

ABSTRACT

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PARCHMENT TO TOUCHSCREEN:
LANDSCAPE JOURNEY & EXPERIENCE FOR
21ST CENTURY LEARNING

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Experiences of landscape journey are informed and mitigated by modalities of place-based practices. Historically, documentation and transmission of landscape knowledge was limited to narratives of those with power and influence. Today, the democratization of power and decentralization of knowledge, particularly as affected by technology, are projected to affect powerful changes for our future.

This project creates innovation in place-based learning through an interdisciplinary approach combining landscape design for outdoor learning environments with collaborative curriculum development. Educators from Gesher Jewish Day School in Fairfax, VA were involved in this collaboration that has yielded an exciting, fresh approach to engaging student relationships to landscape. Students connect to narratives of landscape journey and experience in Jewish tradition while engaging in guided personal explorations of place. In the process, new wisdom, the "Torah of Place," is generated, documented and transmitted through both traditional sense-of-place activities and pedagogies integrating modern mobile technology such as smartphones and tablets.

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LANDSCAPE JOURNEY & EXPERIENCE FOR 21ST CENTURY LEARNING

By

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Thesis submitted to the Faculty of the Graduate School of the
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Foreword

This project began with the idea of exploring the integration of digital technology in outdoor learning environments. The supposition was that, while environmental education frequently stresses the importance of removing ourselves from modern technology to better facilitate direct connections to the natural world, perhaps educators should be willing to meet students halfway when appropriate. Is it possible that utilizing the technology so many young people are accustomed to using throughout their daily lives educators might increase student engagement and positive learning outcomes? That technology fluency might be considered another of the multiple intelligences educators strive to address through curriculum and pedagogy? And if is this the case, how might landscape design help to facilitate these pedagogical innovations?

Initially, several possible research methods were considered. These ranged from facilitating comparative field sessions utilizing both digital and “analog” teaching methods to fully integrating both students and digital smartphone technology into the design process, from site inventory and analysis to concept development. As the site was identified - Gesher Jewish Day School – and collaboration with educators and administration began, the project scope was narrowed to reflect both educator needs and a shorter timeline than would be required to develop the in-depth research proposals first considered.

The most significant impediment on progress was the failure to initiate contact with Gesher educators over the summer, before the school year began (if not the prior

spring). As anyone familiar with educational institutions will be aware of, once the school year starts, educators and administration have their hands full staying on top of the many responsibilities the job entails, and time for planning and implementing new projects is short. Those reading this who are considered a project involving schools or other educational institutions should keep this in mind and initiate contact as soon as possible.

My main collaborator at Gesher, Rabbi Matisyahu Tonti, and I came closest to implementing student field sessions in late spring, during the period between the Jewish holidays of Passover and Shavuot. The progression of these holidays, which references the exodus of the Israelites from slavery in Egypt to the receiving of the Torah (Jewish Bible) at Mount Sinai, lent itself particularly well to the conceptual underpinnings of the project – place-based Torah, or, the Torah (wisdom) of the earth. While we were ultimately unable to ready the sessions in time, our collaboration yielded an exciting and innovative project plan that can be implemented in the future and also serves as a framework for expansion into a year-round curriculum. This applied pedagogy can be found as an appendix in this document. Educators at Gesher and other schools are encouraged to review, adopt, and expand this curriculum as appropriate – while it is specifically integrated into a Judaics-based curriculum, many of the essential concepts, methods, and progressions are applicable to secular educational settings as well. All can benefit from developing a closer relationship to the landscape places around us.

Dedication

Dedicated to my wife, Abby, and our pup, Norman Jellybean, both of whom have supported me with undying love and patience during countless late nights at home and in studio.

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Table of Contents

Foreword	ii
Dedication	iv
Acknowledgements.....	v
Table of Contents	vi
List of Figures.....	ix
Chapter 1: Project Overview	1
Introduction	1
Conceptual Frameworks	5
Chapter 2: Literature Review	10
The Case for Childhood Outdoor Experiences	10
Impact on the Child – Academic Achievement Benefits.....	14
Digital Technology and Education In and Out of the Classroom.....	17
Chapter 3: Site Inventory and Analysis	23
Site Selection.....	23
Regional Context – Jewish Northern Virginia.....	24
Context – Fairfax County	25
Gesher Jewish Day School - General Description and Demographics.....	26
Gesher Site, Zoning, Surrounding Properties.....	29
Existing buildings and infrastructure; Site Use	33
Gesher Curriculum	37

Teacher concerns + hopes; identified opportunities	38
Micro-climate	40
Slope & Topography; Hydrology	41
Soils.....	49
Vegetation.....	52
Existing Trail System & Learning Spaces + Gesher Green Habitats.....	54
Gesher landscape areas by Quadrant.....	60
Social Analysis – Activity Hubs; Gateways; Circulation	68
Chapter 4: Design Approach	76
Conceptual Framework.....	76
Experiential Jewish learning in the landscape	77
Examples of Jewish Movement and Journey.....	79
Chapter 5: Design Narrative	82
Design Inspiration.....	82
Design Materials.....	90
Concept Development	96
DESIGN	100
OVERVIEW.....	101
Appendix B: Additional Soil Classification Information.....	129
Appendix B: Applied Pedagogy	
Project Overview:	136
Enduring Understandings:	137
Key Questions:	137

Goals	138
Session Plan Overview	139
Student Outcomes	140
Skills Learned / Utilized	140
Project Assessment.....	141
Sub-Appendix A: Steps for creating AR layer content	143
Sub-Appendix B: Curriculum Alignment	144
Bibliography.....	155

List of Figures

Figure 1 - Jewish Northern Virginia	24
Figure 2 - Fairfax County Context.....	25
Figure 3 - Front of Gesher Jewish Day School.....	27
Figure 4 - Parcel Map	32
Figure 5 - Indoor and Outdoor features at Gesher	33
Figure 6 - <i>Beit Midrash</i> - "House of Learning"	34
Figure 7 – Commons.....	34
Figure 8 - Cafeteria Courtyard.....	35
Figure 9 - Bennett Library	35
Figure 10 - Israel Garden Courtyard.....	36
Figure 11 - Topography	42
Figure 12 - Slopes	44
Figure 13 - Hydrology: Waterways	45
Figure 14 - Hydrology: Riparian Zones.....	47
Figure 15 - Soil Areas and Classifications.....	48
Figure 16 - Existing Forest Canopy	52
Figure 17 - Existing Trails System & Learning Spaces.....	54
Figure 18 - Educational Birdhouse	55
Figure 19 - Herb Spiral in Existing Student Garden.....	56
Figure 20 - Compost Station	57

Figure 21 - Main Building & Schoolyard	60
Figure 22 - Existing Functional Zones.....	62
Figure 23 - Primary Activity Hubs	69
Figure 24 - Secondary Activity Hubs	70
Figure 25 - Existing & Potential Gateways	72
Figure 26 - Primary Circulation	73
Figure 27 - Secondary Circulation	74
Figure 28 - Tertiary Circulation	75
Figure 29 - The 10 <i>Sefirot</i> mapped out.	83
Figure 30 - The three "mother" letters	86
Figure 31 - Seven "double letters"	87
Figure 32 - Twelve "elemental" letters	88
Figure 33 - Hebrew letters as spatial building blocks.....	89
Figure 34 - Stone precedents.....	90
Figure 35 - Wood Precedents.....	92
Figure 36 - Metal Ornamentation Precedents	93
Figure 37 - Ancient Torah Scrolls	95
Figure 38 - Concept Development Phase I	97
Figure 39 - Concept Development Phase II	98
Figure 40 - Concept Development Phase III.....	99
Figure 41 - Full Site Plan	100
Figure 42 - North Woods Section-Elevation (North-South).....	101

Figure 43 - Site Plan: Schoolyard Detail	102
Figure 44 - Schoolyard - Gaga pit; Labyrinth; Sensory Garden	103
Figure 45 - Schoolyard - Playground	105
Figure 46 - The barefoot path	106
Figure 47 - Gaga Pit & Labyrinth	107
Figure 48 - Tree bosquet and scroll bench	109
Figure 49 - The courtyard has a pleasant microclimate	109
Figure 50 - Bridges and Eco-lab swale during high water	111
Figure 51 - Bridges and Eco-lab swale during low water	112
Figure 52 - Stepping stones allow student access to and across the water	112
Figure 53 - Amphitheater and beit midrash in morning light	115
Figure 54 - Amphitheater and beit midrash in afternoon autumn light	115
Figure 55 - Vernal wetlands at high water (winter-spring)	117
Figure 56 - Vernal wetlands at low water (summer-fall)	117
Figure 57 - View of the vortex and labyrinth from elevated viewing platform	119
Figure 58 - North woods: Labyrinth to Narrows to Sanctuary and Wilderness	120
Figure 59 - Weathered steel mesh banners in the majestic natural sanctuary	122
Figure 60 - The personal sanctuary is shaped after the letter "tet"	122
Figure 61 - "Wilderness Journey" Section-Elevation (North-South)	125
Figure 62 - Locations for augmented reality outposts	127
Figure 63 - Exhibition Chart	146

Chapter 1: Project Overview

Introduction

Twenty-two elemental letters. God engraved them, carved them, weighed them, permuted them, and transposed them, forming with them everything formed and everything destined to be formed.

Twenty-two elemental letters. God set them in a wheel with 231 gates, turning forward and backward. How did God permute them? Alef with them all, all of them with alef; bet with them all, all of them with bet; and so with all the letters, turning round and round, within 231 gates. Thus all that is formed, all that is spoken emerges from one name.

Out of chaos God formed substance, making what is not into what is. He hewed enormous pillars out of ether that cannot be grasped. When Abraham our father, peace unto him, gazed -- looking, seeing, probing, understanding, engraving, carving, permuting, and forming -- he succeeded in creation. Immediately God manifested to him, embracing him, kissing him on the head, calling him "Abraham, my beloved."

Sefer Yetzirah – “Book of Creation”

Traditional Jewish learning focuses largely on text – the original canonized books of the Hebrew Bible (*Torah*¹ – “Teaching,” also known as the Five Books of Moses; *Nevi'im* – “Prophets”; and *Ketuvim* – “Writings”: *TaNaKh*), also referred to as the Written Torah; the *Talmud* and *Mishnah*, which record rabbinic commentary on the original *Tanakh* text (also referred to as the Oral Torah); *Kabbalistic* works of the Jewish mystics such as *Sefer Yetzirah* and *Zohar*; and the thousands of additional stories, commentaries, philosophical works and legal codes recorded through the past two millennia. So rich is the library of Jewish text that Jews are commonly referred to

¹ While “Torah” refers specifically in this case to the Five Books of Moses (Genesis, Exodus, Leviticus, Numbers, Deuteronomy) it also used as a “catch-all” term referring broadly to Jewish wisdom in all aspects, both text-based and non-text-based.

as “The People of the Book.” The wealth of knowledge and wisdom recorded in these texts is a treasure that no single person could ever hope to fully accumulate alone.

While Jews are sometimes assumed to possess a natural proclivity towards academic, text-based learning, 20th century research on pedagogy and education reveals the existence of multiple intelligences and encourages educators to adopt modes of differentiated instruction to accommodate these many intelligences and learning styles within a learning community. In these needs, Jewish children are no different than any other group of children.

Within the Jewish community, a recently released study by the Pew Research Center – “A Portrait of Jewish Americans” (2013) – has caused much hand-wringing for its findings showing rising rates of intermarriage and assimilation, and declining connection with synagogues and other institutions. Compared to the WWII generation, 93% of whom described themselves as Jewish on the basis of religion, only 68% of Millennials in the survey identified with Judaism on a religious basis while 32% described themselves as having no religion and identify as Jewish on the basis of ancestry, ethnicity or culture. While the study and associated media reports have many critics – from those claiming the study “missed the point” (Gerson 2013) to those claiming the study just plain got it wrong (Goldberg 2013) – it suggests what many working within the Jewish community already know: Jewish belief, observance, practice, and community is vastly different in the 21st century than the past, whether compared to the 20th century or any other.

If 21st century Judaism reflects changes in the Jewish community, 21st century

Jewish education should do the same. An emerging field with a newly coined acronym, JOFEE – Jewish Outdoor, Food, and Environmental Education – and quickly expanding programming and infrastructure, shows promise as an important, innovative component of 21st century Jewish education. A recent report (JOFEE 2014), whose findings drew from a mixture of focus-group data, a survey of 800 people age 18 and older, and review forms submitted by 41 programs, examined what the study called “immersive” experiences of four days or longer that fall under the umbrella of “JOFEE.” Compared to the Pew study, the report’s findings are striking:

- Eighty-four percent of respondents said JOFEE experiences increased their sense of hope for the Jewish people.
- Seventy-three percent of participants in JOFEE programs considered themselves to be a leader in their Jewish community, with 67 percent of that group saying their JOFEE experience influenced their leadership.
- Eighty-six percent agreed with the statement, “How I relate to the outdoors, food, or environment is an expression of my Jewishness.”

The study also showed a marked increase from 197 participants across six JOFEE programs in 2000 to 2,405 people participating in 41 different JOFEE programs in 2012. Programs included Jewish holiday retreats and conferences providing hands-on experiences and learning forums celebrating the intersection of food, sustainability and Jewish life, outdoor/food adventures promoting healthy and ethical nutrition and lifestyles, camp (for counselors and staff), teaching and farming fellowships, and

apprenticeships at farms focused on sustainable agriculture modeled after Jewish agricultural connections. Notably missing from the study, as recognized by the research sponsors, were the “much broader array of JOFEE activities which also include shorter and episodic opportunities in different settings, often at the local level, and for all people, young and old.” The Pearlstone Center, for example – a Jewish conference and retreat center with an on-site educational farm with the mission to “ignite Jewish passion” – sees over 4,000 participants a year for short farm-programs and volunteering opportunities, most of whom come from the local Baltimore Jewish community either as individuals or with a Jewish school, synagogue or other institution. Only fourteen years old (the farm itself was established in 2006), Pearlstone is an integral component of 21st century Jewish life for the Baltimore community.

This project further explores a fundamental question for modern learning communities – *What does place-based learning look like in the 21st century?* – and applies it to Jewish learning through the lenses of landscape design for outdoor learning environments and applied pedagogy integration. It suggests that the following components characterize a modern and innovative approach to Jewish education:

1. Relevant to diaspora life & community
2. Place-based: centered on local landscape & community
3. Grounded in tradition; Moving towards the future
4. Creates Jewish citizens & stewards of people, place, & community

In collaboration with Gesher Jewish Day School in Fairfax, VA, this project builds upon these core principles to model design that optimizes the Gesher landscape for place-based Jewish learning and includes an exploratory applied pedagogical approach utilizing modern technology (mobile devices and augmented reality) to document and transmit Jewish landscape knowledge from one generation of students to the next.

Conceptual Frameworks

As mentioned earlier, according to Jewish tradition, the Torah was given to Moses at Mount Sinai in two forms: written and oral. Both contained the laws and traditions that would guide Jews for millennia. The Jewish relationship to Torah study is characterized by its frequency (multiple times a week), cyclicity and repetition (the first five books of Moses are read yearly start to finish), and near-endless depth and breadth. It is a fundamental component of Jewish life and life-cycle events such as Bar/Bat Mitzvahs and weddings, and Jews are proud of this tradition of lifelong learning.

The design and pedagogy in this project stem, however, from a shift in the traditional understanding of what constitutes Torah study. They explore “living Torah” or the “Torah of place.” Renowned Rabbi Shlomo Carlebach commented that “The Torah is a commentary on the world, and the world is a commentary on Torah.” The Torah is seen by many as a living document – the creation of Torah knowledge and wisdom is alive, dynamic, and ongoing, reimagined and renewed by every

subsequent generation of Jews.

Place-based Torah, which might be considered a branch or offshoot of this living Torah concept, is at the heart of this project. Traditional Jewish learning is comprised of stories, knowledge, wisdom and insights based on our ancestors' experiences and journeys through the cultures and landscapes of the ancient Middle East. If landscape can be understood to contain wisdom, how do we access this wisdom? The answer: through developing a relationship to landscape similar to the ongoing study of written Torah, we can gain wisdom of the Earth that will both inform our Jewish learning and better enable our understanding of the world we inhabit. This is place-based Torah.

Design, pedagogy, and technology in this project serve as bridges for place-based Torah, connecting people, place, and community within the Gesher (Hebrew for "bridge") landscape: "wilderness" and "civilization"; natural and built environments; past, present and future traditions, wisdom and knowledge; indoor and outdoor learning environments; student connection to the Gesher landscape; and connecting the Gesher landscape to the landscapes of past Jewish history. The landscape design optimizes the landscape for place-based Jewish learning using a flexible framework built on narratives of Jewish movement and journey. The applied pedagogy demonstrates and explores how Judaics curriculum can be layered into the landscape. And the integration of modern digital technology explores different modalities of learning and landscape connectivity while building on historical uses of technology as both an enabling and restricting factor in the documentation and

transmission of knowledge.

Narratives informing and depicting the Jewish relationship to landscape – from the exile from Eden to Abraham’s journey to a divinely “promised” land; the exodus from Egypt and forty year wandering of the Israelites through the Sinai wilderness to Babylonian exile and two-thousand years of diaspora – rarely depict a static, permanent settlement. Rather, movement and journey are core aspects of the Jewish experience, and while Jewish texts and traditions focus on the “Promised Land” of Israel (the modern state of which was established as a Jewish “homeland” in 1948), Jews have in fact spent far more time journeying towards, away from, and around Israel than in actual permanent settlement.

Throughout the last 4,000-6,000 years, as the Jewish nation has moved nomadically through landscapes of the Middle East and beyond, they have accumulated a tremendous wealth of knowledge and wisdom, much of it directly relating to the landscapes they encountered. This knowledge, and the ability to document, share and transmit it from one generation to the next, has been fundamentally shaped and limited by available technologies. Parchments and ink allowed knowledge to be written and codified into the books we call Torah and Talmud; the printing press allowed for exponentially greater distribution of these works. Today, the essential texts can be found in digital form on the Internet and increasingly obscure texts continue to be digitized.

Technology both enables and limits these processes of knowledge creation and distribution. While there may have been hundreds of thousands of Israelites who

participated in the Exodus, there remains just one central narrative telling this story of freedom, rebirth, and divine revelation.² If the divine revelation of Mount Sinai, a staggeringly profound and momentous spiritual encounter, were to occur today, it seems reasonable to assume that the Israelites, arms outstretched, would be holding smartphones in their hands, taking photos and videos, live-Tweeting, and updating their Facebook statuses. Over the course of the forty year journey through the Sinai Wilderness, perhaps 20-somethings would be blogging their experiences while Israelite teenagers might be Snapchatting ephemeral photos from one end of camp to another. Extreme sports enthusiasts might be recording stunts with GoPro cameras attached to their persons, while a small handful of techies would be filtering the experience through Google Glass augmented reality technology. Perhaps journalists and, later, historians would attempt to craft a single narrative depiction of these experiences, and while such a set of Big Data might exacerbate the challenge of sorting through the many voices and experiences, through modern technology a profusion of individual voices would create a vast body of collective landscape experience and knowledge.

² It is worth noting that while the Bible reads as one text, many Biblical scholars consider it to be a composite of either four distinguishable narratives reflecting the various balances of power and influence in ancient Israelite society (the “documentary hypothesis”) or of various fragments of texts gradually combined over millennia. That said, the overall point – that technology both enables and limits how knowledge is documented and transmitted – remains true.

This project's essential goal is to explore innovative methods for increasing student engagement and ownership within place-based Jewish learning through a combination of design and pedagogical approaches. By nature an iterative process, development of pedagogy informs the design approach, which in turn affects pedagogy, and so on. As in most educational settings, multiple disciplines have a stake in the use of the outdoor learning environment. A successful design approach must therefore maintain enough flexibility to be useful across a wide spectrum of potential users, while also creating a meaningful experience that cultivates stronger connection to the landscape. The applied pedagogy developed collaboratively with Gesher educators explores and develops one particular use of the technology platforms discussed to both demonstrate potential benefits and identify challenges of integration. It is hoped that in future applications educators will feel comfortable both building on this curricular model and exploring other uses of the landscape for multi-disciplinary learning.

Chapter 2: Literature Review

The Case for Childhood Outdoor Experiences

The current state of children and outdoor experiences

The availability of supportive and diverse play environments and children's access to neighborhood space has declined as barriers to children's outdoor exploration have increased over time. Simultaneously, the age at which children are allowed outside unsupervised has risen, as has the availability and level of participation in professionally supervised activities. (Gaster 1991) In a study of a working-class New York City community, Wridt (2004) found that compared to youth in the 1940s, who experienced the streets as an important space for adventure and social gathering, youth in the 2000s have largely moved indoors. Factors in this trend may have included increased prevalence of automobiles and the subsequent build of numerous city parks and playgrounds which then became blighted and unsafe by the 1970s and 1980s. Recent youth activities tend to take place in private or institutionalized settings, and are often dominated by various forms of electronic media.

Karsten found similar trends in 2005: Children's use of space has changed from being primarily outdoors to indoors and has become increasingly adult supervised. For children in the 1950s and early 1960s, "playing meant playing outside" and they had considerable freedom to move around on their own in a

relatively large territory, played with children from diverse backgrounds, and used urban public space for many of their activities. Children in 2003 played outside less frequently and for shorter periods in a more restricted range, with fewer playmates from diverse backgrounds. They were more home-centered, and experienced greater parent-induced constraints. Playday Surveys (2005, 2006) found that safety and the quality of their environment (e.g., the places to play outside) are the biggest factors that impact how much children play outside

A research review by the Children & Nature Network finds evidence of ongoing changes in children's experience of nature, including decrease in outdoor time, increasing adult supervision, declining child access to public play space, and fewer visits to U.S. national parks. Children's lives are more scheduled with structured activities and include less free time, and spend considerable time with electronic media. While better access to natural areas may encourage physical activity, studies show evidence that childhood obesity is increasing and that many students have shorter recess periods, or none at all. Finally, independent child mobility has become increasingly restricted as parents struggle to balance opportunities for independence with safety concerns for their children. (Senauer 2007).

Impact on the Child – Holistic Benefits

In response, research on children and time spent outdoors in nature has shown dramatic impacts of outdoor learning & experiences on overall child development;

academic achievement, self-esteem and self-discipline; civic responsibility; increased creativity and problem-solving; and physical and emotional health (Charles 2007).

Time in nature impacts all aspects of overall child development - cognitive, emotional, physical, spiritual & social. “Play in nature, particularly during the critical period of middle childhood, appears to be an especially important time for developing the capacities for creativity, problem-solving, and emotional and intellectual development.” (Kellert 2005)

The concept of “play” may also be more compelling and inviting to adult caregivers, parents and guardians, while providing similar physical benefits to “exercise,” as well as cognitive benefits – including creativity, problem-solving, focus, and self discipline – and social benefits such as cooperation, flexibility, and self-awareness. (Burdette et al 2005) Chawla (2006) adds increased physical competence, environmental knowledge, and confidence to the benefits to children’s development. Two surveys by Playday (2005, 2006) found that 39% of children do not play outside as much as they would like to and that children generally prefer to play in natural spaces over non-natural spaces.

Risk assessment and management is an important learning outcome from outdoor experiences. Teenage participants who participated in wilderness programs offered by the Student Conservation Association (SCA), the National Outdoor Leadership School (NOLS), and Outward Bound reported positive effects on their personal, intellectual, and, in some cases, spiritual development in both retrospective and longitudinal studies. Pronounced results were found in enhanced self-esteem,

self-confidence, autonomy, and initiative. (Kellert 1998). These programs are structured to teach students how to appropriately assess and manage risk in outdoor environments and balance them with potential benefits of outdoor activities and decisions.

A preoccupation with safety has stripped childhood of independence, risk taking, and discovery without making it safer. In *The Atlantic*, Rosin (2014) advocates for “adventure playgrounds” modeled in part after 1940s era U.K. playgrounds made popular by landscape architect Lady Marjory Allen of Hurtwood. Such playgrounds encourage a “free and permissive atmosphere” with as little adult supervision as possible. Children face what seems to them like dangerous risks, and then conquer them independently, resulting in increased self-confidence and courage. At modern versions such as The Land in North Wales, professionally trained “playworkers” keep a close eye on children but do not intervene except in extreme situations. These playworkers have binders full of “risk-benefit assessments” for activities possible at The Land. Benefits for children making fire include: “It can be a social experience to sit around with friends, make friends, to sing songs to dance around, to stare at, it can be a co-operative experience where everyone has jobs. It can be something to experiment with, to take risks, to test its properties, its heat, its power, to re-live our evolutionary past.” Risks include: “Burns from fire or fire pit” and “children accidentally burning each other with flaming cardboard or wood.” In the two years since The Land opened, no one has been injured outside of the occasional scraped knee.

Impact on the Child – Academic Achievement Benefits

Increased student time in outdoor learning environments has also been correlated with increases in academic achievement. A study by The American Institutes for Research (2005) found a 27% increase in measured mastery of science concepts; enhanced cooperation and conflict resolution skills; gains in self-esteem; gains in positive environmental behavior; and gains in problem-solving, motivation to learn, and classroom behavior following an outdoor learning experience for at-risk youth with little or no nature experience. Students in environment-based instructional programs score as well or better on standardized measures in four basic subject areas — reading, math, language and spelling. (SEER 2005)

Taylor (2001) finds that ADHD symptoms were more manageable after activities in green settings than in other settings; and that the more green a child's everyday environment, the more manageable their attention deficit symptoms will be in general. In addition, contact with the natural world can soothe ADHD symptoms for children as young as five (Kuo & Taylor 2004), and access to green spaces (even just a view) can enhance feelings of peace, self-control, and self-discipline for inner-city youth (Taylor et al 2001). Wells and Evans (2003) find similar results for reducing stress amongst rural children, with the more plants, green views, and access to natural play areas, the more positive the results.

Impact on schools and the Community

The environment-based programs also foster cooperative learning and civic

responsibility, using the natural characteristics of the school grounds and local community as the foundational framework for the curricula. (SEER 2005) A 1998 report (Lieberman & Hoody) by the State Education and Environment Roundtable (SEER) studied nationwide programs utilizing the Environment as an Integrating Context for learning (“EIC programs”). These programs use EIC as a framework for interdisciplinary, collaborative, student-centered, hands-on, and engaged learning.

The study observed benefits of EIC programs that were both broad-ranging and encouraging, including:

- Better performance on standardized measures of academic achievement in reading, writing, math, science, and social studies;
- Reduced discipline and classroom management problems;
- Increased engagement and enthusiasm for learning;
- Greater pride and ownership in accomplishments

Teachers and administrators surveyed reported the following effects of adopting EIC approaches:

- Increased enthusiasm and commitment toward teaching (95%)
- Better working relationships with their students and colleagues (94%)
- More opportunities to explore new subject matter than traditional, discipline-based teaching (95%)
- Frequent occasions to use innovative instructional strategies (96%)
- Strong administrative support played a crucial role in success of EIC

programs.

Teachers responded largely positively, for example:

“When I taught the kids math skills like measuring, in the classroom, they forgot it and couldn’t make use of it. When the students had a chance to use these skills on our nature trail, they not only learned better, but could apply and remember their math skills longer.”

Kim Flynn, math teacher, Jackson County Middle School, Kentucky – quoted in Lieberman & Hoody (1998).

This study was followed by two related studies, conducted by the State Education and Environment Roundtable (SEER), both of which produced results consistent with this original study.

Outdoor learning has positive impacts on the broader community as well. McInerney et al (2011) describe the main task of place-based education (PBE) in schools as “creating opportunities for young people to learn about and care for the ecological and social wellbeing of the community they inhabit and the need to connect schools with communities as part of a concerted effort to improve student engagement and participation.” And, a critical perspective in PBE “encourages young people to connect local issues to global environmental, financial and social concerns, such as climate change, water scarcity, poverty and trade.” (McInerney et al 2011)

Researchers found that place attachment, the degree to which a place is important to people. (Jorgensen & Stedman 2001), contributes to pro-environmental behavior (Payton et al 2005; Halpenny 2007). To enhance place attachment, researchers often suggest that people need to spend more time in a place. For example educators may frequently take children out of classrooms to local ecosystems to

enhance their place attachment (Smaldone et al 2008; Morgan 2009).

Digital Technology and Education In and Out of the Classroom

A survey of Advanced Placement and National Writing Project teachers (Purcell et al 2013) shows that digital tools are widely used in their classrooms and professional lives. Yet, many of these high school and middle school teachers worry about digital divides when it comes to their students' access to technology. Those who teach low-income students especially face obstacles in bringing technology into their teaching. A 2013 PBS survey found that teachers are embracing digital resources to propel student learning. Three-quarters of teachers surveyed link educational technology to a growing list of benefits, saying technology enables them to reinforce and expand on content (74%), to motivate students to learn (74%), and to respond to a variety of learning styles (73%). Seven in 10 teachers (69%) surveyed said educational technology allows them to “do much more than ever before” for their students.

Kossuth (2011) discusses the digital devices students use consistently on campus, which “likely include iPhones, Android devices, and other smartphones, iPads and other tablets, laptops, and netbooks. The question often is, ‘What are students engaged in learning?’ . . . Is the ability to self-select devices, applications, and community and to combine them into a personalized learning environment required in today’s world?”

Two studies in 2005 and 2006 (Roberts et al and Rideout et al) investigated

media in the lives of children ages 6 months to 6 years and eight to eighteen years and may offer a counterpoint. Key findings include:

- Young people today experience a substantial amount of electronic media—Children between the ages of 6 months and 6 years spend an average of 1.5 hours with electronic media on a daily basis, whereas children between the ages of 8 and 18 years spend an average of nearly 6.5 hours a day with electronic media.
- Since 1999, there has been very little change in the amount of time 8 to 18 year olds spend using media—This trend may indicate that young people have reached a limit with regards to how much time they can devote on any given day to media.
- 8 to 18 year old children are packing more media into the same amount of time— When young people use media, about a quarter of the time they are using more than one medium at a time (e.g., reading and watching TV).
- Children’s homes are filled with media—Nearly one third of children from 6 months to 6 years of age live in households where the TV is on all or most of the time.
- Television and music remain the dominant media to which children are exposed— 8 to 18 year olds spend an average of 3 hours a day watching TV and about 1.75 hours a day listening to music.
- Access to and use of computers and the Internet has increased dramatically

since the last surveys were conducted—Since 1999, 13% more 8 to 18 year olds have a computer at home (for a total of 86%); an additional 27% have Internet access (for a total of 74%); and 17% more spend over an hour online each day (for a total of 22%).

- There are some important demographic differences with regards to the amount of time children and youth spend with different types of media—Children whose parents have lower incomes or less formal education, for example, tend to watch more TV and play more video games than children whose parents have higher incomes and more formal education.
- Parents play a critical role in determining children’s exposure to media—Children who grow up in households where TV is more prominent, for example, spend more time watching TV

Wagner (2005) asks similar questions: Being tethered by the electronic leash of an “always on” smartphone, where one is expected to be “always available,” can extend the workday in fairly disconcerting ways. Extending the reach of “anytime, anywhere” access to learning resources raises inevitable questions about whether or not wireless access in the classroom will encourage or enable cheating. Will brevity of expression— characteristic of wireless communication— trump depth of knowledge? Will the “filter generation”— learners who multiprocess and multitask using multiple media— learn how to think critically and communicate effectively while using today’s and tomorrow’s digital tools?

Perhaps the pragmatic move is to offer opportunities to bring these seemingly

disparate sides together, rather than alienating students less-inclined towards traditional educational models. Cochrane (2009) found potential for the integration of mobile Web 2.0 tools (based around smartphones) to facilitate social constructivist pedagogies and engage students in tertiary education. Kolb (2006, 2008, 2011) discusses a host of innovative and highly interesting uses for the technology that do not require using the phones in the classroom. She also addresses the issues that have caused smartphone bans and provides guidelines for overcoming the problems. It remains the mission of educational institutions to prepare students for the realities, digital and non-digital, of life in the 21st century. When simple answers are a quick internet search away, critical thinking skills become even more important for successful student preparation. Energy & resources spent attempting to ban smartphones in educational environments could be redirected towards more creative integration of the technology that explores how it may best be utilized to augment student learning and engagement. Parry (2011) argues that “we are already at the moment in which the ability to use social media, and particularly social media as amplified through the power of the mobile web, has become a key literacy.”

With one billion devices expected to have mobile broadband Internet connections, Gagnon (2010) says the impact of mobile communication cannot be underestimated. With this growth in mobile devices, it seems appropriate to ask what completely new things might be afforded by mobile media for learning. The discussion of learning environments and mobile media grants educators an opportunity to adopt methods of situated, contextual, just-in-time, participatory, and personalized learning. “It seems

common sense that instruction should be performed in the most authentic context possible to practice and demonstrate useful learning, which mobile learning environments can facilitate.”

In 2011, students in a graduate-level course at Appalachian State University built on the concepts behind constructionist pedagogy and service-learning by integrating mobile learning games related to aspects of local wetlands education in partnership with the community and faculty experts. The project not only increased students' interest in community service, it also prompted a strong positive reaction to different types of collaboration. (Wallace 2011) In a partnership with Apple, textbook publishers Houghton Mifflin Harcourt performed a pilot study using an iPad text for Algebra 1 courses, and found that 20 percent more students (78 percent compared to 59 percent) scored ‘Proficient’ or ‘Advanced’ in subject comprehension when using tablets rather than paper textbook counterparts. (Bonnington 2012)

Precedent studies assessing use of smartphone technology in outdoor learning environments is sparser. Two studies in Taiwan (Yuh-Shyan et al 2005 and Chiung-Sui et al 2011) looked at use of PDAs (Personal Digital Assistant – a now somewhat out-moded term) for the collection of varied data, while Stewart et al (2011) researched utility of tablet PCs for field-based notes and data collection. Styliaras and Koukopoulos (2012) examined interactivity and communication among users at various cultural heritage sites and environments permitting the transmission of multimedia content. Investigating capabilities and limitations of smartphone devices, they classified users and cultural content aiming to propose educational scenarios

covering the needs of various user groups.

Augmented reality (AR) is a promising direction for integrating smartphone technology in outdoor learning environments. Columbia University (2010) started a smart phone campus tour system which allowed visitors to experience campus history. In the UK, the University of Exeter created a dynamic AR landscape of flora and fauna that transformed the campus into an accessible learning resource to support formal and informal learning goals (University of Exeter 2010). Chou (2012) used the Layar smartphone application (app) to explore how AR mobile learning can help visitors become familiar with a new environment. The smartphone campus touring system developed provided hidden information in a real (physical) environment, giving freshmen instant assistance if lost. And Liestol (2011) reported a series of experiments with situated simulations testing students in real world environments to understand the extent to which AR platform and expressive potential can improve situated learning – eg in historical sites, ruins, archaeological, etc. The main follow up question was how should these simulations be composed and organized to improve learning?

Chapter 3: Site Inventory and Analysis

Site Selection

Criteria for site selection included a school that was accessible within in the DC-MD-VA area; had an existing outdoor/environmental education curriculum already in place; and contained an accessible outdoor learning environment on site, whether rural or urban. Also ideal was a school with which I had existing connections between educators and administration. The question of whether the school should be Jewish was initially an open one. Ultimately, I chose to work with a Jewish Day School, which heavily guided the project's thematic and conceptual development within the initial parameters of my thesis question.

I chose Gesher Jewish Day School. Further details follow. In brief, Gesher sits on a 57 acre site (with an additional 30 wooded acres available for use) outside Fairfax, VA. Six acres make up the immediate schoolyard around the building, with an additional 45 acres of wooded land, mostly to the north. The Gesher Green program runs environmental education programming with all grades (K-8) throughout the year. I have worked with several Gesher educators in the past, in particular Rabbi Matisyahu Tonti, who runs the Gesher Green program alongside his regular teaching responsibilities. Investigating Gesher's hybrid curriculum of Judaics and secular studies would allow a deep and personal exploration into the unique opportunities of the site.

Regional Context – Jewish Northern Virginia

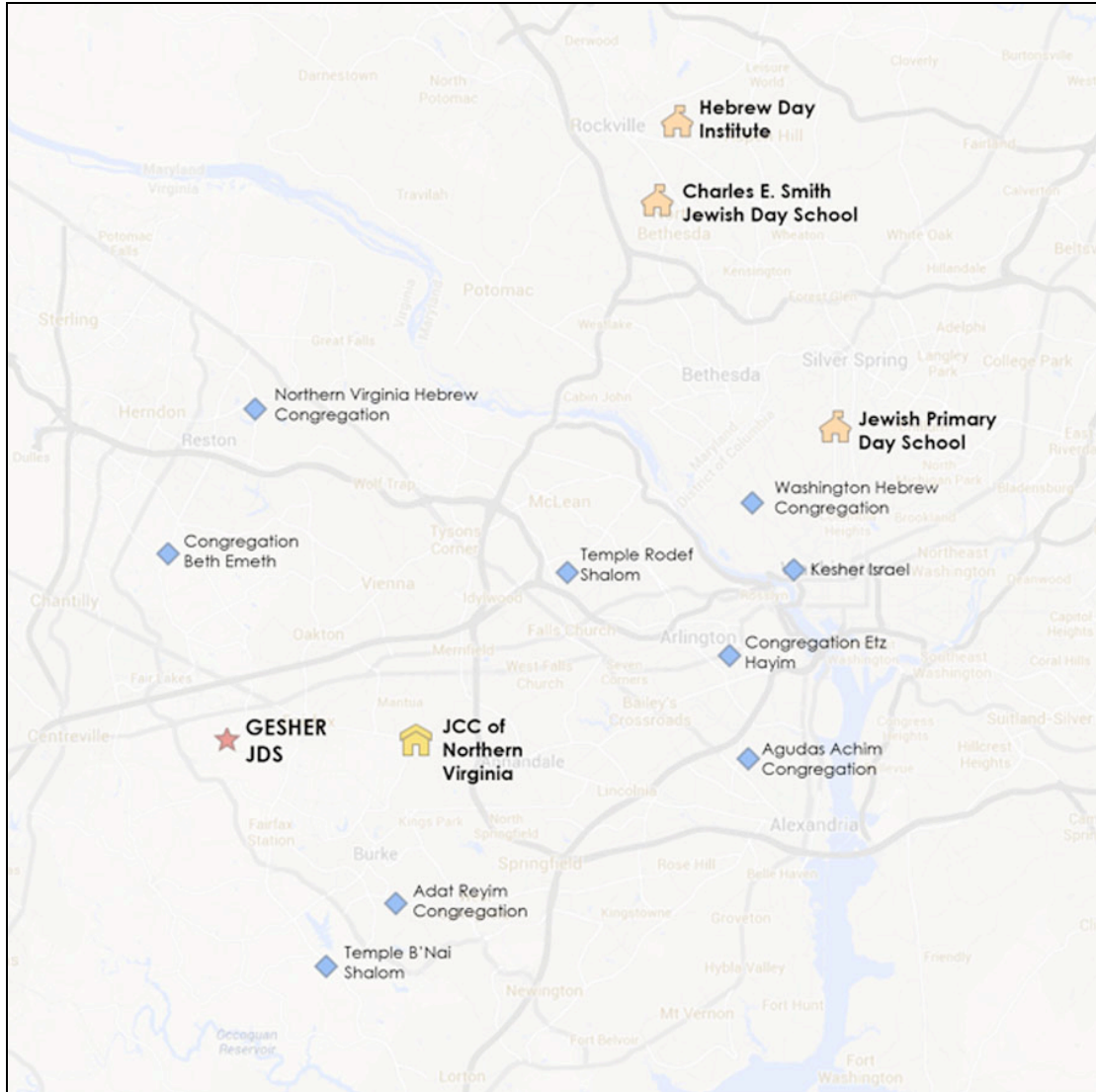


Figure 1 - Jewish Northern Virginia

As in Maryland, Northern Virginia is home to a sizable Jewish population. Unlike Maryland, however, the range and number of institutions serving the Jewish community is limited. Gesher is the only Jewish day school in Northern Virginia

accredited by the Virginia Association of Independent Schools, compared to three Jewish day schools in Maryland/DC. One small Jewish Community Center exists and serves many needs well, but has virtually no outdoor space other than a small playground. One Jewish day camp runs in the summertime at the Chabad-Lubovitch Center in Fairfax on a 5-acre campus. Seven synagogues are spread throughout the area. As reflected in conversations with Rabbi Tonti and other educators, the Jewish community of Northern Virginia is very spread out and, in their opinion, is in need of an institution with the resources and abilities to provide unifying services to the community.

Context – Fairfax County

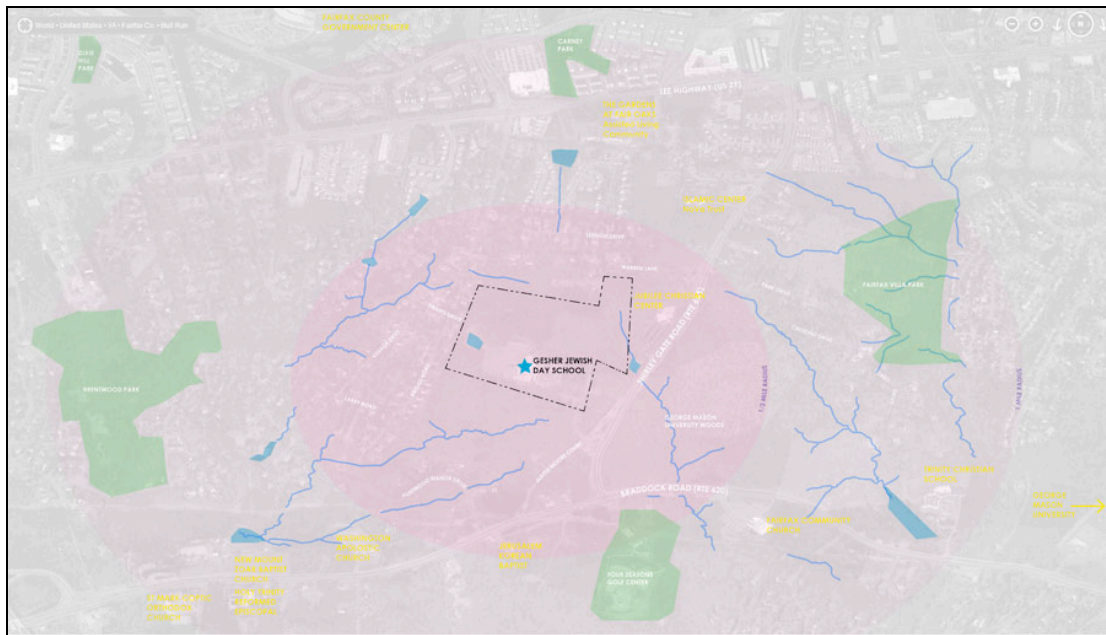


Figure 2 - Fairfax County Context

Fairfax County is a heavily suburbanized area, though a fair amount of green

space has been preserved. Within a one-mile radius of Gesher, three parks and a golf course are available. Two of these parks contain significant acreage (100 or more acres) with many opportunities for hiking trails and other recreational outdoor pursuits. The area probably does not need one more nature park with hiking trails, but rather a learning landscape providing a different and unique user experience that still respects and preserves the ecological and historical character of the landscape.

Also within a mile of Gesher are eight Christian institutions and one Islamic center. As both these religions share significant portions of Jewish text at their roots, they are potential programmatic partners who could be interested in a landscape utilizing themes of journey and movement connected to Biblical narratives and concepts.

Gesher Jewish Day School - General Description and Demographics

Gesher originally started as a kindergarten program at the synagogue Agudas Achim Congregation in Alexandria, VA in 1982. In 1989, the first sixth grade class graduated as the school added a new class every year. In 1994, Gesher moved to a larger space in the Northern Virginia Jewish Community Center. Still requiring more space, they established a satellite campus at the Chabad Community Campus in 1998. In 1999, Gesher added a middle school for seventh and eighth grade, assisted by a grant from the Partnership for Excellence in Jewish Education (PEJE) and a generous community funder.

After another move in 2002, Gesher finally moved to its existing site in 2007

with a new building on 57 acres in Fairfax, VA. The school building is anchored by a wall inspired by the vernacular limestone construction found throughout Jerusalem, and houses a library, technology center, gymnasium, stage, cafeteria, science center and classrooms designed to meet a small group learning approach. The design's cornerstone is the Beit Midrash (lit. *House of Learning*), a round, light-filled space designated for Judaic learning, prayer, and musical services. According to the Gesher website, "the design seeks to connect to the land of Israel with the front facade that mimics the color and feel of Jerusalem."



Figure 3 - Front of Gesher Jewish Day School

Gesher's student numbers are currently well below capacity. The average

number of students per grade (K-8) is approximately 5-12 students, with around 120 total. Capacity for the school is 340 for phase I of development; phase II, according to the website, anticipates capacity for as many as 540 students.

Gesher teachers generally teach subjects within either the lower school or middle school, though some teach all grades. They have described the parents as “largely Republican,” with many working DC as well as the surrounding metro area. The parents are described as “demanding” but also largely very supportive of the school’s efforts for education and innovation.

According to the 2009 strategic planning report, Gesher is committed to planning for and managing the use and development of the entire 57-acre campus for the benefit of the Jewish community in Northern Virginia. Plans include establishing an advisory panel; developing a property master plan; developing Jewish summer camp programs; planning for the development of a Jewish senior home; and facilitating Jewish learning and enrichment for all ages. Obtaining current information regarding the current status of strategic planning was unfruitful. Educators have said potential master plans have also included building a Jewish high school on site, however it did not seem imminent. All of these developments would require significant capital fundraising and expenditure.

Opportunities

Conceptual design connections to Jerusalem and Israel in the school building provide precedent to establish similar connections in the landscape design. If Gesher

becomes utilized by the broader Jewish community, summer programming potential increases, which may assist with both funding and maintenance for an expanded landscape plan.

Constraints

Future development may restrict landscape uses and learning opportunities.

Gesher Site, Zoning, Surrounding Properties.

Gesher Jewish Day School sits on a 57 acre campus in Fairfax County, VA on subdivisions 3 and 1 of quadrant 56-4. The property is owned by Gesher School Inc. and Raymond L. Warren. Of this, approximately 4 acres is taken up by the main building and parking lot, and 5.6 acres by playfields (mostly turf) for soccer and baseball and playground areas. 1.4 acres NW of the playfields is a fenced water retention area – mostly turf, with a few rows of red osier dogwood and a bank of young trees planted along the NW corner of the soccer field. The remainder of the property is wooded, with distinct meadow and vernal pond areas, and a clear-cut strip for powerlines bisects the forested areas along the East and North. This is also a utility access road, with access roads connecting Shirley Gate Rd on the east (this can be seen in 2012 satellite imagery) and another road marked on the GIS records (Forest Hill Dr.) leading north to Warren Ln. This north-south road, however, cannot be seen in 2012 satellite imagery and is not evident on site visits. It may have been replaced by the east-west access road.

Gesher parcels (1, 11, 12 & 18) are zoned Residential-Conservation (R-C) at 1

Dwelling Unit (DU) per 5 acres (AC). The main building surrounds a small courtyard (0.1 ac) where an Israel-themed garden has been planted. A small vegetable garden has been built along the southern edge of the building.

An adjacent 31 acre plot (in subdivision 1, parcels 20 – 28.98 ac; 19A and A1 – 1.5 ac, all zoned R-C 1DU/5AC) of mainly forested land with a seasonal stream lies directly south of the Gesher property. It is owned by Church Presbyterian Rothem. Gesher uses a trail system marked by tree blazes in this property. Gesher teachers use this area throughout the year with students. A local boy scout troop also uses the trail system here and through parts of the Gesher property during both the school year and summertime for a range of activities including hunting and target practice (bow and arrow). They have assisted in the past with trail maintenance. The legal nature of this relationship has not been formalized. Seven additional parcels are zoned along the southern edge of this plot, with an access road (Shirley Ln) marked on GIS and visible in 2012 satellite imagery. The parcels are all owned by varying individuals and appear to be undeveloped.

18 Acres of land to the east of Gesher property is owned by Jubilee Christian Center – parcels 17 (12.1 ac) & 19 (5.9 ac), both R-C 1DU/5AC. The northern and western edges of this property are in a conservation easement. Gesher is bound by residential properties to the North and West. A large plot of public/semi-public land is east of the Gesher campus, owned by George Mason University.

Opportunities

With over 40 acres of forested land, the opportunities to utilize the natural environment for learning are limited only by accessibility, available time, and teacher interest/involvement (granted, these are not insignificant). The collaboration with the boy scout troop is beneficial both for greater community connectivity and as maintenance partners, especially in summer months which are always a challenge for schools. The adjacency of church-owned properties may also provide opportunities for land use with multiple stakeholders – increasing opportunities for funding, maintenance and programming. Zoning also suggests that dense development of the area is unlikely.

Constraints

Lack of ownership over the adjacent southern property may limit use of these areas even with the current trail system. Should the property be sold and developed, or the boy scout troops move locations, maintenance will become a larger and more daunting task.

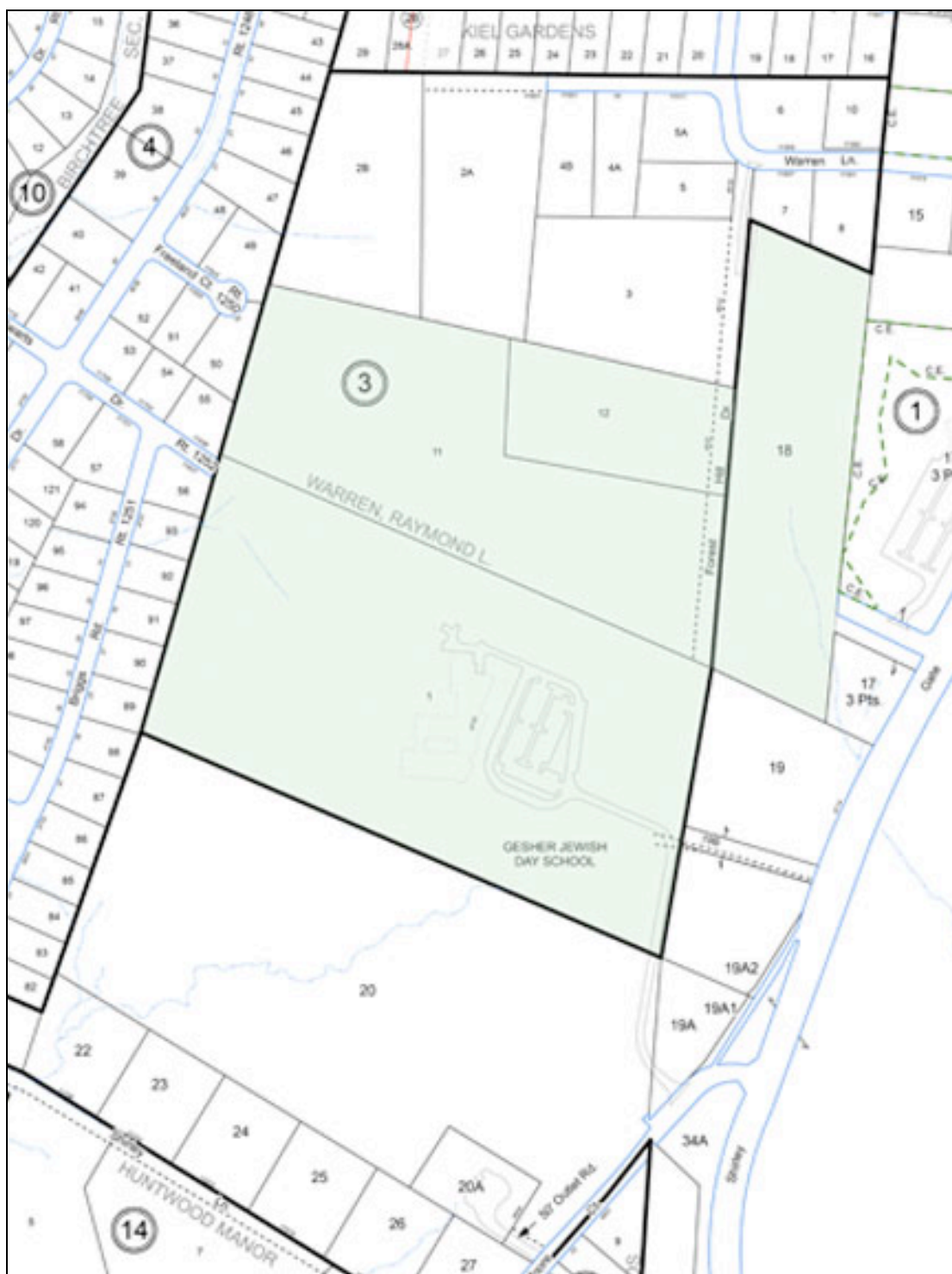
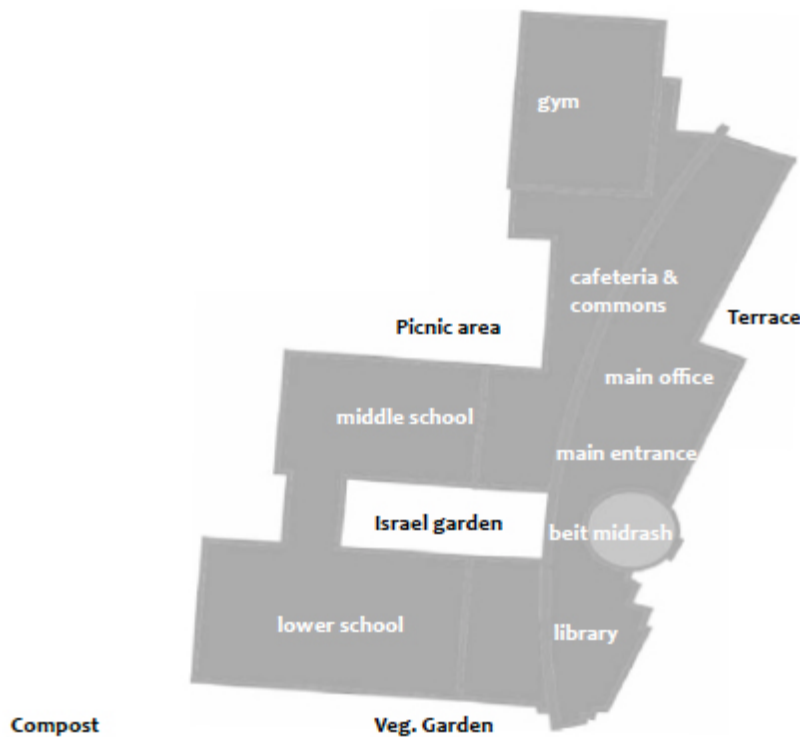


Figure 4 - Parcel Map

Existing buildings and infrastructure; Site Use

The Gesher main school building sits centrally within the property and houses grades K-8. The gymnasium utilizes most of the northern-most building section, with the cafeteria in the north-central area. Science and middle school classrooms are in the south-central area, and provide one of two access points to the central interior courtyard (currently an Israel-themed Biblical garden). The primary school occupies the southern area, with kindergarten (*Gan*) and first grade nearest to the playground accessed by Door 5 on the southwest corner. Numerous doorways provide access points to the schoolyard.



**Figure 5 -
Indoor and
Outdoor
features at
Gesher**



Figure 6 - Beit Midrash - "House of Learning"



Figure 7 – Commons



Figure 8 - Cafeteria Courtyard



Figure 9 - Bennett Library



Figure 10 - Israel Garden Courtyard

Opportunities

The many access points to the schoolyard are opportunities to optimize accessibility and should be considered in the designation and layout of activity areas – e.g. areas intended mostly for younger students should be centralized near the primary school wing; areas for more active play should be accessible to the gym, as well as all other points. The centrality & visibility of the inner courtyard should be utilized as either an exhibitionary space and/or with focused multi-curricular integration in mind (e.g. converted to a greenhouse for farm to table student lunch program?).

Constraints

Getting groups of students from one place to another is frequently a laborious task. Connectivity to the schoolyard is very linear. This could also be an opportunity to utilize landscape design to increase connectivity between currently disconnected areas.

Gesher Curriculum

Gesher curriculum covers both general and Judaic studies. This dual curriculum is intended to enable students to develop “a confident sense of self, love of Judaism, and solid academic skills that will serve them well as they transition to high school and beyond.”

Kindergarten focuses on encouraging individual curiosity and developing awareness of others, with active play and constructive activities throughout the day. They also aim to reach important milestones in both reading and Hebrew language acquisition.

Elementary students (1st-5th grades) spend approximately 60 percent of classroom instructional time on general studies, and 40 percent on Jewish learning and Hebrew language. Students have weekly lessons in art, music, computers, and library, with physical education and science lab twice weekly. The learning atmosphere is guided by Jewish values of *kavod* (respect) and *tikkun olam* (repairing the world).

Middle school (6th-8th grades) focuses on preparing students for high school, with high school level credits for Spanish, algebra, and geometry. The program also expands student activity further beyond the school day to advisory groups, after-school competitive athletics, community service, elective choices, interdisciplinary studies, Jewish life beyond bar and bat mitzvah, and student council leadership. Class

trips include Philadelphia (one night), Israel (two weeks), and the Teva Learning Center at their spring location outside Baltimore for a week of Jewish environmental education.

Opportunities

Align both design and pedagogy with existing curricular needs to increase viability and utility. Keep landscape design flexible to accommodate widest range of curricular connections. Most significantly, build a progression for outdoor and environmental learning opportunities that lead to and follow up from the Teva trip for sixth grade middle school students.

Constraints

Limited time, funding and resources leave teachers overstretched. Design and pedagogy that does not help fulfill these curricular requirements is unlikely to succeed universally.

Teacher concerns + hopes; identified opportunities

The following points come from meetings and conversations with current and former Gesher teachers, including:

Lisa Rosenberg – General Studies

Rabbi Baruch Rock - Primary Grades Judaics

Carina Rock - Second Grade Judaics

Rabbi Matisyahu Tonti – General Studies & Judaics

Josh Gensler-Steinberg – Former Gesher teacher

Existing issues & constraints

- Lack of shade in summer; lack of shelter / wind buffer in winter (playfields)
- Mud & pooling surface water (playfields)
- Maintenance of existing outdoor learning spaces (garden, beit midrash, trails, sitting stumps)
- Teacher Culture: Many other teachers (particularly “veteran”) aren’t interested in taking students outside (e.g. don’t want to get “dirty” and don’t recognize value to same extent)
- Safety (especially in woods) – real and perceived: admin concerned with tripping, injuries, etc; poison ivy & ticks are definite problem
- “Hassle” to get to existing outdoor spaces – even closest ones; not as comfortable and accessible as many teachers would prefer
- Time constraints – class periods are mostly 40 minutes, occasionally 80 minutes
- General culture: “Lots of Republican parents” – don’t necessarily buy in to the green ethic automatically – it’s a harder sell
- Gesher Green curriculum – big Q: to what extent should be separate vs integrated into other disciplines throughout general Gesher curriculum
- Summertime – programming & maintenance for spaces, esp veg. garden
- Existing Israel Garden courtyard – very difficult to access: either through science classrooms or all the way around by front entrance
- Funding – Gesher is not exactly working with a massive endowment. Financial health is shaky at best.

Hopes; Ideas; Opportunities

- Integrate art into outdoor spaces – e.g. paneling on wall outside gym – chalkboard or similar
- Outdoor beit midrash space
- Edible landscaping as much as possible
- Drip irrigation (bonus: tie in with Israeli technology)
- Expand garden
- Create/expand farm to table curriculum & integration
- Greenhouse for year-round growing – possibly replace Israel garden?

- Space focused on younger students (K-1st) at area near Door 5, Gaga pit (which is their wing of building already)
- Flexible spaces for multiple curricular uses
- Develop risk assessment skills; facilitate explorative play; decrease serious risk where possible & develop awareness & management skills for students (e.g. ticks, poison ivy; safe movement)
- Position Gesher as (outdoor) Jewish Community Center for Northern VA (very small JCC exists nearby on Little River Turnpike)

Micro-climate

The playfields are the most exposed areas of the site – they are higher than the surrounding by 6-8 ft with no tree canopy overhead. At close to 6 acres with no tree cover, these playfields are susceptible to cold winds in the winter and hot sun in the warm months without the relief of vegetated microclimate zones throughout. Teachers cite lack of shade as a major impediment to outdoor learning.

Opportunities

Utilize forest areas to demonstrate ecological and social functions and uses of microclimate. Model micro-climates in schoolyard in part after natural models – wind buffers, shade trees, comfort zones etc. Choose native and/or appropriate vegetation with lower maintenance needs and high opportunity for success.

Constraints

Maintenance – current turf is relatively low-maintenance. Adding pathways, shrub and tree plantings, vegetated beds, courtyards, etc increases maintenance needs.

Slope & Topography; Hydrology

The turf playfield areas behind Gesher (west) are leveled to appropriate 1-2% playfield slopes, with peak elevation at 453 ft along the southern edge of the field. Beyond this edge to the south the field slopes sharply down at 30% for 20 ft, with corners in the southwest and northwest. Along the southern edge, the fields drain south into the woods – ultimately to the seasonal stream in parcel 20. The northern half of the field drains northwest to a retention pond (DP0664) with a lowpoint at 432.9 ft. Playfields along the northern area also drain to this retention pond. Three drainage points are located along a swale running north-south along the eastern edge of the soccer field. These seem to pipe under the soccerfield to the outflow at the NW retention pond. An additional swale runs east-west along the northern edge of the playfield and basketball courts, where it meets with the north-south swale and continues to drain around the soccer field to the NW retention pond.



Figure 11 - Topography

In general, the playfields showed ample signs of poor drainage during a February site visit. Surface water pooled on the ground in many areas, with high amounts of exposed soil and mud due to erosion. This is likely at its worst in the wettest seasons, but teachers confirmed it is a problem much of

the year. Next to lack of shade / wind-blocks on the playfields, it is a significant impediment for teachers bringing students outside.

Water treatment facilities are fenced off just to the NE from the Gesher main building. To the west, a large and flat turf area is bordered on the north by an evergreen hedgerow. This is most likely a leech field for the septic system.

In the parcel 20 woods, slopes range from 1.5-4% with the eastern portion of the woods being the flatter area. Most of these woods drain centrally into the seasonal stream that runs from northeast to southwest; a smaller portion drains to another stream in parcel 20A the southeast corner of the woods.

In the northern portion of campus (parcels 11, 12) two peaks at 468.8 ft and 459.9 ft form a slight valley between them, however even around these highpoints slopes range from only 3.5 – 6%. Parcel 18 is largely comprised of a drainage valley with slopes ranging from 2-6.5% that drains out to a drainage pond (DP0414) in parcel 17, then across Shirley Gate Rd to the George Mason property.

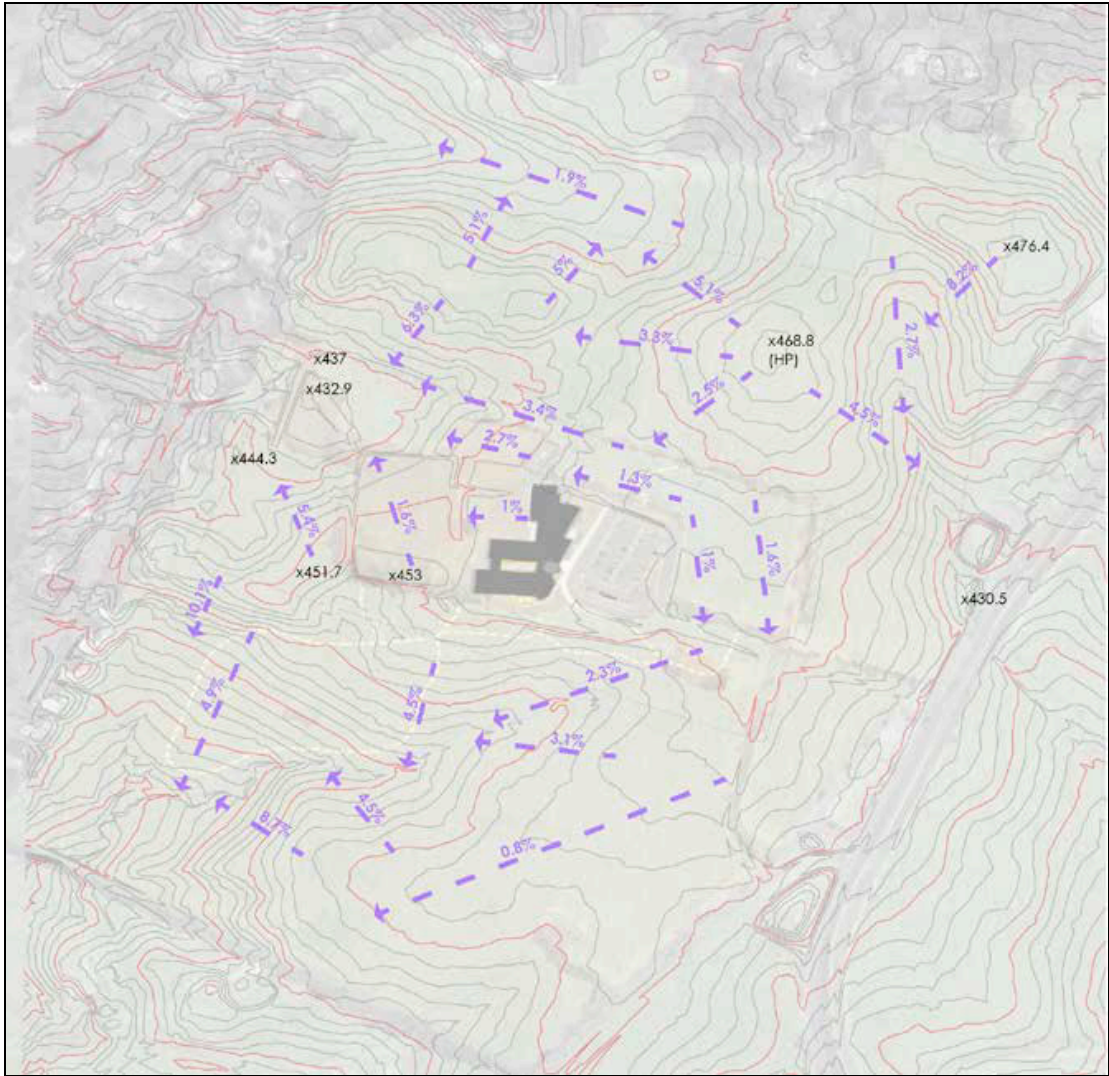


Figure 12 - Slopes

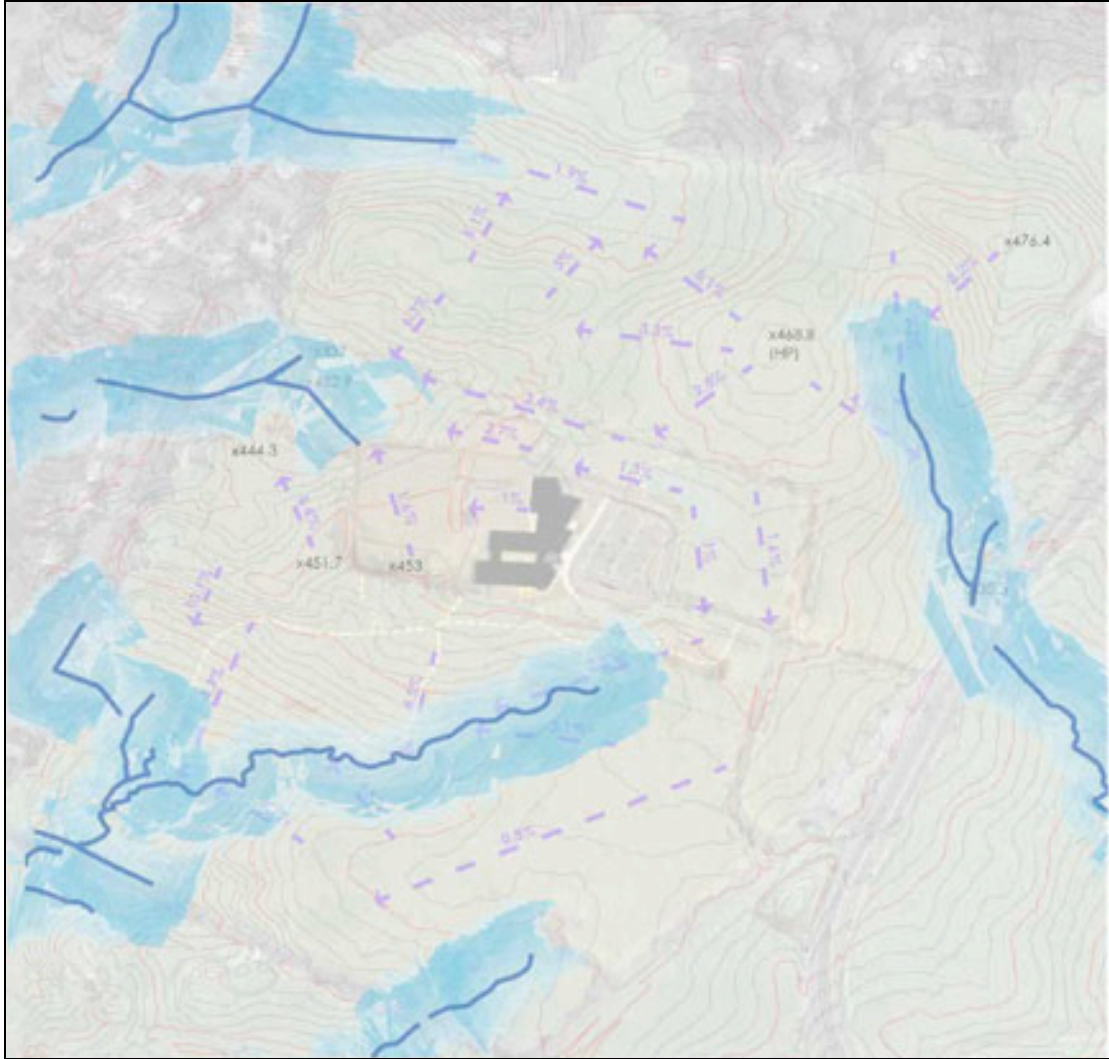


Figure 13 - Hydrology: Waterways

Opportunities

In schoolyard - combine design for stormwater management with design for learning – artful spaces that model hydrological systems (connecting to natural systems in forest), create learning opportunities, niches for play and exploration, and decrease quantities of mud transported inside by student bodies. Integrating best practices for stormwater management also models environmental stewardship.

The septic leach field – large, very flat and very sunny – could make a fantastic space for vegetable garden, orchard or forest garden.

Constraints

Funding, of course. Limits (easements or restrictions on use) of septic leech field may restrict use. Even if not – “ick” factor of potentially growing food over septic field, though nutrients may be beneficial at best or harmless at worst. This needs to be further clarified. Fruit trees might be the way to go, if not restricted. Otherwise, an alternate play area isn’t the worst.

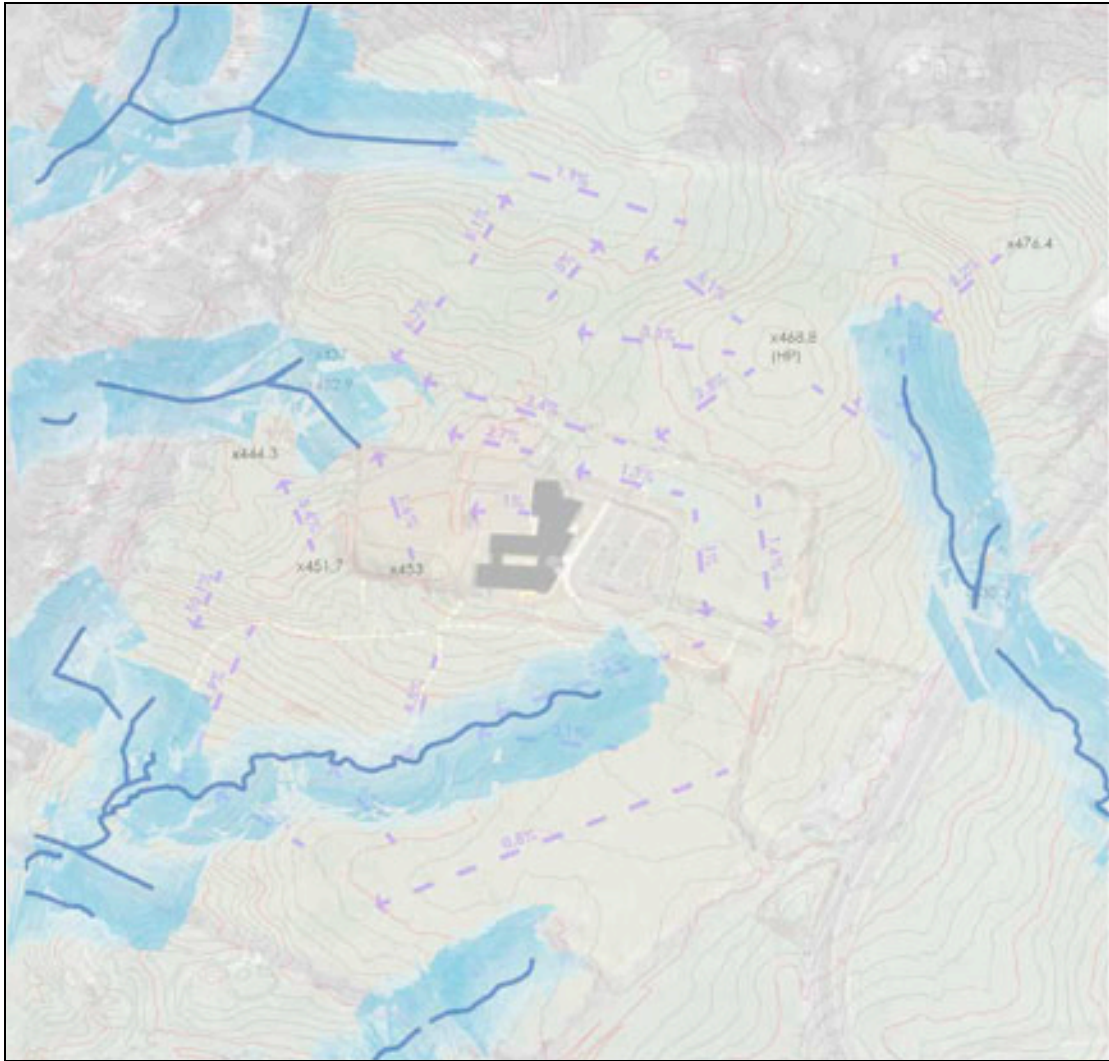
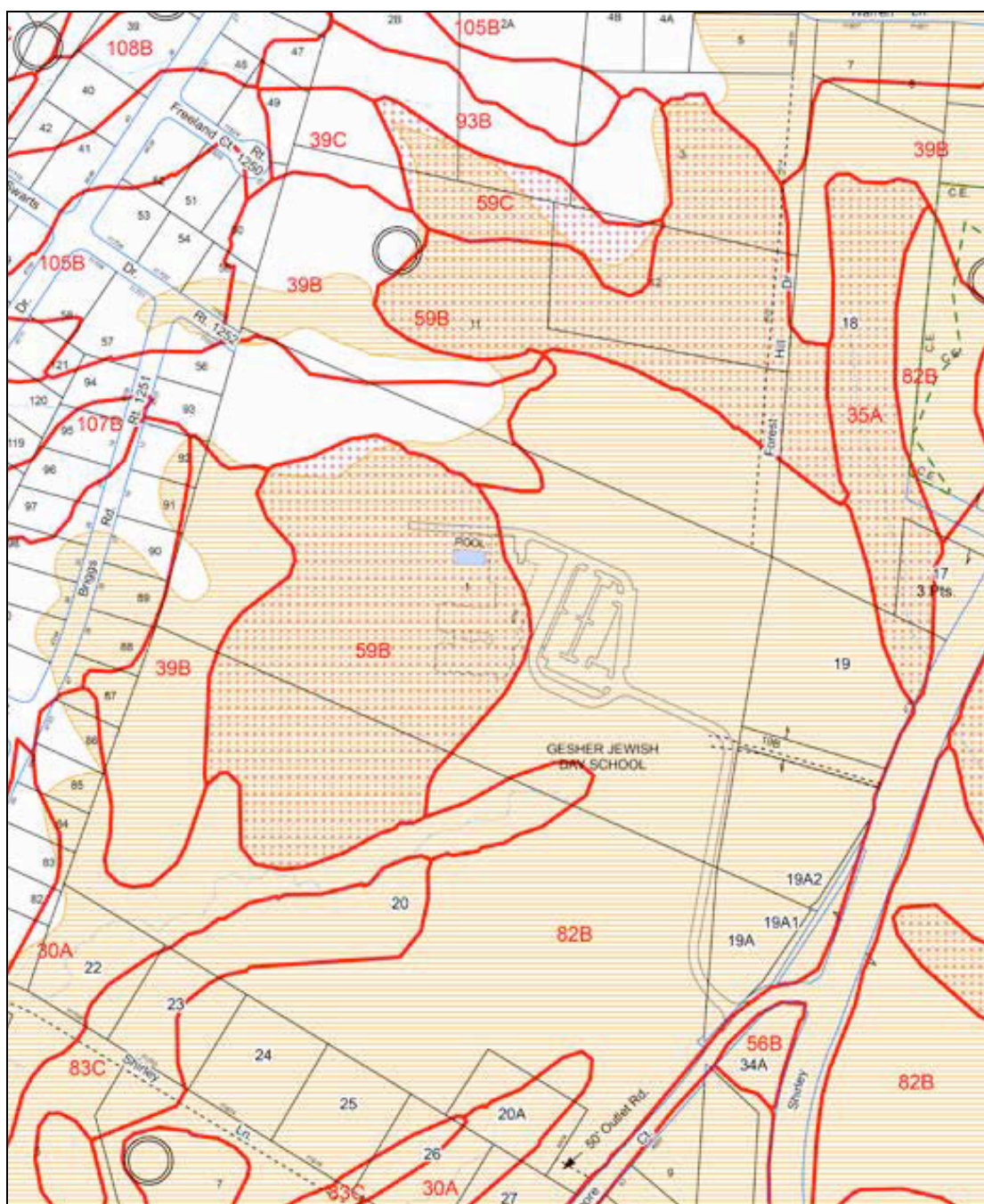


Figure 14 - Hydrology: Riparian Zones



Soils

Gesher sits in the Piedmont physiographic province, near the fall line. Several soil types are found through the Gesher landscape. Full Fairfax County & NRCS descriptions can be found in the appendix at the end of this chapter.

30A: Codorus and Hatboro soils

39B: Glenelg silt loam

*59B& 59C: Haymarket silt loam (**main schoolyard area in 59B)*

Relevant Fairfax County data, as this area is where any significant landscape interventions (including construction, earth-moving, building structures, etc) may be designated:

This soil occurs on broad flat, uplands of the Piedmont and Triassic Basin in areas of igneous bedrock. A thick, highly plastic clay layer occurs in the subsoil. Above and below the clay layer the soil is loamy. Depth to bedrock is greater than 5 feet. The soil is well drained. Foundation support may be poor because of the highly plastic clays. Foundations footings should extend below the plastic clay layer to the loamy material below. Suitability for septic drainfields is marginal because of the plastic clays and slow permeability. Suitability for infiltration trenches is fair. Fibrous asbestos minerals may occur in the greenstone bedrock. These fibers may become airborne during excavation and blasting operations. Worker protection and dust control measures are required in such instances. Please refer to the soils map to

identify affected areas.

82B: Orange silt loam & 83C: Orange silt loam, very stony

93B: Sumerduck loam

Additional Soil Survey Information

In addition to the soil classifications, many of the soil areas on-site include potential asbestos containing soils. Safety precautions must be taken during construction.

Orange soils, which overlie a majority of this geology, also contain shrink-swelling clays which can cause foundation distress.

Further information:

Potential Asbestos Containing Soils (30A, 39B, 82B, 83C): These soils are mapped over potentially asbestos-containing bedrock. Safety precautions must be taken during construction.

“As -- Bedrock With Naturally Occurring Asbestos: These soils occur within a geologic formation known as the Piney Branch Complex, locally known as greenstone. Naturally occurring asbestos minerals, predominantly actinolite and tremolite, are known to occur in this formation. Excavations in bedrock or earth moving activities within this formation may expose these minerals to the atmosphere allowing the fibers to become airborne.

Areas that may contain naturally occurring asbestos soils are depicted on County Tax Map Grids available on the Fairfax County Health Department website at <http://www.fairfaxcounty.gov/hd/chs/naturalasb.htm>. Special precautions regarding these soils or fill originating from these soils are required by the Occupational Safety

and Health Regulations (OSHA), available at www.osha.gov/SLTC/asbestos/index.html, and enforced by the Virginia Department of Labor and Industry. Personnel working in or around this geologic area should be alerted to this potential health risk. For construction activities in this area dust control and worker protection measures must be implemented. Special Guidance has been issued by the U.S. Environmental Protection Agency (EPA) at <http://www.epa.gov/asbestos/>. The Environmental Health Division of the Fairfax County Health Department (703-246-2444) may be contacted for additional information.”

(http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)

Non-Marine Clay High Shrink-Swell Soils (59B, 59C, 35A): Soils containing other shrinking-swelling clays that can lead to foundation distress if precautions are not taken during design and construction.

Opportunities

No major opportunities here – students may take soil samples as part of science curriculum and analyze. No major implications for planting of either trees or vegetable gardens as major agricultural uses will not be part of this project.

Constraints

Asbestos soils – any excavation needs to be done with highest safety measures. Footings for major structures may need to be dug below clay layer (unlikely, however, that major structures of this need will be part of landscape design).

Vegetation



Figure 16 - Existing Forest Canopy

Vegetation Cover Types:

Open Field (1) - No trees present; low shrubs, herbaceous meadow or other non-forest or non-woodland plant community

Upland Forest (2) - Upland hardwoods: oak, hickory and yellow-poplar;

Upland softwoods: Virginia pine

Early Successional Forest Community (3)- Areas of early successional tree canopy dominated by juvenile pioneer species such as Virginia pine, red cedar, tulip poplar, black locust, box elder, sweetgum, black willow, ailanthus, etc. These areas may also contain significant levels of turfgrass and other herbaceous plant materials

Developed Land (5) - Areas of constructed features including buildings, parking and roadways

Maintained Grasslands (6) - grassed and landscaped areas, athletic fields or other green areas devoid of natural vegetation

Bottomland Forest (7) - River birch, sycamore, yellow poplar, sweet gum, green ash

Specific Vegetation Found On-Site:

Turf Grass
Sycamore
Mullen
Pine
Sassafrass
Maple
Ivy
Witch hazel
Oak
Fern
Meadow plants & grasses

Forest floor is low in vegetative growth – mostly leaf-litter, with isolated areas of dense shrubs, patches of grass, fern.

Plant Hardiness Zone: 7

“The prevailing weather pattern for Virginia in the summer and fall is from the south Atlantic and the Gulf of Mexico. Warm, moist air brings thunderstorms and higher humidity. In fall, cooler air from the north and west returns. Winter weather blasts across the state from the northern or central part of the continent.”

(<http://www.fairfaxcounty.gov/nvswcd/youyourland/climate.htm>)

Existing Trail System & Learning Spaces + Gesher Green Habitats



Figure 17 - Existing Trails System & Learning Spaces

An existing, multi-modal trail system with multiple entry points off the southern edge of the playfields and turf surrounding the main building routes through

the south woods of the Gesher campus and into the parcel 20 woods. The trail is mostly well-maintained and marked by paint blazes on trees throughout. There is a blue trail and a white trail. The blue trail leads a short loop and connects habitat areas; the white trail extends further south into the woods. Indications of a shelter-building activity can be seen along the trail, mostly lean-to style shelters constructed from branches and leaves, which teachers confirm was connected to the holiday of Sukkot. The trail extends deep into parcel. The stream marked on GIS maps can be seen from site photos; when I first visited in October it had wet pools but was not visibly flowing. In February the stream had water throughout, and flow was visible but minute.



Figure 18 - Educational Birdhouse

Several learning spaces have been designated throughout the trail system. One is marked by a circle of tree stumps, approximately 30 feet wide, with a firepit in the center. Another is a curious area, fairly large, is marked by wooden signs with various states (Texas, California) painted in white on them. This area is used by the local boy

scout troop, and seems to have seen heavy use as the forest floor here is packed down with most of the vegetation worn away.

A small vegetable garden is between the woods and the main building's southern wall (just east of Door 3). Surrounded by black deer-fencing, the garden area extends approximately 30 feet from the building. The area has been graded flat; the remaining turf between garden and woods (another 20-30 ft) slopes gently down. The garden contains six raised planting beds, a rain-barrel collecting water off the roof, tool shed, and a partially built cob oven. A compost station is outside the garden fence, approximately 100 ft away. By admission of Rabbi Tonti, the garden could use some aesthetic help.



Figure 19 - Herb Spiral in Existing Student Garden



Figure 20 - Compost Station

An outdoor *Beit Midrash* (lit. “house of study”) area is connected by the trail, and sits on the edge of the woods, approximately 100 ft southeast of the garden. A painted wooden sign marks the area, which holds two wooden benches and a wooden cable-spindle used as a table. The groundplane is mostly bare soil and leaves, with three mature trees spread around the area, giving it some additional aesthetic structure. This is another area Tonti and the Rocks said they would like to see improved.

The trail leading into the woods immediately beyond the *Beit Midrash* is called *Derech HaDemuyot* – “character crossing.” The sign marking the area calls it “an Outdoor Museum that exhibits the main characters in the book of *Bereishit* (Genesis). It was established as a gift to the Trees by *kita Bet* (“2nd grade”) in celebration of *Tu b’Shvat*, a Jewish holiday celebrating the “new year” of the trees – lit. 15th day of the month of Shvat.” This area has seven trees – one each for the Biblical patriarchs and matriarchs (Abraham, Sarah, Isaac, etc) clothed in “scarves”

of felt and paper reflecting what students felt were the key character traits of this figures.

A tile-lined trail leads to the meadow habitat – one of the key habitats identified for landscape study in the school’s “Gesher Green” curriculum. These tiles connect to Psalms and were student-created in collaboration with a guest artist. A path leading through the meadow can be followed easily enough, however in October the butterfly benches in the middle were almost entirely grown over by meadow plants. In February, the grasses flattened by winter snow, the benches were uncovered.

The vernal pond can be found off the northeast edge of the parking lot. A wooden platform was built recently to extend slightly over the edge of the pond to allow for student observation and access. This area is also identified in the Gesher Green curriculum, and a sitting circle of stumps is adjacent. The utility powerline clear-cut is just to the north of this area. The woods beyond this access are not used regularly by teachers or students, however contain many areas with potential for outdoor learning and exploration.

While no Chesapeake Critical Zones are found on the Gesher campus or immediately adjacent parcels, all three streams fed by the Gesher campus lead ultimately to Chesapeake Bay Protection Areas.

Opportunities

The existence of a partial trail system gives great momentum to the project. It

should be expanded, particularly within actual Gesher property. Connectivity between existing learning spaces can be improved, and the spaces themselves will benefit greatly from design suggestions to improve aesthetic quality, functionality and accessibility. In particular – the garden (whether this stays at its current location or moves/expands to other locations) and the outdoor beit midrash, which was mentioned by both the Rocks (Carina and Rabbi Baruch) and Rabbi Tonti. Consider how the beit midrash can be expanded and integrated into forest – what’s the nature of a beit midrash? Areas for learning in *chevruta* (two-student pairings) & small group combined with areas for larger group gathering.

The vernal pond area in particular shows promise for a ecologically rich learning environment that can also integrate students’ natural inclinations toward exploration through a more extensive boardwalk system providing access and interest. It is just off the parking lot, not deep in the woods, and the boy scouts use the adjacent area as well, so this is a good site to focus design interventions and remediation service.

Constraints

Accessibility; safety; poison ivy; ticks. Lots of multi-flora rosa, especially near vernal pond (also opportunity for stewardship-based service-learning project removing invasives though).

Gesher landscape areas by Quadrant

Main Building and Schoolyard



Figure 21 - Main Building & Schoolyard

As mentioned before, the main schoolyard suffers from microclimate and erosion issues that limit time spent comfortably outside. The existing site grading and facilities are functional, but lack inspiration. At roughly 5.6 acres, however, the potential opportunities of this space are fantastic.

Identity – Home base

Character: Active; Recreational; Riparian; Exploration / experimentation within boundaries; stewardship

Operations: Play; run; hide & seek; Circle

Forms/Scale: Stone & vegetation; metal ornamentation; diverse ground cover

Application – applied ecology, applied learning → learning from wilderness areas brought back here and modeled / applied → parallels to Jewish accumulation of

knowledge – e.g. Jacob, Moses go on spirit quests and bring back learning to community as leaders

Opportunities

- Make the schoolyard the active, regular outdoor learning space
- Increase accessibility and comfort
- Improve picnic courtyard space – seating, shade, gathering
- Septic leach field is great open flat space
- Convert drainage swale to riparian rain garden eco-lab modeling hydrological systems – learning opportunities include plantings, streambed (wet-dry), soil media, erosion control, drainage guidance, bridges & pathways, concentrated impact
- Formalize pathways
- Diversify groundcover (not just turf) – use well-draining, low-maintenance, low-cost materials
- Create area focused on younger students (K-4) near south wing
- Event Space (BBQs, picnics, schoolwide events with parents/community, outdoor movie nights, gathering, seating, shelter)

Constraints

- Maintenance
- Funding
- Summertime upkeep and program

- Resistance from teachers, admin?
- Resistance re: taking away “open play space” for creating more nuanced areas
- Safety concerns – hazards, visibility



Figure 22 - Existing Functional Zones

Vernal Wetlands & Northeast Stream

The main vernal wetlands sit just Northeast of the parking lot. An additional wetlands area can also be found northwest of the main schoolyard.

Identity: VERNAL WETLANDS

Character: Cyclical Rise & Fall; water; flux; flow; cleansing

Operations: Inquire; circumnavigate; dip; immerse

Forms/Scale: Boardwalk; personal; limited access

Opportunities

- Stewardship opportunities: Wetlands remediation, Invasive Removal
- Ecotone learning
- Boardwalk access (fun, limits impact)
- Connect trail to meadows (south) and forest (north)
- Formalize entrance from parking lot or wherever

Constraints

- Power lines & maintenance road – unattractive
- Parking lot water quality?
- Multi-flora rosa very thick here
- Some hunting blinds in area – frequency?

North Woods

In conjunction with the main schoolyard, the north woods provide the greatest opportunity for student journeys of inquiry-based learning and self-exploration. Its forty-plus acres are a mix of eastern hardwood forest with dense stands of pine. Students could easily spend hours exploring here; at the same time, when walking a

straight line at a quick clip, an adult can traverse its breadth in just ten to fifteen minutes. The north woods are further broken into the Northeast and Northwest quadrants.

Northwest Quadrant – Vortex, Labyrinth, and Narrows

In this area, a strange vortex of downed trees sits by a dense stand of pine. Trees are closely spaced, with light heavily but pleasantly filtered by the pine needles.

Traversing from the second high point on site down then up towards the site's highest point, one passes through thick stands of mountain laurel.

Identity: MAJESTIC MYSTERY

Character: Mystery & Majesty; Hidden Nature;

Operations: Explore; Reveal; Constrict; Gaze; Form

Forms/Scale: Narrow Passageways; Constricted Views

NARROWS

Character: Intimate Passageways

Operations: Crawl/bend; slow movement

Forms/Scale: Low canopy; tunneling; burrow

Opportunities

- Tree Vortex is wacky and interesting, and a perfect learning mystery for inquiry
- Trail connections
- Open spaces pocketed in forest, including pine grove with more opening for

light than more deciduous areas

- Ecological modeling
- Demonstrates wacky/cool/powerful mystery and splendor of nature
- High point 1 in this area

Constraints

- Some multi-flora rosa and other invasives
- Accessibility – farthest area from main school building
- Easy to go off property along northern edge – not many clear markers

Northeast Quadrant (forest) – Sinai and Sanctuary

Continuing up towards the site's high point, the forest opens up with decreasing density. The undergrowth opens to mature hardwood stands, with the site's tallest and thickest trees found at the crown of the high point – a unique opportunity for a natural sanctuary.

Identity: SANCTUARY

Character: Communal & Personal Sacred Space

Operations: Reflection; Gathering; Anointment; Sacrament

Forms/Scale: Womb; Communal > Intimate; Sacramental; Altar

WILDERNESS PASSAGE

Character: Wilderness; Journey

Operations: Explore; Inspect

Forms/Scale: Meanders; Deconstructed pathways; scroll; stone; epic

Opportunities

- Habitat modeling – thicket, deer paths
- Sanctuary in wilderness – could create low-impact designed space at high point 2 here
- Opportunities for building sense of place, spiritual journey
- Shelter – thicket creates hidden openings

Constraints

- Accessibility – also far away and not connected to main schoolyard
- Property boundaries
- Hunting

Southwest & Southeast Quadrants (parcel 20 forest)

SOUTH BANK – This is the area just south of the main schoolyard and school building. It includes the steeply sloping turf just off the school building, and a narrow stretch of woods still within the Gesher property line.

Identity: Adventure play / explore

Character: Active Educational

Operations: Play; study; dig; climb; run; hide

Forms/Scale: Natural elements; play forms; young student scale

Wilderness

Stream / Riparian

Woodland walk

FOREIGN LANDS

Here, the land is not technically part of Gesher property but its trail system is extensively used by Gesher educators.

Character: Reconnaissance; Travel; Movement; Teambuilding

Operations: Hike; view; move; inquire; team-build

Forms/Scale: Paths; teambuilding elements; small group

Opportunities

- Existing trail system can be used, expanded
- Stream access
- Close to building and existing garden, beit midrash spaces, compost and weather stations
- Meadow – pollinator habitat → design space so that benches don't get so overgrown
- Existing tiles from Psalms project
- Character Path (*Derech Ha Demuyot*)

Constraints

- Mostly not Gesher property
- Wet near *Derech* area – trail improvements needed
- Connectivity difficult through parking lot and road access to northern areas

Social Analysis – Activity Hubs; Gateways; Circulation

Existing and potential activity hubs suggest the beginning dimensions of spatial form. Primary hubs delineate the most frequent and extensive spaces for student use, while secondary hubs suggest additional spaces.



Figure 23 - Primary Activity Hubs



Figure 24 - Secondary Activity Hubs

Gateways include transition points both from the main schoolyard into the forest areas, and from various points off-site which could be utilized as entry points depending on the level of public access to future site uses. Primary circulation establishes existing and likely future routes between activity hubs, gateways, and the main building and schoolyard. Secondary and tertiary circulation establish additional

routes between and amongst activity hubs. With a large site, the potential circulation routes are many. Simply building trails following each and every one of these routes would be both time-consuming and a waste of energy and resources. However, the inclination of students to take alternate routes beyond those that may be established through formal pathways is a major opportunity of the site. Design should therefore provide for methods of landscape journey that not only follows established pathways but also provides opportunity for off-trail exploration and inquiry.

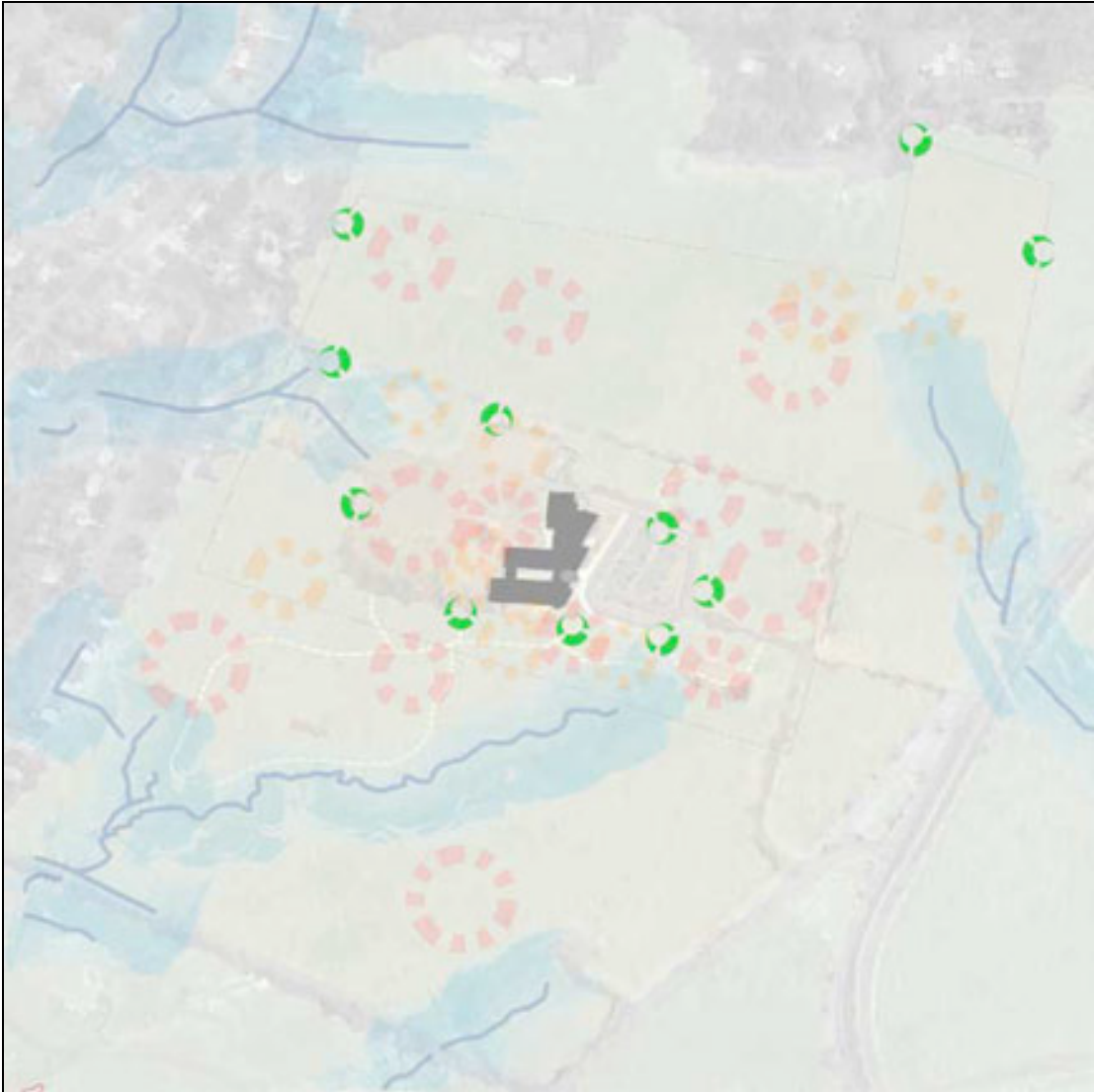


Figure 25 - Existing & Potential Gateways



Figure 26 - Primary Circulation

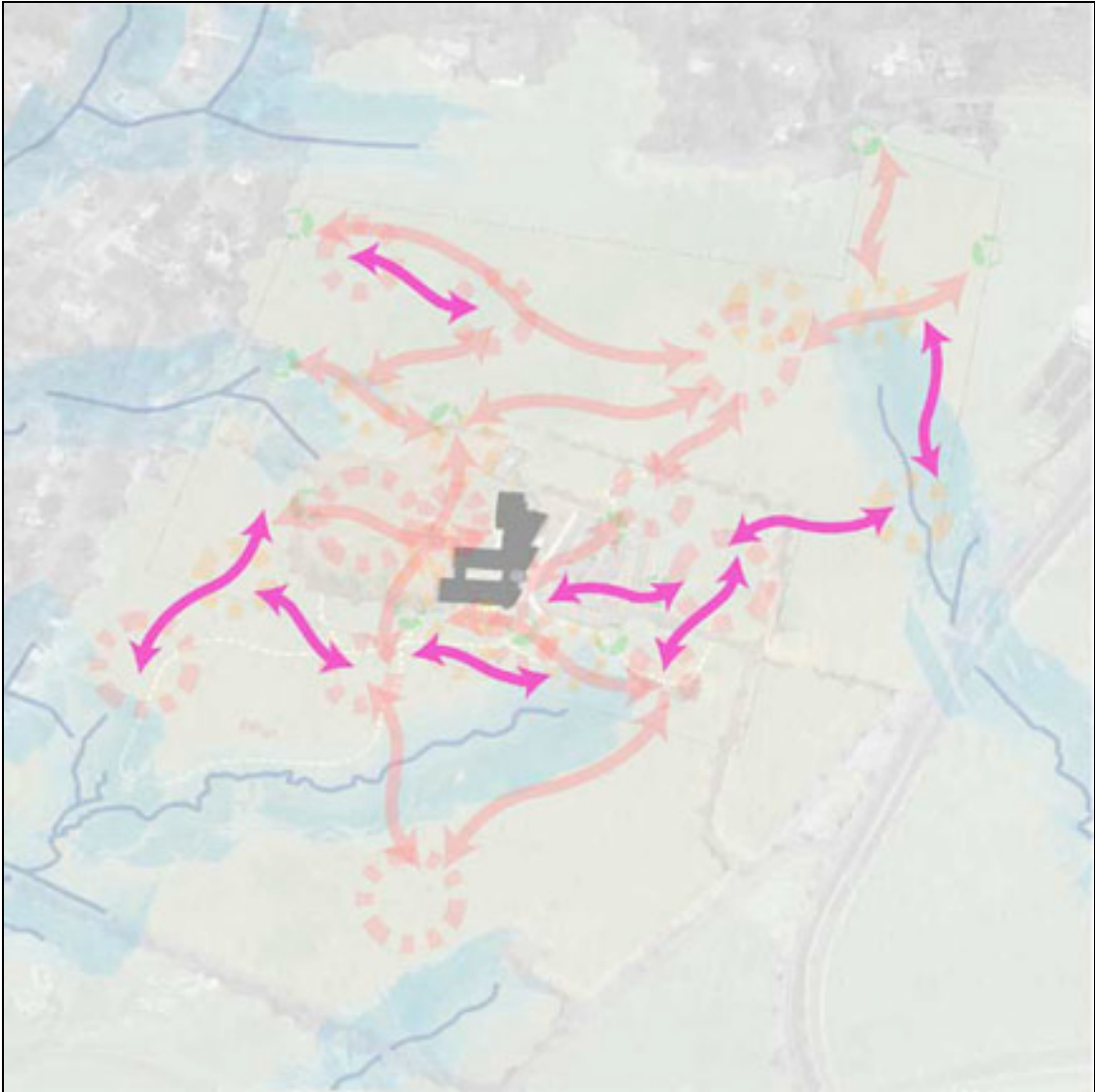


Figure 27 - Secondary Circulation



Figure 28 - Tertiary Circulation

Chapter 4: Design Approach

Conceptual Framework

The conceptual framework for design in this project is Jewish narratives of movement and journey. This framework allows both for specific symbolism and place-making through direct connections to Jewish narratives and for flexibility to adapt the landscape to accommodate a wide spectrum of curricular connections and student experiences. While specific symbolic places and journeys are utilized for inspiration, the design is more a flexible template for place-based Jewish learning than a textbook meant to be followed to the letter.

The design concept utilizes multiple nested layers of movement and journey, working at a variety of physical, cognitive, spatial, and temporal scales. On one side, smaller spaces accommodate both smaller learners and shorter timeslots. The length of pathways through these smaller spaces is shorter and the scale of the vegetation and other objects creating form is appropriate for younger learners. Cognitively, the symbolism represented in these spaces is kept to tangible, simple connections. On the other side, the design allows for a journey encompassing the entirety of the available landscape – an experience geared towards longer field-time and perhaps a culmination for older students of years of interaction with the landscape. Symbolism utilized throughout this scale may be more abstracted than the smaller scales, reflecting both greater flexibility for teachers and greater cognitive ability for older

students. While sensory engagement is a priority element throughout all scales of the design, it is more heavily emphasized for smaller spaces meant to engage younger learners with physical sensations of – and therefore, connections to – the landscape.

Temporal dimensions of journey are inherent in the user experience of space. The nested journeys in this design also parallel a variety of temporal progressions referencing Jewish narratives as well as broader ecological and cosmic narratives. For example, Jewish progressions through time include the evolution of power and knowledge (from tribal autocratic to diffused democratic, more or less) and the maturation of the Israelite nation. Universal progressions parallel history of the universe through time (Big Bang to ongoing expansion of the universe – which also parallels kabbalistic conceptions of contraction and expansion), which also references mirrored scientifically nested scales (atoms -> solar system -> galaxy -> galactic clusters -> etc) and ecological layers (individual -> population -> community -> ecosystem -> biome -> planet).

Experiential Jewish learning in the landscape

In traditional Jewish practices, stories are told and re-told again and again, from year to year, from generation to generation. On the one hand, new commentaries blend with the old to maintain relevance and immediacy with these stories. On the other hand, meaning and learning are made through repetition.

In some cases, Jews not only re-tell stories of the Jewish past, but go as far as to physically re-enact aspects of the Jewish past. The autumn harvest festival, *Sukkot*,

(lit. “booths”) is probably the best example of this – to dually commemorate both the wandering journey through the Sinai Wilderness (a time of great uncertainty and elemental exposure) and agricultural heritage as farmers in ancient Israel (when farmers would live in *sukkot* in the field during harvest). In modern times, Jews build *sukkot*, following specifications laid out in great detail through Torah and Talmudic writings, and eat, study, pray and even sleep in these *sukkot* for up to all eight days of the holiday. *Sukkot* have been interpreted and reimagined by individual Jews for hundreds of years throughout the world in backyards, patios and even small apartment balconies. The experiential nature of this holiday suggests that we recapture knowledge of our ancestor’s intimate, close relationship to landscape encoded in text but enlivened through physically building and dwelling.

The design approach for this project extends this experiential nature to the learning landscape at Gesher. By layering narratives of Jewish journeys over the landscape, students have the opportunity to both strengthen their connection to place and bring experiential dimensions of learning to Jewish narratives and traditions. The design challenge is thus to be maintain a high enough degree of specificity to suggest certain dimensions of experience, symbolism and metaphor while simultaneously retaining enough flexibility to accommodate a wide spectrum of curricular goals, content and disciplines.

The role of technology within the design frameworks of this project is to augment experience through providing in-the-field access to layers of content. As students become more fluent in augmented reality technology, and as the AR

technology itself continues to progress and become more accessible, further layers may continue to be developed for the myriad curricular themes that can be digitally overlaid on the landscape. A non-digital parallel to this might be the many field guides a naturalist might bring into the field – one for birds, another for trees, another for mammals, etc. Just as these field guides augment the landscape experience by providing information allowing for deeper understanding of the landscape, but are not critical to enjoying an experience with it, the technology serves to augment the landscape experience rather than necessarily facilitate it. There will be experiences where the technology is more appropriately kept put away and even turned off or left in the classroom so that there is no interface mitigating a direct and personal connection to the landscape.

Examples of Jewish Movement and Journey

Journey – Patriarchs & Matriarchs

Journeying was central to the largely nomadic tribespeople of Abraham who were frequently on the move throughout the ancient landscape of Canaan and surrounding lands. The Torah (Old Testament) records many of their movements, with some journeys receiving more historical and spiritual significance than others:

- *Abraham's* journey to Canaan (following the departure from homeland) including passage through Egypt, joined by his wife *Sarah*
- *Hagar & Ishmael* – Abraham's first wife and son who Abraham casts out into the desert where they journey, nearly to their deaths. Ultimately, they land in

Be'ersheva.

- *Isaac* – Journey to his (near) sacrifice at Mt Moriah
- *Jacob* – Spirit quest, so to speak, following his deception of Isaac – working under Laban, dreams about wrestling with Gd / angel, angels ascending/descending ladder to heaven, which leads to the first consecration of a holy site (*makom ha'zeh*)
- *Joseph* - discarded by brothers, goes to Egypt, becomes high status advisor to Pharaoh
- *Moses* - Away from Egypt to Midian; Back to Egypt; Exodus to Sinai and Wilderness (but not to Israel)
- *Israelites* - Exodus > Sinai > Wilderness > Israel > Babylon & Diaspora
- *Wandering Jews* (Silk Road, Europe, etc) – this also includes the Khazari Jews, a unique and somewhat legendary kingdom of Jews in the Caucasus region whose king allegedly converted the entire kingdom to Judaism after learning about Judaism from Rabbi Yehuda HaLevi. Author Michael Chabon uses the Khazari Jews as inspiration for the main characters of his adventure romp *Gentlemen of the Road*.
- *New World* - also represented by Michael Chabon and many other authors who write about the Jewish immigrant experience; Superman creators Jerry Siegal and Joe Shuster were Jewish immigrants, who some have argued based Superman in part on escapist fantasies; the diaspora in general is the

existential condition of most of Jewish history for the past two millennia.

Journeys in Time as well as Space:

- *Breishit* (Genesis) – creation of world/universe; *tzimtzum* (contraction)
Kabbalistic concept – God contracts part of God’s self from the original primordial “oneness” of what existed pre-creation in order to make room (create space) for Creation described in Genesis – Time starts here, along with universe as we know it
 - Also related here is Kabbalistic concept of *Sefirot* – manifestations of God’s divine emanation (energy) from the source (*ayn sof* – that without end) into the material world. More on this and other spatial and temporal journeys in the design development section.
- *Shmittah* (sabbatical year) and *Shabbat* (Sabbath) – distinct separations in time created through ritual and observance; meant to go alongside (or even build upon) holy distinctions made in space
- *Olam Haba'ah* (World to Come) – Following coming of the Messiah, a return to Eden-like paradise, redemption, etc.

Chapter 5: Design Narrative

Design Inspiration

The design for the Gesher landscape is heavily inspired by key Jewish concepts, traditions, forms, and physical objects of practice. A brief introduction to these metaphorical forms – or, “metaforms,” – is important for understanding the concept development and ultimate application within the Gesher landscape.

“Metaforms” – Kabbalah & Sefirot

A central tenet of Kabbalah – Jewish mysticism – is the sefira (pl: sefirot), a manifestation of the divine energy emanating into the universe from ayn sof (lit. “without end”), the source of all creation. In Kabbalah, ten sefirot represent the essential facets of this divine energy which can be found throughout the universe.

Each sefira contains essential characteristics which are frequently mapped out along parallel thematic structures. For example, the seven “material” sefirot and the seven days of creation [image:]. The sefirot can also be mapped out along spatial dimensions (two-dimensional and three-dimensional) to create dual physical-spiritual structure in the universe. Connecting vectors between sefirot can also be assigned meaning, sometimes with particular letters of the Hebrew alphabet attributed to these connectors.

The sefirot are also mapped out to parallel the seven days of creation and to spatial dimensions.

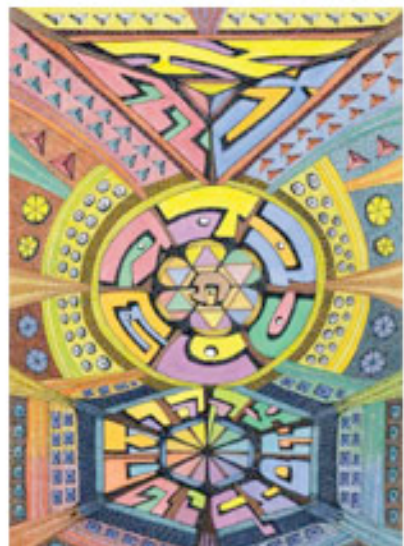
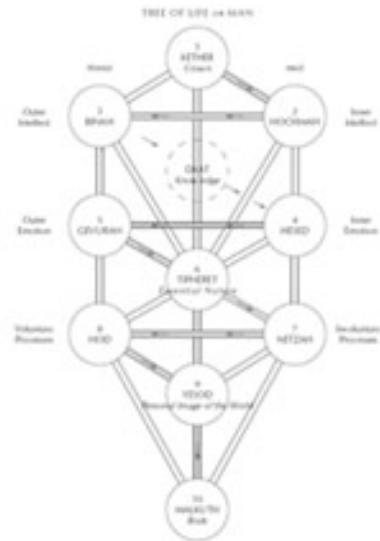


Figure 29 - The 10 *Sefirot* mapped out. The top 3 are considered to be of the divine realm; the bottom 7 exist in the material world / David Friedman

“Metaforms” – Hebrew Letters

Building Blocks of Creation

The Hebrew alphabet evolved from ancient pictographic and ____ alphabets from the Phoenecians and other early Semitic peoples. (SOURCE) The letters

themselves also have strong symbolic value in Kabbalah. In Sefer Yetzirah (“Book of Creation”), a primary Kabbalistic text, the letters of the alphabet are described as divine, elemental building blocks of creation:

Twenty-two elemental letters. God engraved them, carved them, weighed them, permuted them, and transposed them, forming with them everything formed and everything destined to be formed.

Twenty-two elemental letters. God set them in a wheel with 231 gates, turning forward and backward . . . Thus all that is formed, all that is spoken emerges from one name.

Out of chaos God formed substance, making what is not into what is. He hewed enormous pillars out of ether that cannot be grasped. When Abraham our father, peace unto him, gazed -- looking, seeing, probing, understanding, engraving, carving, permuting, and forming -- he succeeded in creation. Immediately God manifested to him, embracing him, kissing him on the head, calling him "Abraham, my beloved." (translated/adapted, Matt 1995)

Note also the connection in the text to Abraham’s special distinction – he was able to parallel the divine acts of creation ascribed to God (looking, seeing, permuting, forming, etc). The text implies this is what attracted God’s attention to him, leading to his special designation as father of a new people and religion.

Hebrew Alphabet – Organizational Structure

Kabbalah further organizes the Hebrew alphabet into three categories: mother letters, double letters, and elemental letters. Through these categories, the letters represent the building blocks making up the physical and spiritual dimensions of the universe.

Mother Letters

The three mother letters – Aleph, Mem, and Resh – represent, respectively, Air, Water, and Fire, the three primary elements from which all else is created. Each

is also attributed with a season, body part, physical operation, and realm. If, as Jewish scholar-philosopher Rabbi Abraham Joshua Heschel describes in his work, the goal of creation is to create holiness in the universe, it moves sequentially through these three realms. First, we create holy space (the air around us – invisible to see, but felt nonetheless) to set the environmental context for holiness. We then create structures within the ever-flowing stream of time (water) for holiness – e.g. the Jewish Sabbath, the sabbatical and jubilee years – which in turn lead to holiness within the soul (fire – kindled and glowing divine energy). The mother letters represent these dimensions of holiness within the universe to which all else returns. While landscape design is a primarily spatial practice, and thus most connected with aleph, good design facilitates experiences in time as well as space. In the Gesher design, the intention is that the spatial design elements, when paired with student interaction and guided pedagogy, facilitate special experiences of time. These, in turn, help to enliven students' souls and engage them in a closer relationship to landscape and to the world around them.

MOTHER LETTERS

	Element	Season	Body	Operation	Realm
א:	Air	Temp.	Head	Sound	Space
ב:	Water	Cold	Chest	Draw	Time
ב:	Fire	Hot	Belly	Enflame	Soul



Figure 30 - The three "mother" letters

Double Letters

The seven double letters of the alphabet are associated with the creation of physical space. In particular, the seven dimensions of place – North / South / East / West / Up / Down and a precise location – may be mapped out using the double letters. The term “double” refers to a double pronunciation. Each of these letters has two possible pronunciations – one with the dot (called a dagesh) in the center (hard), and a second without (soft). The number seven is attributed to the physical building of the world described in Genesis – seven worlds, seven heavens, seven lands, seas, rivers and deserts. The temporal structures of creation also involve concentric cycles of seven – seven days to the week, seven weeks of omer between the holidays of Passover and Shavuot which celebrate freedom from slavery and receiving of the Torah, seven years in the shmittah (sabbatical) cycle, and seven cycles of shmittah to

the Jubilee year – ultimately leading to a holy palace in time (the world to come).

Both the spatial and cyclical-temporal dimensions of the double letters become important metaphors in the Gesher landscape design. When considering place-based education, the seven dimensions of place are critical components of facilitating experience. Similarly, the nesting temporal cycles of seven inspire the nesting journey cycles woven into the landscape design.

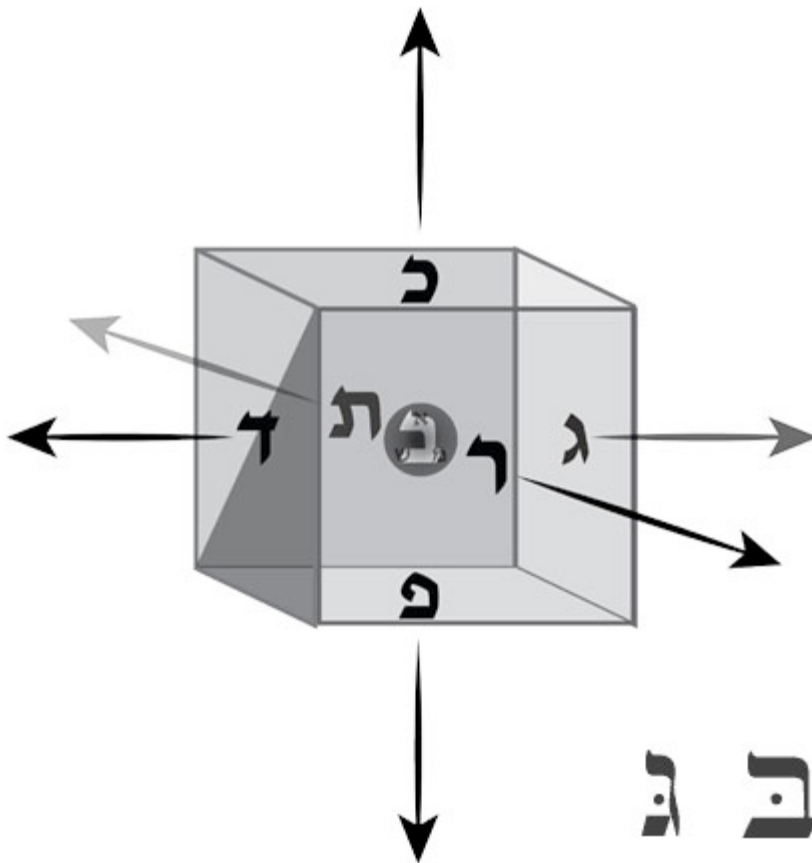


Figure 31 - Seven "double letters" along with two examples of letters, "bet" and "gimmel," with the pronunciation-changing "dagesh" dot

Elemental Letters

The final twelve “elemental” letters are associated with emotion and sensation - speech, thought, motion, sight, hearing, action, sex, smell, sleep, anger, taste, and laughter. They serve to facilitate experience with the physical and spiritual worlds around us. Temporally, they act as the diagonal boundaries below/between the spatial dimensions of the double letters (see diagram). They are associated with the twelve months of the year, and the twelve constellations of the Zodiac (itself a sort of moderator between earth and the heavenly realms, according to Kabbalistic/Medieval theology/cosmology).

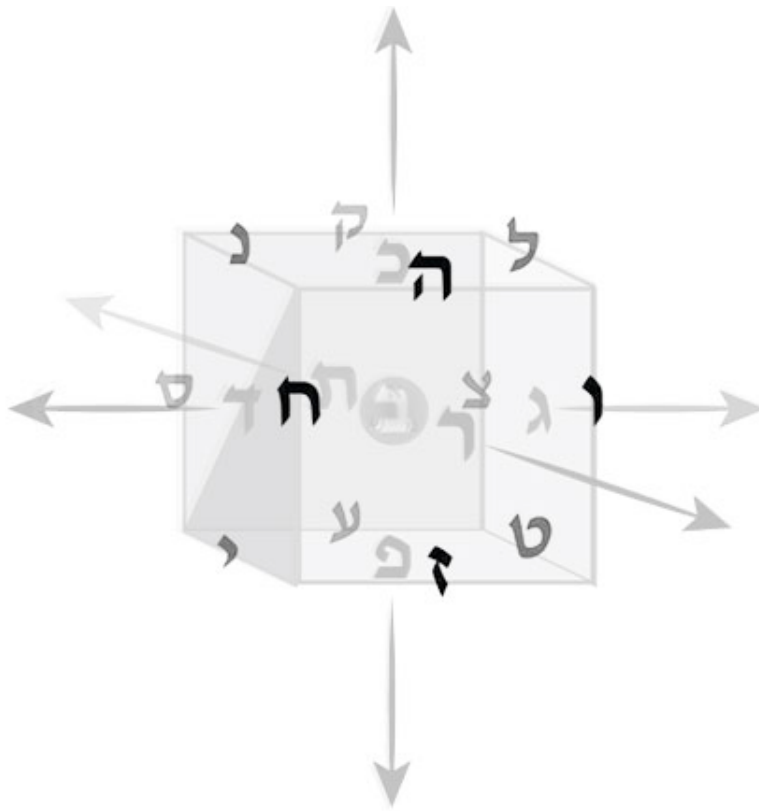


Figure 32 - Twelve "elemental" letters

Hebrew letters as spatial building blocks

Finally, the structure of the actual Hebrew letters themselves mirrors the creation of form and space. Just as form in art and design begins from the simple elements of point, line, and plane, Hebrew letters are drawn by those trained in Hebrew scribal art using prescribed combinations. The letter yud is the point. Vav is a yud with a line extended in a second direction. Dalet extends the line in a third, creating a plane or width. All Hebrew letters are combinations of these basic elements with near-endless layers of meaning associated with each letter. Finally, certain letters sometimes receive “crowns” which serve to ornament certain letters and words, usually for emphasis in a text.



Figure 33 - Hebrew letters as spatial building blocks / with crowns for ornamentation

Design Materials

The choice of design materials stems from these associations of Hebrew letters with formal design elements. The materials themselves are simple choices, simultaneously timeless, ancient, and modern. It is the execution of form that gives them meaning.

Stone (yud)

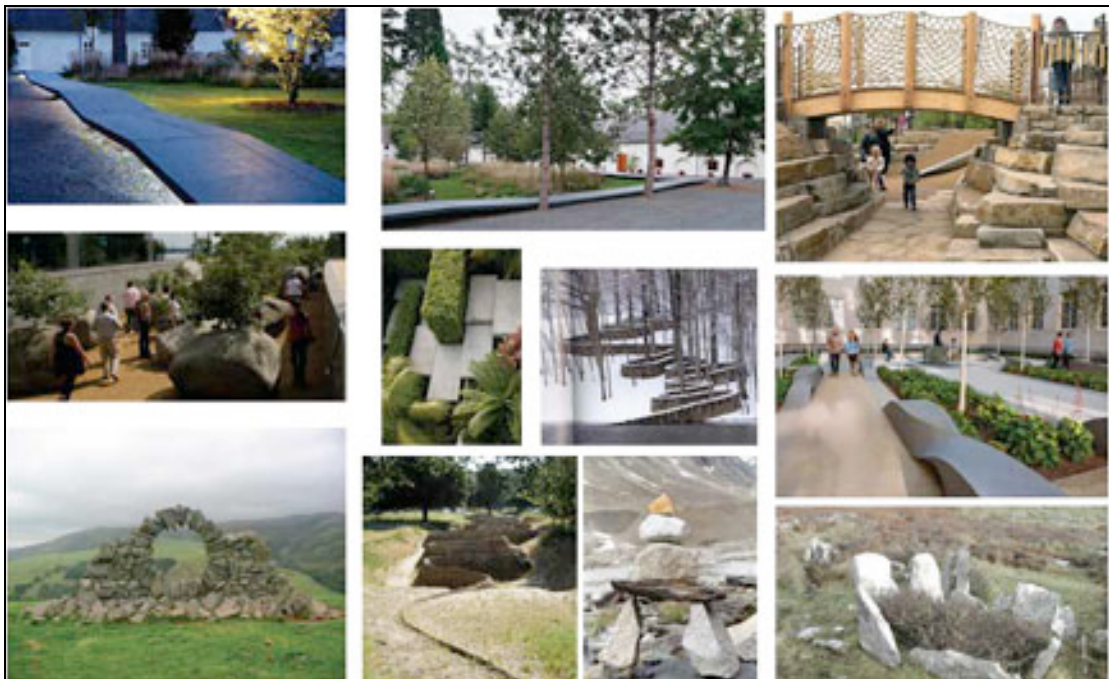


Figure 34 - Stone precedents

Perhaps the first and most basic building material, stone parallels yud (the point) in both physical form and use. In the Torah, the first act of sanctifying sacred space occurs when Jacob places a stone upright as a pillar following a divinely inspired dream (Genesis 28:16-22). He anoints the pillar with oil, and gives the place

a new new – Beth El (House of God). Even before this, Abraham brings his son Isaac to a stone at the top of Mount Moriah in the (near) sacrifice to God. This same point is said to be the foundation stone from which all of creation originated. It is also said by Muslims to be the point from which the Prophet Mohammed ascended to heaven, and is the namesake of the Dome of the Rock in Jerusalem.

Stones have been used to commemorate and memorialize for generations. Jews traditionally place stones on graves (rather than flowers) of loved ones to symbolize their eternal memory. At the Garden of Stones at the Museum of Jewish Heritage in New York City, Andy Goldsworthy used 18 (the symbolic number for “life”) boulders with holes fire-seared through their centers. It was meant as “a contemplative space dedicated to the memory of those who perished in the Holocaust and a tribute to those who survived. For Garden of Stones, Goldsworthy worked with nature's most elemental materials — stone, trees, and soil — to create a garden that is the artist's metaphor for the tenacity and fragility of life.”

(<http://www.mjhnyc.org/garden/about.html>)

In this design, stone serves as a guide – crushed stone and stepping stone pathways guide students through the landscape in prescribed routes; stone walls form restrictive passageways that evoke feelings of constriction referenced throughout Jewish tradition; and stone cairns form loose guides through the wilderness passageway for students who are ready for more independent landscape exploration. It is hewn, weighed, carved, engraved, and placed.

Wood (vav / dalet)



Figure 35 - Wood Precedents

Wood is used throughout the Gesher landscape to build structure and form. It is the foundation for benches that scroll through the schoolyard, benches and tables in the outdoor Beit Midrash (house of learning), and the structural framework for the viewing platform in the North Woods that allows students a birds'-eye perspective of the site. Also hewn from its source material, wood is permuted, carved and layered throughout the landscape.

Metal (ornamentation – crowns)

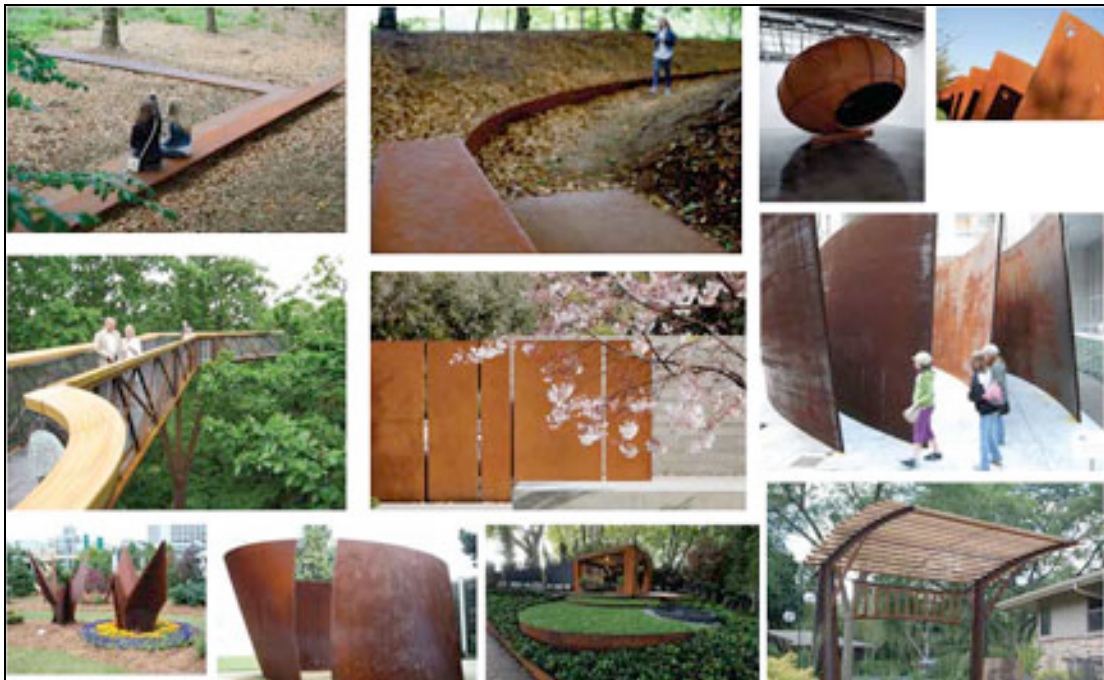


Figure 36 - Metal Ornamentation Precedents

As certain letters and words in written Hebrew texts receive crowns for emphasis and ornamentation, metal is used through the Gesher landscape for ornamentation. While natural systems are respected and protected, the design does not intend to create a impression of a landscape “untouched” by human hands, which would be both inaccurate and misleading. Even areas intended to evoke a sense of wilderness have been heavily impacted by human presence. Here, the human ability to create physical and symbolic beauty and meaning in the landscape is celebrated through the design vocabulary utilized throughout the site, most especially through the use of metal, a material extracted, refined, shaped, molded, transposed and permuted through human handiwork.

Metaforms – Torah as Physical Object

In the design for Gesher, the Torah is used as inspiration not only for the wisdom contained in its text but also as a beautiful and meaningful physical object. A traditional Torah scroll is made entirely of natural materials – wood for the scroll wheels, parchment from the skins of kosher animals, and ink made in part from crushed oak gall nuts. The scroll itself is formed from panels of parchment sewn together. A Torah scroll is also an object with navigational cues to help orient the reader through its textual landscape. Text is divided in columns, with indentations, line breaks, and differentiated spacing in key areas to help set apart one column of text from another. Without these cues, it would be near impossible for someone attempting to find a passage in the book of, say, Leviticus, with the Torah already scrolled to a passage in Genesis. Seasoned Torah readers recognize these patterns – a skill developed only after years of continually reading and reciting the same passages.

Torah is a direct inspiration for the design of the Gesher landscape both in physical form and in the spirit whereupon a person becomes an expert in the navigation of Torah. If landscape is a palimpsest, with multiple layers of “text” enriching the history and meaning of a landscape, its wisdom can be understood and navigated only through a frequent and consistent engagement.



Figure 37 - Ancient Torah Scrolls

When a Torah scroll is damaged or aged beyond repair, it is not idly discarded. Rather, as with all sacred texts containing God's name, a Torah scroll is buried so that its materials return to the earth. Whatever holiness may be bound in the Torah's material form is literally decomposed into the earth.

Concept Development

Concept development began with identifying key activity and engagement areas based on site analysis. These hubs were then connected along circulation lines. The form of these hubs and connectors is similar to diagrams mapping out the Kabbalistic sefirot and their vector connections. They are also reminiscent of the Torah scroll with scroll wheels and parchment circulating throughout the site. Activity areas and circulation routes were then refined and determinations made as to modes of travel and degree of student independence (strongly versus loosely guided). Natural flow patterns began to sync with topographic and vegetative patterns. Curvilinear physical design features serve to highlight the cyclical ebb and flow of hydrological patterns through the site, particularly in the vernal wetlands areas.

The wilderness area of the north woods was in need of navigational cues and design features to organize the area and loosely guide students without prescribing a set path. To accomplish this, curling parchment ribbons were mapped across spiraling movement patterns centralized around the sanctuary area at the site's high point. The resulting grid-like framework would serve to organize the area with guidelines for vegetative plantings and navigational stone cairns inspired by the common wilderness-navigation trail-markers.

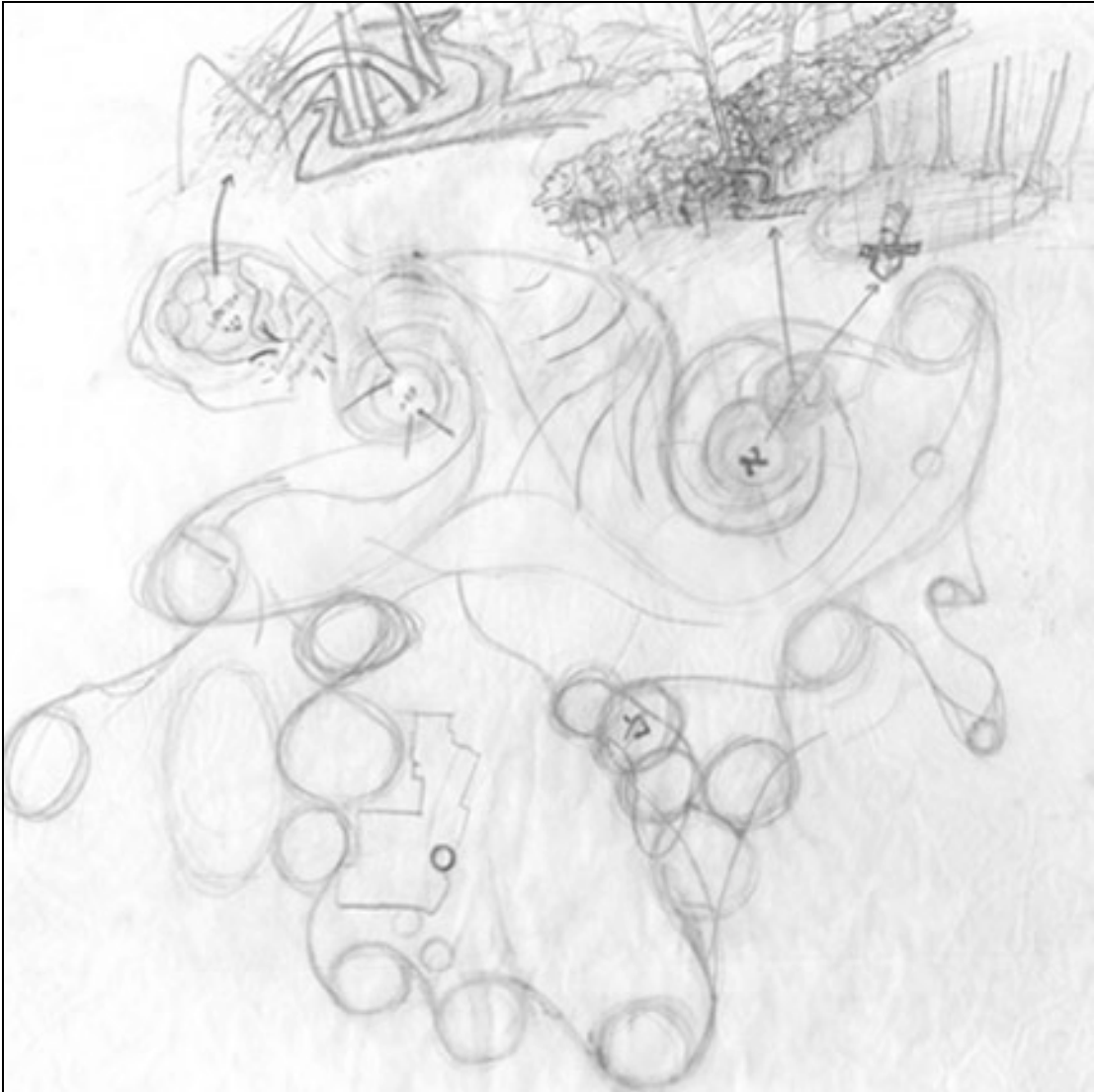


Figure 38 - Concept Development Phase I – Activity hubs mirror the form of sefirot, and circulation routes mirror both the vector connectors between the sefirot and the curling parchment of the Torah scroll. Three main wilderness areas – Sanctuary, Wetlands, and Labyrinth – are possible thematic locations for the three elemental “Mother Letters” of the Hebrew alphabet, which also symbolize air, water, and fire.

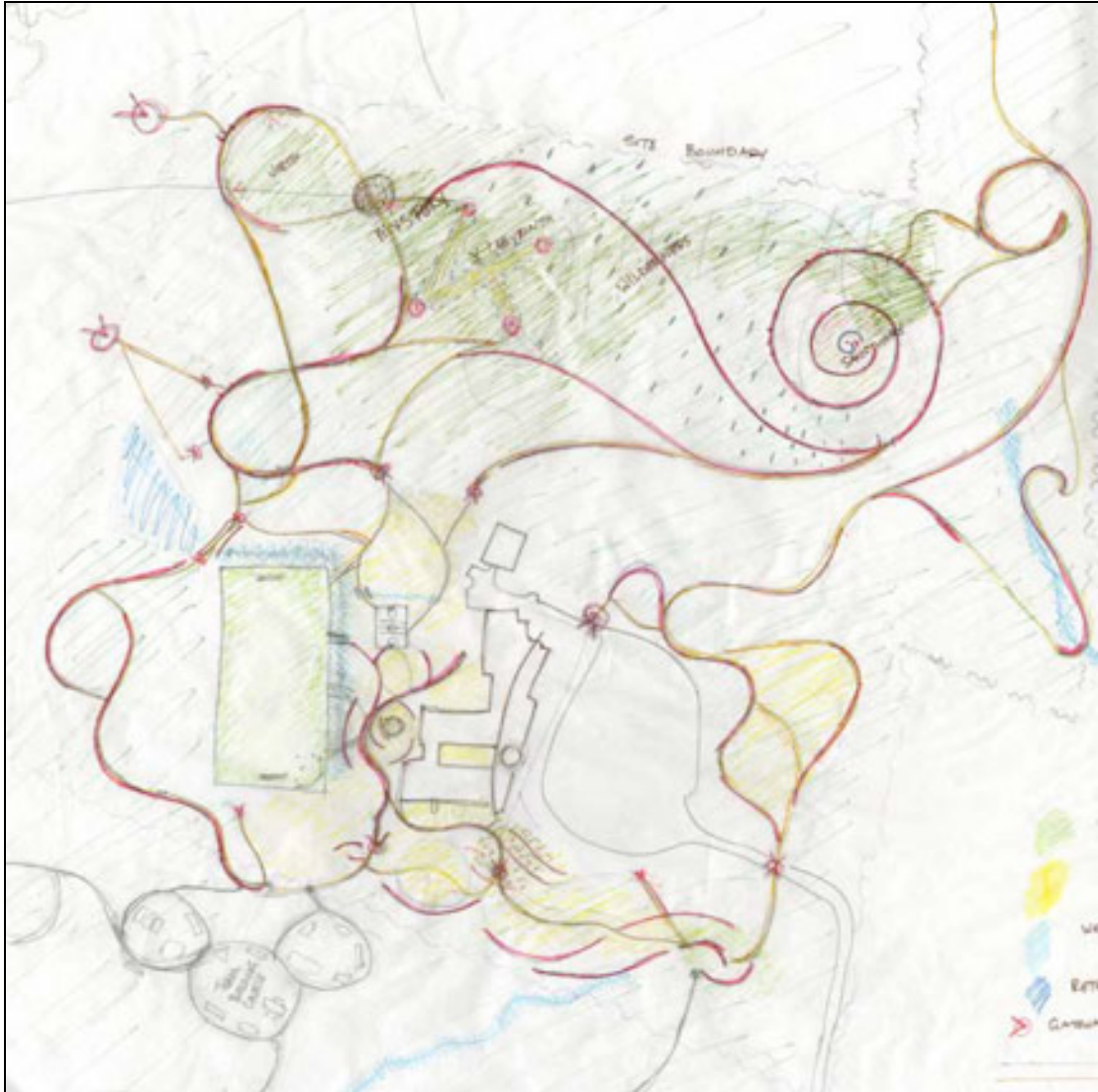


Figure 39 - Concept Development Phase II – Here, the scrolling parchment form takes on greater priority. Form lines explore both direct circulation routes as well as delineation of soft boundaries within the site.

Additionally, materials, forms and movement patterns are found across scales within the site – from the more intimate scale in the schoolyard, scaled to the youngest students, to the mid- and large-scale site-wide implementations for the oldest students.

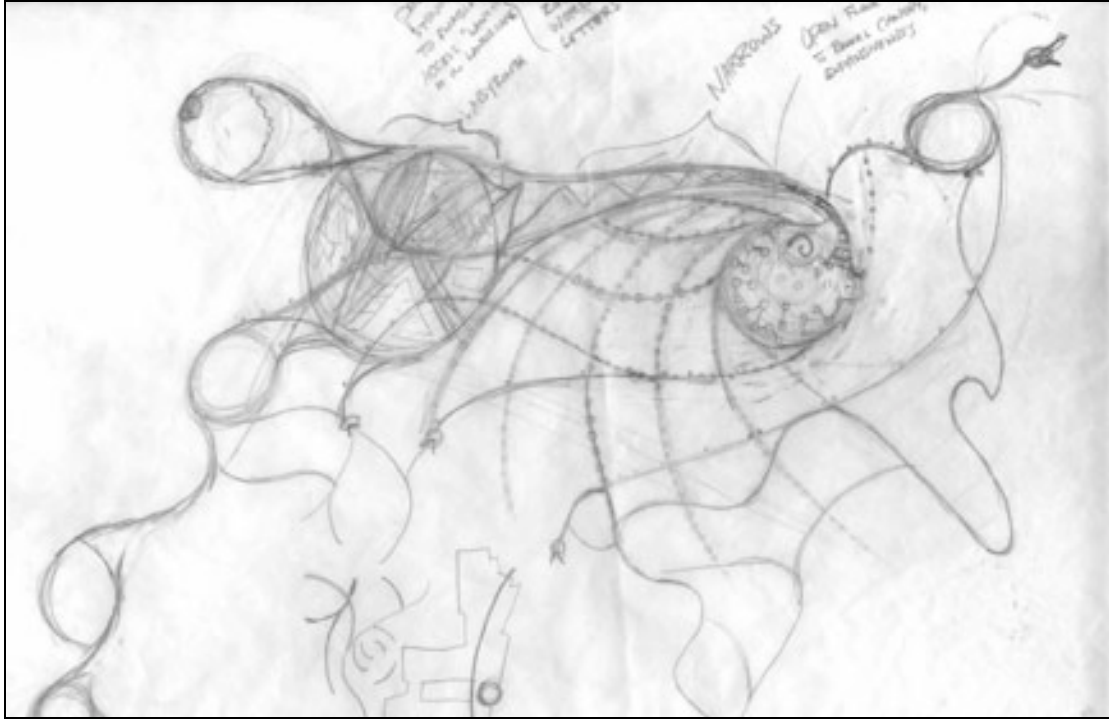


Figure 40 - Concept Development Phase III – *In order to connect more strongly back to main schoolyard, the direction of the spiraling scroll lines was reversed. This also led to a route for the narrows directly through the laurel hedges, leading up and into the Sanctuary. The grid pattern of specimen trees and stone cairns that helps organize the wilderness area can be seen here.*

DESIGN

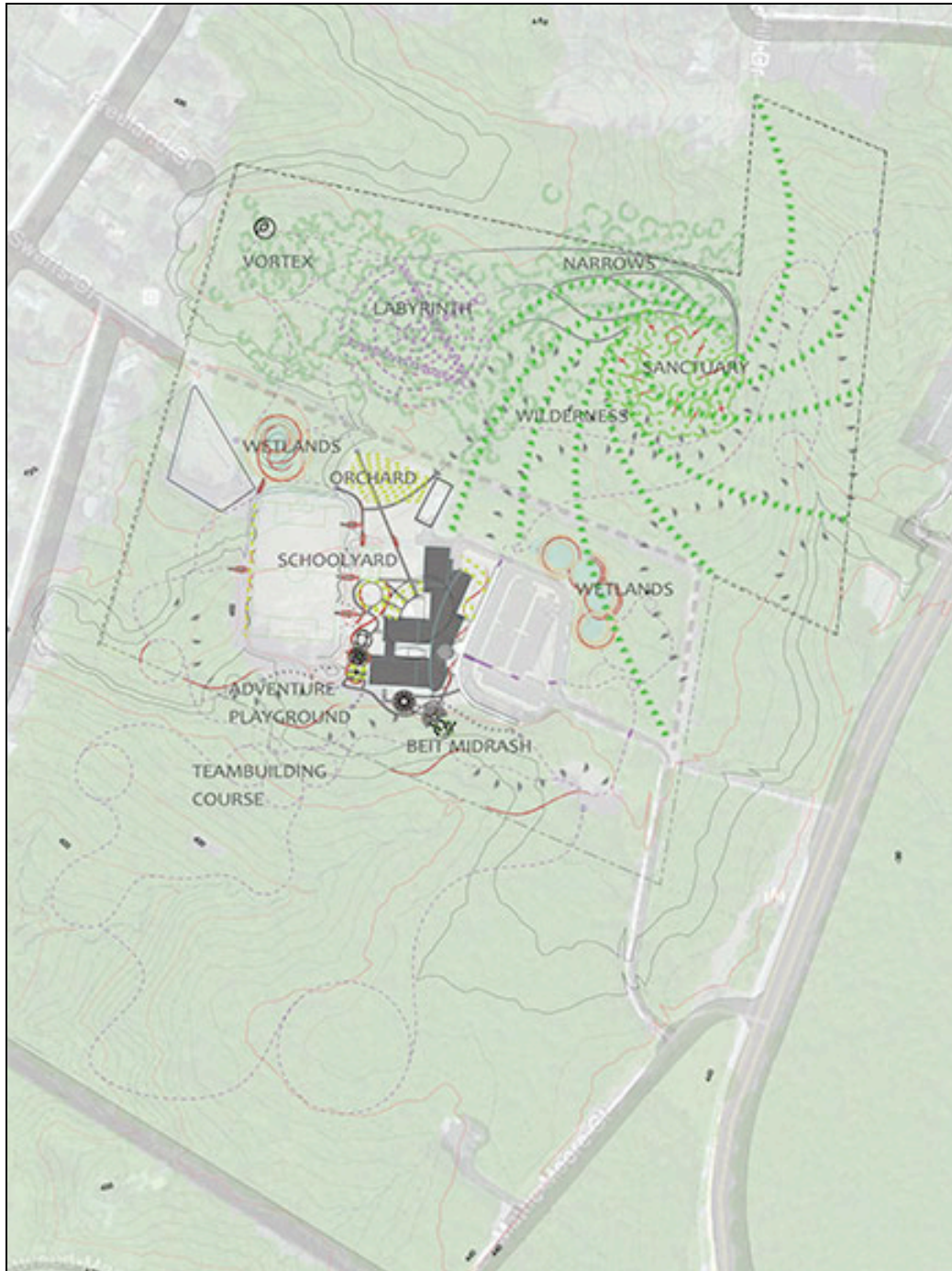


Figure 41 - Full Site Plan – *In the full site plan, most evident is the greatest student journey through*

the entire site. While multiple journeys are possible, and intended, the most obvious journey parallels an archetypal Jewish journey that moves from discovery to struggle to revelation and exploration. In this case, that journey might move through the mysterious vortex, into the labyrinth and narrows, which most directly references the Israelites' slavery in Egypt (whose Hebrew word, Mitzrayim, translates directly to "narrows"), ultimately opening to the revelation at the sanctuary (akin to Mount Sinai), and then the wandering through the wilderness on the way back home to the promised land. Or, in this case, back to school.

OVERVIEW

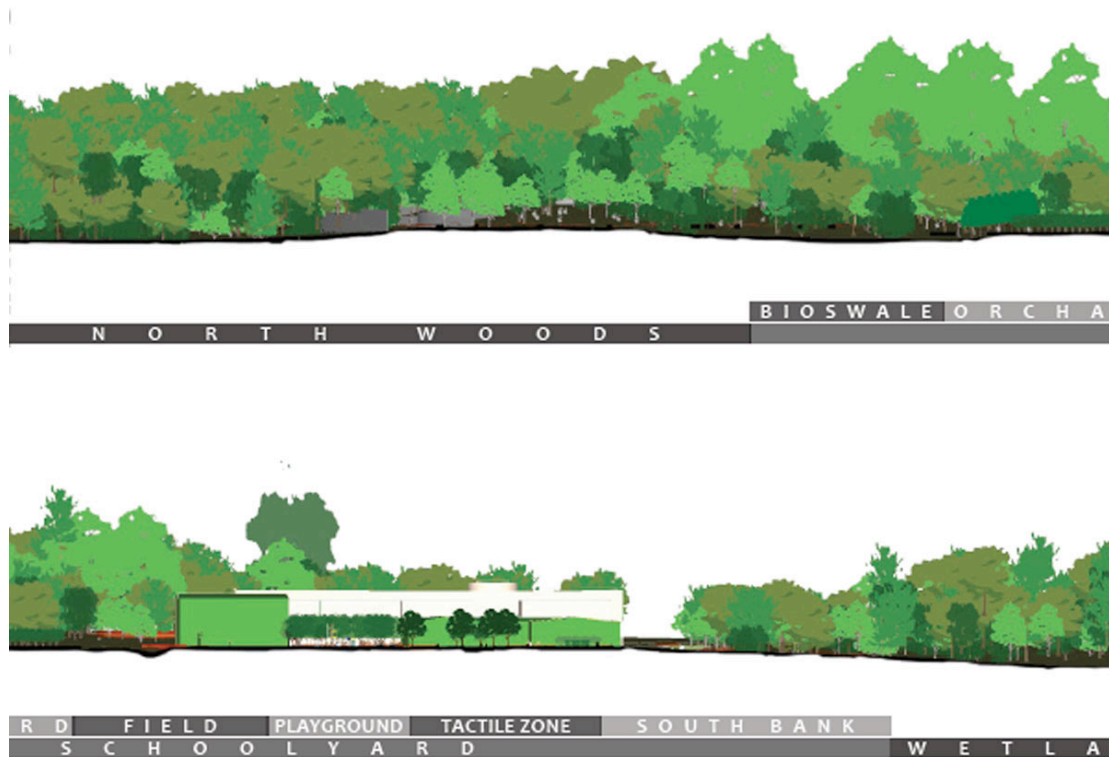


Figure 42 - North Woods Section-Elevation (North-South) – *This graphic shows the topography of the site – modest, but evident – and the relationship of the north woods to the main schoolyard areas.*

Schoolyard

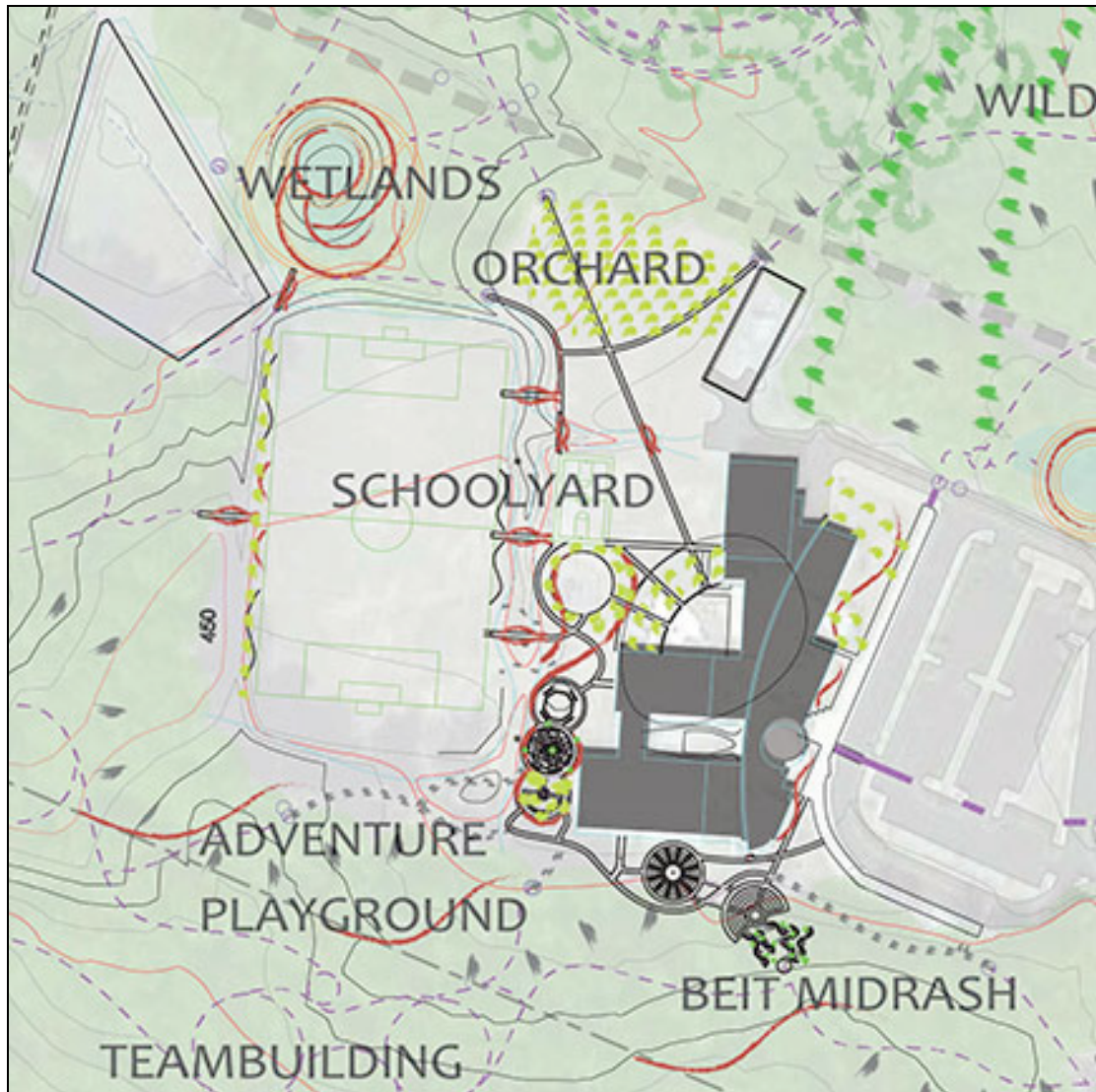


Figure 43 - Site Plan: Schoolyard Detail – Here, the activity hubs in the main schoolyard are evident. They mirror both the circular form of the sefirot and the scrolling parchment of the Torah scroll. Stone cairns are also marked throughout the site as rough grey marks.



Figure 44 - Schoolyard - Gaga pit; Labyrinth; Sensory Garden – *This is the area designed especially with the youngest students in mind, though it is open to all. The scale, tactile nature of elements and materials, and cognitive connections are geared towards the physical and cognitive level of K-2 students, whose classrooms are concentrated in the southwest portion of the main school building (lower right of center in this image). The gaga pit is the upper-right-most circular hub in this image, followed by the labyrinth, then the sensory garden with barefoot path (obscured by shade trees here).*

Multiple journeys are possible throughout the Gesher landscape. These journeys nest in scale, beginning in the schoolyard with the shortest journey. Gesher students, particularly the youngest grades, will spend the majority of their outdoor time in the main schoolyard. It was therefore essential to utilize this space as an introduction to the themes and vocabulary that play out through the site at large. The form establishes the curvilinear patterns taken from the Torah scroll and several activity hubs are created between intersecting curves. Linework explored during concept development takes shape as pathways (paved with stone pavers and crushed stone), and bench-walls. Made from wood at the base, the bench-walls begin to bring the two-dimensional linework into three-dimensional space. A vertical panel along the center of the bench is reminiscent of Torah parchment scrolling through the schoolyard. These scrolling panels are made from a weathered steel mesh, a material that, along with the wood and stone, is carried throughout the site.

Geared especially towards the youngest students, the smallest journey cycle is also the most tangible and sensory-based. Just outside the school wing housing grades K-2 is a barefoot path surrounding a low table for social and educational gathering. The barefoot path is meant, as its name suggests, to be experienced with bare feet. It is divided into panels, each with a different material. Students could be blindfolded and led through the path as a trust-walk for an extra sensory experience. Seating at the center table is provided by wooden logs protruding from under the table like spokes

from a scroll wheel. Young students can simply slide forward and straddle these logs, rather than awkwardly maneuvering into position as with normal bench seating.

Vegetation in this activity hub is low to the ground – tall enough to provide a sense of excitement and mystery to students, while easily seen over by adults supervising play.

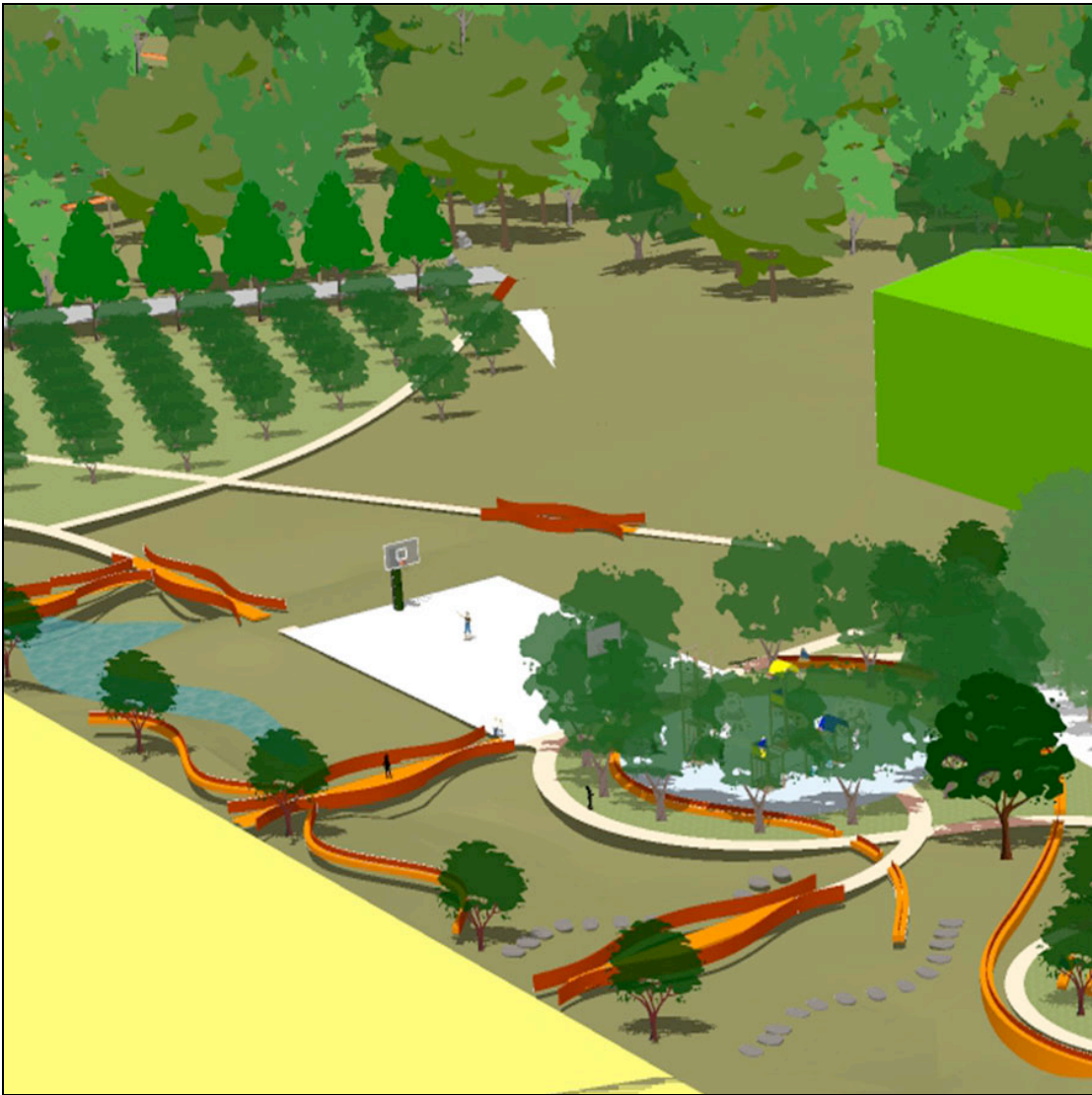


Figure 45 - Schoolyard - Playground; Basketball and Playfields; Orchard; Bridges over Riparian Eco-lab – *The bridges shown here, notable also because Gesher is Hebrew for “bridge,” utilize the wood and weathered steel material vocabulary found elsewhere on site and allow access to playfields*

even if the ecoswales are inundated with stormwater. The existing playground was incorporated into the design, however it could also be rebuilt. The orchard as shown here follows the classic row form of fruit orchards, however these are also meant to be augmented with shrubs, vines, and annuals to create a forest garden habitat.



Figure 46 - *The barefoot path allows students to experience different physical sensations in each panel*

The next activity hub is the small labyrinth – one of two on site. Design for the labyrinths sprung from a combination of the classic Greco-Roman form and the Hebrew letter tzadi (צ), whose Kabbalistic associations suggest the actualizing of potential realized through hunting for the “divine sparks” said by Kabbalists to be embedded throughout Creation. To create the labyrinth, the tzadi was placed into a circle, forming the labyrinth’s bones. Concentric circles responding to the tzadi’s spokes then create the contemplative pathways of the labyrinth. These pathways are

separated by ground-level turf – the material difference marks the labyrinth’s form without creating a tripping hazard for excited students.

Adjacent to the small labyrinth is a Gaga pit³. Dug into the ground, it is now an integral part of the schoolyard design, whereas the existing Gaga court sat lonely above ground without context.



Figure 47 - Gaga Pit & Labyrinth – *The new gaga pit is fully built into the ground to integrate it seamlessly into the site design. Shade trees provide much-needed protection in both cold and hot weather, and benches provide spectator seating while students are waiting for new rounds of the game to begin. Benches are also integrated into the scrolling form that moves through the site, separated by weathered steel mesh backing. These also provide scalable elements that students can run and climb*

³ “Gaga” is a classic Jewish summer camp game, purportedly brought from Israel. It involves hitting a volleyball or similar with hands at other players below the knee to get them out. It is played in either a fully dug-out pit or inside a “pit” made from built-up walls above ground.

on with only moderate risk. The pathways also allow this function for kids who just want to run, providing both interest and ease of travel.

All these hubs are also surrounded by shade trees of varying heights to create habitat diversity and a more comfortable microclimate. Shade trees also surround the “traditional” play area – which in the short time can utilize existing equipment, but may also be converted in the future to a variety of recreational play forms – and are planted in a formal bosquet surrounding the picnic courtyard near the entrance doors to the cafeteria and commons. Gesher teachers remarked that it was uncomfortable to be outside except in the best of weather conditions due to lack of shade in warm weather and wind-buffering elements in cold weather. The courtyard surrounded by the bosquet creates a warm and inviting multi-functional area, whether for teachers gathering students for a picnic or outdoor lesson, large events such as barbeques or PTA meetings, or for teachers during a free period. At its most basic, the schoolyard needs to function as pleasant and inviting outdoor space to help students and teachers forge positive connections with their landscape.

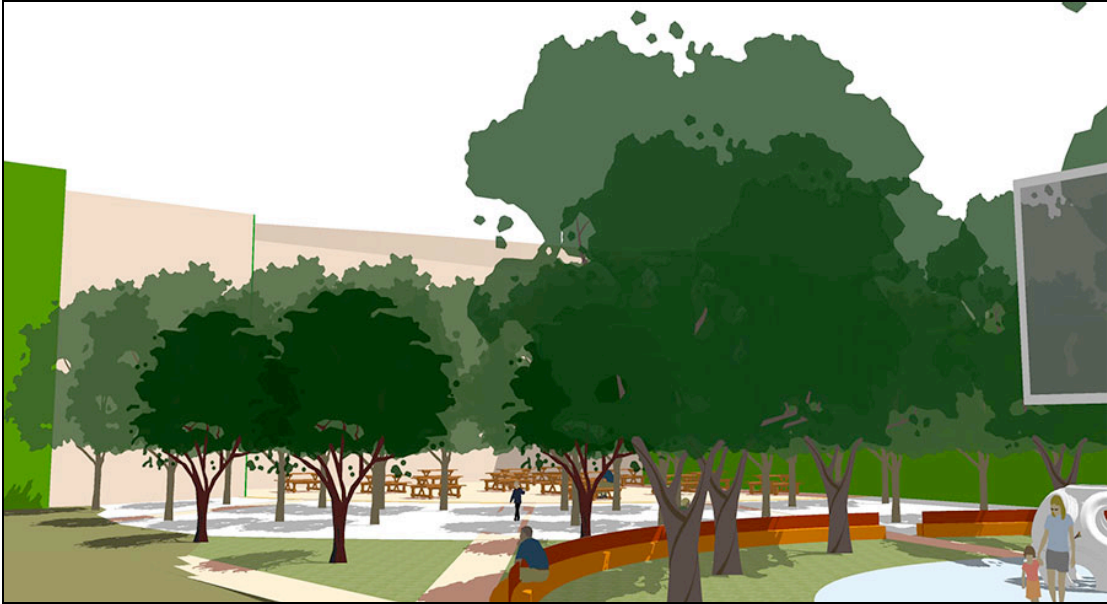


Figure 48 - Tree bosquet and scroll bench – *Modeled after the formal French row planting, the bosquet responds to the circular, scrolling forms, creates microclimate protection, and creates a recreational space for students to run and play in while maintaining open site lines for supervision.*



Figure 49 - The courtyard has a pleasant microclimate - shaded and sheltered by the tree bosquet

Between these activity hubs and the existing soccer field runs an existing drainage swale. In the updated design, this swale is converted into a riparian eco-lab, planted with plants appropriate to bioretention and ripe for student projects and learning. The water level will ebb and flow with seasonal precipitation (often it will be dry), exposing students to a closer relationship with natural cycles.

Of course, even with water flowing through the bioswale, students will need access to the playfields. This is provided by a series of bridges, honoring Gesher's namesake (Gesher is Hebrew for bridge), constructed from the same material palette as other schoolyard elements. The water can also be accessed by a path of stepping stones which ultimately leads to the woods. Similar stepping stone paths branch into the woods off the main schoolyard pathways in several other locations, suggesting that while the pathway is still highly suggested, it is not as heavily prescribed as within the schoolyard. Students who utilize the stepping stone pathways begin to experience a greater degree of independence as they venture further from the main schoolyard area.

In the northern area of the schoolyard, in the flat sump-field area, a forest garden is proposed to utilize the flat space and high degree of sun exposure. Once established, the forest garden will require less regular maintenance than a traditional vegetable garden while giving students opportunities to learn about and mimic natural ecological communities, relationships, and interactions. In this way it serves as both an introduction and reinforcement to learning that will happen in the north woods. Because forest gardens are perennial-based and are designed to create self-sustaining

ecosystems, the area will also suffer less impact on visual appeal if it goes without maintenance during busy times compared to a vegetable garden.



Figure 50 - *Bridges and Eco-lab swale during high water*



Figure 51 - *Bridges and Eco-lab swale during low water*



Figure 52 - *Stepping stones allow student access to and across the water even when the swale is flooded*

South Bank

Along the south bank of the schoolyard lies the next concentric layer of journey. Here, the activity hubs form around a calendar garden and an outdoor Beit Midrash (house of learning).

Split into twelve pie-shaped divisions, the calendar garden is planted according to the Hebrew calendar - a hybrid lunar-solar calendar. Each division is further separated into four, so that planting, maintenance and harvest can be split into weekly cycles if so desired. The calendar garden connects students to the cyclical revolutions of the moon, months, seasons and ultimately years. Beautiful on its own as a gathering space, it can be planted with vegetables, flowers or non-agricultural plantings. This helps overcome the common pitfall of school gardens that, without adequate staff time and resources, can easily fall into disrepair and become aesthetically less-than-ideal. While it will thrive best with regular maintenance, plants can be chosen for multiple values, such as aesthetic beauty and low-maintenance, rather than solely crops that need regular attending.

The outdoor beit midrash responds to a specific teacher request. Carved into the existing slope, the beit midrash amphitheater provides another gathering and event space. Just inside the woods are circular tables with curvilinear scroll benches mirroring the Torah-scroll form. Sized for two to four students at a table, they provide a unique learning space that responds to the classic Jewish learning tradition of the chevruta, a model based on dynamic learning pairs (sometimes extended to small

groups). A teacher may frame a lesson in the amphitheater, then release students into their chevruta groups in the woods for one on one learning time (whether with traditional texts or nature-based learning), then regroup for discussion.

From the outdoor beit midrash, the path connects to the existing trail network in the South Woods. Low weathered steel scroll walls stream intermittently through this area like playful ripples. These forms suggest the delineations of spatial areas without completely restricting movement and flow. To the west is a natural playground area, just into the woods from the playfields. Here the path also winds through the existing firepit, and connects to a proposed teambuilding ropes course, which could be dually used and administered by the local boy scouts troop. To the east, the path runs through the existing Derech HaDemuyot (Trail of the Elders) and into the meadow area. Here, a path to the south runs deep into the south woods and a path to the north connects to the vernal wetlands.



Figure 53 - Amphitheater and beit midrash – *Shown here in morning light, the amphitheater provides event and gathering space facing the forest edge. Stepping stones lead through the beit midrash into the woods. The beit midrash is built into the forest around existing trees.*



Figure 54 - Amphitheater and beit midrash in afternoon autumn light

Vernal Wetlands

The vernal wetlands represent in a very physical way the cyclical ebb and flow of the seasons. With no natural outlet, the wetlands are highest in the winter and spring, and lowest in summer and fall. The natural ecology of this area fluxes with these seasonal changes and is ripe for student study and inquiry projects. The main wetlands is north-northeast from the parking lot, while a secondary wetlands can also be found northwest of the schoolyard near the detention pond.

The design interventions in these areas serve two purposes: 1) increase student access to different parts of the wetlands, and 2) highlight the natural cycles present. Wooden boardwalks allow for access while maintaining a light impact on the delicate wetlands ecology. Weathered steel panels create circular forms that serve as a reference point for students to mark water levels and the accompanying changes in vegetation and other patterns.

North Woods

The north woods serve as the backdrop for more extensive student explorations. Pathways and other navigational cues are meant to serve as suggestions – there is no one “correct” route by which to experience this landscape. That said, the most natural progression might follow in the order of the areas as presented below.

Vortex & Labyrinth

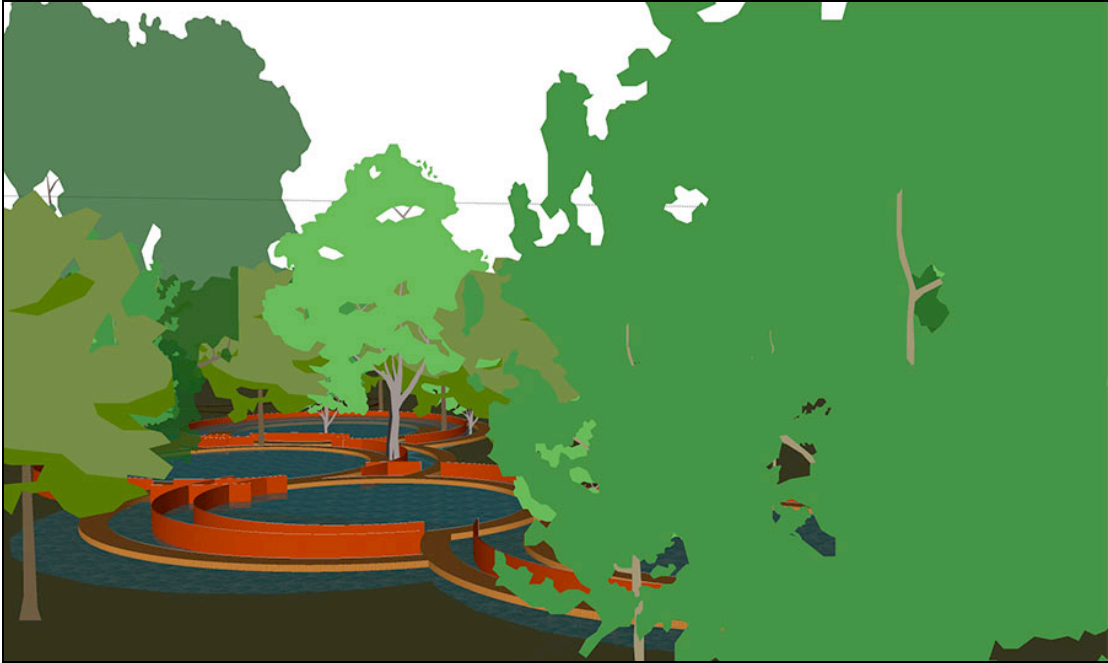


Figure 55 - *Vernal wetlands at high water (winter-spring)*



Figure 56 - *Vernal wetlands at low water (summer-fall)*

Students coming from either the forest garden or the west-side vernal wetlands will cross the utility road and soon encounter either a mysterious natural vortex to the northwest or the second labyrinth to the northeast. The “vortex” is a circular area where most of the trees have been snapped in half and have generally fallen towards a consistent middle point. This may have been caused by an intense wind event such a microburst or from the falling of a larger tree (this is purely conjecture – no overwhelmingly suggestive evidence was seen during site visits). Regardless of the cause, the mystery of this area is enticing. Students are likely to be excited by the prospect of solving the mystery – a perfect setup for inquiry projects.

A pathway circumnavigates this area and leads to a raised viewing platform close to the northwest-most point on the site. Following the formal vocabularies of the rest of the site, a wooden walkway spirals up to the viewing platform 30 feet above the forest floor. This perspective allows students to gaze upon the near-entirety of the Gesher landscape, following in the footsteps of Jewish icons Abraham and Moses, who were both given opportunities to gain a larger perspective on the world. They will also be able to make out portions of the labyrinth, should they desire to enter the labyrinth with a determined route.

The north woods labyrinth is also based on the form of the Hebrew letter tzadi ,though here on a much larger scale. This area of woods is dominated by thin ,(closely spaced conifers (mostly loblolly pine with some spruce and fir). The dense spacing combined with the light-filtering quality of the needle-shaped leaves of the conifers creates a mysterious character prime for combining with a labyrinth. The

pathway of reddish-orange crushed stone will over time be covered in pine needles and other detritus. As the duff-layer thickens, it will make staying on the path all the more difficult, adding to the labyrinthine character of this area and helping give a sense of historical gravitas to the labyrinth in student imagination.

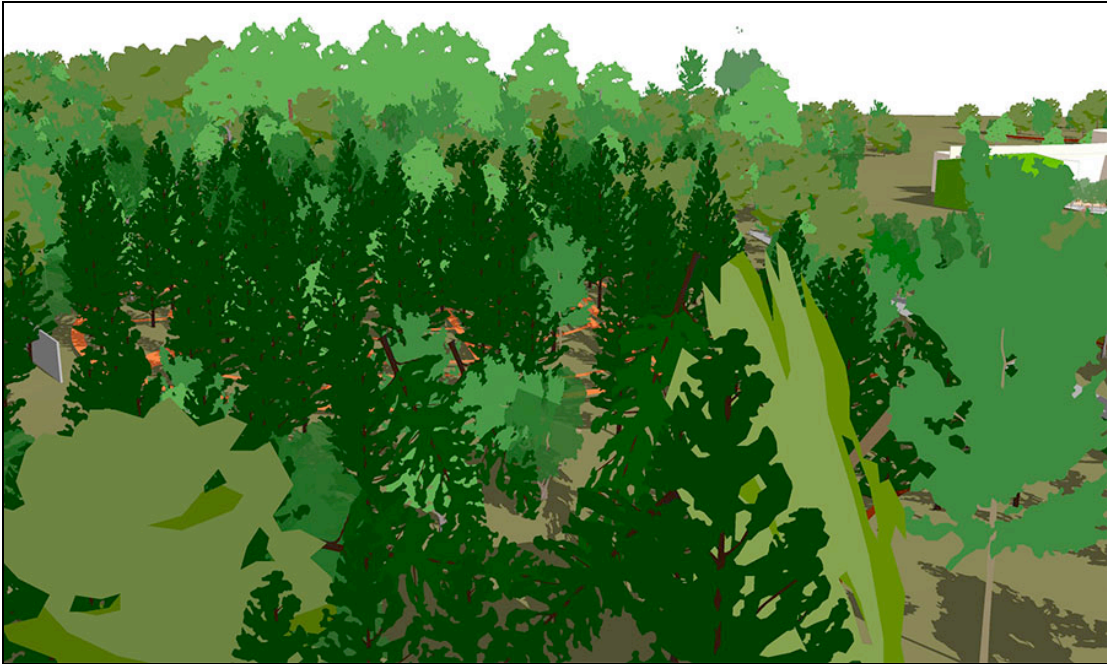


Figure 57 - *View of the vortex and labyrinth from elevated viewing platform*

Narrows

When students reach the northeast “exit” point of the labyrinth, they are directed into the entrance for the “narrows.” This is one area of the site whose path is intentionally heavily prescribed. The route here is framed on either side by walls of stacked stone that evoke the period of Israelite slavery in Egypt – a period that is referenced innumerable throughout Jewish text and tradition, most especially at the holiday of Passover, which commemorates the Exodus from Egypt. During this

period of slavery, Israelites were forced to stack brick upon brick to build Egyptian cities (and possibly pyramids, though this is mainly a common misperception). The stacked stone walls reference this condition.

The Hebrew word for Egypt – Mitzrayim – literally translates to “the narrows,” and is frequently used as a metaphor for the many variables in our modern lives that constrict us. Part of the spiritual goal of Passover, then, is to liberate ourselves from these modern constraints, using the Israelite Exodus narrative as inspiration. Here in the Gesher landscape, as students progress up the hill towards the high point, the stone walls narrow until they are just a few feet apart, physically evoking a feeling of constraint and oppression.



Figure 58 - North woods: *Labyrinth to Narrows to Sanctuary and Wilderness*

Sanctuary

The narrows passes through a dense grove of pine and mountain laurel at its most narrow before opening up to the natural sanctuary at the site's highest point. Here, some of the tallest, most mature trees on site are found. As students emerge from the narrows they are treated to a feeling of expansiveness as the canopy opens to air and sunlight above. The thick tree trunks here are evocative of pillars in a throne room. Hung between the trunks are massive banners of weathered steel mesh, evoking scrolls of parchment from Torah and filtering sunlight to evoke the majestic feeling of an epic sacred space such as that which might have been found at Mount Sinai in the wilderness following the Exodus.

Most of this space – cleared of underbrush to maintain its feeling of open exhilaration – is meant for community gathering and experience. Just off center, though, a personal sanctuary is found, based on the Hebrew letter tet (ט). Tet, a double letter, symbolizes the womb within which the power is held to actualize potential. It is therefore a perfect space for inner reflection. Inside the sanctuary, whose walls are built from branches woven together, is a simple setup of benches and a single stone. Both the stone and the student inside represent the dagesh dot (see the section on double letters) whose presence changes the pronunciation of the letter. In this case, the presence of a student changes the character of the personal sanctuary, which is not the same when unoccupied.



Figure 59 – Sanctuary – *Weathered steel mesh banners hang between columns of trees in the majestic natural sanctuary*



Figure 60 – Preliminary sketch – *The personal sanctuary is shaped after the letter "tet," which symbolizes a womb for incubating potential*

Wilderness Journey

The wilderness acts as an incubation space for personal spiritual questing in many Jewish narratives, from Jacob to the Israelite Exodus to, arguably, the experience of the Jewish diaspora. In the Sinai wilderness, the Israelites spent forty years wandering before their return to the “Promised Land” of ancient Israel (known then as Canaan, the Land of Milk and Honey). Students at Gesher will hopefully not be lost for forty years in this wilderness. However, the spirit of wilderness exploration is evoked in this part of the woods as prescribed pathways give way to loosely guiding navigational cues. In the Sinai wilderness, the Israelites were guided by the form of God as a pillar of cloud in the day and pillar of fire at night. Here at Gesher, pillars of stacked stones reminiscent of cairns used frequently as trail-markers in designated wilderness areas are placed throughout the landscape to act as guides for student wanderers. Together with spiraling rows of planted specimen trees, the cairns create a loose grid of panels in the wilderness area that also organize the space for student inquiry and experience without detracting from its wild character. Similar to the duff-covered pathways of the labyrinth, they also evoke a sense of historicity to the landscape, as though they are the ruins of a forgotten civilization – always a compelling factor for the student imagination.

The overall direction of the wilderness navigational elements leads back to the main schoolyard, which assists teachers pragmatically needing to guide students back to the school building and also referencing the Jewish concept of Teshuva – the

Return. A primary concept of the Jewish High Holidays, Teshuva refers to a return to the divine qualities of each individual human soul as Jews make repentance for moving away from our divine nature during the course of a given year. In this case, the return is to the homeground of school. As Jewish author Michael Chabon might say, any good adventure involves, ultimately, the act of return:

Adventures are a logical and reliable result - and have been since at least the time of Odysseus - of the fatal act of leaving one's home, or trying to return to it again. All adventure happens in that damned and magical space . . . a place of sorrow, marvels, and regret."

~Michael Chabon, Afterword – Gentlemen of the Road: A Tale of Adventure

The Gesher landscape, and especially the north woods, facilitates that magical experience of adventure and exploration quintessential to the Jewish journey experience.

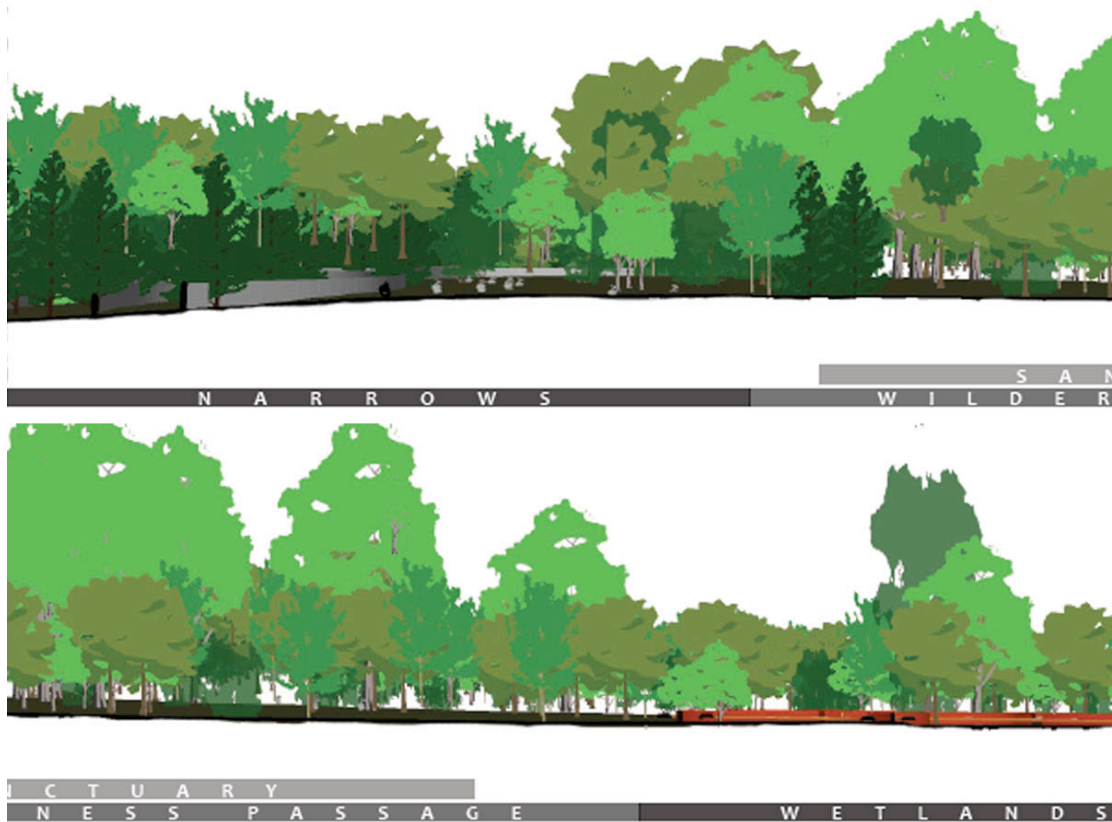


Figure 61 - "Wilderness Journey" Section-Elevation (North-South)

Technology – Expanding the Conversation

The final layer of knowledge on the Gesher landscape is a virtual one that brings the landscape firmly into the 21st century. Building on curriculum developed in collaboration with Gesher educators and administration, the technology integrated into the landscape expands an augmented reality overlay to the entire site. Augmented reality markers – physical, graphic posts at key locations – enable access to layers of digital content and information through a smartphone, which scans the markers using the phone's camera. Such information includes location data, graphic images, video,

websites, and more.

The design and construction of these marker posts remains for further design development. They must, however, be consistent and recognizable, weather resistant, and include visual, scannable graphic content upon which digital content is based.

The curricular connections that can be made to these posts is near-endless. The first phase utilizes seven key locations based on activity hubs of the site and the seven double letters of the Hebrew alphabet. The digital content enables commentary on the physical landscape and continues the conversation – similar to the role of Talmud and ongoing commentary on the original text of the Torah. Also in a nod to the double letters, when students enter the picture and utilize the media, they become the dagesh “dot” at those locations – completing the seventh dimension of place, and affecting the character of the letter and the location.

Conclusion

The student experience of the Gesher landscape as realized through this site design is meant to be repeated, often, in all conceivable iterations throughout a student’s time at Gesher. A student may begin in Kindergarten in the barefoot path, or running along the spiraling pathways of the main schoolyard. They continue to the south bank, planting in the calendar garden and learning in the beit midrash as they get older, and are inspired by the Derech HaDemuyot as they walk to the meadow where they observe butterflies in the natural pollinator habitat. As they approach their final years at Gesher, they are introduced to the north woods, where they are allowed

increasingly independent exploration as they in turn grow in maturity.

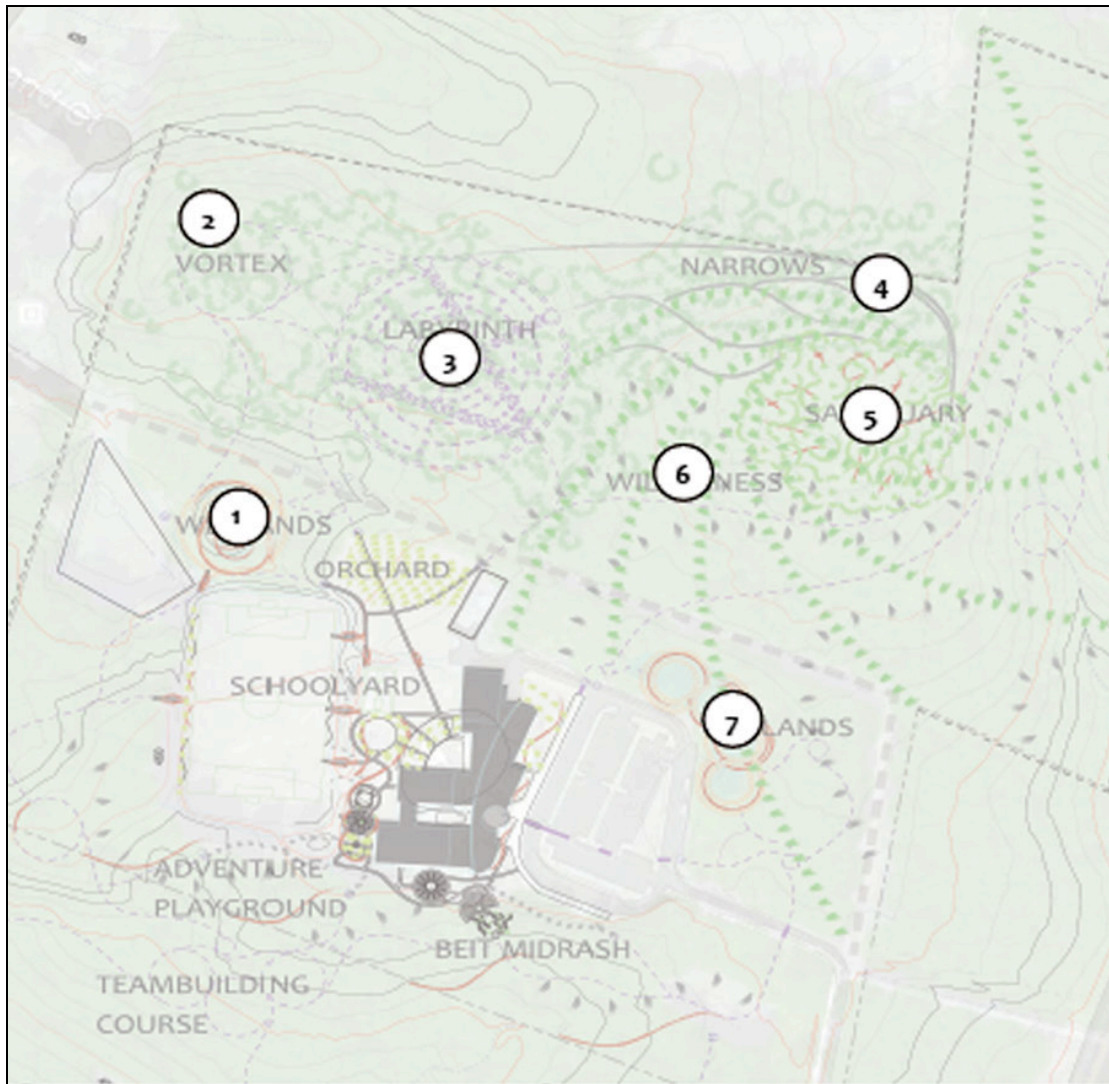


Figure 62 - Locations for augmented reality outposts

The layers of curriculum which can be connected to the landscape journey experience are numerous. One such layer, involving digital augmented reality technology, is explored in detail in the appendix. As students explore the place-based Torah of the Gesher landscape, a regular practice of “study” is encouraged. Grades could rotate through a version of parshat hashavua – the weekly Torah portion —

where every week students share place-based Torah learned from the Gesher landscape. The student experience with Gesher can culminate in a Bar/Bat Mitzvah themed coming of age journey where students are given the ultimate independence to explore the landscape and meaningfully cross through the landscape threshold as they pass the temporal threshold of becoming adults in the eyes of the Jewish community. Just as new insights are gained every time the Torah is studied, whether by the most inexperienced student or the seasoned Torah scholar, the landscape also holds new wisdom that can be uncovered time and again through engaging with its details and intricacies.

Happy Exploring.

Appendix B: Additional Soil Classification Information

30A: Codorus and Hatboro soils

“This channel-dissected soil grouping occurs in floodplains and drainageways of the Piedmont and Coastal Plain, and is susceptible to flooding. Soil material is mainly silty and loamy, but stratified layers of sand and gravels are not uncommon. The seasonal high water table varies between 0 and 2 feet below the surface. Depth to hard bedrock ranges from 6 to 30 feet below the surface. Permeability is variable. Foundation support is poor because of soft soil, seasonal saturation and flooding. Septic drainfields and infiltration trenches are poorly suited because of wetness and flooding potential. Stream bank erosion within these soils may result in undercutting of embankments on adjacent properties. Hydric soils, which may include non-tidal wetlands, occur within this mapping unit.”

(http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)

From NRCS:

The Codorus series consists of very deep, moderately well drained and somewhat poorly drained soils. These soils formed in recently deposited alluvial materials derived from upland soils materials weathered from mostly metamorphic and crystalline rocks. They are on floodplains with smooth, nearly level slopes of 0 to 3 percent. Saturated hydraulic conductivity is

moderately high to high. Mean annual precipitation is 42 inches, and mean annual temperature is 52 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, active, mesic Fluvaquentic
Dystrudepts

TYPICAL PEDON: Codorus silt loam, 0 to 3 percent northwest facing slope in a cultivated field. (Colors are for moist soil.)

The Hatboro series consists of very deep and poorly drained soils formed in alluvium derived from metamorphic and crystalline rock. They are on flood plains. Slopes range from 0 to 3 percent. Saturated hydraulic conductivity is moderately high to high. Mean annual precipitation is 42 inches and mean annual temperature is 52 degrees F near the type location.

TAXONOMIC CLASS: Fine-loamy, mixed, active, nonacid, mesic
Fluvaquentic Endoaquepts

TYPICAL PEDON: Hatboro silt loam on 0 to 3 percent slopes-woods. (Colors are for moist interior soil unless otherwise noted.)

39B: Glenelg silt loam

“This Piedmont soil occurs extensively on hilltops and sideslopes underlain by micaceous schist and phyllite. Silts and clays overlie silty and sandy decomposed rock. Depth to hard bedrock ranges between 5 and 100 feet below the surface. Permeability is generally adequate for all purposes.

Foundation support for small buildings (i.e., 3 stories or less) is typically suitable. Because of a high mica content, the soil tends to "fluff" up when disturbed and is difficult to compact requiring engineering designs for use as structural fill. This soil is suitable for septic drainfields and infiltration trenches. Glenelg is highly susceptible to erosion."

(http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)

From NRCS:

The Glenelg series consists of very deep, well drained soils formed in residuum weathered from micaceous schist on uplands of the Blue Ridge and the Northern Piedmont. Slopes range from 0 to 55 percent. Saturated hydraulic conductivity is moderately high in the subsoil and moderately high to high in the substratum. Mean annual temperature is 53 degrees F., and mean annual precipitation is 40 inches.

TAXONOMIC CLASS: Fine-loamy, mixed, semiactive, mesic Typic Hapludults

TYPICAL PEDON: Glenelg loam, 3 to 8 percent slopes, located in a crop field. (Colors are for moist soil unless otherwise stated.)

59B& 59C: Haymarket silt loam

This soil occurs on broad flat, uplands of the Piedmont and Triassic Basin in areas of igneous bedrock. A thick, highly plastic clay layer occurs in the

subsoil. Above and below the clay layer the soil is loamy. Depth to bedrock is greater than 5 feet. The soil is well drained. Foundation support may be poor because of the highly plastic clays. Foundations footings should extend below the plastic clay layer to the loamy material below. Suitability for septic drainfields is marginal because of the plastic clays and slow permeability. Suitability for infiltration trenches is fair. Fibrous asbestos minerals may occur in the greenstone bedrock. These fibers may become airborne during excavation and blasting operations. Worker protection and dust control measures are required in such instances. Please refer to the soils map to identify affected areas.

(http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)

From NRCS:

Soils of the Haymarket Series are very deep, well drained to moderately well drained with moderately slow permeability. They formed in residuum that weathered from diabase and basalt of the Northern Piedmont uplands. Slopes range from about 0 to 15 percent. Mean annual precipitation is about 36 inches and mean annual temperature is about 57 degrees F.

TAXONOMIC CLASS: Fine, smectitic, mesic Typic Hapludalfs

TYPICAL PEDON: Haymarket silt loam on a 5 percent slope in an oak-hickory type forest. (Colors are for moist soil.)

82B: Orange silt loam & 83C: Orange silt loam, very stony

This plastic clay soil occurs on hilltops and sideslopes over greenstone bedrock in the Piedmont and Triassic Basin. A thin silty surface overlies a plastic clay subsoil. The plastic clay, generally 1- to 2-feet thick often extends to bedrock. A perched seasonal water table, resulting from the slow permeability of the subsoil and underlying bedrock, is between 1½ and 2½ feet below the surface. Depth to hard bedrock ranges between 4 and 6 feet. Foundation support is poor because of the plastic clays, soft soil and high water table but can be improved by sinking the footings down to bedrock. Foundation drains, grading and waterproofing are necessary to prevent wet basements and crawl spaces. Grading and subsurface drainage may be needed to eliminate wet yards. Suitability for septic drainfields and infiltration trenches is poor because of the plastic clays, perched water table and shallow depth to bedrock. Deep basements and excavations may require blasting. Fibrous asbestos minerals may occur in the greenstone bedrock. These fibers may become airborne during excavation and blasting operations. Worker protection and dust control measures are required in such instances. Please refer to the soils map to identify affected areas.

(http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)

From NRCS:

MLRA(s): 136, 148

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE:

Raleigh, North Carolina

Depth Class: deep

Drainage Class (Agricultural): somewhat poorly drained to moderately well drained

Internal Free Water Occurrence: shallow to moderately deep, common

Index Surface Runoff: very high

Permeability: very slow to slow

Landscape: Piedmont

Landform: uplands

Hillslope Profile Position: summits, shoulders, back slopes

Geomorphic Component: interfluves, side slopes

Parent Material: residuum from basic rocks or mixed acid and basic rocks

Slope: 0 to 15 percent

Elevation (type location):

Mean Annual Air Temperature (type location): 57 degrees F.

Mean Annual Precipitation (type location): 42 inches

TAXONOMIC CLASS: Fine, smectitic, mesic Albaquic Hapludalfs

TYPICAL PEDON: Orange loam-forested (Colors are for moist soil.)

93B: Sumerduck loam

This soil consists of silty and clayey alluvium eroded from micaceous bedrock. It occurs along drainageways of the Piedmont. The seasonal high 42

water table is between 2 and 3½ feet below the surface. Depth to bedrock is greater than 6 feet. Foundation support is marginal because of the high water table. Foundation drains and waterproofing are needed to ensure dry basements. Grading and subsurface drainage may be needed to eliminate wet yards. Septic drainfields are poorly suited because of the high water table and slow permeability and infiltration trenches are marginally suited because of the high water table.

(http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)

From NRCS:

The Sumerduck series consists of very deep, moderately well to somewhat poorly drained soils formed in alluvium and slope alluvium from schist, phyllite, metamonzonite and gneiss in the Northern Piedmont. Permeability is moderately slow. Slope ranges from 0 to 7 percent. Mean annual precipitation is about 41 inches, and mean annual air temperature is about 54 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, semiactive, mesic Aquic

Hapludults

TYPICAL PEDON: Sumerduck loam in woods at 350 feet elevation. (Colors are for moist soil unless otherwise stated)

Appendix B: Applied Pedagogy:

21st Century Modalities for place-based Jewish learning & landscape experience

Project Overview:

Gesher Educator: Rabbi Matisyahu Tonti

Students: *multiple grades*

Timeline: *The Omer* – 49 days (7 weeks) leading from Passover to Shavuot

Session length: weekly Gesher Green sessions + augmented reality layer creation sessions

Final Product: Interactive outdoor augmented reality (AR) exhibit

This curriculum for applied pedagogy was developed over a series of collaborative conversations, discussions, and field trials with Rabbi Matisyahu Tonti, General Studies & Judaics teacher at Gesher, and main facilitator of the Gesher Green program. We began with the question of how digital smartphone technology could be integrated with outdoor learning in the Gesher landscape. The proposed student field sessions and projects explore this aspect of how the Gesher landscape can be utilized for multi-disciplinary learning in both an immediate and future timeline. Ultimately, the platform created and revised through this process can be expanded to progressions for year-round learning to bridge exploratory learning in the forest with active, hands-on learning in the schoolyard; digital data and information with real world environments; and ancient Jewish wisdom with modern, living Torah.

Enduring Understandings:

1. Traditional Jewish learning is comprised of stories, knowledge, wisdom and insights based on our ancestors' experiences and journeys through the cultures and landscapes of the ancient Middle East. Shlomo Carlebach said "The Torah is a commentary on the world, and the world is a commentary on Torah." If landscape – a key aspect of the world around us – can be understood to contain wisdom, how do we access this wisdom? Through developing a relationship to landscape similar to the ongoing study of written Torah, we can gain wisdom of the Earth that will both inform our Jewish learning and better enable our understanding of the world we inhabit.

2. Today, we can access knowledge of our ancestors' experiences and the wisdom gained because technologies of the time enabled our ancestors to document and transmit what they had learned. How does modern technology impact our ability to document and transmit our knowledge and experiences with the landscapes where we live today?

Key Questions:

1. What makes a place (or a landscape) "holy"? Are certain places inherently holier than others?
2. Much of the Torah we study is ancient. Is Torah still being written today? If so, by whom?
3. Consider the concept of "Let the Earth teach you Torah." If this is possible,

how do we go about studying the Torah lessons taught by the Earth? Does the Earth use the same methods and materials of traditional Torah study such as books and scrolls?

4. How does technology both enable and restrict how knowledge is documented and transmitted? What would this have looked like in ancient times, and what might it look like today considering modern technology?

Goals

1. Connect student experiences with Gesher landscape to ancient Israelite experiences with landscapes of Mount Sinai, the wilderness, and other landscapes described in Torah.
2. Compare wisdom/knowledge “received” at Mount Sinai (commemorated on Shavuot) to ongoing creation of “living Torah” or “Torah of Place.”
3. Compare use of ancient technologies for documentation & transmission to modern technologies and consider advantages & disadvantages of each.
4. Utilize modern smartphone technology to record & document the “Torah” students have learned through experiences with the Gesher landscape.
5. Synthesize this learning by creating digital media content based on “Gesher Torah” accessible in the landscape through Augmented Reality platforms such as the Layar App.

Session Plan Overview

During Gesher Green Sessions over the seven weeks between Passover (Pesach) and Shavuot, students will progress through a seven-stage program exploring and connecting to the Gesher landscape. Activities for each of these stages are aligned with the seven weeks of the Omer. The learning and deliverables generated through these activities will form the foundation for the content that students will synthesize to create AR layers, which will serve as assessment for their learning in this unit. Media content will include audio, video, graphics, charts, text and web links. Student work will be accessed via an interactive augmented reality exhibition in a *makom kodesh* (special or holy place) which future students and other users will be able to experience. Questions posed throughout the exhibit will encourage users to actively participate in an ongoing discussion of Torah and place.

**See the exhibition chart for detailed breakdown of exhibit concepts, AR layers and associated student content and activities.*

Field Preparation

Research – Additional content depth, Jewish text sources & connections

Compile – Activity guide for student use

Landscape Experiences

“Analog” Media Documentation – *sketches, journaling, graphing data*

Digital Media Documentation -*Video; Audio; Photographic*

Digital Layer Creation

Graphic Design - create design for AR posters

Augment – attach content to AR layers

Test & Refine

Student Outcomes

At the conclusion of the first phase of the project, students will have done the following:

1. Translated their experiences with the Gesher landscape into discernible pieces of knowledge / wisdom such as that transcribed in Torah.
2. Utilized modern smartphone technology to document this knowledge.
3. Utilized augmented reality platforms to create digitally accessible layers of content sharing this knowledge and wisdom.

Skills Learned / Utilized

Smartphone Technology

1. Essential smartphone tools – camera (video & stills); audio; GPS tracking
2. Learn about meta-data associated with smartphone content (e.g. location data)

3. Uploading content to desktop/laptop computers; accessing files & meta-data

Media / Content Generation

1. Site selection for video & still photography
2. Basic video editing
3. Descriptive writing

Augmented Reality Platforms

1. What is Augmented Reality?
2. Basic design layout principles
3. Creating AR Layers for printed media using the Layar Creator
(<https://www.layar.com/products/creator/>)
4. Optimize AR Layers for smartphone & tablet accessibility

Project Assessment

1. Student responses & selections will be documented utilizing smartphone tools
2. All students who have opted-in will have collaborated on content generation and AR layer creation
3. AR layers will be ready in digital form to be integrated into the landscape at Gesher's discretion
4. AR Platform will provide framework for similar future projects across multiple curricular areas

Exhibit	Essential Concept	Breishit Connection (what was created?)	Sefirah Connection	Essential Question(s)	Student Activity	AR Media Content	Location
1 ----- (2)**	Connection; Emanation	Yom HaKishon – Light	Chesed (Loving Kindness)	What is special about this place?	Pokeach Ivrim; Shema Sound Mapping	GRAPHICS: Photo Snapshots; Sound Maps	Forest
2 ----- (3)	Structure; Discipline	Yom Hashmini – Sky / Heavens	Gevurah (Justice)	Why do different habitats exist? How can we tell them apart/ what are the boundaries?	Transect line inventory;	TEXT: Meet a tree description; VIDEO: Describing trees; CHART/GRAPH: Transect Line Inventory	Forest -> meadow
3 ----- (1)	Harmony; Inclusion	Yom HaShlishi – Waters separated from dry land; seeds; grasses of the field (Ch. 2)	Tiferet (Compassion)	Why do grasses get special mention in Breishit? What are "grasses of the field" and why are their seeds so important?	Find the seed + sketch	GRAPHICS: Seed Sketch	Meadow
4 ----- (2)	Cycles; Endurance	Yom HaRiv'i – Luminaries (sun, moon, stars); day & night; week / month / year / seasons	Netzach (endurance)	What evidence of time cycles do we see here? What season is it now? How do we predict things will change?	Sun-dial Light Study	GRAPHICS: Light Study charts; TEXT: Cycle descriptions	Meadow
5 ----- (2)	Humility	Yom HaHamishi – Fish & Birds	Hod (Humility)	When do you feel small? When do you feel big?	Micro-parks; to-scale section drawings?	PHOTOS: Micropark "Macro" Shots; GRAPHICS: Section Drawings?	Meadow / Forest
6 ----- (1)	Foundation; Communication	Yom HaShishi – All other animals; humans; speech	Yesod (Bonding)	How would you name these things if you were given this task? What's the power of a name?	Plant/tree sketch; leaf rubbing; Name Giving; Follow-up: research plant name in English, Latin, Hebrew	WEB: Links to plant species found in area; TEXT: Students' Plant-Names	Meadow / Forest
7 ----- (5)	Shabbat; Appreciation	Yom HaShabbat – Rest	Malchut (sovereignty)	What Torah wisdom did you learn from the Earth in this place?	Video Responses	VIDEO: Responses	Meadow / Forest

*sessions are framed by week, but multiple "weeks" may happen during a single session if needed.

** Hebrew letters for each week are based on the Kabbalistic framework of the "double" letter family (not the normal numerical alef-bet equivalents). These letters are organized together because each has a double form – one with the dot (dagesh), the hard pronunciation; and one without, the soft pronunciation. In Sefer Yetzirah, Kabbalah uses the letters of the alef-bet as a metaphor for the building blocks of creation – the world around us. So one might think of the mekum kodesh space as formed by the "double letters" and the students as the "ages" – they change the nature of the space when present. (The other letters are organized into either 3 mother letters (א / ב / ג) or 12 elemental letters forming emotions and structures of time and the boundaries of the universe).

Figure 63 - Concepts, Connections, Essential Questions, Student Activities, AR media content, and location for each exhibition station

Sub-Appendix A: Steps for creating AR layer content

Sound-cloud (audio)

- Create group student account(s)
- Upload audio files
- Link to LayAR campaign

Youtube (video)

- Create group student account(s)
- Upload video
- Link to LayAR campaign

Image Carousel

- Save images to folder
- Annotate if needed
- Carousel will work best if all images are cropped to same dimensions
- Upload images to carousel through LayAR Creator

Future User Interaction

The final stage of both the student field sessions and the exhibition will feature video responses to a prompt asking “What Torah (wisdom) have you learned from this place?” These videos will be uploaded to Youtube with consistent tags so that they will be easily found when the tag phrase is searched. As more users interact with the site and respond with video comments, a growing virtual discussion board will exist as commentary on the landscape.

Sub-Appendix B: Curriculum Alignment

A wide range of curricular standards are addressed and often augmented through this project. Below are descriptions of this in each relevant category. This section is meant as a starting point for curriculum alignment, with the intention that further development of curriculum will help to align curriculum with greater specificity and relevance.

Gesher Curriculum

Science

Much of this project will be framed through inquiry – what do you (the student) find meaningful in this landscape? What are the characteristics of this place that give it its unique character? In the process of learning about place, students will make observations, compare and contrast ecosystems, measure and record field data, and apply scientific concepts learned in the classroom to the Gesher landscape. Furthermore, they will synthesize this learning by analyzing their landscape interactions and repackaging the information so that it is accessible to a general audience of community members learning about the landscape. This will be a collaborative process with students, and will include a diversity of media used for communication, including text, video and graphics.

Social Studies

Students will utilize broad social studies skills like mapping, defining and comparing landforms and considering how climate affects the Chesapeake region and the natural vegetation that grows here. In learning about landscape studies, they will also consider how geographic features influence the development of the built environment – cities, suburbs, homes, schools, etc. This influence will be considered in both the historical use and development of the Gesher landscape, and in how it will influence design decisions potentially made in the near future as students determine what is significant in the landscape – categories of information on which they will base their creation of digital AR layers. As students determine how to make their digital layers of information accessible in the landscape, they will also be considering how to create a legacy of physical remnants in the landscape and what these remnants will suggest about these students if they were to be studied in the future, thus helping to contextualize archaeological studies of the past.

Language Arts

Students will need to utilize language arts to present their information across all platforms they choose – not only for text, but also script-writing for videos and effective labeling and description for graphic media. Students will need to effectively marry language arts with these other media forms to communicate with their audience, and will gain additional experience with multiple forms of expository writing.

Mathematics

For inventory and analysis, students will need to apply their understanding of the coordinate plane to real-world measurements and mapping systems. Similarly, abstract concepts of decimals, fractions and percents, slope, geometric characteristics of angle, line and plane and calculations of area, perimeter, density, and depth will be applied to understanding and documenting the physical Gesher landscape. For any quantitative measurements recorded, students will need to determine appropriate graphical displays of their data in the analysis and AR layer creation stages of the project.

Judaics

Consultation with Rabbi Tonti has guided the Judaics component of the project towards integration with units leading to the holiday of Shavuot, which commemorates receiving the Torah at Mount Sinai. Students are asked to link traditional sources of wisdom and knowledge such as the codified texts of Torah with modern wisdom and knowledge. They will specifically consider what Jewish knowledge we are building today in relationship to landscapes throughout the world. Knowledge and wisdom about the Gesher landscape will be documented and transmitted utilizing modern technology, with an understanding of how technology in the past enabled transmission prior wisdom to future generations. Students will also be empowered to share their own individual knowledge and relationships as they take part in collectively building a body of knowledge regarding the Gesher community

and landscape – the Torah of (this) Place. (see additional Melton Tanakh standards below, with extensions bridging traditional Tanakh study to place-based Jewish learning)

Melton Standards and Benchmarks for Tanakh (Hebrew Bible) learning

The Melton Standards and Benchmarks are the product of a project from the Jewish Theological Seminary's Melton Research Center for Jewish Education. The project is designed "to help schools adopt a standards-based approach for the teaching of TaNaKH and in turn support schools in establishing the requisite capacity for maintaining and sustaining change" (www.jtsa.edu). Reviewing these standards was recommended by Gesher administration as curriculum was developed for this thesis project. The extensions for place-based Torah are my own.

Standard 1: Students will become independent and literarily astute readers of the biblical text in Hebrew.

Extension: Students will develop independent relationships with the Gesher landscape and astute observers of its unique character and ecology, particularly in contrast with landscapes described in Tanakh.

Standard 2: Students will be engaged in the learning of ancient, rabbinic, and modern modes of interpretation of the biblical text and will see themselves as a link in this ongoing chain of interpretation.

Ext: Students will engage with experiential, interpretive learning in the Gesher

landscape and compare/contrast their experiences with ancient, rabbinic and modern modes of Jewish landscape experience. They will see themselves as a link in this ongoing chain of landscape interpretation and explore innovative modes of modern interpretive transmission.

Standard 3: Students will appreciate Tanakh as a multivocal text with a complex history of development.

Ext: Students will appreciate landscape as a complex, interdependent web of systems and interaction – a palimpsest of both human and non-human development and interactions throughout recent and ancient history. Students will understand their own role as individual voices contributing to ongoing Torah and the growing body of knowledge linked specifically to the Gesher landscape.

Standard 4: Students will view Tanakh as the formative narrative of the Jewish People—past, present, and future.

Ext: Students will understand how the landscapes of our ancestors shaped the development of their beliefs and relationship with the divine, and how our relationships with landscapes around the world continually shape our own Jewish communities and personal perceptions, biases, and beliefs. They will understand how the wisdom they document and transmit will inform future

generations of Gesher students.

Standard 5: Students will, through the study of Tanakh, understand and value that the Land of Israel informs and shapes the historical, theological, and sociological experiences of the Jewish People.

Ext: Students will understand and value the holiness inherent in all places, as well as how Judaism creates holiness through distinction and separation. They will appreciate the inherent tension in this dualism.

Standard 6: Students will develop an appreciation for the sacredness of Tanakh as the primary record of the meeting between God and the people of Israel and as an essential text through which Jews continue to grapple with theological, spiritual, and existential questions.

Ext: Students will appreciate the role of each individual Jew in receiving, documenting and transmitting wisdom and divine inspiration; they will explore uses of modern technology for documenting, transmitting and engaging with both new and traditional forms of Jewish wisdom.

Standard 7: Students will understand, through the study of Tanakh and its interpretations, the role of mitzvot [commandments] in the shaping of the

ethical character and religious practices of the individual and the Jewish People.

Ext: Students will learn how traditional understanding and observance of the mitzvot has changed and adapted over the millennia, and consider how modern interpretation and innovative application of mitzvot, particularly in relation to landscape, connect with the ethics and values described in Tanakh.

Standard 8: Students will develop a love of Torah study for its own sake and embrace it as an inspiring resource, informing their values, moral commitments, and ways of experiencing the world.

Ext: Students will develop a relationship with landscape for its own sake and embrace it as an inspiring resource that informs their values, moral commitments, and ways of experiencing Judaism.

Computer Technology Education

Students will gain proficiency in mobile device use and utility. They will also gain exposure to the digital realms of augmented reality, and to communications media through the creation of content for their AR layers. Students will be welcome to use existing software platforms at Gesher such as Microsoft Word and Publisher, and we can also explore the option of training students in graphics and design software such as Adobe Photoshop, Illustrator and InDesign, and SketchUp for simple but effective

3D modeling so that interested students can get a head start on industry-standard software. (see additional ISTE standards below)

ISTE Standards – According to their website, the ISTE Standards “are the standards for learning, teaching, and leading in the digital age and are widely recognized and adopted worldwide. The family of ISTE Standards work together to transform education.” They consist of standards for Students, Teachers, and Administration to learn, teach, work with, and effectively support digital learning goals and methods.

Gesher administration also recommended reviewing these ISTE standards for the technology component of the thesis project. Below, the standards are listed with comments *in italics* denoting original language applied to this specific project.

ISTE Standards – Student

1. Creativity and innovation - *Students demonstrate creative thinking* through creating AR layers, *construct knowledge* by preparing and organizing content for AR layers, *and develop innovative products* [AR layer exhibit] *and processes* [documenting & transmitting place-based knowledge] *using technology*.
2. Communication & collaboration - *Students use digital media* [smartphone tools, content generation] *and environments* [Layar creator] *to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others*, [future Gesher students].
3. Research & information fluency - *Students apply digital tools to gather,*

evaluate, and use information in preparing & organizing content for AR layers.

4. Critical thinking, problem solving, and decision making - *Students use critical thinking skills to plan and conduct research [preparing AR layers], manage projects [creating AR layers], solve problems, and make informed decisions using appropriate digital tools and resources.*
5. Digital citizenship - *Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior, including considering when appropriate and when not to utilize digital technology in the landscape, and the relative impact of digital layering vs other landscape interventions.*
6. Technology operations and concepts - *Students demonstrate a sound understanding of technology concepts, systems, and operations as applied to the creation of AR layers for the Gesher landscape.*

ISTE Standards – Teachers

1. Facilitate & Inspire student learning & creativity - *Teachers use their knowledge of subject matter [Judaics, Ecology, Environmental Ethics], teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.*
2. Design and develop digital age learning experiences and assessments -

Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools [smartphones; Layar augmented reality] and resources to maximize content learning in context [place-based Jewish learning] and to develop the knowledge, skills, and attitudes identified in the Standards.

3. Model digital age work and learning - *Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.*
4. Promote and model digital citizenship and responsibility - *Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.*
5. Engage in professional growth and leadership - *Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.*

ISTE Standards – Administrators

1. Visionary leadership - *Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology [in the outdoor learning environment] to promote excellence and support transformation throughout the organization.*

2. Digital age learning culture - *Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.*
3. Excellence in professional practice - *Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources.*
4. Systemic improvement - *Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources.*
5. Digital citizenship - *Educational Administrators model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.*

Bibliography

- Alexander, Bryan. "Apprehending the Future: Emerging Technologies, from Science Fiction to Campus Reality." *EDUCAUSE Review*, 2009. PDF file.
- Broda, Herbert W. *Moving the Classroom Outdoors: Schoolyard-Enhanced Learning in Action*. Stenhouse Publishers, 2011. PDF file.
- Brown, Keffrelyn D., and Amelia Kraehe. "When you've only got one class, one chance: acquiring sociocultural knowledge using eclectic case pedagogy." *Teaching Education*, Vol. 21, No. 3, 313-328, 2010. PDF file.
- Burdette, Hillary L., M.D., M.S.; and Robert C. Whitaker, M.D, M.P.H. "Resurrecting Free Play in Young Children: Looking Beyond Fitness and Fatness to Attention, Affiliation and Affect." American Medical Association, 2005.
- Chabon, Michael. *Gentlemen of the Road*. Del Ray, 2007. Book.
- Charles, Cheryl. *Children & Nature Network Research and Studies: Volume One*. Annotated Bibliography. C&NN, 2007. PDF file.
- Charles, Cheryl, and Alicia Senauer. *Children's Contact With the Outdoors and Nature: a Focus on Educators and Educational Settings*. Research review. C&NN, 2010. PDF file.
- Charles, Cheryl, Richard Louv, and Sara St. Antoine. *Children & Nature Network 2010 Report Progress, Initiatives, Studies, Tools, Networks, and Innovation*. C&NN, 2010. PDF file.

- Chawla, Louise. "Learning to Love the Natural World Enough to Protect It," *Barn*, No. 2, Norsk senter for barneforskning. 2006.
- Chen, Yuh-Shyan, Tai-Chien Kao, and Jang-Ping Sheu. "Realizing Outdoor Independent Learning with a Butterfly-Watching Mobile Learning System." *Journal of Educational Computing Research* 33 (4): 395-417, 2005. PDF file.
- Chiung-Sui Chang, Wan-Tzu Wong, and Chih-Yung Chang. "Integration of Project-Based Learning Strategy with Mobile Learning: Case Study of Mangrove Wetland Ecology Exploration Project." 2011. PDF file.
- Cochrane, Thomas, and Roger Bateman. "Smartphones Give You Wings: Pedagogical Affordance of Mobile Web 2.0." *Australasian Journal of Educational Technology*. 26:1, 1-14, 2010. PDF file.
- Cohen, Isaac, Isaac Hametz, and Rachel Vassar. "Expanding Eruv: Urban Typologies and the Making of Jewish Space." *It's a Thin Line: Eruv from Talmudic to Modern Culture*. CJH ALEPH, 2014. PDF file.
- Cosco, Nilda, and Robin Moore. "Sensory Integration and Contact with Nature: Designing Inclusive Outdoor Environments." *The NAMTA Journal*, Vol. 34, No. 2, Spring 2009. PDF file.
- Culatta, David. "From Innovation Clusters to Datapalooza: Accelerating Innovation in Educational Technology." *EDUCAUSE Review*, 2012. PDF file.
- Cummiskey, Matthew. "There's an App for That Smartphone Use in Health and Physical Education." *Journal of Physical Education, Recreation & Dance*, 82, 8, 2011. PDF file.

- Cunningham, Chuck and Cassie Dull. "Use them ... Or Lose them? the Case for and Against using QR Codes." *Currents* 37 (8): 42-45, 2011. PDF file.
- Danks, Sharon Gamson. *Asphalt to Ecosystems : Design Ideas for Schoolyard Transformation*. Oakland, CA: New Village Press, 2010. Book.
- Dickens, Harry, Andrew Churches, and 21st Century Fluency Project. *Apps for Learning : 40 Best iPad/iPod Touch/iPhone Apps for High School Classrooms*. Vancouver, BC; [Thousand Oaks, Calif.]: 21st Century Fluency Project ; Co-published with Corwin Press, 2012. PDF file.
- Fager, Kenneth W. *IOS Deployment Methods in Wisconsin K-12 Schools*. 2012.
- Frost, Joe. "Back to Nature and the Emerging Child Saving Movement: Restoring Children's Outdoor Play." *C&NN Leadership Writing Series, Volume one: Number 3*. C&NN, no year. PDF file.
- Gaster, S. "Urban Children's Access to Their Neighborhood: Changes Over Three Generations." *Environment and Behavior*, 23(1), 70-85, 1991. PDF file.
- Gerson, Jordie. "What the Debates About the Pew Study on Judaism in America Missed." *The Huffington Post*. Publ. October 9, 2013. Web.
- Goldberg, J.J. "Pew Survey About Jewish America Got It All Wrong." *The Jewish Daily Forward*. Publ. October 13, 2013. Web.
- Halpenny, E. A. "Examining the relationship of place attachment with pro-environmental intentions." Paper presented at the 2006 Northeastern Recreation Research Symposium, Bolton Landing, New York. 2007.

Hannah, Gail Greet. "Roundtable Report: Technology and the Landscape."

Roundtable discussion. *Landscapeforms*, 2012. PDF file.

Hart, Roger. "Ladder of Participation." *Children's Participation from Tokenism to Citizenship*. Florence: UNICEF Innocenti Research Centre, as cited in www.freechild.org. PDF file.

Hazon. *Seeds of Opportunity: A National Study of Immersive Jewish Outdoor, Food, and Environmental Education (JOFEE)*. Hazon, 2014. PDF file.

Hofferth, S.L. & J.F. Sandberg. "Changes in American Children's Time, 1981-1997." In S.L. Hofferth & T.J. Owens (Eds.), *Children at the Millennium: Where Have We Come From, Where Are We Going?* (pp. 1-7). New York: JAI, 2001. Book.

Huang, Yueh-Min, Yen-Ting Lin, and Shu-Chen Cheng. "Effectiveness of a Mobile Plant Learning System in a Science Curriculum in Taiwanese Elementary Education." *Computers & Education* 54 (1): 47-58, 2010. PDF file.

Kali, Yael, Ed., Marcia Linn Ed., and Jo Ellen Roseman Ed. *Designing Coherent Science Education: Implications for Curriculum, Instruction, and Policy*. Technology, Education--Connections (TEC) Series Teachers College Press, 2008. PDF file.

Kamaras, Jacob. "After Pew pessimism, is 'JOFEE' the new acronym for the Jewish future?" Publ. March 10, 2014. JNS. Web.

Karsten, L. "It All Used to be Better? Different Generations on Continuity and Change in Urban Children's Daily Use of Space." *Children's Geographies*,

- Vol.3 (3), pp275-290, 2005. PDF file.*
- Katz, James Everett. *Creativity and Technology : Social Media, Mobiles and Museums*. Edinburgh: MuseumsEtc, 2011. PDF file.
- Kellert, Stephen R. "Reflections on Children's Experience of Nature." *C&NN Leadership Writing Series, Volume one: Number 2*. C&NN, 2005. PDF file.
- Kharif, Olga. "Cell Phones Make Headway in Education." Special Report. *Business Week*, 2008. PDF file.
- Kolb, Liz. "Adventures with Cell Phones." *Educational Leadership* 68 (5): 39-43, 2011. PDF file.
- . Toys to Tools: *Connecting Student Cell Phones to Education*. Excerpt. International Society for Technology in Education, 2007. PDF file.
- Kudryavtsev, Alex, and Marianne E. Krasny. *Urban Environmental Education: Preliminary Literature Review*. Cornell University Civic Ecology Lab, 2012. PDF file.
- Kuo, Frances E.; and Andrea Faber Taylor. "A Potential Natural Treatment for Attention-Deficit/Hyperactivity Disorder: Evidence from a National Study." In *American Journal of Public Health, Vol 94, No. 9, September 2004*. American Public Health Association.
- Lanclos, Patsy and Visions Technology in Education. *ILearn iTeach iPod Touch, iPhone, & iPad Apps for Curriculum*. Eugene, OR: Visions Technology in Education, 2011. PDF file.
- Lens-FitzGerald, Maarten. "Layar 101: Intro to AR and Interactive Print." *Layar*

- Webinar*, December 2013. PDF file.
- Lieberman, Gerald A., and Linda L. Hoody. *Closing the Achievement Gap: Using the Environment as an Integrating Context*. Report: executive summary. SEER, 1998. PDF file.
- Liestol, Gunnar. "Learning Through Simulations: Exploring Mobile Augmented Reality." *EDUCAUSE Center for Applied Research*, 2011. PDF file.
- Marcus, Clare Cooper, and Carolyn Francis. *People Places: Design Guidelines for Urban Open Space*. 2nd Edition. Wiley, New York, 1998. Book.
- Martinelli, J. "Integrating Smartphone & Twitter into Course Content." *Technology and Teacher Education Annual 4 (Conf 21)*: 2298-2302, 2010. PDF file.
- Matt, Daniel C. *The Essential Kabbalah: The Heart of Jewish Mysticism*. HarperOne, New York, 1995.
- McCann, E. "Restoration-based education: teach the children well." Pages 315-334 in D. Egan, E. E. Hjerpe, and J. Abrams, editors. *Human dimensions of ecological restoration: integrating science, nature, and culture*. Island Press, Washington, D.C., 2011.
- McInerney, Peter, John Smyth, and Barry Down "“Coming to a place near you?” The politics and possibilities of a critical pedagogy of place-based education.” *Asia-Pacific Journal of Teacher Education*, 39:1, 3-16. 2011. PDF file.
- Minocha, Shailey. "Evaluating the effective use of emerging technologies in education." *International Conference on Technology for Education Conference*, 16-20 July 2012, Hyderabad, India. PDF file.

- Moore, Robin. "How Cities Use Parks to Help Children Learn." *City Parks Forum Briefing Papers*. American Planning Association, 2003. PDF file.
- . "Outdoor Settings for Playing and Learning: Designing School Grounds to Meet the Needs of the Whole Child and Whole Curriculum." *The NAMTA Journal*, Vol. 21, No. 3, Summer 1996. PDF file.
- Moore, Robin, and Nilda Cosco. "Greening Montessori School Grounds by Design." *The NAMTA Journal*, Vol. 32, No. 1, Winter 2007. PDF file.
- . "Using behaviour mapping to investigate healthy outdoor environments for children and families: conceptual framework, procedures and applications." *Innovative Approaches to Researching Landscape and Health. Open Space : People Space 2*. Routledge, 2010. PDF file.
- Morgan, M. "Interpretation and place attachment: implications for cognitive map theory." *Journal of interpretation research*, 1. 2009.
- National Environmental Education Foundation, *Greening STEM: Taking Technology Outdoors – EE Week 2013 Educator Toolkit*. NEEF, 2013. PDF file.
- . *Tech and Our Planet: Tapping Into Student Interest in Science, Technology, Engineering, and Math for a Greener, More Prosperous Future*. NEEF, 2013. Infographic. PNG file.
- Oller, Rick. "The Future of Mobile Learning." *EDUCAUSE Center for Applied Research*, 2012. PDF file.
- Parry, David. "On Teaching Mobile Literacy." *Mobile Perspectives, EDUCAUSE Review*, 2011. PDF file.

- Payton, M. A., Fulton, D. C., & Anderson, D. H. "Influence of place attachment and trust on civic action: a study at Sherburne National Wildlife Refuge." *Society and natural resources*, 18(6), 511-528. 2005.
- Pence, Harry E. "Smartphones, Smart Objects, and Augmented Reality." *Reference Librarian* 52 (1): 136-145, 2011. PDF file.
- Pew Research Center's Religion & Public Life Project. *A Portrait of Jewish Americans: Findings From a Pew Research Center Survey of U.S. Jews*. Pew, 2013. PDF file.
- Playday 2005 and 2006 Survey Reports. British Market Research Bureau for the Children's Play Council, 2005, 2006. PDF file.
- Price, Sara, Paul Davies, William Farr, Carey Jewitt, George Roussos, and George Sin. "Fostering Geospatial Thinking in Science Education through a Customisable Smartphone Application." *British Journal of Educational Technology* (1), 2013. PDF file.
- Project Noah. "Pool Monitor: Tracking Insect and Amphibian Interactions Using Technology." Lesson plan. PN, 2013. PDF file.
- . "Writing Goes Wild: Using Technology to Bring Together Science and Writing." Lesson plan. PN, 2013. PDF file.
- Purcell, Kristen, et al. "How Teachers Are Using Technology at Home and in Their Classrooms." *Pew Research Center's Internet & American Life Project*, 2013. PDF file.
- Rideout, V. and E. Hamel. *The Media Family: Electronic Media in the Lives of*

- Infants, Toddlers, Preschoolers, and Their Parents.* Kaiser Family Foundation, 2006.
- Rivkin, Mary. "The Schoolyard Habitat Movement: What It Is and Why Children Need It." *Early Childhood Education Journal*. Volume 25, No. 1, 1997. PDF file.
- Roberts, D. F., Foehr, U., & Rideout, V. *Generation M: Media in the Lives of 8 to 18 Year Olds.* Kaiser Family Foundation, 2005.
- Robinson, Emma-Jane. "A Sense of Place – a Model to Compare Places, Peoples and Their Relationships over Time – Salisbury Plain Revisited." Paper presented at the *Forum UNESCO University and Heritage, 10th International Seminar, "Cultural Landscapes in the 21st Century."* Newcastle-upon-Tyne, April 2005. Revised: July 2006. PDF file.
- Rosin, Hanna. "The Overprotected Kid." Publ. March 19, 2014. *The Atlantic*. Web.
- Senauer, Alicia. *Children & Nature Network Research and Studies: Volume Two.* Annotated Bibliography. C&NN, 2007. PDF file.
- Smaldone, D., Harris, C., & Sanyal, N. "The role of time in developing place meanings." *Journal of leisure research*, 40(4), 479-504. 2008.
- Stewart, Meg, Jeffrey Clark, Jeremy Donald, and Keri VanCamp. "The Educational Potential of Mobile Computing in the Field." *EDUCAUSE Quarterly* 34 (1), 2011. PDF file.
- Styliaras, Georgios and Dimitrios Koukopoulos. "Educational Scenarios with Smartphones in Cultural Heritage Sites and Environments." *Journal of*

- Educational Multimedia and Hypermedia 21 (3): 285-315, 2012. PDF file.*
- Taylor, Andrea Faber; and Frances E. Kuo. "Is Contact with Nature Important for Healthy Child Development? State of the Evidence." In Spencer, C. & Blades, M. (Eds.), *Children and Their Environments: Learning, Using and Designing Spaces*. Cambridge, UK: Cambridge University Press, 2006.
- Taylor, Andrea Faber; Frances E. Kuo; and William C. Sullivan. "Views of Nature and Self-Discipline: Evidence from Inner City Children." *In the Journal of Environmental Psychology, 21, 2001. PDF file.*
- Tedesco, Ashley. "Doom, Gloom, and the Pew Research Center." Publ. February 19, 2014. Jewcy.com. Web.
- Valkanova, Yordanka and Mike Watts. "Digital Story Telling in a Science Classroom: Reflective Self-Learning (RSL) in Action." *Early Child Development and Care 177 (6-7): 6-7, 2007. PDF file.*
- Varady, Aharon. "On the siah of suah: Vegetation and Sacred Space in Mystical Jewish Prayer Praxis." Final paper for course: *Mystical Jewish Prayer: Rishonim to Hassidut. JTSA, 2013. PDF file.*
- Wagner, Ellen D. "Enabling Mobile Learning." *EDUCAUSE Review, 2005. PDF file.*
- Wason-Ellam, L. "Children's literature as a springboard to place-based embodied learning." *Environmental education research, 16(3), 279-294, 2010. PDF file.*
- Wells, N.M., and Evans, G.W. "Nearby Nature: A Buffer of Life Stress Among Rural Children." *Environment and Behavior. Vol. 35:3, 311-330.*
- Wridt, Pamela J. "An Historical Analysis of Young People's Use of Public Space,

Parks and Playgrounds in New York City.” *Children, Youth and Environments*
14(1), 86-106, 2004. PDF file.

Yarmey, Kristen. "Student Information Literacy in the Mobile Environment."
EDUCAUSE Quarterly 34 (1), 2011. PDF file.