

**CITY OF HOMER
HOMER, ALASKA**

Aderhold/Parsons

RESOLUTION 25-041

A RESOLUTION OF THE CITY COUNCIL OF HOMER, ALASKA REQUESTING, IN THE INTEREST OF PEDESTRIAN SAFETY, THAT THE STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES MODIFY ITS CURRENT DESIGN FOR RECONSTRUCTION OF THAT PORTION OF THE STERLING HIGHWAY CROSSING THE DIAMOND CREEK DRAINAGE TO INCLUDE A PEDESTRIAN UNDERPASS AND MULTI-USE PATHWAY.

WHEREAS, The City of Homer accepted ownership of the Diamond Creek Recreation Area (DCRA) in 2007 and the Homer Soil & Water Conservation District prepared a Multi-Resource Management Plan for the DCRA which was subsequently adopted by the City of Homer in May of 2013; and

WHEREAS, The DCRA management plan sets forth recreational objectives, including the development of additional recreational trails and access trail heads, including a parking area at the western most edge of the DCRA located at approximately Milepost 168.0 of the Sterling Highway; and

WHEREAS, There are existing trails and trail head parking areas on the north side of Diamond Creek located west of the Sterling Highway within the Alaska State Parks Diamond Creek State Recreation Site (DCSRS) that are heavily used by hikers and bicyclists; and

WHEREAS, There exists an extensive recreational trail system within the DCRA and adjacent Department of Natural Resources (DNR) owned Homer Demonstration Forest (HDF) that is heavily used for skiing in the winter and hiking during the summer; and

WHEREAS, The DCRA provides a critical link between these parcels, complementing in essential ways the watershed functions they provide, and the public uses they support; and

WHEREAS, The Alaska Department of Transportation and Public Facilities (AKDOT/PF), over the course of the next several years, will be reconstructing the Sterling Highway from Milepost 157 to 169, Anchor Point to Baycrest Hill; and

WHEREAS, The City of Homer has worked with Homer Trails Alliance, Happy Trails, LLC, and Kinney Engineering, to develop a plan to connect these parcels through a proposed pedestrian underpass; and

WHEREAS, These studies have concluded that the safest and most practical route to connect these parcels lies within the Sterling Highway Right of Way; and

WHEREAS, Reconstruction of the Sterling Highway across the Diamond Creek drainage, approximately milepost 167.5 to 168.0, provides an opportunity to develop a pedestrian underpass, providing an interconnecting trail link that is safe, reliable, and is an opportunity that will not present itself again for many decades.

NOW, THEREFORE, BE IT RESOLVED that the City Council of Homer, Alaska hereby requests, in the interest of pedestrian safety, that the Department of Transportation modify its current design for reconstruction of that portion of the Sterling Highway crossing the Diamond Creek Drainage to include a pedestrian underpass and multi-use pathway.

BE IT FURTHER RESOLVED, that the City Council of Homer, Alaska, requests the AKDOT/PF modify its current design to include the construction of an interconnecting pathway from the existing trail system within the DCSRS north of Diamond Creek on the west side of the Sterling Highway to the proposed "Green Timbers" trailhead parking area located at Milepost 168.

BE IT FURTHER RESOLVED, that the City Council of Homer, Alaska requests the City Manager to work diligently with the AKDOT/PF to accomplish the construction of the pedestrian underpass and interconnecting pathway.

BE IT FURTHER RESOLVED, that the City Council of Homer, Alaska provides the City Manager the authority to enter into an agreement with AKDOT/PF, if necessary, for the maintenance of the associated pathway excluding the pedestrian underpass.

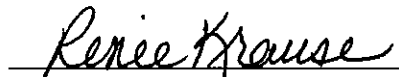
PASSED AND ADOPTED by the Homer City Council this 28th day of April, 2025.

CITY OF HOMER



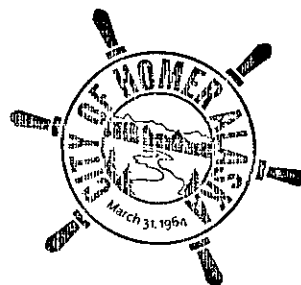
RACHEL LORD, MAYOR

ATTEST:



RENEE KRAUSE, MMC, CITY CLERK

Fiscal information: NA





MEMORANDUM

Resolution 25-041, A Resolution of the City Council of Homer, Alaska Requesting, In the Interest of Pedestrian Safety, that the State of Alaska Department of Transportation and Public Facilities Modify its Current Design for Reconstruction of that Portion of the Sterling Highway Crossing the Diamond Creek Drainage to Include a Pedestrian Underpass and Multi-Use Pathway. Aderhold/Parsons.

Item Type: Backup Memorandum
Prepared For: Mayor Lord and City Council
Date: April 28, 2025
From: Councilmembers Aderhold and Parsons
Through: Melissa Jacobsen, City Manager

Background

Homer City Council has supported Homer Trails Alliance's (HTA's) advocacy of an underpass of the Sterling Highway at Diamond Creek to connect trails in the Diamond Creek Recreation Area (DCRA) and Alaska State Parks Diamond Creek State Recreation Site (DCSRS) for two years (see attached Resolution 23-014). At our regular meeting on March 10, 2025, City Council reviewed the trail plan developed by Kinney Engineering and Happy Trails, Inc. The plan included trail segments across private properties because Alaska Department of Transportation and Public Facilities (ADOT/PF) had told the City that the trail could not be within the highway right of way (ROW). At that time, Council asked city staff to reach out to affected property owners to determine their willingness to develop trail easements across their properties.

Since that council meeting, Councilmembers Parsons and Aderhold met with representatives of HTA (Billy Day, Sandy Cronland, and Dave Eberle) and city staff (Melissa Jacobsen, Dan Kort, Julie Engebretsen, and Leon Galbraith) on April 10, 2025 to discuss recent correspondence and opportunities with ADOT/PF regarding the possibility of an underpass and connecting trails. Dave Eberle volunteers with HTA and is a former ADOT/PF Central Region Director.

Based on the knowledge that ADOT/PF will construct a gravel service access ramp in the Sterling Highway ROW to Diamond Creek to install and provide future maintenance access to the culvert, Happy Trails, Inc. prepared an updated field report with a trail concept that would use the access ramp (see attached).

While using the access ramp as the trail to an underpass at Diamond Creek makes sense, the ADOT/PF Central Region Director is the person who needs to make the decision to allow use of the access ramp as a trail.

Resolution 25-041 provides information ADOT/PF Central Region Director Sean Holland needs to make the decision and sets up the opportunity for city staff to meet with Director Holland to discuss the project. Dave Eberle had offered to support these meetings.

Based on the current design and construction schedule for the Sterling Highway project, Dave Eberle developed the timetable below for engaging with ADOT/PF:

Task	Target Date	Status
Secure drawing details for maintenance access road and elevations. Secure draft design for pedestrian underpass.	March 31	complete
Onsite visit with Happy Trails to walk routing alternatives within or adjacent to highway ROW.	April 5	complete
Meet with Homer public works and City Manager to discuss underpass, pathway reports, maintenance agreements and timetable.	April 10	complete
Obtain sample copy of typical maintenance agreement with ADOT/PF.	April 21	
Begin informal dialog with ADOT/PF Commissioner and Regional Director. Discuss possible onsite visit.	May 1	
Update Happy Trails report including recommended routing changes to Kinney Engineering report.	May 7	
Meet with City to discuss updated trails reports and proposed maintenance agreement. Extend formal invitation to ADOT/PF Commissioner and Regional Director.	May 12-15	
Meeting between City and ADOT/PF to discuss details of pedestrian underpass, pathway routing, and maintenance agreement. Visit project site with ADOT/PF representatives.	June 2-13	
Develop draft maintenance agreements: HTA/City, City/ADOT/PF, and City/Borough.	July 1	
Work with ADOT/PF and Dowl Engineers to refine underpass details.	July 14-18	
Finalize all maintenance agreements and present to City for formal approval. Transmit agreements to Borough and ADOT/PF.	August 15	
Execute formal maintenance agreements with all parties.	Sept 14-19	

Recommendation

Discuss and vote on Resolution 25-041

Attachments:

Resolution 13-055

Resolution 23-014

Diamond Creek Recreation Area Underpass Conceptual Drawing date April 17, 2025

Memorandum from City Engineer Galbraith dated February 28, 2025

Kinney Engineering LLC - Homer Diamond Creek Trail Route Memorandum dated February 14, 2025

Happy Trails, Inc. Homer Trails Alliance Diamond Creek Recreation Area Concept Trail Plan February 2025

**CITY OF HOMER
HOMER, ALASKA**

City Manager

RESOLUTION 13-055

A RESOLUTION OF THE HOMER CITY COUNCIL
SUPPORTING THE DIAMOND CREEK RECREATION AREA
PLAN AND ADOPTING THE PLAN AS IT APPLIES TO CITY
OWNED LANDS ACQUIRED THROUGH THE FOREST
LEGACY PROGRAM.

WHEREAS, The City routinely adopts park plans by resolution for city facilities; and

WHEREAS, The Homer City Council adopted Ordinance 07-03, accepting ownership of
two parcels totaling 273 acres in the Diamond Creek area as part of the Forest Legacy Program
to keep for public park land in perpetuity; and

WHEREAS, The Forest Legacy Program requires all development on the lands be
approved by certain state and federal agencies; and

WHEREAS, The Diamond Creek Recreation (DCRA) Plan is a management and
development plan; and

WHEREAS, State and Federal agencies can review the plan and all associated
development projects for consistency with the Forest Legacy Program.

NOW, THEREFORE, BE IT RESOLVED that the Homer City Council hereby adopts
the Diamond Creek Recreation Area Plan as it applies to city owned lands.

PASSED AND ADOPTED by the City Council of Homer, Alaska, this 28th day of May,
2013.

CITY OF HOMER


MARY E. WYTHE, MAYOR

ATTEST:


JO JOHNSON, CMC, CITY CLERK

Fiscal Note: N/A

**CITY OF HOMER
HOMER, ALASKA**

Aderhold/Davis

RESOLUTION 23-014

AN RESOLUTION OF THE CITY COUNCIL OF HOMER, ALASKA
INTENDING TO ADD A ROGERS LOOP ROAD OFF-STREET PARKING
PROJECT TO ITS CAPITAL IMPROVEMENT PLAN AND TO WORK
WITH HOMER TRAILS ALLIANCE ON TRAILS AND TRAILHEAD
RELATED PROJECTS IF THE ORGANIZATION RECEIVES A
TRANSPORTATION ALTERNATIVES PROGRAM GRANT FROM THE
ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC
FACILITIES

WHEREAS, The Homer Trails Alliance (HTA), a non-profit group based in Homer, has
submitted a Transportation Alternatives Program (TAP) proposal to the Alaska Department of
Transportation and Public Facilities (DOT&PF) to expand existing trail systems in and beyond
the western boundary of the City of Homer to connect existing and new non-motorized trails
that will enable pedestrians, bicyclists, and wheelchair users of all ages and abilities to travel
between trailheads and trail systems along the Sterling Highway within the State owned
Homer Demonstration Forest and the City of Homer's Diamond Creek Recreation Area and
Alaska State Park's Diamond Creek Stat Recreation Site; and

WHEREAS, The HTA proposal includes new parking, restrooms, trailheads, and trails on
parcels owned by the City of Homer in the Diamond Creek Recreation Area and adjacent to
Rogers Loop Road near the Homer Demonstration Forest; and

WHEREAS, The City Council approved the Diamond Creek Recreation Area Management
Plan in May 2013; and

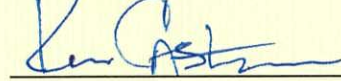
WHEREAS, The Diamond Creek Recreation Area is currently used for winter recreation
and to protect wetlands and waters in the Diamond Creek watershed; and

WHEREAS, The City-owned parcel on Rogers Loop Road was purchased with the intent
of creating off-street parking for an existing trailhead, but this project has not been
constructed.

NOW, THEREFORE, BE IT RESOLVED that the City Council of Homer, Alaska, intends to
add a Rogers Loop parking area to its Capital Improvement Plan and will work with HTA on
other trail and trailhead related projects if the organization receives a TAPS grant from
DOT&PF for its proposed project.

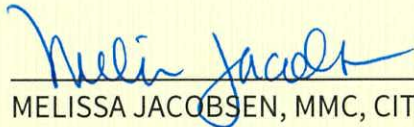
PASSED AND ADOPTED BY THE CITY COUNCIL OF HOMER, ALASKA, THIS 13th day of
February, 2023.

CITY OF HOMER



KEN CASTNER, MAYOR

ATTEST:



MELISSA JACOBSEN, MMC, CITY CLERK

Fiscal note: N/A





Diamond Creek Recreation Area Concept Trails Addendum I

Produced for Homer Trails Alliance

Sterling Highway Underpass Trail Field Study

Purpose

On April 5, 2025, Jon Underwood of Happy Trails Inc. joined Homer Trails Alliance volunteers Billy Day, Sandy Cronland, and Dave Eberle to walk the proposed trail route between the proposed Green Timbers trailhead in the Diamond Creek Recreation Area (DCRA) and the Diamond Creek State Recreation Site (DCSRS). The purpose of the field work was to determine the feasibility of creating a trail connector through a proposed Sterling Highway underpass using the highway Right of Way.

Benefits and Challenges

Timely

The Diamond Creek Area Multi-Resource Management Plan, adopted by the City of Homer in 2013, mentions Sterling Highway underpass concept in two objectives: 1. to connect DCRA and DCSRS, and 2. form part of an all-season trail system in DCRA. This plan has been in place for 12 years awaiting an opportunity for such a project.

In the near future, the Alaska State Department of Transportation and Public Facilities (DOT-PF) plans to rebuild the area where the Sterling Highway crosses Diamond Creek, installing a fish passage culvert and widening the road to the north to include turn lanes. The road in this area will be completely rebuilt. It may be decades before a similar opportunity arises.

Safe Connectivity

At this time it is difficult to travel on foot from one area to the other. Even in early April, crossing the road on foot required waiting for a break in traffic, which is traveling at full highway speeds. Easy, quiet passage between these two recreation areas will expand opportunities for residents and tourists alike to visit either area and combine the trail experience in novel ways.

Sterling ROW

This plan requires constructing trail in the highway Right of Way. Permission and construction from DOT is necessary to do this, and it will be necessary for the City of Homer to commit to maintenance. At the same time, it is possible for the trail to utilize structures that will already be in place due to highway reconstruction. An access ramp is planned on the east side of the road, allowing construction access. The access ramp can be left in place and become the trail route. The access ramp can be extended across the planned fish passage culvert to route the trail across the creek to the underpass.

Avoiding Negative Control Areas

This route avoids multiple areas that are problematic for design and construction:

1. This route avoids private property, which abuts the crossing area on two sides, as well as the possible approaches.
2. This route minimizes crossings of Diamond Creek.
3. This route avoids the poor soil found in the creek bottom area. This poor soil would require a large amount of fill or long boardwalk structures to create a sustainable trail.

Concept Map

The following concept map portrays the idea of the connection desired between DCRA and DCSRS. It does not portray specific design of items in the highway ROW. The trail route has been field checked but not field flagged.

Underpass Trail

April 7 2025 Concept

7% grade to DCSRS. Endpoint TBD

Exit ROW onto KPB and State property

Fill slope protection

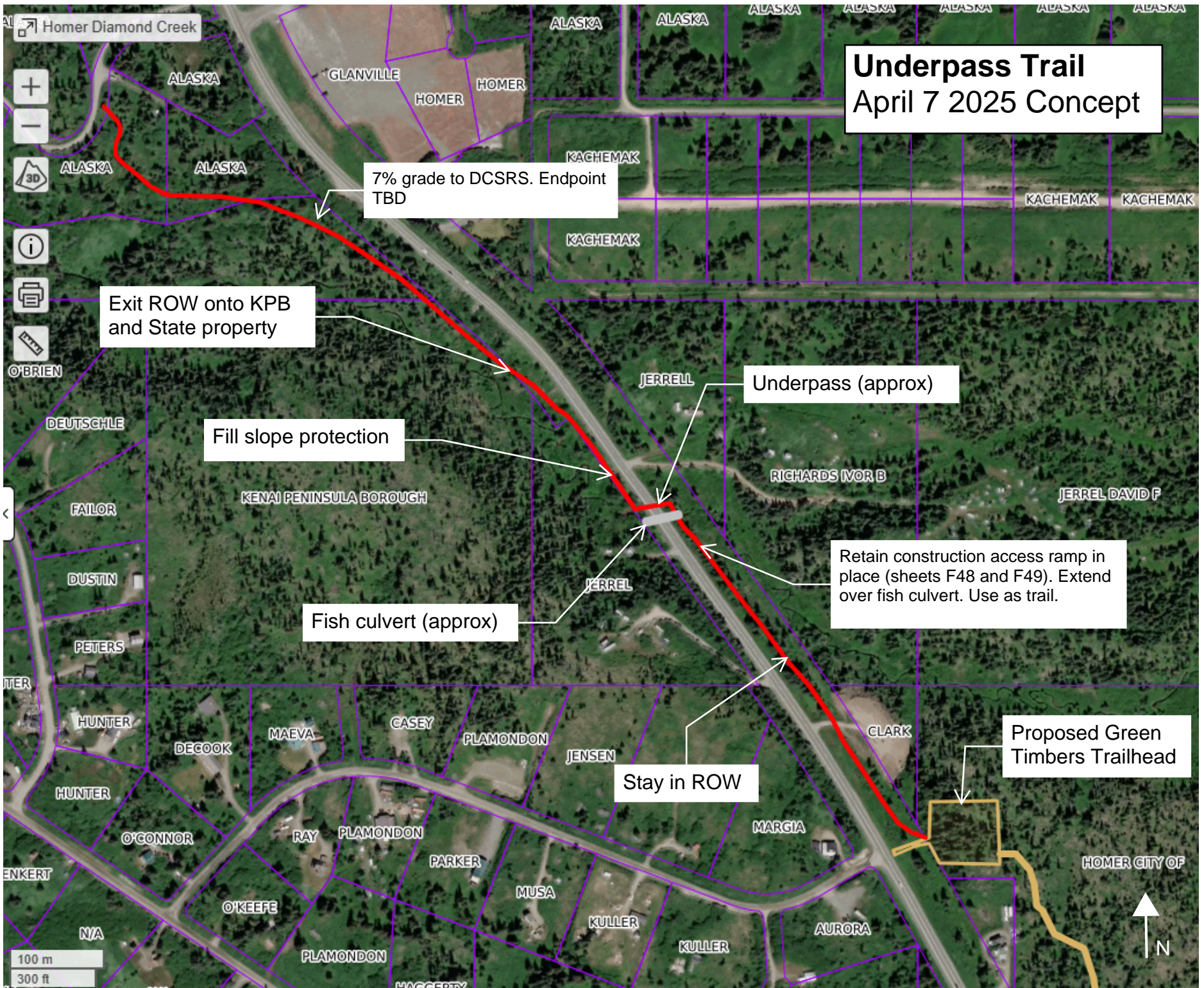
Underpass (approx)

Retain construction access ramp in place (sheets F48 and F49). Extend over fish culvert. Use as trail.

Fish culvert (approx)

Stay in ROW

Proposed Green Timbers Trailhead





MEMORANDUM

City Council update on preliminary design studies for the Diamond Creek Recreation Area (DCRA) Trails and a Sterling Highway Pedestrian Underpass

Item Type: Informational Memorandum
Prepared For: City Council
Date: February 28, 2025
From: Leon Galbraith, P.E., City Engineer
Through: Melissa Jacobsen, City Manager

The purpose of this Memorandum is to update the City Council and present the attached two documents recently completed with preliminary design studies for the Diamond Creek Recreation Area (DCRA) Trails and a Sterling Highway Pedestrian Underpass.

Through Ordinance 24-06(A), the FY24/25 Capital Budget included \$25,000 from the HART Trails Fund to complete these preliminary design studies.

Resolution 24-090(A) authorized issuance of a task order to Kinney Engineering, LLC to provide the professional services as the consultant tasked with completing these preliminary design studies.

The Kinney Engineering study has developed an option for a trail extension linking the city-owned DCRA property and the DCRA trail to the west side of the Sterling Highway leading to the Diamond Creek State Recreation Site (DCSRS). A pedestrian underpass used to cross the Sterling Highway would also be part of the trail extension. The study is intended to demonstrate the feasibility of the construction of a pedestrian trail, including right of way analysis. This is intended to be a preliminary study, not a final design. Assessing the feasibility of a proposed route is an important first step.

As a subcontractor to Kinney Engineering, Happy Trails also completed a preliminary design study of potential trail routes and costs for the area east of the Sterling Highway on the City owned parcel labeled as the DCRA. This includes a new parking lot at the area labeled as "Green Timbers TH".

Staff has reached out to Alaska DOT&PF (DOT) to discuss these final studies. Staff with the DOT appear to still be supportive of the trail project and Sterling Hwy underpass alternative locations that are proposed in the Kinney Engineering study. The proposed trail presented to the DOT shows the trail crossing three (and possibly four) privately owned properties as well as Kenai Peninsula Borough (KPB) Lands before reaching the State of Alaska DNR lands. A Homer Electric Association overhead power easement would also be crossed. The DOT expressed that they would like to see something definitive such as established trail easements between the City and the private land owners as well as with the KPB before the DOT commits to constructing a pedestrian tunnel.

Securing these proposed easements is estimated to take as long as one to two years, and the DOT's highway project construction is anticipated to occur in the summer of 2027. Therefore, we would need these easement agreements to be in place as soon as possible (less than one year) for the pedestrian tunnel to be included in the DOT's highway project design prior to their bidding and construction.

ANTICIPATED NEXT STEPS

If the Council wishes to pursue this project further, the following steps are anticipated:

- A Council sponsor would need to bring forward a resolution of support and future funding ordinance for easement acquisition.
- The City will need to reach out to all of the private property owners and KPB to see if they are willing to grant trail easements to support the proposed project.
- If any private property owner denies easement, the project is either dead, or the City would have to reach out to Kinney Engineering to investigate alternative routes to avoid the individual private property owner's lot, with the understanding that the DOT has expressed they are not willing to allow the trail to parallel the Sterling Highway within their right-of-way.
- If all property owners are interested in granting the trail easements, the City will need to fund further survey and design work as well as swiftly draft up the easement drawings and agreements for routing through the KPB's platting process as well as negotiate any potential payments associated with granting said easements.

When considering whether or not to pursue this trail further, the Council should also remember that the timeline is very short to get the DOT any easement agreements. There is the possibility that the DOT would accept something short of an established easement (if the process is underway), however that is risky. The City could invest substantial resources towards this effort and not make the deadline, or the partial process may not be sufficient to convince the DOT to construct the pedestrian tunnel. The DOT has expressed that they support the concept of the pedestrian tunnel, however they cannot construct the pedestrian tunnel on good intentions, only to have constructed a tunnel that doesn't get used because the City cannot secure the needed trail easements, or doesn't have the money to construct the trails themselves.

ATTACHMENTS

1. Homer Diamond Creek Trail Design Study-Final
2. DCRA Trails Study



TO: City of Homer Public Works Department

FROM: Brian Lamson, PE
Jan Keiser, PE
Margaret Devlin, Engineering Technician
Randy Kinney, PE, PTOE

DATE: 2/14/2025

SUBJECT: Task Order #24-01 – Proposed Diamond Creek Trail Route Memorandum

1. Purpose

The purpose of this Memorandum is to identify the design criteria and proposed trail route connecting the Diamond Creek Recreational Area (“DCRA”) to the Diamond Creek State Recreation Site, including a crossing under the Sterling Highway.

2. Background

The Alaska Department of Transportation and Public Facilities (“DOT&PF”) is planning to improve the Sterling Highway from MP 157-169, which includes a new fish passage culvert under the Sterling Highway for Diamond Creek flowing from the north side of the highway to the south. The Sterling Highway project lies within the vicinity of the DCRA on the northern side of the highway to and the Diamond Creek State Recreation Site (“DCSRC”), on the southern side of the highway. These areas are regularly, and frequently, used by local residents and visitors for hiking, mountain biking and skiing. Local residents have long desired an undercrossing that would allow these non-motorized users to safely cross under the highway. DOT&PF expressed concern that they are reluctant to develop an undercrossing in a location where there are no trails directly connecting to it.

City of Homer (“COH”), Kinney Engineering LLC (“Kinney”), DOT&PF, and Kenai Peninsula Bureau staff held a kick-off/scoping meeting on September 18, 2024 followed by a field review of the trail corridor, including the existing Diamond Creek crossing of Sterling Highway.

The COH City Council adopted Ordinance 24-06(A) supporting the undercrossing project and appropriating funds to conduct a design study that would investigate the feasibility of *“the construction of a pedestrian trail in the DCRA and connecting the new trail to the DCRS, including right of way analysis.”* The City Council also adopted Resolution 24-090 authorizing staff to issue Task Order 24-01 to Kinney to conduct this study. Kinney will focus on the areas in the immediate vicinity of the Sterling Highway.

The City also issued Task Order 24-02 to Kinney, which authorizes Kinney to commission Happy Trails, Inc., (“Happy Trails”), as a subcontractor, to identify a trail route in the “backcountry”; that is, areas away from the Sterling Highway. Kinney will focus its efforts on trails from the proposed Green Timbers Trailhead south to the DCSRC. Happy Trails will focus its efforts on trails from the proposed Green Timbers Trailhead north to the existing trail system in the northeast portion of the DCRA.

3. Design Criteria

3.1. Design Standards and Guidelines

These design standards and guidelines apply to the DCRA trails and connections, including:

- Alaska Highway Preconstruction Manual, DOT&PF, 2025
- Alaska State Parks Trail Management Handbook, Section 3: Trail Design Parameters, Alaska Division of Natural Resources, 2015.
- Americans with Disabilities Act Standards for Accessible Design, Department of Justice, 2010
- City of Homer Trail Manual Design Criteria, COH, 2009
- Guide for the Development of Bicycle Facilities, 4th Edition, American Association of State Highway Transportation Officials, 2012
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2nd Edition, American Association of State Highway Transportation Officials, 2021.

3.2. Selected Design Criteria

Design Criteria was chosen by location and ownership of the property surrounding the proposed trail as well as surrounding slope conditions. Table 1 (next page) shows the three trail classes and their chosen design criteria.

3.2.1. Portions in the DOT&PF ROW

Sections of the trail within the DOT&PF right-of-way (ROW) would need to meet the requirements of a Low ADT Shared Use Path as outlined in the Alaska Highway Preconstruction Manual. These sections would follow the DOT&PF Standard Trail seen in Attachment A.

3.2.2. Portions outside of DOT&PF ROW

Happy Trails elected to use the Alaska State Park Standards for a Bicycle Terra Trail Class 5 for the portion of the trail system from the proposed Green Timbers Trailhead to an existing trail in the DCRA. The goal was to create a trail that was as accessible for all ages and all abilities as possible. We will apply the same standards to the portions of the trail located outside of DOT&PF ROW where possible. Due to the steep slopes located on the bluffs, a Class 5 trail will not be suitable everywhere. Geotechnical investigations would be required to confirm the suitability of the soils to support at Class 5 standard trail on the bluffs. The existing ground cross slopes were analyzed to evaluate which class trail would be suitable for construction in the bluff sections of the trail.

The portions of the trail that cannot support the Class 5 Alaska Trail Standards will follow the Alaska State Parks Standards for a Class 1 Single Lane Trail. This is due to the steep bluffs and cross sections of the switchbacks. Alaska Trails Standard Class 1 and Alaska Trails Standard Class 5 typical sections can be seen in Attachment A. A profile of both bluff sections can be seen in Attachment B.

Table 1: Trail Standards

Design Criteria		Alaska Trails Standard: Bicycle Terra Trail Class 1	Alaska Trails Standard: Bicycle Terra Trail Class 5	Alaska Preconstruction Manual
Tread Width		6"-12" single lane 36" - 48" double lane	36"-60" single lane 72"-120" double lane	8 feet
Separation from Roadway		N/A	N/A	Min 5', 10' for year- round
Surface	Material	native, ungraded. May be continuously rough Sections of soft or unstable tread on grades <5% may be common	Imported Material, routine grading Uniform, firm, stable	2 inches of asphalt overlying 4 in crushed aggregate base on top of 2 ft selected material
	Obstacles	24"	None	N/A
Structures		18" minimum width	60" min width	varies
Clearance	Vertical	6'	8' - 9'	8 feet (undercrossings)
	Horizontal	24"-36"	72" - 96"	8 feet (undercrossings)
	Shoulders	0'-12'	8'-12'	
Grade	Target	5%-20%	2% - 5%	N/A
	Maximum	30% short pitch max 50% on downhill segments only	8% short pitch max for 0-5% of trail	5% or adjacent road grade *
Cross Slope	Target	5%-10%	2% - 3%	1% *
	Maximum	10%	5%	2% *
Design Turn Radius		2'-3'	8'-12'	Based on Design Speed *

*from AASHTO Guide for the Development of Bicycle Facilities

4. Route Alternatives

4.1.Process

The geospatial data used for this analysis were collected from the Kenai Peninsula Borough's GIS online data portal, including contour lines, parcel boundaries, and basemap information. These datasets were integrated with the design criteria, which considered factors such as terrain grade, right-of-way constraints, public land availability, proximity to Diamond Creek, and connectivity to the existing Diamond Creek Recreation Site Trailhead. The proposed path was then generated using ArcGIS, evaluated with the design criteria, and adjusted accordingly where necessary. DOT&PF provided Civil 3D files from the Sterling Highway MP 157-169 Rehabilitation project with survey and the proposed highway design that was used to take a closer look at things within the DOT&PF ROW.

4.2. Trail in DOT&PF ROW

At the September 18, 2024 meeting, DOT&PF stated that they prefer the trail be outside of their ROW except for trail crossings under the highway which should be more or less perpendicular to the roadway and ROW.

In addition to their stated preferences, as a practical matter, the ROW on Sterling Highway on both sides near the proposed trail underpass is constrained, making it difficult to construct a trail that would be within the DOT&PF ROW as well as meeting DOT&PF design standards. Keeping the trail within the ROW involves more than just being able to fit a trail and the proposed highway embankment within the ROW. Diamond Creek is at a low point in the highway with the proposed highway profile going down at a 6% grade on both sides of the creek and existing bluffs outside of the highway embankment. Portions of the trail within the DOT&PF ROW would be subject to ADA guidelines, these allow the trail profile to match but not exceed the 6% highway grade. The trail needs to be lowered in comparison to the highway to go under the highway. Since the trail cannot be steeper than the highway, this requires the proposed trail be longer than the adjacent highway. This length would typically be added with a loop in the trail alignment going down to the undercrossing, but there is not room for one within the ROW.

In addition to direct ROW constraints, the trail alignment will need to cross Diamond Creek at least once. Having this crossing within DOT&PF ROW would involve either a fish passage culvert or a bridge that meets DOT&PF standards, which would not work with the projects schedule or budget. However, the connecting trail has simple structures for stream crossings outside of DOT&PF ROW property and similar crossings could be used if creek crossings are outside of DOT&PF ROW.

In addition to ROW constraints, snow maintenance operations on the highway may render a trail within the ROW unusable at times when plows cast snow off the roadway. These factors have guided the corridor development which, except for the immediate undercrossing of Sterling Highway, has the trail traversing private and public lands. As such, the corridor allows other design criteria to be used instead of the more restrictive criteria required within DOT&PF ROW.

4.3. Proposed Diamond Creek Trail Alignment

This route was developed using a comprehensive spatial analysis performed by assessing existing geographic information layers and incorporating design criteria as key parameters to shape the proposed path. This corridor and general alignment are depicted in Figure 1 on page 5. Figure 2 on page 5 shows the trail profile and grades. Additionally, the conceptual path was designed to limit disturbances to private properties wherever possible.

A primary objective of the design was to minimize areas with grades exceeding 5% to enhance accessibility and safety. There are two bluffs where this will not be practical. For Bluff 1 (north of Diamond Creek) we recommend constructing this segment of trail as a single lane Class 1 trail. For Bluff 2 a series of switchbacks on a Class 5 trail with a 5% profile grade is feasible without adding significant earthwork to the project, alternatively this section could be constructed as a Class 1 trail with less switch backs to reduce project cost. Bluff profiles are included in attachment B.

The trail undercrossing of Sterling Highway can be on the north or south side of the proposed Diamond Creek culvert. Crossing north of the culvert would require an easement from a private property with multiple owners. Crossing south of the creek can eliminate this property impact but requires a short section of trail parallel to the highway to avoid impacting this property. The following figures and discussion are based the trail crossing south of the proposed creek culvert. Attachment C shows both crossings overlaid on the highway design plans.

The proposed alignment for a trail connection located outside of DOT&PF ROW would connect the Green Timbers Trailhead with the Diamond Creek State Recreation Site via City of Homer, Borough, Department of Natural Resources, and private properties as seen in Figure 1 below. The trail would meet DOT ROW near the proposed fish passage and connect to the west side of Sterling Highway via a pedestrian underpass. This assumes trail easements in private property can be achieved

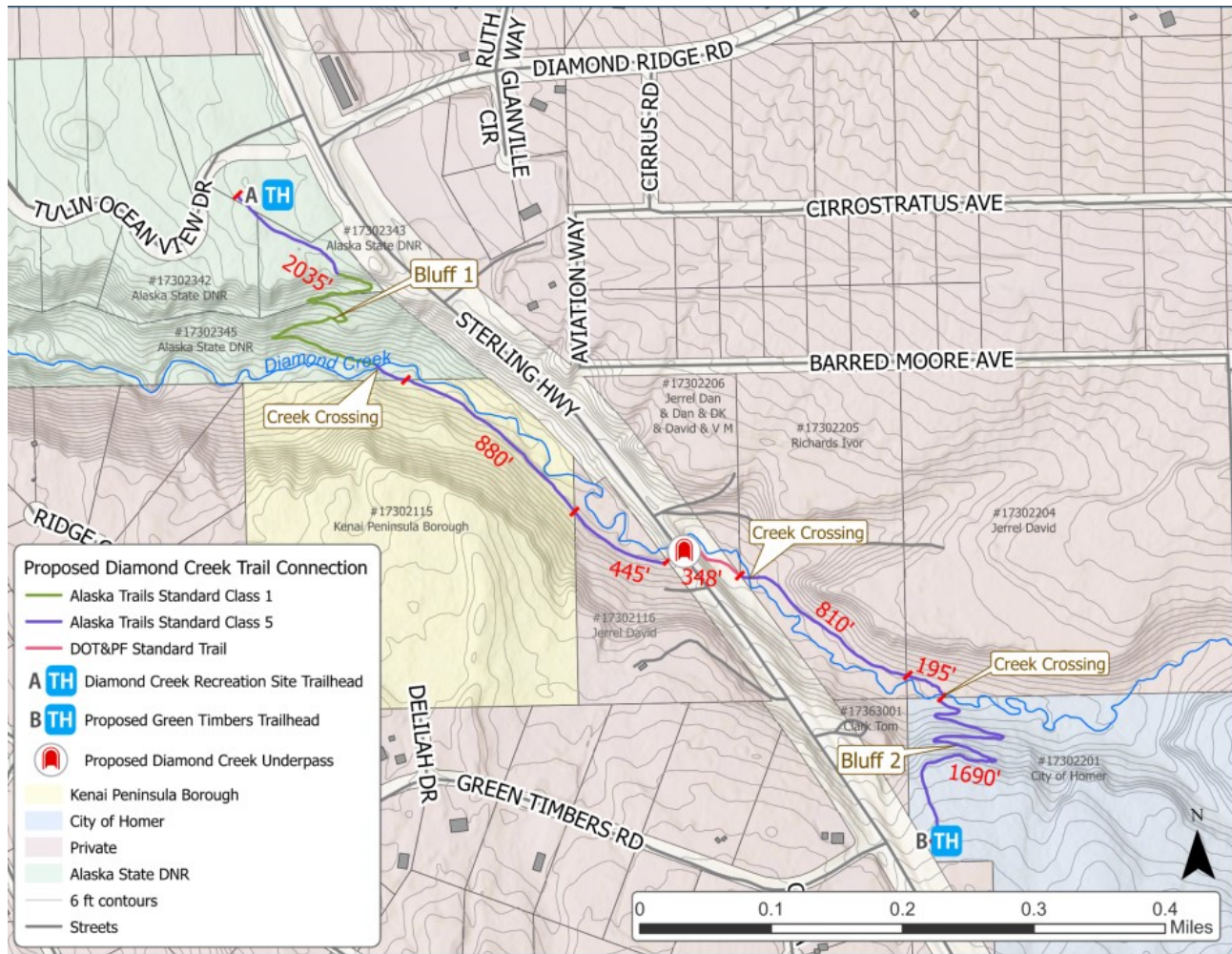


Figure 1: Proposed Diamond Creek Trail Alignment

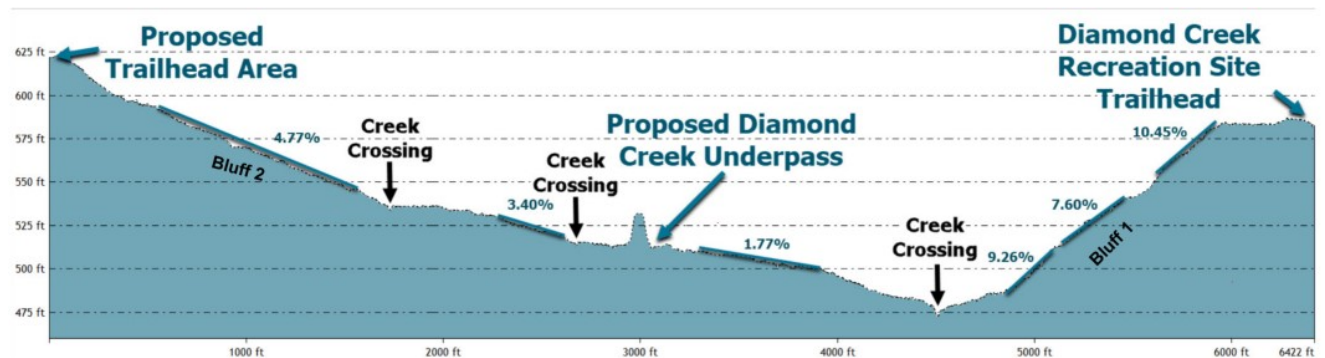


Figure 2: Proposed Diamond Creek Profile

Properties Impacted

The proposed conceptual trail impacts several properties. Each property ownership type, trail length, and design criteria used can be seen in Table 2 below.

Table 2: Property Ownership and Trail Type

Ownership	Length of Class 1 Trail (feet)	Length of Class 5 Trail (feet)	Length of DOT&PF Standard Trail (feet)	Total Length of Trail in Property (feet)
Alaska State DNR	1,370	665		2,035
Kenai Peninsula Borough		880		880
Private		445		445
AK DOT&PF			348	348
Private		810		810
Private		195		195
City of Homer		1690		1,690
Total Lengths	1,370	2,695	348	6,403

Private property owners will need to be contacted to acquire trail easements through their properties. In addition to the properties listed above, the trail will cross a 20-foot Homer Electric Association for their overhead lines.

5. Attachments:

Attachment A Typical Sections

Attachment B Bluff Profiles

Attachment C Crossing Overlay

PLANS PREPARED BY: KINNEY ENGINEERING, LLC 3909 ARCTIC BLVD. SUITE 400 ANCHORAGE, AK 99503 : COA# AECL 1102 : PROJECT LOCATION: HOMER, AK

DRAFTING LOCATION

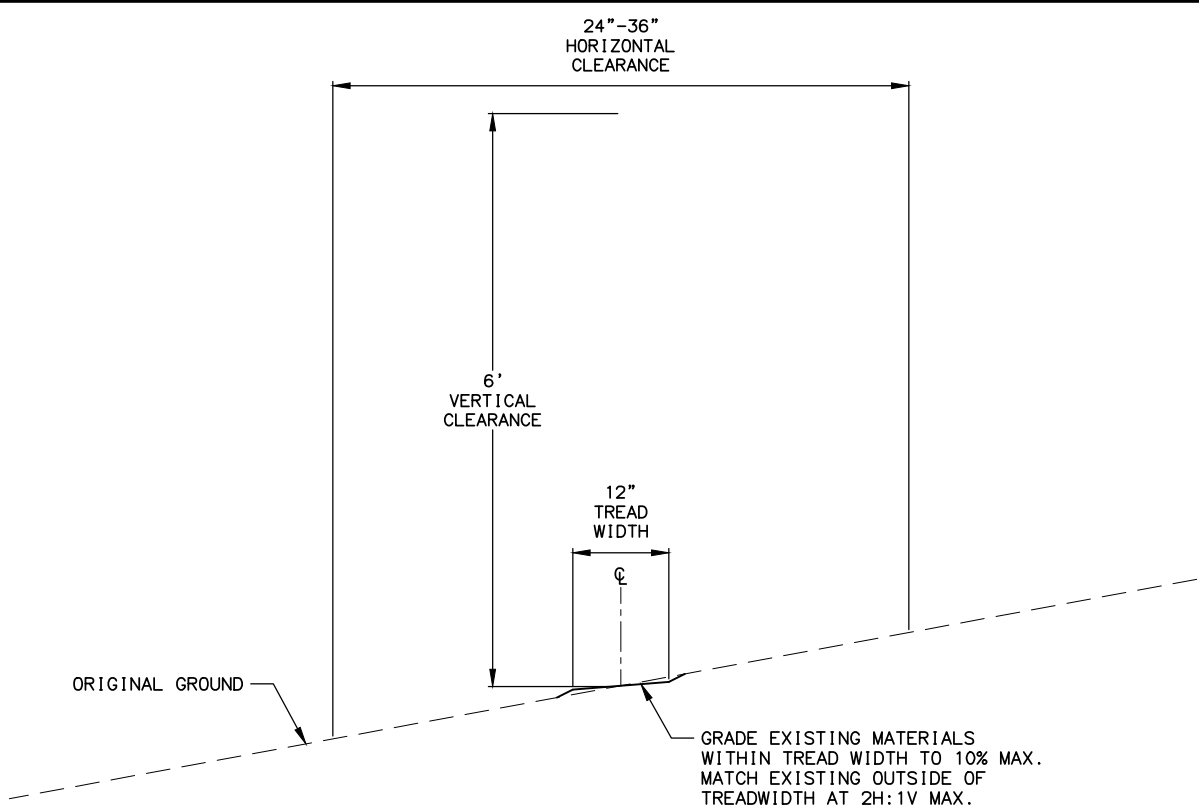
DRAFTED BY: BILL PADDOCK

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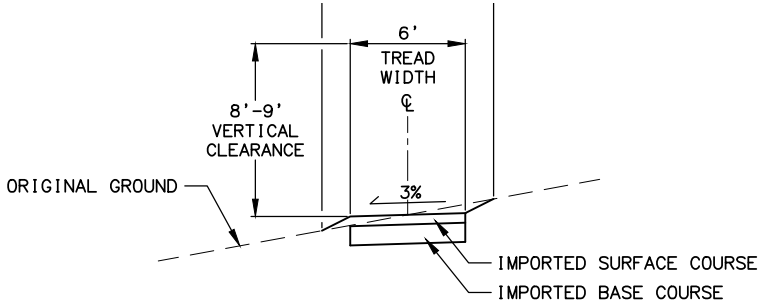
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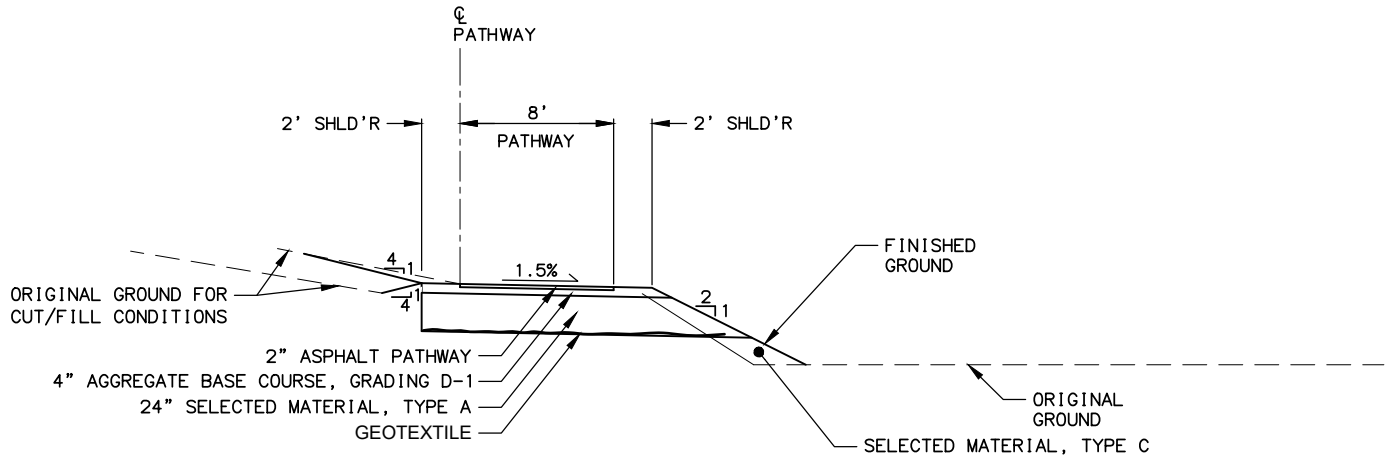
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ALASKA TRAILS STANDARD CLASS 1



ALASKA TRAILS STANDARD CLASS 5



DOT&PF STANDARD TRAIL

SHEET NO.		TOTAL SHEETS
B1		B2
ADDENDUM NO.		
ATTACHMENT NO.		
REVISIONS		
NO.	DATE	DESCRIPTION

PLANS DEVELOPED BY:
KINNEY ENGINEERING, LLC
FOR
CITY OF HOMER, ALASKA
PUBLIC WORKS DEPARTMENT



PHONE: (907) 235-3170
FAX: (907) 235-3145

CITY OF HOMER
DIAMOND CREEK TRAIL &
UNDERPASS STUDY

TYPICAL SECTIONS

PLANS PREPARED BY: KINNEY ENGINEERING, LLC3909 ARCTIC BLVD. SUITE 400ANCHORAGE, AK 99503 : COA# AECL 1102 : PROJECT LOCATION: HOMER, AK

DRAFTING LOCATION

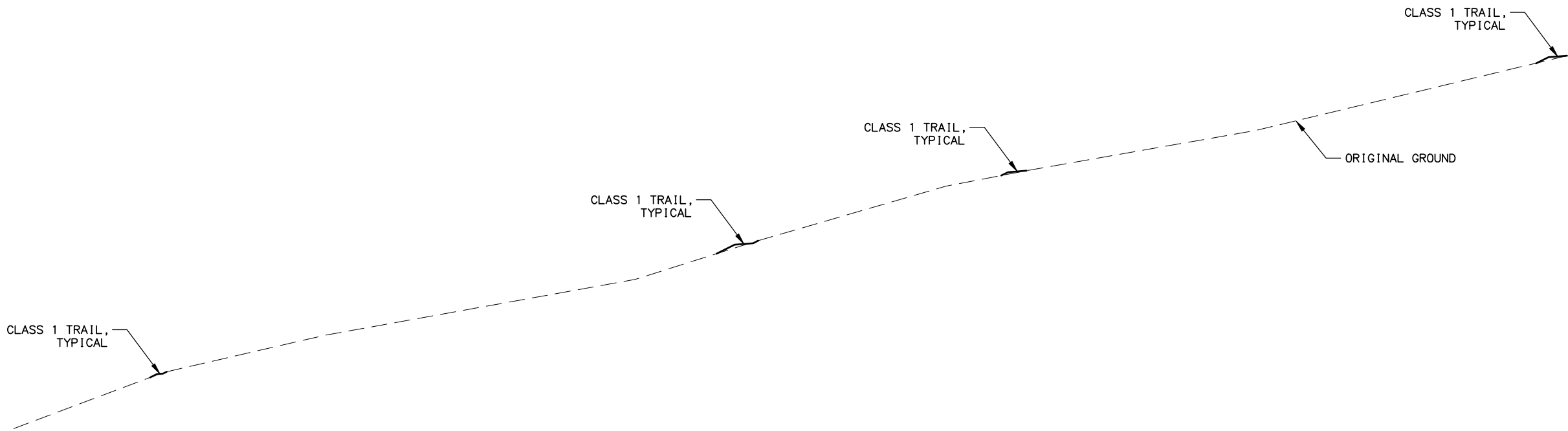
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SCALE

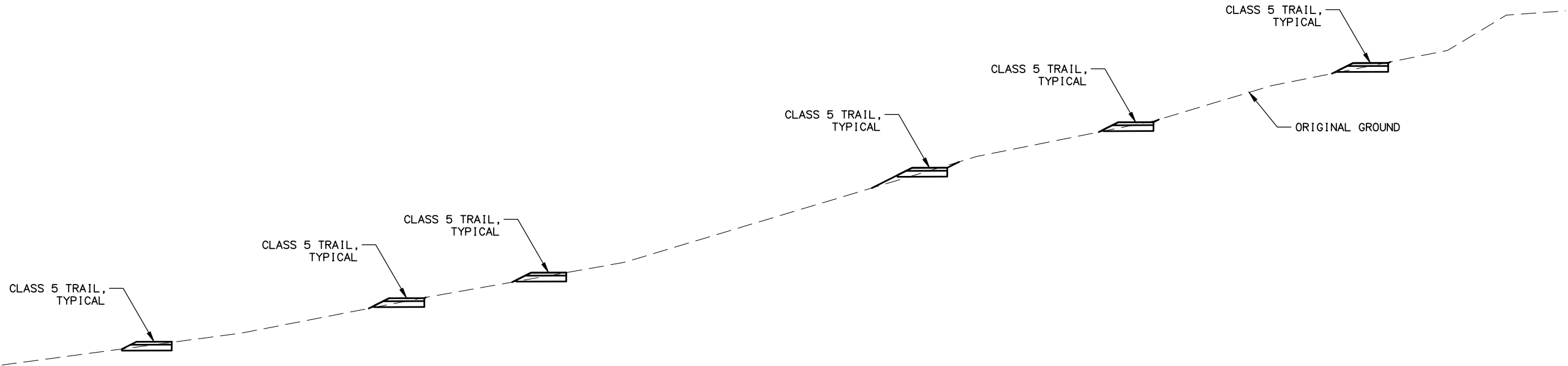
LAYOUT: B2

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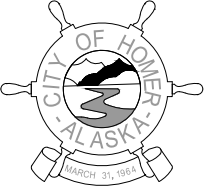
BLUFF 1 SWITCHBACK PROFILE



BLUFF 2 SWITCHBACK PROFILE

SHEET NO.		TOTAL SHEETS	
B2		B2	
ADDENDUM NO.			
ATTACHMENT NO.			
REVISIONS			
NO.	DATE	DESCRIPTION	

PLANS DEVELOPED BY:
KINNEY ENGINEERING, LLC
FOR
CITY OF HOMER, ALASKA
PUBLIC WORKS DEPARTMENT



PHONE: (907) 235-3170
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CITY OF HOMER
DIAMOND CREEK TRAIL &
UNDERPASS STUDY

TYPICAL SECTIONS



Diamond Creek Recreation Area

Concept Trail Plan



Purpose

The Diamond Creek Recreation Area (DCRA), located on land managed by the City of Homer, Alaska, is a popular and well-used trail recreation area in winter. The low-lying, treeless bogs provide an easy path for groomers and skiers alike to traverse the Baycrest Ski Trails without damage to the vegetation or wildlife. In summer, however, these trails cannot support any kind of recreation.



The Diamond Creek Recreation Area Multi-Resource Management Plan, adopted by the City of Homer in 2013, outlines two Recreational Objectives.

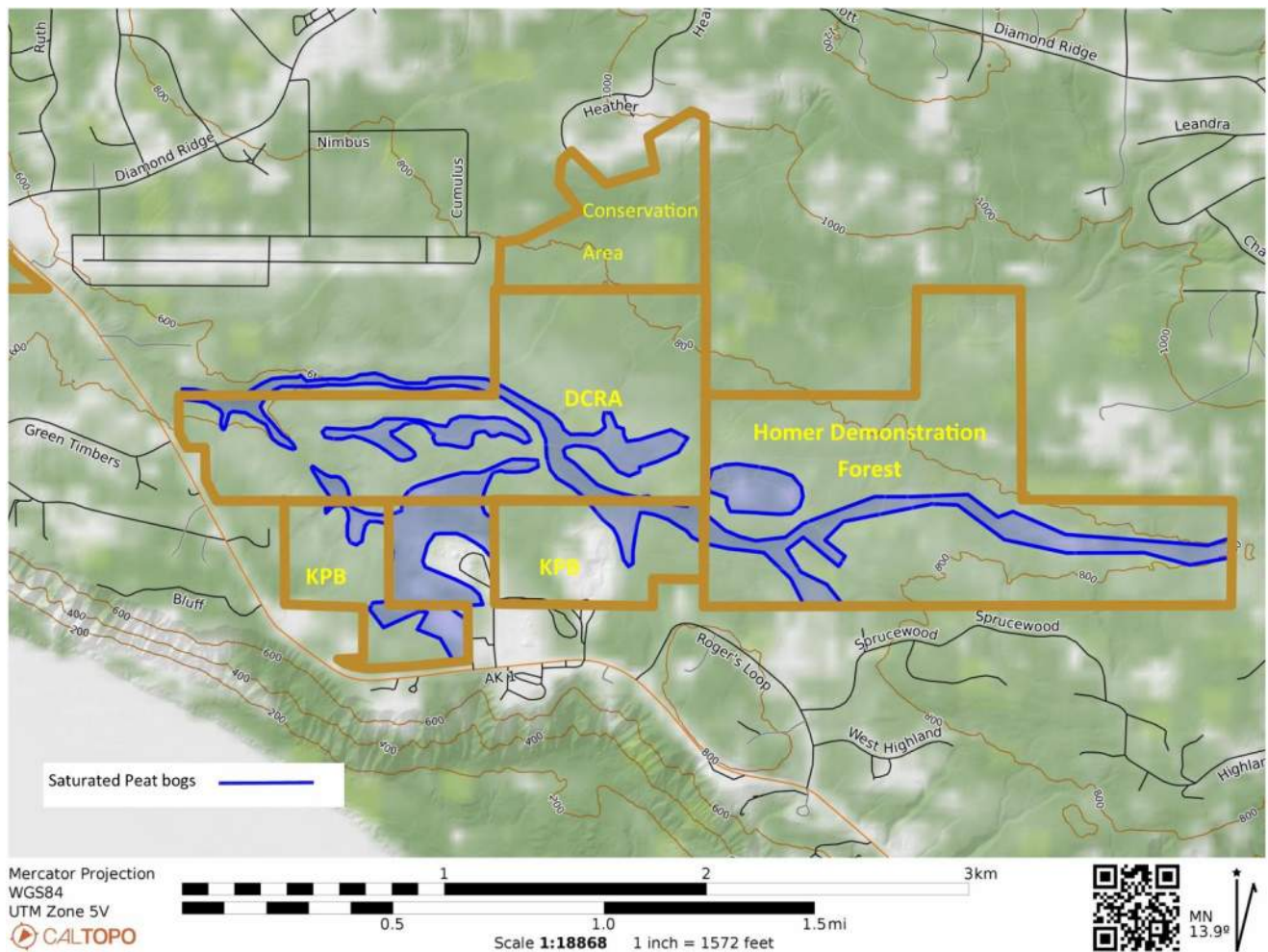
Recreational Objective 1: Improve controlled, non-motorized recreational access to the DCRA. The Plan outlines specific ideas for parking lots and a pedestrian underpass across the Sterling Highway to connect the DCRA to the Diamond Creek State Recreation Site.

Recreational Objective 2: Construct summer-use trails within the DCRA. Specifically, trail loops and connectors in the upland “forest islands” and across the Sterling Highway via an underpass, hardened to create sustainable use by non-motorized recreationists.

This Concept Trail Plan provides a preliminary plan to achieve these objectives. Field work was conducted in October 2024 by Jon Underwood of Happy Trails, Inc. and Billy Day and Sandra Cronland of the Homer Trails Alliance. The concept routes were explored, collecting GPS information and making notes of soil conditions and water and wetland crossings. Work was limited to route-finding, with limited amounts of measurement. No trail lines were flagged or specified. The technical work of engineering, layout and flagging for construction remains to be done. *This preliminary plan represents a 15% design and should not be used for planning construction or soliciting bids.*

Soils

To understand what soil quality means for trails, we can divide trails into two categories: natural surface or hardened trails. Natural surface trails are composed of the dirt, gravel or rock found on the trail, which is the preferred surface for most trails. Some soils cannot withstand the wear and tear of any kind of sustained traffic, so they must be fortified by gravel, geofabric, grid, or boardwalk.



According to the National Resources Conservation Service, the dominant soil types in the DCRA are Spenard peat and Starichkoff peat. Any kind of peat retains water and drains poorly- utterly insufficient for a trail tread surface. The map above delineates areas of saturated peat soil in DCRA and surrounding public areas. This soil is so unstable, only moss and grass can grow there. (See photo example on left). Simply walking across it causes noticeable surface movement.

Saturated peat cannot support a heavy gravel structure without collapsing or being displaced. So much gravel is required to create a durable tread surface that the trail disrupts water flow and alters natural vegetation. We recommend boardwalk in these areas to preserve the natural soil and ecosystem.



The other type of soil found in DCRA is wet silt (see photo on left). This soil must be hardened with gravel, or a combination of gravel, geofabric, or grid to withstand non-motorized trail traffic.

Gravel construction on trails entails difficult logistics. It must be hauled from the pit and then hauled out on the trail. If hauled by a machine, the trail must be constructed at every point to withstand the ground pressure of the loaded machine. This typically increases the amount of gravel that must be hauled. To haul more in a load, a stronger, wider trail bed must be built. So the amount that can be hauled in one trip is limited by the fact that you want a small, narrow trail in most cases. At some point it can become economically more feasible to haul gravel in super-sacks with a helicopter.

Both gravel and boardwalk construction methods are

costly, but boardwalk is much more costly. For this reason, the trails should remain in the “tree island” areas and only cross the peat soils when necessary and in the shortest possible distance. Please note that the map only depicts the most obvious areas based on aerial photographs. Our recon team observed several areas within the “tree islands” that featured standing water and may not be suitable for gravel construction. Better routes may be discovered in later design iterations.

Proposed All-Season Trails

There are some clear routes to connect existing trails and trailheads to the proposed underpass crossing the Sterling Highway. Adding a few connectors between these trails will create loops, which are always

preferred by trail users. These trails are conceived and specified to conform to Alaska State Parks Pedestrian Trail Class 5. *See Appendix II.*

Construction Phases

Phase I: Connect Baycrest ski trails to proposed Green Timbers trailhead. Construct GT Trailhead. A trail similar in concept to the one proposed in the Kinney Engineering memorandum would connect to the underpass and Diamond Creek State Recreation Site.

Phase II: Construct trail to connect Green Timbers trail and Baycrest Ski Trails to KPB trailhead; construct KPB trailhead.

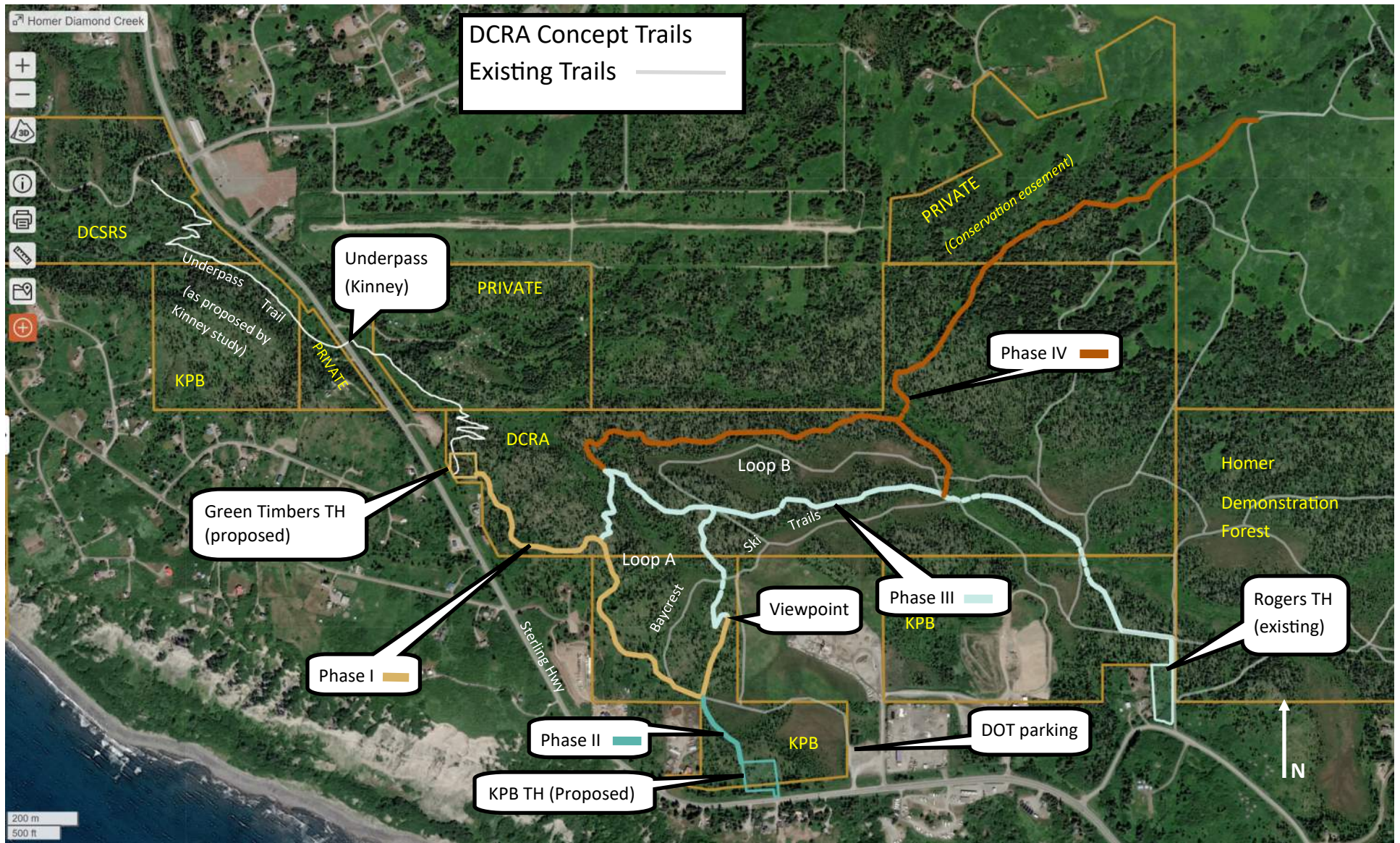
Phase III: Construct trail to complete Loop A and connect to Rogers trailhead.

Phase IV: Construct trail to complete Loop B and Homestead Connector.

Trail Inventory (Concept Trails Only)

Boardwalk and bridges are treated as the same for this level of planning, since they are proposed to have almost identical construction and load capacity.

Name	Length, ft	Gravel, ft	Boardwalk, ft	Width, in.	Clearing ft
Phase I, Green Timbers to Viewpoint, GT TH	4470	4470	0	72	10
Phase II, KPB connector, KPB TH	709	709	0	72	10
Phase III, GT/KPB to Rogers	8504	7489	1015	72	10
Phase IV, Homestead Connector	8999	8849	150	72	10
Underpass Trail	6392				



Trailheads and Parking

Rogers Trailhead is one of the most heavily used trailheads for the winter trail system, and also provides access to recently upgraded boardwalk trails in the HDF. An area was cleared in 2024 for parking.

KPB and Green Timbers Trailheads are proposed and conceptual only. See Construction and Costs-Phase I below for more information.

AK DOT/PF parking area. The AK DOT/PF owns property that provides access to a portion of the trail system and has been used for parking in the past. However, this area is currently occupied by an asphalt plant and associated piles of gravel to support Homer's Airport Project and has not been available for parking. The AK DOT/PF will likely use this area for construction support of the Sterling Highway projects that are planned in the near future. Thus, this area is not reliably available for parking.

DOT vs KPB parking

In the past the DOT parking lot has provided convenient, free parking for winter trail users of the Baycrest Ski Trails. However, if a boardwalk is constructed across the saturated peat soils directly west of the DOT lot (see map below), it will cost \$8-900,000, much more than simply constructing a parking lot on KPB land. Moreover, the trail system will gain a convenient year-round parking area not shared with DOT. Negotiation with KPB will be required to obtain permission.

Phase I: Green Timbers to Baycrest Ski Trails

Phase I: Connect Baycrest ski trails to proposed Green Timbers trailhead. Construct GT Trailhead. A trail similar in concept to the one proposed in the Kinney Engineering memorandum would connect to the underpass and Diamond Creek State Recreation Site.

Winter construction

Money, time and the natural environment may be saved by hauling materials and completing construction of these trails in winter. The open bog areas that are a barrier in summer become clear, smooth access paths when frozen and covered with snow.

Estimated Costs Phase I

Trails

Clearing and stumping, 4470 ft @\$6 per foot	\$26820
Layout, measurement, specs, permitting	\$25000
Gravel, 12" pit run 8' wide, 2:1 fill slopes, 4470 ft @\$13 per foot	\$58110
Gravel, 6" type II, 6' wide, 4470 ft @ \$7.13 per foot	\$31871
TOTAL Trail	\$141801

Green Timbers Parking lot

Clearing & Grubbing	\$5000
2400 cu. yds. Classified Fill X \$35 / yd.	\$84000
660 cu. yds. Type IIA X \$55 / yd	\$36000
1350 sq. yds. geotextile fabric X \$1.00 / sq. yd	\$1350
TOTAL parking lot	\$126350

TOTAL Phase I \$268151

Costs based on estimates from local contractors and proposals from boardwalk component suppliers supplied by Homer Trails Alliance, and calculations by Happy Trails Inc. Calculations include October 2024 prevailing wage rates as published by the State of Alaska.

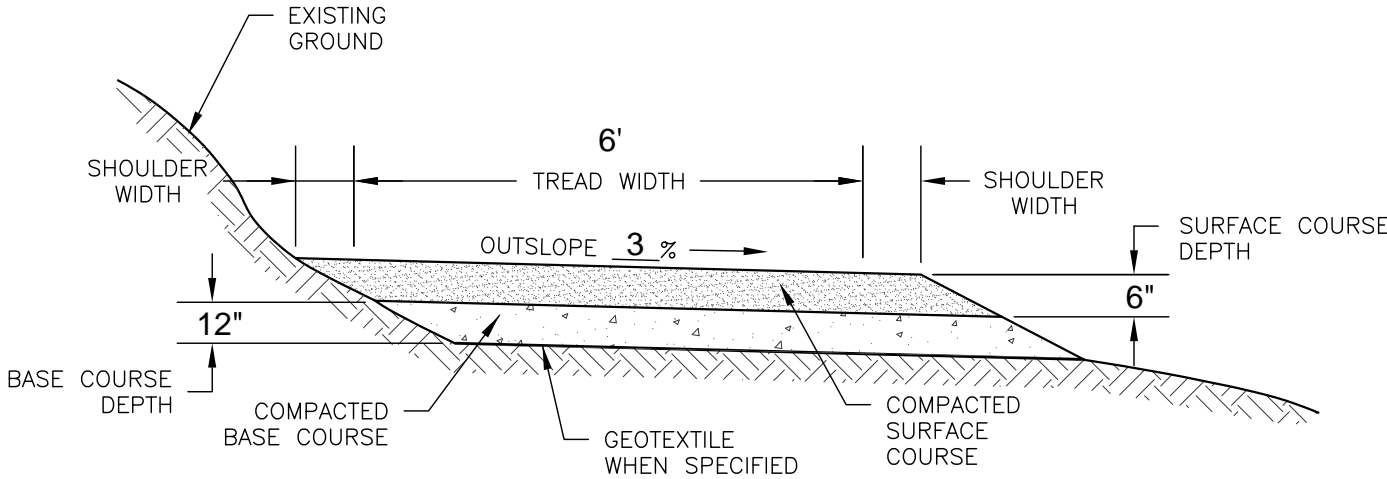
Gravel Hardening

12" of pit run gravel or 3" or higher graded cobble as a base, topped by 6" of D-1 or E-1 for a smooth top surface. See diagram.

SURFACING SECTIONS

TYPICAL ID	SECTION TYPE	TREAD WIDTH	SHOULDER WIDTH		GEOTEXTILE TYPE	BASE COURSE		SURFACE COURSE		COMMENTS
			UPHILL	DOWNHILL		TYPE	DEPTH	TYPE	DEPTH	
		6'				Pit Run	12"	D-1	6"	Compacted, 2:1 fill slopes

N/A WHEN NOT APPLICABLE



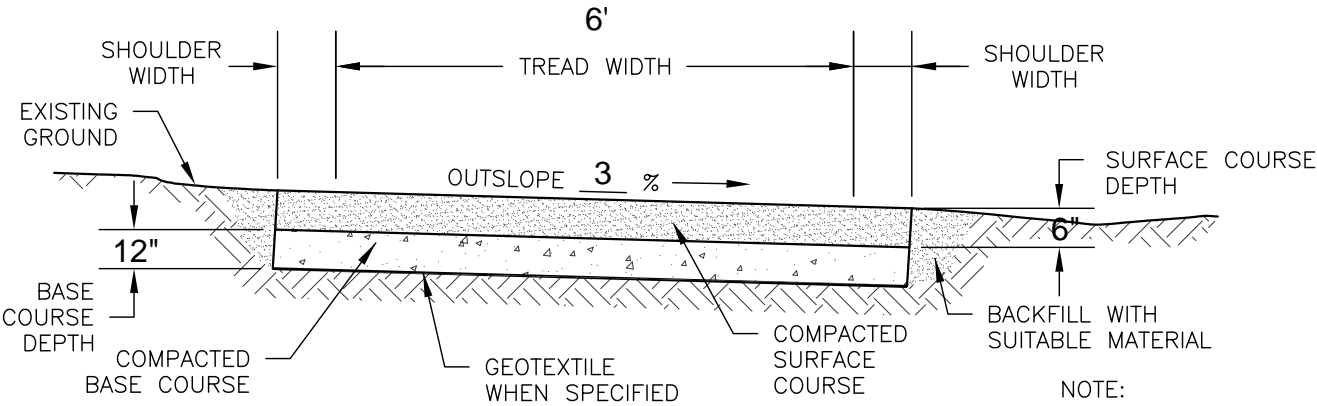
A OUTSLOPED SECTION

BASE COURSE MATERIAL TYPE

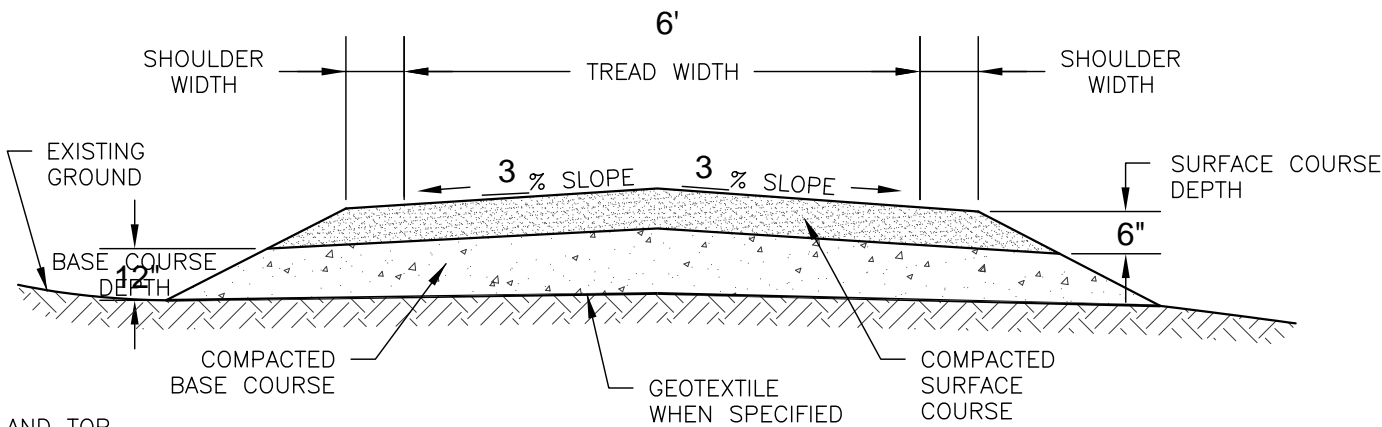
TYPE	MATERIAL	GRADATION	COMMENTS
B1	PITRUN		
B2	D-1		
B3			

SURFACE COURSE MATERIAL TYPE

TYPE	MATERIAL	GRADATION	COMMENTS
S1	PITRUN		
S2	D-1		
S3			
S4			
S5			



B EXCAVATED SECTION



C RAISED SECTION

- NOTE:
1. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
 2. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.

NOT TO SCALE

DCRA Concept Trail Plan

PROJECT NAME & LOCATION

DCRA Trails, Homer, Alaska

Page 8 of 17

DRAWING NAME

Typical Gravel Surfacing

SECTION

TYPICAL ID

REVISION DATE

11/20/2024

NO SCALE

DRAWING NO.

SHEET

February 2025 OF



Mirror Lake Trails, Chugiak



Mirror Lake Trails, Chugiak



Shoup Bay Trail, Valdez



Riverwalk Park, Delta Jct.

Typical gravel surfacing projects in Alaska

Boardwalk

Trail sections across saturated peat soils should be constructed as boardwalks. These boardwalks would be constructed by drilling helical piles into the soil to a sufficient depth that they encounter firm soil. The piles are cross-braced and a frame attached to support Fiber Reinforced Polymer (FRP) decking. This boardwalk construction technique provides a long-lasting structure with minimal disturbance of fragile soils and vegetation.

Foundation: 3" diameter helical piles, cross-braced. Helical piles can be driven in winter.

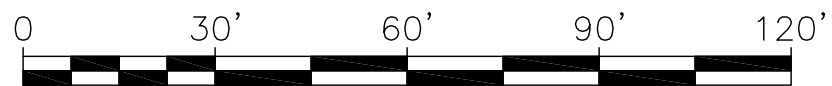
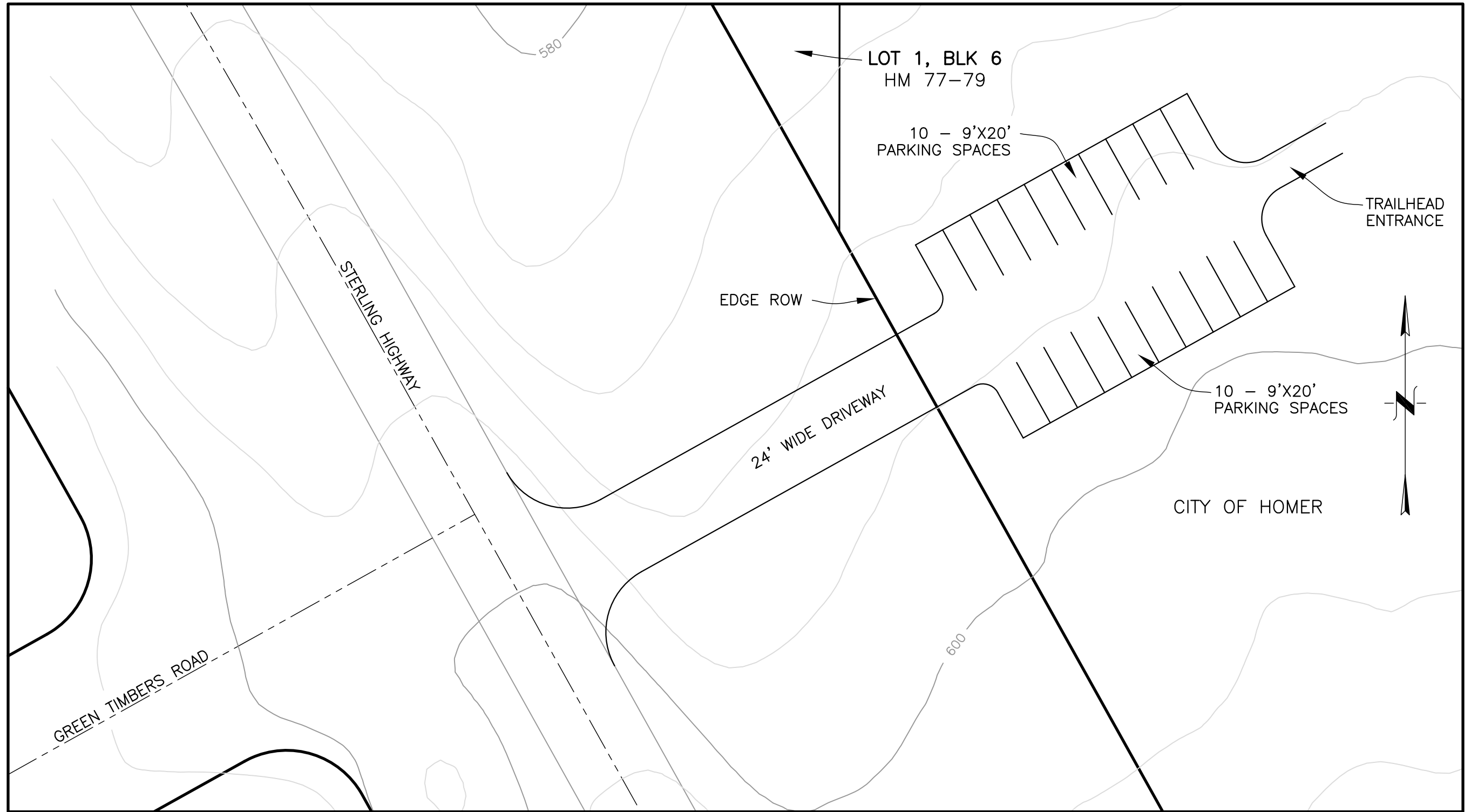
Structure: FRP (Fiber Reinforced Polymer) girders and decking. See photo below.

This method of construction yields a structure that is very long-lasting- up to 100 years as opposed to typical wood-decked trail boardwalk built on wooden sills laid into swampy ground, which last 10-20 years.

Boardwalk built with FRP structure and deck



Union Valley Reservoir Boardwalk, El Dorado National Forest, California



GRAPHIC SCALE

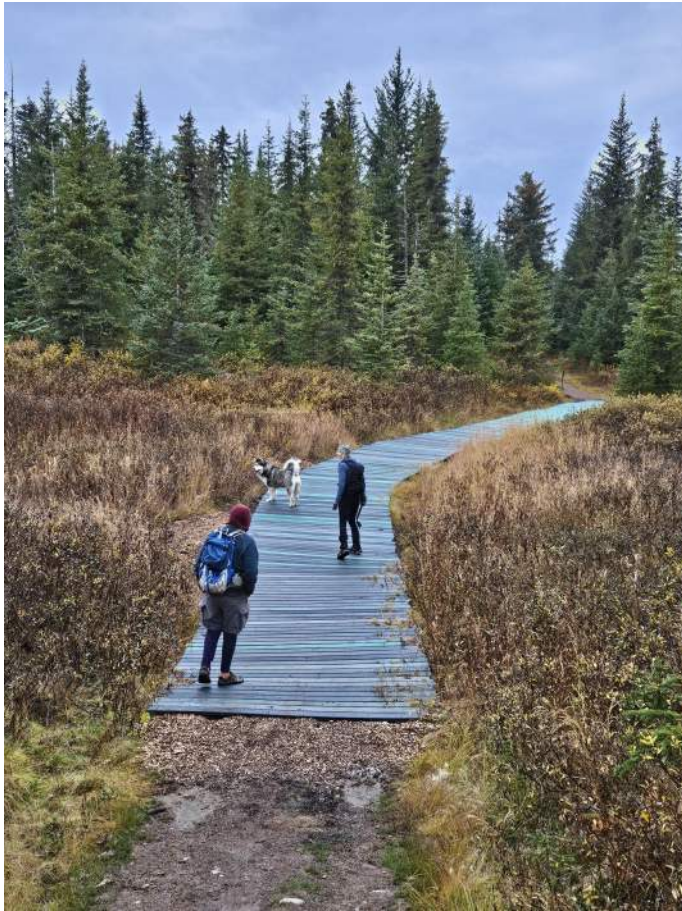
JANUARY 2023

REVISION NO.	DATE	REVISION DESCRIPTION

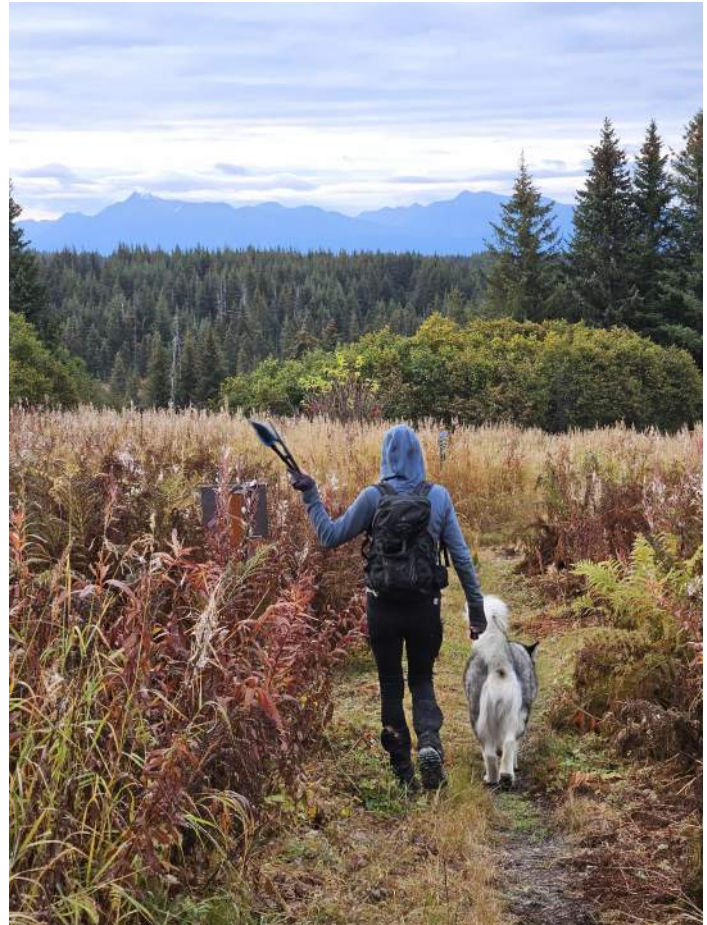
HOMER TRAILS ALLIANCE
PO BOX 2215
HOMER, ALASKA 99603
www.homertrailsalliance.org

GREEN TIMBERS TRAILHEAD
PROPOSED OFF-ROAD PARKING
AND DRIVEWAY ACCESS
CITY OF HOMER, ALASKA

SHEET NO.
2 OF 3



Boardwalk near Rogers Trailhead



Homestead Trail NE of DCRA



Muktuk Marston Trail, Chugach State Park

Acknowledgements and Thanks

Diamond Creek Recreation Area Multi-Resource Management Plan, May 2013, Homer Soil & Water Conservation District. Officially adopted by the City of Homer in May 2013.

Billy Day and Sandra Cronland, Homer Trails Alliance for their warm hospitality and passion for trails. Billy supplied most of the construction cost estimates based on quotes from local contractors.

Jan Keiser, Kinney Engineering, for her skill at bringing ideas and people together.

Appendix I

Nine Elements of a Sustainable trail

A **Sustainable Trail** is a trail that conforms to its terrain and environment, is capable of handling its intended use without serious resource degradation, requires minimal maintenance, and focuses on maximizing the user's experience.

New trail construction projects should strive to meet all nine elements. For existing/social trails, these elements can be used as a template for identifying problems, and prescribing or implementing improvements.

- 1. Planned & Designed:** Guided by design documents & specifications; public comment; EA/EIS and other permitting; field recon; and professional design & layout.
- 2. Contour Curvilinear Alignment:** Layout for sidehill construction following topography. Avoids straight lines, matches the curves of existing topography. Enables full bench construction, which promotes sheet flow drainage. Avoids the fall line. Conforms to, not imposed on, terrain.
- 3. Controlled Grade:** Grade choices designed and deliberate, not just responding to terrain as encountered. Follows “half-rule” regarding side-slope: trail grade generally not more than half the steepness of side-slope it crosses (Eg: on a measured slope of 20%, a traversing trail should not be steeper than 10%). In Alaska, because of poor soils and often unpredictable hydrology, we have found a “one-third rule” to be a more reliable predictor of sustainability.
- 4. Integrated Water Control:** Drainage designed and constructed into initial alignment (via grade reversals). Reduces dependence on drainage structures, which can fail. Post-construction drainage incorporates rolling grade dips, topo-mods, etc. All tread is either out-sloped (toward drainage point) or crowned (on flat ground). Avoids reliance on culverts and “waterbar” style drains.
- 5. Full Bench Construction:** 100% of tread surface excavated from sloping terrain to native undisturbed ground. Avoids $\frac{3}{4}$ to $\frac{1}{2}$ bench, with trail tread on cut & fill sections.
- 6. Durable Tread Surface:** When bench cut isn't possible because of low side-slopes, or soils are fragile, use other trail hardening methods. On-site material, imported material, structures, geo-textiles, etc. Implement the simplest solution first. Always begin with drainage structures before tread structures.
- 7. Regular Maintenance:** Even the most sustainable trail needs maintenance. This should be accounted for in trail planning and funding.

8. Integrates Well into the Environment: Trail does not destroy the feel, aesthetics or ecological integrity of the surrounding environment. Rather, the trail enhances natural features & draws users into surroundings. Trail is an interpreter of landscape.

9. Satisfies the Intended User: If a user's needs are not met, they won't use the trail or they'll use it in a way that degrades it. A good trail makes a user happy!

A trail that incorporates the nine Sustainable Elements has a dramatic reduction in life-cycle maintenance costs when compared to an unplanned, undesigned trail, which more than compensates for a higher initial cost. Additionally, a sustainable trail offers significantly improved public safety and transportation alternatives, higher user-satisfaction, more stringent resource protection, better environmental aesthetics, and increased adjacent property values.

Adapted from IMBA guidelines by Interior Trails LLC and Happy Trails Inc.

Appendix II Trail Design Parameters

Table 3.1 - Hiker / Pedestrian Terra Trail Design Parameters

Trail Class 5 Recommended for DCRA

Designed Use Hiker/Pedestrian: Terra Trail		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	0" – 12"	6" – 18"	18" – 36"	24" – 60"	36" – 72"
	Double Lane	36"	36"	36" – 60"	48" – 72"	72" – 120"
	Structures (Minimum Width)	18"	18"	18"	36"	36"
Design Surface	Type	Native, ungraded May be continuously rough	Native, limited grading May be continuously rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native with improved sections of borrow or imported material, and routine grading Minor roughness	Likely imported material, and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	No protrusions
	Obstacles (Maximum Height)	24"	14"	10"	8"	No obstacles
Design Grade	Target Grade	5% – 25%	5% – 18%	3% – 12%	2% – 10%	2% – 5%
	Short Pitch Maximum	40%	35%	25%	15%	5% – 12%
	Maximum Pitch Density	20% – 40% of trail	20% – 30% of trail	10% – 20% of trail	5% – 20% of trail	0% – 5% of trail
Design Cross Slope	Target Cross Slope	Natural side slope	5% – 20%	5% – 10%	3% – 7%	2% – 3% (or crowned)
	Maximum Cross Slope	Natural side slope	25%	15%	10%	3%
Design Clearing	Height	6'	6' – 7'	7' – 8'	8' – 10'	8' – 10'
	Width	≥ 24" Some vegetation may encroach into clearing area	24" – 48" Some light vegetation may encroach into clearing area	36" – 60"	48" – 72"	60" – 72"
	Shoulder Clearance	3" – 6"	6" – 12"	12" – 18"	12" – 18"	12" – 24"

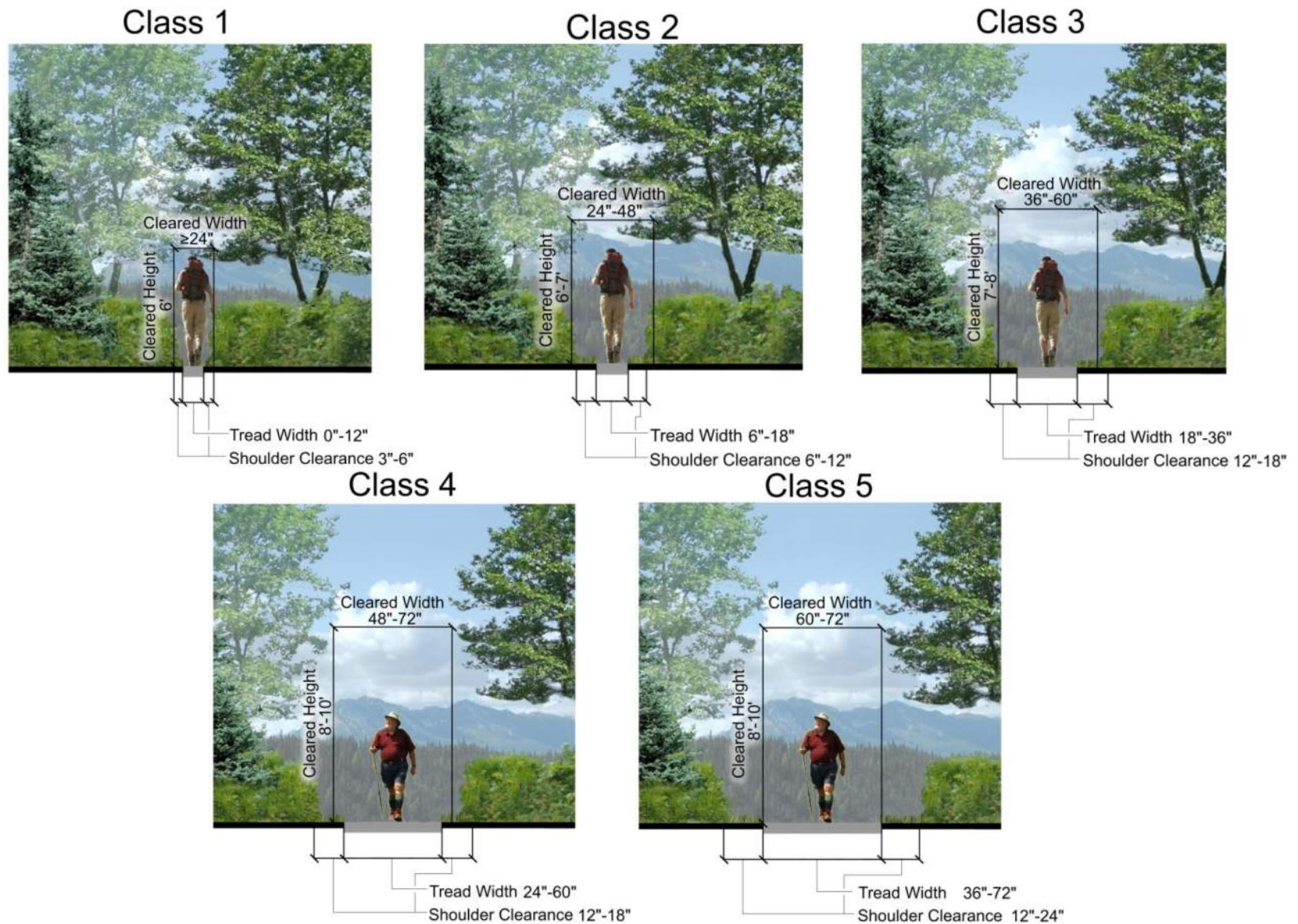


Figure 3.1 - Hiker / Pedestrian Terra Trail Design Parameters