

Mining The Past



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Design Thesis | Spring 2012

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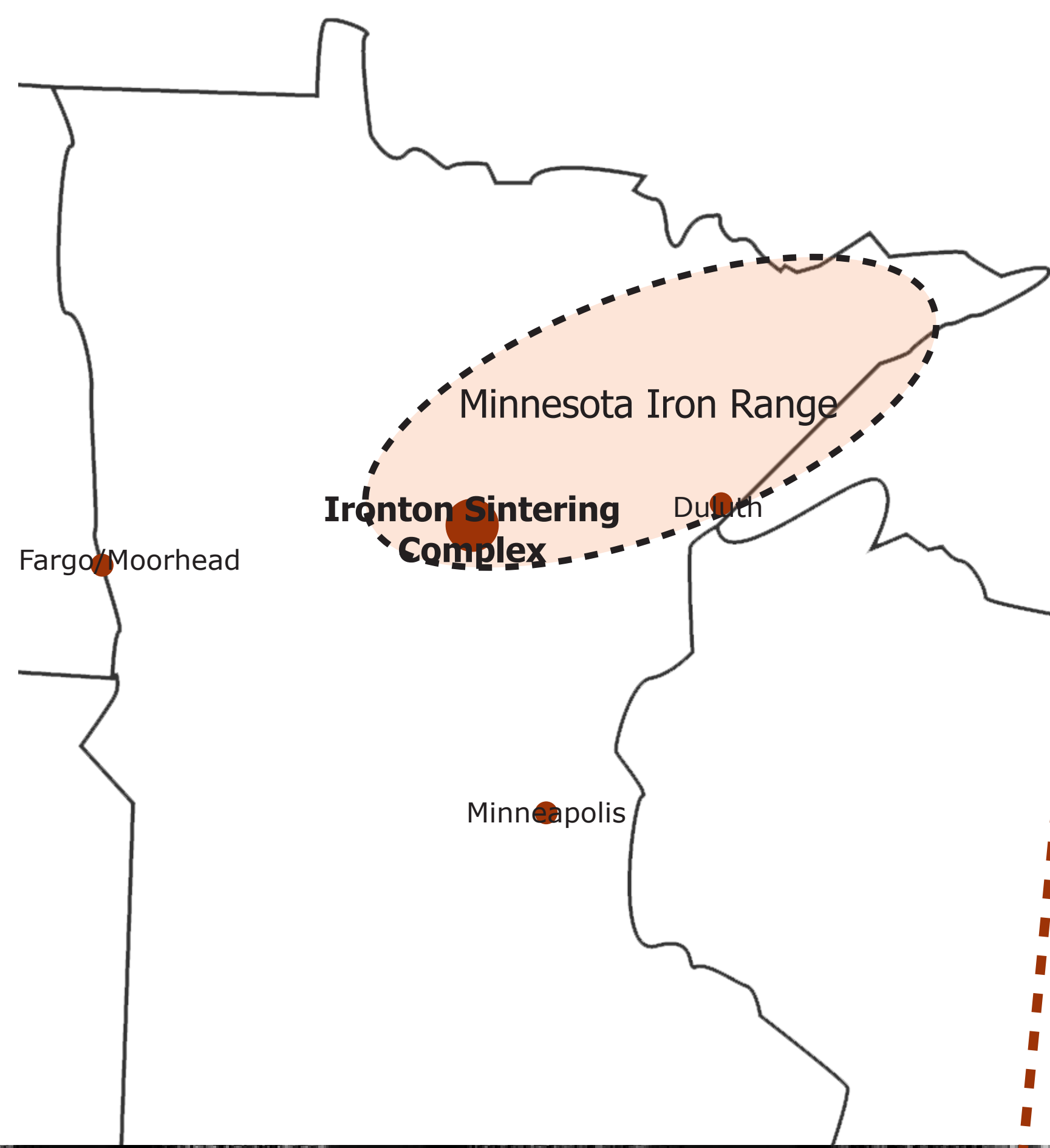


How can landscape architecture be used to reclaim and re-purpose former iron mining sites in order to preserve cultural identities?

about:

- > Reclamation-Based
- > Exemplification of History and Culture
- > Enrichment
- > Tourist Attraction
- > Strengthened Bond Between Past and Present
- > Growing Cultural Pride

Context



- > Ironton Sintering Complex
- > 35 Acre Site
- > National Register of Historic Places
- > No Longer In Use
- > Town Population: ~3,000
- > Climate similar to Fargo

Site



Crosby, MN

Ironton, MN

why here?

- > Industrial History
- > Regional Culture
- > Natural Beauty

Iron Range

History.....>



- The first ore to be commercially mined from the region came from the Soudan Mine opened by the Minnesota Iron Company in **1884**.
- The iron mining drew immigrants from all over the world including **Finland, Sweden, Italy, Norway and Croatia** and by **1900** nearly **70%** of mine workers were **foreign-born**.
- By the early **1900s** the Iron Range contained the largest variety of immigrants outside the Twin Cities
- As mining operations increased, new towns were **founded** and existing ones **grew exponentially** spurring the **development** of the Iron Range.
- Currently, mining operations have slowed and the economy of the region is in a state of **transition**.

Iron Range

Culture.....>



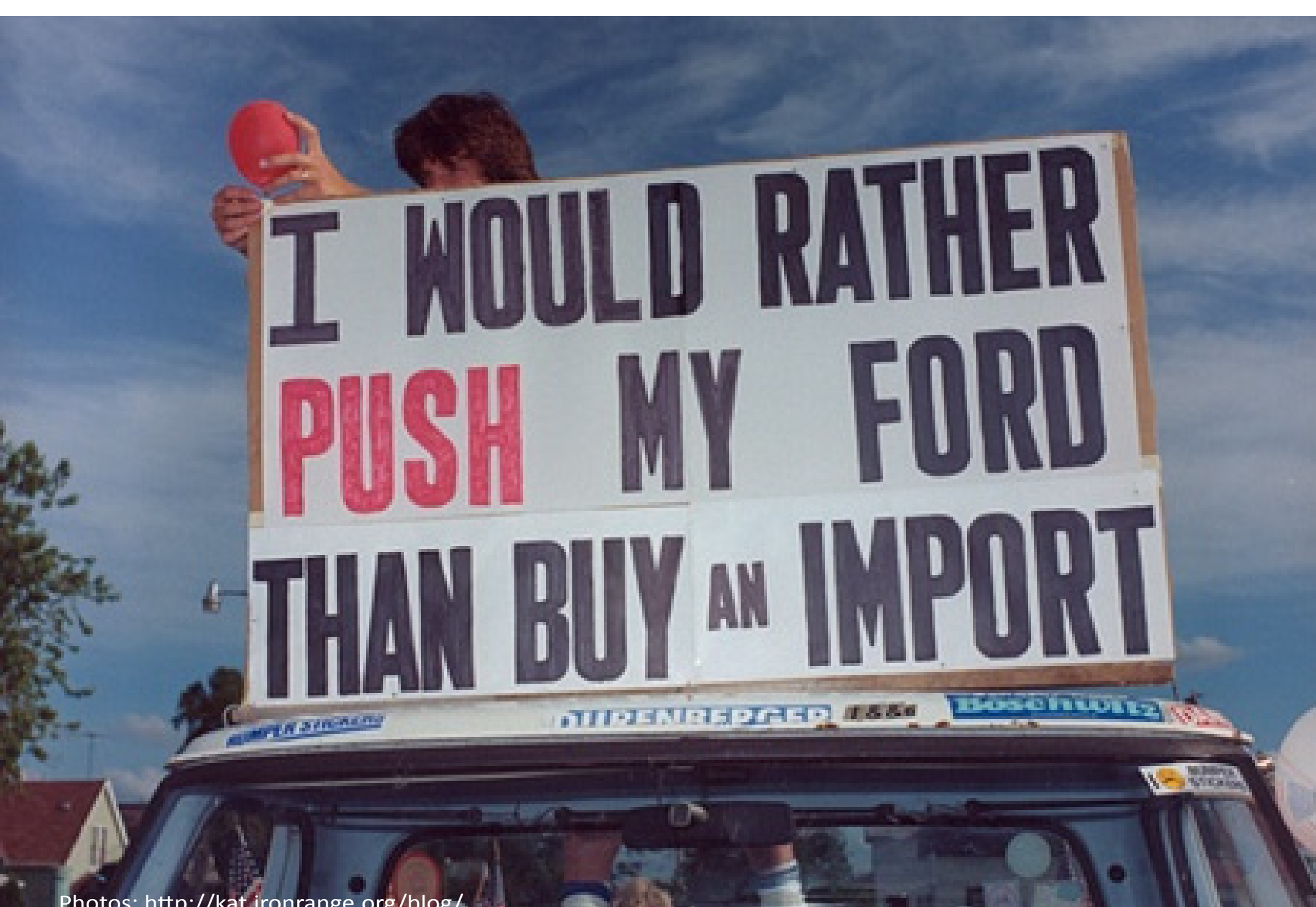
History

- > The modern history of “Da’ Range,” as the locals call it, can fit into roughly five generations. With such a young history it is no wonder the population is so well connected to its past. Practices started out of necessity, such as back-yard gardening and community meetings, have been passed down from generation to generation. People from The Range have a strong sense of pride and identity.



Outdoors

- > The Iron Range holds some of Minnesota’s most beautiful natural landscapes. Rolling hills, rocky shores, bountiful forests and numerous lakes have instilled within the people a strong connection to the outdoors. Activities ranging from biking to hunting/fishing and boating are all practiced in abundance throughout the region.



Patriotism

- > For Iron Rangers, as they call themselves, dedication to the country that has provided for them is a thing of pride and is celebrated heavily throughout the region.



Photos: <http://kat.ironrange.org/blog/>



Saturday, April 9
9 A.M. - 5 P.M.

Celebrating local traditions and practical resources for sustainable living

In Mtn. Iron along the Hwy 169 corridor:
Mtn. Iron Community Center
Merritt Elementary School
Messiah Lutheran Church

\$2 Admission
Kids under 18 admitted FREE
Admission is FREE
Between 9 a.m. and 3 p.m.
with an acceptable recyclable*

- Youth Activities**
- Demonstrations**
- Exhibits • Vendors**
- Local foods • Speakers**

Watch for our Sustainability Guide & event schedule inserted in Hometown Focus

***Accepted recyclables includes:**
Monitors/terminals, CPUs, Laptops, Docking stations, Printer/toner cartridges, Copy and Fax machines, Printers, TVs, MP3 players/iPods, Cellular and hard wire phones, Circuit boards, Wire and cabling, Cash registers, Keyboards/mice, AV equipment, Stereo equipment, Video boards, Glucose testers, Game consoles, DVD/VHS players, Networking equipment, Other computer peripherals, GPS units



PRESENTED BY

SPONSORED BY

Club Mesabi • Natural Harvest • Northeast Entrepreneur Fund • Eveleth-Gilbert, Mtn. Iron-Buhl, Virginia Community Education • Duluth Energy Efficiency Program • Mesabi Daily News • Hibbing Daily Tribune • Grand Rapids Herald-Review

For more info go to www.ironrangeearthfest.org or call Connie Olson at 218-742-9504

photo: <http://ironrangeearthfest.files.wordpress.com/2011/03/ef-poster-2011.jpg>

Community

> Nearly all of the small towns throughout the Iron Range organize community events ranging from the Mardi Gras-like 4th of July celebrations to the cultural Land of the Loon Festival. Parades, crafts and traditional food are always a large draw for locals as well as tourists.



photo: <http://www.landoftheloonfestival.com/parade/>

January
Night Sky of the Northwoods

February
Laskianen Finnish Sliding Fest
Full Moon Snowshoe Hike

March
Eveleth Puck Days
Pepsi Challenge Cross Country
Ski Race

April
Iron Range Earth Fest

May
Bob Dylan Days

June
Land of the Loon Fest

July
Northern Lights Music Fest
Aurora Patriotic Days
Fourth of July Celebrations

August
Great River Energy Mesabi
Trail Tour

September
Wirtanen Pioneer Farm Fest
Housekeeping Olympics

October
Night Sky of Northwoods
Halloween Carnival

November
Iron Stories

December
Weihnachtsfest
Balkan holiday Bazaar
Holiday Heritage Fest
Winter Solstice Celebration

Site **Information**

Analysis.....>

Site Photos



Current Entry
-uninviting
-nondescript



Former Sintering Furnace
-overgrown
-in need of minor repair
-a lot of character



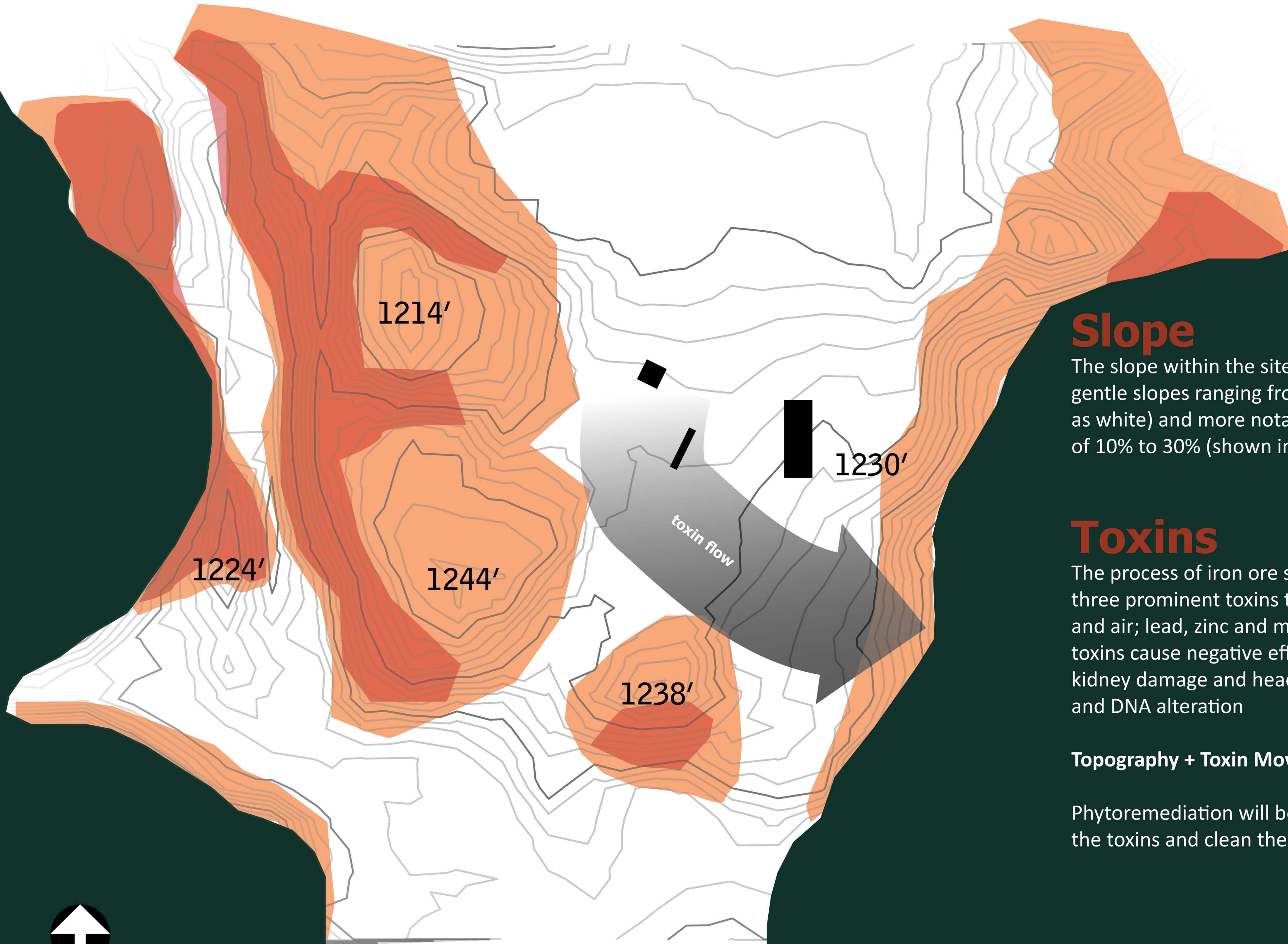
Former Sintering Elevator
-in disrepair
-overgrown
-a lot of character



Current Landscape
-undefined
-unkempt



Former Sintering Warehouse
-in disrepair
-full of debris/garbage
-a lot of character



Slope

The slope within the site ranges from gentle slopes ranging from 0%-5% (shown as white) and more notable slopes upwards of 10% to 30% (shown in red).

Toxins

The process of iron ore sintering produces three prominent toxins that enter the soil and air; lead, zinc and mercury. These toxins cause negative effects ranging from kidney damage and headaches to blindness and DNA alteration

Topography + Toxin Movement = Location

Phytoremediation will be used to uptake the toxins and clean the soil.



What's the Plan?



Gateway to the Range:

- > A place that exemplifies history and culture
- > Creates a source of pride for locals
- > Jump off point for tourists
- > Community Involvement

A Living Museum:

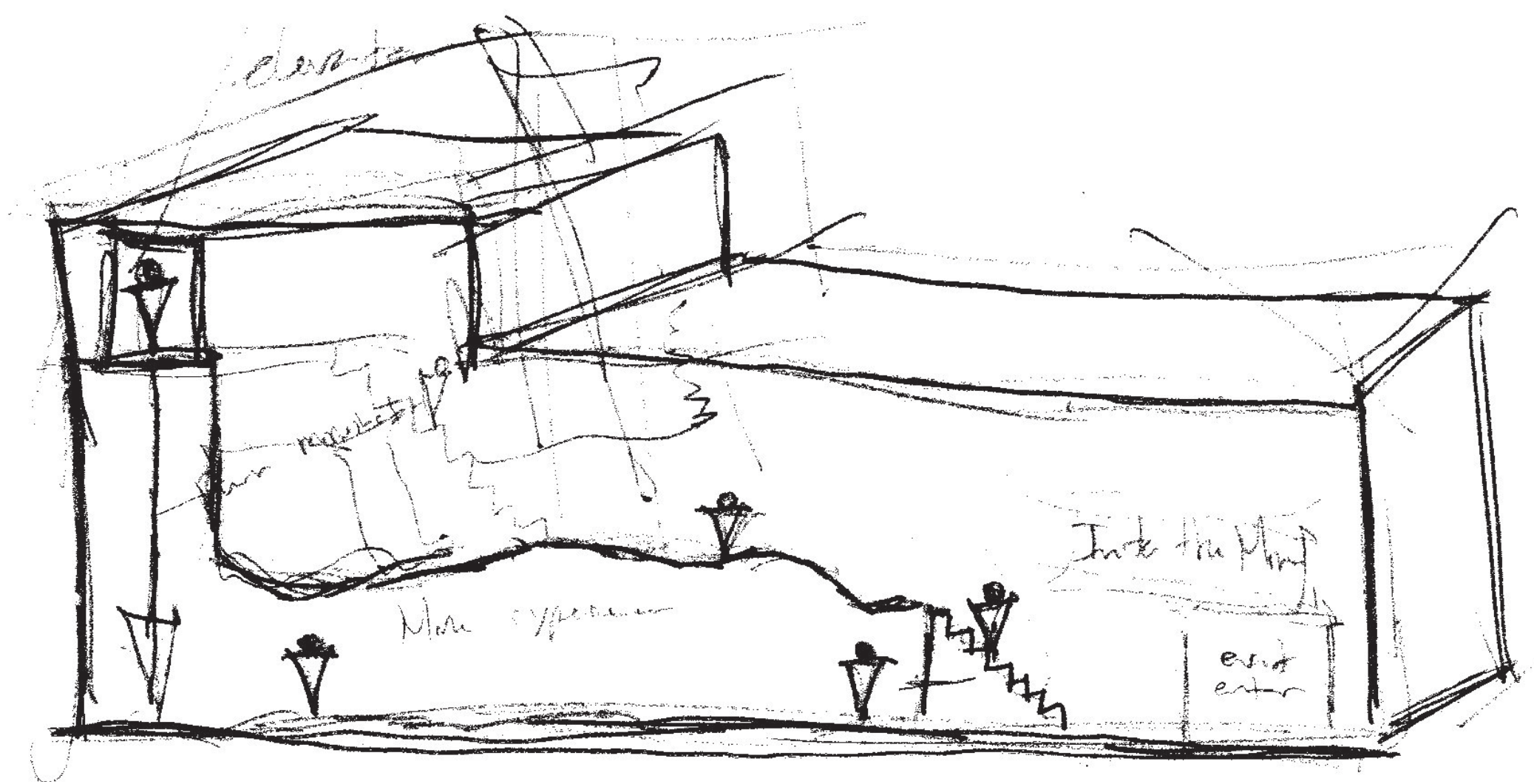
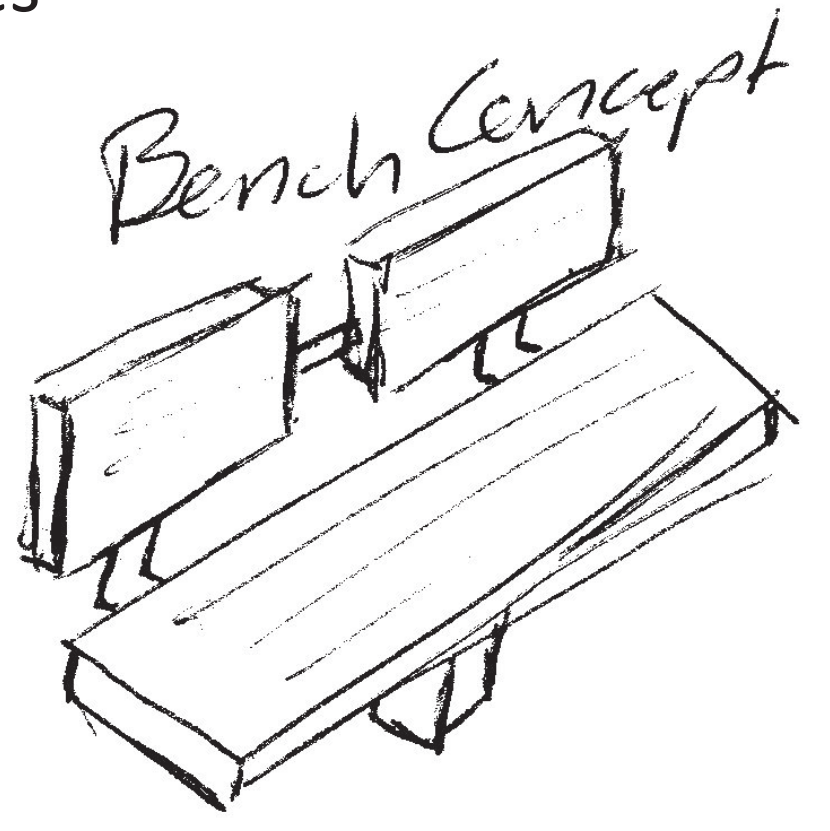
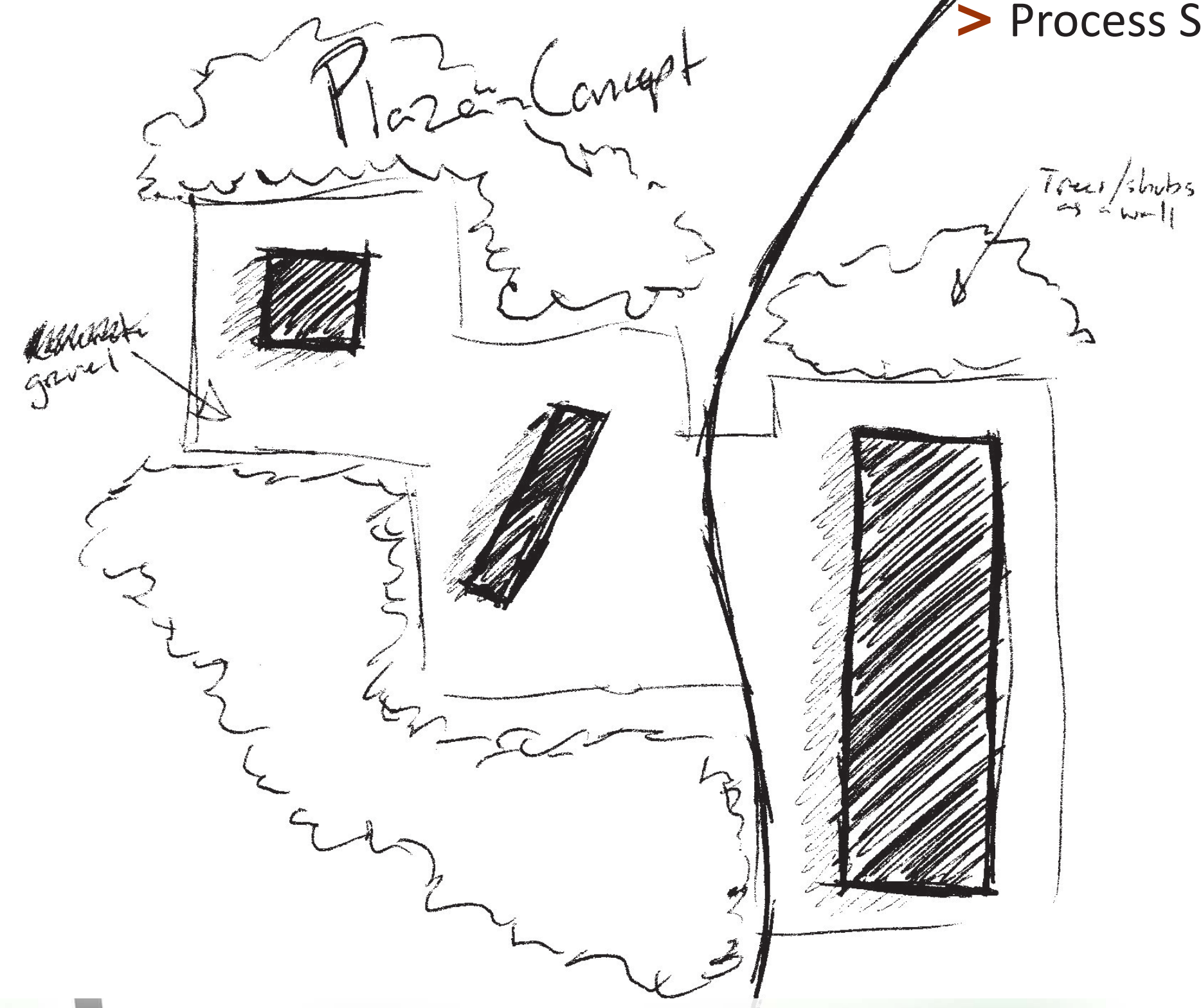
- > Trail system
- > Interactive exhibits that change through the year
- > A Changing cultural focus
- > Community Involvement

Clean-Up:

- > Uptake and neutralization of toxins
- > Minimal impact on existing ecology
- > Aesthetically pleasing

Initial Concepts

> Process Sketches



> "Full Immersion" Concept



> Entry Concept



> Park Design at Midterm

Design

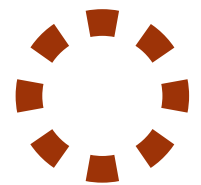
Proposal



Cohesive Design

master plan

Portsmouth Mine
Discovery Park



Discovery Trail
(Primary)



Discovery Trail
(Secondary)



- > Connection to community
- > Embraces three core concepts
- > Takes advantage of natural landscape
- > Minimal impact on natural environment



Entry

A defined entrance greets visitors as they enter Portsmouth Mine Discovery Park. The theme of the entrance, like that of the park as a whole, reflects the industrial heritage of the region in both material and form. The added vegetation symbolizes the regrowth of damaged ecologies while adding further aesthetic appeal and definition.



A New
Gateway
to The Range



Portsmouth Mine Discovery Park

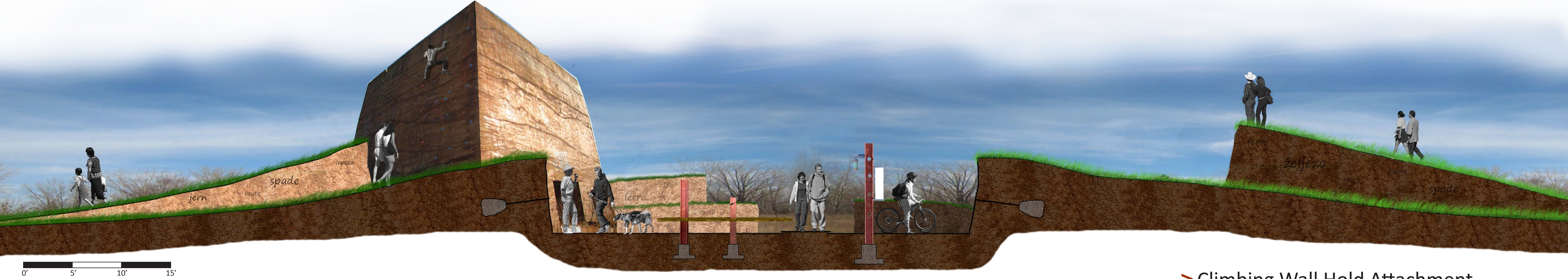
Ironton, Minnesota



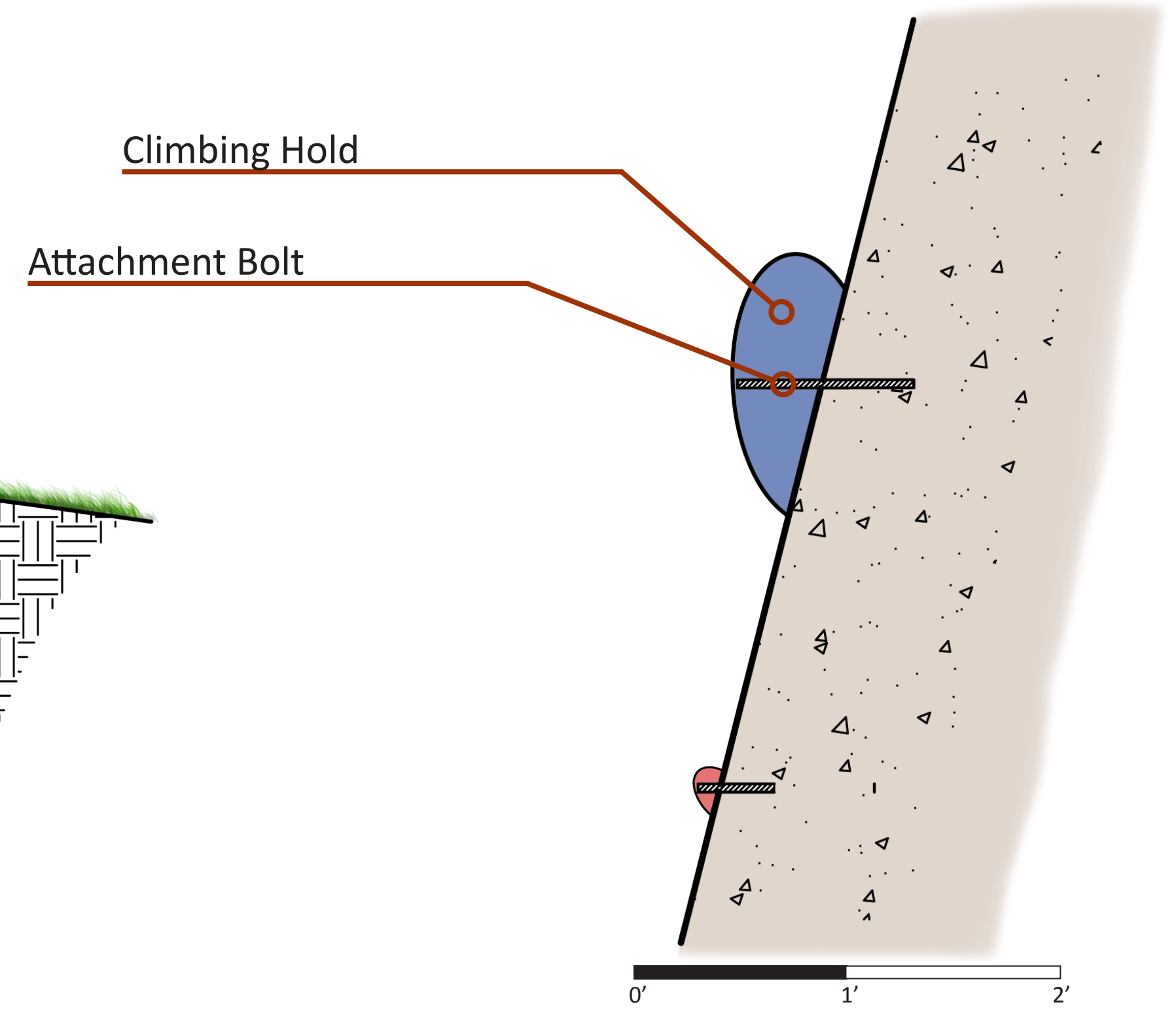
- > **Sculpted Landscape**
-provides definition, reminiscent of pit mines
- > **Public gathering space**
-farmers markets, craft fairs, festivals and events
- > **Tourism information**
-maps, trip planning, itineraries, events calendars
- > **Adapted Structures**
-climbing wall, cultural mural, immersion museum
- > **Toxin Remediation**
-holistic cleaning of sintering toxins and parking runoff

Gateway to **the Range**

sculpted landscape

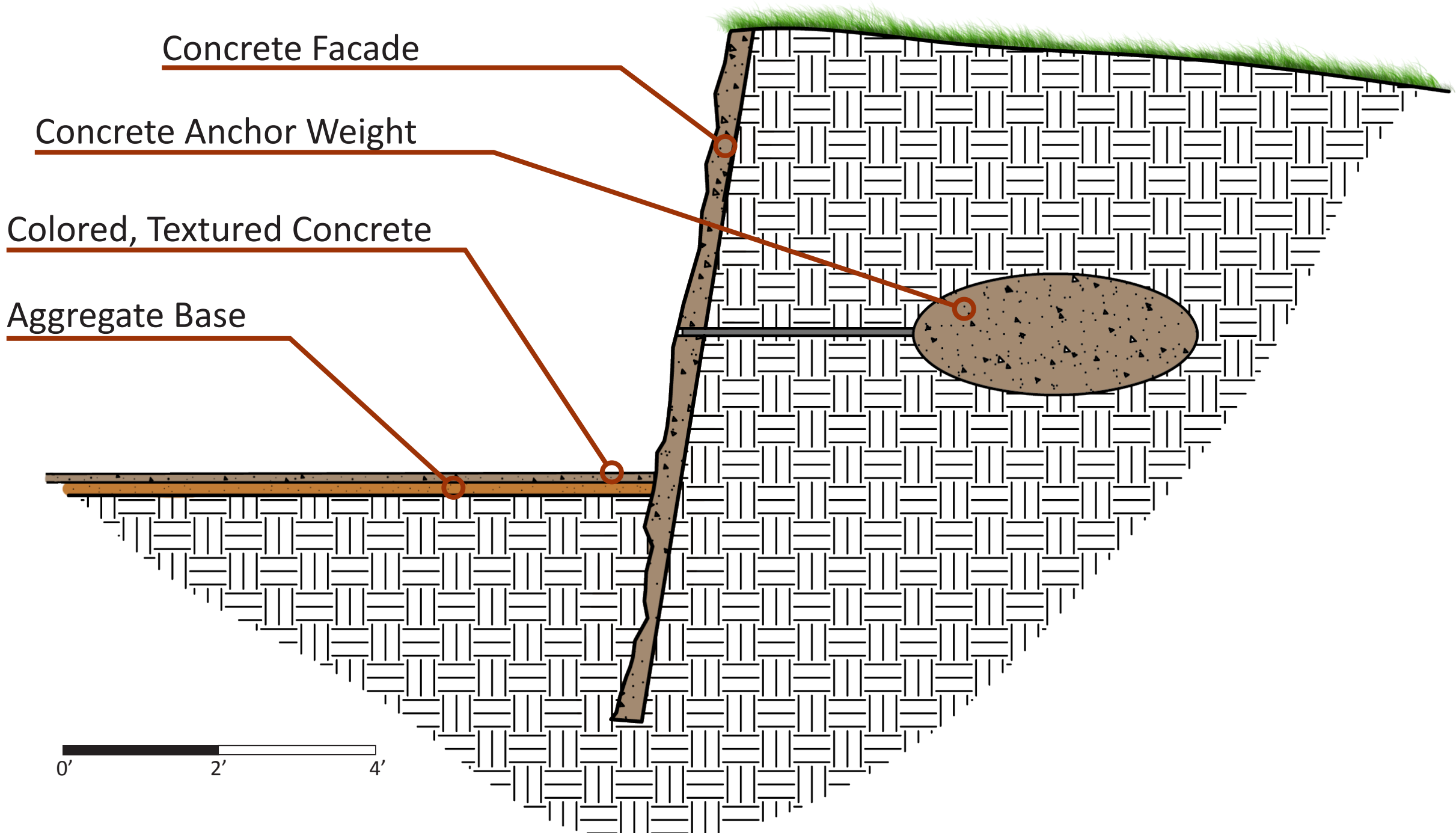


> Climbing Wall Hold Attachment



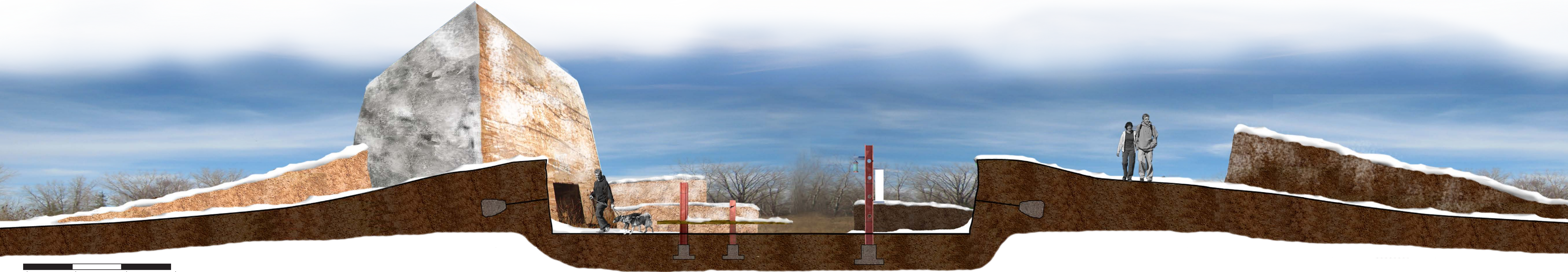
- > Terraces built to 4'-6' in height
- > Sheet-piling wall construction with concrete faux-dirt, concrete facade
- > Former sintering furnace re-imagined as a climbing wall with new routes added monthly.

> Terrace Retaining Wall



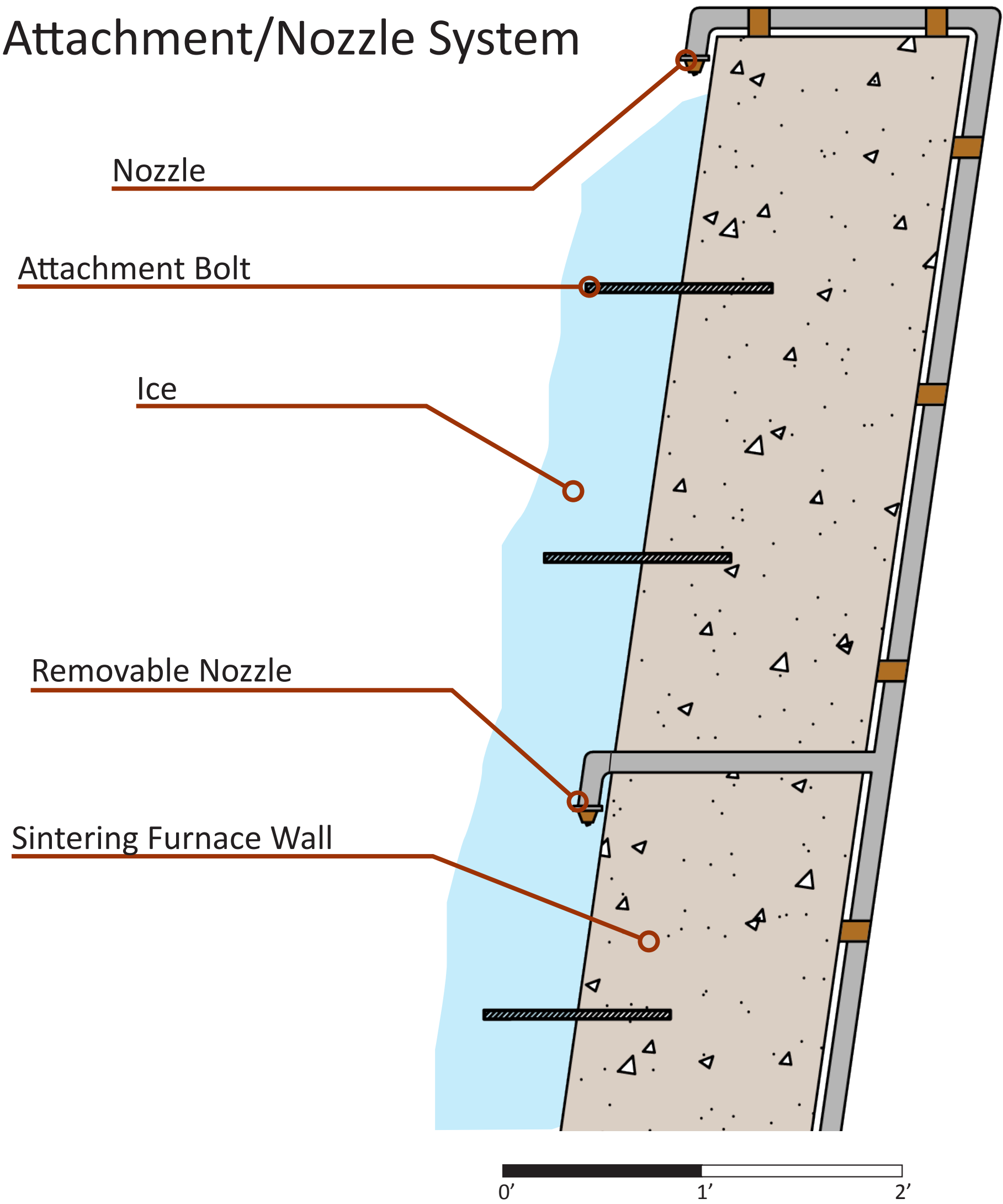
Gateway to **the Range**

sculpted landscape



> Ice Climbing Wall Attachment/Nozzle System

- > Terraces allow for sledding, skiing and snowboarding (particularly for children)
- > Climbing wall adapts for ice climbing
- > Ice wall is carefully built using a system of removable nozzles



Gateway to **the Range**

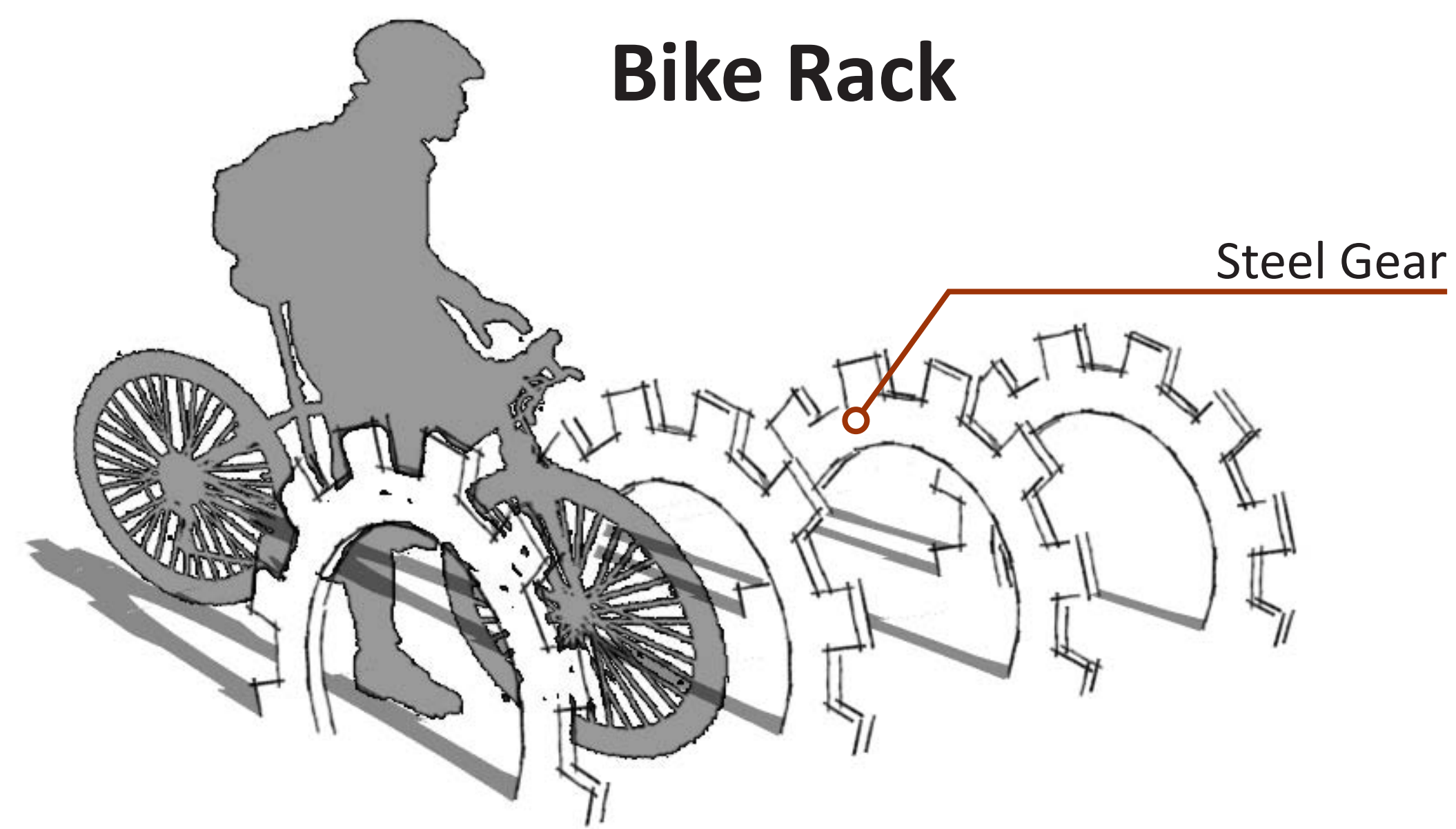
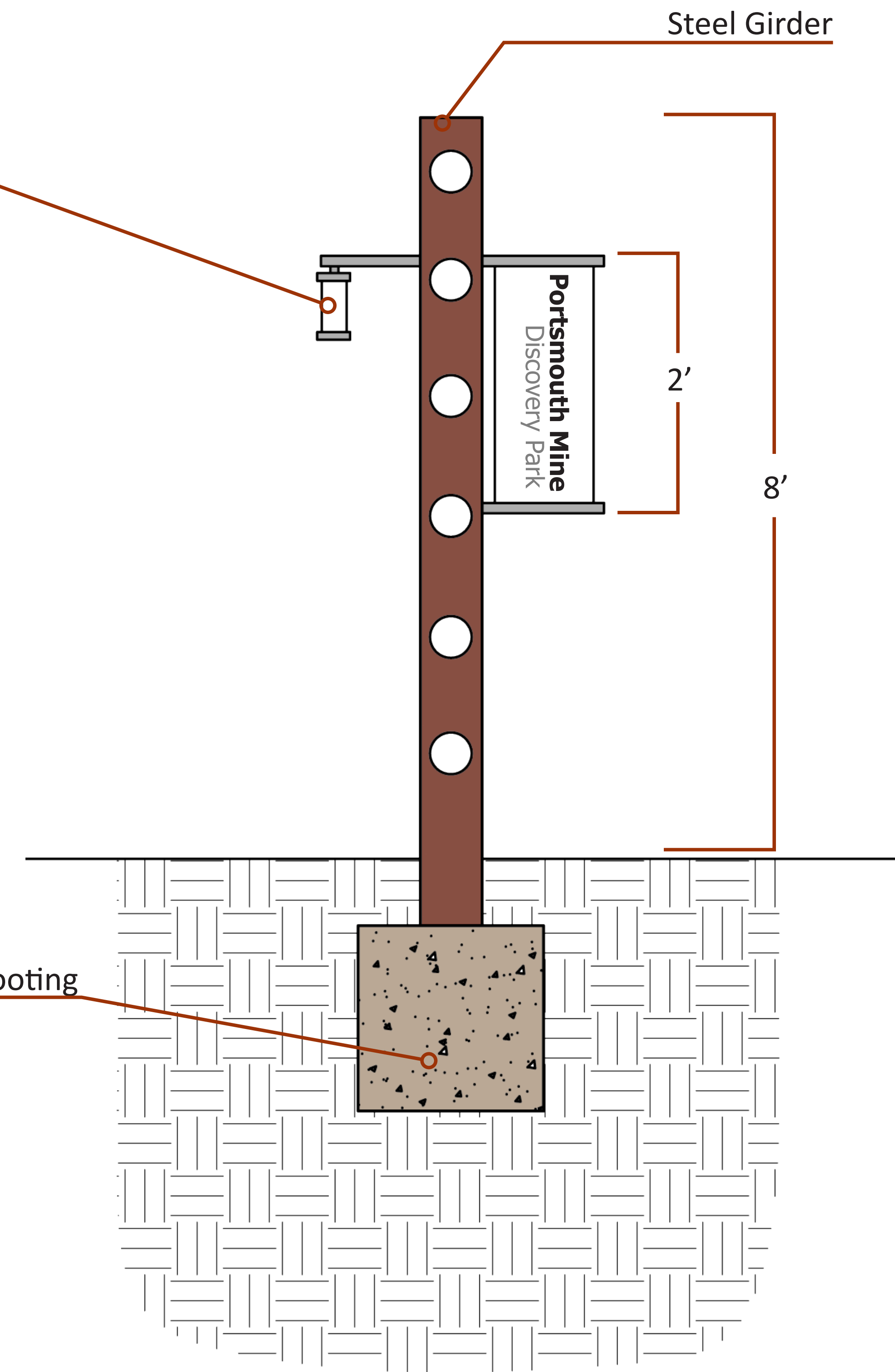
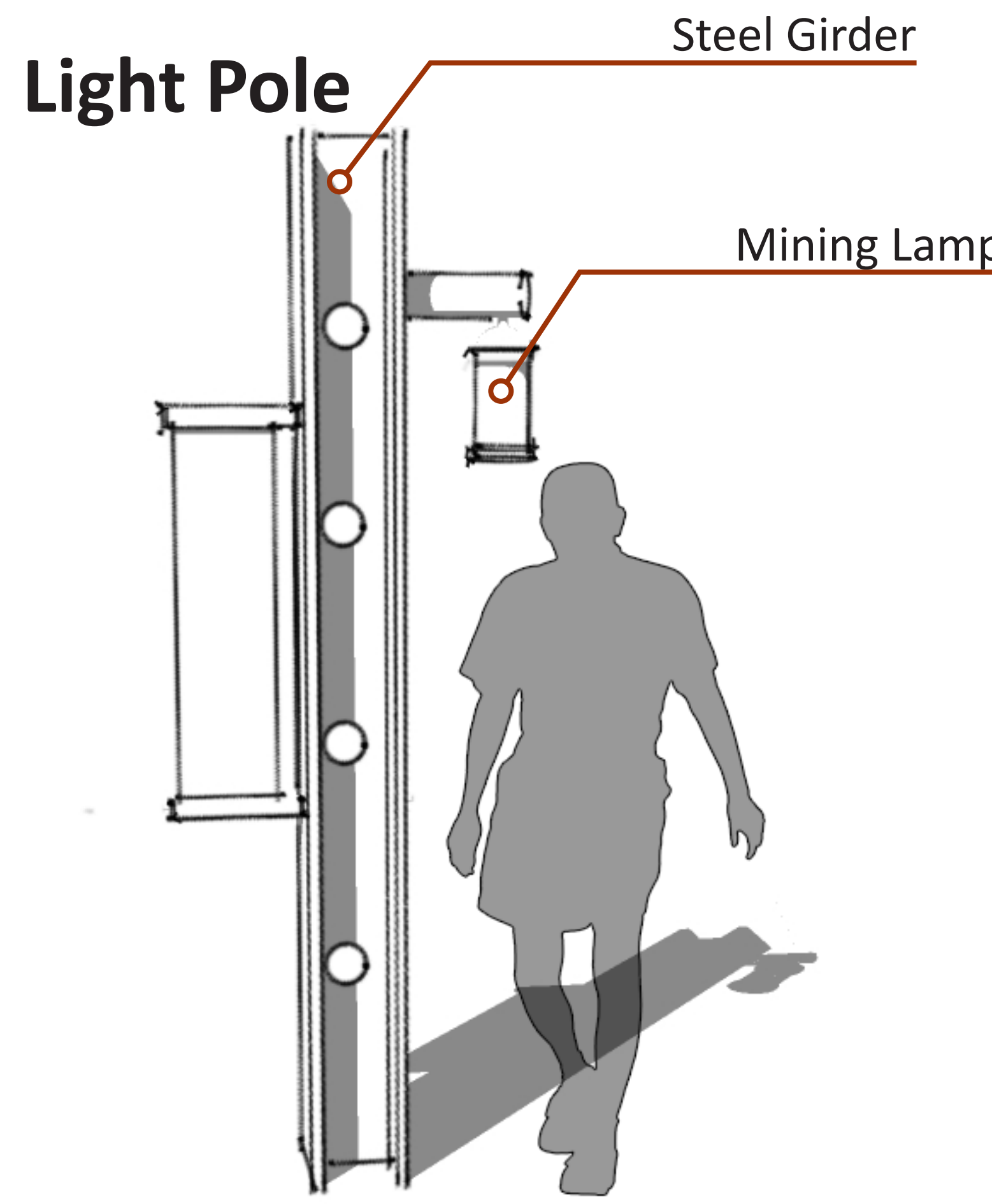
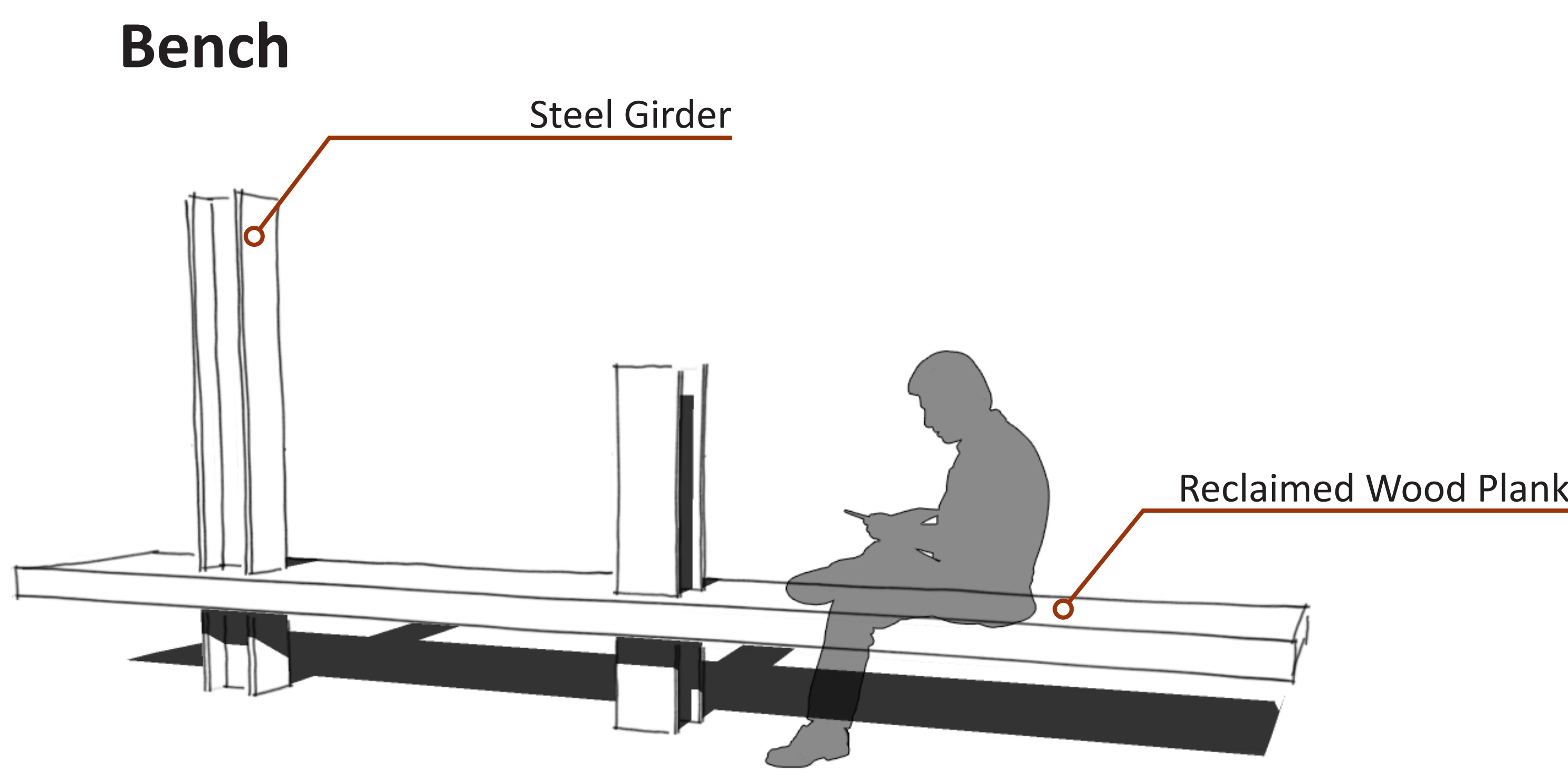
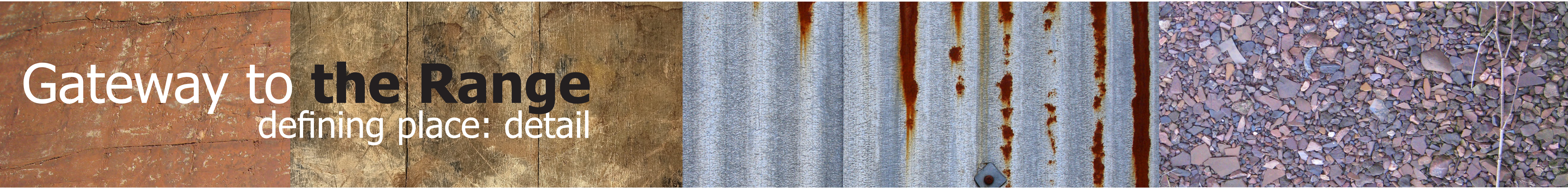
defining place: Material



- > Reclaimed and Donated Materials
- > Industrial materials and form reflect sites history
- > The words for “iron”, “shovel”, “ore” and others are imprinted within the concrete in the native languages of the regional immigrant groups.
- > Red maples, sparsely planted throughout the central gathering space, will bear vibrant red fall color representing the redness of iron ore.

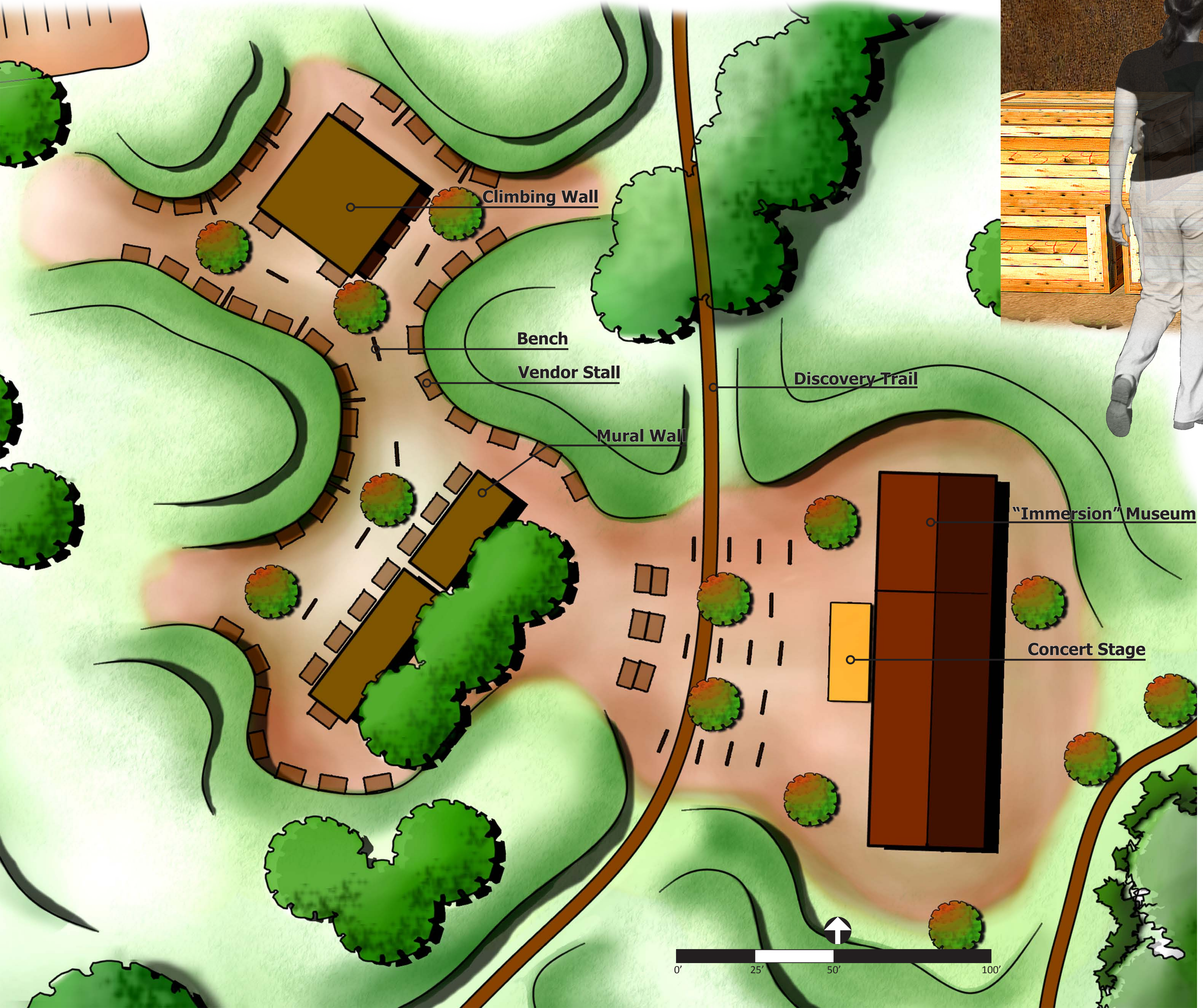
Gateway to **the Range**

defining place: detail



Gateway to the Range

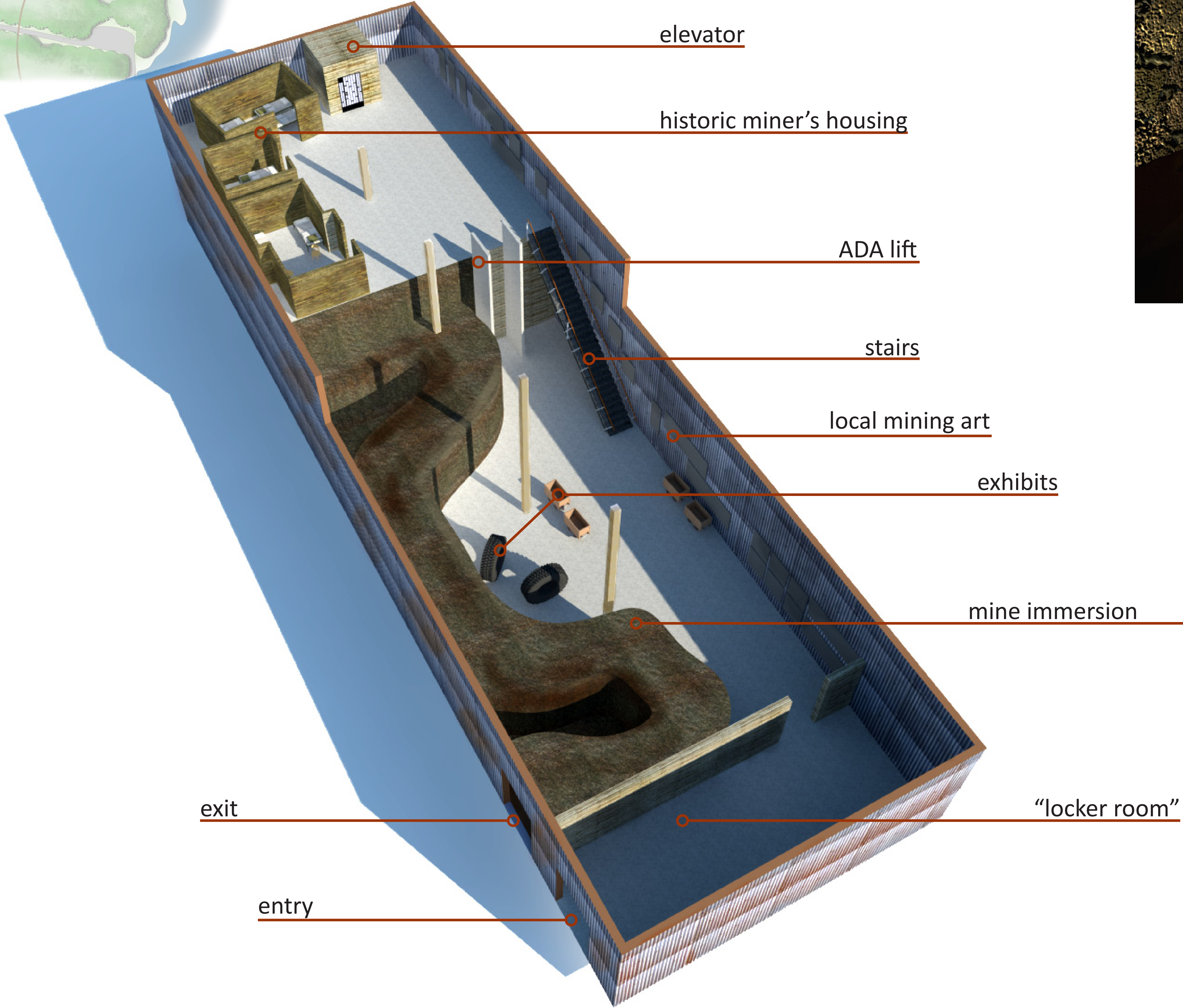
event space



- > Central gathering space hosts markets, concerts and other events
- > Local music, crafts and food are promoted improving the local economy and attracting future visitors
- > Terraces act as natural backdrops for vendor stalls while spatially defining the event

Living Museum

immersion gallery



- > “Starting point” of the Living Museum
- > Visitors don coveralls and miners hats before entering the gallery space
- > Gallery space features traditional company-provided housing, art, historic elements and large-scale exhibits rotating on a cultural calendar
- > Visitors experience a “full immersion” experience in a mock-mine

Toxin Cleanup

concept

Iron Ore Sintering

produces

**Lead
Mercury
Zinc**

causes

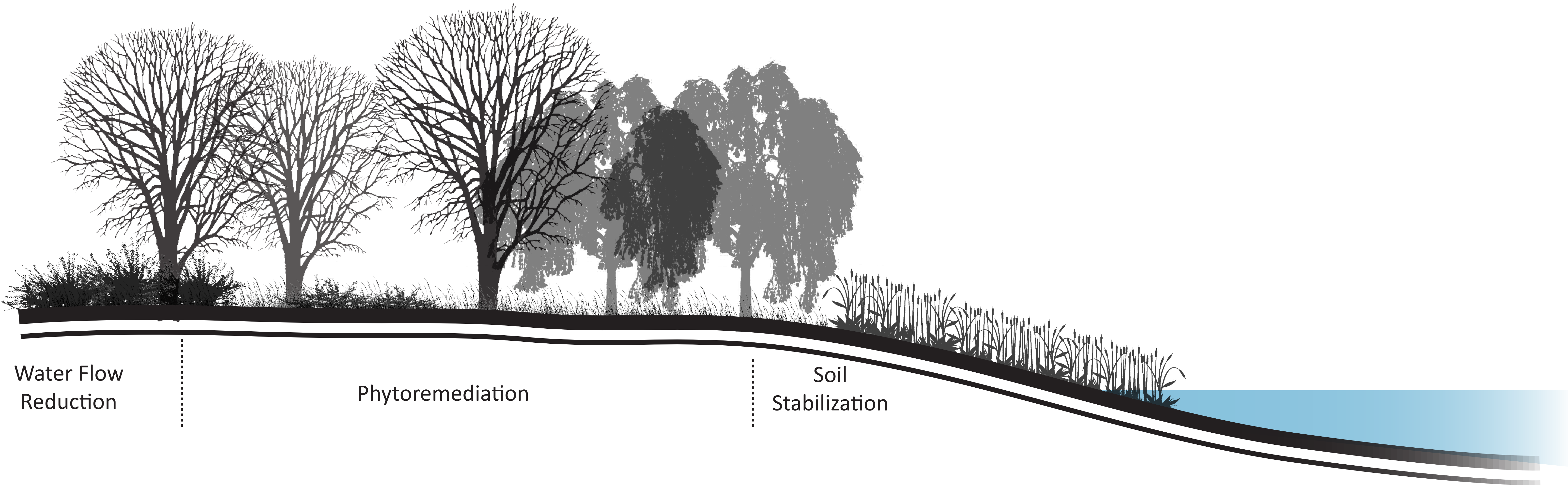
**Anemia
Deafness
Kidney Damage
Rashes
DNA Alteration
...and more**

Solution

**Phyto
remediation**

Effect

**Clean Water
Clean Soil
Healthy
Environment
Healthy People
Education**



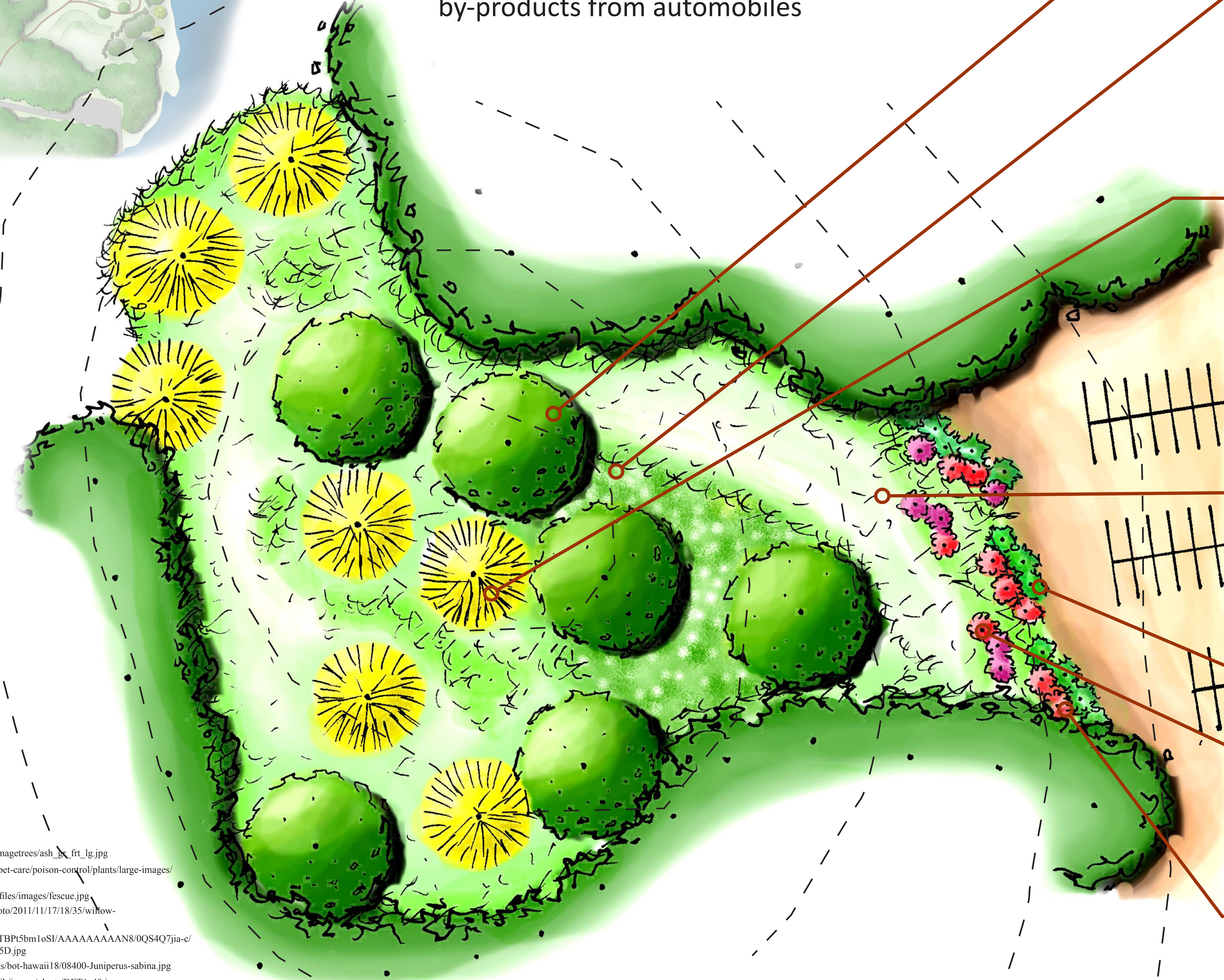
- > Gardens are aesthetically pleasing while functional
- > Designed to slow the flow of water, remediate toxins and stabilize the soil
- > Planted with native plants well suited for the local soil typology
- > Annual testing of water, soil and plant material
- > Plants burnt at end of life cycle with toxins separated from ashes

Toxin Cleanup

parking remediation



- > Placed at a natural low point with drainage from the primary parking lot
- > Garden focuses on the uptake of petroleum by-products from automobiles



> **Green Ash**
Fraxinus pennsylvanica
Tolerant to Petroleum



> **English Ivy**
Hedera helix
Toxin Uptake: Carbon Monoxide, Petroleum
Hyperaccumulator, Phytoextraction



> **Golden Weeping Willow**
Salix abla "Tristis"
Toxin Uptake: Mercury, Lead, Zinc
Phytostabilization, Phytoextraction, Phytodegradation, Rhizodegradation, Phytovolatilization



> **Tall Fescue**
Festuca arundinacea
Toxin Uptake: Lead, Zinc, Diesel Fuel
Accumulator, Phytoextraction, Rhizodegradation



Savin Juniper
Juniperus sabina



Diablo Ninebark
Physocarpus opulifolius "Diabolo"



American Winterberry
Ilex verticillata



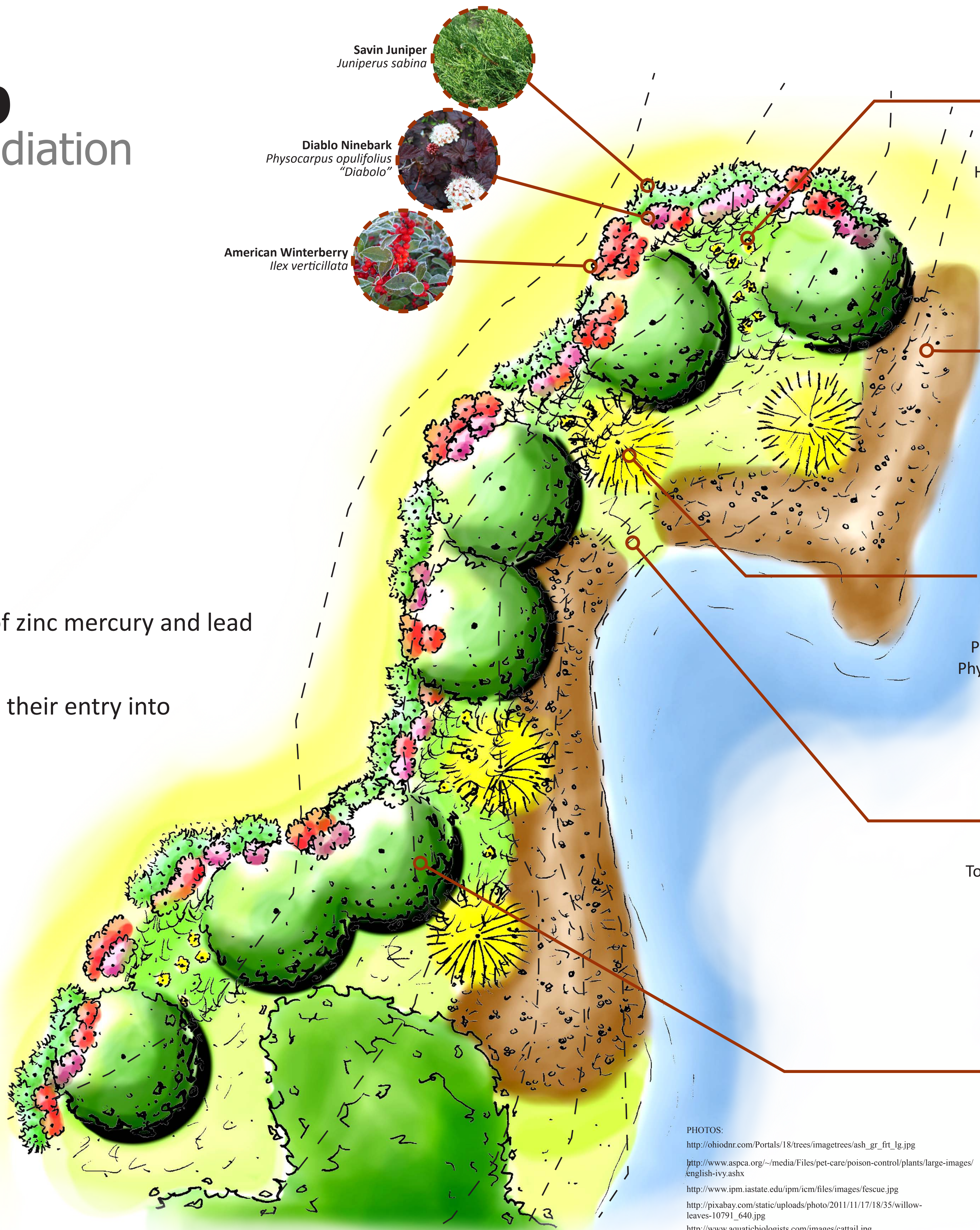
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<http://www.ipm.iastate.edu/ipm/icm/files/images/fescue.jpg>
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<http://luirig.altervista.org/cpm/albums/bot-hawaii18/08400-Juniperus-sabina.jpg>
http://www.abnativeplants.com/_ccLib/image/plants/DETA-40.jpg

Toxin Cleanup

toxin remediation



- > Garden focuses on the uptake of zinc mercury and lead
- > Stops the movement of toxins and their entry into Portsmouth Mine Pit Lake



- Savin Juniper
Juniperus sabina
- Diablo Ninebark
Physocarpus opulifolius
"Diabolo"
- American Winterberry
Ilex verticillata

> **Sunflower**
Helianthus annuus
Toxin Uptake: Lead, Zinc
Hyperaccumulator, Phytoextraction,
Rhizofiltration



> **Cattail**
Typha latifolia L
Toxin Uptake: Lead
Hyperaccumulator,
Phytostabilization



> **Golden Weeping Willow**
Salix abla "Tristis"
Toxin Uptake: Mercury, Lead, Zinc
Phytostabilization, Phytoextraction,
Phytodegradation, Rhizodegradation,
Phytovolatilization



> **Tall Fescue**
Festuca arundinacea
Toxin Uptake: Lead, Zinc, Diesel Fuel
Accumulator, Phytoextraction,
Rhizodegradation



> **Eastern Cottonwood**
Populous deltoides
Toxin Uptake: Lead, Mercury, Zinc
Accumulator



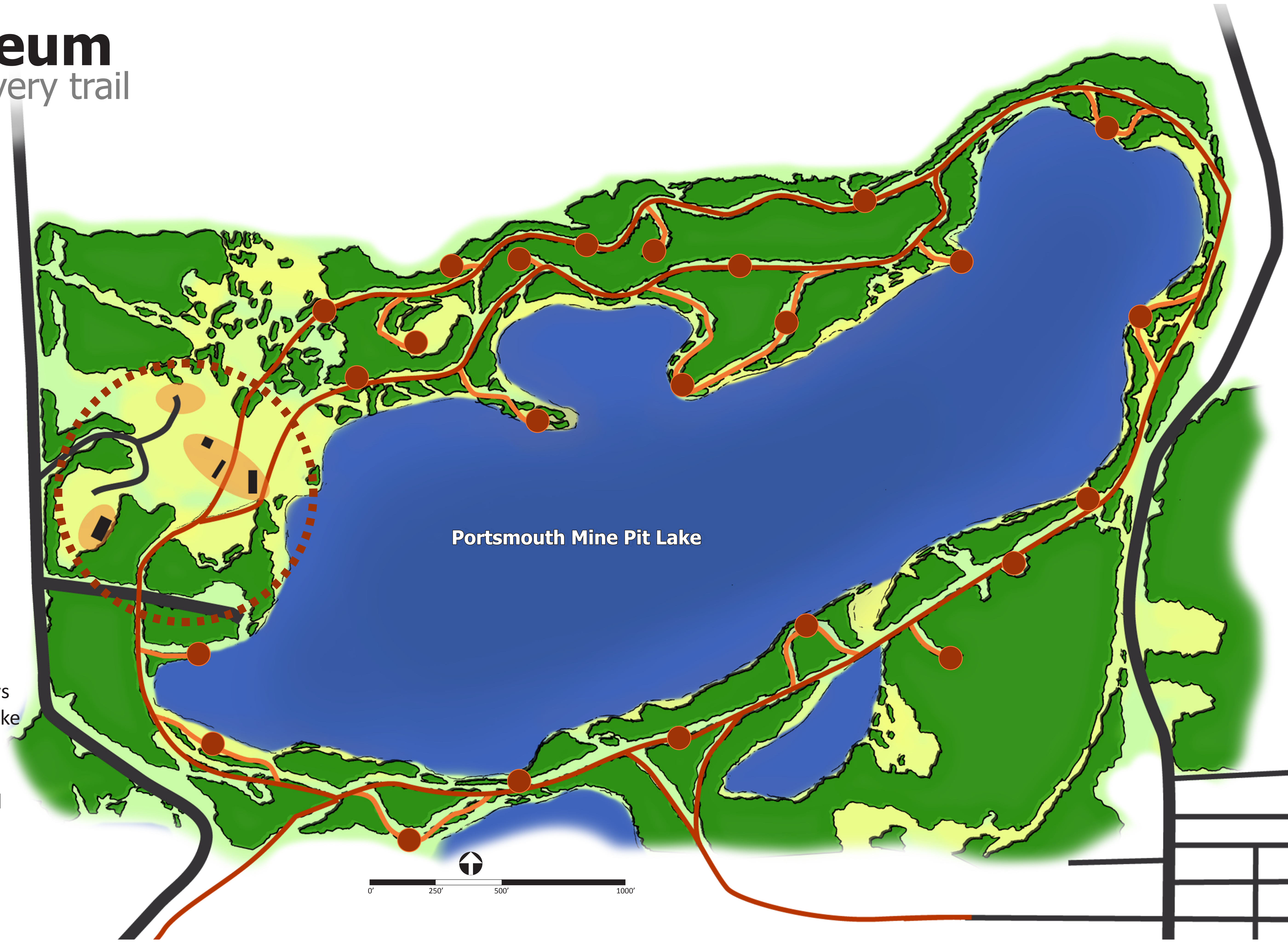
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<http://orchidflowers.files.wordpress.com/2011/02/sunflower1.jpg>

Living Museum

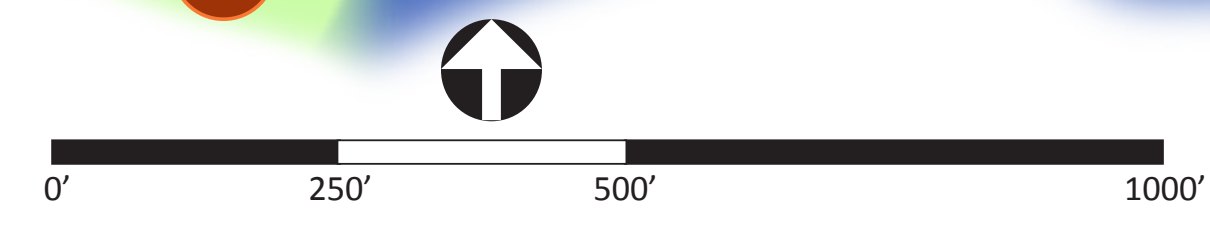
discovery trail

- Portsmouth Mine Discovery Park 
- Discovery Trail (Primary) 
- Discovery Trail (Tertiary) 
- "Discoverable" 

- > 2.5 mile trail
- > Connects to existing trail systems
- > Trail takes advantage of natural landscape for views of Portsmouth Mine Pit Lake and surrounding forests
- > 24 "discoverables" located within 5 minutes of each other by foot



Portsmouth Mine Pit Lake



Living Museum

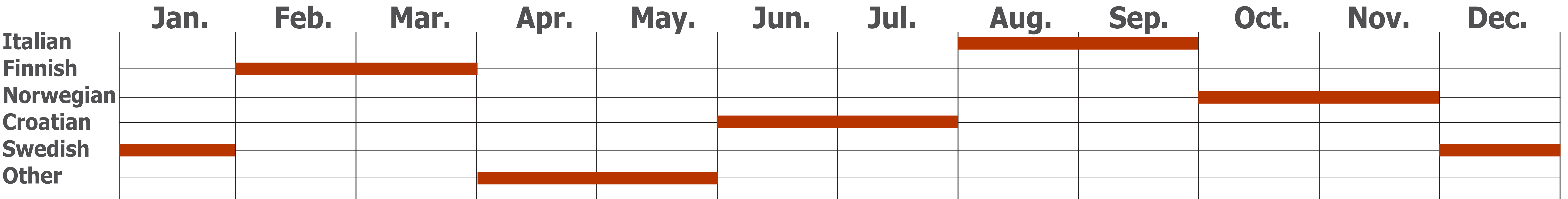
discoverables



- > “discoverables” range in theme from current and historic mining to cultural elements such as Norwegian wood sculptures
- > Some change in theme based on the seasons and a rotating cultural calendar
- > Signage provides further information on exhibits and how they relate to the Iron Range

Living **Museum**

cultural calendar



- > Each major cultural group is given a two-month period of focus
- > Smaller cultural groups are given the same two-month period rotating year to year
- > Organized events and activities will reflect the culture of the time

Living Museum

cultural calendar

DECEMBER/
JANUARY

Dog Sledding



SnowShoeing



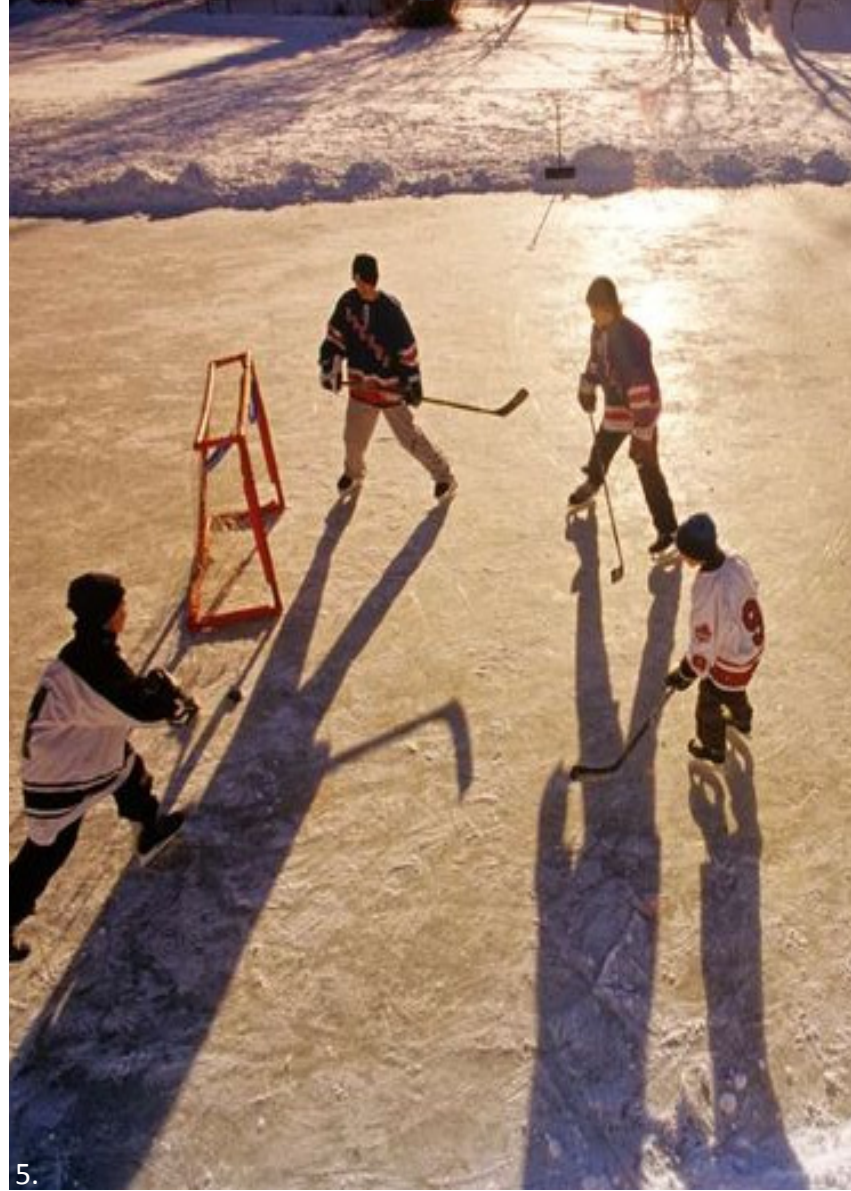
Swedish

FEBRUARY/
MARCH

Cross Country Skiing



Ice Hockey



Finnish

APRIL/MAY

Chinese Celebration



German Festival



Other

JUNE/JULY

Traditional Dance



Food Festival



Croatian

AUGUST/
SEPTEMBER

Trail Riding



Spaghetti Cookoff



Italian

OCTOBER/
NOVEMBER

Viking Festival



Climbing Competition



Norwegian

Images:
 1. <http://www.boyned.com/Winter/SnowSports/DogSledding/DogSled/dog11.jpg>
 2. http://4.bp.blogspot.com/_8B4z3L2H/TQABv4Vt4I/AAAAAAAAAko/Gv4WzE2n3o/s1600/peter_m_5-1.jpg
 3. <http://images.morris.com/images/furniture/controlled/0002/0000/05/20/442015018.jpg>
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 6. <http://magazine.blogs.nytimes.com/tag/music/page/2/>
 7. http://www.croatia.org/crown/content_image/2009/LADO_Prijorje.jpg
 8. <http://www.piccoluniversitaliana.com/de/faqs/images/pb080001-1.jpg>
 9. http://www.visitrentohoe.com/images/calendar/1_5331707852_68170e806_2.jpg
 10. http://4.bp.blogspot.com/_owmxyf0Zw/FpLdIG08_0/AAAAAAAAA8HQ/vp3ooUsvWFM/s1600/akob+1.jpg
 11. <http://chinesefestival.org/f/2008/r1.jpg>
 12. <http://www.expressmilwaukee.com/images/blogs/blog1290widea.jpg>

Tourist Information

itineraries and culture camps

> Itineraries change with seasons as well as culture calendar to reflect the numerous attractions within Ironton/Crosby and The Range as a whole



> Tourists can engage in overnight stays or “culture camps” at the Portsmouth Mine Pit Lake Campground and learn traditional immigrant dances, languages and cooking techniques

The image shows a 'Sample Itinerary: What to Do?' flyer. The top part has a photo of people walking on a dirt path with the text 'What to Do?'. Below that is a 'Welcome' section with a photo of a person on a mountain bike. The bottom right part is a list of activities with times.

What to Do?

Welcome to Ironton/Crosby, Minnesota!

We are happy to have you in our community and look forward to providing you with a great vacation in the Iron Range!

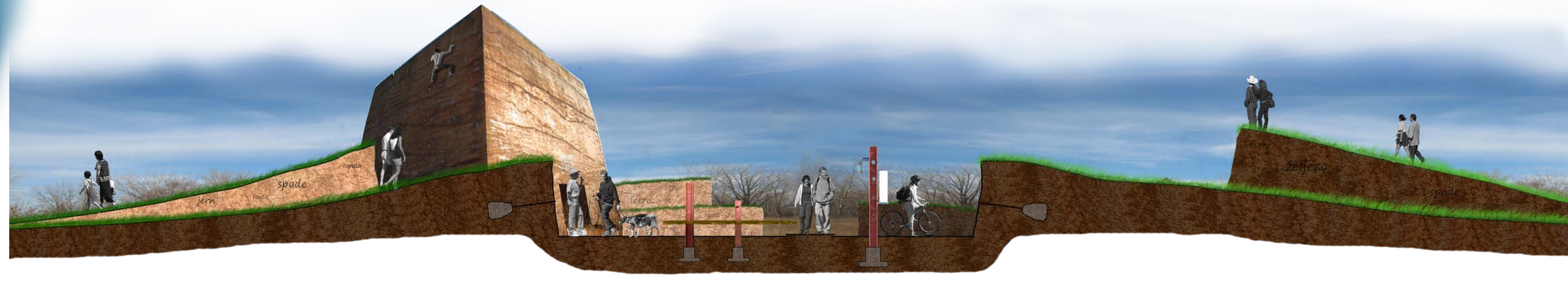
In Ironton/Crosby you will find a bountiful amount of activities that capture the outdoor heritage and mining history of the region. From our beautiful, natural and pit mine lakes, vibrant forests and expansive trail systems to our friendly people, diverse culture and colorful history there is something here for everyone!

Sample Itinerary:

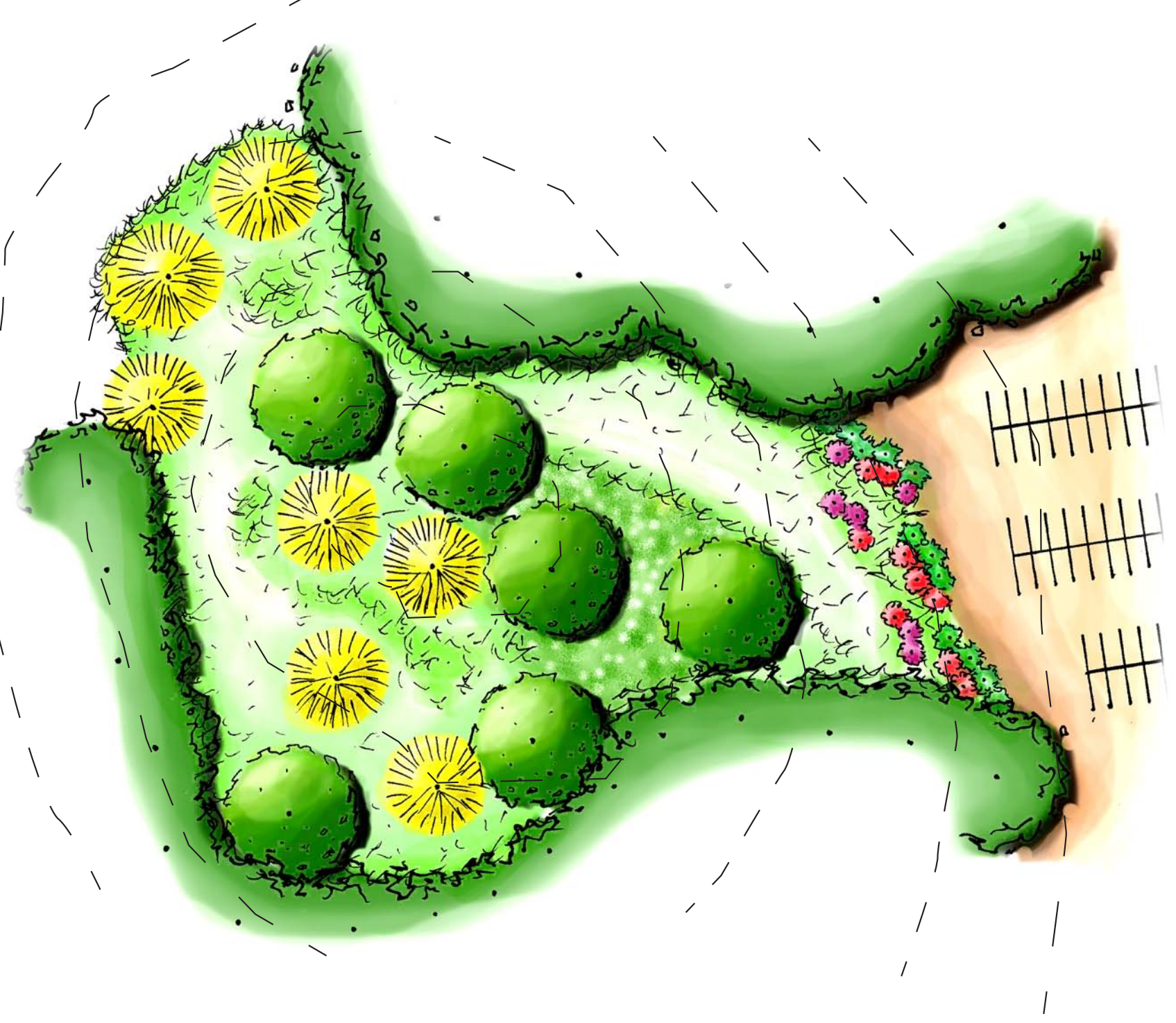
- 10:00 AM - Arrive in Ironton/Crosby
- 10:30 AM - Eat breakfast at Timber's Diner - Ironton
- 11:30 AM - Walking tour of Portsmouth Mine Discovery Park
- 1:30 PM - Lunch at You Betcha Restaurant - Crosby
- 2:30 PM - Geocaching excursion along the Discovery Trail at Portsmouth Mine Discovery Park
- 4:30 PM - Experience the "Full Immersion" sensory experience at Portsmouth Mine Discovery Park
- 5:30 PM - Rock Climbing at the Historic Sintering Wall at Portsmouth Mine Discovery Park
- 6:30 PM - Rent Mountain Bikes and hit the Trails around Ironton/Crosby
- 8:30 PM - Dinner and a Show at the Nordic Inn Medieval Brew and Bed



Design Result conclusion



Through the creation of a "Gateway to the Range", the interactive "Living Museum" and the remediation of past ecological damage, Mining the Past not only recognizes the history and culture of the Iron Range, it celebrates it.

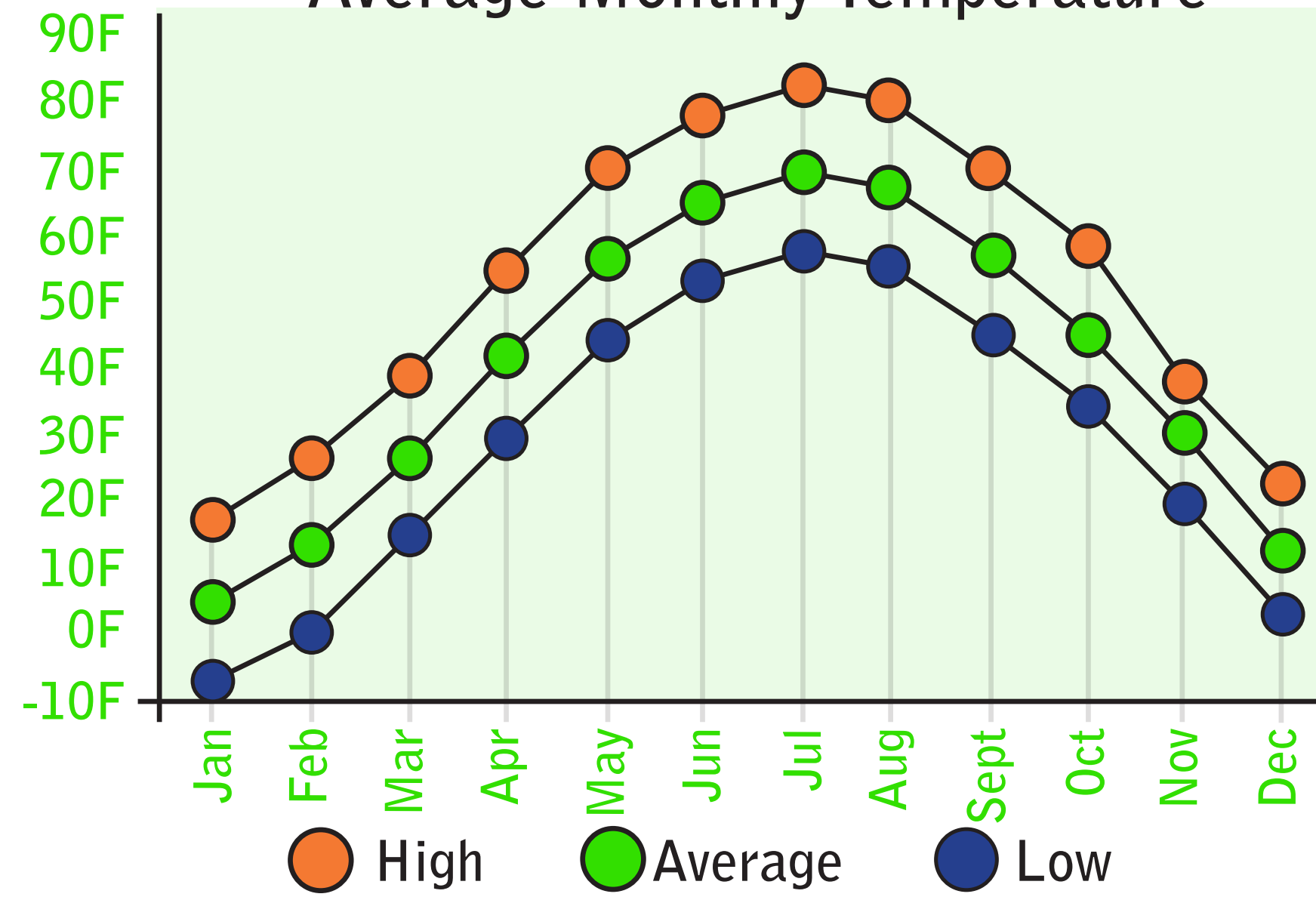


A New Gateway to The Range

...and there was more...

In the Air

Average Monthly Temperature



Photos: http://upload.wikimedia.org/wikipedia/commons/8/8e/Pose_lake_Minnesota.jpg

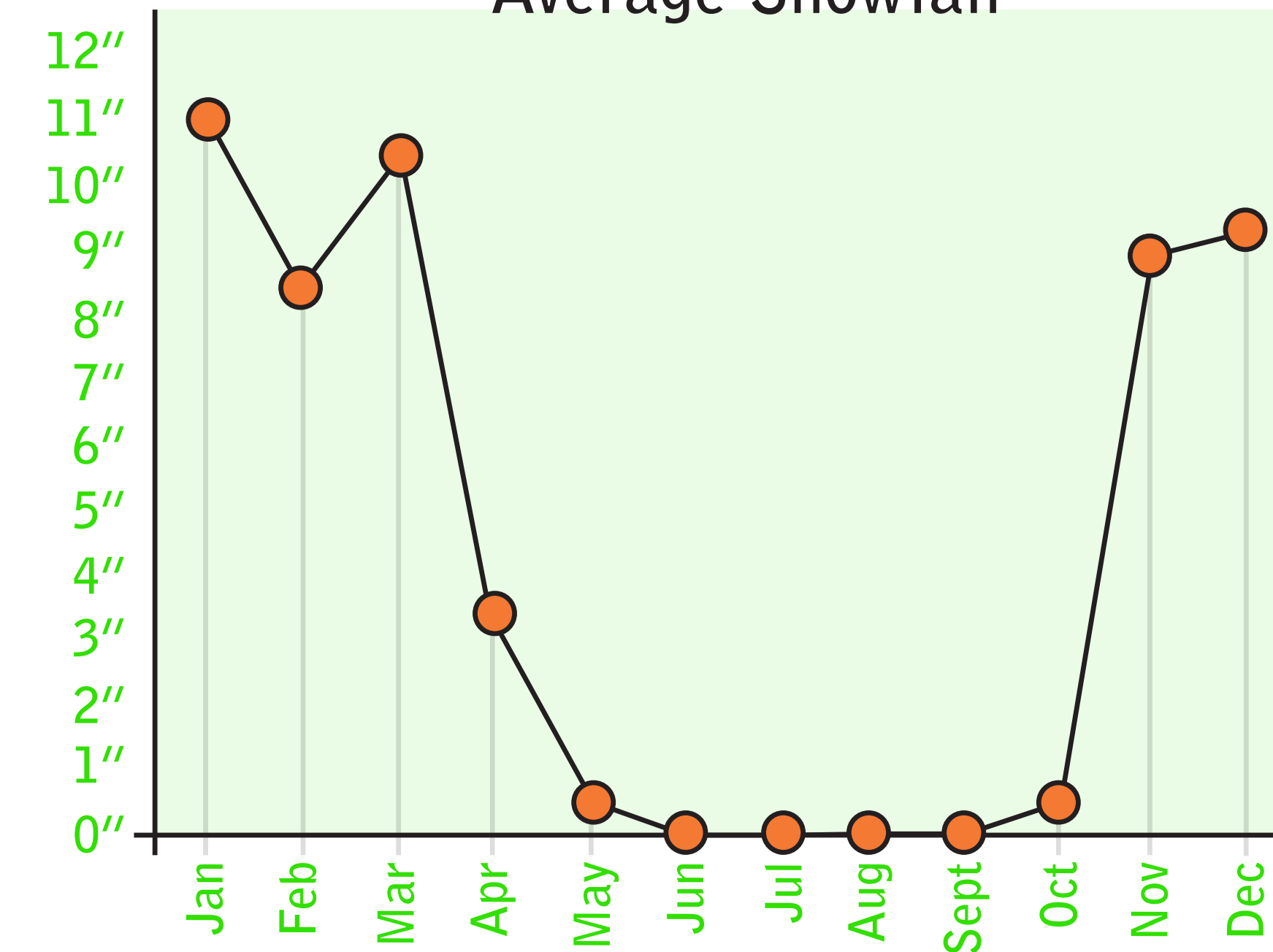
Climate

The climate in the Iron Range region is typical of northern Minnesota and similar to that of Fargo. The winters are cold and produce bountiful snow while the summers can get quite hot.

Design Implications:

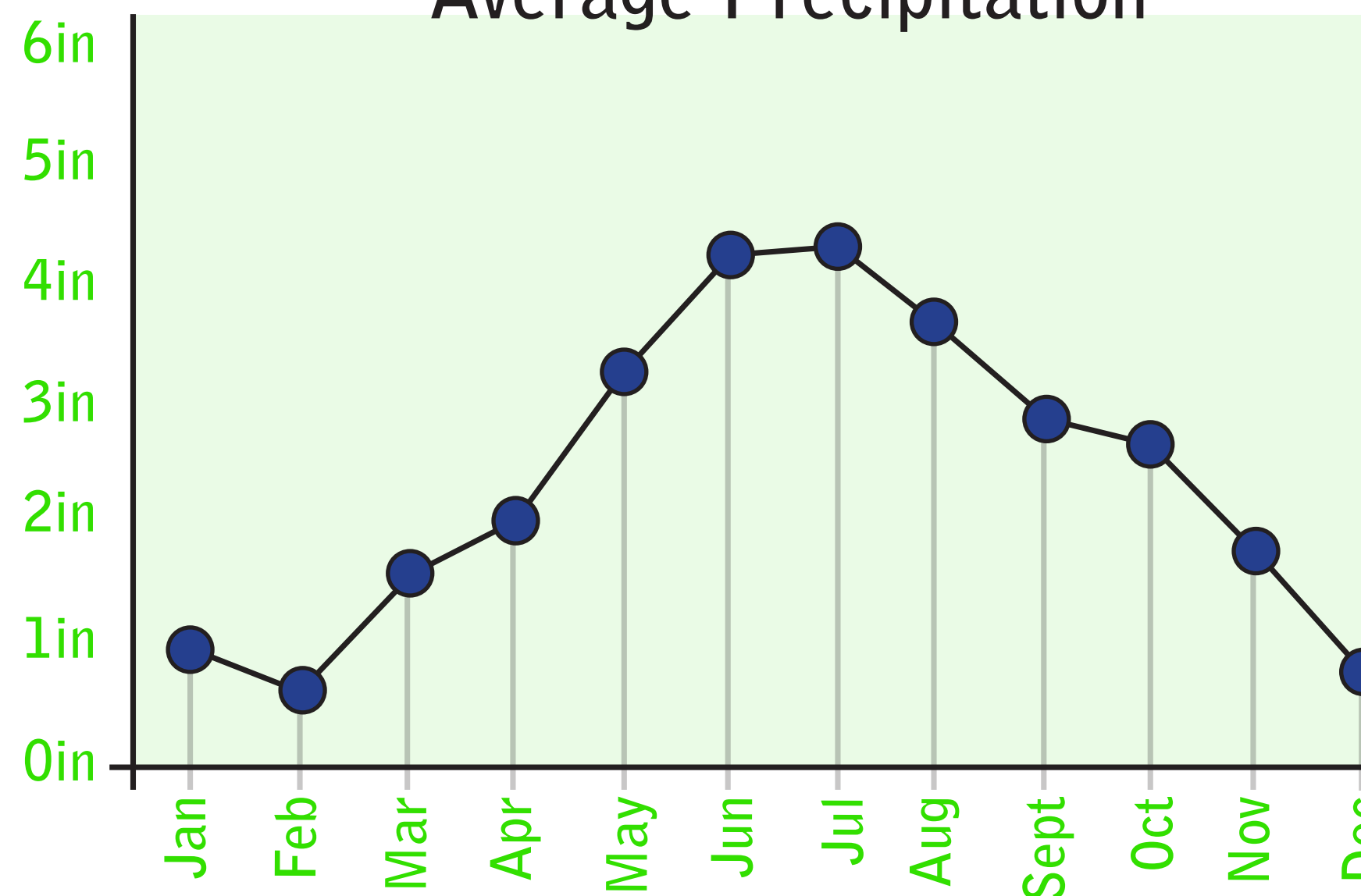
As the seasons in the Iron Range change the weather conditions in such extreme ways so to do the activities. This means that a successful design within the Iron Range must not just accommodate the seasonal weather changes but celebrate them.

Average Snowfall



Photos: <http://www.mylakeome.com/sitebuildercontent/sitebuilderpictures/mushers.JPG>

Average Precipitation



Photos: http://home.comcast.net/~twday60/images/trials/duluth_2004-3.jp

On the Ground

Water

The average depth of the water table within Crow Wing County is 25 feet below ground. The implications for this are that potential on-site contaminants such as mercury, zinc and lead will likely have penetrated deep enough into the soil to contaminate the groundwater. Mercury has been found present in the surrounding bodies of water, which are more than clean enough for recreational use, but not at levels above those found in the majority of Minnesota's lakes.

Toxins

The process of iron ore sintering produces three prominent toxins that enter the soil and air; lead, zinc and mercury.

Zinc: occurs naturally all over the world. Is necessary for normal bodily function in humans and most other animals. High concentration can cause rashes, stomach aches, anemia and damage to the pancreas.

Lead: Can cause numerous health effects in humans including brain damage, reduced fertility, kidney damage, miscarriages and high blood pressure. Can cause similar damage in other organisms as it builds up in their bodies. Lead is transported easily from prey to predator and can also damage organisms essential to soils including worms and bacteria.

Mercury: Highly abundant in freshwater lakes. Mercury causes brain damage, kidney failure, deafness, amnesia, nervous system damage and DNA alteration in humans. Similar effects are seen in other organisms as well and is rapidly spread through food chains.

Design Considerations

While the current effect of the perceived toxins on-site remain to be determined (no thorough tests have been conducted), the assumption can be made that the soils on-site carry some level of contamination. This contamination will need to be addressed in some way even if that intervention is minor. The ideal method for dealing with this issue is some sort of phytoremediation. Whatever the method, the process will be conducted with the least amount of environmental disturbance possible.



Connections



Location

The site is located just over one half mile from Ironton proper and just a bit further from Crosby. Being well connected to the towns via roads and trails further strengthen the sites potential.

Right: One of the many biking trails found in the Iron Range



Photos: <http://10000likes.blogspot.com/2011/06/minnesotas-cuyuna-lakes-mountain-bike.html>

