GROUNDS FOR THE GREATER GOOD

Enhancing Accessibility and Ecology at the All Souls Church Property

INDEX

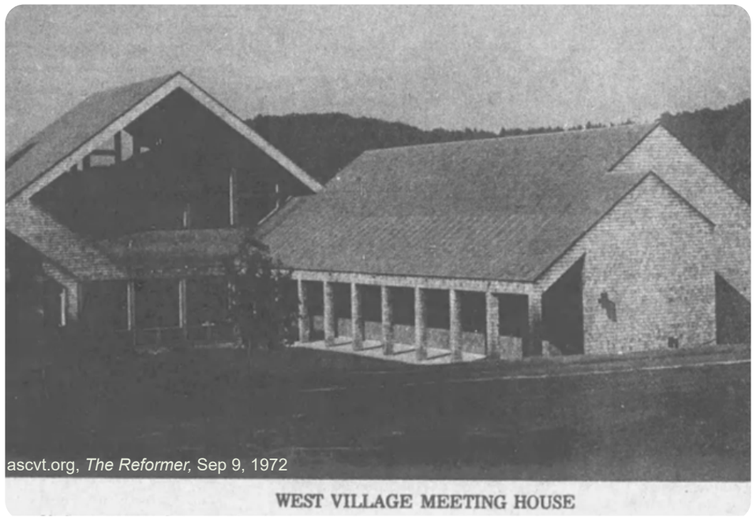
Sara Ozawa | The Conway School | Fall 2022

CONTEXT

THE HISTORIC HOME OF A COMMUNITY THAT CARES

The Unitarian and Universalist congregations in Brattleboro banded together in 1922, growing their community-oriented congregation in downtown Brattleboro until church members realized in the late 1960s that "the entry stairs were hard for older people, there wasn't enough parking after the post office went up, and it was expensive to heat." They were "cramped for parking space and stifled by outdated architecture hardly reflective of the expansive and progressive attitude" of the congregation. Hence the move to 29 South Street.

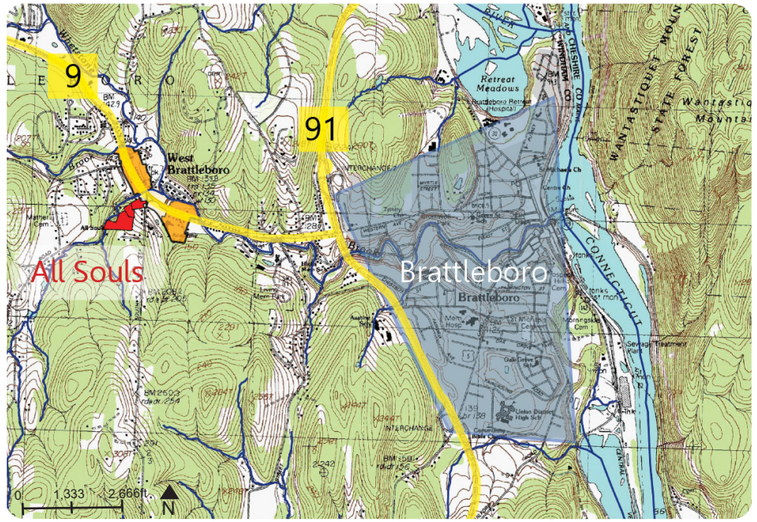
1972



In 1970, architect Jean Paul Carlhian designed the All Souls Church community a new sanctuary on a former sheep pasture, placed atop a promontory ridge on the lower slope of one of southern Vermont's many glacial hills. He sought to evoke the rolling hills of the setting with vast, peaked roofs with abundant windows to bring nature in, honoring the community's spiritual connection to nature. All Souls congregation named the iconic building "The Meeting House" to symbolize the desire for the space to serve as more than their spiritual home, but as a place open to all to gather, engage in the arts, and exchange ideas.

2022

Today, the Meeting House is 52 years old, and continues to hold space for a variety of stakeholder groups. While the growth of the forest during this time period now evokes a different feel – less vista, more nestled retreat – the beauty of the setting continues to influence the special sense of spirituality congregation members feel from the forested site.



The 10.1-acre parcel is located amid rural residential neighborhoods on a hill that slopes up to the south from the West Brattleboro Village Center. Route 9, a well-traveled thoroughfare, connects the church to downtown Brattleboro 2.5 miles east. The north-south orientation of these undulating hills is indicative of the area's glacial history, and the valley that holds West Brattleboro and Route 9 was once a channel for icemelt.

"The Unitarian Universalist Association expects all of its member congregations to welcome and value diversity of sexual and affectional orientation, gender identity and expression, race and ethnicity, ability/disability, class and educational background, age, and citizenship status."

Unitarian Universalist Association

LGBTQ Welcoming Congregation

Ecological conscientiousness and radical inclusivity are two of the congregation's core values.

GREEN SANCTUARY CONGREGATION

"Climate justice calls us to mitigate (reduce) the emissions that cause climate change, adapt to changing climate conditions, and increase resilience to worsening climate impacts through congregational transformation and community engagement. We must balance the urgency of the climate crisis with the need to center justice in our actions."

Unitarian Universalist Association

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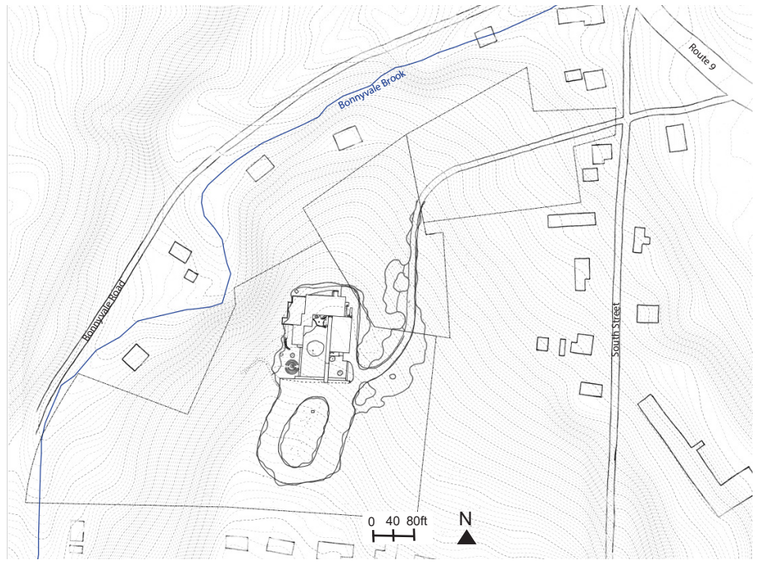
the ConwaySchool
Graduate Program in Sustainable Landscape Planning + Design
88 Village Hill Rd.Northampton, MA 01060
413-369-4044
www.csld.edu

DESIGNED BY: SARA OZAWA
FALL 2022

CONTEXT
ALL SOULS UNITARIAN UNIVERSALIST CHURCH
29 SOUTH STREET, WEST BRATTLEBORO, VT 05303

SITE OVERVIEW

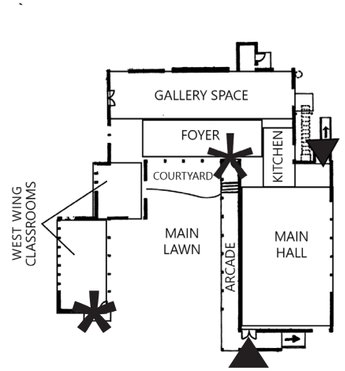
FULL PROPERTY MAP



The 10.1 acres span three parcels. The two north right-of-way parcels connect the southernmost parcel where the building is sited to South Street. The forest provides a nice buffer between the building and the neighboring residences which are located in close proximity to the property boundaries. The traffic of the surrounding streets and the Village Center is visibly blocked from the main area, but the sounds still travel up the hill.

Because most active use of the property occurs between the building and the parking lot, analyses and design recommendations will largely focus on this area.

BUILDING DETAILS



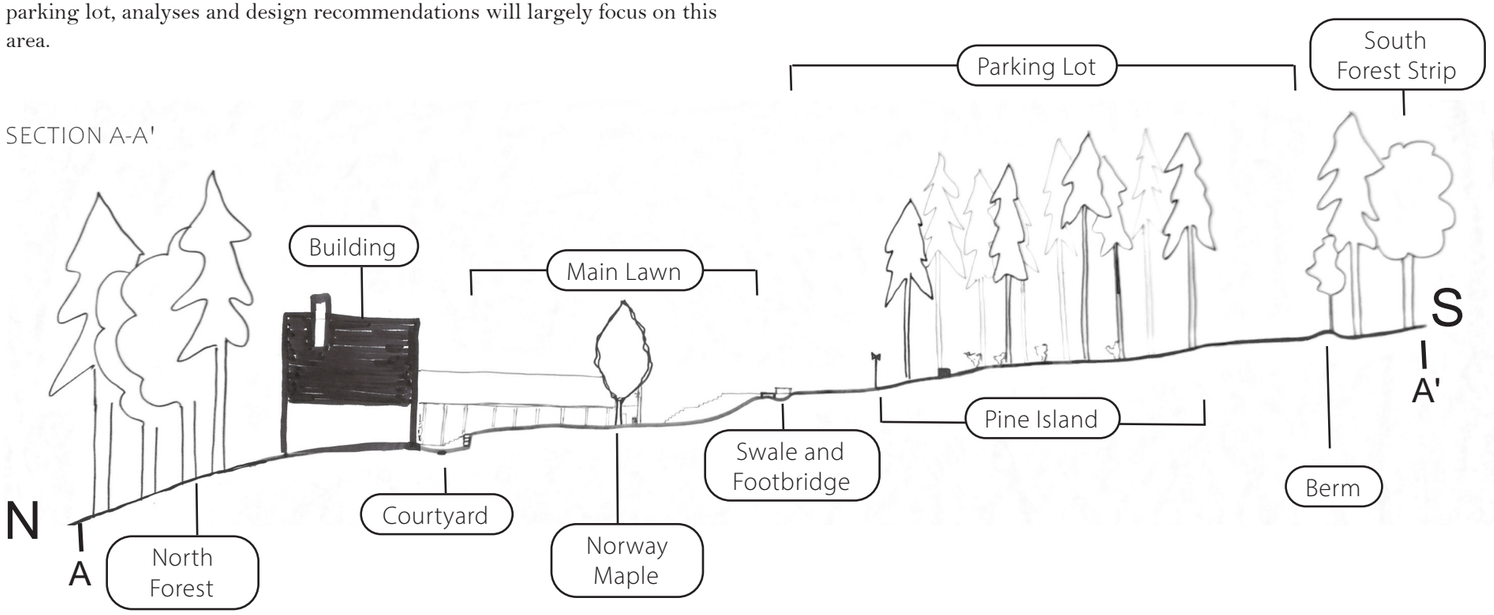
Main entrances (Non-ADA accessible)

ADA-accessible entrances

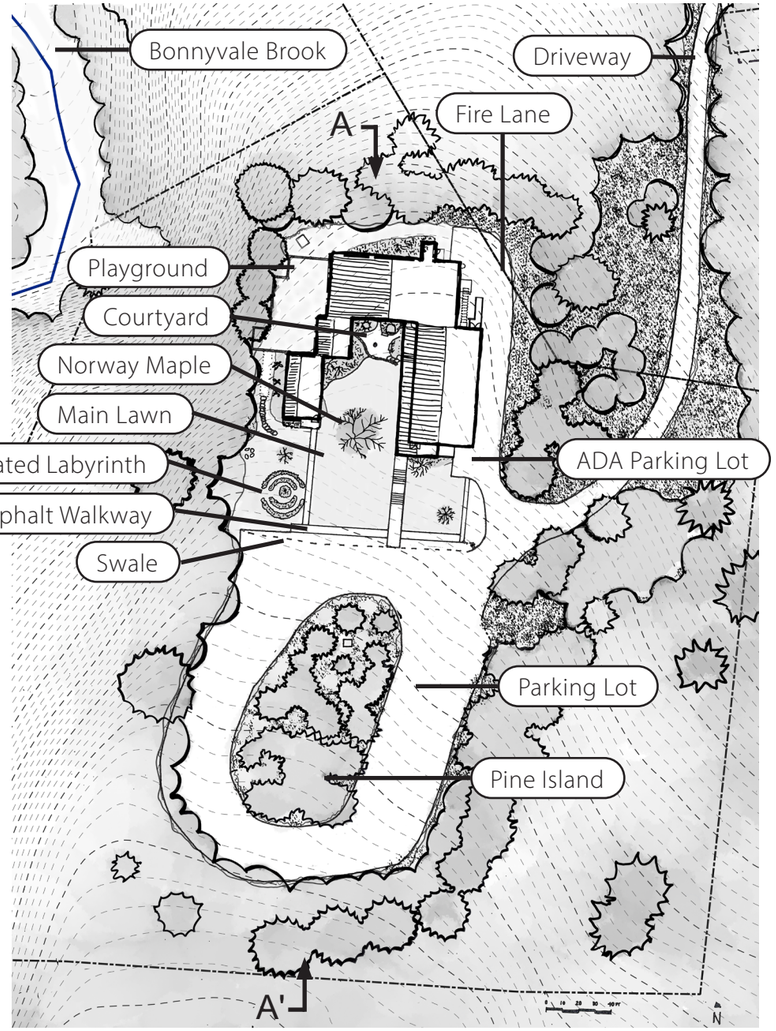
Ramp, showing downward direction

The building is divided into two parts: the north and east wings are more cohesively connected together as a unit and use of this main area often requires circulating between the two wings. This main area is also largely ADA accessible. The west wing can only be accessed internally by staircase and does not have an ADA-compliant entrance.

SECTION A-A'



MAIN AREA MAP



The main area of use extends between the parking lot and the building. The gravel lot circles around an island of pine trees. A drainage swale partially lines the northern edge of the lot at the base of the curb and walkway.

The area between the building and the lot is largely turf grass, with some beds lining the building planted with a mix of ornamental and native plants. Other vegetation includes scattered ornamental trees, notably the central Norway maple, and a labyrinth-shaped bed in front of the west wing of the building. A recessed, stone courtyard with ornamental beds abuts the building, with a 2.5-foot tall stone retaining wall defining the edge up to the main lawn.

The entire main area is encircled by forest.

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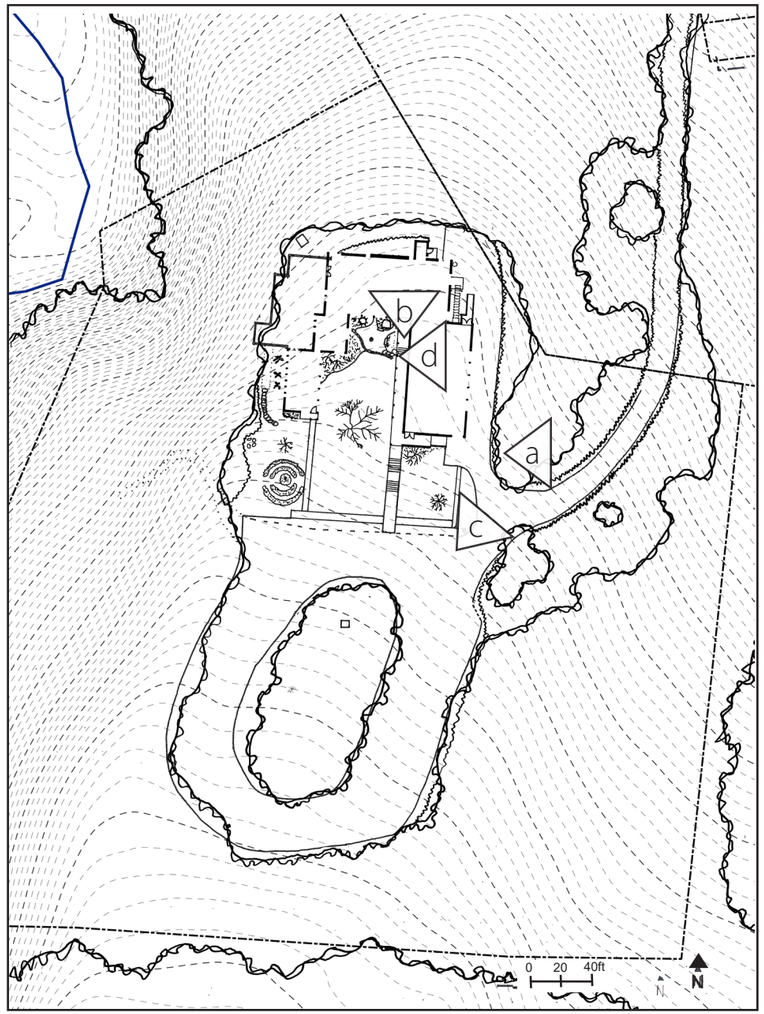
413-369-4044
www.csld.edu

Site Overview
All Souls Unitarian Universalist Church
29 South Street, West Brattleboro, VT 05303

CLIENT GOALS

The clients' main goals relate to their values of inclusivity and ecological sustainability.



SAFE PATHWAYS TO THE BUILDING AND IMPROVED ACCESS FOR ALL

Though difficult access was cited as one of the reasons the congregation chose to relocate from their previous building, the Meeting House was built before the Americans with Disabilities Act. While the church has implemented incremental measures to expand and enhance accessibility, they are interested in **a universally accessible main entrance, with more ADA parking spots** to accommodate community need. The current designated accessible parking area does not have marked spaces and can fit up to two cars tightly, depending on how people park (a). Congregants would also like to **relocate the trash receptacle** because they feel its current placement outside of the ADA entrance diminishes the welcoming spirit and functionality of that access point. It also poses a potential hazard there, as a bear has broken into the receptacle in the recent past.

During the winter, the **snowfall off of the large roof accumulates quickly, eventually sliding into the arcade** down to the main entrance (b). Congregation members currently install plywood as a temporary barrier between the snow buildup and the arcade, but are interested in exploring long-term landscape solutions. Additionally, the lower, northernmost extent of the parking lot can become **dangerously icy** and this has resulted in injuries in the past (c).

Elders make up the majority of the congregation, so attention to creating gentler avenues of access both by foot and by wheels is a focus.

A PARKING LOT PROTECTED FROM STORMWATER EROSION

The long, steep, oval-shaped gravel parking lot develops **long, deep rills** after repeated or intense precipitation, which make for an **unpleasant drive and uneven walking terrain** (c). The water flow also carries sediment from the lot downslope, depositing it in a swale at the lowest part of the lot, which often clogs as **sediment builds up** under the pedestrian bridge. The swale leads to a storm drain which ends across the drive and also **clogs**. Sediment is also carried directly off the lot to the west and east where the berm ends. **Flattening out rills, regrading, and clearing out sediment from the stormwater system are costly, recurring measures that church stakeholders hope can be reduced**.

AN ECOLOGICAL , LOW-MAINTENANCE LANDSCAPE WITH OUTDOOR SPACES FOR GATHERING + SOLITUDE

During COVID, the congregation became aware that there were no areas outdoors conducive for hosting services to facilitate safe pandemic practices. They realized their current use of the property was restricted to the area linking the lot to the building, and that though they once had trails into the forest for summer camp, they currently have no clear access into the forest. In addition to **reestablishing trails and service-sized spaces (for around 50 people)**, they are interested in siting **areas that can accommodate meetings of 2 to 15** and also establishing **areas for solitary meditation.** They cherish **memorial benches and trees** and seek to add more throughout the grounds. They would like an **ecologically beneficial landscape that looks maintained without requiring intensive management.** The courtyard is currently their most functional outdoor gathering space (d).

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Client Goals
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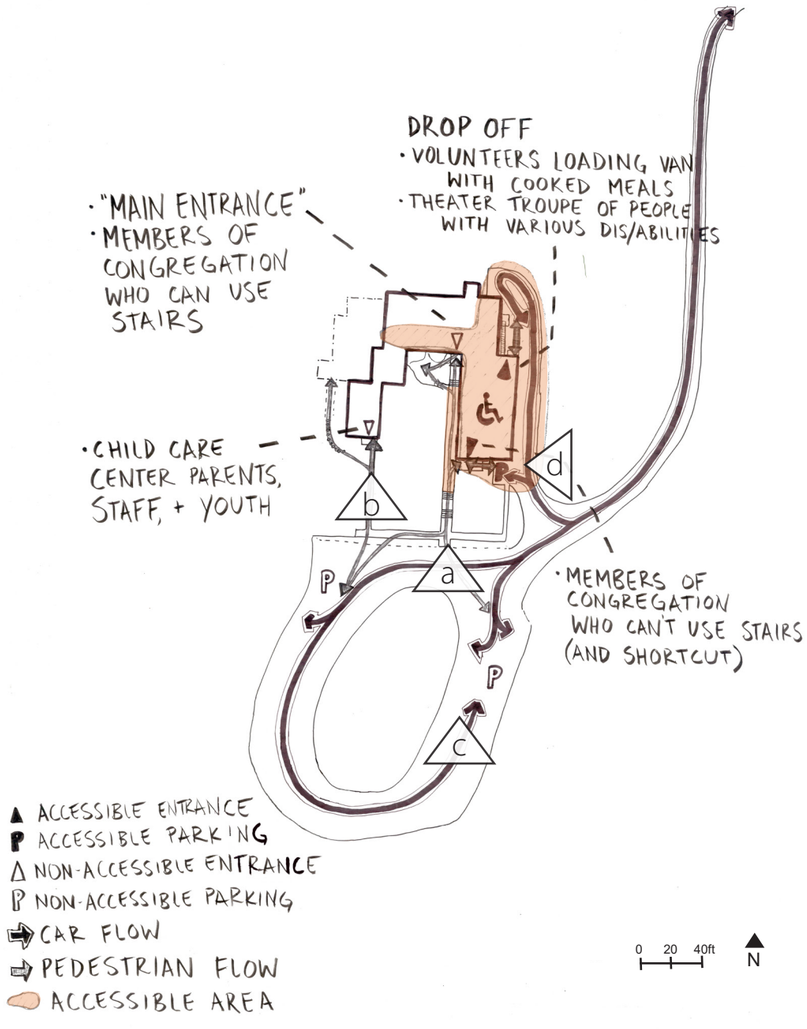
CIRCULATION + ACCESS

The current conditions are challenging and sometimes unsafe for elderly pedestrians due to steep slopes, uneven walking surfaces, snow, and ice.

The ADA-compliant and gentlest pedestrian access zone is limited to a small portion of the building, the fire lane, and the ADA lot.

People tend to park cars in spots closest to the building, and the lot only fills to capacity for a few special events each year.



MAIN AREA

This primary pedestrian corridor connects the lot to the main foyer entrance and to the ADA entrance into the main hall, which holds services that up to 50 people regularly attend.

There is also a rotating gallery space highlighting local artists' work that can accommodate medium sized events like exhibit openings, but this is another space in the building that can only be accessed by stairs.

The main entrance is not ADA accessible as it requires crossing the long, uneven, sloped lot and three flights of stairs. This route can even be a challenge for pedestrians, especially in the winter when ice forms and the snow off the roof impedes the walkway. Congregation members feel that a unified, universally accessible entrance would better align with their values.

WEST WING

The entry level has multi-purpose rooms where choir practice, a grief group, and youth religious education classes meet. These small church social groups of between 5 to 15 people would enjoy meeting outside if there was a space to do so. A nature-based preschool uses the basement floor and the playground west of the building.

The section of parking lot in front of this wing is one of the most utilized because it offers the shortest route from the main lot to the front entrances and has the most direct access to formal walkways.

Congregation members have reported the walkway from the lot to this wing is dangerous due to unevenness of breaking asphalt and nonuniform steps into the building. Additionally, pedestrians must walk directly behind parked cars to access the walkway to this entrance, which poses another safety concern, especially as a corridor for young children.

This wing is connected to the rest of the building by a stairwell so even if the entrance was ADA compliant, wheelchair users would need to exit the building and drive to access the ADA entrances in order to access the ADA bathroom.

PARKING LOT

The building is used throughout week, but even with overlapping events the parking lot is usually less than half full. Before the pandemic, the lot reached or exceeded parking capacity between 5-10 times per year, and the church would provide a shuttle to a nearby high school for overflow parking. The church has a capacity of 250 people in their main event hall, and have fit up to 90 cars in the lot in the past.

Because the lot edges are not clearly defined, people sometimes park too far into vegetated areas, potentially compacting soil and damaging roots, or they park too far back, shrinking the circulation channel. Inconsitent spacing between cars can prolong how far people need to cross the lot by foot, which is a particular problem in the winter when the lot gets icy. The area everyone must walk across - the lowest section of the lot between Pine Island and the sidwalk - is the iciest part of the lot.

MAIN ADA ENTRANCE

Two ADA entrances open into the main hall. The front, main ADA entrance is sometimes used as a shortcut to the Main Hall, as opposed to walking further to the primary entrance. Their wooden outdoor trash receptacle is located in the arcade across from the main ADA entrance, impeding space for anyone coming to and from the ADA parking lot. The current location is not just unwelcoming, but could also be a hazard to someone exiting the building as a bear broke in to the receptacle on a few occasions last year.

The back ADA door is often used as a drop off area for participants of the theater program for people with varying dis/abilities that routinely uses the service space. The turn-around area at the end of the fire lane is frequently used as a loading zone or a convenient parking area, which may be in violation of fire code.

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Circulation + Access

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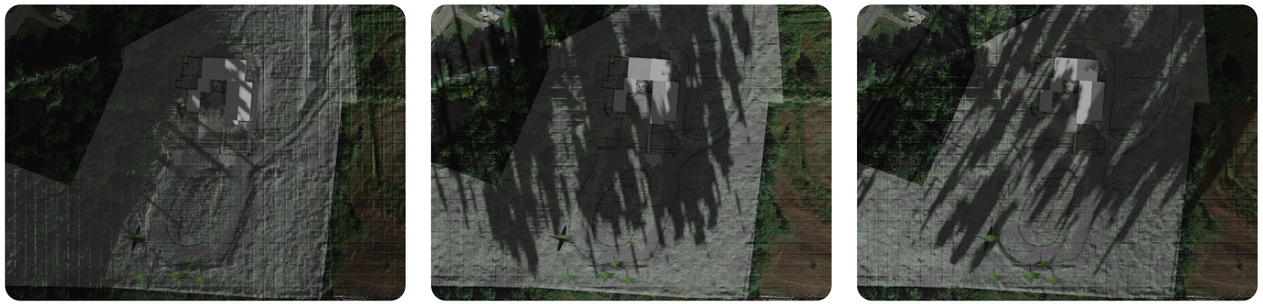
SUN + SHADE

9 AM | NOON | 3 PM

SUMMER SOLSTICE

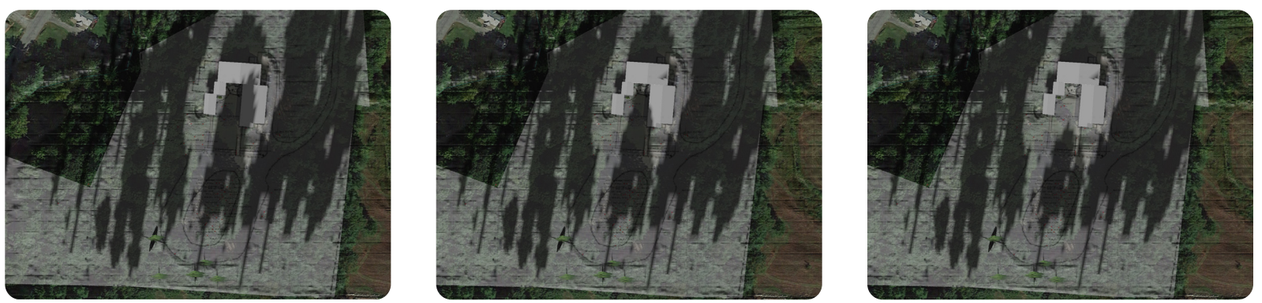
EQUINOX

WINTER SOLSTICE



SNOW + ICE

1:30PM WINTER SOLSTICE



NO PINE REMOVAL | NORTHMOST PINES REMOVED | ALL PINES REMOVED

SUNNY SUMMERS, SHADY WINTERS

The courtyard, main lawn, and building receive direct sun for most of the day in the hottest months of the year. The courtyard is the sunniest area on the property, which may make gathering unpleasant during this time frame, but more pleasant in the transitional seasons. Because the largest windows face south, the persistent heat of the sun undermines the efficiency of indoor cooling systems. Closer to the equinoxes, the Norway maple casts some shade on the west wing until early afternoon.

During the growing season, the main lawn receives the most hours of sunlight. The lawn in front of the west wing and portions of pine island receive partial sun.

Around the winter solstice, the roof receives some sunlight throughout the day, but long shadows from the building and the surrounding forest provide little opportunity for snow and ice to melt.

Congregation members celebrate the 100th Annual Meeting on May 22nd in the sunny courtyard

Shade from the pines extends across lower lot and main lawn at 1pm on October 29th

THE PROBLEM WITH PINE ISLAND

This snapshot at 1:30pm on winter solstice shows the significance of the shade from the pines in the center of the parking lot.

These stoic pines provide many benefits including beauty, shading the lot in late spring and early fall, taking up stormwater, and other ecological functions. However, pines are prone to dropping limbs or toppling in significant wind events. Their stability relies on the infrastructure of a community's root system. so in this isolated cluster they are particularly vulnerable to blow down. That one of the pines on the island fell on the reverend's car suggests the possible hazard of this group of trees.

Thinning the pines, especially the group of northernmost trees, may help alleviate the intensity of shade influencing the hazards along the pedestrian routes, but it may make the trees more susceptible to blow down. Full removal would most effectively reduce snow and ice buildup, but would be an extreme aesthetic change with probable hydrological repercussions due to reduced water interception and absorption. Other interventions like adding berms and regrading away from building may provide enough mitigation.

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SUN + SHADE

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VEGETATION

Each section of forest is experiencing early stages of vegetative dieback due to pests and disease or habitat loss from introduced plant proliferation, consistent with the regional pattern of climate change pressures.

FOREST TYPES

DOWNSLOPE DECIDUOUS

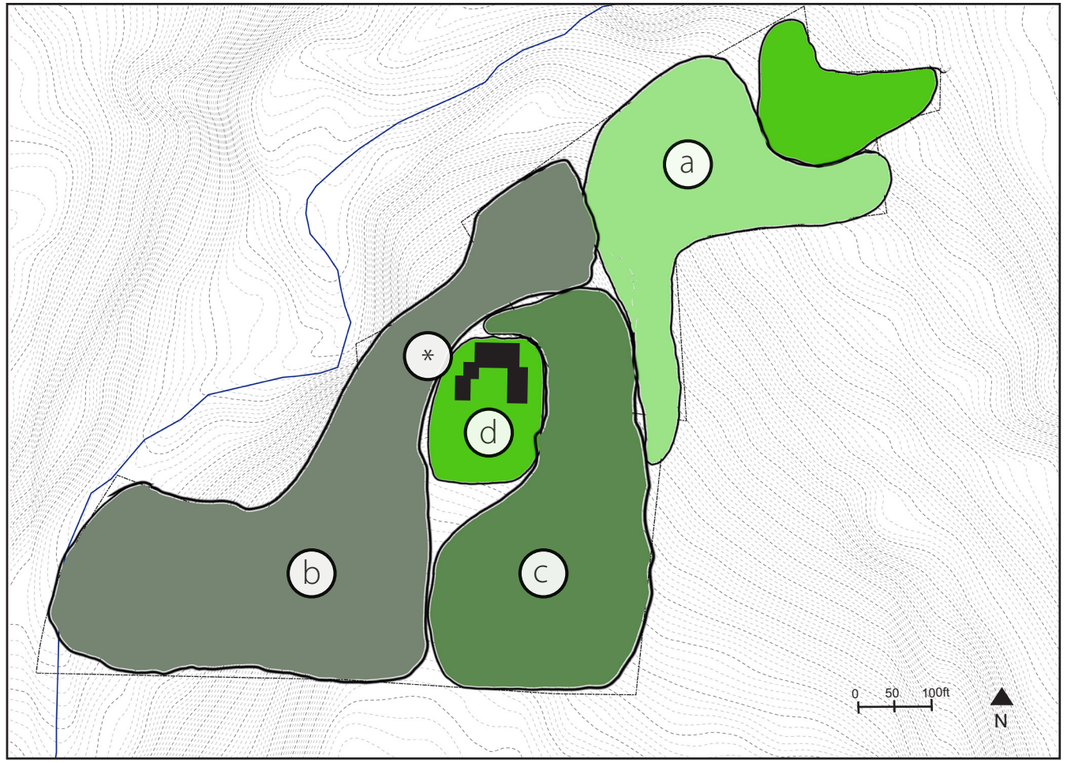
	Plant name	Strata	Concerns	Is concern present on site?
Predominant trees	Sugar maple	Canopy	Rising temperatures, drought will reduce immunity to disease like Armillaria root rot	Unknown
	American elm	Subcanopy	Dutch elm disease kills trees within 1 or 2 seasons by blocking vascular system	No
	White ash	Subcanopy	99% of trees die within 5 years after being infested by the emerald ash borer	No
	Grey birch	Subcanopy	-	-
	Black birch	Subcanopy	-	-
	Paper birch	Subcanopy	-	-
	American basswood	Subcanopy	-	-
				-
Problem plants	Norway maple	Midstory	Alters decomposition, macroinvertebrate communities, and prolifically reproduces, outcompeting native species that provide more ecological benefits	Mild-Moderate
	Vinca	Groundcover	Spreads in thick mats suppressing native groundcover and wildflowers, including spring ephemerals	Extensive

RETIRED SUGAR BUSH

Predominant trees	Sugar maple	Canopy	Rising temperatures, drought will reduce immunity to disease like Armillaria root rot	Unknown
	Eastern hemlock*	Subcanopy/ midstory	Woolly adelgid causes trees to die within 3-10 years. Expected to spread throughout the northeast, with hopes that some trees may be resistant, though no examples have been found yet.	Mild
	White oak	Subcanopy	-	-
	American beech	Midstory	Beech bark disease can kill trees or make them more susceptible to blow down within 5 years, though some are immune or persist for over a decade after infestation	Extensive
	Black birch	Midstory	-	-
	Grey birch	Midstory	-	-
	White ash	Seedlings	99% of trees die within 5 years after being infested by the emerald ash borer	No

DISTURBED + IMPRESSIONABLE

Predominant trees	White pine	Canopy	Effects of climate change are expected to exacerbate existing pests and pathogen	Unknown
	Sugar maple	Subcanopy	Rising temperatures, drought will reduce immunity to disease like Armillaria root rot	Unknown
	Red maple	Subcanopy	-	-
	Shagbark hickory	Subcanopy	-	-
	American beech	Midstory	Beech bark disease can kill trees or make them more susceptible to blow down within 5 years, though some are immune or persist for over a decade after infestation	Moderate
Problem plants	Norway maple	Midstory, seedling	Alters decomposition, macroinvertebrate communities, and prolifically reproduces, outcompeting native species that provide more ecological benefits	Extensive
	Glossy buckthorn	Midstory, seedling	Forms dense, monospecific stands that exclude native understory species and canopy recruitment, changing ecosystem dynamics and reducing quality of bird food	Extensive
	Multiflora rose	Shrub	Forms dense thickets that outcompete biodiverse native understory	Moderate
	Bittersweet	Vine	Severely damages trees, can shade out seedlings and inhibit forest succession	Moderate



MAIN CULTIVATED AREA

Specific congregation members steward memorial beds in the courtyard.

Many native pollinator plants grow in the labrynth and garden beds in the main lawn area, but some congregation members feel they appear unruly.

The central Norway maple was planted by now-deceased congregation members, but debate is out as some people feel it is blocking the view of the building without providing effective shade, and others are concerned about its status as an invasive plant. It likely helps sequester water before it can flow to the foundation, so removal would necessitate the installation of alternative runoff mitigation.

Lawn is somewhat effective at erosion prevention but requires regular maintenance and fertilization and provides little ecological or stormwater mitigation benefit.

LEANING HEMLOCKS

The hemlocks at the top of the steepest part of the west slope have been limbed back to protect the power line and as a result, they now lean toward the building. They display signs of mild woolly adelgid presence, which will increase their susceptibility to blow down in storms. While they may not die back completely for another 3 to 5 years, an arborist would likely need to climb the trees to remove them, and it will be safer and less costly to remove the trees before they die. Proactive measures will also prevent the potential of a hazard from escalating any futher.

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VEGETATION
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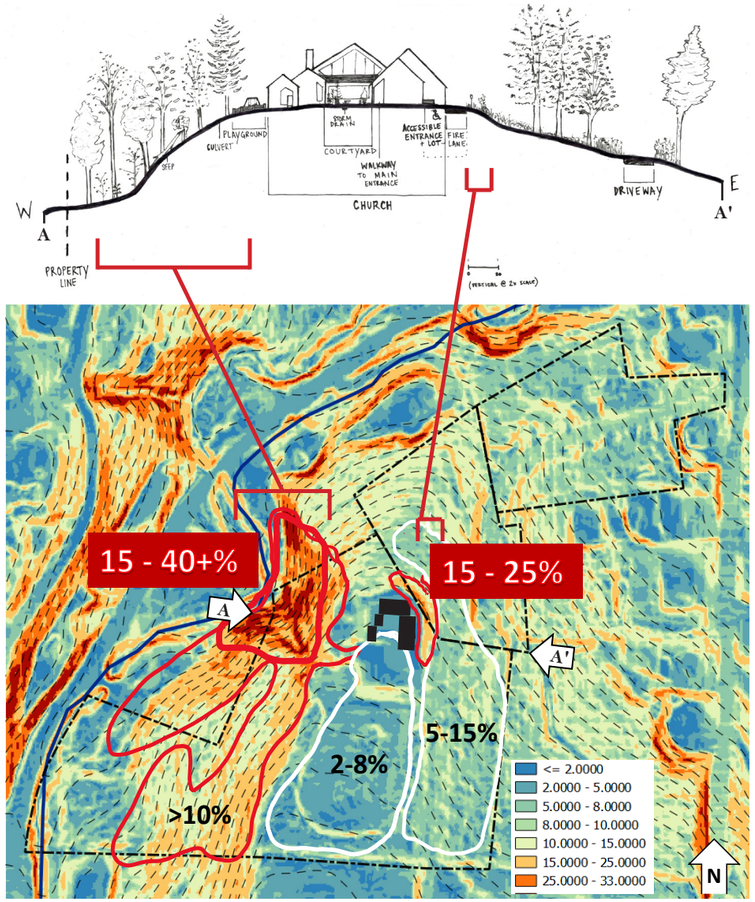
HYDROLOGY + SOILS

The main area of use is encircled by slopes on all sides that add challenges to meeting the client's goal of increased access, mitigation of stormwater runoff, and creating gathering space.

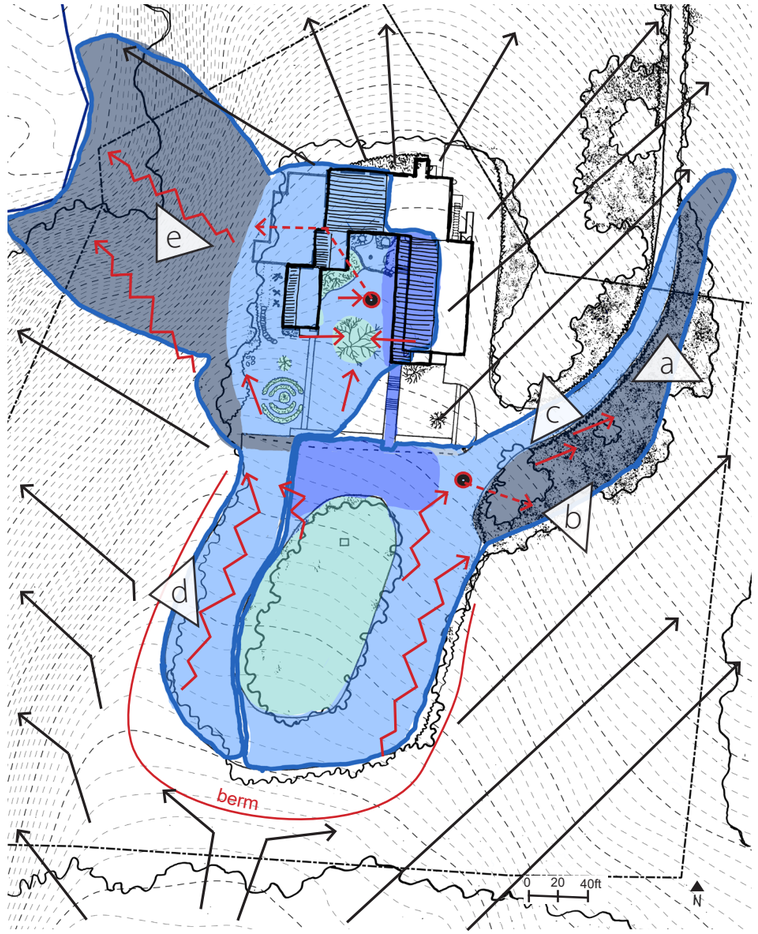


SLOPES

The slope to the west of the main area is considerably steeper than the rest of the property, particularly the gullies west of the building. It may be challenging to locate sites flat enough for gathering comfortably and to create gentle trails.

Gentler slopes are concentrated in the center of the main area of use and in the forest north and east of the parking lot. These areas may be more conducive for gathering spaces and gentle trails.

The slope drops steeply off the east edge of the fire lane. Achieving an ADA compliant grade requires regrading and the installation of retaining walls, which complicates possibilities for expanding ADA parking in the vicinity of the two ADA entrances.



DRAINAGE

The position of the property on a ridgeline is advantageous because most uphill water sheds off the sides before reaching the main part of the property. Any water that would continue downslope onto the property is redirected to the outer forest by the berm that outlines the lot, which also directs water from the lot to two different output locations (b/c and e). Only a quarter of the lot appears to shed water towards the northwest slope, but it is likely contributing to erosive processes (e). The remainder of the lot moves water to the area northeast of the lot, either directly or through the swale and stormdrain system at the northern edge of the lot. Pine island is permeable, so does not produce runoff and also infiltrates some runoff from the lot. The main lawn storm drain receives all runoff from the main lawn and the large roofs, conveying it to the eroding slope via pipe. Turfgrass produces runoff as it has low permeability. The main lawn is crowned, influencing water and snow to move toward the sides of the building.

Gravel surfaces have become impervious from 50 years of compaction, and because of the grade, water gains momentum across large surface area, causing rills to form as sediment is carried downslope into vegetated areas (a). The accumulation of sediment in this area is significant, even despite routine clearing of the culvert (b). The excess sedimentation suppresses groundcover, creating opportunity for opportunistic species that suppress native vegetation to colonize the area (c). The church paved the long driveway in November 2022 because of the treacherous driving conditions caused by the erosion and constant maintenance. Photo (c) is of the same area before and after the paving crew came and installed riprap swales along the existing runoff channel. Clogging of the system has occurred before, resulting in excess water moving toward the building and to the stormwater system that connects to the eroding slope.

Sediment deposition into waterways is a conservation concern in the state of Vermont, as it adversely affects water quality and aquatic habitat. All Souls is directly upslope from Bonnyvale Brook which along with all of the water on the property, drains into the Whetstone Brook and connects to the Connecticut River.

LEGEND

- runoff surface area
- runoff output area
- snow + ice zone
- areas of infiltration
- direction of water
- direction of erosion
- storm drain and direction of pipe to output

SOILS

Marlow soil, a fine sandy loam, covers most of the property. Marlow soil is considered a soil of statewide significance, meaning that the soil quality, location, and moisture supply has the potential for crop production, but liming factors pose constraints. On the property, the soil has ideal texture and drainage characteristics, but shallow depth to a hardpan layer **(d)** and excessive slopes make the west side of the property prone to erosion. The part of the slope where waterflow off the west side of the lot runs and the stormwater infrastructure for the main lawn and building area is directed is experiencing active erosion. The hard pan layer is either exposed or under a shallow layer of soil. Tree roots are helping hold the soil in place, but as the impact worsens over time, trees are beginning to fall downhill **(e)**. Because the hill is predominantly hemlock forest, proactive erosion prevention measures will need to be taken as trees start to die.

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HYDROLOGY + SOILS

ALL SOULS UNITARIAN UNIVERSALIST CHURCH

29 SOUTH STREET, WEST BRATTLEBORO, VT 05303

SUMMARY ANALYSIS

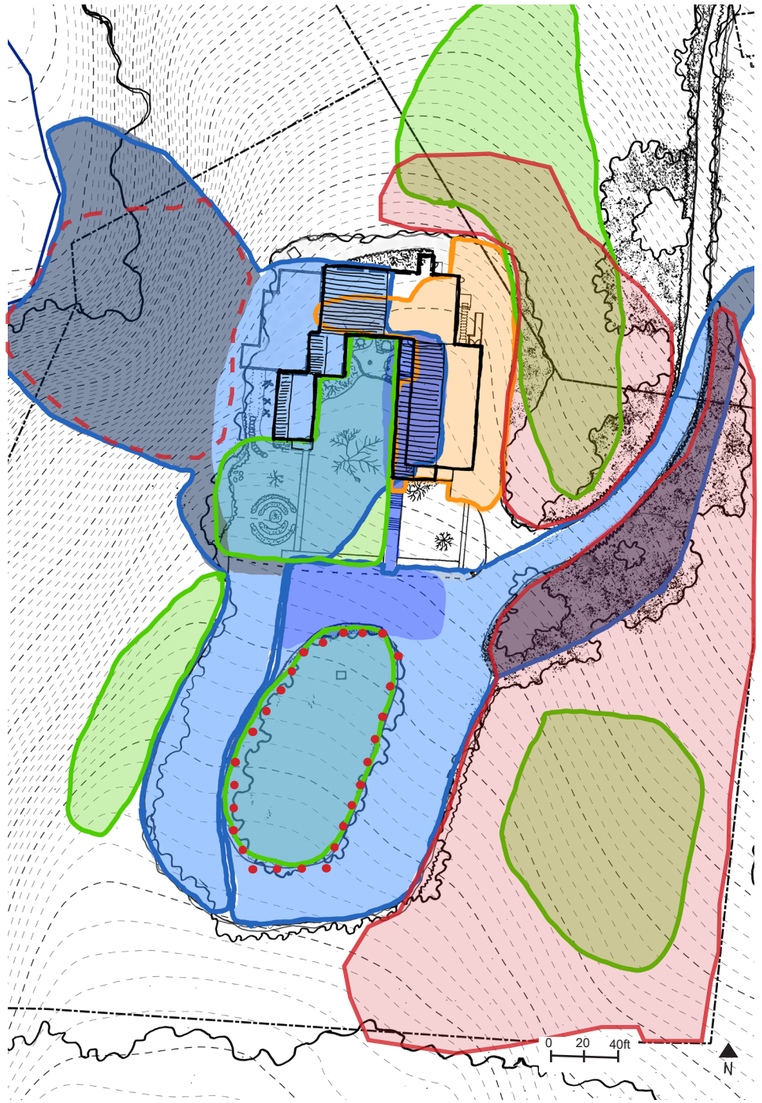
CLIENT GOALS:
A less erosive parking lot
Safer access for all
Activated outdoor spaces

ADDITIONAL DESIGN DIRECTIVES:
Protect the health of ecosystems on the site and downslope

GREATEST CHALLENGES:
Slopes quicken water flow and cause erosion and instability of ecosystem functionality, create a steep commute that is challenging for pedestrians and difficult to transform to meet ADA standards, and limit areas that can accomodate easily accessible , flat gathering sites.

Most intervention will require some earthwork, which can be expensive.

GREATEST ADVANTAGE:
Intervention in a few notable areas can address overlapping issues.



HYDROLOGY

- runoff surface area
- runoff output area
- vulnerable hemlocks

Strategies for reducing the amount of water exiting the system:
- reduce the amount of impervious surface
- regrade some slopes to be flatter so water slows and sinks rather than flowing quickly and eroding
- increase vegetation to uptake and store water locally

Strategies for rehabilitating and protecting:
- divert water from reaching eroding slope
- redirect water to existing output on east side of lot
- dredge sediment deposition and remove proliferating problem vegetation
- install infrastructure and plant vegetation that will stabilize, soak up water, and suppress undesired plant growth

ACCESSIBILITY

- snow + ice zone
- pines casting winter shade
- ADA zone

Strategies for uplifting:
- regrade lawn to direct water and snow away from building and walkway
- relieve winter shade by reducing coniferous canopy
- install an elevated walking path

Strategies for expanding:
- increase ADA parking spots
- create ADA access into the forest and to the main lawn area
- determine viability of an ADA-compliant main entrance

GATHERING

- possible gathering site areas
- problem plant proliferation zone

Strategies for exploring:
- prioritize gathering spaces in areas that are easy to walk to or could be ADA accessible
- site gathering spaces where problem plants need to be removed
- limit further disturbance after installation

DESIGNED BY: SARA OZAWA
FALL 2022

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413-369-4044
www.csld.edu

SUMMARY ANALYSIS
ALL SOULS UNITARIAN UNIVERSALIST CHURCH
29 SOUTH STREET, WEST BRATTLEBORO, VT 05303

FINAL DESIGN

Abundant, easily accessible outdoor spaces allow the communities who gather in the spirit of the Meeting House to enjoy the vibrant forest settings. New stormwater management systems beautify as much as they mitigate ecological concerns, create safer pedestrian circulation, and protect the building. Humans and nonhumans flock to the Meeting House grounds to enjoy communion with intentional, caring people and to be immersed in the solace of the forest.

WEST SLOPE STABILIZATION

The hemlocks at the top of the slope leaning toward the building have been removed. Slope stabilizing groundcover, midstory, and canopy trees fill the gap where the hemlocks once stood. Conservation specialists have developed a phased hemlock forest succession plan and installed erosion prevention and streambank restoration measures that slow and spread water, revegetate, and rebuild soil along the slope. The stormwater system in the courtyard has been diverted to the north or east side of the building.

MAIN LAWN CONGREGATION AND INFILTRATION

Stoic, high-branching trees planted in the **bioswale** at the lower lot frame views of the building, soak up stormwater, and shade the new **amphitheater**. An audience of 60 can comfortably watch the reverend, choir, or theater group on stone-enforced risers planted with a durable native groundcover. Low-maintenance, perennial plants with defined form and small trees with distinctive branching and blooms provide a beautifully tidy, ecologically beneficial backdrop to the low, wooden stage. The lawn now slopes down away from the building to influence rain and snow toward the center. Local stones encircle an **infiltration basin** with a low-maintenance rain garden and pollinator meadow.

The area in front of the west wing is now recessed into the hillside to be the same grade as the ADA entrance. The new walkway and steps up into the west wing are even and consistent. A terrace planted with low-maintenance, edible, perennial shrubs buffers views of the parking lot, and a berm planted with thornless berry bushes and wild strawberry define the forest edge. The flat, adaptable **ADA accessible event area** is most often adorned with picnic tables used regularly for post-service potlucks and lunchtime for the school, but can also accommodate an event tent and fold out chairs for hosting a variety of gatherings, rain or shine.

Raised, crowned pathways create safer pedestrian circulation by preventing extended water contact and reducing ice formation in winter. Two **paths** in the lot move pedestrians out of car circulation and the **bermed walkway** in the lower lot slows traffic. The path on the west edge directs water away from the vulnerable slope into the bioswale.

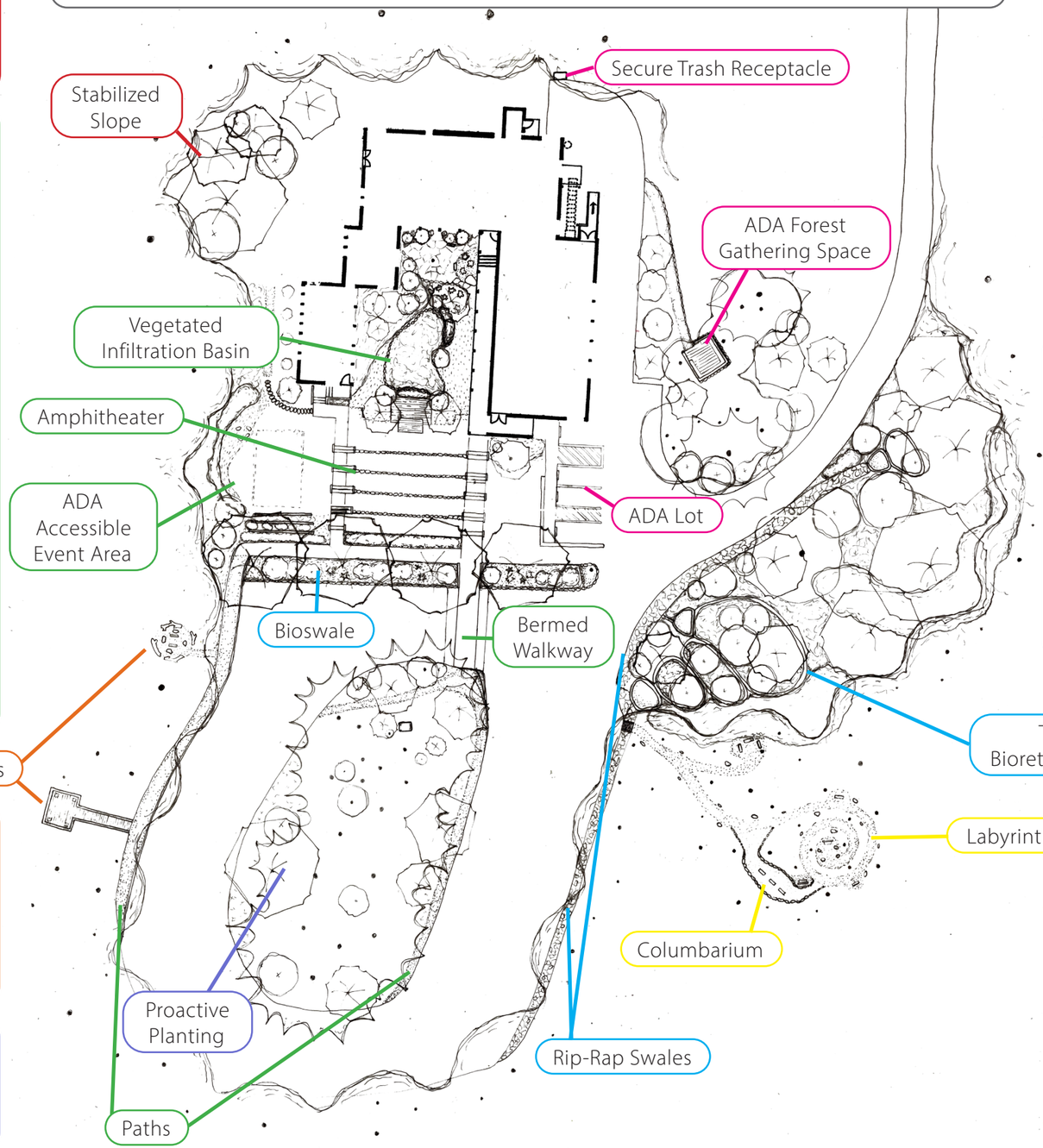
WEST SLOPE FOREST GATHERING SPACE

Small clearings in the forest before the slope steepens are easily accessible from the new path lining the west edge of the lot, but are nestled into the forest enough to provide a feeling of refuge. Natural materials like downed logs and stones shape the space and provide seating along with moveable, lightweight benches.

An observatory deck hanging over the steep slope provides a gentler gathering option uniquely positioned to provide those visiting with an experience among the treetops.

PROACTIVE PLANTING ON PINE ISLAND

Understory shrubs, midstory trees and future deciduous shade trees are being planted to ensure a smooth transition for when the pines fall or are removed. The new plants are hardy species that function as additional stormwater management infrastructure but that also provide aesthetic value.



ADA ZONE EXPANSION

The 4-spot, **ADA compliant lot** connects to both of the main gathering spaces via the arcade, no longer obstructed by the **trash receptacle** that has been relocated to the end of the fire lane. A trailhead near the back ADA entrance gently connects to a **flat deck** large enough to accomodate multiple wheelchair users. Strategically planted shrubs and small trees shelter the space from the driveway and building to create a sense of forest enclosure.

STORMWATER RUNOFF MITIGATION AND FOREST UNDERSTORY INTERVENTION

The parking lot directs water away from the eroding slope and toward the **vegetated bioswale** at the bottom of the lot, or to **riprap swales on the eastern edge** that lead directly to the area where runoff had historically gravitated to from the lot, causing sedimentation and the proliferation of undesired understory and vine growth.

By installing **terraced biorentention basins** and a vegetated overflow area here, much of the undesired vegetation on the forest edge has been removed, though Fox grape has been left behind when possible to keep important habitat and forage for songbirds and pollinators. Vigorous native rain garden species grow densely enough to possibly outcompete the undesired species with some attention and management for the first few years.

MEMORIAL GROVE MEDITATION

A gravel path into the forest forks off to a small gathering space shrouded in the vines and shrubbery on the edge of the wet area. Favorite sayings and names of loved ones who have passed flutter on fabric tied to branches along the main path and are engraved on the benches, rocks, and boulders that line the way. The path becomes a **walking labyrinth** that ends in an area conducive for solitary contemplation or group meditation.

A spur off to the side nestles between the stacked stone walls of a **columbarium**. The space is large enough to accommodate small memorial services and is shaped to provide a sense of privacy.

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Designed By: Sara Ozawa
Fall 2022

Final Design
All Souls Unitarian Universalist Church
29 South Street, West Brattleboro, VT 05303

9/16

STORMWATER MANAGEMENT STRATEGY

Because the issues present on site are interconnected and particularly complicated due to the slopes, it is recommended that **no changes to the site be made until a streambank restoration specialist, arborist, and civil engineer are consulted** about tree health, streambank erosion, stormwater movement, rates, and volumes, and regrading to improve accessibility and to redirect runoff.

The ideas in this planset explore possibilities, but further analysis is necessary.

FINAL DESIGN HYDROLOGY

By terracing and vegetating the main lawn areas between the parking lot and the building, more water is being slowed and infiltrated. Although it is unclear if sinking water in front of the west wing is a solution or if the hardpan layer channels water to resurface downslope in the eroding area, slowing the pace of water flow will help reduce erosiveness.

Regrading of the main lawn influences water and snow flows away from the building toward an infiltration basin. Establishing a new output for the courtyard storm drain may be necessary even with this additional intervention, depending on evaluation by stormwater experts.

Stabilizing vegetation and other erosion control infrastructure as deemed appropriate by an expert will help mitigate runoff from the building and rebuild soil to begin fostering a resilient slope ecosystem..

The entire lot now directs water to the east bioretention basins either via an enlarged bioswale at the north edge of the lot or a riprap swale lining the east edge. The elevated paths act as berms directing water flow and limit how much water comes into contact with the walking surface, deterring the build up of ice in the winter. The area around the basins is planted with plants with aggressive growing habits to prevent regrowth of problem plants like multiflora rose, bittersweet, glossy buckthorn, and Norway maple..

By slowing water, encouraging infiltration and increasing vegetation uptaking stormwater, the area's capacity to mitigate runoff is expanded while also trapping sediment and remediating problematic plants, shifting the site's paradigm to be more in line with Vermont's conservation goals.

PARKING LOT RECOMMENDATIONS

Redirecting water away from the erosion-prone west slope and drastically reducing the amount of sediment eroding off of the lot into the stormwater system is paramount. The client expressed a desire to maintain the existing number of parking spots, though minimizing the amount of impervious surface area is one strategy for reducing runoff-related issues.

If the lot is kept in its current state, erosive rills will likely be unavoidable because of the steep grade. Consistent regrading will be necessary to remediate erosion, the wear caused by regular use, and plowing in the winter. Excess sedimentation from the gravel substrate will continue to negatively affect the forest and watershed, and will reduce the efficacy of the infrastructure and will require more frequent maintenance.

Flattening the grade of the lot is a challenge because there is approximately 14' of elevation change from end to end. Regrading would be extreme, requiring extra steps down to the building and recessing the lot into the hill making access into the forest more challenging. Past regrading attempts have had impermanent results.

Paving can help ensure the longevity of the earthwork, and, when combined with green stormwater infrastructure, may be the best way to protect downslope forest and riparian ecosystems in compliance with the state of Vermont's conservation goals. Permeable paving may not be viable here: it is unclear if it is possible to recreate permeable conditions from half a century of compaction and possible hardpan. Additionally, the current imperviousness of the lot may actually be helping prevent percolation that may contribute to erosion on the west slope. Paving with a lighter colored material may help reduce heat island effect but using regular asphalt would create continuity with the recently paved drive and would likely be less costly.

Paving should only be done after a civil engineer has been consulted and stormwater infrastructure has been installed.

PRECEDENTS

A wattled retaining fence staked with live tree cuttings that simultaneously revegetates and builds soil is one approach to stabilizing slopes.

Bioswale absorbs runoff and channels excess toward the storm drain in the lower lot.

Bermed walkway for shedding water and slowing traffic.

RESOURCES

Consider reaching out to the local contact for the EQIP for Wildlife Habitat program. Through EQIP (Environmental Quality Incentives Program) a biologist from Vermont's Fish and Wildlife Department will provide a free consultation to qualifying landowners.

https://vtfishandwildlife.com/get-involved/partner-in-conservation/eqip-for-wildlife-habitat

Brattleboro also has its own Tree Advisory Board and Tree Warden who can provide assistance regarding forest health and management.

https://vtcommunityforestry.org/node/4180

Vermont Invasives has abundant information and tools to guide assessment and management planning which will be particularly relevant when installing new stormwater infrastructure and gathering space in the parts of the forest where undesirable plants are already proliferating. This organization does promote use of herbicides which can have harmful longterm ecological repercussions. The community should determine if that mitigation approach aligns with their ecological ethics.

https://vtinvasives.org/land/management

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STORMWATER MANAGEMENT
ALL SOULS UNITARIAN UNIVERSALIST CHURCH
29 SOUTH STREET, WEST BRATTLEBORO, VT 05303

BIORENTION BASIN DETAILS

PLANT PALETTE

Rain garden plants are able to tolerate brief periods of inundation while also being able to survive dry spells, some even tolerating drought. These versatile plants are excellent choices for the landscape given the predicted pattern for the region as the climate changes: extended droughts and periodic but intense precipitation events. Choosing native plants in the middle or northern end of their range is also a way to proactively adapt the landscape for warmer temperatures and can play a part in climate migration of species that rely on those plants for food and habitat. Rain garden plants from the Pine Island plant palette would work well in shadier parts of this area.

Many of the plants listed here have more aggressive growth habits so are well-suited to contend with the existing less-beneficial or problematic plants proliferating in that area. However, these plants would be less ideal to place in other areas functioning as part of the stormwater system, where the client would like to have a more cultivated aesthetic.

						IDEAL GROWING CONDITIONS		RESILIENCE				ORNAMENTAL INTEREST				LANDSCAPE BENEFIT			
	Common Name	Botanical Name	Layer	Height	Spread	Light	Soil	Drought	Salt	Compaction	Deer	Spring	Summer	Fall	Winter	Low maintenance	Rain garden	Erosion control	Edible or Fragrant
1	Shagbark hickory	Carya ovata	Tree	50-100'	20-40'	Sun, p sh	Average-wet	x						Yellow foliage		x			E
2	Tupelo	Nyssa sylvatica	Tree	30-60'	20-35'	Sun, p sh	Average-wet	x						Red foliage					
3	Red maple	Acer rubrum	Shade tree	35-50'	20-40'	Sun, p sh	Average-wet			x	x	Red bloom		Multicolored foliage		x	x	x	
4	Fox grape	Vitis labrusca	Vine	4-40'	6-12'	Sun, p sh	Average		x		x		Purple fruit			x			E, f
5	Serviceberry	Amelanchier canadensis	Small tree/ shrub	10-18'	5-10'	Sun, p sh	Adaptable		x			White bloom	Red fruit	Red/purple foliage		x			E
6	Sunchoke	Helianthus tuberosus	Perennial	4-10'	3-8'	Sun, p sh	Average							Yellow bloom					E
7	Sweet pepperbush	Clethra alnifolia	Shrub	4-8'	4-6'	Sun, p sh	Average-wet	x	x	x	x		White bloom			x	x	x	F
8	Silky dogwood	Swida amonum	Shrub	3-8'	3-6'	Sun, p sh	Average-wet			x		White bloom	Blue fruit	Red/purple foliage	Red stems	x	x	x	
9	Spotted Joe Pye Weed	Eutrochium maculatum	Perennial	3-7'	3-4'	Sun, p sh	Average-wet			x	x		Pink/purple bloom			x	x		
10	New England aster	Symphyotrichum novae-angliae	Perennial	2-4'	2-4'	Sun, p sh	Average-wet	x						Purple bloom		x	x		
11	White snakeroot	Ageratina altissima	Perennial	2-3'	2-3'	Sun, p sh	Average-wet				x		White bloom			x	x		F
12	Hyssop-leaved boneset	Eupatorium hyssopifolium	Perennial	2-3'	16"-2'	Sun, p sh	Average-dry	x	x		x		White bloom			x	x		
13	Cardinal flower	Lobelia cardinalis	Perennial	2-3'	8"-1'	Sun, p sh	Wet				x		Red bloom			x			
14	Showy tick trefoil	Desmodium canadense	Perennial	18"-3'	1-2'	Sun, p sh	Adaptable			x			Purple bloom			x	x		
15	Black huckleberry	Gaylussacia baccata	Shrub	1-3'	2-3'	Sun, p sh, sh	Average-dry	x			x	Pink bloom	Purple fruit	Red/purple foliage		x	x	x	E
16	Zig-zag goldenrod	Solidago flexicaulis	Perennial	1-3'	1-3'	Sun, p sh, sh	Average-dry	x			x		Yellow bloom			x	x		
17	Canada windflower	Anemone canadensis	Groundcover	1-2'	3-5'	Sun, p sh	Adaptable			x	x		White bloom			x			
18	Christmas fern	Polystichum acrostichoides	Fern	8-16"	1-2'	P sh, sh	Average-dry	x			x				Evergreen	x	x		
19	Canada mayflower	Maianthemum canadense	Perennial	2-4"	10-14"	P sh, sh	Average-dry	x	x		x	White bloom	Red fruit			x	x		

PRECEDENTS

Because of the slope, terracing may be necessary for installing stormwater mitigation infrastructure.

Pinterest, Julie Melear

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BIORETENTION BASIN DETAILS
ALL SOULS UNITARIAN UNIVERSALIST CHURCH
29 SOUTH STREET, WEST BRATTLEBORO, VT 05303

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MAIN LAWN DETAILS

PLANT PALETTE

These plants are native plants with ornamental aesthetics, whether they have stunning blooms, all-year interest, compact form, or elegant branching. They also all serve ecological purposes as pollinator forage or habitat, or remediating stormwater runoff. Small trees are effective at water uptake and can provide shade over the courtyard and building without detracting from the view of the architectural beauty of the Meeting House.

Rain garden plants must be used within the infiltration basin and bioswale, but can also be planted throughout the whole area. In lieu of lawn, a multi-story, native, perennial landscape will more effectively mitigate runoff, provide habitat, attract pollinators, and add all-year beauty.

Plants that grow as a slowly spreading mass make for easier maintenance: gaps where weeds could grow are often suppressed, or if weeds do grow through they are easy to distinguish. The shape of the mass can be left to form on its own, with minor intervention when desired or if a plant begins crowding out the space. The infiltration basin meadow plants can be weedwhacked in the early spring, leaving vital habitat for insects to burrow through the winter. Leaving leaves dropped in the fall as mulch insulates plants and insects in the winter and keeps soil moist, adding nutrients as they decompose. Pennsylvania sedge is a native groundcover known to grow where turf grass struggles, provides significant ecological benefit, and does not require mowing or irrigation.













	Common Name	Botanical Name	Layer	Height	Spread	IDEAL GROWING CONDITIONS: Light	Soil	RESILIENCE: Drought	Salt	Compaction	Deer	ORNAMENTAL INTEREST: Spring	Summer	Fall	Winter	LANDSCAPE BENEFIT: Low maintenance	Rain garden	Erosion control	Edible or Fragrant
1	Red maple	Acer rubrum	Tree	35-50'	20-40'	Sun, p sh	Average-wet			x	x	Red bloom		Multicolored foliage			x	x	
2	Redbud	Cercis canadensis	Small tree	12-25'	10-20'	Sun, sh	Adaptable				x	Pink bloom							
3	Pagoda Dogwood	Swida alternifolia	Small tree	10-20'	6-15'	P sh, sh	Average-wet						White bloom						
4	Serviceberry	Amelanchier canadensis	Small tree	10-18'	5-10'	Sun, p sh	Adaptable		x			White bloom							E
5	Witch Hazel	Hamemalis virginiana	Small tree	8-15'	6-15'	S, p sh, sh	Adaptable			x	x			Yellow bloom		x		x	
6	Winterberry	Ilex verticillata	Shrub	4-10'	4-10'	Sun, p sh	Average-wet		x	x	x	White bloom		Red fruit		x	x		
7	Sweet pepperbush	Clethra alnifolia	Shrub	4-8'	4-6'	Sun, p sh	Average-wet	x	x	x	x		White bloom			x	x	x	F
8	Early azalea	Rhododendron prinophyllum	Shrub	3-8'	3-5'	Sun, p sh	Average					Pink bloom							
9	Inkberry	Ilex galbra	Shrub	3-6'	3-5'	Sun, p sh	Adaptable	x	x		x	White bloom	Dark purple fruit	Dark purple fruit	Evergreen	x			
10	Swamp milkweed	Asclepias incarnata	Perennial	2-4'	1-2'	Sun, p sh	Average-wet				x		Pink bloom			x	x		
11	Blue lobelia	Lobelia siphilitica	Perennial	2-3'	12-16"	Sun, p sh	Average-wet	x			x		Purple bloom			x	x		
12	Shrubby cinquefoil	Dasiphora floribunda	Shrub	1-3'	1-3'	Sun, p sh	Adaptable	x	x		x		Yellow bloom			x	x		
13	Sweet goldenrod	Solidago odora	Perennial	1-3'	1-2'	Sun, p sh	Average-dry	x	x		x			Yellow bloom		x	x		E
14	Black-eyed Susan	Rudbeckia hirta	Perennial	1-2'	12-18"	Sun, p sh	Average-dry	x	x		x		Yellow bloom			x	x		
15	Sundial lupine	Lupinus perennis	Perennial	1-2'	8-12"	Sun, p sh	Average-dry	x		x	x	Blue-purple bloom	Blue-purple bloom						
16	White wood aster	Eurybia divaricata	Perennial	1-2'	12-18"	P sh, sh	Average-dry	x						White bloom		x	x		
17	Red columbine	Aquilegia canadensis	Perennial	8"-2'	8-12"	Sun, p sh	Average-dry	x	x		x	Orange bloom				x	x		
18	Partridgeberry	Mitchella repens	Groundcover	1-2"	10-14"	P sh, sh	Adaptable	x			x		White bloom, red fruit		Evergreen	x			E
19	Pennsylvania sedge	Carex pensylvanica	Groundcover	6-10"	12-18"	Sun, p sh, sh	Average-dry	x			x					x	x	x	






PRECEDENTS

Shaded seating also slows stormwater.

Stones define edges of the infiltration basin meadow.

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MAIN LAWN DETAILS
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WEST WING DETAILS

PLANT PALETTE

The universally accessible West Wing area will largely be a place for gathering around food and will be in close proximity to the school. All of these plants are perennials that require little maintenance and are edible for humans and nonhumans alike. Shrubs on the terraced retaining walls help block views into the parking lot. Wild strawberry is a lawn alternative, weed suppresser, slope stabilizer, and habitat enhancer. It can tolerate foot traffic and will bounce back after occasional mowing.

						IDEAL GROWING CONDITIONS		RESILIENCE				ORNAMENTAL INTEREST				LANDSCAPE BENEFIT			
	Common Name	**Botanical Name**	**Layer**	**Height**	**Spread**	**Light**	**Soil**	**Drought**	**Salt**	**Compaction**	**Deer**	**Spring**	**Summer**	**Fall**	**Winter**	**Low maintenance**	**Rain garden**	**Erosion control**	**Edible or Fragrant**
1	American cranberry bush	Viburnum opulus	Shrub	5-12'	4-7'	Sun, p sh	Average-wet		x		x	White bloom	Red fruit	Red/purple foliage		x	x		E
2	Beaked hazelnut	Corylus cornuta	Shrub	4-12'	4-6'	Sun, p sh	Average-wet	x				Pink bloom	Green fruit	Multicolored foliage		x			E
3	Black chokeberry	Aronia melanocarpa	Shrub	3-10'	3-6'	Sun, p sh	Adaptable	x	x	x	x	White bloom				x	x	x	
4	Bayberry	Morella caroliniensis	Shrub	2-6'	3-6'	Sun, p sh	Average-dry	x	x		x		Blue fruit		Evergreen	x		x	E
5	Flowering raspberry	Rubus odoratus	Shrub	3-5'	4-6'	Sun, p sh	Average				x		Purple bloom, red fruit			x	x	x	E, f
6	Wild bergamot	Monarda fistulosa	Perennial	2-4'	12-18"	Sun, p sh	Average				x		Pink bloom			x	x		E, f
7	Fiddlehead fern	Matteuccia struthiopteris	Fern	2-3'	2-4'	Sun, p sh, sh	Average-wet			x	x				Brown fronds	x			E
8	May apple	Podophyllum peltatum	Groundcover	6-12"	3-5'	P sh, sh	Average				x	White bloom	Yellow fruit			x			E
9	Nodding Onion	Allium cernuum	Perennial	12-18"	8-14"	Sun, p sh	Average-dry	x			x		Pink bloom			x	x		E, f
10	Wild Strawberry	Fragaria virginiana	Groundcover	2-5"	1-2'	Sun, p sh	Average-dry	x			x	White bloom	Red fruit			x	x		E
11	Carolina spring beauty	Claytonia caroliniana	Perennial	2-5"	4-6"	P sh, sh	Average-wet				x	Pink bloom							E
12	Partridgeberry	Mitchella repens	Groundcover	1-2"	10-14"	P sh, sh	Adaptable	x			x		White bloom, red fruit		Evergreen	x			E

PRECEDENTS

Vegetated retaining wall terraces slow and sink water and the lower beds are at a height that makes harvesting easier from a seated position or without bending down.

Native, edible, perennial understory plants seamlessly integrate into the forest. They create an aesthetic edge, provide food for community enjoyment, and benefit pollinators, birds, and nonhuman animals.

Using picnic tables that convert to benches allows a space to be multifunctional for both group eating and also for a calm place for enjoying the garden.

RESOURCES

Read more on the relationship between lawn and environmental impact by visiting Penn State Extension's article, 'Improving Local Water Quality Through Lawn Conversion'.

https://extension.psu.edu/improving-local-water-quality-through-lawn-conversion

Edible Brattleboro may be able to provide additional resources on how to plant and tend to an edible landscape.

http://ediblebrattleboro.org

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PINE ISLAND DETAILS

PLANT PALETTE

A more diverse array of shade-tolerant vegetation will increase habitat while also proactively establishing plants to replace the shade, water uptake, and beauty of the pines. Spreading plants can compete with plants like vinca and poison ivy that are beginning to spread to the island from the forest outskirts. Planting screening shrubs and trees along the periphery makes the edge clearer for people parking cars, protecting roots from compaction and helping create a consistent parking pattern. With visual barriers to the lot, the island may feel like more of destination to gather.

Changes to Pine Island should only take place after consulting with an arborist about the current health of the pines and developing a longterm plan. Additionally, meeting with a civil engineer about regrading the lot for better accessibility and to determine the extent of required stormwater management may result in a plan that involves disturbing the area. Hypothetically, if the pines were thinned, native understory plants may emerge on their own or plants that require more sun from the other palettes may be additional options to plant in the new gaps. White oak might start sprouting naturally to eventually become a stately canopy tree and gray birch or river birch could be planted as fast-growing, eye-catching trees. All of these pine replacement options are excellent habitat providers, are extremely durable in challenging conditions, and will provide shade in summer but will let sun through in the winter to relieve ice and snow build up along primary pathways.

PRECEDENTS

A woodland garden

						IDEAL GROWING CONDITIONS		RESILIENCE				ORNAMENTAL INTEREST				LANDSCAPE BENEFIT			
	Common Name	**Botanical Name**	**Layer**	**Height**	**Spread**	**Light**	**Soil**	**Drought**	**Salt**	**Compaction**	**Deer**	**Spring**	**Summer**	**Fall**	**Winter**	**Low maintenance**	**Rain garden**	**Erosion control**	**Edible or Fragrant**
1	White Oak	Quercus alba	Tree	60-80'	30-40'	Sun, p sh	Average-dry	x	x		x			Red/purple foliage		x			E
2	River birch	Betula nigra	Tree	25-45'	15-25'	Sun, p sh	Average-wet		x	x	x			Yellow foliage		x	x		
3	Gray birch	Betula populifolia	Tree	20-40'	8-15'	Sun, p sh	Average-dry	x	x		x				Silver bark	x	x		
4	Musclewood	Carpinus caroliniana	Tree	20-30'	20-35'	P sh, sh	Average-wet				x			Red foliage		x			
5	Striped maple	Acer pennsylvanicum	Small tree	15-25'	7-10'	P sh, sh	Average							Yellow/ bronze foliage	Striped bark, red buds				
6	Witch Hazel	Hamemalis virginiana	Small tree	8-15'	6-15'	Sun, p sh, sh	Adaptable			x	x			Yellow bloom		x		x	
7	Spicebush	Lindera benzoin	Shrub	6-12'	6-12'	Sun, p sh, sh	Average-wet		x		x	Yellow bloom	Red fruit	Yellow, bronze foliage		x	x		E, f
8	Hobblebush	Viburnum lantanoides	Shrub	3-8'	4-9'	P sh, sh	Average-wet				x	White bloom	Red fruit	Yellow, red, purple	Aesthetic buds				E
9	Blue cohosh	Caulophyllum thalictroides	Perennial	2-3'	1-2'	P sh, sh	Average-wet				x	Yellow bloom	Blue fruit			x			
10	Woodland phlox	Phlox divaricata	Perennial/ groundcover	10-14"	12-16"	P sh, sh	Average					Purple bloom				x			F
11	Foam flower	Tiarella cordifolia	Perennial/ groundcover	3-12"	1-2'	P sh, sh	Average				x	White bloom				x			
12	Lowbush blueberry	Vaccinium angustifolium	Shrub/ groundcover	1-2'	1-3'	Sun, p sh, sh	Average-dry	x				White bloom	Blue fruit			x	x		E, f
13	Wild ginger	Asarum canadense	Perennial/ groundcover	3-6"	12-16"	P sh, sh	Average-wet				x	Maroon bloom							
14	Bunchberry	Cornus canadensis	Groundcover	2-5"	8-16"	P sh, sh	Average-wet					White bloom	Red fruit	Red/purple foliage		x			
15	Canada mayflower	Maianthemum canadense	Groundcover	2-4"	10-14"	P sh, sh	Average-dry	x	x		x	White bloom	Red fruit			x	x		
16	Wintergreen	Gaultheria procumbens	Groundcover	1-4"	6-12"	P sh, sh	Average-dry	x			x		White bloom	Red foliage, red fruit	Evergreen	x			E, f

RESOURCES

All plant information and photos are sourced from the Native Plant Trust's Garden Plant Finder. They have a number of valuable resources on their site, including detailed information on invasive plant mitigation.

nativeplanttrust.org

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413-369-4044
www.csld.edu

Designed By: Sara Ozawa
Fall 2022

Pine Island Details
All Souls Unitarian Universalist Church
29 South Street, West Brattleboro, VT 05303

FOREST GATHERING SPACE DETAILS

BIRCH CIRCLE AND "THE MOTHER TREE"

The congregation identified a large pine just beyond the berm in the western forest that they would like to visit regularly for solitary enjoyment or small gatherings. The pine has many large, low, dead limbs that could be hazardous, but a nearby circle of birch and beech could be an additional or alternative option.

The client prefers natural seating materials like stone and wood. Considering mobility and comfort of seating options will facilitate the function of the different spaces. Wood is less durable than stone, but can be more comfortable and easier to move.

The birch circle is another area flat enough to hold gatherings before the slope drops off to the west.

View towards "the Mother tree" from the birch circle.

Outdoor cushions can make any of these options more comfortable and can easily be brought outside as needed for meetings and gatherings.

Lightweight wooden benches can be easily reoriented to fit different types of small gatherings. Existing forest debris can help shape the space.

MEMORIAL GROVE

The church hosts memorial services and has a few memorial trees and stone benches. They would like to provide more options for community members who would like to commemorate ancestors and loved ones.

Some congregation members are also interested in meditation and gravitate toward the form of a labyrinth which is already present on the property, but in a way that hasn't been functional for the desired purpose because of its location and difficulty of maintenance.

This area could be a meaningful area for the bereavement groups to gather or to host small memorial services.

A walking labyrinth facilitates reflection, contemplation, and meditation both in groups and in solitude.

Akin to traditional wish trees, people may choose to adorn the trees surrounding the memorial area with notes to loved ones who have passed on written on fabric and ribbon, while being careful not to girdle the trees.

Engraved sitting boulders, benches, and stones lining paths create a variety of ways to memorialize loved ones in the landscape.

A stacked stone columbarium weaves between trees and also serves as a sitting wall. This one was built by Dan Snow, a member of the local Stone Trust.

ACCESSIBLE AREAS

Opportunities to create ADA-compliant outdoor gathering spaces are limited because of slopes, but siting areas near the parking lots, at a gentle grade, and with easily navigable materials benefits pedestrians and wheelchair-users alike.

ADA-compliant trails must have a grade of 5% or less. Rails are required for grades between 5 and 8% and grades steeper than 8% are not compliant.

Wooden boardwalks with edges and crushed, compacted gravel are good ADA-compliant options for trail design. Pros and cons of traction and regularity of upkeep should be considered. It may be possible to use excess material from regrading the parking lot as path material.

Using ADA-compliant approaches not only eases circulation for all trail users, but reduces negative human impact on the environment, particularly in vulnerable areas. Separation from the forest floor provides a comfortable option for those concerned by ticks.

ADA-compliant trail materials can buffer human interaction from the forest floor, reducing soil disturbance which aids the proliferation of biodiversity-suppressing plants.

Building a deck over the steep slope provides a unique experience of the landscape by creating a special opportunity to mingle in the forest's midstory. The deck can be built to include tree trunks as a feature in the space, so long as wheelchair circulation is not impeded upon. The flatness of the space and the use of decking materials meet ADA criteria.

RESOURCES

The United State Access Board developed the national standards for ADA recreational spaces. The guide they developed can be found online here:

Outdoor Developed Areas: A Summary of Accessibility Standards for Federal Outdoor Developed Areas, 2014. *https://www.access-board.gov/files/aba/guides/outdoor-guide.pdf*

The best way to understand which approaches to developing trails will be best for the site is to physically explore the options. Accessible Nature's webpage on Vermont has a detailed list of accessible hikes and other informational links: *https://www.accessiblenature.info/*

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DESIGNED BY: SARA OZAWA
FALL 2022

FOREST GATHERING DETAILS
ALL SOULS UNITARIAN UNIVERSALIST CHURCH
29 SOUTH STREET, WEST BRATTLEBORO, VT 05303

SOIL SAMPLE RESULTS

UMass Extension

WEST WING RESULTS

Assorted samples collected from the labyrinth beds.

Results

Analysis	Value Found	Optimum Range	Analysis	Value Found	Optimum Range
Soil pH (1:1, H2O)	5.5		**Cation Exch. Capacity, meq/100g**	9.4	
Modified Morgan extractable, ppm			**Exch. Acidity, meq/100g**	7.4	
Macronutrients			**Base Saturation, %**		
Phosphorus (P)	0.7	4-14	Calcium Base Saturation	18	50-80
Potassium (K)	36	100-160	Magnesium Base Saturation	3	10-30
Calcium (Ca)	342	1000-1500	Potassium Base Saturation	1	2.0-7.0
Magnesium (Mg)	31	50-120	**Scoop Density, g/cc**	0.94	
Sulfur (S)	10.5	>10			
Micronutrients *					
Boron (B)	0.0	0.1-0.5			
Manganese (Mn)	4.6	1.1-6.3			
Zinc (Zn)	1.3	1.0-7.6			
Copper (Cu)	1.0	0.3-0.6			
Iron (Fe)	11.3	2.7-9.4			
Aluminum (Al)	231	<75			
Lead (Pb)	3.1	<22			

* Micronutrient deficiencies rarely occur in New England soils; therefore, an Optimum Range has never been defined. Values provided represent the normal range found in soils and are for reference only.

Soil Test Interpretation

Nutrient	Very Low	Low	Optimum	Above Optimum
Phosphorus (P):				
Potassium (K):				
Calcium (Ca):				
Magnesium (Mg):				

Recommendations for Home Strawberries-Establishment

Limestone (Target pH of 6.0)	Nitrogen, N	Phosphorus, P2O5	Potassium, K2O
	lbs / 100 sq ft		
10	.1 - .15	0.5	0.5

Comments:

-Your magnesium level is low. Dolomitic limestone is recommended.
*To supply Nitrogen, apply EITHER 0.8 - 1.25 lbs. Dried Blood (12-0-0) OR 0.2 - 0.3 lbs. Urea (45-0-0) per 100 square feet. Application should be split between early spring and mid-June.
*To supply Phosphorus, apply EITHER 4.2 lbs. Bone Meal (4-12-0) OR 1.1 lb. Triple Phosphate (0-45-0) per 100 square feet.
*To supply Potassium, apply 0.8 lbs. Potash (0-0-60) per 100 square feet.
-For instructions on converting nutrient recommendations to fertilizer applications in home gardens and landscapes, see Reference "Step-by-Step Fertilizer Guide for Home Grounds and Gardening" (listed below).
-Maintain a 3 to 5 inch organic mulch on soil surface.
-The lead level in this soil is less than 22 ppm, which falls below the listed optimum level. However, many variables affect this result, and safety thresholds vary by location and soil use. There is still a potential risk of lead exposure for soils used for growing food or as play areas for children. Our Total Sorbed Metals test provides an accurate measurement of soil lead. For more information about lead levels in soil, see the fact sheet entitled "Soil Lead: Testing, Interpretation, & Recommendations," listed under General References at the end of this report. ATTN: The Total Sorbed Metals Test is currently unavailable. We apologize for any inconvenience.

References:

New England Small Fruit Management Guide	http://extension.umass.edu/fruitadvisor/ne-small-fruit-management-guide
Step-by-Step Fertilizer Guide for Home Grounds and Gardening	https://ag.umass.edu/SPNTL-4

MAIN LAWN RESULTS

Assorted samples collected from the garden beds in the main lawn area.

Results

Analysis	Value Found	Optimum Range	Analysis	Value Found	Optimum Range
Soil pH (1:1, H2O)	5.9		**Cation Exch. Capacity, meq/100g**	9.5	
Modified Morgan extractable, ppm			**Exch. Acidity, meq/100g**	4.7	
Macronutrients			**Base Saturation, %**		
Phosphorus (P)	0.6	4-14	Calcium Base Saturation	47	50-80
Potassium (K)	24	100-160	Magnesium Base Saturation	3	10-30
Calcium (Ca)	891	1000-1500	Potassium Base Saturation	1	2.0-7.0
Magnesium (Mg)	34	50-120	**Scoop Density, g/cc**	0.93	
Sulfur (S)	11.6	>10			
Micronutrients *					
Boron (B)	0.1	0.1-0.5			
Manganese (Mn)	6.1	1.1-6.3			
Zinc (Zn)	1.0	1.0-7.6			
Copper (Cu)	1.0	0.3-0.6			
Iron (Fe)	6.7	2.7-9.4			
Aluminum (Al)	171	<75			
Lead (Pb)	1.9	<22			

* Micronutrient deficiencies rarely occur in New England soils; therefore, an Optimum Range has never been defined. Values provided represent the normal range found in soils and are for reference only.

Soil Test Interpretation

Nutrient	Very Low	Low	Optimum	Above Optimum
Phosphorus (P):				
Potassium (K):				
Calcium (Ca):				
Magnesium (Mg):				

Recommendations for Flowers, Roses, & Herbs

Limestone (Target pH of 6.5)	Nitrogen, N	Phosphorus, P2O5	Potassium, K2O
	lbs / 100 sq ft		
7.5	.1 - .2	0.25	0.25

Comments:

-Do not topdress with more than 5 lb limestone per 100 sq ft at one time. Split the above application between early spring and mid-autumn.
*To supply Nitrogen, apply EITHER 1 - 1.5 lbs. Dried Blood (12-0-0) OR 0.2 - 0.4 lbs. Urea (45-0-0) per 100 square feet. Application should be split between early spring and mid-June.
*To supply Phosphorus, apply EITHER 2.1 lbs. Bone Meal (4-12-0) OR 0.6 lb. Triple Phosphate (0-45-0) per 100 square feet.
*To supply Potassium, apply 0.4 lbs. Potash (0-0-60) per 100 square feet.
-For instructions on converting nutrient recommendations to fertilizer applications in home gardens and landscapes, see Reference "Step-by-Step Fertilizer Guide for Home Grounds and Gardening" (listed below).
-The lead level in this soil is less than 22 ppm, which falls below the listed optimum level. However, many variables affect this result, and safety thresholds vary by location and soil use. There is still a potential risk of lead exposure for soils used for growing food or as play areas for children. Our Total Sorbed Metals test provides an accurate measurement of soil lead. For more information about lead levels in soil, see the fact sheet entitled "Soil Lead: Testing, Interpretation, & Recommendations," listed under General References at the end of this report. ATTN: The Total Sorbed Metals Test is currently unavailable. We apologize for any inconvenience.

References:

Home Lawn and Garden Information	http://ag.umass.edu/resources/home-lawn-garden
Step-by-Step Fertilizer Guide for Home Grounds and Gardening	https://ag.umass.edu/SPNTL-4

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