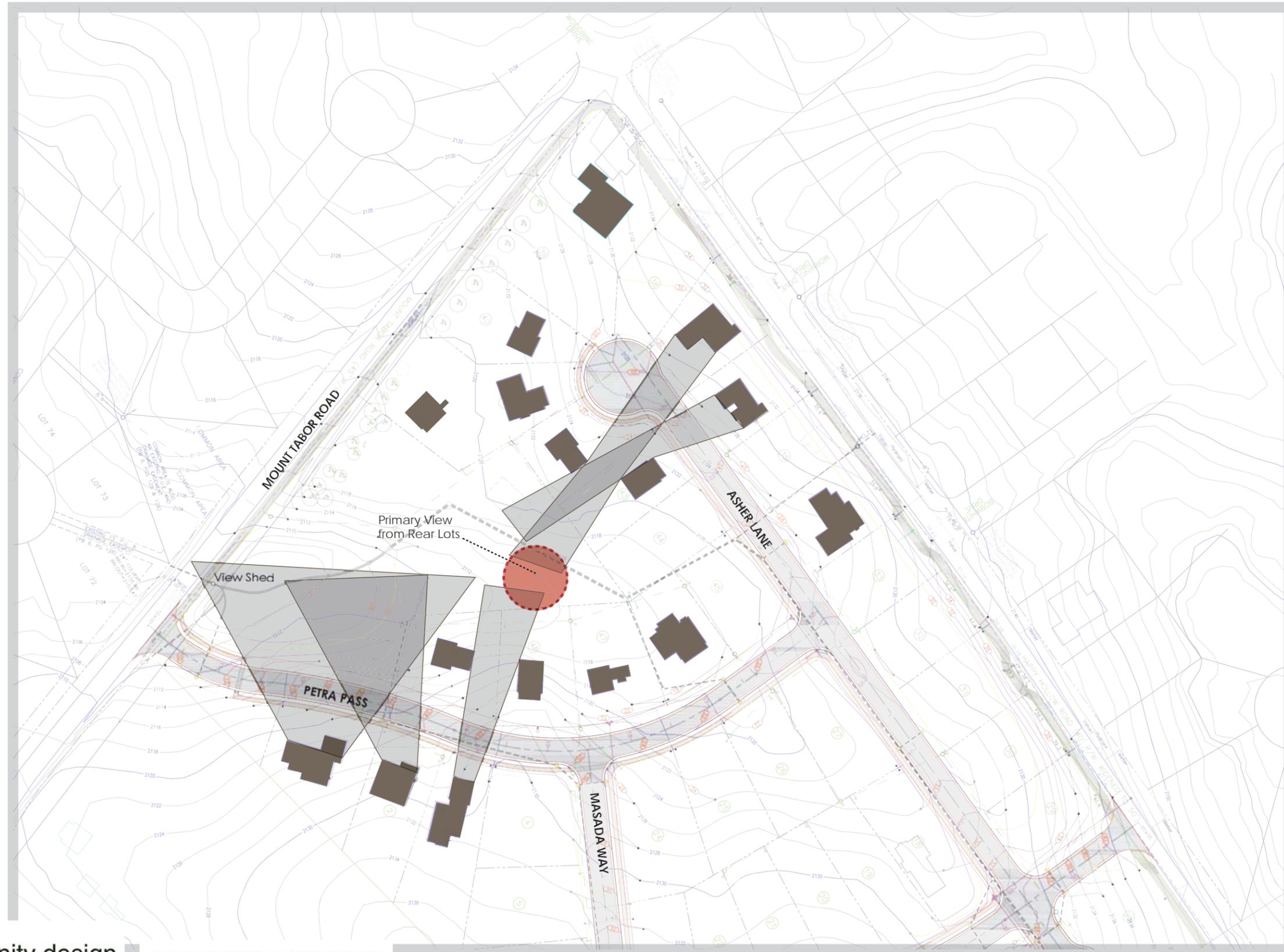


NOT TO SCALE

cd community design
ac assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Initial base map information provided by Altizer, Hodges, & Varney, Inc.



VIEWSHED ANALYSIS

Mount Tabor Meadows Commons
Blacksburg Virginia



NOT TO SCALE

cd community design
ac assistance center

College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Vision

The MTM community members held many meetings prior to enlisting the services of CDAC, in which they developed a series of criteria and visions for the common space. Four key goals for the space were agreed upon and are as follows:

Increase Stormwater Efficiency

A large portion of the site is an existing stormwater basin. The community would like to retrofit the basin in a way that would increase infiltration and decrease stormwater flows.

Create an Urban Forest

As a method for reducing runoff the community would also like to see an urban forest within the space. Native species will be used to mimic the zones of a natural forest, from the upland forest to the lower creek and river species.

Site a Playground

The playground will be a place for the neighborhood children to play and socialize. A pre-fabricated play structure is desired, but it is also necessary that the entire Common Space be a place that is friendly for outdoor recreation, exploration, and education.

Include Other Amenities

The community expressed an interest in having a covered structure to host community events and gatherings. They would also like a space designated for potential community garden spots. Community members also expressed a desire to create habitat opportunities for the barn swallows that currently nest in the old barn on site.



Creek Bed

Photo from: www.flickr.com/pandorea...



Flowering Dogwood

Photo from: www.nycgovparks.org/



Natural Play

Photo from: www.thedailygreen.com



Barn Swallow

Photo from: www.ctbirding.org

Stormwater: Existing Conditions and Options

Currently the design of the basin allows water to flow in an open channel through the Commons, as seen by the photos of the pipes and grass swale below. In order to increase infiltration the CDAC team proposed a dry creek bed channel which will not only slow down water flow with stone weirs, but will also increase ponding time to provide greater amounts of groundwater infiltration. A series of large and small weirs will maximize efficiency and reduce overflow, as well as create a dynamic landscape for exploration. The photos to the right depict the aesthetic of the dry creek bed.



Photo from: <http://www.lefflandscape.com>



Dry Creek Bed

Existing stormwater outfall pipe.



Photo from: <http://www.aila.org.au/canberragarden>

Dry Creek Bed with Foot Bridge



Existing grass swale.



Photo from: <http://www.blockandstone.com>

Dry Creek Bed with Riparian Plantings



Existing outfall pipes and overflow drain (far right).

Urban Forest: *Plant Palette*

The community hopes to create an urban forest that will provide many environmental services: stormwater management through, increased infiltration and on-site storage; shade and cooling effects; wildlife habitat; and edible foods. The idea is to mimic a Virginia Appalachian forest by using native species that would naturally occur in low areas and along water sources and transition up to an upland forest of large Oak and Beech trees. This is an opportunity to provide a beautiful, educational, and unique landscape in the commons. Some selected trees include American Beech, for its shade and tree climbing qualities and Black Willow for its high levels of root uptake. Service Tree, Paw Paw Tree, and Persimmon are not only native but provide edible fruit for people and wildlife, and Witch Hazel has wonderful winter color. Other potential species include the Red Oak, Tulip Poplar, and Flowering Dogwood.



Witch Hazel

Photo from: www.flickr.com/Studyjunkie



Service Tree

Photo from: www.flickr.com/dbarronoss



American Beech

Photo from: www.flickr.com/Baileysa115



Paw Paw Tree

Photo from: <http://www.veggiegardeningtips.com>



Black Willow

Photo from: www.flickr.com/8ran



Persimmon

Photo from: www.flickr.com/poppy2323

Playground: *Familiar and Imaginative*

Within the Commons, the community would like to have a play structure that provides a place for the neighborhood children to play and exercise their minds and bodies. While they envision a portion of the playground being a prefabricated structure, they would also like to encourage exploration into the other components of the natural space. "We want to see an integrated play space that provides transitions between the natural landscape we are creating, and the physical playground. We have chosen a structure that continues with this natural aesthetic, and plan to construct additional features (i.e. natural tunnel) to weave the hardscape into the overall landscape" (Beth Lohman, MTM resident). Below are examples of the types of character desired by MTM for play equipment.



Natural Tunnel

Photo from: Boxerwood Nature Center

Exploration Logs



Photo from: <http://playgrounddesigns.blogspot.com>



Play Naturally, Landscape Structures, Inc.

Photo from: www.playlsi.com

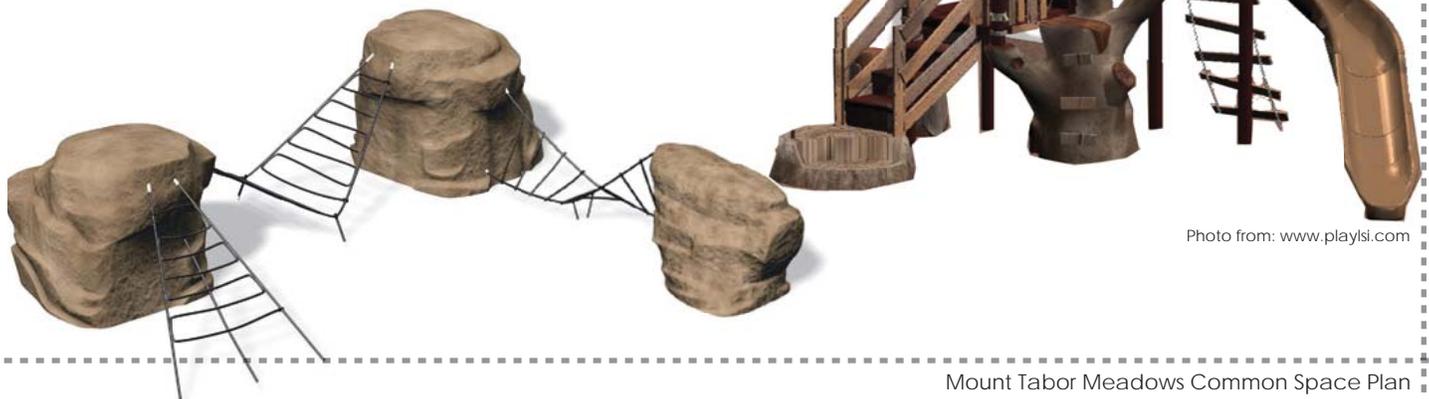


Photo from: www.playlsi.com

Amenities: Structure and Gardens

Additional site amenities such as a community shelter and community gardens are desired by MTM. The shelter would serve as a place for picnics and other community events and the gardens would be a place for residents to grow and share the joy of growing one's own vegetables with neighbors.



Garden Plot

Photo from: www.flickr.com/Sobajac



Garden Plot

Photo from: www.flickr.com/gardeninginaminute



Garden Plot

Photo from: www.flickr.com/wetgraphite



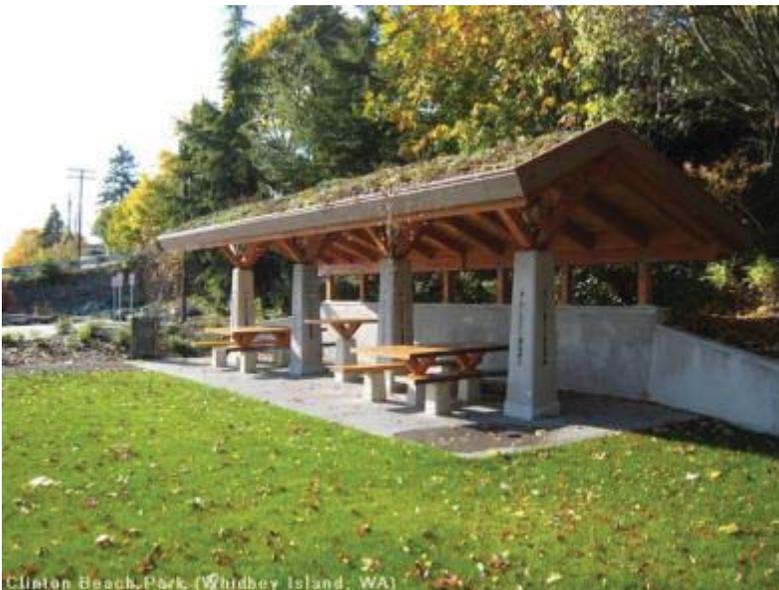
Picnic Shelter

Photo from: www.flickr.com/bballchico



Community Gardens

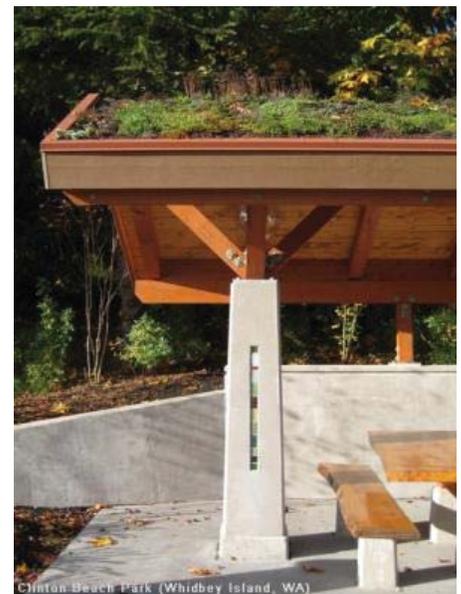
Photo from: www.flickr.com/Pogorita



Clinton Beach Park (Whidbey Island, WA)

Green Roof Shelter

Photo from: Clinton Beach Park



Clinton Beach Park (Whidbey Island, WA)

Photo from: Clinton Beach Park

Conceptual Layout

After conducting the initial site analysis and brainstorming concept ideas, the CDAC team developed a series of conceptual diagrams to illustrate various potential site layouts and stormwater approaches for the site. Each conceptual diagram designates a space for the playground, community space, and walking trail. Aspects of the diagrams are interchangeable and were intended to serve as a talking point for the community meeting.

Concept A: Bioretention Terraces

The bioretention terraces would be a series of stone walls, with overflow weirs designed to create pools of water to allow for maximum water infiltration. Any water beyond capacity would simply flow through the weirs and out of the basin as it is currently doing. The areas of green on the 11x17 pullout on page 17 represent the location urban forest component of the vision, avoiding the underground utilities easements.

Concept B: Dry Creek Bed

The dry creek bed is an enhancement of the current grass swale on the site. By creating a longer and more curvaceous channel, the water will have more time to absorb into the earth. The creek bed would be planted with plants specified for bioretention, meaning they have a high tolerance to drought and inundation and have the ability to absorb large amounts of water. This concept also suggests creating a rain garden at the community shelter to serve as a demonstration for collecting roof runoff. The rain garden would also be a starting point for the meandering creek bed. There is also a space designated on the upper western portion of the site for community gardens.



Bioretention Terraces

Photo from: Andropogon Associates



Creek Bed

Photo from: www.flickr.com/SchmidtDesign Group

Conceptual Layout: cont.

Concept C: Level Spreader

The level spreader works similarly to the bioretention terraces, only it would be installed in a much more naturalized form. This concept also suggests placing the community gardens in the small space on the southwestern edge of the site. This area has a slight slope that could be a great place for terraced planting beds. One draw back would be having the gardens adjacent to the main entry, as they have a more informal aesthetically, especially in the non-growing season.

Concept D: Creek Bed with Check Dams

This version of the dry creek bed looks at adding several meandering branches to the main swale and also a series of small check dams. The check dams would be a mound of stone placed in the bed perpendicular to the swale, and at the sizing specifications of the Virginia Department of Conservation and Recreation. The check dams serve as a way of slowing down the flow of water. In a large storm event they would be highly effective in increasing infiltration. In Concept D, the community space and the gardens are integrated with each other.

Outcome:

The CDAC team received valuable comments and feedback from community members in April related to the analysis and initial concepts. This feedback was used to help in create two refined conceptual alternatives. The community agreed that the dry creek bed concept was their favorite stormwater concept and that they would like to see the playground and community space integrated, with the community gardens being a separate entity.

11x17 pullouts of the four conceptual diagrams can be found on the following pages.

Concept A

Bioretention Terraces

Mount Tabor Meadows Commons

Blacksburg Virginia



- Urban Forest
- Community Space
- Play Area
- Existing Sidewalk
- Walking Trail
- Conceptual Stormwater Treatment
- N NORTH
- NOT TO SCALE

cd community design
ac assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Concept B

Dry Creek Bed

Mount Tabor Meadows Commons

Blacksburg Virginia



- Urban Forest
- Community Space
- Play Area
- Existing Sidewalk
- Walking Trail
- Conceptual Stormwater Treatment



NORTH

NOT TO SCALE

cd community design
ac assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Initial base map information provided by Altizer, Hodges, & Varney, Inc.

Concept C

Level Spreader

Mount Tabor Meadows Commons

Blacksburg Virginia



- Urban Forest
- Community Space
- Play Area
- Existing Sidewalk
- Walking Trail
- Conceptual Stormwater Treatment
- Potential Access Points
- ▲ NORTH
- NOT TO SCALE

cd community design
ac assistance center

College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Concept D

Creek Bed with Check Dams

Mount Tabor Meadows Commons
Blacksburg Virginia



- Urban Forest
- Community Space
- Play Area
- Existing Sidewalk
- Walking Trail
- Conceptual Stormwater Treatment



NORTH

NOT TO SCALE

cd community design
ac assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Initial base map information provided by Altizer, Hodges, & Varney, Inc.

Conceptual Development

The CDAC team developed two conceptual master plans exploring specific components and their layout on the site.

Conceptual Master Plan A

In this version of the Commons, a single channel creek bed is proposed, beginning with a rain garden at the eastern-most corner of the site, and meandering through the site to end at a large rain garden on the lowest point of the site. The community gardens are located on a flat high point near the current model home. The community shelter is located centrally on the site with the playground adjacent to it on a flat high point as well. Climbing boulders and the natural tunnel are located in the open space around the shelter to create a transition of the playground into the other portions of the site and to further integrate the two spaces. In an effort to make the playground a place that is also adult friendly, an arbor designed to hold porch swings is proposed to provide adults with a place to sit while children are playing. The tree plantings in this concept are less dense, allowing for more native grasses and open space.

Conceptual Master Plan B

Conceptual Master Plan B proposes a creek bed with two channels and areas for ponding created with stone weirs, as were proposed in Layout D. The community gardens are located in the same place as Plan A. The shelter is located adjacent to the rain garden at the beginning of the creek bed to allow for collecting the roof runoff in the rain garden. This could serve as demonstration for rain garden application for homeowners in the community. The playground is located in the same area, as it is the most suitable location, but the natural transition play features are distributed over a larger area in hopes of encouraging exploration of the creek bed and urban forest corridor. A trail with small foot bridges helps to encourage this as well.

11x17 pullouts of Conceptual Master Plans A & B can be found on the following pages.



Key

Utilities Setback Typ. -----

Small Tree

Medium Tree

Large Tree



NORTH
Not to Scale

Mount Tabor Meadows, Blacksburg Virginia Conceptual Master Plan A

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.



College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University



Not to Scale

Mount Tabor Meadows, Blacksburg Virginia Conceptual Master Plan B

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Initial Base Map Information Provided By: Altizer Hodges & Varney Inc.



College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

Final Conceptual Master Plan

The Final Conceptual Master Plan is the culmination of design ideas and feedback from the community and Blacksburg Town Staff. Feedback and comments from community members helped to determine the location of various amenities, in addition to some constraints determined in the analysis phase of the project.

The master plan contains all the amenities that the community requested including a urban forest, community gathering area, walking loop, playground, and community garden space. Native plants offer seasonal value and edible landscape opportunities. The braided dry creek bed offers additional opportunities for stormwater storage and management and also creates visual interest in the space. Proposed barn swallow houses fit nicely in the natural environment. Educational signage highlights the best management practices and describes the zones of an Appalachian forest mimicked in the Commons.

An 11x17 pullout of the Final Conceptual Master Plan can be found on the next page with a number key locating and describing each item on the plan. Supporting sketches can be found on page 26.

KEY

- 1 Dry Creek Bed
- 2 Stone Weir
- 3 Storm Drain Outfall
- 4 Foot Bridge
- 5 Walking Trail
- 6 Meadow Grasses
- 7 Community Garden
- 8 Climbing Boulders
- 9 Natural Tunnel
- 10 Playground
- 11 Arbor with Porch Swings
- 12 Community Shelter
- 13 Demonstration Rain Garden
- 14 Connection to Woodbine
- 15 Future Public Bike Path Connection
- 16 Maintained Turf Grass
- ★ Educational Signage
- 🏠 Barn Swallow Housing



**Mount Tabor Meadows
Final Conceptual Master Plan**

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.
Initial Base Map Information Provided by: Altizer Hodges & Varney Inc.



College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

Site Sketches

A Playground

The Tree House (Landscape Structures Inc., a partner of Kaboom) is an example of a pre-fabricated structure that could be purchased for the site. The design of this structure works with the natural theme of the play space. Surrounding the playground is a porch swing/arbor design that will serve as place of relaxation and conversation for adults and children. An small grove of American Beech and Red Oak trees surround the common space and act as a screen for adjacent homes. The Beech tree sited near the playground because of its branching structure - to provide future climbing opportunities for neighborhood children.

B Natural Tunnel

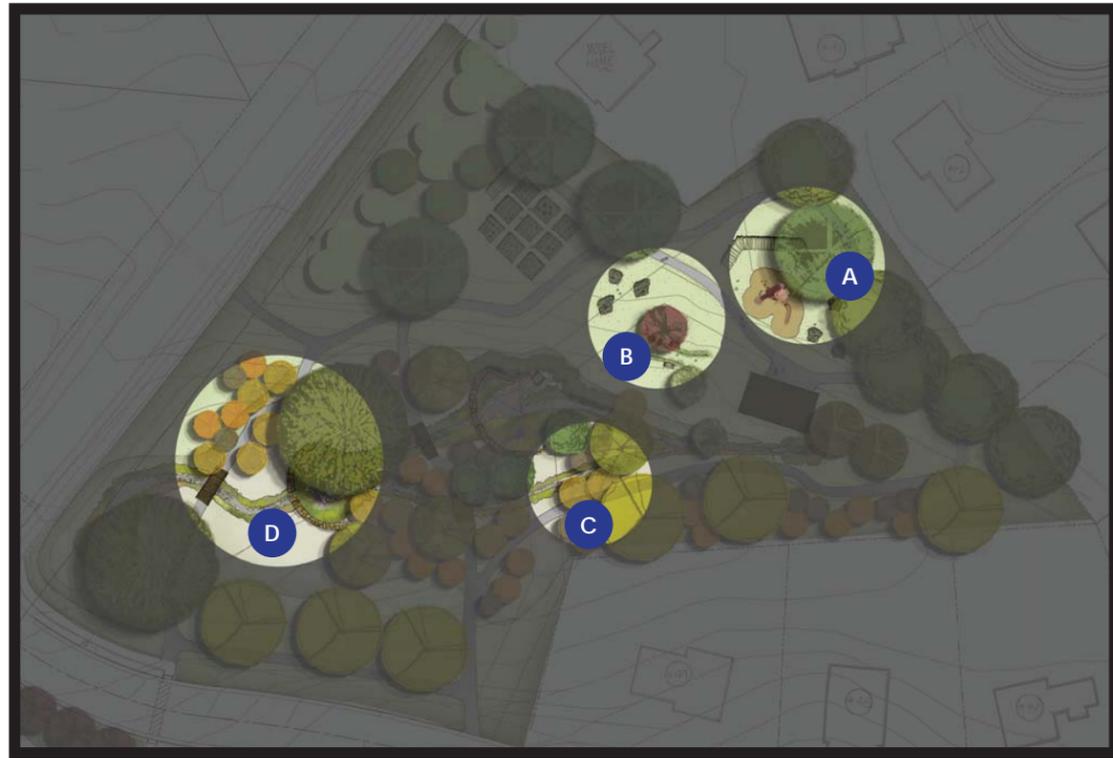
Sketch B depicts some of the more natural play options in the community space. The tunnel is an inexpensive play feature that encourages creative play, different from the traditional playground. The structure could be constructed out of corrugated plastic pipe and covered with existing dirt and turf to create a tunnel and land bridge feature. The proposed boulders create additional spaces to climb throughout the play space and can be constructed using rocks found on site.

C Creek Bed

The dry creek bed provides an both aesthetic and environmentally beneficial feature in the common space. The addition of check dams and ponding areas along the creek bed will allow for increased infiltration and reduced stormwater flow speed. Dense plantings of wildflowers, native grasses, and small shrubs will help slow water, reduce erosion, and uptake water through the plants.

D Pathway

Stretching just over a ¼ mile through the site is a permeable crushed stone pathway that provides an exercise opportunity as well as a stage to experience the common space. Walking along the trail, users can learn about the stormwater management, the urban forest, creek bed vegetation, and wildlife. Three wooden foot bridges are found along the pathway providing access over the creek beds while allowing users to engage in the natural system.



A



D



B

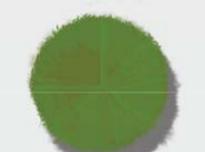
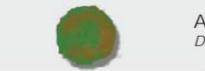


C

Planting Options

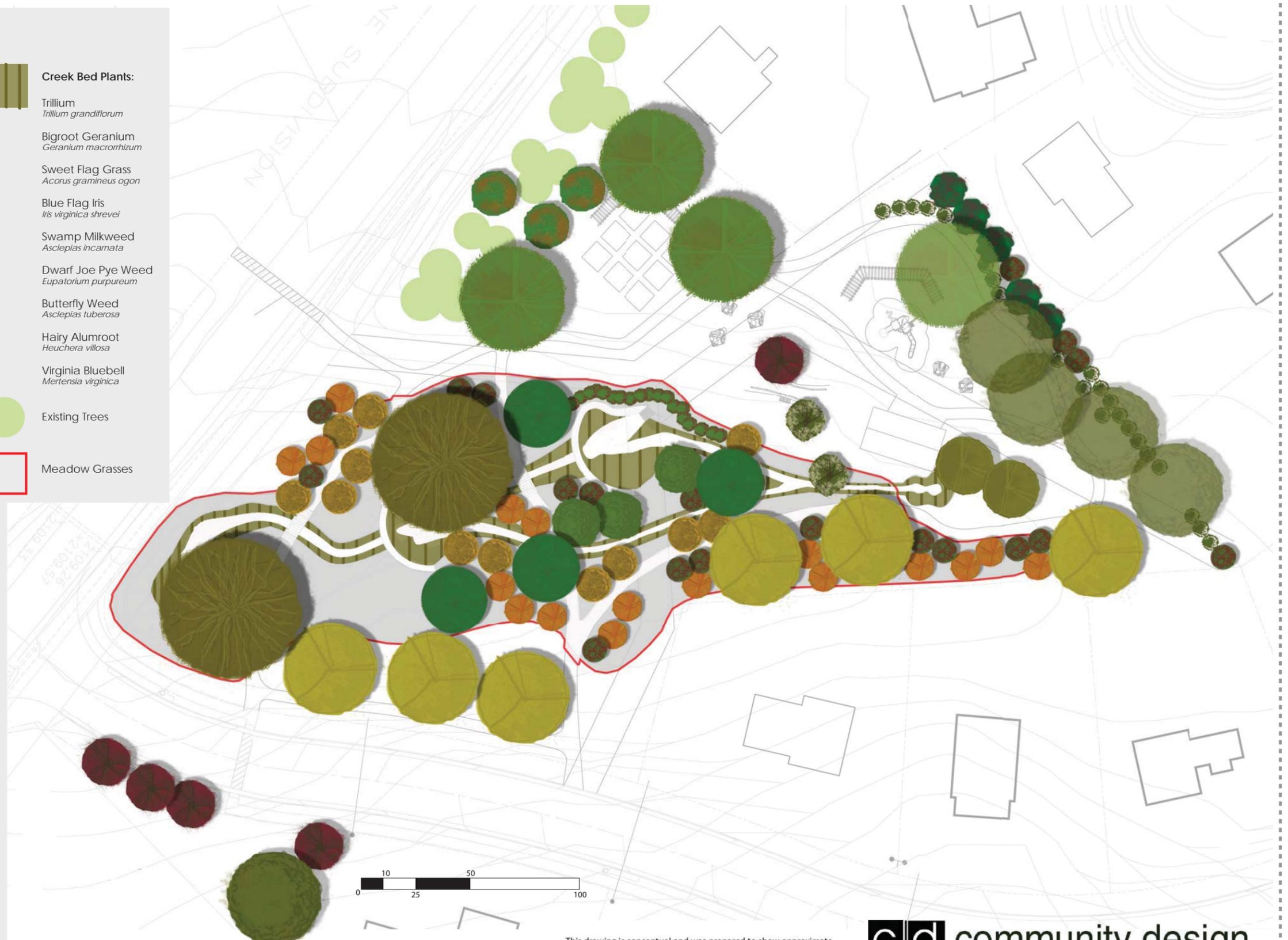
In order to achieve the desired urban forest, plant selection was very important in the design process. The CDAC team selected plants that will not only be beneficial to the landscape in terms of shade, cooling, and root uptake, but also for creating a native and beautiful natural forest landscape. The proposed planting plan for MTM can be found on page 29. The subsequent pages highlight the suggested species and some of their characteristics.

KEY

-  Black Willow
Salix nigra
-  American Beech
Fagus grandifolia
-  Tulip Poplar
Liriodendron tulipifera
-  Red Oak
Quercus rubra
-  Yellow Birch
Betula alleghaniensis
-  Southern Catalpa
Catalpa bignonioides
-  Paw Paw
Asimina triloba
-  American Persimmon
Diospyros virginiana
-  Eastern Redbud
Cercis canadensis
-  Flowering Dogwood
Cornus florida
-  Witchhazel
Hamamelis virginiana
-  Flame Azalea
Rhododendron calendulaceum
-  American Holly
Ilex opaca 'Jerzy Knight'
-  Serviceberry
Amelanchier spp.
-  Rugosa Rose
Rosa rugosa.
-  Sweetspire
Itea virginica

Note: Tree symbols represent approximate mature size.

-  **Creek Bed Plants:**
-  Trillium
Trillium grandiflorum
-  Bigroot Geranium
Geranium macrorrhizum
-  Sweet Flag Grass
Acorus gramineus ogon
-  Blue Flag Iris
Iris virginica shrevei
-  Swamp Milkweed
Asclepias incarnata
-  Dwarf Joe Pye Weed
Eupatorium purpureum
-  Butterfly Weed
Asclepias tuberosa
-  Hairy Alumroot
Heuchera villosa
-  Virginia Bluebell
Mertensia virginica
-  Existing Trees
-  Meadow Grasses



Mount Tabor Meadows Conceptual Planting Plan

This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change and is not intended to replace the use of construction documents. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Initial Base Map Information Provided By: Altizer Hodges & Varney Inc.



College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

Service Berry

Amelanchier spp.

Zone 4, full sun,
Small to large shrub (can
prune to tree form), 4-6 ft.
x 10-15 ft.

Hardy and adaptable,
early flowering, red to or-
ange foliage in fall, edible
fruit, naturally found at
forest edges.



Photo from: <http://www.flickr.com/esywkr>



Photo from: www.stonegategardensinc.com

Paw Paw

Asimina triloba

Zone 5b, full sun/part
shade

Medium size suckering
tree, 20-35ft. x 20-35ft.
Understory tree found
near stream banks, edible
fruit



Photos from: www.npsnj.org

Yellow Birch

Betula alleghaniensis

Zone 4, full sun,
Small to large shrub (can
prune to tree form), 4-6 ft.
x size desired.

Hardy and adaptable,
early flowering, red to or-
ange foliage in fall, edible
fruit, found at edges.



Photo from: <http://www.flickr.com/ecodoug>



Photo from: calphotos.berkeley.edu

Southern Catalpa

Catalpa bignonioides

Zone 5, full sun/partial
shade
Large Tree; 30-40ft. x 30-
40ft.

Beautiful flowers in late
May. Very tolerant of dif-
ferent soil conditions and
can take alkaline soil, may
be difficult to purchase.



Photo from: www.city-data.com/knoxville



Photo from: <http://upload.wikimedia.org>

Eastern Redbud

Cercis canadensis

Zone 4, full sun/shade
Small Tree 20-30ft. x 25-35ft.

Adaptable to pH, good in many soil types (except very wet), beautiful flowers in early spring.



Photo from: <http://www.flickr.com/karisrene>



Photo from: gardenofpossibilities.files.wordpress.com

Flowering Dogwood

Cornus florida 'Cherokee Sunset'

Zone 5, full sun/partial shade, moist soil,
Small Tree 15-20ft. x 15-20ft.

Excellent vigor and resistance to anthracnose, good fall color from pink to red/purple.



Photo from: <http://www.flickr.com/donsutherland1>



Photos from: www.ppd.l.purdue.edu

American Persimmon

Diospyros virginiana

Zone 5, full sun,
Large Tree can sucker, 50-75ft. x 50-75ft.
Edible fruit, grows well in poor sandy soil and is a early mid-succession species.

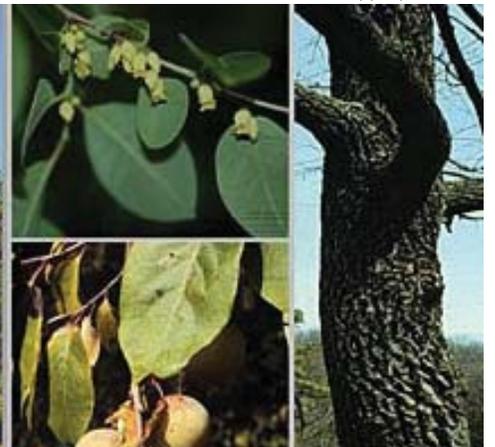


Photo from: www.tva.gov

American Beech

Fagus grandifolia

Zone 4, full sun,
Large Tree, 90-100ft. x 50-75ft.

Large muscular trunk, good for climbing, excellent shade tree



Photo from: <http://www.flickr.com/ledges>

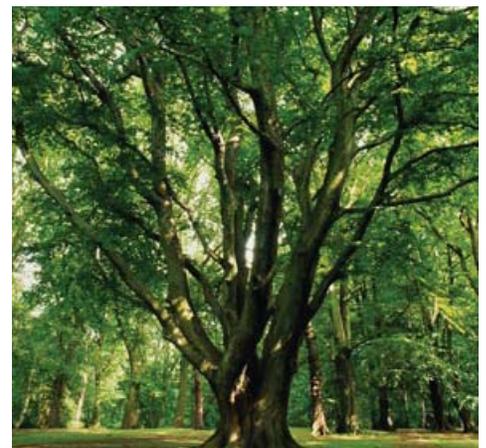


Photo from: www.tvhs.k12.vt.us

Witch Hazel

Hamamelis virginiana

Zone 3b, full sun/shade
prefers moist stream banks
Small Tree 20-30ft. 20-25 ft.
Beautiful yellow, fragrant
flowers in fall.



Photo from: www.flickr.com/Studyjunkie



Photo from: awaytogarden.com

American Holly

Ilex opaca 'Jerzy Knight'

Zone 5b, part shade/part
sun
Small Tree, 35-50ft.x 15-25
ft.
Evergreen, showy red ber-
ries in winter



Photo from: <http://www.flickr.com/neal1960>



Photos from: <http://www.talltreesgroup.com>

Sweetspire

Itea virginica

Zone 5, full sun,
Large Tree can sucker, 50-
75ft. x 50-75ft.
Edible fruit, grows well in
poor sandy soil and is a
early mid-succession spe-
cies.



Photo from: <http://www.flickr.com/whitebuffalobk>



Photo from: www.finegardening.com

Tulip Poplar

Liriodendron tulipifera

Zone 4, full sun, pH adapt-
able
Loves deep well drained
loam, slightly acidic soil,
fast growing
Large Tree: 70-90ft. x 35-
50ft.
Beautiful in large group-
ing, good fall color (yel-
low).



Photo from: <http://www.flickr.com/domesticateddiva>



Photo from: www.life.illinois.edu

Red Oak

Quercus rubra

Zone 3b, full sun
low pH soils, fast growing
Large Tree: 50-65 ft. x 50-65ft

Nuts for wildlife
Excellent tree when properly grown.



Photo from: www.flickr.com/lamnothamiet



Photo from: awaytogarden.com

Flame Azalea

Rhododendron calendulaceum

Zone , full sun to part shade

Medium shrub, 8ft.x 8ft.
Showy yellow to red orange flowers in late spring to summer, prefers higher acidic soil of 4.5-5.5 pH



Photo from: fragmentsfromfloyd.com



Photos from: www.flickr.com/bradwilson, dvm

Rugosa Rose

Rosa Rugosa

Zone 5, full sun,
Large Tree can sucker, 50-75ft. x 50-75ft.
Edible fruit, grows well in poor sandy soil and is a early mid-succession species.



Photo from: www.kolibrikerteszet.hu



Photo from: www.finegardening.com

Black Willow

Salix nigra

Zone 2, full sun,
Large Tree, 45ft.-70ft. x 45ft.-70ft.
Excellent for absorbing ground water



Photo from: www.duke.edu/~cwcook/trees/



Photo from: www.life.illinois.edu

Creek Bed Plants

The dry creek bed is designed to be an 8-10 ft. wide channel with a 2-4 foot wide rock lined swale in the center. The remainder of the channel should be densely planted with hearty plant material that can withstand periods of drought as well as inundation. The list of plants CDAC has compiled are naturally occurring creek bed plants.

Sweet Flag Grass

Acorus gramineusogon

Zone 4-8, full sun -part shade

Size: 24-36"

Requires moist soils, should be located in the lowest areas within the creek bed.



Photo from: www.smpl.org



Photo from: www.bloomriver.com

Swamp Milkweed

Asclepias incarnata

Zone 3-9, full sun to part sun

Size: 2'-4'

Attracts butterflies and, requires average to dry soils and should be located in higher areas of the creek bed.



Photo from: www.robsplants.com



Photo from: <http://pics.davesgarden.com>

Butterfly Weed

Asclepias tuberosa

Zone 3-9, full sun to part sun

Size: 3'-5'

Attracts butterflies and larvae, requires average to dry soils and should be located in higher areas and around edges of the creek bed



Photo from: www.main.nc.us/graham/wildflowers



Photo from: www.missouriplants.com

Joe Pye Weed

Eupatorium purpureum

Zone 5-10, full sun

Size: 2' -6'

Requires moist soils and should be located in the bottom of the creek bed, flowers pale pink to purple in July-September



Photo from: www.flickr.com/annemiel



Photo from: <http://thymeafterthyme.com>

Bigroot Geranium

Geranium macrorrhizum

Zone 3-8, full sun to part shade

Size: 8" -1'

Low growing, spreads, blooms April- July purple-deep red, can be placed on banks of creek bed.



Photo from: www.flickr.com/lesprecieuxdonnes



Photos from: www.pflanzenreich.com

Hairy Alumroot

Heuchera villosa

Zone 4a-9b light shade to full shade

Size: 6" - 12"

Sometimes called Coral Bells, many color varieties Very drought tolerant, blooms, late summer, early fall



Photo from: www.flickr.com/gardenessupply



Photo from: hechtgarden.blogspot.com

Blue Flag Iris

Iris virginica shrevei

Zone: 3a-10a, full sun to partial shade

Size: 2' -3'

Requires moist soil, so should be located in the bottom of the creek bed. Blooms mid-season, blue to purple flowers.



Photo from: <http://wisplants.uwsp.edu>



Photo from: www.flickr.com/jerryoldenette

Virginia Bluebell
Mertensia virginica

Zone: 3a-9b, partial to full shade

Size: 18" -24"

Blooms light blue clusters in mid spring, need moist soil, plant in bottom areas of the creek bed.



Photo from: <http://fatherpitt.files.wordpress.com>



Photo from: <http://www.bellewood-gardens.com>

Trilium
Trilium grandiflorum

Zone: 4-9 part shade to full shade

Size: 12" -18"

low growing naturalizing ground cover, requires medium moisture, should be planted in the lower portions of the creek bed.



Photo from: <http://www.angliabulbs.com>

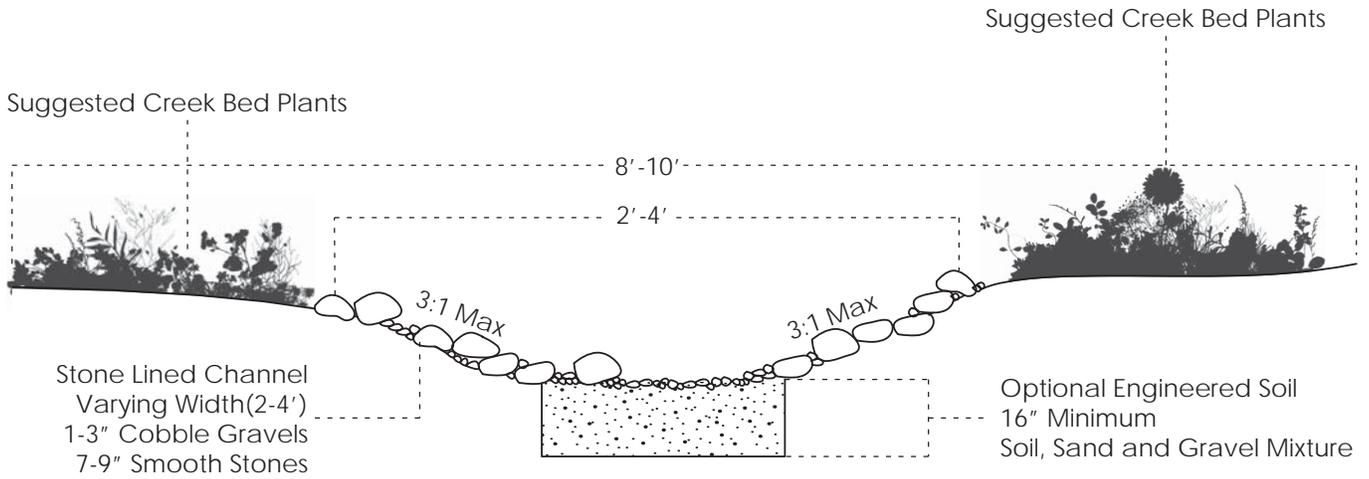


Photos from: <http://www.srgc.org.uk>

Creek Bed Construction Details

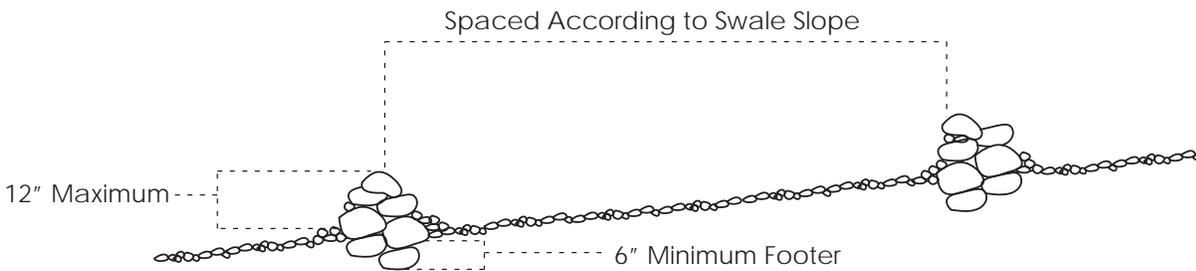
Dry Creek Bed

Typical Section



Check Dam

Typical Section

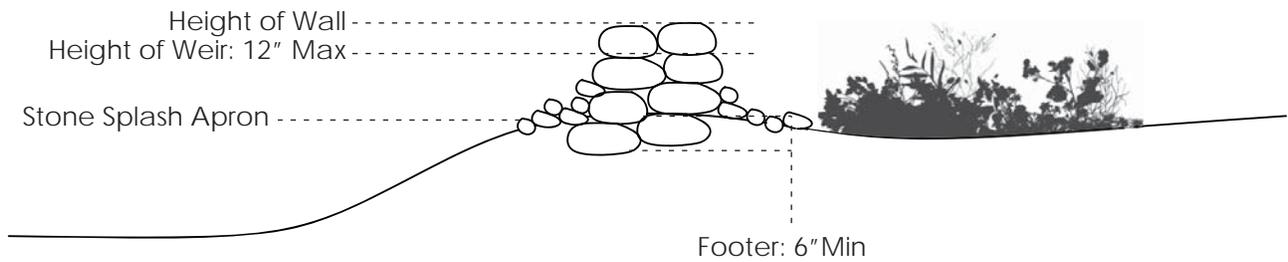


*Check Dams are required when slope of swale is greater than 2.5%.

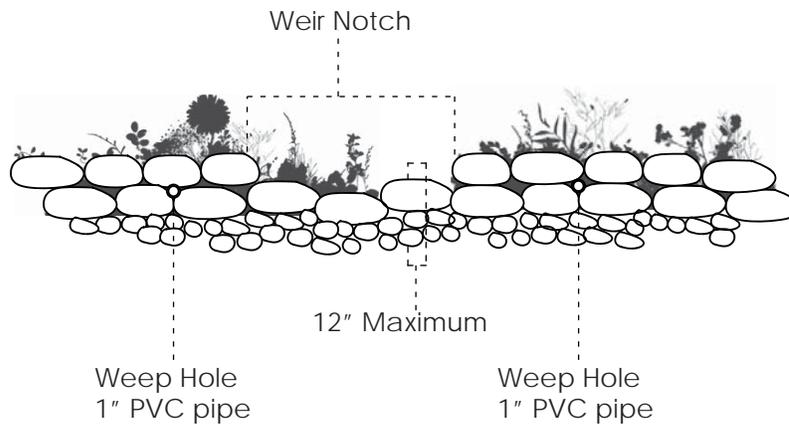
These suggested details are designed based on the Virginia Department of Conservation and Recreation (DCR)'s specifications for Dry Swales. See Appendix B for more information.

Stone Weir
Typical Section

The Stone Weir walls are designed to define larger areas of ponding on the site. The walls are constructed of various size stone and gravel and stacked sturdily but with some holes to allow water to pass gently through. In addition, 1 inch PVC pipe weep holes should be incorporated. Some stone found on the site during recent construction could be re-purposed here. The wall height should be a maximum of 12 inches.



Stone Weir
Typical Elevation



Conclusion

The CDAC team submits this final report and conceptual design for the Mount Tabor Meadows Common Space, with the hope that the implemented design will serve as a place for recreation, education, natural beauty and be a conscious effort toward increasing environmental stewardship in the community. The new common space will be a place that is not only fun to use and beautiful to look at but, it will serve as an example of designing natural systems and their services for the surrounding communities.

Appendices

Appendix A.....Plant Schedule and Alternatives

Appendix B.....DCR Specifications for Dry Swales

Appendix C.....Kaboom Design Competition

Appendix D.....Sun Study

Appendix E.....Barn Swallow Housing

Appendix A: Plant Schedule and Alternatives

Botanical Name	Common Name	Quantity	Size	Notes	Alternatives
Amelanchier spp.	Serviceberry	19	Bare root. Serviceberry is fast growing so small sizes are okay	Multi-trunked or standard trunk are options; Specify which one is desired when ordering.	
Asimina triloba	Paw Paw	3	whatever is available	May be difficult to find. Difficult to transplant. Two (male and female) are needed if fruit is desired. http://www.crfg.org/pubs/ff/pawpaw.html provides good information about cross-pollination and cultivars. www.ediblelandscaping.com carries these, the largest size they offer being 3 gal. container plants.	
Betula alleghaniensis	Yellow Birch	4	container or B & B	May be difficult to find and perhaps slow to establish. Soil needs to be uncompacted--that is important for long term survival. Careful post establishment irrigation is important.	Black (Sweet) Birch - <i>Betula lenta</i>
Catalpa bignonioides	Southern Catalpa	2		Availability may be limited	Yellowwood (<i>Cladrastis kentuckea</i>) would have a similar crown shape, size and bloom time. Though it is a larger tree, bigleaf magnolia is a large-leaved flowering native (<i>Magnolia macrophylla</i>).
Cercis canadensis	Eastern Redbud	5	B&B is desirable; bare root is cost effective and may also work	b and b is desirable. Bare root might work (look up in Dirr) and would be cheaper. Dirr notes b&b and container plants. <i>Creating the Urban Forest: The Bareroot Method</i> from Cornell notes this is a moderately difficult species to transplant as bareroot, though fall planting increases success.	
Cornus florida	Flowering Dogwood	2	container or B&B		
Diospyros virginiana	American Persimmon	3	Container plant is desirable	Available for order online if not easily located in nurseries.	
Fagus grandifolia	American Beech	5	B and B and decent size probably desirable (2-3 inch caliper)		<i>Fagus sylvatica</i> . If native trees are a higher priority than having a Beech, <i>Quercus rubra</i> (red oak), <i>Quercus alba</i> (white oak) are good alternatives.
Hamamelis virginiana	Witchhazel	12	container or B&B; Suggested height - 3 to 5 feet tall, depending on cultivar	Find out if on own roots or is grafted. If not a cultivar or is on own roots, you won't have to worry about post planting pruning.	
Ilex opaca 'Jersey Knight'	American Holly	5	container or B&B	Dirr recommends using a cultivar; 'Dan Fenton', 'Farage' and 'Old Heavy Berry' are given good remarks. Of course, selection will depend on what's available.	
Itea virginica	Sweetspire	22	container or B&B	Make sure pH is below 7 or preferably 6.5	
Liriodendron tulipifera	Tulip Poplar	6		Best to avoid bare root--as it can desiccate easily. Fast growing	
Quercus rubra	Red Oak	4	b and b is best 2-3 inch caliper		

Botanical Name	Common Name	Quantity	Size	Notes	Alternatives
Rhododendron calendulaceum	Flame Azalea	17	container	Can be difficult to establish. Availability may be limited. Make sure compaction is very low and post transplant irrigation maintained for at least 2 growing seasons. Meadowbrook Nursery (www.we-du.com) in North Carolina has these, 1 gal. through mail order, 3 gal. if you want to pick it up at their nursery.	Fothergilla (Fothergilla major 'Mt. Airy') will have white flowers in early spring and excellent fall color. Another idea would be oakleaf hydrangea (Hydrangea quercifolia 'Snow Queen' or 'Alice') which has generous white blooms in early summer and good burgundy fall color.
Rosa Rugosa	Rugosa Rose	18		Very tough plant	
Salix nigra	Black Willow	2	bare root, container, or B&B	Very tough plant	Weeping Willow- Salix babylonica
Creek Bed Plants					
Acorus gramineus ogon	Sweet Flag Grass				
Asclepias incarnata	Swamp Milkweed				
Asclepias tuberosa	Butterfly Weed				
Eupatorium purpureum	Dwarf Joe Pye Weed				
Geranium macrorrhizum	Bigroot Geranium				
Heuchera villosa	Hairy Alumroot				
Iris virginica shrevei	Blue Flag Iris				

Appendix B: DCR Specifications for Dry Swales

As the Mount Tabor Meadows community continues to grow, stormwater infiltration will be increasingly important. The DCR specifications for Dry Swales is an excellent tool to be used to insure proper design of the Dry Creek Bed which is included in the MTM Commons design. The full version of the DCR specifications can be viewed online at www.dcr.virginia.gov

VA DCR STORMWATER DESIGN SPECIFICATION NO. 10

DRY SWALES

VIRGINIA DCR STORMWATER DESIGN SPECIFICATION No. 10

DRY SWALES

VERSION 1.8
April 13, 2010



SECTION 1: DESCRIPTION

Dry swales are essentially bioretention cells that are shallower, configured as linear channels, and covered with turf or other surface material (other than mulch and ornamental plants).

The dry swale is a soil filter system that temporarily stores and then filters the desired Treatment Volume (T_v). Dry swales rely on a pre-mixed soil media filter below the channel that is similar to that used for bioretention. If soils are extremely permeable, runoff infiltrates into underlying soils. In most cases, however, the runoff treated by the soil media flows into an underdrain, which conveys treated runoff back to the conveyance system further downstream. The underdrain system consists of a perforated pipe within a gravel layer on the bottom of the swale, beneath the filter media. Dry swales may appear as simple grass channels with the same shape and turf cover, while others may have more elaborate landscaping. Swales can be planted with turf grass, tall meadow grasses, decorative herbaceous cover, or trees.

Appendix C: Kaboom Grant Competition

During the course of the design process, MTM community members discovered a grant competition sponsored by Kaboom.org, a national non-profit playground provider. The design competition required the community to create a webpage on Kaboom.org in which community members could become members of the project and support the process, write comments and ideas on the discussion board and ultimately convey the vision for the Commons. The grand prize for the competition was up to a \$5000 discount to be used to purchase new playground equipment. The CDAC team helped to organize the website, provided the necessary drawings and support for the community. The competition was judged by a celebrity panel of designers and citizens, including Miss America. The MTM Commons was selected as a finalist and then a national voting contest ensued. MTM finished first.

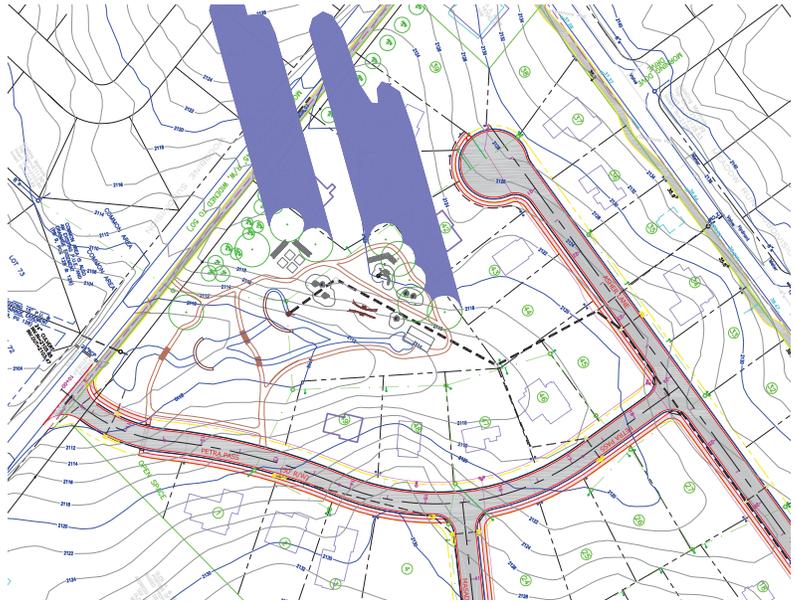
The Kaboom contest was not only a way to raise funding for the playground equipment, but it was an excellent means to help get the community involved and informed in the work that was happening related to the MTM Commons. Many individuals from the surrounding area became involved in the project and it also received some media recognition. The Roanoke Time, NRV Current and News Channel 10 all featured the competition at some point.



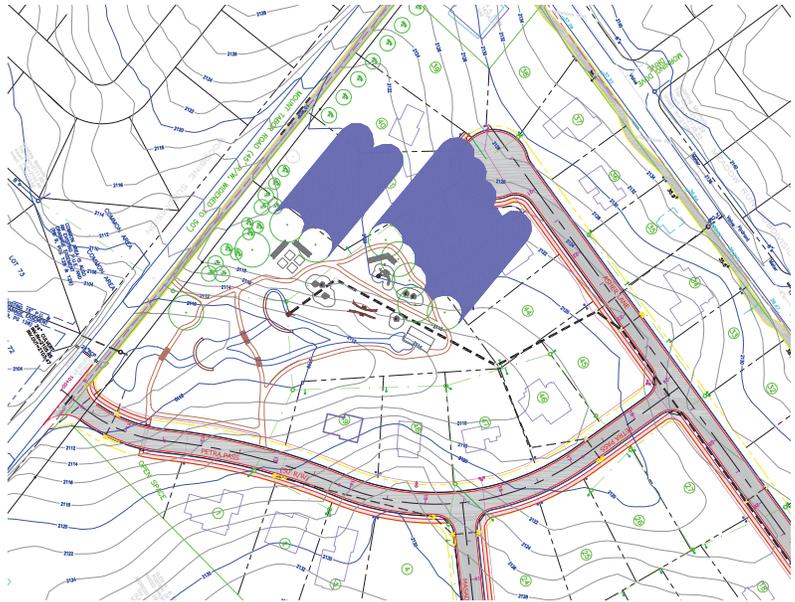
CDAC team members Kaitlyn Illmensee (left) and Ashleigh Marshall (center) work with MTM children during a charrette, in which they drew pictures and listed components they wanted to see included in a new playground.

Appendix D: Sun Study

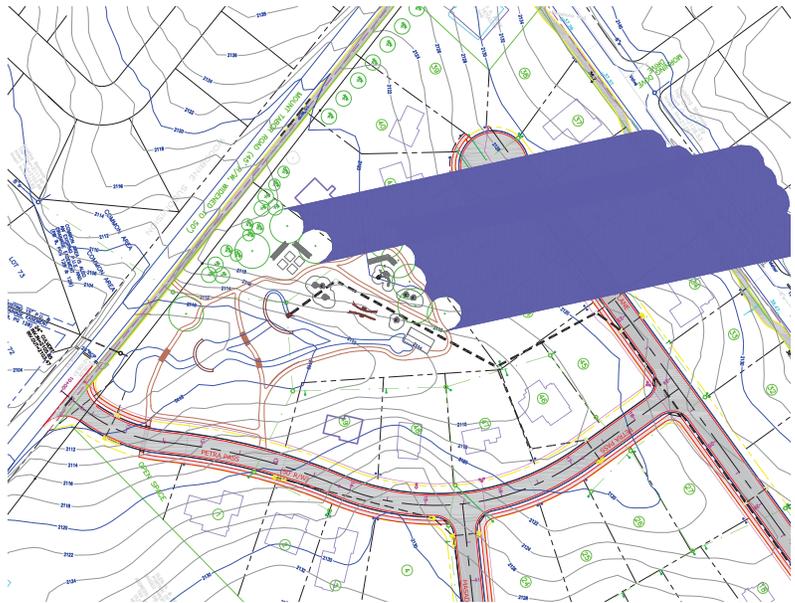
December 9AM



December 1 PM

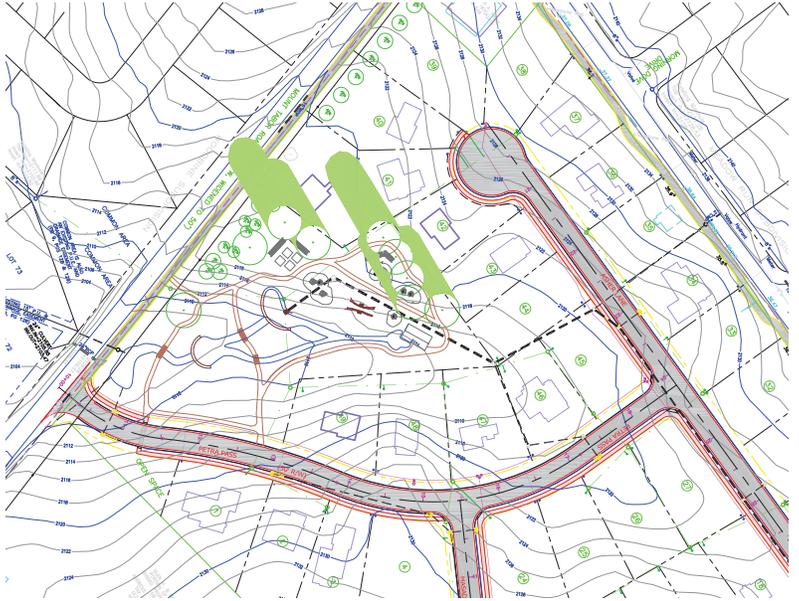


December 4 PM

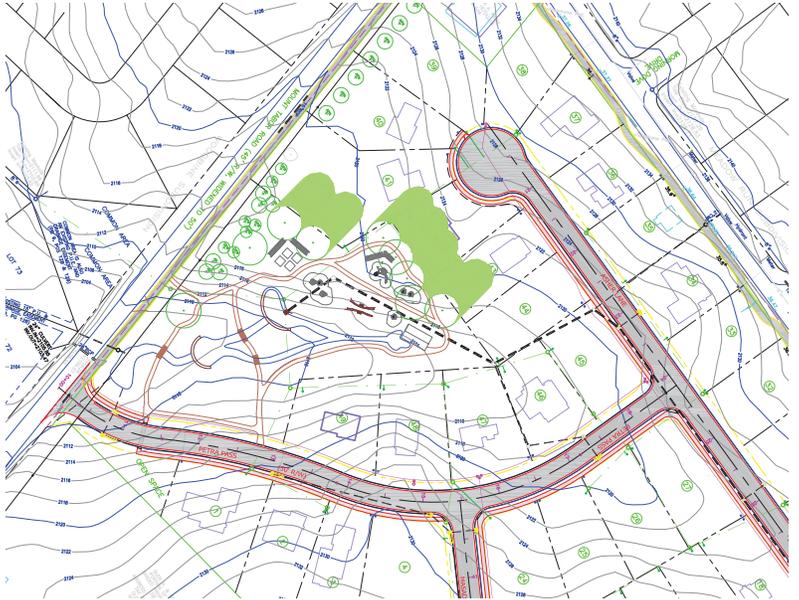


Appendix D: Sun Study

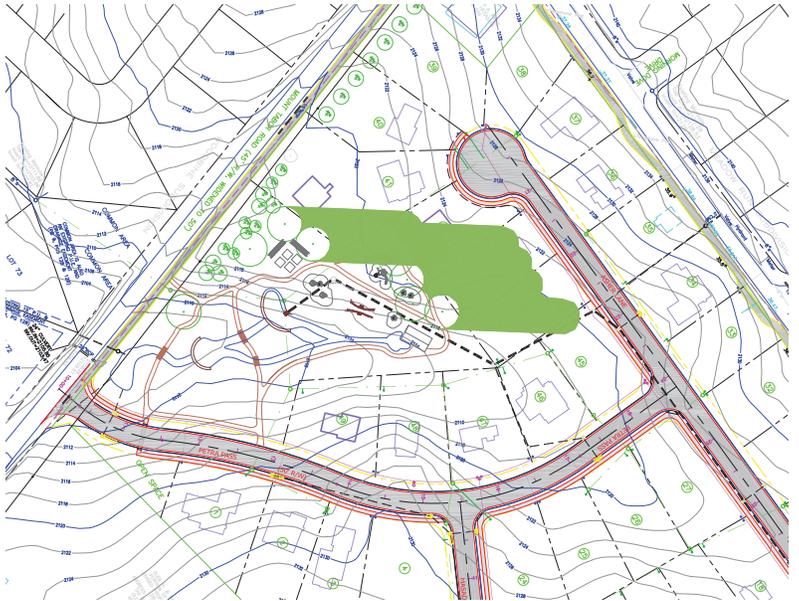
March 9AM



March 1 PM

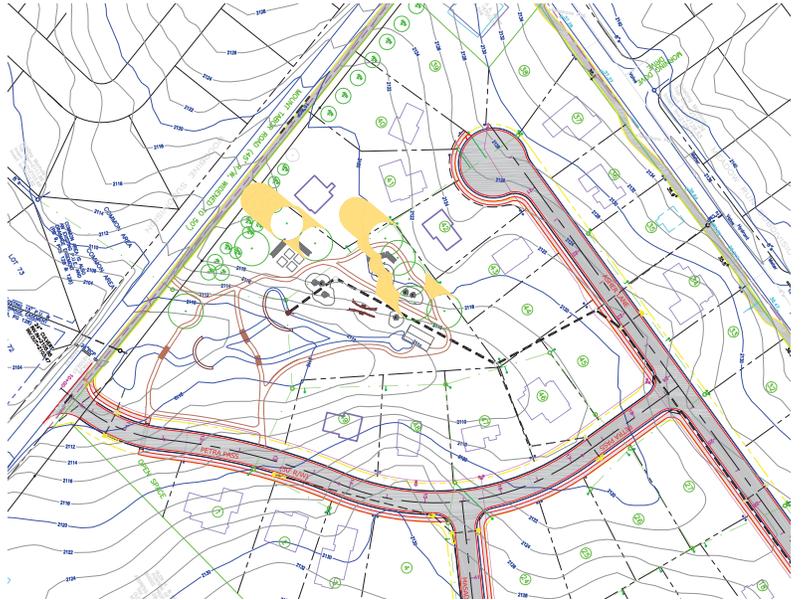


March 4 PM

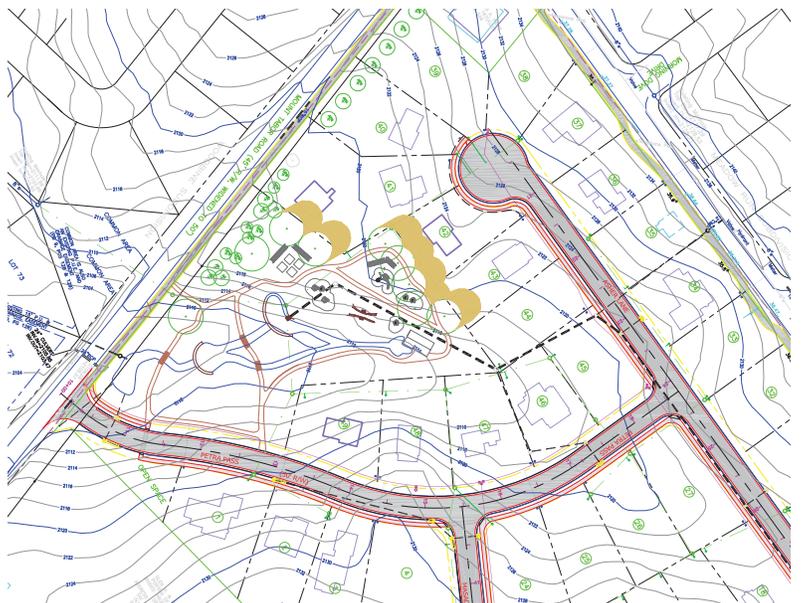


Appendix D: Sun Study

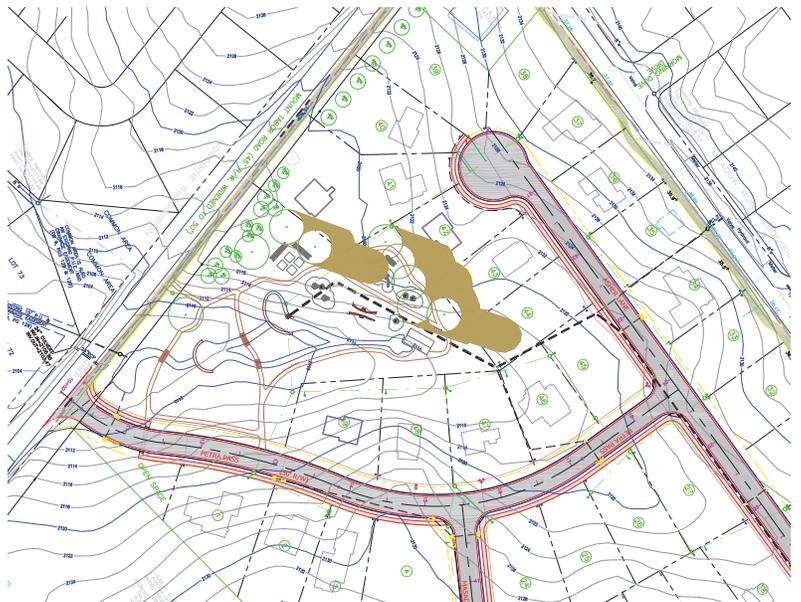
June 9AM



June 1 PM



June 4 PM





Coveside Bird Houses



Swallow Houses

Barn Swallows breed from Alaska across Canada, throughout the United States, and south through central Mexico. With the proliferation of human-provided nesting sites, the North American Barn Swallow population has increased in most places during the 20th century. Numbers are especially up in the central and eastern United States. Barn Swallows show strong fidelity to their natal site, most nesting within 20 miles of their birthplace and some much closer. Members of a pair typically stay together to raise a second brood and return in successive years to the same nest site. If you have the right habitat, barn swallows are easy to attract. A simple nesting perch may be placed under the eaves, inside a garage or barn, or on the side of a building.

Tree Swallows are found all across the continental United States and Canada, and in parts of Alaska, as far north as cavities are available, avoiding only the southeastern corner of the U.S. Tree Swallows prefer open habitats, such as the edges of woods, and areas near water, including marshes, shorelines and swamps. Tree Swallows are quite tolerant of humans. Nesting is quite synchronous in Tree Swallows; that is, females tend to begin nesting within a week or 10 days, usually in April, of their neighbors. Tree Swallows nest in natural tree cavities, woodpecker holes and nest boxes. Tree Swallow houses should be placed 5 to 15 feet high on a post or tree in open areas. They should be spaced 30 to 100 feet apart with the entrance hole facing east.

Violet-green Swallows are found from the Rocky Mountains west to the Pacific coast. Their range spans from central Alaska and central Canada south to the Mexico's highlands. Violet-green Swallows prefer open, deciduous, or mixed coniferous-deciduous forests containing ponderosa pine, aspen, willow and spruce trees. In the northern part of its range, this species breeds at lower elevations on the coast and in wooded canyons. In the southern part of their range, they

Appendix E: Barn Swallow Housing

breed at higher elevations (2,000 to 3,000 meters). Violet-green Swallows nest in cliff crevices, natural tree cavities, woodpecker holes, in old nests of Bank Swallows and Cliff Swallows, under the eaves of buildings, and in nest boxes. They can nest in close association with Cliff Swallows, Tree Swallows, White-throated Swifts, and Western Bluebirds. One report documented a pair of Violet-greens assisting a pair of Western Bluebirds in raising young. The swallows guarded the nest and tended the bluebird nestlings, and after the bluebirds fledged, the swallows used the nest site. In the northern portion of their range, pair formation begins in mid-April and breeding begins in late May. In the southern portion, breeding begins in early May. Violet-green Swallow houses should be placed 9 to 15 feet high in open or broken deciduous or mixed deciduous-coniferous forests, wooded canyons, or edges of dense forests.



Barn Swallow House
\$27.95



Tree Swallow House
\$25.95



Violet-green Swallow House
\$25.95



Backyard Bird House
\$29.95

