

KIRKSIDE INN

SITE RESOURCES ANALYSIS

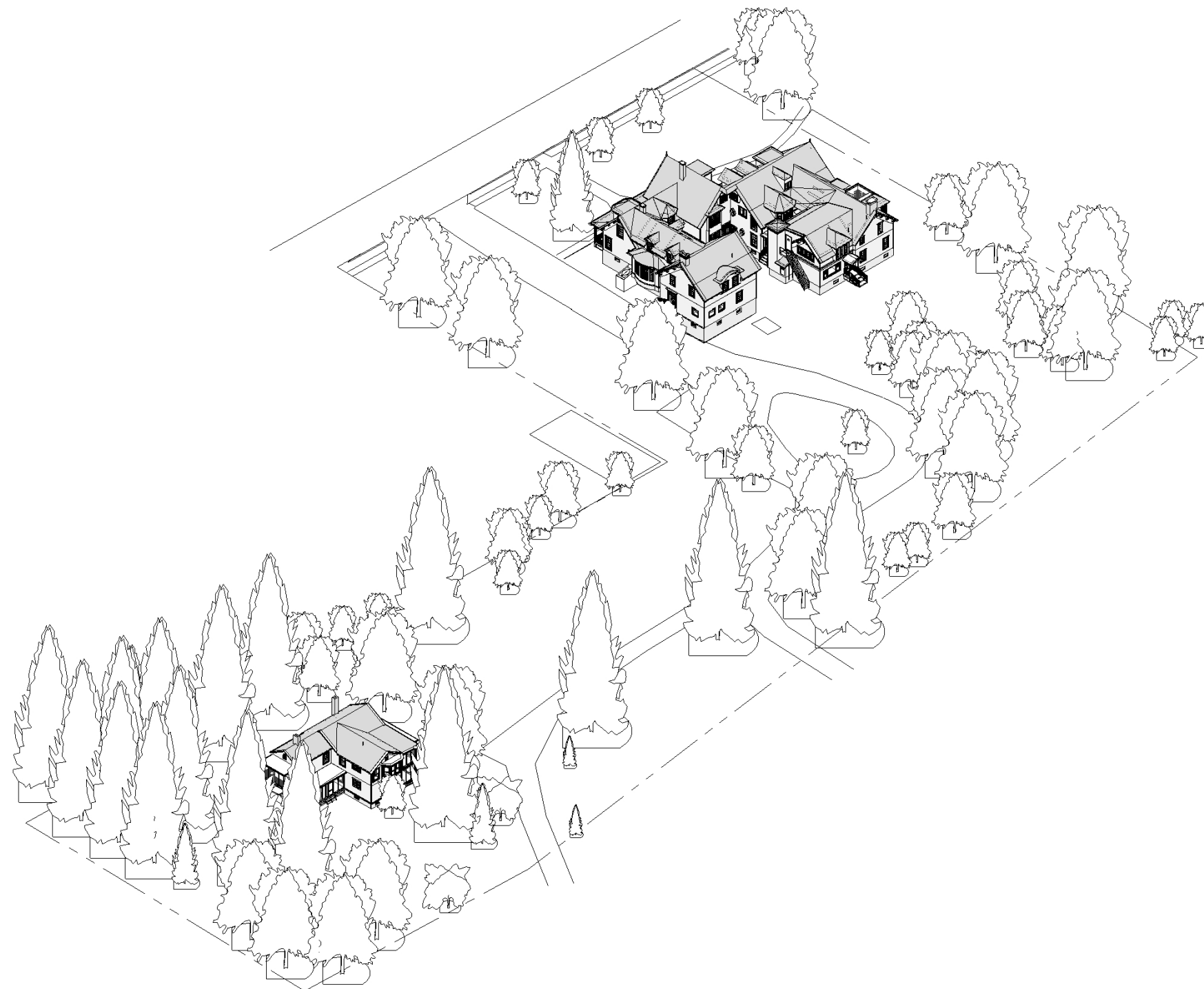


TABLE OF CONTENTS	02
PURPOSE SUMMARY	03
SITE RESOURCES ANALYSIS	
Context	04
Site	05
Community Access	06
Climate	07
Sun & Shade	11
Wind	10
Earth	15
Water	17
Systems	20
Structures	21
Garden	22
Resources Appendix	23



KIRKSIDE INN

SITE RESOURCES ANALYSIS



purpose summary

PROJECT PURPOSE STATEMENT

“To transform Kirkside into a welcoming inn and immersive educating facility that encourages and supports entrepreneurs, incubates hospitality businesses, and cultivates the local food system, in a way that engages the community, with transparency and sharing, in a creative process that builds commitment and inspiration for reviving Roxbury, its historic integrity, and its unique essence, so that this vital property serves to seed regenerative practices in the hospitality industry, transform the regional food system, and continuously grow the quality of life in Roxbury for generations.”

SITE RESOURCES ANALYSIS PURPOSE

The purpose of this Site Resources Analysis is to compile a holistic understanding of existing conditions of the environment encompassing Kirkside Inn to inform the design team’s schematic layout and program. Evaluating the physical environmental conditions before finalizing the site design will enable the most contextually appropriate schemes to present themselves, as well as represent the Earth as a project stakeholder as we become aware of potential short- and long-term implications of new activity on the site.

The design team will learn the following about the site from this Site Resources Analysis:

- What the site will feel like throughout the seasons
- What environmental conditions to expect at certain times of year
- How to orient certain site elements
- Potential issues associated with site conditions
- Opportunities for regenerative site design strategies and systems
- Resources to aid in site planning and management

ADDITIONAL RESEARCH

In order to fully comprehend the site, additional information and research is needed outside of Cycle’s scope of work for this deliverable.

This would include:

- Existing utility data for Kirkside
- Projected occupancy energy usage and systems data
- Soil testing on site to determine nutrient availability and pH
- Site evaluation of potential invasive species
- Conduct a Place Audit to determine how people currently use the site and adjacent grounds, what pathways they take to move across the site, how wildlife moves across the site, etc



KIRKSIDE INN

SITE RESOURCES ANALYSIS

Kirkside is located in the middle of the Catskills, centrally located from many major metropolitan areas.

Kirkside is:

2.5 HOURS FROM NYC

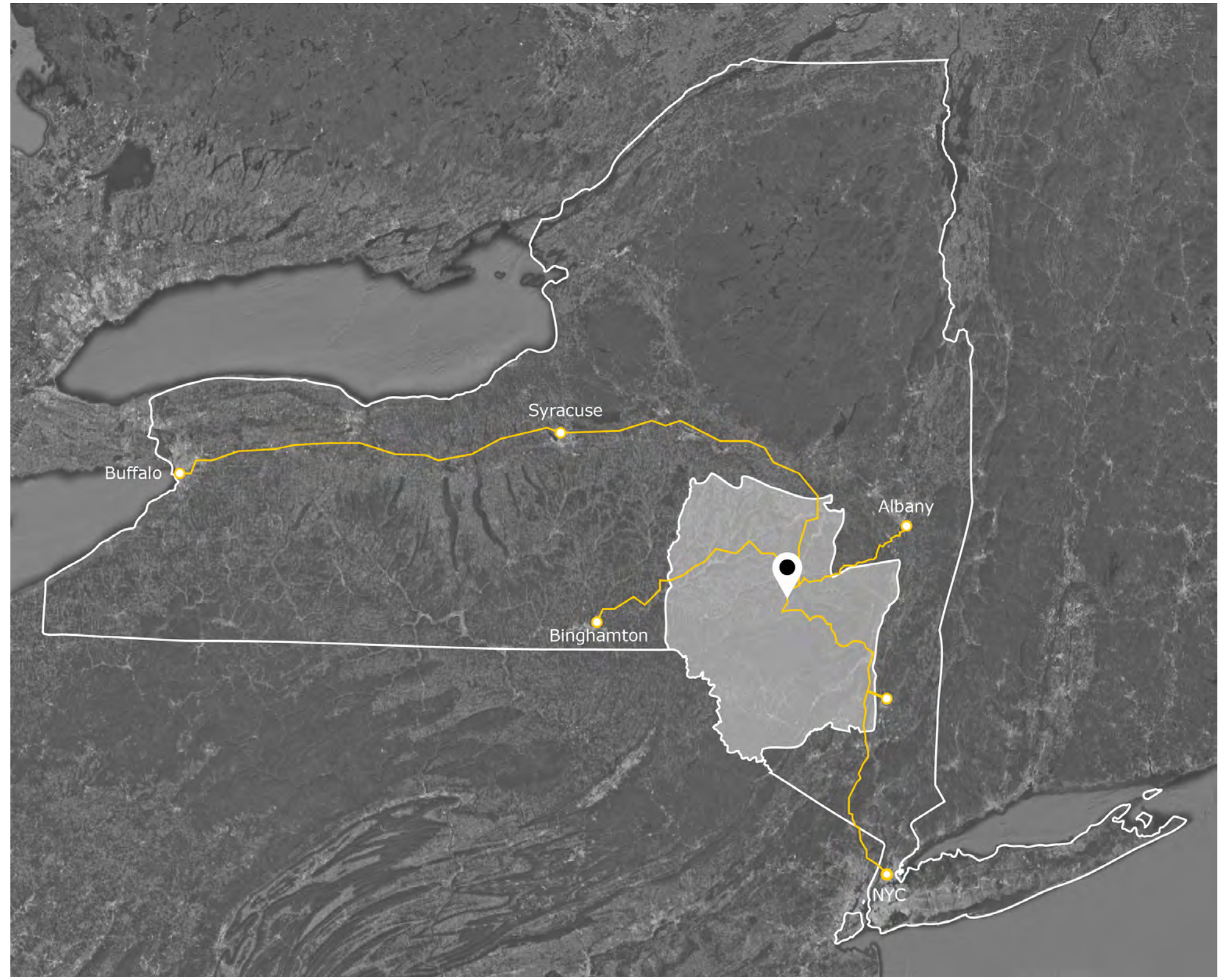
1.5 HOURS FROM ALBANY

1.5 HOURS FROM POUGHKEEPSIE

2 HOURS FROM BINGHAMTON

2.5 HOURS FROM SYRACUSE

5 HOURS FROM BUFFALO



KIRKSIDE INN

SITE RESOURCES ANALYSIS

The grounds of Kirkside occupy approximately 2.65 acres

The grounds of Kirkside Park, including the barns, occupy approximately 12 acres

The East Branch of the Delaware River runs between the barns and the park, and is about 20-35 feet wide in this area

There are two foot bridges crossing the river at the north and south ends of the park

The site is relatively wooded, with a mix of coniferous spruce trees and deciduous maples, with two apple and one cherry tree



KIRKSIDE INN

SITE RESOURCES ANALYSIS

The community currently accesses the public Kirkside Park and event barn grounds by walking or driving up from Main Street, through the existing driveway onto the site.

There may also be some site access from parking in the Jay Gould Memorial Church parking lot and walking over to the grounds.

This public access way must be maintained in the proposed circulation flows for the new site design. Consider how pedestrians may use the driveway/vehicle space to navigate the grounds, and explore options for providing a hybrid people/vehicle right-of-way.



community access



KIRKSIDE INN

SITE RESOURCES ANALYSIS

This climate graph shows average high and low temperatures of each month and average rain and snowfall amounts per month in Roxbury.

The warmest month of the year is July

The coldest month of the year is January

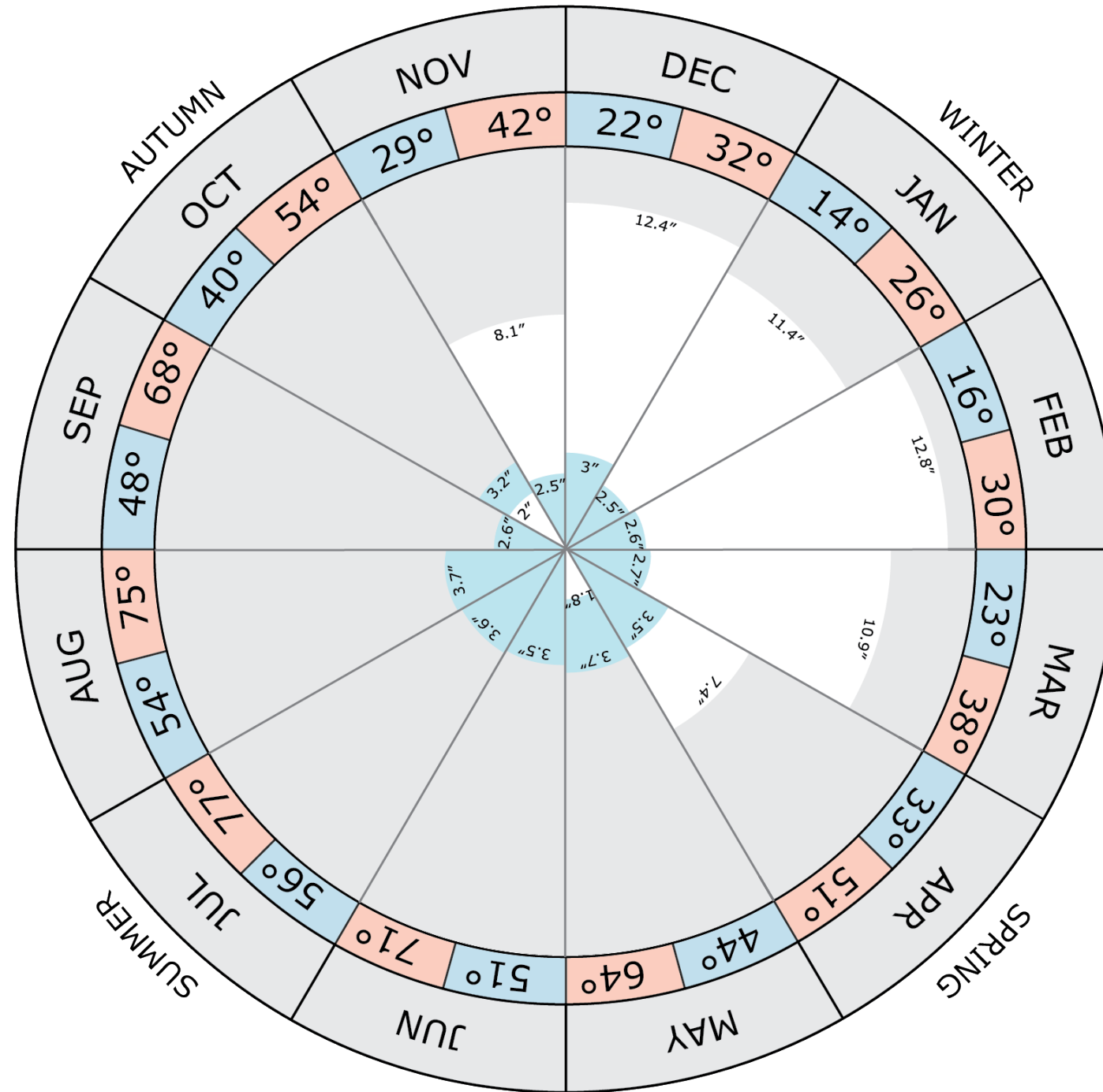
April through August sees slightly more rain on average

December through February sees steady snowfall.

TOTAL ANNUAL RAINFALL:

37.4" OVER 176 DAYS

Jan	7.4 days
Feb	8.3 days
Mar	12.3 days
Apr	16.9 days
May	21.3 days
Jun	19 days
Jul	19.1 days
Aug	19.3 days
Sep	15.5 days
Oct	15.5 days
Nov	11.5 days
Dec	11 days



TOTAL ANNUAL SNOWFALL:

66.9" OVER 109 DAYS

Jan	22.2 days
Feb	20.7 days
Mar	19 days
Apr	9.2 days
May	1.8 days
Jun	0 days
Jul	0 days
Aug	0 days
Sep	0 days
Oct	3.6 days
Nov	12.1 days
Dec	20.4 days



KIRKSIDE INN

SITE RESOURCES ANALYSIS

WINTER SNOW

The shadiest spots on site in the winter are where snow remains on the ground through warmer days, as it takes longer to melt.

Currently, Roxbury provides plowing of snow on Township streets, and requires the clearing and salt or sanding of walkways and sidewalks within 24 hours of snowfall event.

Vehicles must be moved from the roadway for plowing, and snow is deposited in the roadway.

Consider snow removal pathways that prioritize pedestrian access to the site and remove cars from the public roadway when possible.

Road salts (sodium chloride or calcium chloride) are harmful to plants and should be avoided around planting areas. Consider calcium magnesium acetate (CMA) as a less corrosive option or use another abrasive like sand or ash. The soil can also be slowly irrigated with water to lower salt concentrations when temperatures are above freezing.



KIRKSID INN

SITE RESOURCES ANALYSIS

SEASONAL TEMPERATURES

Hot Days 83

Mild Days 91

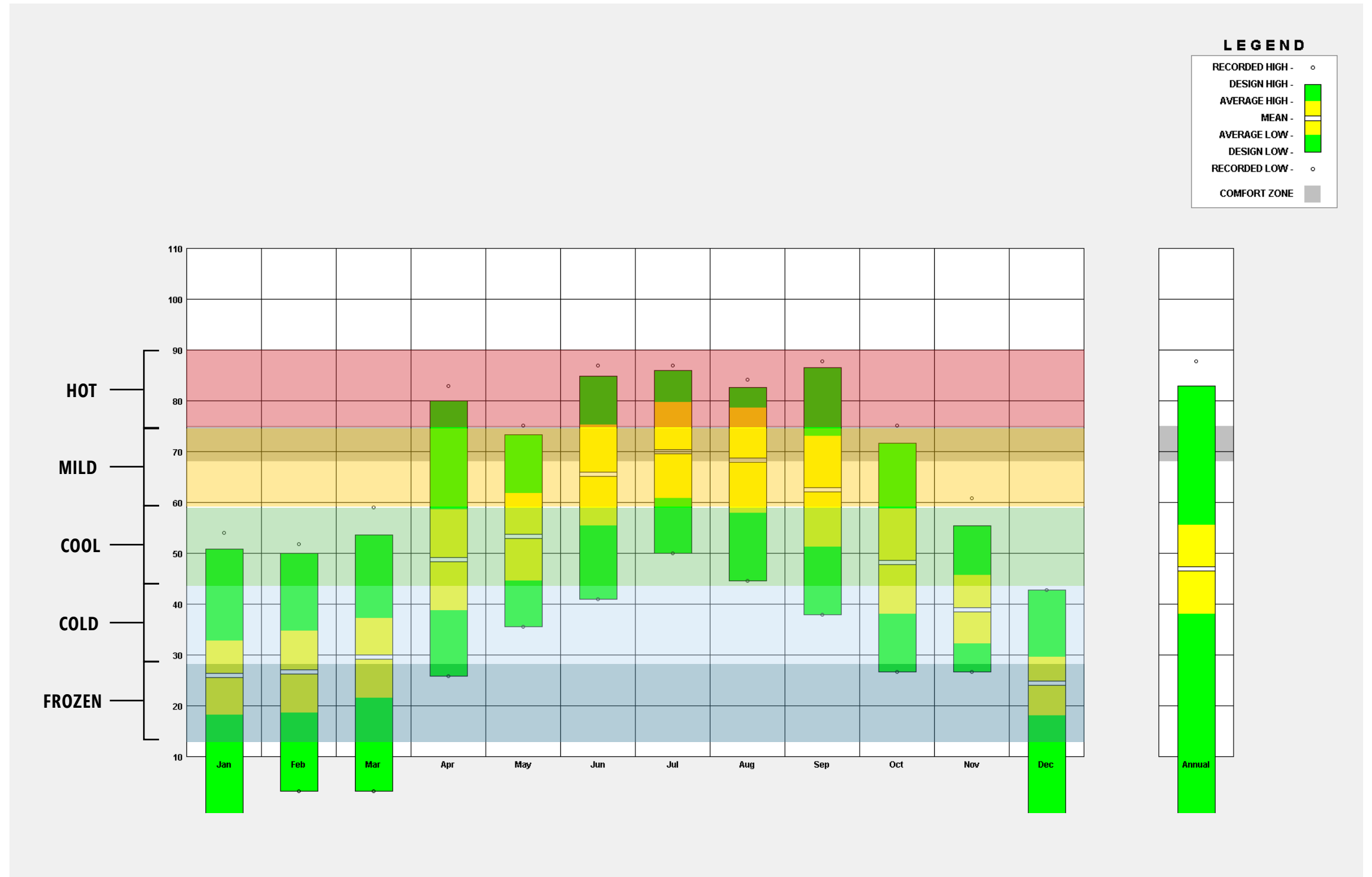
Cool Days 78

Cold Days 96

Frozen Days 17

climate

TEMPERATURE



CLIMATE DATA FROM MONTICELLO STATION



KIRKSIDE INN

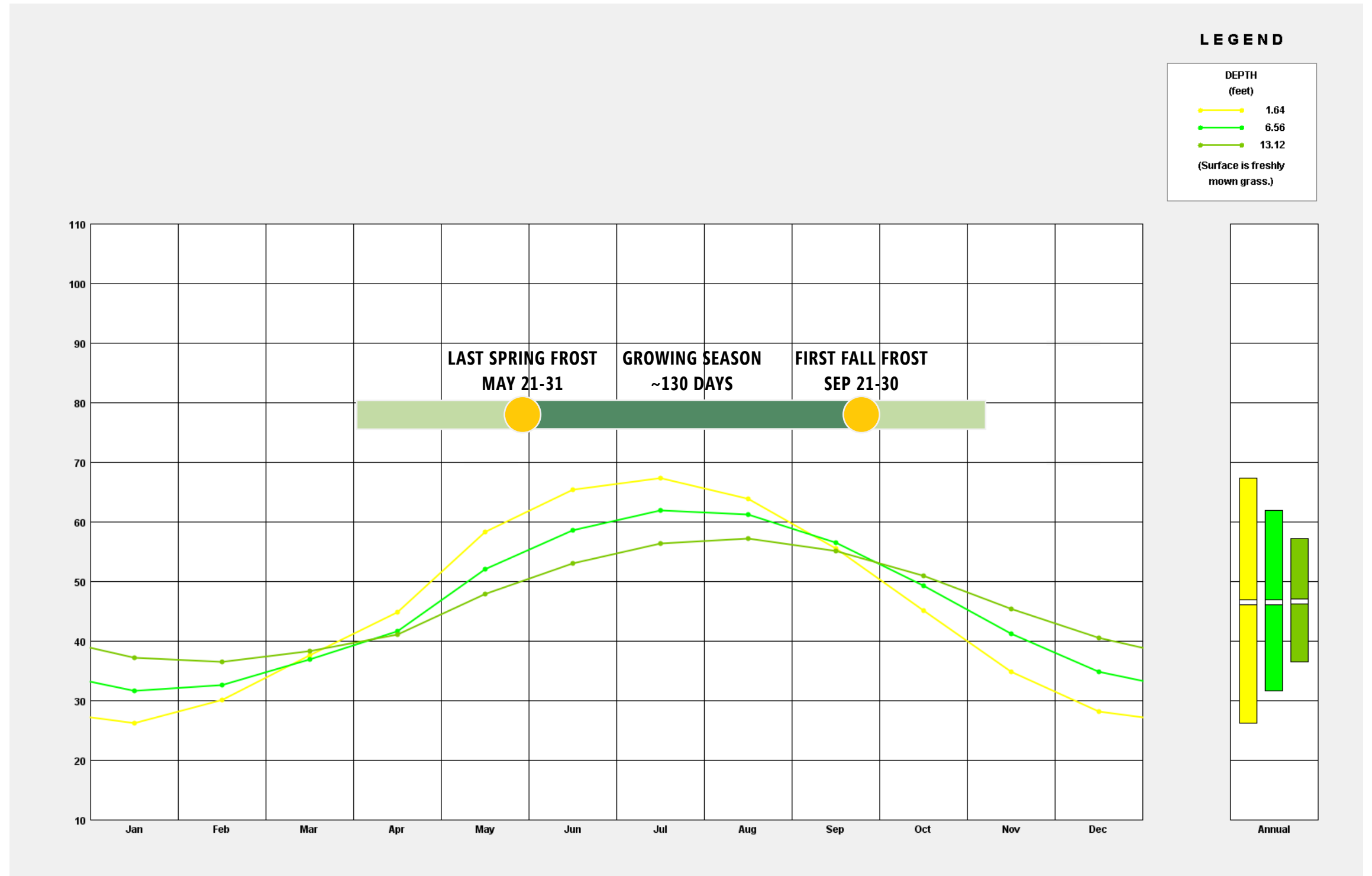
SITE RESOURCES ANALYSIS

GROUND TEMPERATURE

Roxbury is located in a USDA Hardiness Zone 5a, with a few Zone 5b areas on the peaks of surrounding hills.

The average last spring frost falls between May 21st and 31st, and the average first fall frost falls between September 21st and 30th.

Ground can be worked and amended in the spring as soon as the ground temperature is above freezing around late March, and plant into the fall through early November.



CLIMATE DATA FROM MONTICELLO STATION

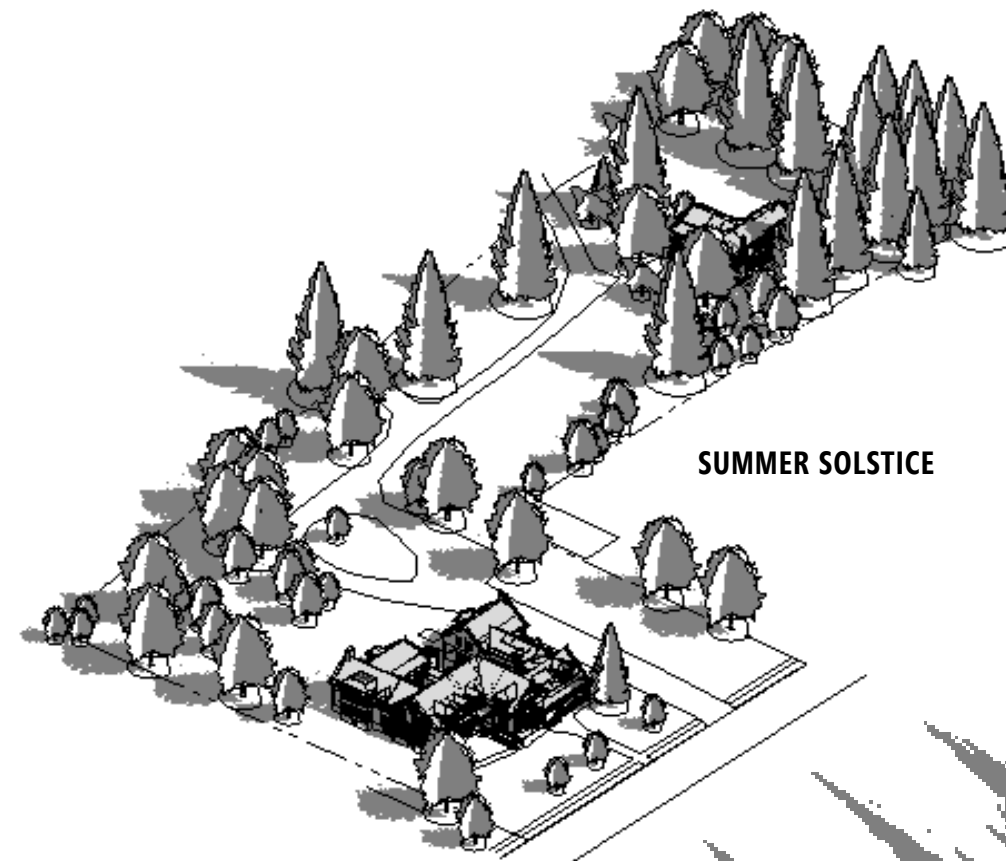
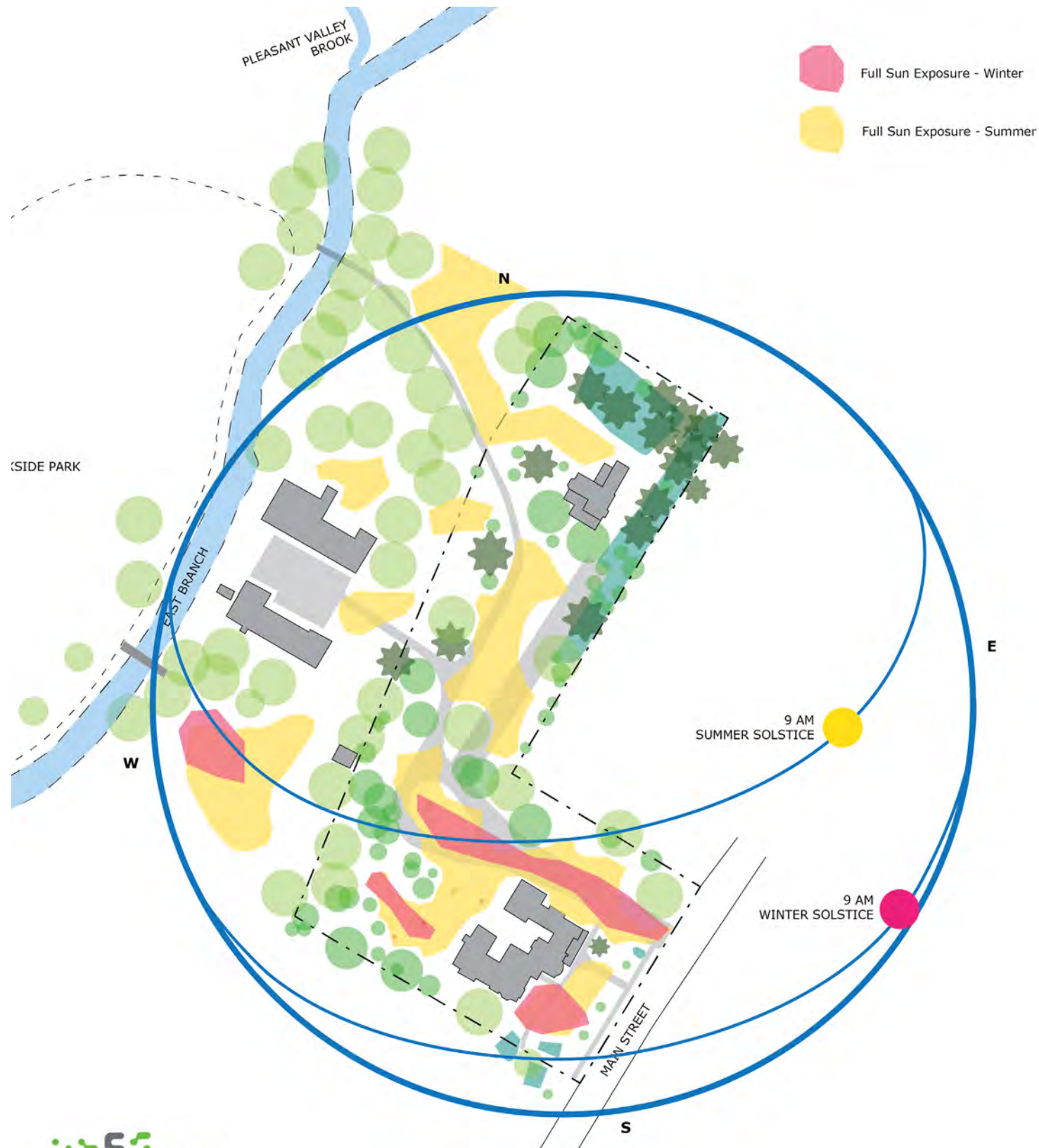


KIRKSIDe INN

SITE RESOURCES ANALYSIS

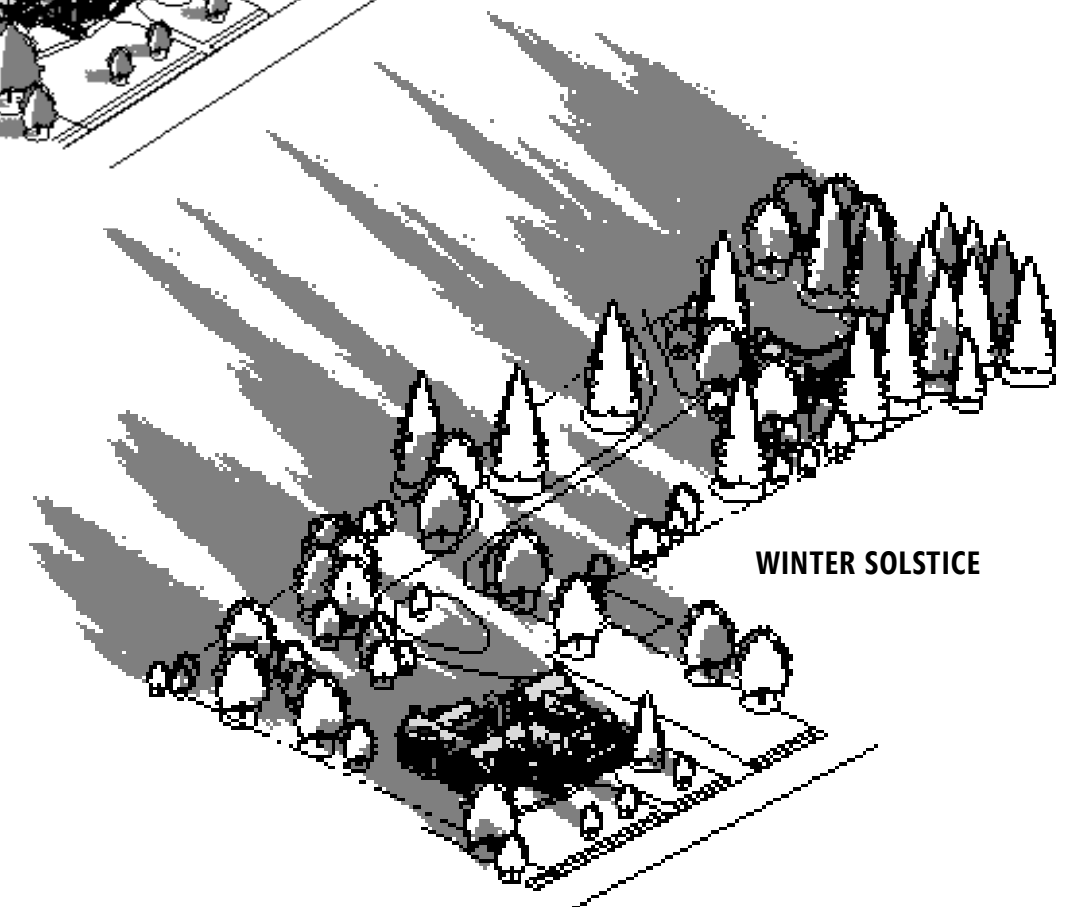
sun & shade

MORNING



Solar Time:	9:00 AM
Day Length:	15:17 Hrs
Sun Azimuth:	102.34
Sun Altitude:	48.37
Hour Angle:	0.01
Declination:	23.43
Sunrise/Sunset:	4:22 am / 7:38 pm
Civil Twilight:	3:47 am / 8:13 pm
Nautical:	3:02 am / 8:58 pm
Astronomical:	2:07 am / 9:53 pm

Solar Time:	9:00 AM
Day Length:	9:05 Hrs
Sun Azimuth:	139.1
Sun Altitude:	12.76
Hour Angle:	-0.96
Declination:	-23.43
Sunrise/Sunset:	7:24 am / 4:28 pm
Civil Twilight:	6:52 am / 5:00 pm
Nautical:	6:16 am / 5:36 pm
Astronomical:	5:42 am / 6:10 pm

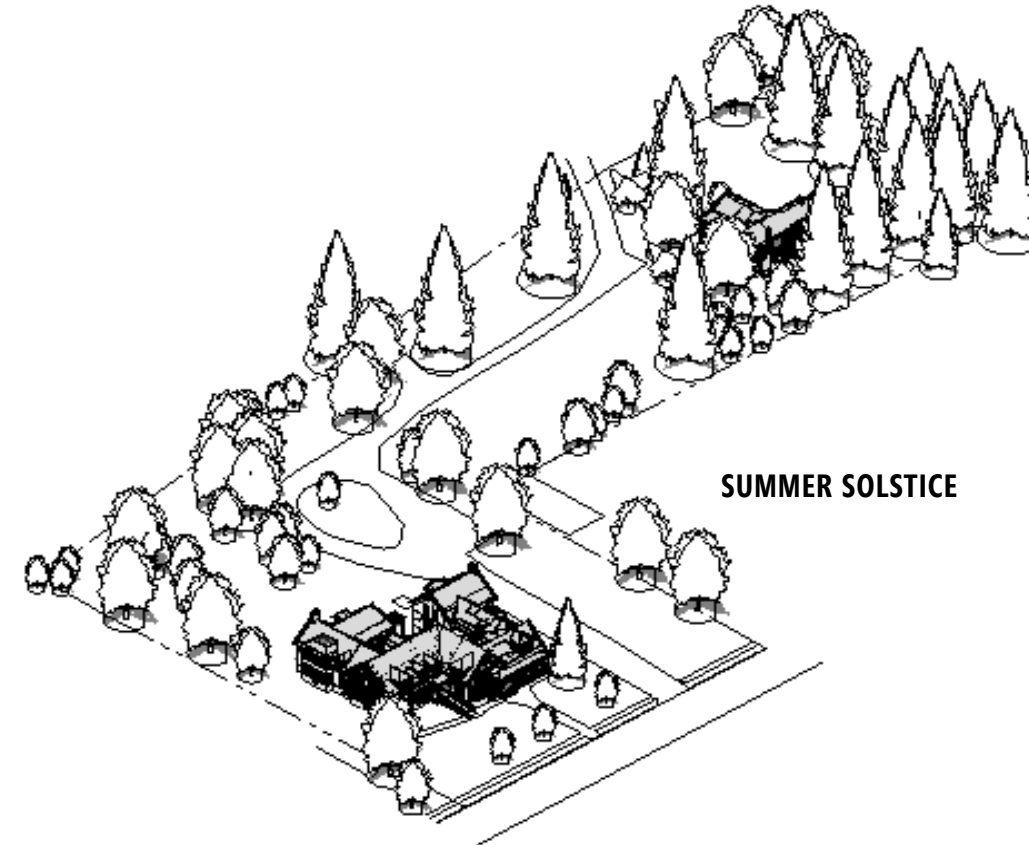
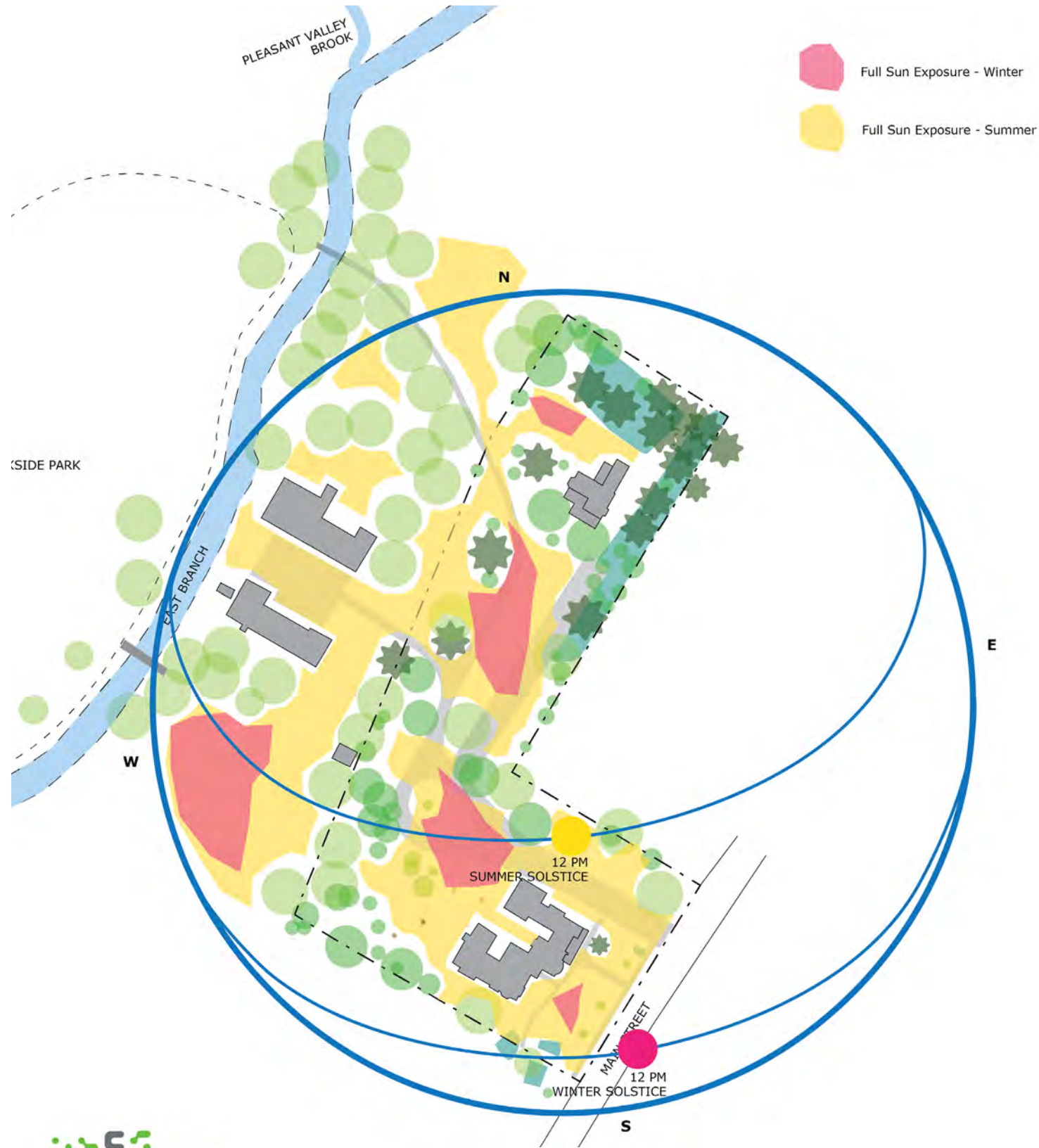


KIRKSID INN

SITE RESOURCES ANALYSIS

sun & shade

MIDDAY



Solar Time:	Noon
Day Length:	15:17 Hrs
Sun Azimuth:	179.96
Sun Altitude:	71.11
Hour Angle:	0.01
Declination:	23.43
Sunrise/Sunset:	4:22 am / 7:38 pm
Civil Twilight:	3:47 am / 8:13 pm
Nautical:	3:02 am / 8:58 pm
Astronomical:	2:07 am / 9:53 pm

Solar Time:	Noon
Day Length:	9:05 Hrs
Sun Azimuth:	-179.03
Sun Altitude:	24.27
Hour Angle:	-0.96
Declination:	-23.43
Sunrise/Sunset:	7:24 am / 16:28 pm
Civil Twilight:	6:52 am / 5:00 pm
Nautical:	6:16 am / 5:36 pm
Astronomical:	5:42 am / 6:10 pm

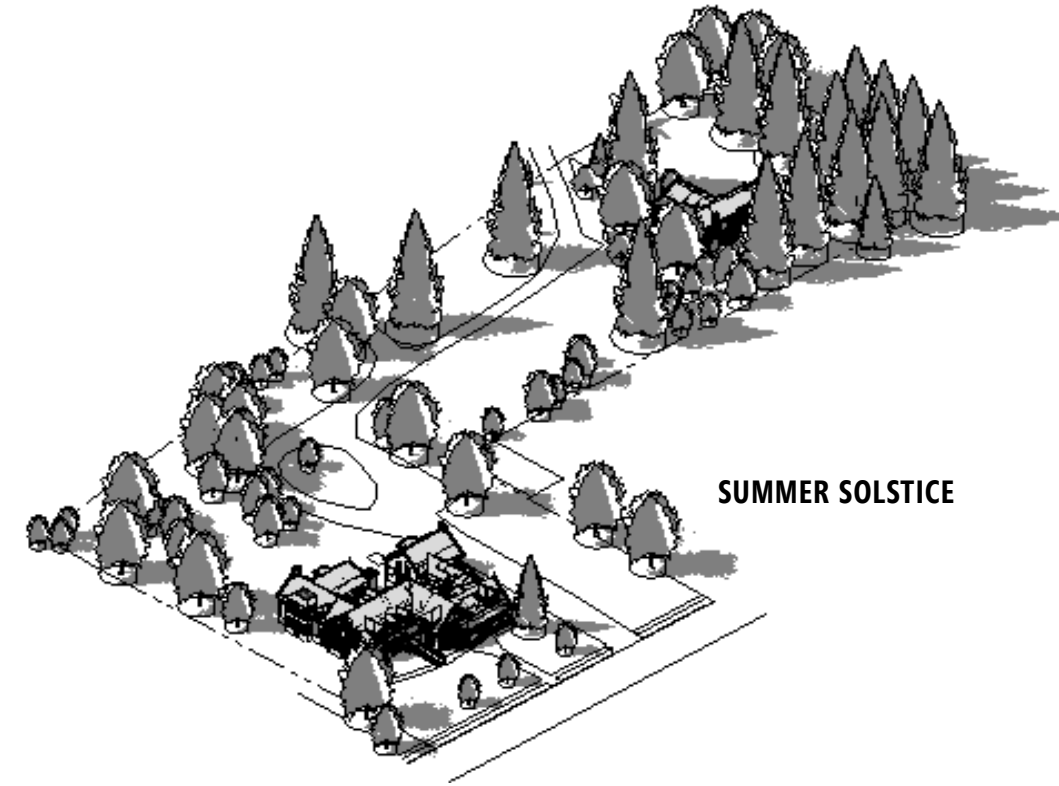


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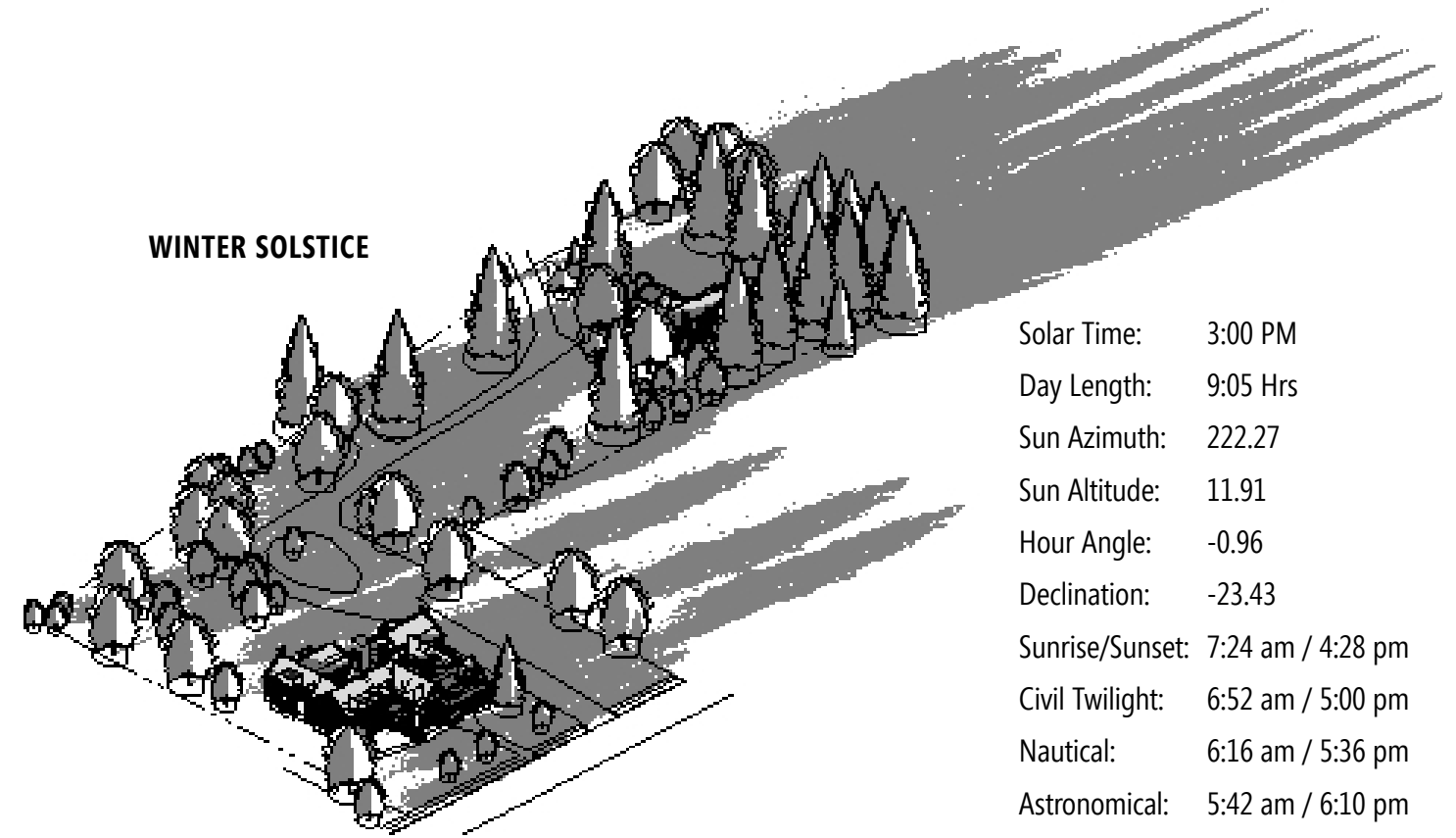
SITE RESOURCES ANALYSIS

sun & shade

AFTERNOON



Solar Time:	3:00 PM
Day Length:	15:17 Hrs
Sun Azimuth:	257.59
Sun Altitude:	48.43
Hour Angle:	0.01
Declination:	23.43
Sunrise/Sunset:	4:22 am / 7:38 pm
Civil Twilight:	3:47 am / 8:13 pm
Nautical:	3:02 am / 8:58 pm
Astronomical:	2:07 am / 9:53 pm



Solar Time:	3:00 PM
Day Length:	9:05 Hrs
Sun Azimuth:	222.27
Sun Altitude:	11.91
Hour Angle:	-0.96
Declination:	-23.43
Sunrise/Sunset:	7:24 am / 4:28 pm
Civil Twilight:	6:52 am / 5:00 pm
Nautical:	6:16 am / 5:36 pm
Astronomical:	5:42 am / 6:10 pm



KIRKSIDE INN

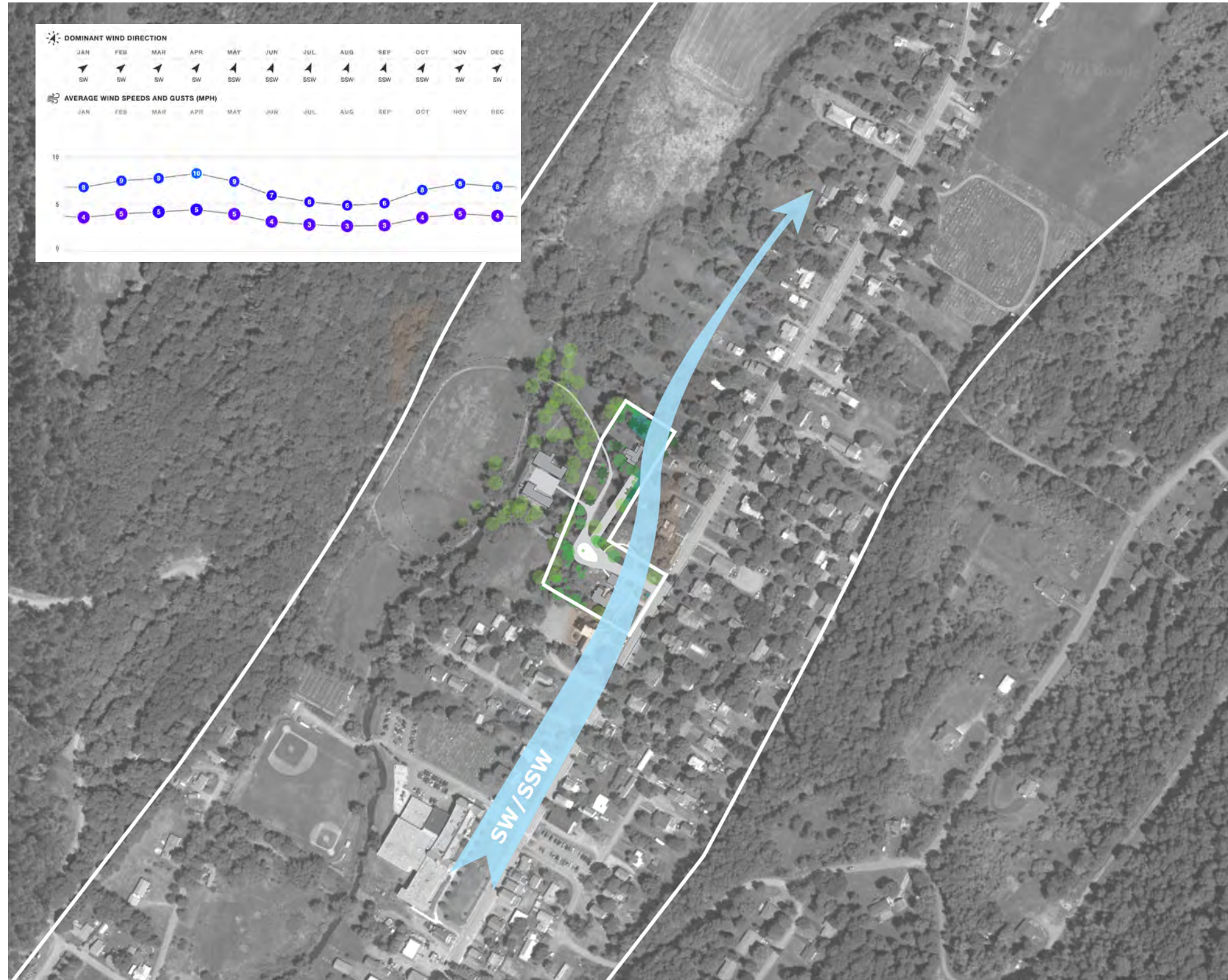
SITE RESOURCES ANALYSIS

PREVAILING WINDS

Prevailing winds predominately come from SW and SSW, moving north through the valley.

Wind speed averages from 4-8 mph.

Wind gusts tend to be stronger from February to May and milder from June to September.



wind



KIRKSIDE INN

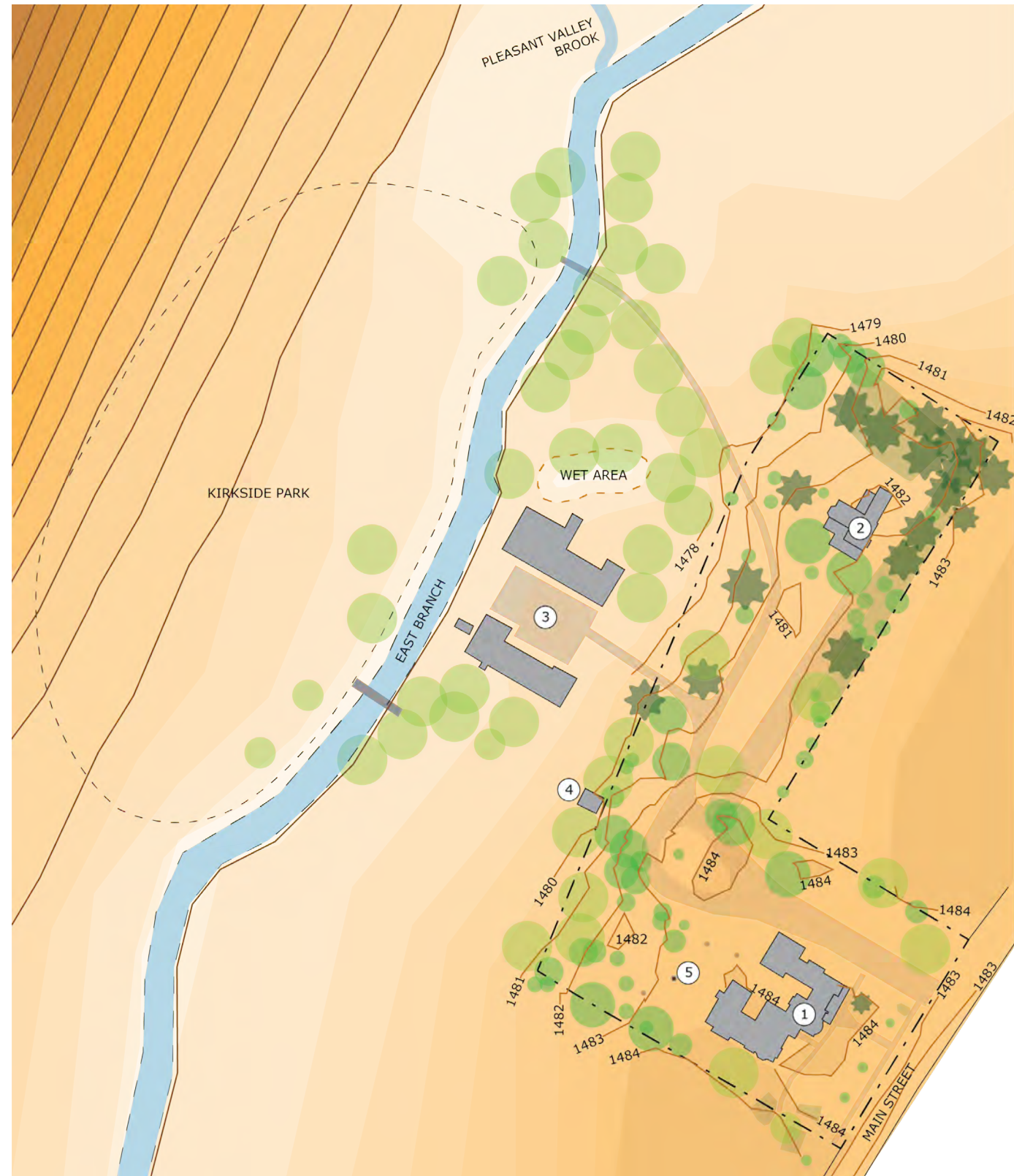
SITE RESOURCES ANALYSIS

The topography of the site is relatively flat, gently sloping downward from the east towards the East Branch to the west.

Kirkside Park is at the foothill, and is mostly flat with a more pronounced change in elevation as the hill rises up to Sheppard Hill golf course. The low-lying areas of the park are prone to flooding.

There are some areas of high elevation on the Kirkside grounds: in the front yard of Kirkside Mansion and by the existing driveway.

There are also some areas of low elevation on the grounds: southwest of the Summer Cottage and north of the barns. This was marked as a "wet area" in the first survey of the grounds.



- Deciduous Trees from Site Survey
- Coniferous Trees from Site Survey
- Trees from Schematic Layout
- Bushes/Wooded Areas
- Tree Stumps
- 1 Kirkside Mansion
- 2 Summer Cottage
- 3 Kirkside Barns
- 4 Children's Playhouse
- 5 Firepit
- 1ft Contours from Survey
- 20ft Contours from USGS Topo Map



KIRKSIDE INN

SITE RESOURCES ANALYSIS

SOIL PROFILES

Tunkhannock series: very deep, well to somewhat excessively drained soils formed in water-sorted glacial material derived from reddish sandstone, siltstone, and shale.

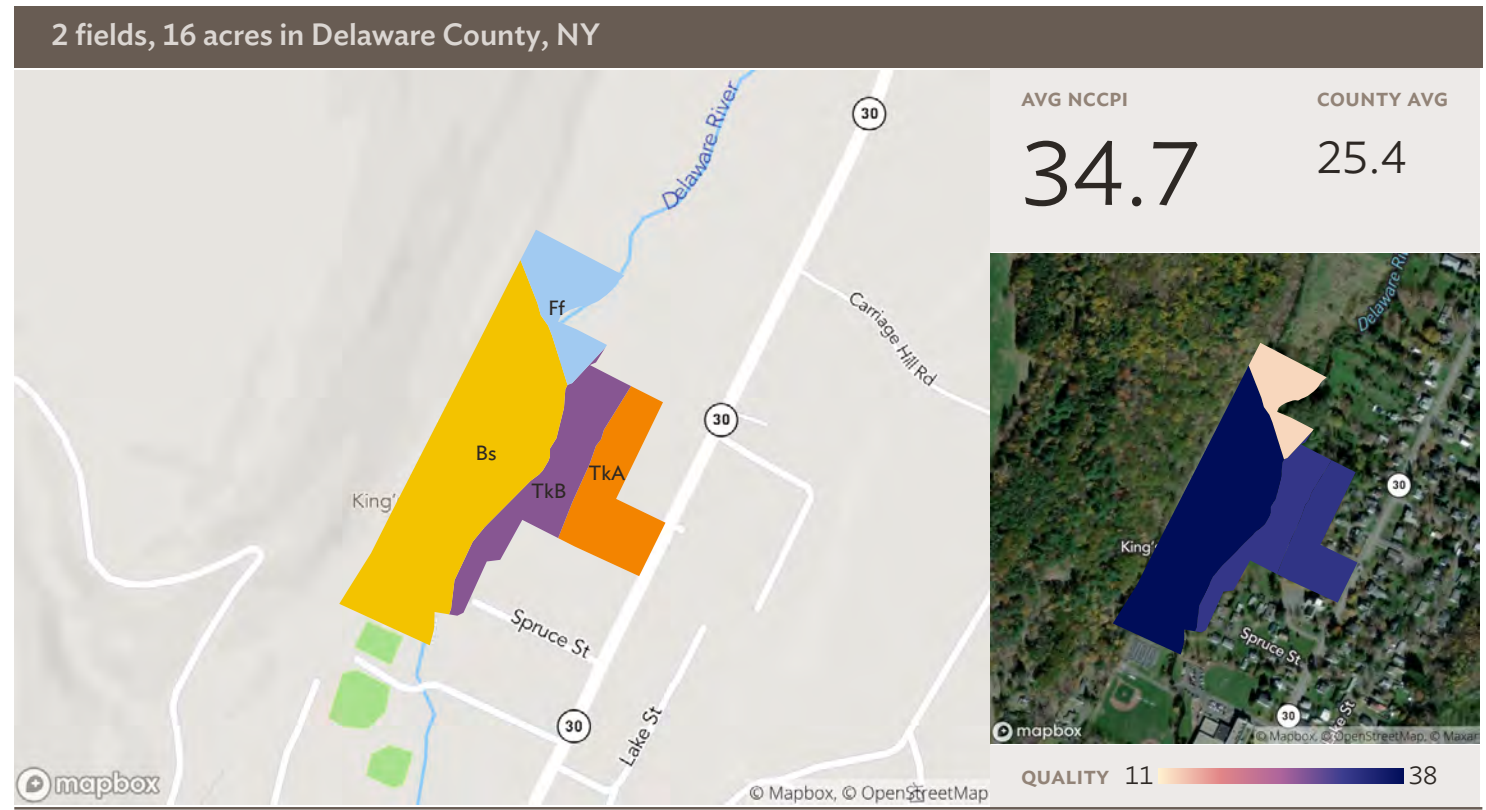
- Gently sloping (0 to 60%)
- Drainage: Moderately rapid in first 20-40" of soil
- Depth to bedrock is 3.5-10'
- High presence of rock fragments in B and C horizons
- Soil pH: extremely to moderately acid throughout
- Use & Vegetation: cleared for agricultural purposes, wooded with maple, black cherry, beech, ash, oak, hemlock, and white pine

Bash series: very deep, somewhat poorly drained soils formed in recent alluvial deposits derived from reddish acidic sandstone, siltstone, and shale.

- Level soils on floodplains (0 to 3% slope), with high ability to transmit water movement through saturated soils
- Drainage: Poorly drained in first 16-40", slow runoff, flooded in spring
- Depth to bedrock is >60"
- Soil pH: extremely to strongly acid
- Use & Vegetation: forested with cover of woody or herbaceous plants, may be cleared and used for hay or pasture, native trees include maple, ash, and hemlock



Fields | Soil Survey March 24, 2021



All fields

16 ac

SOIL CODE	SOIL DESCRIPTION	ACRES	PERCENTAGE OF FIELD	SOIL CLASS	NCCPI
Bs	Basher silt loam	9.06	55.2%	2	40.7
TkB	Tunkhannock gravelly loam, 3 to 8 percent slopes	2.86	17.4%	2	32.1
TkA	Tunkhannock gravelly loam, 0 to 3 percent slopes	2.60	15.9%	2	32.5
Ff	Fluvaquents-Udifluvents complex, frequently flooded	1.88	11.5%	5	12.6
					16.39
					34.7



KIRKSIDE INN

SITE RESOURCES ANALYSIS

HISTORY OF THE EAST BRANCH

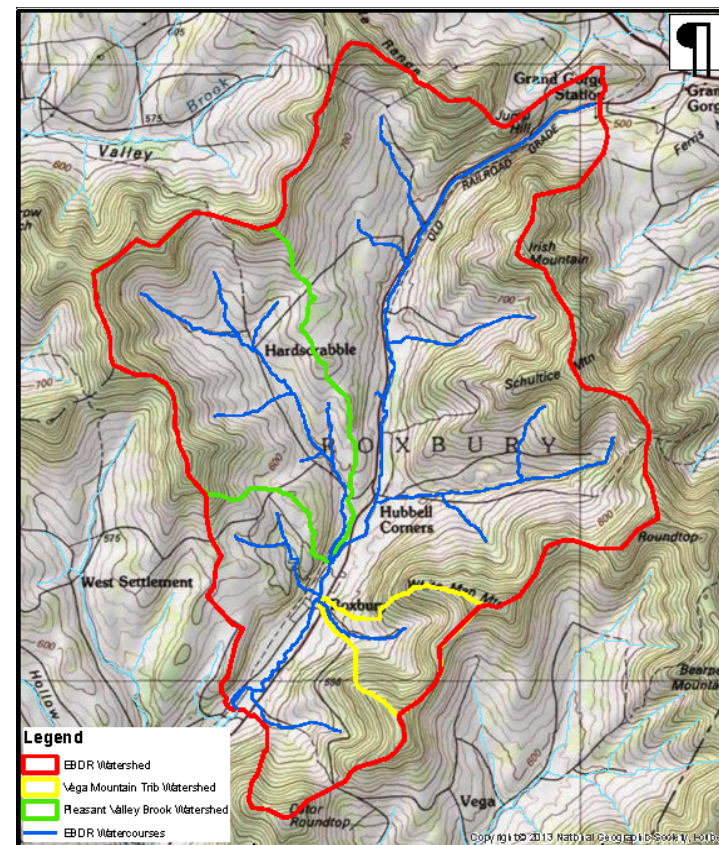
The headwaters of the East Branch begin in a small pond south of Grand Gorge, flowing southwest to create the Pepacton Reservoir, the largest in the NYC drinking water supply, as designated in Figure 1.

The East Branch was called Papakunkill, and the settlement and farms flooded by the creation of the reservoir was called Pawpachton by Native Americans (Bussy, 1996).

East Branch Tributaries are Beaver Kill River and Willowemoc Creek. Contributing mountain-fed streams feed into the East Branch from Vega Mountain, Iris Mountain, Moresville Range, Montgomery Hollow, Pleasant Valley Brook, White Man Mountain, Burroughs Memorial Road, Roxbury Mountain Road, Meeker Hollow, Caroll Hinkley Road, and Cator Roundtop.



FIGURE 1: DELAWARE RIVER TRIBUTARY MAP



WATERSHED

The watershed of the East Branch (EBDR) is 23.8 square miles, composed of 80% forested land, 15% grasslands and agricultural lands, and less than 3% residential.

70% of the soils in the watershed have a low capacity for infiltration and a high tendency for runoff, contributing to flash flooding as rainfall moves quickly into streams rather than absorbing into soils. The forested areas reduce this effect, encouraging filtration and reducing runoff (2020 Local Flood Analysis).

Figure 2 is a topographic map of the current course of the East Branch overlaid on the 1869 Beers map of Roxbury, showing the change in the river's course. This section of the river has been moved to accommodate the placement of the railroad and development in the flood plain (2020 Local Flood Analysis).

The East Branch flows generally southward, carving a 1000-1500' valley through the mountains rising 500 to 600' from the valley floor.

The development of 12-acre Kirkside Park in 1910-1915 formalized the river course with stone retaining walls, an island in the river, rustic bridges, pathways, and landscaped garden beds (Living Places).

water

EAST BRANCH OF THE DELAWARE RIVER

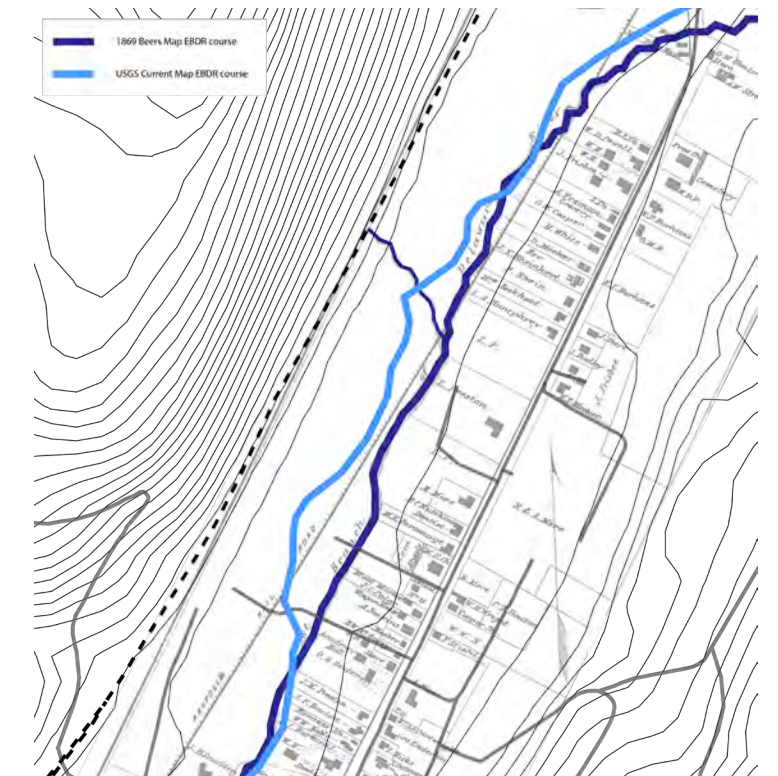


FIGURE 2: MOVEMENT OF THE EAST BRANCH



KIRKSIDE INN

SITE RESOURCES ANALYSIS

FLOOD CONCERNS

The Catskills experience large storm events with uneven distribution throughout the watersheds, often with simultaneous local flash floods in one area with drought in another.

11 major flood events have occurred since 1933, most commonly in summer and fall. Summer floods are caused by extreme weather events, while winter and spring floods are caused by snowfall and snowmelt.

The East Branch is not a major source of flooding in Roxbury, as annual peak flows from 2001-2021 have not exceeded the 10-year peak discharge, as shown in Figure 3. Vega Mountain Stream, however, has been a repeated source of flood damage for Roxbury.

The 2020 Local Flood Analysis by MMI reveals the flooding of Kirkside Park is caused by "substantial sediment aggradation in the area where Pleasant Valley Brook enters the broad valley of the EBDR...where deposits have formed a multichannel alluvial fan that disperses the stream toward either the river or Kirkside Park."

They recommend that the town redirect this flow to reduce the flooding of Kirkside fields, shown in Figure 4 (2020 Local Flood Analysis).

EAST BRANCH WATER FLOW CONDITIONS

- Maximum discharge: 866 ft³/s, Aug. 28, 2011, gage 7.73 ft;
- no flow for part of Sept. 13, 2002, Sept. 29, 2014, and for many days during September and October 2016 (USGS).

National Flood Hazard Layer FIRMeTte

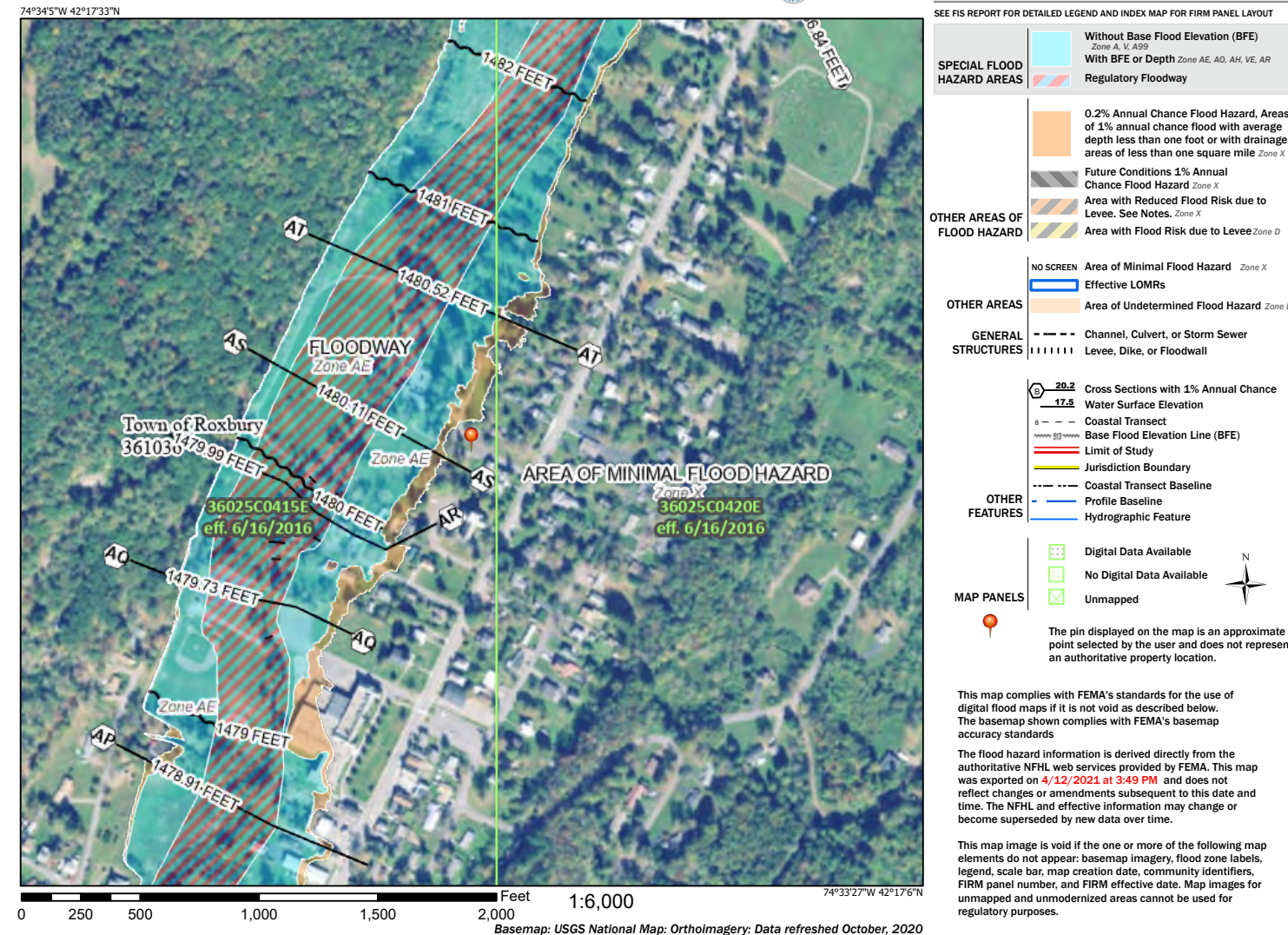
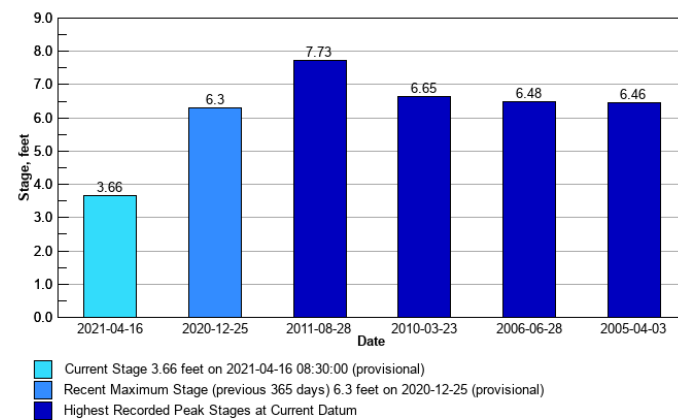


FIGURE 3: FEMA FLOOD HAZARD MAP

USGS 01413088 EAST BRANCH DELAWARE RIVER AT ROXBURY NY



USGS WaterWatch

water

EAST BRANCH OF THE DELAWARE RIVER

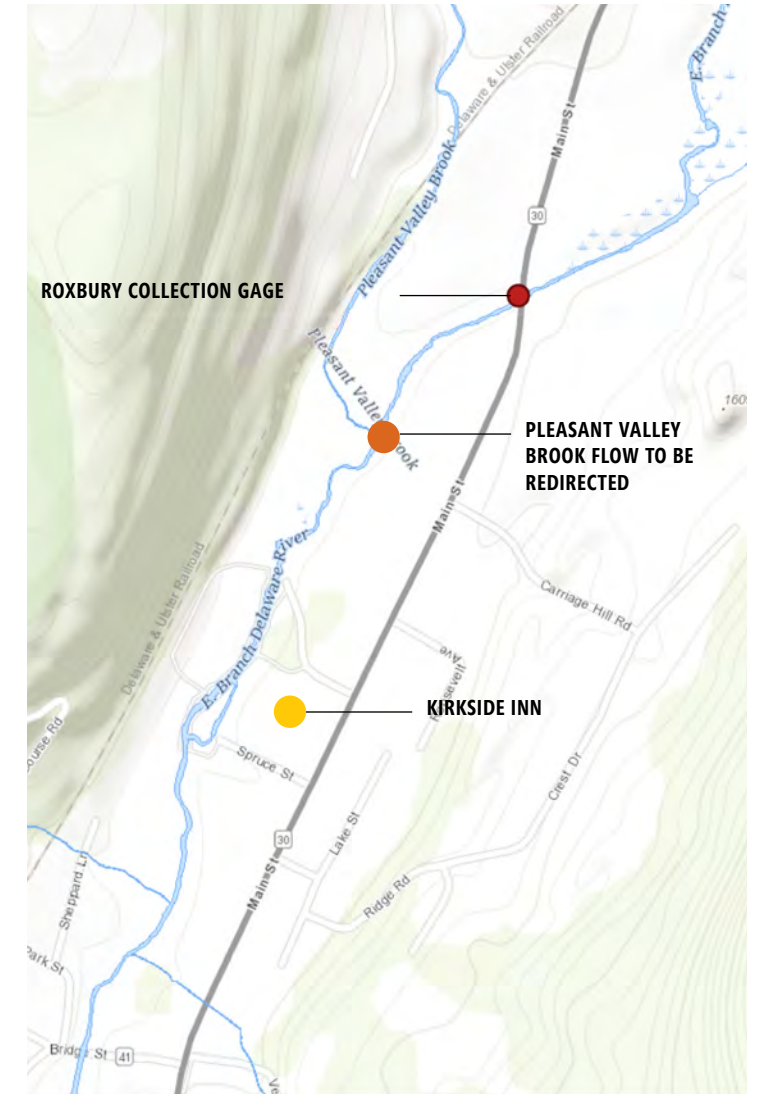
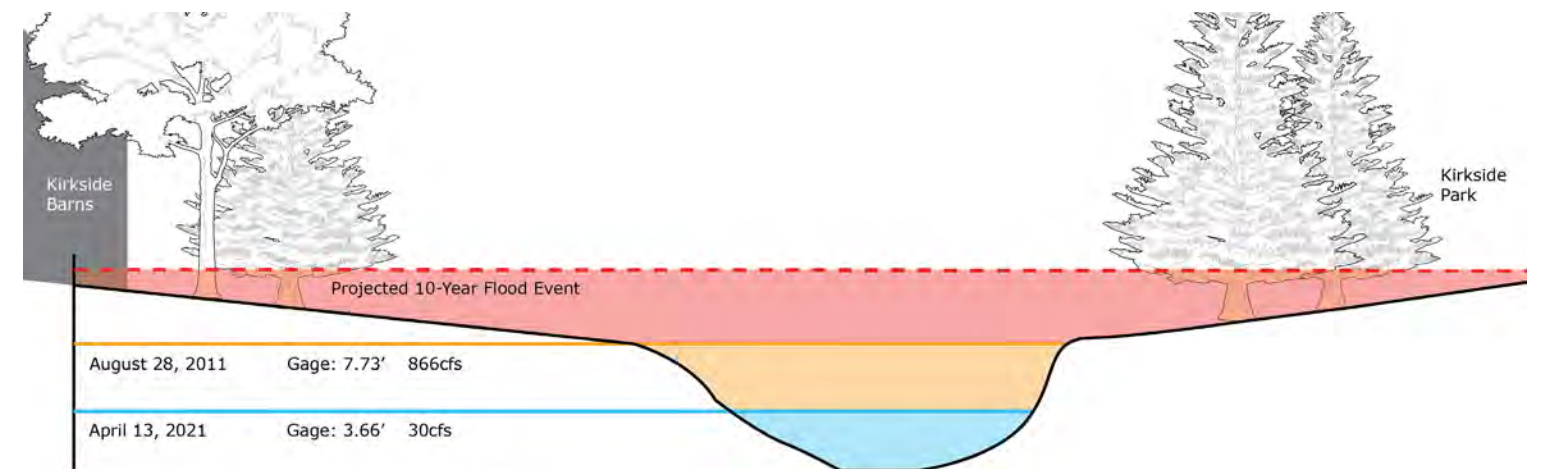


FIGURE 4: USGS NATIONAL WATER DASHBOARD MAP



KIRKSIDE INN

SITE RESOURCES ANALYSIS

WATER MOVEMENT

- The 2020 Local Flood Analysis studied the perennial wet area in Kirkside Park, which is caused by the confluence of Pleasant Valley Brook and the East Branch.
- Water moves across the site from high elevation to low elevation, generally across the contours and west towards the river. The blue arrows in the diagram indicate potential surface water runoff pathways.

PROJECTED SITE WATER USAGE

- Most hotels use between 100 and 200 gallons of fresh water per occupied guestroom per day: 36,500-73,000 gal/room/year
- Kirkside's existing water usage should be measured and evaluated, anticipating demand appropriate for a 10 room hotel and restaurant seating a set number of guests. On-site laundry should prioritize water conservation, or off-site services should be explored.

RAINWATER HARVESTING

- Estimating the roof of Kirkside to be approximately 5790 sqft, and a total annual rainfall of 38", collection could reach **102,113 gallons of water annually** if collected solely from the Kirkside roof. (5970 sf Roof area x 38" annual rainfall x 0.623 conversion factor x 0.85 runoff coefficient x 0.85 safety factor).
- Additional roof areas can be used to collect rainwater on the event barns and summer cottage, as well as setting up rain barrels at various field locations if needed.
 - Barn roofs: 3136sf + 3528sf = **113,984 gal/year**
 - Guest house roof: 1132sf = **19,362 gal/year**



KIRKSID INN

SITE RESOURCES ANALYSIS

EXISTING UTILITIES

- Existing utilities mostly run underground with the exception of some overhead electric lines connecting to Main Street
- Further investigation of the utility connections to the barns is needed
- The survey did not show a sanitation connection to the Summer Cottage
- The quality and capacity of the existing septic tank should be evaluated

EXISTING WASTE STORAGE AND PROCESSING

- Roxbury waste goes to the Delaware County Solid Waste Management Center
- Waste must be sorted before admittance, or will be fined
- Waste is then shipped to Canada for landfill/treatment

CONSTRUCTION WASTE

- Construction waste can't be mixed with household waste
- Received at \$87/ton

EXISTING WATER SOURCE

- Town water is from well source and automatically controlled based on water levels in the storage tank.
- An auxiliary well exists to provide back up as needed.
- The only water treatment at each well source is disinfection with chlorine and corrosion control with zinc orthophosphate.

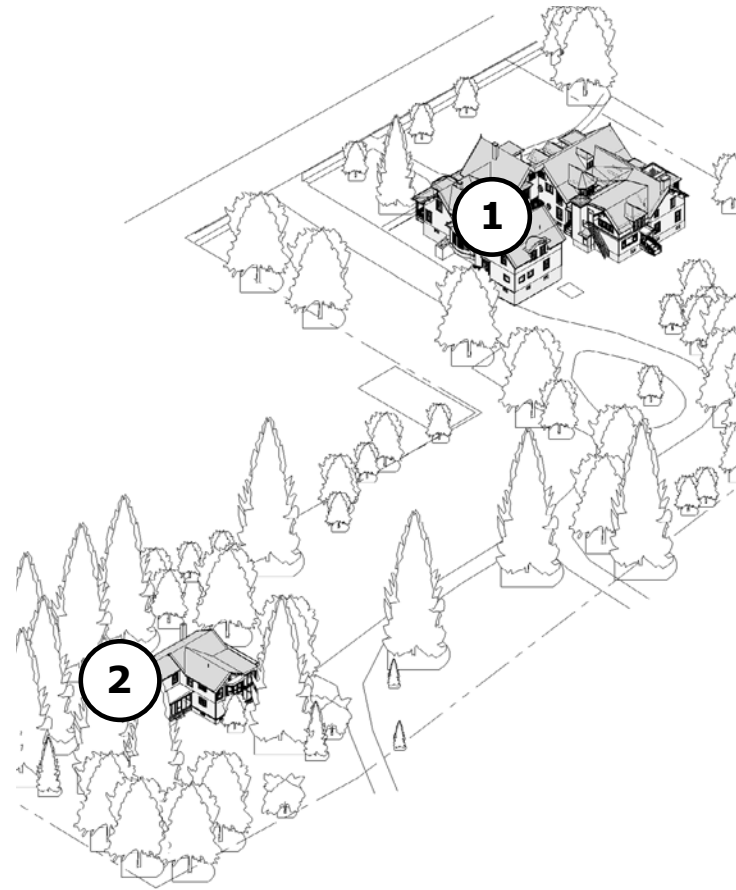
WASTE WATER TREATMENT

- Town waste water treated at Grand Gorge treatment plant, with a capacity of 500,000 gal/day
- The facility's process includes preliminary treatment, primary settling, micro-filtration, UV disinfection, post-aeration, solids handling, odor control, and 5,500 gal/day septic receiving



KIRKSIDE INN

SITE RESOURCES ANALYSIS



1: KIRKSIDE MANSION

Interior conditions are to be renovated, while the exterior architecture is to be maintained with contextual historic preservation efforts.

2: SUMMER COTTAGE

Existing conditions of the summer cottage are not conducive to renovation, based on initial assessments by the architect and surveyor.

Building materials from the summer cottage can be reused and incorporated into the rest of the site as necessary and when desired.



structures

EXISTING CONDITIONS & MATERIALS

1



2



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SITE RESOURCES ANALYSIS

FULL SUN EXPOSURE

The location of sunlight on the site is important for planning site elements such like gardens and planting areas. Agricultural production, such as raised beds or a greenhouse, should be located in an area with full sun exposure year-round to be most productive.

Areas without full sun exposure can still be planted with varieties that tolerate partial or full shade, and can also be used to site contemplative public realm elements, such as hammocks and seating areas.

FOOD FORESTS

Consider the creation of Food Forests in the understory areas of trees with plant communities that synergize with the existing species, such as tree guilds. See resource appendix for Plant Guild examples.

INVASIVE SPECIES

Determine if the existing maples are Norway (yellow in fall) or Sugar maples (red in fall) - Norway maples are invasive and cast excessive shade on early spring understory plants, and have often replaced the native Sugar maple in many landscapes. Work with Cooperative Extension or a local arborist to remove/cut back these trees and replace them with native species.



SUNSHINE HOURS

Jan	3.1 hours
Feb	2.9 hours
Mar	4.6 hours
Apr	6.7 hours
May	7.8 hours
Jun	8.7 hours
Jul	9.8 hours
Aug	9.2 hours
Sep	8 hours
Oct	4.6 hours
Nov	4.3 hours
Dec	3 hours

SOLAR

Site Solar Position Winter & Summer **24**

WATER

2020 Local Flood Analysis **001**
Delaware River Watershed Stream Corridor MGMT Program **107**
Rainwater Harvesting System Practitioners Manual **134**
Woody Shrubs for Stormwater MGMT **334**

WASTE

Composting to Reduce the Waste Stream **394**

GARDEN

Gardening Guide Northern NY **444**
NY Native Plants **477**
Companion Planting Guide **487**
Tree Guild Guide **492**
Norway Maple Invasive Species **528**



