DRAFT

Quarry Park Mini Master Plan

City of Duluth • DRAFT April 20, 2016

TKDA

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History/Background

QUARRY PARK is a post-industrial site with a long history in Duluth, most recently being utilized for recreational uses such as ice climbing, picnicking, dog walking, and hiking. Commonly called Casket Quarry, the location has been known to neighbors as a climbing and recreational resource since the 1970s. The site is an abandoned quarry, owned and operated by the Duluth Crushed Stone Company beginning in 1902. The company produced crushed rock, concrete, building material, paving material, and other stone and rock products from rock harvested at the quarry.

Another interesting item of historical note is the presence of black basalt rock above the quarry floor that closely resemble rocks returned from the Moon on the Apollo 11 mission. Researchers studying the rocks returned from the Moon in the 1970s and 1980s discovered that the rock at quarry is similar in mineralogy and chemistry to the rocks on the Moon. American and Japanese scientists have used the rock from quarry in experiments dealing with plant growth and other issues related to long-term plans to establish human presence on the Moon.

More recently, the area has been utilized as an informal recreation area by Duluthians. While most of the recreational uses at quarry have carried on with little impact to the site—use of the site by those gathering in groups for parties, however, has left behind charred remains from fire pits, broken glass, and other debris which needs to be cleaned up. In 2015, the City of Duluth began a process to acquire the land comprising the 30 acres in an effort to re-purpose the quarry as a City park and to provide unique recreational opportunities to the public. A portion of the land was tax-forfeited land obtained from St. Louis County, while the westerly portion was purchased from Oneota Cemetery Association. That process was completed in early 2016 as the master planning process for the park commenced.

History/Background

Ice climbing at the quarry

Pond and quarry wall

Master Planning Process

The master planning effort included a large group of stakeholders representing a wide variety of user groups and interests. The process involved obtaining input from City Staff, two stakeholder group meetings, engaging the general public in two public meetings, and collecting input from the public via emails and online comment forms. A basic issues map was developed from the kick-off meeting, and with each subsequent meeting, input received was used to refined concepts included in the draft mini-master plan for Quarry Park. The following timeline summarizes the meetings as well as their focus and outcomes:

City Staff kick-off meeting
December 4, 2015

City Engineering, Business Development, Parks and Recreation, Maintenance & Operations, Property & Facilities Management divisions were represented at the meeting. A list was generated of existing conditions, background issues, and basic considerations that would need to be addressed while making proposed improvements at Quarry Park.

Stakeholder meeting #1
December 16, 2015

Community stakeholders met to review the mini-master planning process for Quarry Park, and discussed issues relevant to local user groups. Existing site conditions and concepts for amenities and uses for the park were suggested and reviewed in small group discussions. Input received was used to generate the concept mini-master plan presented on January 14.

Public meeting #1
January 14, 2016

Presented initial concept of mini-master plan for Quarry Park, obtained input from attendees at the meeting (live and on survey), and discussed concerns. A list of desired park amenities and uses was developed at the public meeting and used to refine the concept master plan.

Stakeholder meeting #2
January 26, 2016

This meeting was a follow up with stakeholder groups addressing comments received at the January 14 public meeting. It was to further refine those comments for inclusion in the mini-master plan. Graphical depictions of park improvements as well as data received at the public meeting were discussed, with additional input on proposed amenities being obtained and used to create the draft mini-master plan presented at the second public meeting on February 11, 2016.

Master Planning Process

Ice climbing committee
February 2, 2016

The development of consistent ice for climbing presents a recreation opportunity that is unique to Quarry Park. Because this is a unique and potentially significant feature of Quarry Park, a separate meeting was held with a smaller group of individuals with expertise farming ice for winter climbing. Discussion centered around developing a source of water for creating suitable ice and potential systems for water delivery.

Public meeting #2
February 11, 2016

The draft mini-master plan for Quarry Park was presented at this public meeting. The public was presented with the process, the plan developed to-date, and offered an opportunity to review the plan and offer comment on its status and other potential issues or amenities to be included at Quarry Park. The plan was revised to the draft version offered for public comment based on information received at this meeting.

Public comment period
March 21 – April 1, 2016

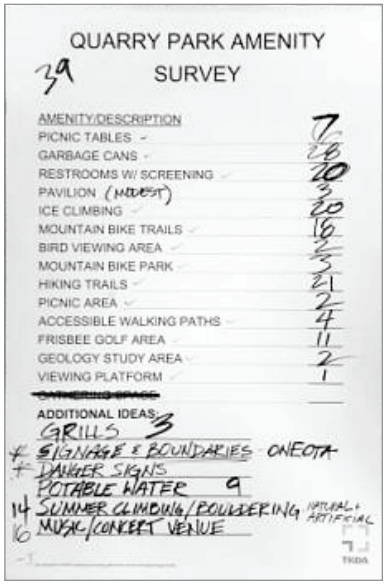
The City of Duluth posted the draft mini-master plan for public comment during this period for final public review and comment. Comments received during this period were incorporated into the final mini-master plan submitted for review and approval by the Parks and Recreation Committee at is March 9, 2016 meeting.

Parks & Recreation Commission approval
April 20, 2016

The final mini-master plan for Quarry Park was presented for review and approval at this regular meeting of the Parks & Recreation Commission. The plan was submitted for City Council approval and adoption following this meeting.

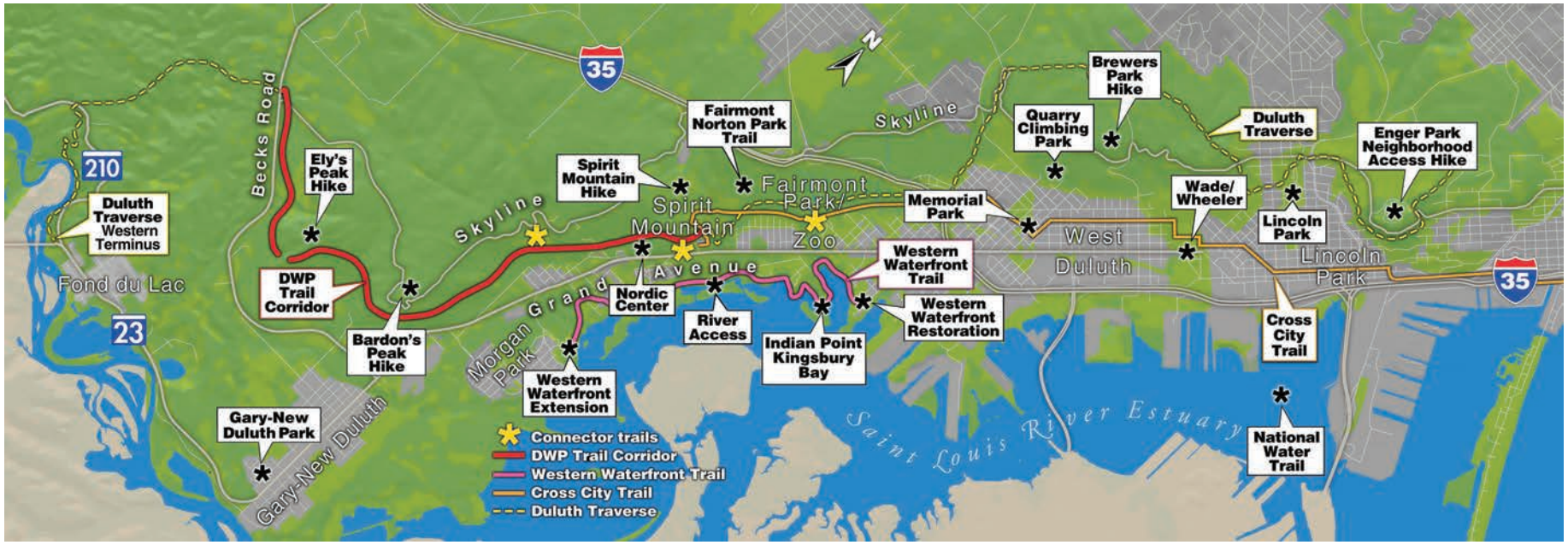
Small group discussion at Stakeholder meeting #1

Partial list of amenities from Public meeting #1



Regional Context

The quarry site located in West Duluth, and is one of three established ice climbing locations in Minnesota. The two other areas are located in nearby Sandstone, MN, while the other is in Winona in southeast MN. Quarry Park is part of the larger St. Louis River Corridor Initiative, which encompasses approximately 28 projects initiated with the 1/2 & 1/2 Tourism Tax funding made available by legislative action in 2014. When completed, Quarry Park will have connector trails linking the nearby neighborhood to the Duluth Traverse Trail and the Superior Hiking Trail, both regionally significant trails, threading through an entire recreational corridor.

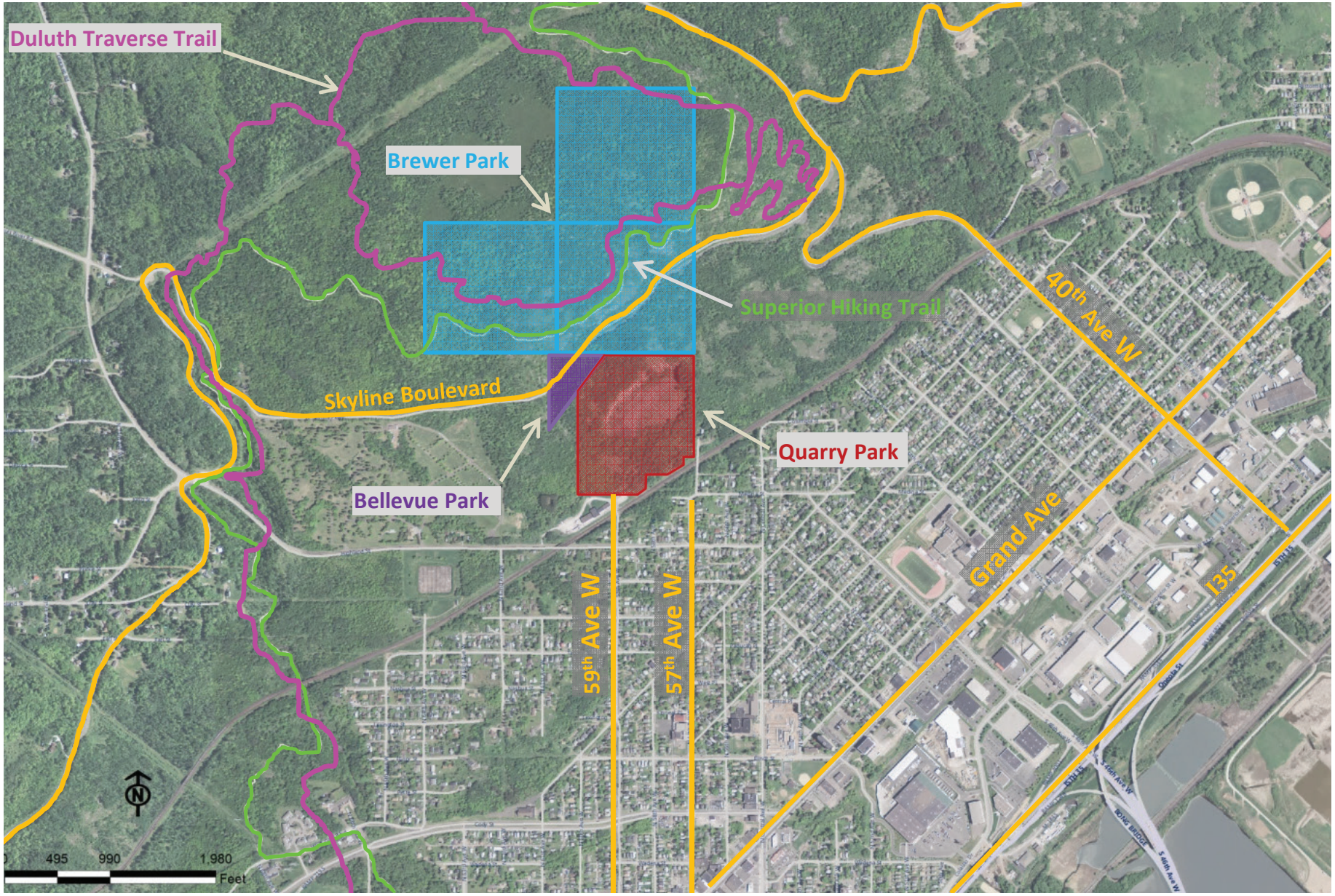


Site Context

The quarry site, approximately 30 acres, is located in West Duluth, in close proximity to Brewer Park, Piedmont Park, the Superior Hiking Trail, and the Duluth Traverse Trail. The neighborhood below the quarry is mostly single family homes with a business district located near Grand Ave. Quarry Park itself will be zoned P-1 in the City of Duluth zoning code. The quarry is bounded by Skyline Parkway, a National Scenic Byway and designated bikeway, to the north, Canadian National Railroad to the south and between 57th Ave West and 60th Ave West to the east and west, respectively. South of the rail road is mostly single family homes with some businesses intermixed. Brewer Park and Bellevue Parks share boundaries with the quarry on the north and northwest sides, respectively. Oneota Cemetery is directly to the west and St. Louis County land is located to the east along with several residences to the southeast.

The Duluth Traverse multi-use mountain bike trail passes through Brewer Park and connects to nearby Piedmont Park to the east and by the end of 2016, to Spirit Mountain Recreation Area to the west. A multi-use connector trail between Quarry Park and the Duluth Traverse Trail in Brewer Park is recommended. Skyline Parkway is a designated bike route and the connector trail will cross Skyline Parkway. The Superior Hiking Trail also passes through Brewer Park and a connecting hiking trail with Quarry Park is also recommended.

Site Context



Existing Conditions/Challenges and Opportunities

The quarry has long been used by ice climbers during the winter months and by neighbors as an informal park to hike, walk dogs, and enjoy views of the St. Louis River. It is also known for being a gathering location for parties with vandalism as a frequent problem. Graffiti, fire rings, broken glass and garbage are common issues found throughout the site.

It is a unique site within the City in terms of potential for a City park. The sheer wall creates an excellent opportunity not only for ice climbing, but affords some spectacular views of the St. Louis River. There are areas in the site that appear to be wetlands and a delineation of the site should be considered prior to any site improvements likely causing impacts. The lower portion of the quarry is relatively flat offering an opportunity for ADA-compliant trail access to the City park.

Some of the existing conditions include:

- 30 acres of a mixture of forested areas (balsam, alder, and ash), rocky outcrops, the quarry floor (approx. 6 acres), wetlands, an intermittent pond (approx. 0.5 acres) and areas of invasive species.
- Exposed quarry wall that is nearly 1,000 feet in length and extending over 100 feet vertically at some sections of the wall which offers a unique climbing opportunity.
- Naturally forming ice on the quarry walls in winter.
- Industrial ruins from when the site was used as a quarry.

PHOTOS COURTESY OF BAY WEST

Existing Conditions/Challenges and Opportunities

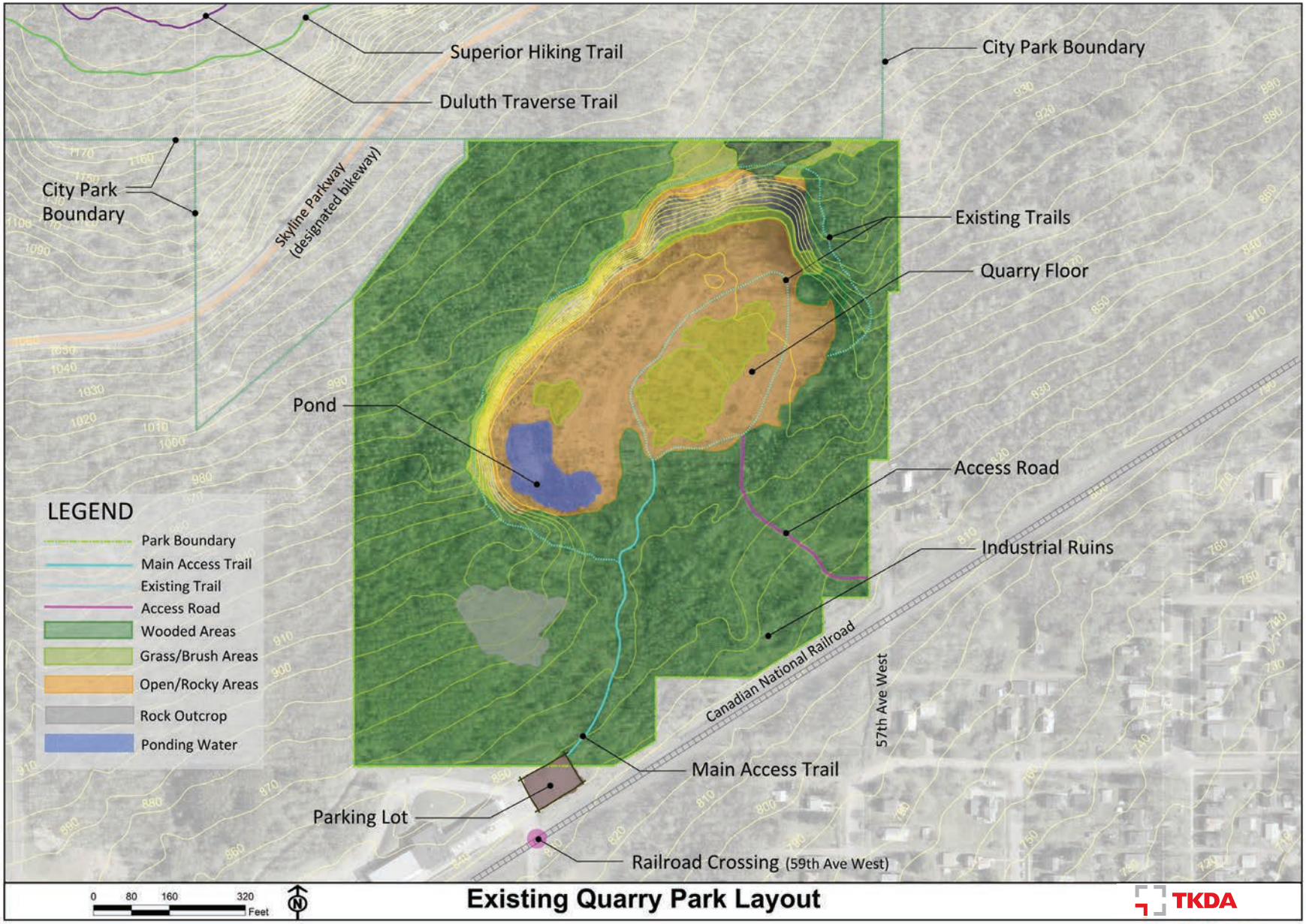
There are many opportunities to improve the site and create better user experiences including:

- Transform a neglected industrial space into a formal City park.
- Improve the main access trail and loop trails in the quarry floor to meet ADA accessibility requirements.
- Add a multi-use connector trail and a hiking connector trail to the Duluth Traverse Trail and the Superior Hiking Trail, both regionally significant trails passing through nearby Brewer Park. These connector trails will serve as a neighborhood connection from below Quarry Park to the existing trail network.
- Create a sustainable ice climbing facility to enhance naturally forming ice on the wall.
- Incorporate multi-use gathering spaces in the quarry floor.
- Re-use rock and other natural features to create amenities for the park.

Main access trail can be improved for ADA compliance

Industrial ruins can be transformed into spaces for new activities

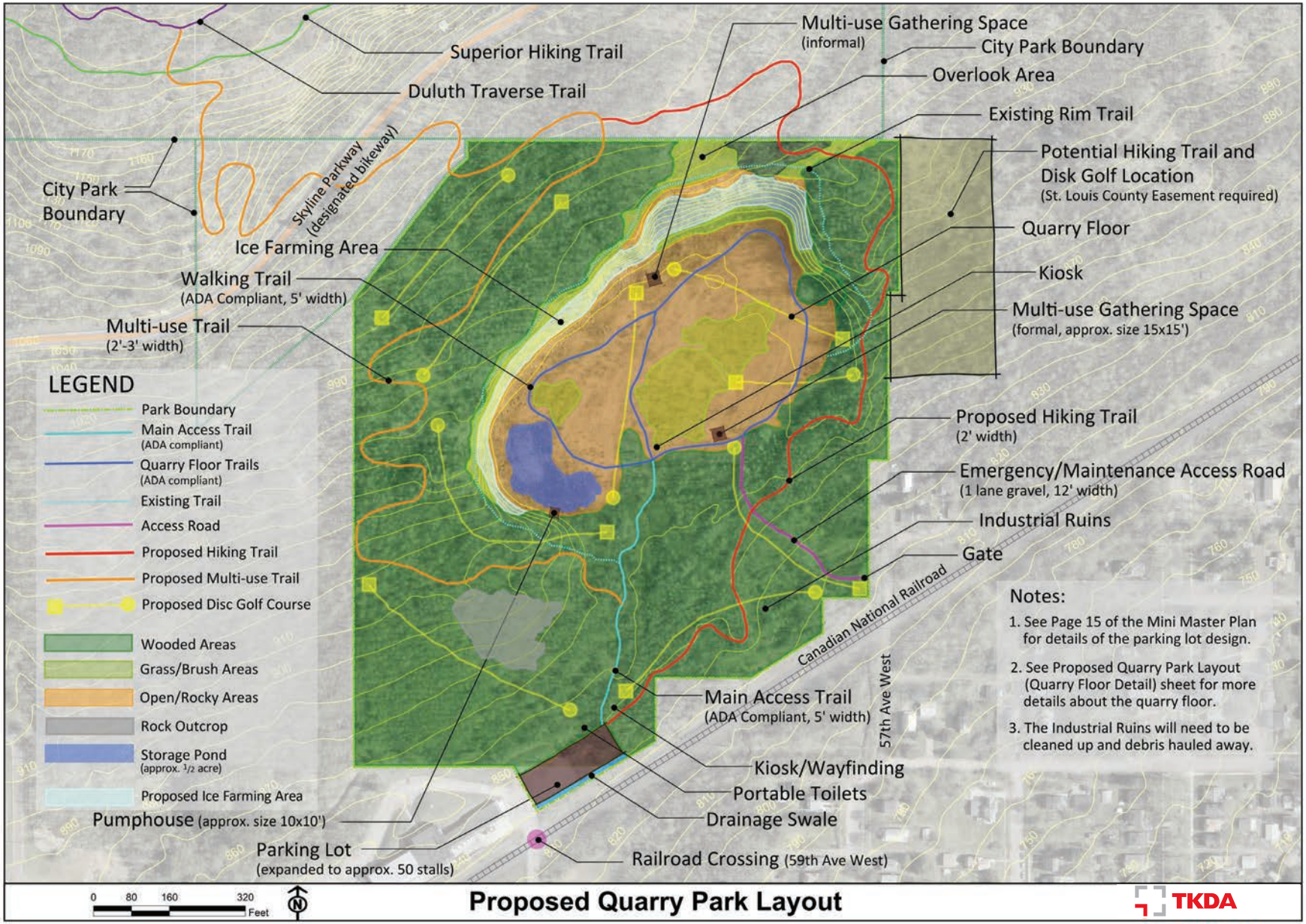
Existing Conditions/Challenges and Opportunities



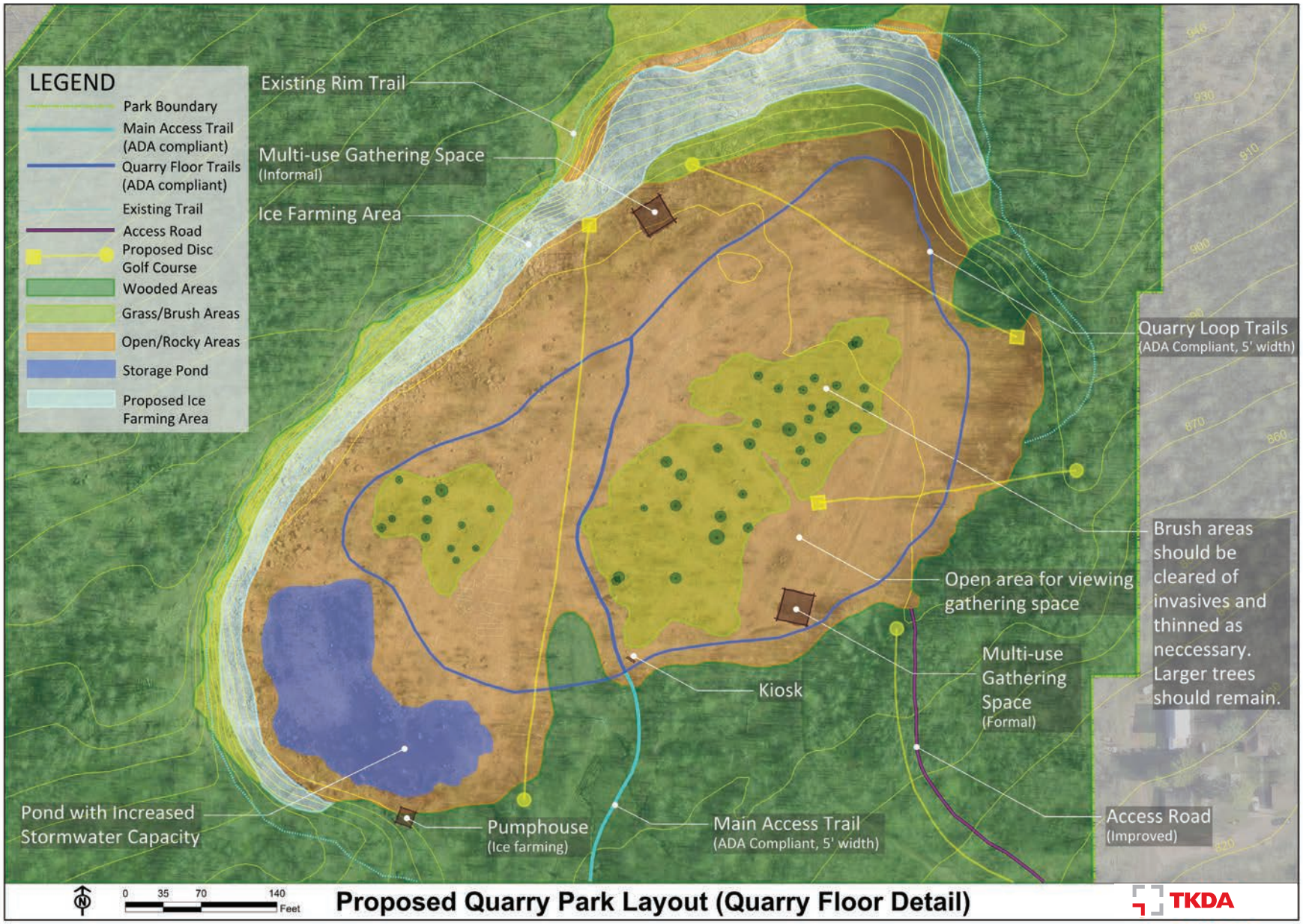
Accessibility

The quarry site offers a unique opportunity in Duluth to create universal access to the park with a portion of the trails meeting ADA requirements. The main access trail and the loop trail within the quarry floor should all be designed to meet ADA requirements. This means from the entrance at the parking lot throughout the entire quarry floor loop, park users will have an ADA-accessible trail. Access points to the climbing areas will also be ADA-compliant, providing ADA access up to the base of the climbing experience. The steep topography going north towards Skyline Parkway creates challenges for ADA-compliant trails, but new alignments of existing trails will increase accessibility to the top of the quarry.

Proposed Layout



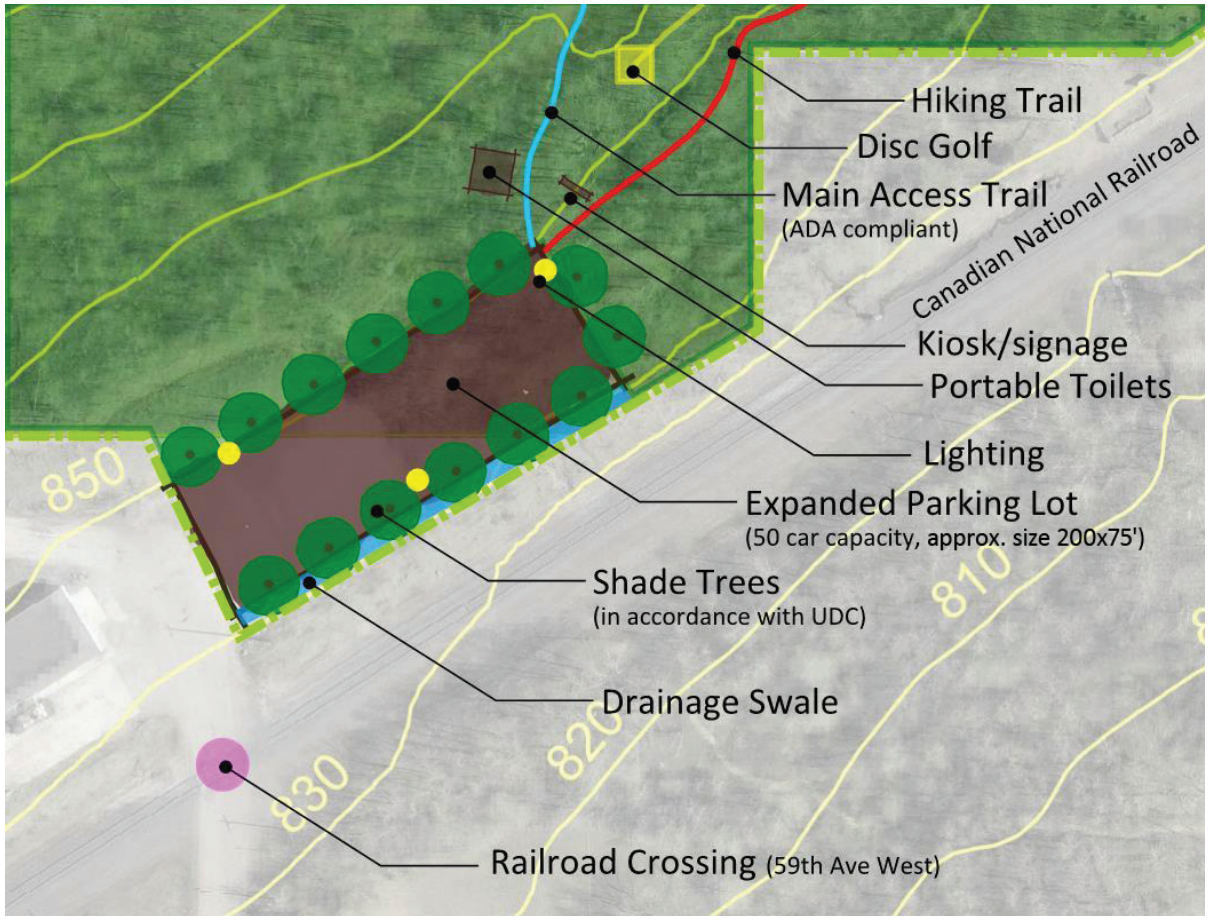
Proposed Layout (Quarry Floor Detail)



Recommendations

Parking Lot

It is recommended that parking be consolidated at the existing 59th Avenue West parking lot. It is important to expand the parking lot to sufficient size to alleviate on street parking concerns. A fifty (50) stall parking lot should fit within the existing topography and will generally provide adequate capacity. ADA parking signs as well as shade trees could be installed. It is recommended to have lighting as well as portable screened toilets. Park entrance signage and wayfinding should also be included in the parking lot design.



Recommendations

Gated Access Road

It will be necessary for emergency responders, City maintenance vehicles, and other vehicles during special events to have access to the quarry floor. The existing road leading from 57th Avenue West will be improved to a single-lane (12-foot width) gravel access road. A gate is recommended at the 57th Avenue West access point to restrict traffic to only the uses suggested above. Appropriate signage to direct park users to the parking lot located at 59th Avenue West is also recommended.

Trail Connectivity

The close proximity of existing regionally significant trails offers an opportunity to connect Quarry Park with this trail system. A multi-use connector trail and a hiking connector trail to the Duluth Traverse Trail and the Superior Hiking Trail, both in Brewer Park, should be constructed.

Multi-use Gathering Spaces

These spaces (approx. 15' x 15') can serve many functions including a stage, a pavilion, or an outdoor classroom. By using rocks and other natural features for seating, a stage, etc., the rustic nature of the park can be maintained.

Park Amenities

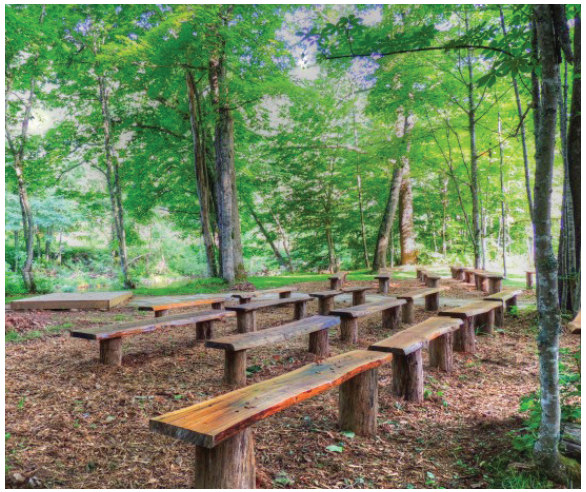
These include garbage cans, signage, and wayfinding. Trailhead signage at the parking lot and wayfinding signage at all junctions along the trails is strongly encouraged.

Site Programming

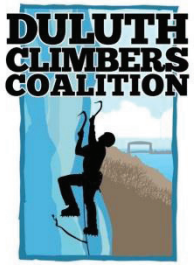
The City has identified the Duluth Climbers Coalition and the Duluth Disc Golf Club as two of the premier partners in the newly established park. Both groups will create opportunities for climbers and disc golfers of all abilities to utilize the park. In addition, the site will be permitted for events to promote recreational opportunities such as the DCC Ice & Mix Fest, as well as local and regional disc golf tournaments.

Park Management

Recommended: 6:00 a.m. – 10:00 p.m.
Rules: Park rules should be established in accordance with City of Duluth policy and posted near the park entrance.



Ice Climbing



The quarry has been used by climbers since the 1970s. It is a unique site for use as an ice climbing venue. To ensure consistent ice for climbing, an ice farming system should be installed. Ice farming can be defined as the process of controllably, and renewably, generating ice for the purposes of ice climbing. In order to farm ice, a sustainable system will need to be installed. A formal partnership between the Duluth Climber's Coalition and the City will be created to outline the management and operations expectations for ice farming.

Goals:

1. Provide ice farming for consistent ice each winter climbing season.
2. Design a sustainable water source and easily maintained system.
3. Provide approximately 500,000 gallons of available water each season.
4. Contain/reuse melt water from quarry so there is no increased storm water flows downhill.
5. Design piping to minimize potential for vandalism.

Preferred design

Drilled Well		Well with Storage Pond	
Significant upfront costs, but provides long-term affordability.	+	Location ideal if using existing pond in quarry floor.	+
Additional access road costs if well drilled at top of quarry.	-	Potential for creation of two ponds-one in quarry floor and one on top of quarry. Top pond would only be to help catch runoff onsite above the rock face; lower pond catch and store runoff from interior surface of quarry.	+
Minimized access costs if well is drilled in quarry floor near the proposed storage pond.	+	Undetermined pond on top of quarry may impact existing ground water flows. Will need to be explored further in design phase.	0
Well provides good backup water supply to storage pond onsite; may not be able to sustain flow requirements of 15-30 gpm by itself depending on available well flows onsite.	+	A storage pond would be beneficial in collecting and storing the required annual volume of water needed for ice farming. See comment under Drilled Well for need to provide combined system at quarry.	+
Consider burying piping to minimize vandalism, more expensive than exposed piping on rock.	-		
Municipal Water		**Storage Pond System**	
Considerable cost to bore/bring municipal water line to site.	-	Unique opportunity to provide a water feature and develop sustainable water source and storage for Quarry Park ice farming.	+
Potential impact of chlorine residual.	-	Cost for excavating rock may be high depending on the nature of the rock and access with equipment. Able to leave rock removed from quarry floor onsite; could be used in landscape work or other features.	-
Ongoing cost for water supply will drive O & M budget higher.	-	Existing low/pond area in quarry floor provides opportunity to remove additional rock to create water storage, flow paths already established to create a source of water to refill the pond when ice melts in spring or summer rains run off.	+

Disc Golf

Quarry Park is an excellent location to expand disc golf opportunities in Duluth. Disc golf is a minimally intrusive activity, requiring minimal clearing or tree removal. There are opportunities in the quarry to have flat, open holes, narrow, wooded holes, and some holes with significant vertical changes. The preliminary layouts are 9 holes spread throughout the site. Disc golf courses have been built and played with success at other sites in Duluth.

The Duluth Disc Golf Club will enter into a formal agreement with the City to manage and maintain the disc golf course and associated infrastructure.

Preliminary Phasing and Cost Estimates

The included cost estimates and phasing plan is intended to be used for long term planning and implementation of amenities at Quarry Park. They can also be used to aid solicitation of grant funding. The cost estimates are preliminary and all improvements will require additional review to generate more accurate cost estimates. The cost estimates are based on 2016 construction costs, adjustments in costs will be necessary for construction beyond 2016.

Phase 1 amenities are generally items to be constructed within 1 – 2 years. These items generally carry the highest priority either in terms of popularity or safety and code requirements.

Phase 2 amenities are generally items to be constructed in 3 – 5 years. These items may carry high popularity, but budgetary restrictions may require longer range planning to implement.

Phase 3, or Long Range amenities are generally items to be constructed in 6 – 10 years. These are typically lower priority items currently, or items that will require significant financing to implement.

It may be possible to move certain amenities up in the planning process if grant money or volunteer work can be generated to alleviate some of the costs.

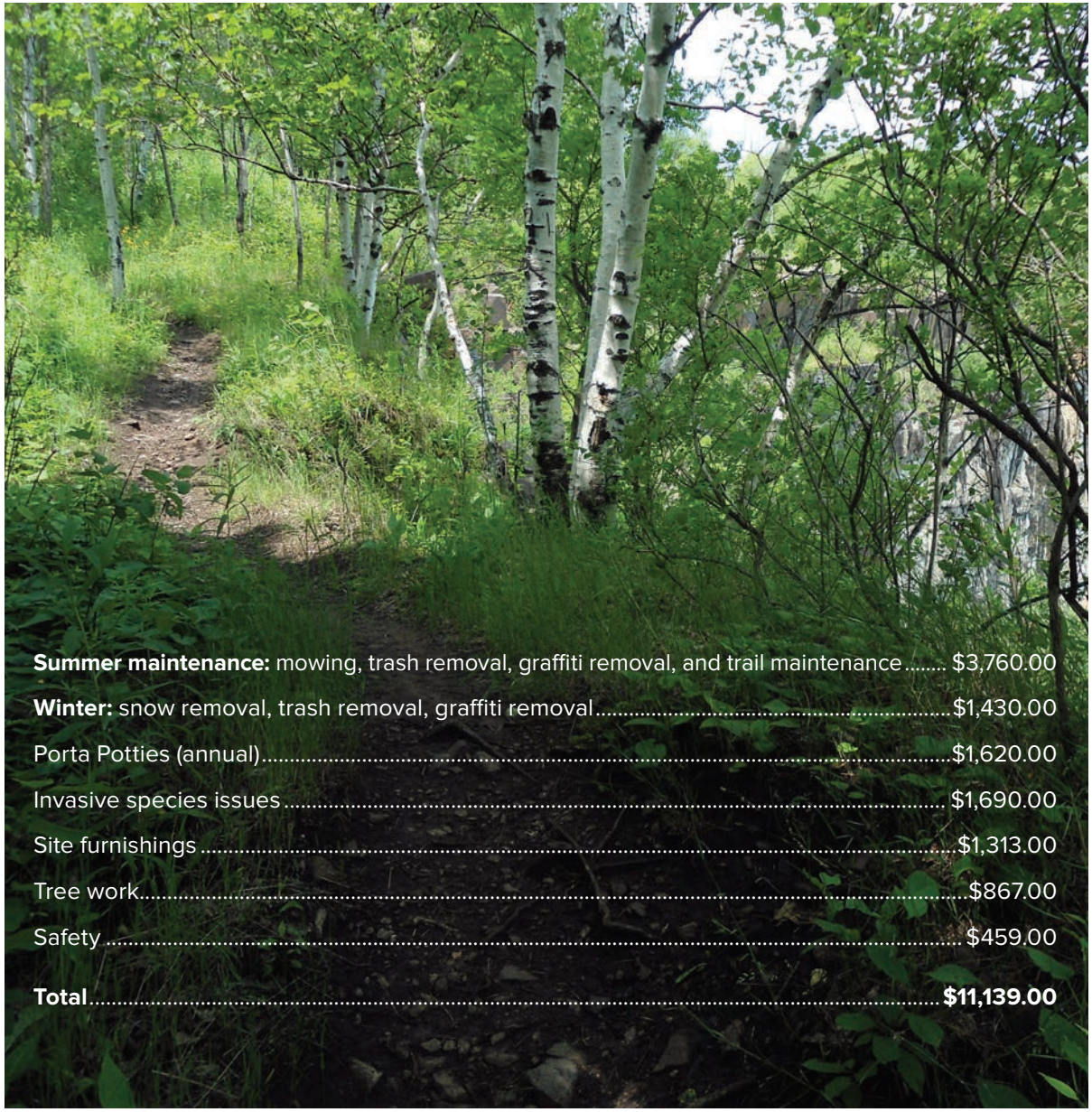
Cost Estimates

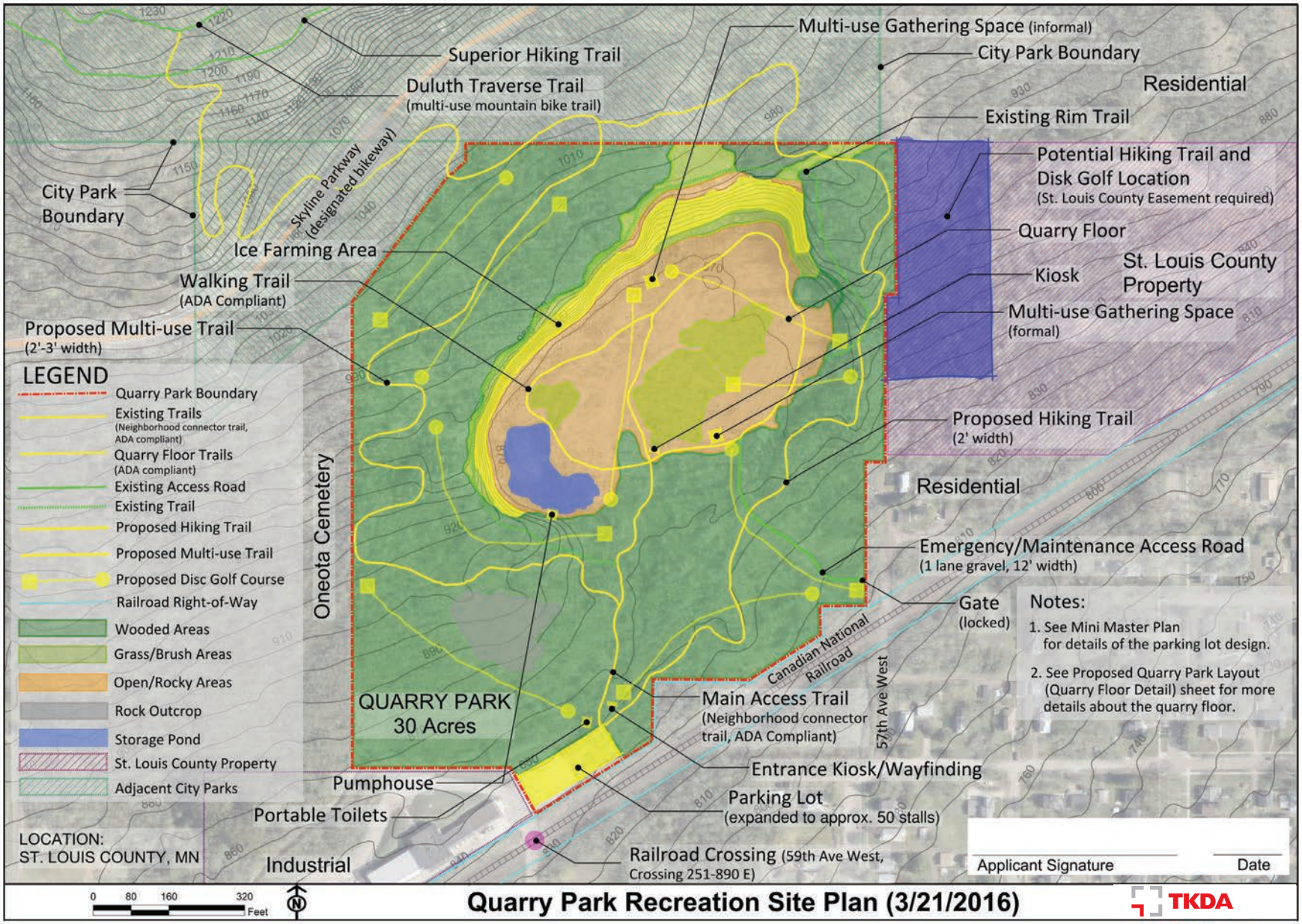
Phase 1 Improvements (1 – 2 YEARS)	Classification	Est. Cost (2016)
Demo/Trash Removal	Safety	$10,000
Standard Amenities (trash receptacles, signage, wayfinding, portable restrooms)	Safety	$4,000
ADA-Accessible Main Trail (59th Avenue trailhead)	Access	$20,000
Emergency Access Improvements	Access	$20,000
Entrance Gate (57th Avenue)	Access	$5,000
Transformer/Electrical Drop (59th Avenue area)	Utility	$8,500
Ice Climbing/Farming	Recreation	$85,000
Storage Pond/Water Feature	Utility	$100,000
Stormwater Controls (channel, berms, culverts)	Stormwater	$10,000
Multi-use Trail Connection	Recreation	$15,000
Disc Golf Course	Recreation	$20,000
Buckthorn/Invasives Removal, Selective Pruning	Vegetation	$20,000
ADA-Accessible Walking Trails (Quarry loop)	Access/Recreation	$15,000
SUB TOTAL		**$332,500**
Contingency, Design, & Administration (25%)		$83,125
PHASE 1 TOTAL (1-2 YEARS)		**$415,625**

Phase 2 Improvements (3 – 5 YEARS)	Classification	Est. Cost (2016)
Hiking Trail Connection	Recreation	$15,000
Parking Lot Expansion	Access	$18,000
Restroom Screening	Safety	$4,000
Lighting (parking lot)	Safety	$10,000
Viewing Platform (top of Quarry, seating)	Recreation	$15,000
Multi-use Gathering Space	Recreation	$40,000
Picnic Tables (accessible)	Recreation	$9,500
Potable Water Source	Utility	$30,000
Geology Study Area	Education	$2,000
SUB TOTAL		**$143,500**
Contingency, Design, & Administration (25%)		$23,125
PHASE 2 TOTAL		**$166,625**

Long-Term Improvements (6 – 10 YEARS)	Classification	Est. Cost (2016)
Off Leash Area	Recreation	$25,000
Bouldering Structures (DCC will pay for construction)	Recreation	$20,000
SUB TOTAL		**$45,000**
Contingency, Design, & Administration (25%)		$11,250
LONG-TERM TOTAL		**$56,250**
TOTAL FOR ALL IMPROVEMENTS		**$638,500**

Annual Maintenance



Summer maintenance: mowing, trash removal, graffiti removal, and trail maintenance	$3,760.00
Winter: snow removal, trash removal, graffiti removal	$1,430.00
Porta Potties (annual)	$1,620.00
Invasive species issues	$1,690.00
Site furnishings	$1,313.00
Tree work	$867.00
Safety	$459.00
Total	**$11,139.00**

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