CARPENTER STREET FIELD LANDSCAPE MASTER PLAN

City of Keene, Department of Park & Rec
Keene, New Hampshire

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The Conway School
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INTRODUCTION, GOALS, AND COMMUNITY PROCESS

CAN CARPENTER STREET FIELD BECOME A DESTINATION?

The City of Keene envisions Carpenter Street Field (CSF) as an open space and recreational centerpiece for the redevelopment of the East Side Neighborhood. While there are many parks and open spaces on the west side of Keene, City officials and residents have expressed a desire for such public spaces on the east side. CSF is in a prime location, a quarter-mile from downtown, to help achieve the City’s goals. City officials believe that adding more features to the field will help to increase the variety of uses and users.

Currently CSF is heavily used for active recreation (sports that require a large field such as rugby, lacrosse, flag football, and ultimate frisbee). The field is also used for dog walking, sunbathing, practicing baseball, meetings, and playing on the swings and natural playground. There are some uses, mainly isolated to the northwest corner, deemed unsafe and unwanted by community members.

In addition to attracting and supporting a broad range of users, the City would like to see the field drain quicker in order to support regular use and reduce the degradation of the field. The City would also like to explore the potential for storing flood water at CSF.

On May 6, 2015, the first of two public forums were held to gather public input on the design direction for the landscape master plan for Carpenter Street Field. Twenty-five citizens, users of the field, and city officials met at Bentley Commons. Students from the Conway School facilitated an hour-long workshop where participants were asked to identify their favorite features at Carpenter Street Field and what features they’d like to see incorporated into the design. The data collected helped inform the goals for the design.

On June 6, 2015, students from the Conway School returned to show design alternatives and receive feedback on them. Twenty-two attendees, half of whom participated in the first forum, shared with the students what they would like to see in the final design.

In addition to the two public forums, there were over thirty responses to an on-line bulletin board that was open for over one month.

FIELD USERS, CONCERNED CITIZENS, AND CITY OFFICIALS ENGAGED IN DESIGN CHARRETTES TO HELP UNLOCK THE POTENTIAL OF CARPENTER STREET FIELD.
EXISTING CONDITIONS

ACTIVELY USED SPORTS FIELD WITHIN DOWNTOWN KEENE

Carpenter Street Field is a heavily used active recreational property in downtown Keene, NH. The City of Keene acquired the five-acre Carpenter Street Field in 2012 from the school district. The field is maintained and programmed by the Department of Parks and Recreation (DPR).

Along the northern edge, a dense wall of vegetation separates the residential backyards to the north from the top of the field. Along the eastern edge, a row of evenly spaced lindens provide shade for the off-street parking. A mix of businesses and residences line the eastern side of Carpenter Street. In the southeastern corner abutting the property line is a nondescript one-story cinder block storage garage. Also just beyond the southern property line is the former jewelry factory Findings. Findings owns the rectangular ~6-acre lawn that abuts the City’s property. Occasionally practice takes place across the property line on this open lawn. The western edge of Carpenter Street Field drops steeply approximately 5’-8’ to Beaver Brook. Most of the brook is lined with Japanese knotweed and other invasive plant species.

A handful of mature trees dot the western edge of the field, providing shade for park users. In the northeast corner a large (30’x10’) metal swing set sits against the dense vegetation. A small (~1200 square feet) fenced-in natural playground is along the eastern fence line. The 4’ chain-link fence runs the entirety of the eastern edge, separating the parking from the field.

Benches and bleachers are in poor condition and placed far from each other. One portable toilet is located just south of the natural playground along the fence. Next to the portable toilet is one of two open-topped garbage cans. The garbage can is moved to various locations around the field based on need.

The northwest corner, possibly due to the vegetative barrier and having the one bench under shade, is the primary location for activities such as littering, smoking, fighting, and drug use. DPR mows down this vegetative barrier every summer to increase visibility for patrolling officers.

DPR maintenance crews pick up trash twice a week and mow, aerate, and seed the lawn. The bank (covered in Japanese knotweed) is occasionally mowed too.

Beaver Brook is a heavily channelized waterway that bounds the western edge of Carpenter Street Field. Although trash has been known to accumulate within the brook, multiple species of wildlife have been observed in and near the brook.

View of actively used field from across Beaver Brook. Sport activity occasionally spills over the southern property line onto the strip of grass belonging to Findings.

Athletes throw balls against the neighboring private storage facility for practice.

Unsanctioned parking along Carpenter Street compacts tree roots and causes depressions that end up holding water after a rain.

Fenced-in natural playground in the northeast corner is small and has few play elements.

The backstop and adjoining diamond are available for practice but are not formalized for any sanctioned games.
Carpenter Street Field is located within a dense and diverse neighborhood. The City is focused on redeveloping the east side of Keene. One aim of this redevelopment is to create more accessible open spaces for citizens of all ages and abilities to gather, play, and enjoy nature. Carpenter Street Field located at the intersection of more dense multi-use areas and residential neighborhoods can play an important role in achieving this aim.

Currently all formal access by street and sidewalk into CSF is from the residential areas in the east. The only access from the more dense and developed areas to the west is via an informal dirt path (~500') from Harrison Street. The long dirt path connects to the northwest corner of the field and is neither universally accessible nor maintained.

The Railroad Land development, an area of high-density mixed use, began undergoing redevelopment in 2006 and is continuing to add new housing and businesses to this area which already includes many businesses (grocery store, restaurant, hotel, offices) and residences for a variety of income levels. Railroad Land extends east from Main Street to Beaver Brook. Carpenter Street Field is the closest open space for residents and workers in this area and downtown.

Many of the residents living downtown and in the adjacent Railroad Land appreciate the walkability of the dense development here. Many housing units do not have private yards, and residents appreciate access to public green space.

Senior citizens make up a high percentage of the population within a quarter mile from the CSF. Elderly may require flatter paths, additional lighting, and more frequent places to sit.

Four schools, including one public school, are within a 15-minute walk to CSF. The Waldorf School currently uses the field for their athletic programs. CSF is a valuable athletic and educational resource for schools within walking distance.

The City Express Bus #5 stops in front of the former Mill Building on Railroad Street, a six-minute walk from CSF. The former mill building is home to market-rate senior housing, a Montessori school, and numerous health care businesses. Adding signs at the bus stop to guide visitors to the field and formalizing a path to the field may increase the number of users arriving by public transportation.

The city-wide Cheshire Rail Trail comes within 500' of CSF. The trail is used by bicyclists, skateboarders, roller skaters, walkers, and dog walkers. During the public forums citizens have identified creating signs along the rail trail to guide visitors to the field and formalizing a path to the field may increase the number of users arriving by alternative transportation.

Dense urban development creates a more community-oriented and pedestrian-friendly atmosphere. Reducing reliance on vehicles and emissions they produce helps to mitigate for climate change. A key element of dense mixed-use urban areas is the inclusion of open space for individuals to gather and recreate. Having open space within walking distance of work and home has been shown to help increase one's health, happiness, and civic pride.
WATERSHED ANALYSIS

WHAT HAPPENS WHEN CITIES ARE BUILT AT THE CONFLUENCE OF RIVERS?

Managing stormwater throughout the city is a high priority for the City of Keene. Keene sits in a basin formed by glacial Lake Ashuelot. Sediments left behind as the glacial lake retreated are fine and therefore not very permeable. Given the topography, soil characteristics, the amount of impervious surface, and the number of rivers flowing through the city, flooding is a potential threat to the built environment.

Carpenter Street Field is within the lower end of the Beaver Brook watershed. The watershed covers approximately 10.4 square miles. The upper portion of the watershed is forested. Natural floodplains (vegetated and pervious) along the banks of waterways (rivers, brooks, and streams) help accommodate overflow during heavy rains.

The Beaver Brook Watershed becomes constricted by the built environment beginning at Concord Road (2.5 miles north of CSF). An increase in the amount of impervious surfaces reduce the areas alongside waterways to accommodate flood waters. Instead of being infiltrated into the ground close to the source, flood waters are forced to spread further out to storm drains and porous undeveloped land.

Any work done at CSF to help ameliorate property damage due to flooding would be “a drop in the bucket” given its small size. A city-wide approach will be most effective in helping reduce the negative impacts of flooding on the built environment.

The City of Keene is in a basin formed after the last ice age. The large basin receives water runoff from the hills to the west and east (maps.google). There is evidence that channelizing Beaver Brook began as far back as 1877. Altering waterways was common occurrence in the development of new settlements. Channelizing a brook could provide for multiple functions such as speeding up the waters to increase the potential of harnessing hydro power, draining low-lying areas to be used for industry or agriculture, and moving water downstream quicker.

The altering of the brook seemed beneficial at the time but it has had long term negative consequences. Removing the natural meandering pattern of a lowland brook reduces the amount of bank side flood water storage. A straighter channel also provides fewer sites for wildlife to find shelter and food. A meandering brook slows the speed of water therefore reducing the potential erosion caused by flood waters flowing downstream during a storm.

Downtown Keene: 1853

Maps show the growth of the built environment of Keene and the consequential realignment of Beaver Brook.

Downtown Keene: 1877

A section of Beaver Brook, 3/4 of a mile north of Carpenter Street Field, shows the realignment of a sinuous stream into a straight channel. The red line designates the unaltered path Beaver Brook took within a less built environment. The permeable land adjacent to the brook provides flood water storage and water filtration. A meandering brook slows the speed of water therefore reducing the potential erosion caused by flood waters flowing downstream during a storm (maps.google).

The Beaver Brook watershed is outlined in black. The landscape north of Concord Road can more easily accommodate stormwater at the source due to the permeability, rather than increasing the amount of water downstream. The landscape south of Concord Road is more built, therefore less permeable causing a wider extent of flood waters during heavy storms. (Map from Beaver Brook Restoration Plan, Moosewood Ecological LLC, 2009).

Watersheds

The water collected in the Beaver Brook Watershed drains primarily into Beaver Brook and then on to the Otter Brook before joining the Upper Ashuelot River.

Data Source for GIS Map: GRANIT: DATA SEARCH, CITY OF KEENE
NEIGHBORHOOD ANALYSIS: HYDROLOGY

IMPERVIOUS SURFACES CONTRIBUTE TO FLOODING

Within a half-mile of Carpenter Street, especially westward towards downtown, a high proportion of the ground is covered by impervious surfaces (concrete, asphalt, and buildings). Rainwater falling on these surfaces flows into storm drains and is carried in pipes underground. Many of these storm drains lead to Beaver Brook. The force of the water leaving the pipes may cause erosion along its banks.

Because of these multiple factors, the amount of water that spills over the banks of Beaver Brook during a storm far exceeds the amount CSF could store even though it is an open field. Any work done to alter the shape and width of the brook and the adjacent bank could help to store stormwater, provide other ecological services such as creating a diversity of habitat, and slow the water down. The negative impacts of flooding needs to be addressed city-wide, particularly upstream.

Beaver Brook runs along the western edge of CSF and is heavily channelized. The brook is dredged following heavy flooding. During heavy storms, flood waters spill over the bank and extend beyond the property line of CSF, damaging buildings in all directions.

Rainwater that flows along impervious surfaces can become contaminated with pollutants such as oils, and fertilizer. Pollution can have significant negative effects on ecosystem functions and biotic interactions. In addition, warmed by the impervious surfaces, runoff may alter the ecosystem of the brook by potentially decreasing the available oxygen and altering habitat for native species.
SITE ANALYSIS: SOILS, SLOPES, AND DRAINAGE

SHALLOW DEPTH TO GROUNDWATER LIMITS INFILTRATION

Soils at Carpenter Street Field are fine sandy loams. Sandy loams typically drain moderately well; however, the Rippowam soil on the western half of the field is a floodplain soil with a high water table. According to the USDA, the depth to water table in Rippowam soils are anywhere from 0 to 18 inches. A high water table may limit water infiltration and therefore may lead to surface pooling. Any grading along the western edge of the field would require more in-depth analysis of the exact height of the water table.

GENTLY SLOPED FIELD IS WET ALONG SOUTHERN EDGE

Most of the field is less than 2% slope, and drains to the southwest corner. A 1% or less slope is recommended for most large athletic fields. The western bank edge has slopes of 5% to 25% down to the brook. A berm between the gentle slope of the field and the steep slope to the brook apparently blocks stormwater from draining into the brook, causing pooling and a wet playing surface in the southern end of the field. There is one storm drain in the parking area along the street, which outfalls to the brook. Water also pools in the depressions left from cars parking along Carpenter Street.

Wet field conditions can present dangerous situations for athletes. A wet field is more prone to getting chewed up and compacted by athletic uses. Compaction hinders infiltration and makes it harder for grass to grow.

A 30” drainpipe below ground was installed in 1931. According to one public works official it could benefit from being replaced. The drainpipe empties into Beaver Brook and carries stormwater from storm drains to the east.

In spring 2015, during a dry month, surface soil samples dug by students from the Conway School appeared to show no evidence of ground water. Additional exploration is advised to determine the depth to water table. A total of six composite soil samples of the field were taken to determine the levels of heavy metals. According to UMASS Soil and Plant Tissue Testing Lab, none of the samples are above the US Environmental Protection Agency’s threshold standards. The low level of heavy metals in the soils indicates the field is likely safe for children, who are more susceptible to the ill affects of heavy metals.

Soil samples were taken to test for heavy metals

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Soil samples were taken to test for heavy metals
SITE ANALYSIS: VEGETATION

LAWN FOR SPORTS, INVASIVE BANK, AND LITTLE AROUND THE EDGES

NORTHERN EDGE
A thick vegetative barrier of various heights separates the field from the houses beyond. Some of the trees include American elm, silver maple, Norway maple, walnut, and black cherry. The majority of the shrubs are non-native and considered invasive including Japanese honeysuckle, multiflora rose, Japanese knotweed, and burning bush. Invasive species can out-compete native plants which have co-evolved with the local wildlife.

The thick wall of vegetation (native and exotic trees and invasive shrubs) provides a visual barrier of the neighboring residential backyards to the north.

WESTERN EDGE
Native red maples and box elders dot the bank helping to stabilize the soil and sequester water. However the steep edge down to the brook is mostly covered with Japanese knotweed and multiflora rose.

A stretch of bank free of Japanese knotweed beneath the box elders may be more easily remediated.

Red maples provide shade, water sequestration, and habitat. Japanese knotweed spreads aggressively along bank reducing the diversity of flora at CSF.

EASTERN EDGE
Just beyond the chain link fence an evenly spaced row of Linden trees mark the property boundary with their stately presence.

Large mature lindens provide shade for cars parking along the street, but care should be taken to protect their root systems from compaction.

SOUTHERN EDGE
The field extends past the southern property line with no demarcation of the boundary.

Practicing teams often use the extra space by the private lawn to the south.

The entire field is a mix of grasses, clover, dandelions and other weeds. This is not a recommended mix for athletic fields according to experts. Typical athletic turfs in cold zones such as Keene include Kentucky bluegrass and perennial ryegrass.
SITE ANALYSIS: SUN AND SHADE

A SUNNY AFTERNOON FIELD DURING PRIME ATHLETIC SEASONS

Spectators are forced to look into the sun to watch afternoon games while sitting on the bleachers along the eastern edge. The playground, swings, and the benches along the western edge receive no shade during the afternoon hours from mid-spring to mid-fall. The lack of shade may reduce the use of the field or at least the number of spectators.

The parking lot receives full shade in the afternoon hours.

The brook receives full sun most of the way along the field. Full sun increases water temperatures. Urban streams tend to run warmer than forested streams due to the lack of shade and the addition of warmed stormwater from impervious surfaces. Some aquatic species are well suited for warmer water temperatures while others are not. Providing more shade and a diversity of thermal pockets will help increase the diversity of biotic life within the brook.

The images to the right show the shade provided by trees at three times of day (10am, 12pm, and 6pm). These times represent when the field would most likely be heavily used. The equinoxes bracket the primary season for field-based recreation, with peak sun at summer solstice.

In the middle of the summer there are very few spots on the field to find refuge from the sun after noon.
PRIMARY ENTRANCE FROM THE EAST

ACCESS
The officially designated entrance to Carpenter Street Field is from Carpenter Street along the east. Unofficial off-street parking is available on this side of the field. A 42' high chain-linked fence separates the field from the parking area. Along the fence, five openings accommodate pedestrian access. Two are 20' wide, one is 40' wide, another is 54' wide and the fifth opening is a missing stretch of fence 10' wide at the southeastern corner. A 10' wide locked gate provides access for maintenance vehicles. Rugby players have expressed frustration with the lack of emergency vehicular access.

An informal and unofficial dirt path connects the northwest corner with Harrison Street and downtown. The dirt path runs parallel to Beaver Brook and residential back yards. The path is not universally accessible and is not maintained by the City.

Forum attendees said that they arrived at CSF by foot, bicycle, and/or vehicle. Currently there is no bicycle rack.

CIRCULATION
Users of the field come from all over Keene and surrounding towns. The primary activity, organized team sports, occur in the center of the field.

The bleachers are heavily used during games and practice. Bleachers along the eastern edge are in full afternoon sun. The sunlight can interfere with views of the action on the field.

Three permanent benches are set along the western edge. The benches are in poor condition with one heavily used bench missing slats. The other two benches receive full sun in the afternoon hours possibly reducing the use.

The playspaces in the northeastern corner consist of a stand-alone large swing set and an enclosed natural playscape. The natural playscape is located along the perimeter fence and is surrounded by a chain-link fence. It features a buried pipe large enough for children to climb through, a wooden bench, and a mound to run over.

Those coming to Carpenter Street Field for uses other than organized sports tend to meander through the field; there is no centralized gathering place. Some may find respite on the lawn beneath a tree while others take advantage of the full sun on the bleachers.

Some visitors allow their dogs to run free off-leash. Although this activity is not sanctioned it seems to be a popular site within walking distance of citizens without yards to provide exercise for their dogs. In multiple visits to the site we saw no evidence of feces left behind. Providing litter bags is a way the City can support the cleanliness and hygiene on the field.

The broken bench in the northwest corner, where activities such as smoking, drinking, littering, and fighting occur, is of concern to neighborhood residents and users of the field, especially parents. This area is provided some seclusion by the hedge of vegetation beneath and around the trees. Some users have placed grocery bags on tree limbs as trash receptacles to curb the amount of trash on the field. A garbage can in this area could potentially reduce the amount of littering.

A father and children practice baseball in early spring.

A lonely bench is exposed to full sun.

Off-street parking along Carpenter Street is unsanctioned. The parking is used by visitors and nearby residences. The uneven compaction of the parking area leads to pooling and potential stress to tree roots.

Weathered bleacher provides seating for sports viewing.

An informal, unmaintained, non-universally accessible foot path along Beaver Brook and a chain-link fence leads to Harrison Street and downtown.
SUMMARY ANALYSIS

AN OPEN SPACE GEM IN THE ROUGH

Carpenter Street Field is a 5-acre open space owned and maintained by Keene’s Department of Parks, Recreation, and Cemeteries. Its primary use is for large field sports. The proximity of CSF to downtown, residential neighborhoods, basketball courts, and the Cheshire Rail Trail is one of its greatest assets. The diversity of neighborhood types and public spaces provides opportunities for a large variety of users to experience open space within the densely developed edge of downtown. Connecting CSF to the Cheshire Rail Trail that bisects Keene east-west and just over the brook from CSF was the most common request on the on-line bulletin board.

A sunny and flat field is conducive to large team sports yet the lack of shade is problematic for spectators. Members of the team sports have shared their appreciation of having a sports field so close to downtown and on the east side of Keene. They support the improvement of the field and share their willingness to be stewards of CSF.

Though well used by sports teams, there is little else for a wide range of users. Minimal and uncomfortable seating, no paths within the field, and a lack of amenities for seniors makes CSF less accessible.

Beaver Brook is channelized and in full sun for most of the year. The banks are steep and covered mainly in invasive vegetation. These factors reduce habitat and increase the intensity of flooding. The field is in a floodplain. A flat field with compacted soils and a potentially high-water table increases the amount of time the field is submerged. The brook is not easily accessible yet an asset to local schools as an outdoor classroom.

Some residents are discouraged by occasional littering, loitering, vandalism, fighting, and drug use at the park, which city police monitor. The high brush and trees in the northwest corner provides shade and a visual barrier. These activities are city-wide issues and have been mentioned to be concentrated within a close proximity to the north and east of CSF.

Parking is unsanctioned along Carpenter Street and causes compaction to the soils. Compacted soils have negative effects on tree roots. Openings in the fence are small and athletes have expressed concern at the lack of access for emergency vehicles. The only other entrance to CSF is from an informal dirt path in the northwest corner.

Implications:
- Given the high number of seniors living within a quarter-mile of CSF adding features may increase visits from this demographic.
- Addressing the demand on the field for active recreation, the drainage and quality of grass is a priority. Adding shade will improve the spectator experience.
- More active and passive recreation uses and increased public stewardship may decrease the amount of illicit behavior.
- Protect trees from car parking. Provide access for emergency vehicles.
- Explore safe and accessible connections to downtown, surrounding neighborhoods, and the Cheshire Rail Trail.
- Brook and bank remediation can improve habitat, provide floodwater storage, and allow for greater public access.
**DESIGN ALTERNATIVES**

These three designs accommodate a multitude of client and public goals. Each one has unique elements that explore specific design directives.

These designs have in common:
- A universally accessible walking circuit
- Formalized access to downtown
- Covered gathering space
- Bathrooms
- Athletic field
- Playground
- Floodwater storage
- Riparian buffer (a vegetated edge alongside a brook, stream, and/or river to stabilize the bank, reduce erosion, and provide habitat for wildlife)
- Lower impact parking along Carpenter Street
- Daylighting underground drainage pipe into a vegetated basin (a catchment filled with plants and stones at the end of a drainage pipe that filters sediments and pollutants)

**Alternative #1  GO WITH THE FLOW**
The largest field of the alternatives (224'x430') accommodates the greatest playing and sideline needs of all the athletic uses. A swale along the southern edge helps drain water off the field and into the brook. The bank of the brook is minimally cut back to provide floodwater storage while protecting the trees. Gatherings, picnics, and play occur along the northern edge.

**BENCHED CUT**

A slight bench cut will provide minimal stormwater storage while keeping the trees. A large field accommodates the fullest capacity needs of all sports.

**Alternative #2  ALL THE WAY**
Most of the field is lowered, providing a large amount of stormwater storage across the entire field. Spectators sit along the terraced bank to enjoy the action on the field and views of the riparian buffer.

**BENCHED CUT**

The entire field is lowered 18” to accommodate the most stormwater storage. Along the eastern edge, terraced seating is available to view the action on the field. The field would be prone to more frequent flooding in smaller storms due to the lowered level.

**Alternative #3  ROUND THE BEND**
A deep bank cut including on adjacent property creates a wide vegetated riparian buffer with shallow slopes down to the brook, providing access for education and play. If the property to the south can be acquired by the City, a wetland to filter stormwater and a backstop for informal ballgames could be added. Additional facilities at the north end reduce the size of the athletic field.

**BENCHED CUT**

A gradual slope to the brook edge provides both stormwater storage at the source and access to the brook for recreation and education.

**NOT FOR CONSTRUCTION. PART OF A STUDENT PROJECT AND NOT BASED ON A LEGAL SURVEY.**
Carpenter Street Field is a valuable asset for the East Side Neighborhood, the Downtown Core District, and all of Keene. Active and passive recreational features draw new visitors to the park to engage in a healthy outdoor lifestyle. Seating, lighting, shade, and other amenities create a pleasant atmosphere while parents watch their children climbing up rope structures, hopping from one boulder to another, or watching the salamanders sun bathe. An improved universally-accessible path in the northwest corner passes along the brook connecting the park to Harrison Street and downtown. On the southwestern edge a 10’ wide pedestrian bridge spans the brook welcoming visitors from the Cheshire Rail Trail, basketball courts, and neighborhoods from the south.

**FORMALIZING THE INFORMAL**
A universally-accessible path connects to downtown. (For details see Sheet 16)

**PLAY AND FITNESS FOR ALL**
Play structures, bocce court, workout zone, and pavilion serve a broader range of users. (For details see Sheet 13)

**VEGETATED RIPARIAN BUFFER**
A densely vegetated brook edge provides ecological services and aesthetics. (For details see Sheet 15)

**MEANDERING STREAM**
A new path for Beaver Brook is a place to explore, habitat for wildlife, and floodwater storage. (For details see Sheet 15)

**EXPANDING CONNECTIONS**
A pedestrian bridge crosses Beaver Brook adding a new and exciting connection to Carpenter Street Field from downtown and beyond. (For details see Sheet 16)

Carpenter Street Field provides valuable ecological services. A vegetated riparian buffer and a meandering stream highlight the western edge of the park. Retaining some of the older trees and grading other parts of the bank to a more gentle slope creates an inviting area for visitors of all ages and abilities to explore. The buffer is home to a diverse array of flora and fauna and the stream has pockets for new aquatic life. The widened bank provides for additional floodwater storage.

Carpenter Street Field continues to be a home for field sports. The athletic field remains the centerpiece of the park. A clearly delineated pitch, graded at 1%, provides a quality surface for the athletes. The overall grading assists stormwater to drain to the brook. Bleachers, team benches, and shade structures improve the viewing experience.

**SANCTIONED AND SUSTAINABLE PARKING**
Delineated parking spots provide clarity and reduce compaction on tree roots. (For details see Sheet 17)

**ATHLETIC FIELD**
The centerpiece of Carpenter Street Field is evenly graded for effective drainage and comfortable use. (For details see Sheet 14)

**WALKING CIRCUIT**
A safe and universally accessible path loops around the field. (For details see Sheet 16)

**CLIENT (CITY OF KEENE) GOALS**
- Create additional uses while maintaining existing uses
- Develop multi-generational attractions and uses
- Improve access from downtown
- Improve the aesthetics of the field
- Create a more vibrant presence within the neighborhood
- Explore flood storage potential
- Improve drainage for the playing field

**PUBLIC GOALS**
- Create a walking circuit
- Provide easier and safer access from downtown and Cheshire Rail Trail
- Install bathrooms
- Improve the quality of the athletic field
- Improve seating
- Acquire adjacent vacant properties
- Provide for universal accessibility
- Provide lighting
- Increase vegetation
- Improve the playground
- Designate a parking area
DESIGN DETAILS: PLAYING AROUND

PLAY AND FITNESS FOR ALL
The northern edge of the park is heavily used for play, fitness, and gathering. All ages are welcome on the multi-level multi-component play structures. The play structures are sturdy, durable, and safe providing multiple opportunities for children to develop physical strength, coordination, and balance. Beneath the structures is a soft durable surface making it safe in the occasional fall. Alongside the playground a small bocce court is enjoyed by all, especially a favorite of the senior population. A universally-accessible workout station provides an opportunity for fitness for the community. The pavilion, with enough seating for up to 32 people, provides shade and protection from the elements for small to large gatherings. The large swing set remains a key feature for play. The restroom features composting toilets able to accommodate up to 60 uses a day from spring to fall. Additional lighting helps create a sense of safety, a desire mentioned frequently by residents and city officials alike. The concentration of all the play and fitness features allows for parents and guardians to engage in other activities while children remain in clear view.

GOALS ADDRESSED:
• Create additional uses while maintaining existing uses
• Develop multi-generational attractions and uses
• Improve the aesthetics
• Create a more vibrant presence within the neighborhood
DESIGN DETAILS: A FULL PITCH

THE ATHLETIC FIELD
The field is regraded at a uniform 1% slope towards the brook. A 1% slope is the maximum recommended for athletic fields. The even slope running down from east to west ensures even drainage. The field is a typical cold-zone high-quality mix of Kentucky bluegrass and perennial ryegrass. These are the grasses, installed as sod from a local sod farm, recommended for heavily-used athletic fields. The overall dimensions (430’x215’) accommodate the full needs of all the current users with additional buffer zones along the edge for team benches and fan viewing.

Organic lawn care is recommended because the entire field is in the floodplain and adjacent to the brook. Yearly maintenance should include aeration and adding compost each fall (compost spreader runs behind aerator) and overseeding in the spring and fall. The City of Keene should consider using similar organic practices city-wide where properties are in a floodplain to reduce the polluting of waterways.

Further investigation into soil permeability, especially along the western edge, where USDA reports a high water table, is recommended. Because of (potential) high water table and a 1% slope, working with a contractor experienced in the construction of athletic fields is advised.

CONSTRUCTION NOTE
The sub-surface drainpipe below the field that runs from east to west into the brook may need to be replaced when the field is regraded. The pipe should be set to flow into a pre-treatment vegetated infiltration basin uphill from the brook to clean and infiltrate polluted stormwater, if possible.

GOALS ADDRESSED:
- Create additional uses while maintaining existing uses
- Improve the aesthetics
- Improve drainage for the athletic field
DESIGN DETAILS: A RIVER RUNS THROUGH IT

A VEGETATED RIPARIAN BUFFER

The buffer serves multiple ecological and aesthetic functions. Trees sequester stormwater reducing the amount of water in the soil. Vegetation helps to stabilize the bank from erosion and filters any sediments from runoff keeping the brook free of particulates. According to local ecologist Jeff Littleton, establishing the brook to its more serpentine shape and increasing the amount of diverse and native flora along the bank can have a significant positive impact improving the habitat for a diversity of fish, amphibians, reptiles, invertebrates, and birds. An increase of wildlife in the riparian buffer and the brook provides ideal places for education about ecosystem services and the benefits of supporting wildlife in urban environments. The added vegetation is a vibrant place for kids to play and explore the wonders of the outdoors. Parents can watch from the benches or lawn in the shade of existing and new trees. Paths meander through the buffer along a gentle slope providing access to the brook for all. Local students can assist in the stewardship of the brook by collecting data on the quality of water and biotic activity in the brook.

CONSTRUCTION NOTE

Some root trimming of existing trees will be necessary to achieve the grading required to drain the field. If the trees show decline in 5 years they may need to be replaced. In the meantime, plant new trees so they can get established.

ESTABLISHING A BUFFER

With great care, remove all invasives along bank. The Japanese knotweed (IK) requires extra attention due to the ease in which it reestablishes itself from any part of the plant. Be sure to collect all parts of the plant (roots, stems, and leaves) and dispose of properly. Proper disposal may include: incineration or drying out on an impermeable surface (e.g., asphalt, concrete). Once the invasives have been removed and the bank graded, plant an herbaceous erosion control wetland mix from New England Wetland Plants (sedges, grasses, bulrushes, and forbes) Seed at 2 times the recommended rate. Cover with a coir biodegradable erosion mat and staple in place. To plant shrubs or trees, cut an X in the mat, plant the tree or shrub, then sew the erosion mat back together. Use live staking or tublings for shrub erosion control. Apply mycorrhizal fungi in hole when planting. More soil testing should be done prior to planting to evaluate needs for soil amendments.

A MEANDERING STREAM

The new meandering path of the stream has many benefits. A more natural bending brook invites visitors to explore the mysteries of a brook ecosystem or sit along the path and admire the bounty of wildlife passing through. More bends in the brook slows down the speed of the water reducing erosion along the bank and creates new patches of habitat. In addition to widening the brook’s surface area, the bank is cut back (up to ~80’) accommodating floodwater storage during storms. Providing floodwater storage along the brook may reduce the frequency of the field flooding during small storms.

Redirecting a brook is a dynamic process and once changed the future path the brook will take is unknown. Stones (large boulders and river stones) placed along bank help maintain the new meandering shape. City officials should start a conversation with adjacent property owners to discuss the impact reshaping the brook will have on their property. It is recommended, at minimum, to explore arming the western bank to reduce severe erosion and further slow the brook. Ideally, neighboring property owners will seize the opportunity to extend the meandering into their property. See sheet 4 for the previous path of Beaver Brook.

Although, multiple conversations with experts helped to inform the final alignment of the brook in this design, it needs to be assessed and set by a fluvial expert.

A VEGETATED INFILTRATION BASIN

The sub-surface drain outfalls into a vegetated basin lined with stone. The stone and vegetation reduce erosion from fast waters exiting the pipe. The vegetated basin helps to hold sediment, filter contaminants, and infiltrate stormwater. Given the age of the pipe, installed in 1931, it should be evaluated and possibly replaced during the construction of the new field and park.

GOALS ADDRESSED:

- Create additional uses while maintaining existing uses
- Develop multi-generational attractions and uses
- Create a more vibrant presence within the neighborhood
- Improve the aesthetics
- Improve drainage for the athletic field
- Explore flood storage potential
THE WALKING CIRCUIT
A universally accessible (equal to or less than 5% slope) path rings the entire field providing visitors of all abilities an opportunity to exercise and explore. The walking circuit (~2.5 miles) is lined with low shrubs and groundcovers helping to separate the path from the athletic field. The circuit provides access to all the features in the park with connections to the parking area, the path downtown, and the bridge. Seating areas line the path where picnicking, board games, reading, exercise machines should be under shaded areas.

Boardwalks help introduce visitors to the wetlands (treadwelandarch.tumblr.com). A crushed stone path around a park provides a comfortable and safe walking experience (en.wikipedia.org/wiki/National_Mall). Natural play elements along the walking circuit spread the play opportunities throughout the park (ckchilddevelopmentcenter.org).

Various seating arrangements should be considered:
• right-angled seating that allows conversation between a few people,
• circular inward-facing seating that accommodates larger groups,
• more secluded individual seating for those who seek privacy

WHAT DO SENIORS NEED IN A PARK?
A list of criteria based on UCLA Luskin School of Public Affairs 2014 report PLACEMAKING FOR AN AGING POPULATION: Guidelines for Senior-Friendly Parks

Improve control: Provide orientation and wayfinding with large, visible fonts. “The park layout needs to be legible.” Signs should be 54 inches off the ground or lower, so people in wheelchairs can also see them.

Offer greater choice: “Everyone values options, such as passive or active recreation, sun or shade, single or multiple seating. Chairs should be moveable.” Madeline Brozen, Program Manager of the UCLA Complete Streets Initiative and the Assistant Director of the Lewis Center for Regional Policy Studies, emphasized that the group older than 65 is incredibly diverse, from “not old to advanced dementia,” so they have different needs.

Create a sense of security: “There should be shade but not too much so it feels enclosed.” Parks should enable “eyes on the street.” Isolated areas need good maintenance. Sidewalks should be wide and smooth. Check spaces between paved and unpaved areas to make sure there aren’t spots where a cane or wheelchair can get caught.

Accessibility: If a park is a good distance from a senior facility, add benches along the way so there are place to stop.

Social support: Design should facilitate interaction. Parks can feature bulletin boards, outdoor reading rooms, sculptures and fountains that help start conversations.

Physical activity: Parks should also feature mile markers for encouragement. “These kinds of things are low impact, high benefit.” Exercise machines should be under shaded areas.

Nature: Bring in water features, which are relaxing, beautiful, and help muffle street noise. Make sure they are wheelchair accessible. And lastly, parks should highlight natural beauty.

Improve the aesthetics
Create a more vibrant presence within the neighborhood
Develop multi-generational attractions and uses
Create additional uses while maintaining existing uses
GOALS ADDRESSED


A variety of plantings provide a rich natural experience for visitors (sustainableci.com).
DESIGN DETAILS: A GENTLE ARRIVAL

FORMALIZING THE INFORMAL
A formalized universally-accessible path connects Carpenter Street Field and downtown in the same location as the former informal trail. Closing the Harrison Street bridge to vehicular access may increase use of this trail by residents of the East Side Neighborhood and Railroad Land neighborhood. The formal trail creates quick and easy access into the play and fitness areas of the park. Upon entering the Railroad Land neighborhood, the formal trail creates quick and easy access of this trail by residents of the East Side Neighborhood and city-wide may increase visitor-ship and support arriving at the park through ways other than personal vehicles (opensource.com/life).

SANCTIONED AND SUSTAINABLE PARKING
35 vehicular parking spaces (including three handicapped spaces) are delineated along Carpenter Street. Parking spaces are spread beneath the existing lindens and structural soil is added below to help reduce compaction on the roots. Compacted roots are often the cause of urban trees failure to thrive. Two decorative archways welcome visitors to the Carpenter Street Field and Park. At each entry arch bike parking is provided. Emergency vehicle access is available at each archway.

CONSTRUCTION NOTE
Cornell University has done extensive research on urban trees using structural soil. Dr. Nina Bassuk wrote, “Existing trees have been retrofitted with CU-Soil using an airspade. Typically we can clean off down to approximately 12 inches and backfill with CU-Soil, compact it and pave with various surfaces, the best being porous asphalt. The trees have prospered under this scenario.” Cornell Student Designers: Aitan Mizrahi Janice Schmidt

GOALS ADDRESSED:
• Improve access from downtown
• Create additional uses while maintaining existing uses
• Develop multi-generational attractions and uses
• Improve the aesthetics
• Create a more vibrant presence within the neighborhood
Action is required beyond the property lines for Carpenter Street Field to actualize its potential as a destination park, a heavily used recreational field, and to enhance the livability of the neighborhood and city.

Properties adjacent to CSF, the private storage, the defunct jewelry manufacturer, and the empty lot across the brook to the southwest, should be considered for acquisition. These properties can provide additional parking, indoor recreational and gathering space, and storage for the Department of Parks and Recreation.

An additional bridge, in the northwest edge of the field (see alternative #1), may be useful to connect more directly to downtown and Railroad Land development through the parking lot.

Local developers have expressed interest in seeing CSF become more of a destination within the east side of the city. Mr. Dugan, executive director of Monadnock Economic Development Corporation, supports the idea of a multi-use trail that connects the Ashuelot River Park with CSF through Railroad Square. Keith F. Thibault, Southwestern Community Services (SCS), has expressed a willingness to work with the City to help improve CSF. Southwest Community Services runs a program, New Hope New Horizons, that provides job placement assistance for adults with developmental disabilities. Members of New Horizon may be available to help steward CSF.

Physical improvements to CSF will increase the need for maintenance and care of the park and field. Creating a stewardship program may help the City reduce its costs and help promote civic pride. Social service organizations nearby, such as Serenity Center and the Phoenix House, can be allies in developing a

GOALS ADDRESSED:
• Improve access from downtown
• Create additional uses while maintaining existing uses
• Create a more vibrant presence within the neighborhood
PLANTING PLAN

New plants throughout add diversity and four season interest to the brook edge and walking path inviting both people and wildlife in.

Manually remove the knotweed and other invasive plants along the bank and replace with a base of sedges, grasses, bullrushes, and forbs (New England Wetmix) to stabilize the brook bank and give a natural habitat to build from for the new downtown park. All the native species plants are selected for their ability to work in a floodplain.

The trees on the northern border are approximated on the plan. The walking path should be placed so as to preserve as many of them as possible. Minimize excavation over roots or avoid altogether. The shrub layer below should have the invasive plants removed and the remaining natives pruned. If required to maintain privacy from neighboring properties, mountain laurel and spicebush could then be added.

Remove four of the least healthy lindens on the south end to make room for a new park entrance and additional parking. A new line of redbud trees will add spring color. Another linden will be removed for restroom and field maintenance access on the north end.

Cool season grasses, grown from seed, take about two years to establish to mature adult stage where they can resist the most abuse. Sod is recommended to be installed over the athletic field and between the playground areas. The playground grass mix needs to tolerate more shade than the athletic field, but should still withstand heavy use.
Improving the athletic field was the number one priority for the park. A regraded field will provide an even playing surface that will drain consistently.

The bank of the brook is excavated to provide more area for flood water in the event of flooding but it also provides for easier access to the brook edge. Extreme care must be taken when disposing of the soils containing Japanese knotweed due to its ability to propagate from minuscule pieces.

To attempt to preserve most of the existing trees, the grade has been sculpted around the root zones of the trees, leaving the trees on virtual “islands”. The box elders and red maples are highly valued for their ability to stabilize a bank and should survive the root pruning necessary to lower the bank.

The city may want to consider replacing the drain from the catch basin on the east side of the property during the field construction. It drains to the brook and could be daylighted to an infiltration basin in order to filter the storm water before it enters the brook, if there is sufficient height to raise its elevation.

Additional studies into the depth to groundwater may be advisable before proceeding with the project to confirm if additional sub-surface drainage is needed below the athletic field.
PRECEDENTS: MATERIALS

USDA Forestry Service recommends using fine aggregate (3/8-inch minus) for a firm and stable, accessible crushed stone walking path (about-bicycles.com).

A section of boardwalk can get you through the wet spots (123rf.com).

Interpretive signs increase awareness and appreciation among park users (flickr.chesbayprogram.com).

Play features can be easy to create and from recycled materials. Bright colors and interactive elements make playing fun.

A public water fountain could help reduce use of plastic water bottles. Solar powered lamps help save on electrical costs while providing light in the evening hours for visitors to enjoy the park.

The bench is a recycled plastic that is located at other parks around the city. Bike stands provide a safe place to store bicycles while visiting the park (bike rack: commons.wikimedia.org).

Large climbing rope structures help children develop physical strength, coordination, and flexibility (playful.com).

A majestic fence delineates the park and field from the parking area (newenglandfence.com).

Clearly labeled garbage and recycle cans may help keep Carpenter Street Field free of litter and reduce waste (globalindustrial.com).

PRECEDENTS: MATERIALS

NOT FOR CONSTRUCTION. PART OF A STUDENT PROJECT AND NOT BASED ON A LEGAL SURVEY.
PRECEDENTS: URBAN PARKS

AN URBAN PARK DESIGNED FOR THE MARGINALIZED AND HOMELESS COMMUNITIES

Oppenheimer Park in Vancouver, Canada is located on the east side of downtown in an economically depressed neighborhood. The park has been used for many years by a variety of populations. The park was also known as the home for the Industrial Baseball League and used by a famed Japanese-Canadian baseball team. It was recently redesigned and built to accommodate marginalized and homeless populations. This progressive approach to incorporate these populations rather than evict them has been quite successful. Renovations were completed in May of 2010 and now the park is heavily used by neighbors of all ages, ethnicities, and income levels. Upgrades to the park include a new field house and washrooms, universally accessible walkways, children’s playground, sports court with a basketball hoop, horseshoe pitch, patio spaces, picnic tables and seating areas, central lawn area, trees and flowers, sub-surface drainage and a new irrigation system.

Even though the park is used by those afflicted with addiction, other park goers feel safe due to long sight-lines and the increased number of people in the park. According to Sandy MacKeigan, head programmer at Oppenheimer Park, a full-time staff is an essential element to ensuring good cooperation.

KEY FEATURES:
- Rounded field house: a 650 sq. ft. activity space, first aid room, and kitchen space with no blind corners
- Rubber playground surface: easy to keep clean, washes down with a hose, and easier to find hazardous items such as needles
- Sharps containers: one is located in the bathroom and another along the path between benches
- Lighting: provides a sense of safety after dark

A NATURE-BASED PLAYSCAPE REFERENCES LOCAL ECOSYSTEM

The Westmoreland Nature-Based Play Area was a pilot project for Portland Parks and Recreation (Oregon). It was part of an overall master plan prepared for Westmoreland Park in 2004, following years of flooding, creek degradation, and user groups competing for park space. The recommendations included relocating various facilities, restoring Crystal Springs Creek, eliminating the duck pond, consolidating the play area, and expanding the age groups served, modifying the casting pond, interpretive improvements near the restroom building, parking modifications, and the addition of a skate park.

The Play Area opened to the public in September 2014. It replaced an outdated playground with a nature-based playscape. The designed playscape referenced the specific characteristics of the site and its surrounding community. The process involved comprehensive public input and consensus-building process that resulted in unique play elements, which were custom-made for this park and that celebrate the community’s vision.

According to Portland Parks and Recreation, “Nature-based play can provide important connections for children and adults to the natural environment. Playing in natural environments improves language skills and collaboration; improves imagination and creativity; supports positive social development; and enhances balance, agility, and overall health.”

This project was supported with funding from a voter-approved bond measure.

KEY FEATURES:
- Movable natural elements
- Log climbers and piles
- Dry creek channel with water pump
- Creek access

A MULTI-GENERATIONAL PARK HAS A PLACE FOR SENIORS

In St. Petersburg, Florida (pop. 269,688 as of 2013) Azalea Park, 33 acres of recreational space, is located near a residential neighborhood, two elementary and middle schools, and a large shopping mall. The 33 acres is divided into two sections, a 15-acre park alongside an 18-acre recreation center. In 2012 the Parks and Recreation department worked with Trust for Public Land to install a Fitness Zone, a multi-generational, universally accessible outdoor gym. The Fitness Zone expands the opportunities to all citizens to practice a healthy lifestyle. The Fitness Zone is designed to accommodate individuals in wheelchairs and senior citizens and it is free. “Making it affordable makes it accessible, too,” says Paralympian Jen French. “Not everyone has the financial means to join an exercise club.”

KEY FEATURES:
- Playground
- Azalea Recreation Center
- Outdoor Fitness Zone
- Disc Golf Course
- 2 Lighted Football/Soccer Fields
- 2 Lighted Outdoor Basketball Courts
- Lighted Softball Field
- Non-Lighted Softball Field
- 4 Lighted Tennis Courts
- Lighted Racquetball/Handball Court
- Picnic Shelter
- Restrooms

Azalea Park in St. Petersburg, Florida has active recreational facilities for all ages and abilities (stpeteparksrec.org).

PRECEDENTS: URBAN PARKS

Carpenter Street Field: A Landscape Master Plan
Client: City of Keene
Conway Student Designers: Aitan Mizrahi, Janice Schmidt

Carpenter Street Field: A Landscape Master Plan

NOT FOR CONSTRUCTION. PART OF A STUDENT PROJECT AND NOT BASED ON A LEGAL SURVEY.

Oppenheimer Park is located in a dense urban neighborhood. It provides an open space for all people, including homeless and marginalized communities (stpeteparksrec.org).

Westmoreland Park in Portland, Oregon chose nature-based playscapes to provide connections for parents and children to the natural environment (portlandoregon.gov).

Azalea Park in St. Petersburg, Florida has active recreational facilities for all ages and abilities (stpeteparksrec.org).
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### Notes

- The document appears to be a cost estimate for landscaping and site preparation for a project. Each item is listed with the quantity, unit cost, and total cost.
- The grand total for site preparation is $23,260.00, and the grand total for site improvements is $2,224,127.13, leading to a total of $2,247,387.13.
- Other categories include parking and utilities, with a total of $320,310.00.
- The grand total for the project is $2,567,697.13.