TRANSPORTATION ADVISORY COMMITTEE
491 E. PIONEER AVE.
HOMER, ALASKA

MAY 21, 2013
TUESDAY, AT 5:30
COWLES COUNCIL CHAMBERS

REGULAR MEETING AGENDA

1. CALL TO ORDER

2. APPROVAL OF AGENDA

3. PUBLIC COMMENTS REGARDING ITEMS ON THE AGENDA

4. RECONSIDERATION

5. APPROVAL OF SYNOPSIS
   A. Regular Meeting Synopsis of February 19, 2013 Page 1

6. VISITORS
   A. Anna Bosun- AKDOT (15 minutes)
   B. Kevin Walker – Kachemak Drive Path Association Report (5 minutes)

7. STAFF & COUNCIL REPORT/COMMITTEE REPORTS/BOROUGH REPORTS

8. PUBLIC HEARING

9. PENDING BUSINESS
   A. Waddell Way Update – Resolution 13-033 Approving a 2005 Transportation Plan Central Business District East/West Corridor Alternative Using Hazel Avenue as the Connection to Heath Street, and the Waddell Way Portion of the Road Corridor be Connected to Heath Street at Bonanza Avenue Page 7

10. NEW BUSINESS
    A. HART Annual Review Page 11
    B. Summer Trail Improvement Plans – Spit Trail, Cruise Ship Dock Trail, Greatland Trail Page 21
    C. Homer Area DOT Updates – Pioneer Ave., Lake Street, Main/ByPass
    D. Non-Motorized Transportation and Trail Plan Separate Document

11. INFORMATIONAL MATERIALS
    A. Resolution 13-040 Directing City Administration to Terminate all Survey, Design, and Cost Estimating Work on the Kachemak Drive Pathway. Page 23
    B. Steep Slope Information from City Code Page 25
    C. Community Design Manual Steep Slope Information Page 29

12. COMMENTS OF THE AUDIENCE
13. COMMENTS OF THE STAFF
14. COMMENTS OF THE COUNCILMEMBER
15. COMMENTS OF THE CHAIR
16. COMMENTS OF THE COMMITTEE MEMBERS
17. ADJOURNMENT/NEXT REGULAR MEETING IS SCHEDULED FOR MAY 21, 2013 at 5:30 p.m. in the Homer City Hall Cowles Council Chambers located at 491 E. Pioneer Avenue, Homer, Alaska.

Clerk's Office 5/16/2013 mj

 UNAPPROVED

Session 13-01, a Regular Meeting of the Transportation Advisory Committee was called to order by Chair Roberts at 5:32 p.m. on February 19, 2013 at the City Hall Cowles Council Chambers located at 491 E. Pioneer Avenue, Homer, Alaska.

COMMITTEE MEMBERS: Highland, Roberts, Smith, Venuti, Walker

STAFF: Public Works Director Meyer
Deputy City Clerk Jacobsen

APPROVAL OF AGENDA

The agenda was approved by consensus of the Committee.

PUBLIC COMMENTS REGARDING ITEMS ON THE AGENDA

None

RECONSIDERATION

No items were scheduled for reconsideration.

APPROVAL OF MINUTES

A. Regular Meeting Synopsis of November 20, 2012

The Synopsis was approved by consensus of the Committee.

VISITORS/PRESENTATIONS

STAFF & COUNCIL REPORT/COMMITTEE REPORTS/BOROUGH REPORTS

Public Works Director Meyer updated the Committee on transportation oriented projects. The spit trail project is moving forward with cruise ship funds for improvements that will go from the Sterling Highway around back side of the Small Boat Harbor over to the Deep Water Dock and DOT funds to extend the spit trail from where it stops now near the fishing hole out along the top of the Small Boat Harbor to Fish Dock Road then back out to the Sterling Highway and around to the End of the Road Park. Improvements will include paving the parking area at End of the Road Park, also a restroom there and one at the Deep Water Dock. They hope to start construction this summer and finish up by spring of next year. This will expand the walkability of the spit tremendously as the spit trail is heavily used. Crittenden Road improvement district has been created and construction bid will be going out soon. Today we learned that Waddell Street petition has adequate support to schedule a neighborhood meeting and move on to the objection period. If it goes well it can be included with Crittenden contract.

Councilmember Roberts commented that our Mayor and staff are in Juneau lobbying for us for transportation issues on our CIP list.

PUBLIC HEARING

There were no public hearings scheduled.

PENDING BUSINESS

A. Road Grades and Steep Slopes

Mr. Walker commented regarding issues he has as a neighboring resident to the Canyon Trails Subdivision with run off into an inadequate sized culvert near his house. During the development he was unable to get approved copies of plans for the development. It is a steep slope that failed for four years and was finally fixed this past summer. He expressed concern about stabilizing open slopes in a timely manner. It is a problem for the City in allowing development of these slopes when the culverts freeze every winter. There have been some significant events in the last 11 years that have cause issues with erosion and we need to figure out how to build roads right and if side slopes go on forever, maybe not build roads there. Maybe 100 to 150 foot rights of way should be required on the slopes that can be seeded and protected right away or bigger lots so you can find a different route to get to the lots at the end of the road.

Mr. Smith commented that larger culverts won't solve an icing problem, it is a maintenance concern. Culverts are sized to handle the flow for a 100 year storm in the area they cover, it is a hydrological calculation.

Public Works Director Meyer commented regarding the Canyon Trails Subdivision. That particular area was an unusual situation. Mr. Meyer isn't aware of any changes to the City's regulations regarding road development. There are options for things like thaw pipe, or thaw wire, but energy costs are involved to for those options. Public Works has been focused on getting a second steamer truck to improve response times to frozen culverts. When cutting into a slope there is a potential for ground water to surface after things begin to freeze and glaciate on the slope or in the ditch line below it. He doesn't know how to stop it from happening, other than cutting of water uphill, but that is easier said than done.

Mr. Walker suggested enforcing the regulations the City has and increasing culvert size as three foot culverts around town don't freeze as often as two foot culverts.

Mr. Smith noted that the City has a rigorous set of requirements for steep slope development, separate from regular road development. It's very thorough and gives the Public Works Director some authority to make decisions on a case by case basis. This committee spent quite a bit of time dealing with this in the past.

NEW BUSINESS

A. Waddell Way Street Improvements Proposal

Public Works Director Meyer reviewed the proposal drawings that were included in the packet. He explained that the property in question has been put up for sale and there is a potential buyer who is interested in developing the property, but expressed concern as the proposed right of way outlined in the Transportation Plan goes through the property where cabins are located and comes out across from Grubstake. In discussion with the potential buyer it became apparent that the cabins are an important component of the property. Mr. Meyer wanted to have input from the committee regarding the options for the right of way. The Design Criteria manual says streets should be brought together in an intersection, not a

lot of alternating intersections going up a street. Another issue is if Grubstake is going to be utilized as an east west corridor, then Waddell Way should connect to it. If it isn't an issue, there are other options to look at.

The committee extensively discussed some history of the development of the Transportation Plan and options of Waddell Way coming out across from Grubstake, as outlined in the Transportation Plan, and the alternate options of it coming out across from Bonanza or a location midway between Grubstake and Bonanza.

Discussion points included:

- Making Grubstake or Bonanza a thoroughfare doesn't seem like a good option as it routes traffic through the residential neighborhoods
- When developing the Transportation Plan they found you can't always get a modeled extension without affecting a neighborhood.
- Moving it to Bonanza saves having to go through the cabins, but it precludes doing a through modeled extension, which was the purpose of the modeled extension program.
- The model extension program is to provide access that allows traffic to get off the main arterials.
- Hazel Avenue is already developed with large parking lots on both sides and good access for doing errands.
- The middle option would make it difficult to have a safe traffic area, having three different roads entering on to Heath Street.
- Using the Bonanza connection precludes one of the two options that were approved by Council in the Transportation Plan.
- It is important to consider the east west movement of traffic flow.
- The middle option comes out at the steepest point on Heath Street, but levels out near the intersections of Bonanza and Grubstake.
- In twenty years this east west corridor will be beneficial. The Committee has talked about the traffic challenges that already exist in the City.
- Using the Grubstake access raises another issue of the extension on through Grubstake to make the connection.
- Hazel Avenue is also listed in the Transportation Plan as an option for a portion of the east west corridor.

The potential buyers of the property were in the audience and Chair Roberts invited one of them to briefly share feedback they may have.

Bill Williams, city resident, commented on behalf of the group. He engaged the Committee in clarification of some of the points of their discussion. Mr. Williams then provided an overview of their plan for the property and their intent to fully utilize the cabins. He expressed that developing Waddell Way across from Grubstake will inhibit them from moving forward with their plans.

Chair Roberts asked if anyone wished to propose a motion for an east west corridor of Hazel or Grubstake.

VENUTI/HIGHLAND MOVED TO USE HAZEL AVENUE.

Mrs. Venuti commented that using Grubstake would impact the neighborhood where there are lots of residences with children and animals. Hazel already has parking lots and good access.

VOTE: YES: VENUTI, HIGHLAND, WALKER, SMITH, ROBERTS

Motion carried.

Chair Roberts asked if there is a motion for the north, south, or middle route for Waddell Way entering Heath Street.

VENUTI/SMITH MOVED TO RECOMMEND THE SOUTH ROUTE. (across from Grubstake)

Mrs. Venuti commented that the northern route is too far up and the middle option would be extremely dangerous for the people coming out of Bonanza or Grubstake.

Mr. Smith questions whether the elevation would allow for a safe option at Bonanza, and Mr. Walker agreed with concerns regarding elevation.

Public Works Director Meyer noted the slope between Grubstake and Bonanza increase but the grades at the intersection of Bonanza are the safest.

Chair Roberts commented that if recommending using Hazel as the connection, she doesn't think there is any difference between turning left at Bonanza or at Grubstake.

VOTE: YES: SMITH
NO: WALKER, VENUTI, HIGHLAND, ROBERTS

Motion failed.

HIGHLAND/WALKER MOVED TO USE THE NORTH ROUTE ACROSS FROM BONANZA FOR THE EAST WEST HEATH STREET TO LAKE STREET.

There was no discussion.

VOTE: YES: ROBERTS, VENUTI, HIGHLAND, WALKER
NO: SMITH

Motion carried.

Chair Roberts stated that the Transportation Committee recommends to Council that Hazel would be the east west corridor and Waddell Way would come in at Bonanza.

B. Memorandum from Deputy City Clerk Jacobsen Re: Consideration of Telephonic Participation by Committee Members

Supporting comments included that in the age of telecommunication all of the laydowns and so forth can be made available to anyone with an internet connection or satellite telephone. The Council respects the need to call in. If there are only three members present it would be helpful to have another member who could participate on the phone.

Other comments were that it isn't always easy for staff to implement. It is appropriate at the Council level where they are making binding decisions, but as an advisory committee it isn't as necessary. It is challenging to conduct business when members are telephonic, including

calls dropping and referencing visual aids, like their work with the maps tonight. Staff added that if laydown materials were presented during a meeting, it wouldn't be feasible to stop the meeting to for time to scan and email information to members participating on the phone. Point was also raised that three members of this committee is a quorum.

HIGHLAND/WALKER MOVED TO ALLOW TELEPHONIC PARTICIPATION BY TRANSPORTAION ADVISORY COMMITTEE MEMBERS WITH A LIMIT OF ONE TIME PER YEAR.

VOTE: YES: HIGHLAND, WALKER
NO: SMITH, ROBERTS VENUTI

Motion failed.

INFORMATIONAL ITEMS

AUDIENCE COMMENTS

Bob Philips commented that they have been working on the proposal for the property near Waddell Way and worked with Planning Staff for quite a while before the transportation issue came up. Their design was to start building this summer and finish by winter. Waiting three months for a decision kills the project. He had a thought that of using both plans to make one proposed route would be a better situation.

COMMENTS OF THE STAFF

Public Works Director Meyer commented that going to the Council with this is the quickest way to make a decision. He appreciates the committee's decision making process, it was very valuable.

COMMENTS OF THE COUNCILMEMBER/CHAIR

Chair Roberts asked to include the steep slope development requirements as an information item in their next packet. She appreciates the way this group works together and has good discussion.

COMMENTS OF THE COMMITTEE MEMBERS

Mr. Smith commented that Anna Bosin works for State DOT and has the information on Lake Street and intersection project. He hopes to get her to come for the May meeting.

Ms. Highland welcomed Kevin to the group and this was one of the most difficult decision making meetings they have had.

ADJOURN

There being no more business to come before the Committee the meeting adjourned at 7:50 p.m. The next regular meeting is scheduled for May 21, 2013 at 5:30 p.m. in the City Hall Cowles Council Chambers.

_____
MELISSA JACOBSEN, CMC, DEPUTY CITY CLERK

Approved: _____

CITY OF HOMER
HOMER, ALASKA

City Manager/Public Works

RESOLUTION 13-033

A RESOLUTION OF THE CITY COUNCIL OF HOMER, ALASKA, APPROVING A 2005 TRANSPORTATION PLAN CENTRAL BUSINESS DISTRICT EAST/WEST CORRIDOR ALTERNATIVE USING HAZEL AVENUE AS THE CONNECTION TO HEATH STREET, AND THE WADDELL WAY PORTION OF THE ROAD CORRIDOR BE CONNECTED TO HEATH STREET AT BONANZA AVENUE.

WHEREAS, The Transportation Advisory Committee and the City Council has shown support for proceeding with the Waddell Way Road Improvements between Lake Street and Heath Street; and

WHEREAS, The Transportation Advisory Committee recommended at their February 19th meeting, that the new east/west central business district road corridor recommended in the 2005 Transportation Plan follow Alternate B, using Hazel, not Grubstake, and that the Waddell Way portion of the corridor connect to Heath Street at Bonanza Avenue; and

WHEREAS, The City cannot effectively proceed with the right-of-way acquisition and design, and property owners in the area cannot effectively proceed with development until the Waddell Way road corridor alignment has been established.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of Homer, Alaska, approves a 2005 Transportation Plan Central Business District East/West Corridor alternative using Hazel Avenue as the connection to Heath Street, and the Waddell Way Portion of the road corridor be connected to Heath Street at Bonanza Avenue.

PASSED AND ADOPTED by the Homer City Council this 8th day of April, 2013.

CITY OF HOMER

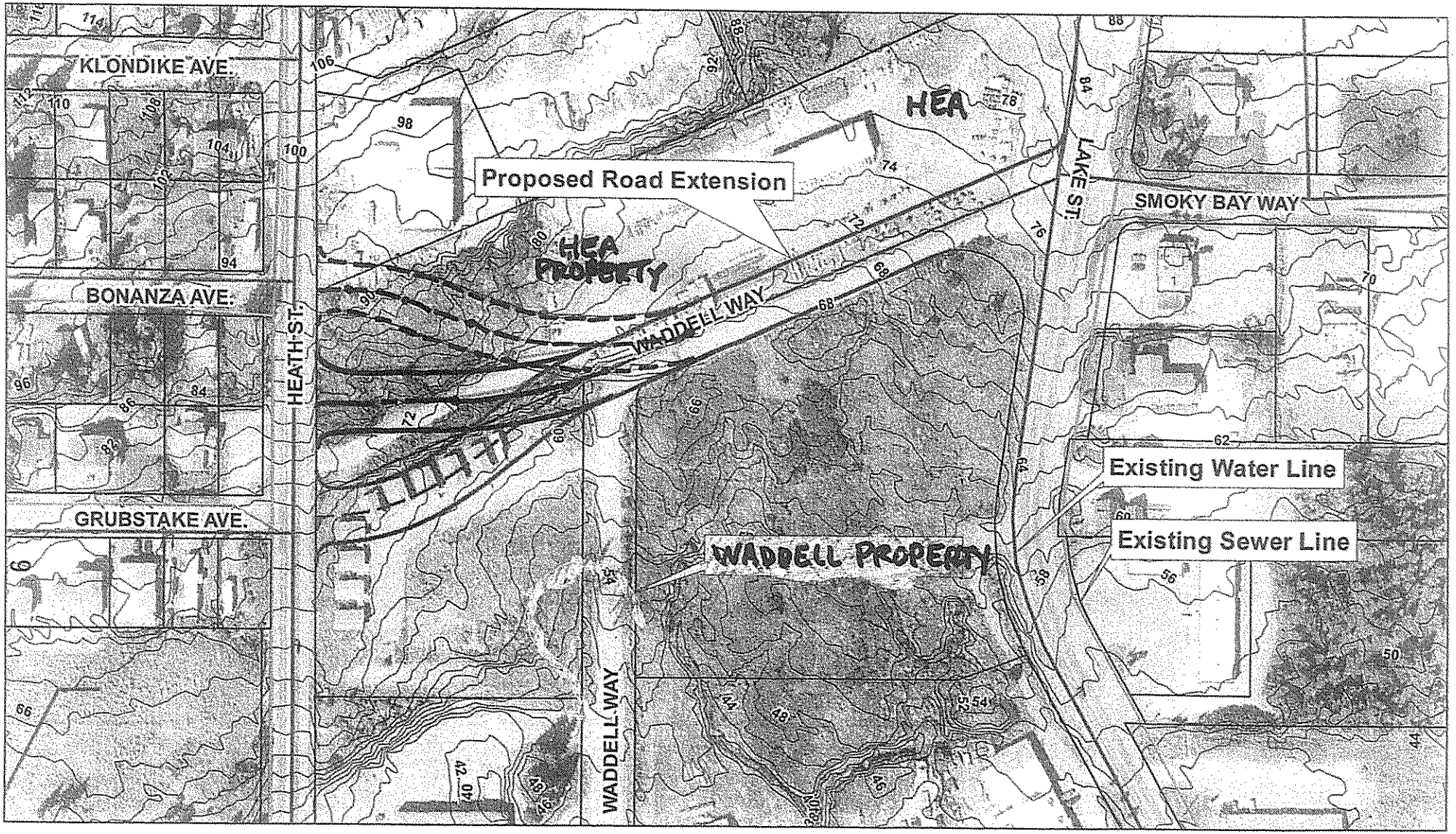
Mary E. Wythe

ATTEST: MARY E. WYTHE, MAYOR

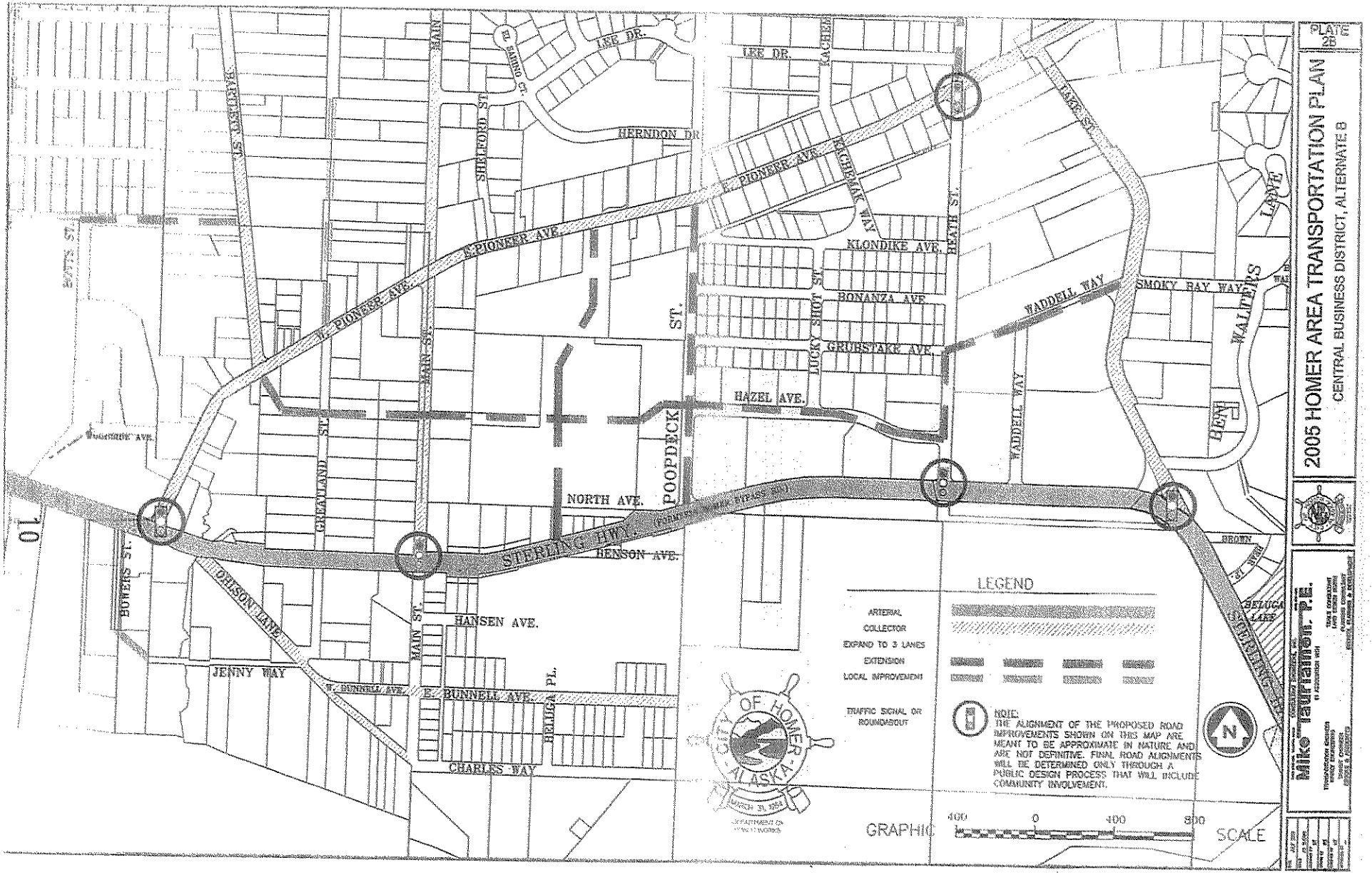
Melissa Jacobsen Acting City Clerk

JO JOHNSON, CMC, CITY CLERK

Fiscal Note: N/A



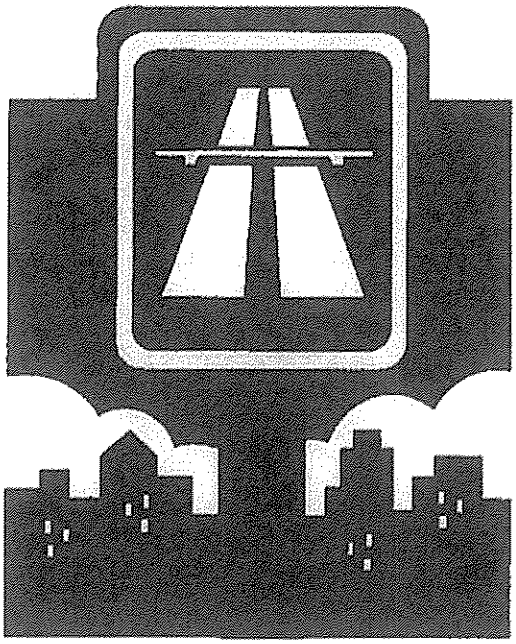
Proposed Waddell Way Street Improvements Options



CENTRAL BUSINESS DISTRICT
ALTERNATE B

H.A.R.T. POLICY MANUAL

Homer Accelerated Roads and Trails Program



Adopted September 10, 2007

Produced & Distributed by the City Clerk's Office — 2/19/2008 — rt

H.A.R.T. POLICY MANUAL

(HOMER ACCELERATED ROADS AND TRAILS PROGRAM)

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February 2008

I. PURPOSE and INTENT

1. The H.A.R.T. is a combined local funding source of dedicated sales tax and assessments to upgrade city streets, new city streets and new city non-motorized trails.(Ordinance 06-42(S); Resolution 88-47 #1)

2. The intent of the program is to reconstruct local substandard city roads and/or upgrade existing city roads, construct new city streets and non motorized trails, thereby reducing maintenance cost, improving access, increasing property values and improving the quality of life. (Ordinance 06-42(S); Resolution 88-47 #2)

3. Reconstruction and new construction shall be to City Standards. (Ordinance 06-42(S) Resolution 88-47 #19)

4. The City will not accept a street for full time maintenance until it meets city standards and is shown on the official maintenance map.[1] (Ordinance 85-14 07/01/85; Resolution 88-47 #8)

5. When practical, the intent of the program is to preclude the destruction of existing property improvements in built up areas. (Resolution 88-77(A), be it further Resolved clause.)

6. State maintained roads are not part of this program. (Resolution 88-47 #7)

7. The criteria for the H.A.R.T. shall be reviewed annually by the Transportation Advisory Committee, with recommendations reported to the Homer City Council. (Resolution 88-47 #22)

8. Annexed roads are included as newly eligible roads, as listed on the Official Road Maintenance Map. (Resolution 03-116, 08/25/03)

9. New roads shall be listed on the Official Road Maintenance Map. (Resolution 07-82)

10. New trails shall be listed on a map in the City Clerk's Office. (Resolution 07-82)

II. DEFINITIONS

A. Sidewalk- the term "sidewalk" means a pedestrian facility associated with a road and generally within a street right of way. (Resolution 07-82)

B. Trail – a pedestrian facility detached from a road, or not within a street right of way. (Resolution 07-82)

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[1] 1.Clerk's Note: Done by Ordinance

III. QUALIFYING CRITERIA

A. Roads

The schedule of street improvements and costs developed by the Public Works Department August 87, consisting of Groups I-IV and the annexed roads of the City boundary amendment of Ordinance 02-08(A) and as noted on the Official Road Maintenance Map, are hereby incorporated. (Resolution 05-70, 06/13/05; Ordinance 02-23(A), 06/10/02; Ordinance 02-08(A), 04/08/03; Resolution 03-116, 08/25/03)

Amendments to the schedule can be accomplished only by Council action and are limited to additions to the schedule due to revision of the street map or transfer of state rights-of-ways to the City.

All projects will be authorized only after a public hearing to insure public participation in the process. (Resolution 88-47 #13)

1. The following criteria may be considered for roads qualifying for reconstruction/utility improvements: (Resolution 88-47 #14, Resolution 87-61(S))

a. Life, safety and traffic flow (Resolution 87-61(S), Resolution 88-47);
b. Correct deficiencies of existing systems (Resolution 87-61(S), Resolution 88-47);
c. System wide basis versus local needs (Resolution 87-61(S), Resolution 88-47);
d. Complete traffic circulation pattern (Resolution 87-61(S), Resolution 88-47);
e. Encourage economic development (Resolution 87-61(S), Resolution 88-47);
f. Correct drainage problems (Resolution 87-61(S), Resolution 88-47);
g. Reduce maintenance cost (Resolution 87-61(S), Resolution 88-47);
h. Built to city standards prior to acceptance for maintenance (Resolution 61(S), Resolution 88-47);
i. Reconstruction is a higher priority than new construction projects (Resolution 87-61(S), Resolution 88-47);
j. Property owner contribution through LID process by paying $30 per front foot for gravel and $17 per front foot for paving cost of a residential standard street and the city pays all costs for additional improvements deemed necessary (Resolution 87-61(S); Resolution 88-47, Resolution 94-50; Resolution 95-97)
k. City share can apply to related utilities, sidewalks, street lighting, drainage, paving and/or reconstruction of roads identified on the road maintenance map. (Resolution 88-47, Resolution 04-41(A).);
l. Other factors deemed appropriate by the City Council. (Resolution 87-61(S, Resolution 88-47))

2. The following criteria may be considered for new local roads in addition to applicable criteria in 1:

a. Connectivity to existing road(s), for example completes a traffic pattern.
b. Arterials or thoroughfares;
c. Existing utilities;
d. Contributing funds such as property owner assessments, loans, grants, etc;
e. Level of need. (Resolution 07-82)

B. Trails

New local non motorized trails shall be prioritized according to the following:

a. Project is listed in the HNMTTP or furthers a stated goal of that plan;
b. Solves a safety concern;
c. Creates connectivity to existing trail(s), completes pattern or provides access to a point of interest;
d. Protects an established trail;
e. Creates or improves a trailhead;
f. Has significant scenic or aesthetic value;
g. Existence or potential for contributing funds;
h. Property owner participation. (Resolution 07-82)

IV. FINANCING and ASSESSMENTS

1. The program will utilize an additional dedicated City sales tax not to exceed three quarters of one percent (¾%) supplemental with assessments against adjacent benefited properties. (Ordinance 06-42, Resolution 87-61(S), Resolution 88-47 #3).

2. A three quarters of one percent (¾) dedicated sales tax and will be collected for up to twenty years expiring December 31, 2007 and reauthorizing up to an additional twenty years expiring December 31, 2027 to participate in funding the accelerated roads and trails program (Ordinance 06-42, Resolution 87-61(S), Resolution 88-47 #4). Reauthorized twenty additional years at the October 3, 2006 election (Resolution 06-145(S)) to expire December 31, 2027. Ten percent of the annual revenue shall be used for trail projects.

3. The road improvements will be financed on a combined pay as you go basis as well as sale of revenue bonds in a fifty-fifty ratio. There may be future bond sales as revenues increase. (Resolution 87-47 #6)

4. The City will attempt to obtain long term financing for up to ten years for the private share of funding. (Resolution 88-74 #12, bond change Ordinance 89-17, regarding ten years financing.)

5. Interest, if any, generated from the program will remain with the program funds. (Resolution 88-47 #18)

6. Abutting property owners will share the cost of upgrading a street to residential standards by paying $30 per front foot for gravel and $17 per front foot for paving.[2] (Resolution 87-61(S), Resolution 88-47, Resolution 94-50, Resolution 95-97)

7. The City will pay all costs for any additional improvements required when deemed necessary by the City. Other improvements requested by the benefited property owners will be paid by those same property owners. (Resolution 88-47 #11)

8. The $30/$17 split in front foot assessment stands unless there is 100% agreement on a revised formula for a specific project or the amount is adjusted by the City Council. (Resolution 87-61(S), Resolution 88-47; #21; Resolution 95-97)

9. Road Reconstruction assessment payment date, penalty and interest shall be set as soon as the reconstruction project has been accepted by the Public Works Department regardless if the LID/Assessment district wherein reconstruction has been completed is also scheduled for paving as part of the same LID/Assessment District. Paving assessment payment date, penalty and interest will be set as soon as the paving project has been accepted by the Public Works Department. HCC 17.04.070--110. (Resolution 96-73)

10. New Local Roads may be constructed by 100% program funds when the construction thereof benefits the entire City or when the City owns the property wherein the road is to be constructed. The Road to be constructed must meet the qualifying criteria and be recommended by the Transportation Advisory Committee to the City Council. This expenditure must be approved via Ordinance with justification noted within the body of the Ordinance. Whenever possible, New Local Roads will be constructed using the LID process HCC 17.04 and the assessment methodology as noted in item 6. and 8. (Resolution 07-82)

11. HART funds may be used to leverage outside funds for New Local Roads and Trails. (Resolution 07-82)

12. New Local Trails may be constructed using 100% program funds and follow the procedures listed in item 10. (Resolution 07-82)

13. Sidewalks shall be paid for out of road funds, and trails shall be paid for out of the 10% allocated to trails. (Resolution 07-82)

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[2] Danview/Svedlund and Sabrina/Mark White are grandfathered in at the $20/$11 split per Council action. (Resolution 94-52)

V. UTILITIES

1. Prior to street reconstruction, necessary related non existing water and sewer improvements shall be encouraged whenever possible. (Resolution 88-47 #9)

2. Water and Sewer utility extensions necessary to extend the utilities short distances beyond a construction area will be paid for by the program. (Resolution. 88-47 #10)

3. Water and sewer utility relocations directly caused by reconstruction will be paid for by the Accelerated Roads Program. (Resolution. 88-47 #10)

4. Water and sewer utility upgrades necessary for future capacity that are done concurrently with reconstruction and/or paving will be paid for by the utility (a) fund. (Resolution 88-47 #10)

5. The City shall recover from the property owner the cost of construction of City-provided sewer and water service connections by including the cost of construction of such connections in the service connection fee established under HCC Chapter 14.13. (Resolution. 88-47)

6. Cost of installing stub-outs would be a necessary expense to anyone building on lots requiring sewer and/or water service. Sewer and/or Water funds or other public money was provided to pay the cost of these stub-outs because of the benefit of a quality finished road and the use of stub-outs benefit only those particular lots. Costs will be recouped from benefiting property owners through deferred assessments. The Planning Clerk and Finance Department will maintain a listing of these deferred sewer and/or water service connection fees.

7. Whenever practical street lights shall be included in the construction of new local roads and shall be paid by HART funds. Property owners participating in a road reconstruction and/or paving LID may request street lights. If the project is deemed feasible the property owners shall be assessed for the installation of the street lights on an equal share per parcel methodology. Property owner approval of the street light assessment shall follow the process in HCC 17.04. Once constructed, the City will absorb the utility billing for the street light(s). (Resolution 07-82)

VI. SPECIAL PROVISIONS

1. Additional right-of-way required will be paid by this program, at no additional cost to abutting property owners. (Resolution 88-47 #20)

2. Corner lots are exempt from a double front footage assessment and the total assessed frontage shall not exceed the longest side of the lot. Reconstruction assessments apply to

reconstruction and paving. Corner lot agreement is required after 10/25/94. (Resolution 87-61(S) #15; Resolution. 88-47 #15, Resolution 91-68, Ordinance 94-16(A))

3. Lots having a frontage on two parallel streets, or flag lots having a frontage on two perpendicular streets, are exempt from a double front footage assessment unless actually accessing the lot from both streets either prior to or after reconstruction and/or paving Deferred Assessment Agreement Required pursuant to HCC 17.04.160. (Resolution 88-47 #16)

4. This program includes paving driveway aprons on contracts funded by H.A.R.P. (Resolution 88-47 #17; Resolution 91-48)

5. When at all practical, the center line of rights-of-way will be the established road center line. Where impractical, the center line may be shifted to mitigate improvement encroachments of high cost hillside excavation. (Resolution 88-77(A))

6. In established neighborhoods, where improvements such as housing, carports, lawns or landscaping have been constructed near the right-of-way line and ditching would seriously impact these improvements, alternates to open ditching may be considered. These alternates may include gently sloping ditches back to the lawn, trench drains, standard or rolled curbs and gutter or any other sound engineering practices. The cost of these alternates will be born by the road program unless the residents elect to participate in the curb, gutter and sidewalk programs. (Resolution 88-77(A))

7. Pedestrian amenities shall be included in all new road projects unless exempted by the City Council. (Resolution. 04-41(A))

8. Exempting Certain Lands that will not be Developed due to Conservation Easements or Owned by Organizations that Conserve Land for Public Purpose and/or Habitat Protection from the Homer Accelerated Roads Program and the Homer Accelerated Water and Sewer Program Assessment District Assessments on a Case by Case Basis and that Each Program Shall be Amended to Include this Exemption under Special Provisions. (Resolution 05-50(A).)

9. New Subdivisions may not participate in HART for the construction of subdivision roads or trails.

a. Exception: To encourage trail connectivity, the Subdivider will be required to pay a prorated share of the project cost not to exceed 75% of the cost of public trail construction. (Resolution 07-82)

10. HART funds may be used in accordance with Title 11.04.05. If a development includes a segment of an arterial or collector street as shown on the Master Plan, the

developer shall construct the streets on the alignment adopted in the Master Roads and Streets Plan, and conforming to the respective classification. The developer shall be required to construct the street to a twenty-eight-foot width in accordance with the minimum requirements of a local residential street; provided, however, that the City may, upon direction of the City Council, elect to require construction to the full standards and pay to the developer the cost difference between the required street and the proposed street. (Resolution 07-82)

VII. TRAIL PRIORITIZING CRITERIA AND PLANNING GUIDELINES

A. Trail Prioritizing. The TAC and Parks and Recreation Advisory Commission will review the trail priority list during the annual review of the HART. The list will be presented in a memorandum from staff, and will contain a mix of large and small projects. Generally it will include up to five trail projects that staff has reviewed and found ready for preliminary work. Trails on this list are planned for construction in the near term (one to three year timeframe). Staff will actively work to prepare those projects for construction. (Resolution 07-82)

B. Trail Planning Guidelines

Trail design shall take into account at minimum the following:

1. Use context sensitive design when locating and planning trails to take advantage of scenic resources.

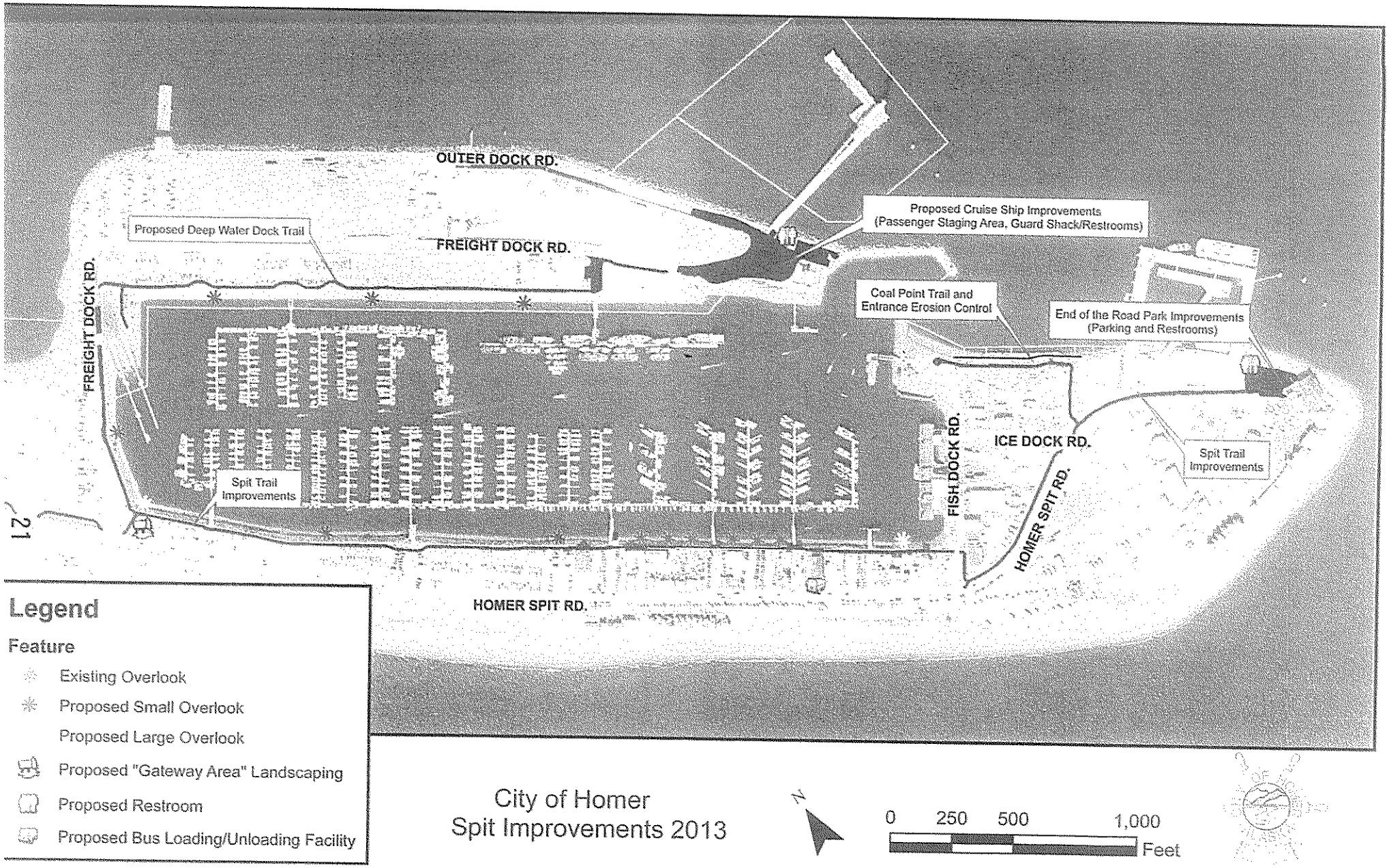
2. Respect the character of trails based on function, setting, and expectation of accessibility.

3. Evaluate the soils, drainage, wetlands, Tsunami zone, flood plain, stream setbacks, historical resources, visual resources, topography, existing and potential land use, zoning and land ownership.

4. Where estimated costs, operating costs and outside funding availability are considerations and important criteria, care should be used to ensure that important trails are not eliminated solely using cost as a determinant.

5. Multi-use trails are encouraged. Design of the trail should include consideration of compatible uses such as pedestrians and bicycles.

6. All trails should be designed to recognize the requirements of ADA standards and guidelines. (Resolution 07-82)



Legend

Feature

- Existing Overlook
- Proposed Small Overlook
- Proposed Large Overlook
- Proposed "Gateway Area" Landscaping
- Proposed Restroom
- Proposed Bus Loading/Unloading Facility

City of Homer
Spit Improvements 2013

N

0 250 500 1,000
Feet

CITY OF HOMER
HOMER, ALASKA

Mayor

RESOLUTION 13-040

A RESOLUTION OF THE HOMER CITY COUNCIL DIRECTING THE CITY ADMINISTRATION TO TERMINATE ALL SURVEY, DESIGN, AND COST ESTIMATING WORK ON THE KACHEMAK DRIVE PATHWAY.

WHEREAS, Resolution 12-079(A) authorized the allocation of up to $20,000 from the HART Fund for the purposes of survey work and an engineering estimate to determine the cost of constructing the initial one-half mile of the proposed Kachemak Drive Non-Motorized Pathway; and

WHEREAS, the Council's intent when adopting Resolution 12-079(A) was to determine if the trail alignment favored at the time by the Parks and Recreation Advisory Commission and its sub-committee, the Kachemak Drive Path Committee, was feasible and what it might cost to construct; and

WHEREAS, The City Engineer and contract surveyor studied the preferred trail alignment and concluded that construction would be prohibitively expensive due to the topography and terrain and that bridges, retaining walls, and slope stabilization measures would be required.

NOW, THEREFORE, BE IT RESOLVED that the Homer City Council finds that it is not in the City's interest to pursue the project any further due to funding, permitting, construction, and other concerns.

BE IT FURTHER RESOLVED that the Council hereby directs the City administration and the Parks and Recreation Advisory Commission and its subcommittee, the Kachemak Drive Path Committee to discontinue all work on this project and to expend no further funds on it.

PASSED AND ADOPTED BY THE HOMER CITY COUNCIL this 22nd day of April, 2013.

CITY OF HOMER

_____
MARY E. WYTHE, MAYOR

ATTEST:

_____

JO JOHNSON, CMC, CITY CLERK

Fiscal Note: N/A

Chapter 21.44

SLOPES

Sections:

21.44.010 Purpose and intent. This chapter regulates development activity and structures in areas affected by slopes, bluffs, coastal bluffs and ravines, and provides the means for additional review and protection to encourage safe and orderly growth to promote the health, welfare and safety of Homer residents.

21.44.020 Applicability. a. This chapter applies to all development activity that disturbs the existing land surface, including without limitation clearing, grading, excavating and filling in areas that are subject to any of the following conditions:

1. Lots with average slopes 15% or greater, bluffs, coastal bluffs and ravines;

2. Located within forty (40) feet of the top or within fifteen (15) feet of the toe of a steep slope, bluff, coastal bluff or ravine; and

3. Any other location where the City Engineer determines that adverse conditions associated with slope stability, erosion or sedimentation are present.

b. This chapter imposes regulations and standards in addition to the requirements of the underlying zoning district(s).

21.44.030 Slope development standards. The following standards apply to all development activity on a site described in HCC 21.44.020.

a. No development activity, including clearing and grading, may occur before the issuance of a zoning permit under HCC Chapter 21.70.

b. Area of development.

1. Except where the City Engineer approves a site plan under HCC 21.44.050 that provides for a larger area of development, the area of development on a lot with an average slope:

a. Of 15 to 30 percent shall not exceed 25 percent of the total lot area.

b. Greater than 30 percent but less than 45 percent shall not exceed 10 percent of the total lot area.

2. The area of development on a lot with an average slope of 45 percent or greater shall not exceed the area of development described in a site plan approved by the City Engineer under HCC 21.44.050.

c. Setbacks. Subject to the exceptions to setback requirements in HCC 21.44.040, all development activity is subject to the following setback requirements.

1. No structure may be closer to the top of a ravine, steep slope or non-coastal bluff than the lesser of:

i. 40 feet; or

ii. 1/3 of the height of the bluff or steep slope, but not less than 15 feet.

2. No structure may be closer than 15 feet to the toe of a bluff other than a coastal bluff.

3. No structure may be closer than 40 feet to the top of a coastal bluff and closer than 15 feet to the toe of a coastal bluff.

d. Natural Drainage. The site design and development activity shall not restrict natural drainage patterns, except as provided in this subsection.

1. To the maximum extent feasible, the natural surface drainage patterns unique to the topography and vegetation of the site shall be preserved. Natural surface drainage patterns may be modified only pursuant to a site plan approved by the City Engineer under HCC 21.44.050, and upon a showing that there will be no significant adverse environmental impacts on the site or on adjacent properties. If natural drainage patterns are modified, appropriate soil stabilization techniques shall be employed.

2. The site shall be graded as necessary to ensure that drainage flows away from all structures for a distance of at least 10 feet, especially where building pads are cut into hillsides.

3. The development activity shall not cause an adverse effect on adjacent land and surrounding drainage patterns.

e. Erosion control.

1. Erosion control methods approved by the City Planner and City Engineer, including without limitation sediment traps, small dams and barriers, shall be used during construction and site development to protect water quality, control soil erosion and control the velocity of runoff.

2. Winter Erosion Control Blankets. If development on a slope is not stabilized by October 15, erosion control blankets (or a product with equivalent performance characteristics) must be installed upon completion of the seasonal work, but no later than October 15. The erosion control blankets shall remain in place until at least the following May

3. Vegetation shall remain undisturbed except as necessary to construct improvements and to eliminate hazardous conditions, in which case it must be replanted with approved materials including ground cover, shrubs and trees. Native vegetation is preferred for replanting operations, and will be used where practicable.

4. Grading shall not alter the natural contours of the terrain except as necessary for building sites or to correct unsafe conditions. The locations of buildings and roads shall be planned to follow and conform to existing contours as nearly as possible.

21.44.040 Exceptions to setback requirements. a. Any of the following may be located within a setback required by HCC 21.44.030(c):

1. A deck extending no more than five feet into the required setback.

2. An unoccupied accessory structure having a building area not greater than 200 square feet that is no closer than 15 feet to the top of any bluff or ravine.

3. A boardwalk, sidewalk, foot path or stairway that provides access to a beach, bluff or accessory structure, and that is located at or within three feet above ground level.

4. Development activity that the City Planner determines is reasonably intended to stabilize an eroding coastal bluff.

b. No structure other than a structure described in (a) of this section may be located in a required setback without a conditional use permit issued in accordance with HCC Chapter 21.71 and a site plan approved by the City Engineer under HCC 21.44.050.

21.44.050 Site plan requirements for slope development. a. No permit for development activity for which HCC 21.44.030 or 21.44.040(b) requires a site plan may be approved unless the City Engineer approves a site plan for the development activity that conforms to the requirements of this section. The City Engineer shall accept or reject the plan as submitted or may require that specific conditions be complied with in order for the plan to meet approval.

b. The site plan shall be prepared by a qualified geotechnical engineer licensed to practice in the state of Alaska and shall include the following information.

1. The location of all watercourses, water bodies, and wetlands within 100 feet of the location of the proposed development activity.

2. The location of all existing and proposed drainage structures and patterns.

3. Site topography shown by contours with a maximum vertical interval of five feet.

4. The location of all proposed and existing buildings, utilities (including onsite well and septic facilities), driveways and streets.

5. The location of all existing vegetation types including meadow, forest and scrub lands, identifying all areas of vegetation that will be removed as well as vegetation to be preserved or replaced. Specifications for revegetation shall also be included.

6. Specific methods that will be used to control soil erosion, sedimentation, and excessive storm water runoff during and after construction.

7. A description of the stability of the existing soils on site and a narrative and other detail sufficient to demonstrate the appropriateness of the development and construction methods proposed.

8. A grading plan for all areas that will be disturbed by the development activity.

9. A slope stability analysis including the following:

i. Summary of all subsurface exploration data, including subsurface soil profile, exploration logs, laboratory or *in situ* test results, and ground water information;

ii. Interpretation and analysis of the subsurface data;

iii. Summary of seismic concerns and recommended mitigation;

iv. Specific engineering recommendations for design;

v. Discussion of conditions for solution of anticipated problems;

vi. Recommended geotechnical special provisions;

vii. An opinion on adequacy for the intended use of sites to be developed by the proposed grading as affected by soils engineering factors, including the stability of slopes. (Ord. 10-56 §2, 2011).

SECTION 1.05
STREET DESIGN CRITERIA

Article 5.1 Soils Requirements

A. Testhole Locations

The purpose of testholes is to collect sufficient data to allow the engineer to determine soil conditions on project site as the basis for design. Testholes shall normally be spaced not farther than 300 feet apart. Spacing greater than 300 feet may be approved if field samples indicate uniform soil conditions.

B. Testhole Depth

The depth of testholes shall be 8 to 10 feet below finished grade. Where peat is encountered, the depth of testholes shall be at least 4 feet below the bottom of peat. In areas where permafrost is expected, representative testholes up to 30 feet deep, or as adequate to determine the depth of permafrost, may be required.

C. Soils Report Requirements

Soils reports shall contain the following information:

1. Text

   a. Project location and topography.
   b. Brief geology of area involved.
   c. Exploration method and equipment, including sampling equipment.
   d. A brief description of the laboratory testing program including the name of the testing agency.
   e. Subsurface conditions which include groundwater and seepage conditions, grouping of soils into major types, distribution of soil groups, and frost penetration if exploration was conducted during the freezing period. Soils shall be classified according to frost classification, the Unified Soil Classification System, or the U.S. Department of Agriculture soil type.
   f. Conclusion and recommendations pertinent to the design of the proposed improvements including predicted frost action.

2. Testhole Logs

   a. Date of boring, testhole number, horizontal

location (distance and offset), and elevation. Where the existing ground is flat or of a uniform slope, the elevation requirement may be waived by the Public Works engineer.

b. Ground water level recorded after stabilized and/or 24 hours.

c. Depth to top of each strata and bottom of testhole and/or refusal.

d. Soil moisture content (percent) at each sampling interval as well as the Atterberg Limits of representative samples.

e. Visual soil classification of each strata in accordance with the Unified Soils Classification System. The classification letter designation and frost classification shall be noted.

f. The results of mechanical analysis performed, one for each typical soil group as described in the subsurface conditions section of the text. The testhole number and depth of sample shall be noted.

Article 5.2 Survey Requirements

A. Topographic Features

All topographic features, including trees and shrubs (if these would impact design or construction), shall be located within the area between the right-of-way centerline and a line located 20 feet inside the property line. Buildings and other major topographic features outside of this area shall also be located.

B. Elevations

1. Cross sections are required at 50-foot intervals along the centerline and where the slope of the ground profile changes. Elevations shall be noted to a point 50 feet from the right-of-way centerline and shall include the right-of-way centerline, the property lines and all obvious points where the slope of the ground changes.

2. Elevations are required for all driveways in cases of reconstruction of existing streets. Minimum requirements are elevations of the pavement edge parallel to the right-of-way centerline, elevations at the property line, and garage or carport floor elevations. In critical locations additional information may be required for design purposes. For new streets, future driveway locations should be specified.

Article 5.3 Vertical Design Requirements

A. For purposes of this manual, the following terrain classification system shall apply:

1. Level - grade range of 0 to 8 percent.

2. Rolling - range of 8.1 to 15 percent.

3. Hilly - grade of over 15 percent.

B. Specific Criteria

1. The desirable minimum street grade is 0.40 percent and the absolute minimum grade is 0.30 percent.

2. The desirable maximum street grade is 6.0 percent. Absolute maximum grades are as specified in Chapter 11.04 of the Homer Municipal Code for respective functional/design classifications of streets, except for short distances. The maximum values for short distances (under 500 feet), are specified, but the use of such short sections shall be subject to the City Public Works Engineer's discretionary approval. Their use should be limited to hilly terrain and the steeper reaches of rolling terrain sections. In hilly areas, further increases are possible as specified below.

3. In hilly areas:

a. Grades up to 15 percent will be allowed on short tangent sections not exceeding 100 feet in length.

b. The maximum grade through a horizontal curve with a radius less than 150 feet shall not exceed 5.0 percent where the change in horizontal alignment exceeds 120 degrees.

c. The maximum grade along the uphill tangent from a horizontal curve with a radius less than 150 feet shall not exceed 5.0 percent for at least 100 feet to allow for acceleration and braking.

4. The cross slope to crown on paved streets shall be 2.0 percent, and on gravel streets shall be 3.0 percent, intersections and superelevations excepted.

5. The grade of the primary street through the intersections shall not exceed 7.0 percent, unless otherwise approved by City Public Works Engineer.

Collector Street	40 mph (may be reduced to 30 mph in hilly areas)
Residential Streets	25 mph (20 mph in hilly areas)

3. Whenever possible, vertical curves shall be separated by a tangent of at least 25 feet.

E. Driveway Grades

Driveway grades shall be designed in accordance with Figure 7, Driveway Requirements, unless otherwise approved by the City Public Works Engineer.

F. Cul-de-sacs

The maximum grade of the cul-de-sac bulb measured in any direction shall not exceed 5 percent.

G. General Controls

The City Public Works Engineer will review each street or road design for conformance with the following "General Controls for Vertical Alignment," developed by the American Association of State Highway and Transportation officials:

1. A smooth grade line with gradual changes should be strived for in preference to a line with numerous breaks and short lengths of grades

2. The "roller-coaster" or the "hidden-dip" type of profile should be avoided. Such profiles generally occur on relatively straight horizontal alignment natural ground line.

3. Undulating grade lines, involving substantial lengths of momentum grades, should be appraised for their effect upon traffic operation. Such profiles permit heavy trucks to operate at higher overall speeds than when an upgrade is not preceded by a downgrade, but may encourage excessive speeds of trucks with attendant hazard to other traffic.

4. A broken-back grade line, two vertical curves in the same direction separated by short section of tangent grades, generally should be avoided, particularly in sags where the full view of both vertical curves is not pleasing.

5. On long grades it may be preferable to place the steepest grades at the bottom and lighten the grades near the top of the ascent, or to break the sustained

grade by short intervals of lighter grade instead of a uniform sustained grade that might be only slightly below the allowable maximum. This is particularly applicable to highways with low design speeds.

6. Where intersections at grade occur on highway sections with moderate to steep grades, it is desirable to reduce the gradient through the intersection. Such a profile change is beneficial for all vehicles making turns and serves to reduce the potential hazards.

The City Public Works Engineer may require adjustment of design vertical alignment to meet these criteria.

Article 5.4 Profile and Specification Requirements

A. Plan and Profile Requirements - General

Street designs must be submitted to the City on 24" x 36" plan and profile paper; details to be presented in the plan and profile shall at minimum conform to the requirements of section (B) and (G) below. The City Public Works Engineer may require that additional information be provided on the plan and profile as he deems necessary.

B. Alignment and Plan View

The plan view shall at minimum present:

1. Point of curvature and point of tangency on all curves.

2. Horizontal curve data.

3. Right-of-way borderlines.

4. Centerline and stationing on centerline.

5. Existing and proposed driveway locations.

6. Existing streams or drainageways.

C. Monuments

All monuments on or near right-of-way, or required to be established in the proposed street(s) to be constructed, shall be shown.

D. Utilities

Plan view shall show the location of all existing buried or overhead utilities within the right-of-way of the street to

be constructed, or within 20 feet of said right-of-way. The plan view shall further locate all public utilities to be constructed prior to road improvements, if the street and utility improvements are phased concurrently. All manholes, valves, cleanouts, keyboxes, pedestals and poles shall be shown.

E. Structures and Culverts

Plan view shall locate all existing structures within 50 feet of the right-of-way of the street to be constructed, and shall fix the location, size, and length of all existing or proposed culverts within the right-of-way.

F. Profile View

Profile view shall show all roadway grades, vertical curve data (including vertical point of curvature and vertical point of tangency), original ground profile at centerline, original ground profile at both right and left right-of-way ~~edge,~~ the profile of all existing water, sewer and storm drain facilities (existing or proposed), and logs of all test borings.

G. Engineer's Stamp

Plans shall be signed and stamped by a civil engineer registered in the State of Alaska prior to approval by the City Public Works Engineer.

H. Specifications

All plans and profiles shall be accompanied by a bound set of project specifications, including all sections of the Municipality of Anchorage Standard Specifications applicable to the project, and including standard modifications as approved or specified by the City of Homer, and special provisions to govern improvement construction.

Article 5.5 Horizontal Design Requirements

A. General

The construction centerline will coincide with the right-of-way centerline unless otherwise approved. Approval to shift the construction centerline may be considered to attain the following objectives:

1. Reduction of retaining wall requirements;

2. Reduction of slope easement requirements;

3. Facilitation of intersection alignment;

4. Reduction of utility relocations.

B. Horizontal Curves

1. The radius of curvature along the centerline of the street shall not normally be less than:

Major Arterial Street	700 feet
Minor Arterial Street	600 feet
Collector Street	500 feet
Residential Street	150 feet

Larger radii may be required in some instances.

2. For steep hillside areas the minimum radius of curvature along the centerline of the residential streets shall be 120 feet with curve widening.

3. Streets shall be superelevated on curves; the superelevation rate shall be as appropriate to maintain design speeds, as listed in the Design Factor Summary. Rates of superelevation are to be obtained from AASHTO's 1984 "Policy on Geometric Design of Highways and Streets." Superelevations shall not exceed 6 percent. As a general rule transition to the superelevation section shall be obtained with 2/3 of the transition on the tangent and 1/3 on the curve. Superelevation transition lengths shall be determined by the degree of curve, design speed, and superelevation rate in accordance with recognized engineering standards.

4. The stopping sight distance shall be considered for horizontal curves (see Figure 6).

C. Curb Radii

Curb radii at intersections shall be specified in accordance with Figure 8, Curb Return Standards.

D. Cul-de-sacs

Cul-de-sacs shall be designed in accordance with Figure 9, Cul-de-sacs.

E. Curb Cuts

1. Curb cuts shall have a minimum curb opening width of 12 feet.

2. Residential areas the maximum curb opening width of a single driveway curb cut is 20 feet.

3. Curb cuts shall be located so that the nearest edge of a driveway fronting on an arterial or collector street is a minimum of 45 feet from the right-of-way line of any intersecting street. The nearest edge of a driveway fronting on a residential street shall be a minimum of 25 feet from the right-of-way line of any intersecting street.

4. Access to arterial or collector streets will be discouraged and may be denied for any parcel of property which also has access onto a residential street.

5. The maximum curb cut width for conmmercial lot access to an arterial or collector street shall be 40 feet.

6. The total width of a curb cut for a lot shall not exceed two-fifths of the lot frontage which faces the street, except for zero lot line development where the combined curb cut shall not exceed two-fifths of the combined lot frontage.

F. Driveways (other than curb cuts)

Geometric standards for driveways are as specified in the DOT manual.

G. Trip Generation Rates

Unless otherwise directed the average daily traffic count (ADT) shall be estimated using the following criteria:

Housing Type	ADT per Unit
Single Family Detached	8.2
Two-Family (duplex, townhouses)	8.0
Multi-Family (townhouses, apartments)	7.3
Mobile Home	5.5

A more comprehensive listing of trip generations is listed in Appendix 1.

H. Utilities

1. Should utility line extensions be necessary within the right-of-way of a paving project to provide service, the utility company shall be contacted in writing during the design phase to coordinate the necessary construction prior to paving.

2. Where water and sewer connection are required for unserviced lots, the property owner(s) shall be contacted by letter during the design phase to coordinate construction prior to paving. In residential areas, connections may be provided to unserved lots. Where development plans are not known, the connections shall be sized in accordance with the recommendations of the City of Homer.

I. General Controls

The City Public Works Engineer will review each road or street design for the following "general controls for horizontal alignment" developed by the American Association of State Highway and Transportation Officials:

1. Alignment should be as directional as possible, but every effort should be made to preserve developed properties and community values. On new urban highways, a flowing line that conforms to the natural contours is preferable aesthetically to one with long tangents that more heavily scar the terrain. With flowing alignment the construction scars can be kept to a minimum and natural slopes and plant growth can be preserved. Such design is desirable both from a construction and maintenance standpoint. In general, the number of short curves should be kept to a minimum. Winding alignment, composed of short curves, should be avoided since it tends to cause erratic operation and accidents.

2. In alignment predicated on a given design speed, use of the maximum degree of curvature for that speed should be avoided wherever possible. The designer should attempt to use generally flat curves, retaining the maximum for the most critical conditions. In general, the central angle of each curve should be as small as the physical conditions permit, so that the highway will be as directional as possible.

3. Consistent alignment should always be sought. Sharp curves should not be introduced at the ends of long tangents. Sudden changes from areas of each curvature to areas of sharp curvature should be avoided. Where sharp curvature must be introduced, every effort should be made to approach it with successively sharper curves.

4. For small, deflection angles, curves should be sufficiently long to avoid the appearance of a kink. Curves should be at least 500 feet long for a central

angle of 5 degrees, and the minimum length should be increased 100 feet for each 1-degree decrease in the central angle.

5. Sharp curvature should be avoided on high, long fills and elevated structures. In the absence of cut slopes, shrubs, trees, etc., above the roadway, it is difficult for drivers to perceive highway alignment and sharpness of curvature and adjust their operation to the conditions.

6. Caution should be exercised in the use of compound circular curves. Preferably their use should be avoided where curves are sharp. Compound curves with large differences in curvature introduce the same problems that arise at a tangent approach to a circular curve. Where topography or right-of-way restrictions make their use necessary, the radius of the flatter circular arc (R_1) should not be more than 50 percent greater than the radius of the sharper circular arc (R_2), (R_1 should not exceed 1.5 R_2). A several-step compound curve on this basis is suitable as a form of transition to sharp curves. A spiral transition between flat curves and sharp curves is even more desirable, although spirals are not normally used in the State of Alaska.

7. Any abrupt reversal in alignment should be avoided. Such a change makes it difficult for a driver to keep within his own lane. Also, it is difficult to superelevate both curves adequately, and erratic operation may result. A reversal in alignment can be designed suitably by including a sufficient length of tangent between the two curves for superelevation runoff, or preferably an equivalent with spiral curves.

8. The "broken back" arrangement of curves (short tangent between two curves in the same direction) should be avoided. Except on circumferential highways, most drivers do not expect succeeding curves to be in the same direction, the preponderant condition of succeeding curves in opposite directions developing a subconscious habit in drivers to follow them. Also, broken back alignment is not pleasing in appearance. Use of spiral transitions wherein there is some degree of continuous superelevation, is preferable for such conditions. The term "broken back" usually is not applied when the connecting tangent is of considerable length, say 1,500 feet or more. But even in this case the alignment will not be of pleasing appearance when both curves are clearly visible for some distance ahead.

9. To avoid the appearance of inconsistent distortion, the horizontal alignment should be coordinated carefully with the profile design. General controls for this coordination are discussed under a following heading of Combination of Horizontal and Vertical Alignment.

The City Public Works Engineer may require adjustment of design horizontal alignment to meet these criteria.

J. Pre-existing Platted Rights-of-Way Less Than 60' Wide

1. (Construction or reconstruction of existing streets in pre-existing platted rights-of-way narrower than those defined in Section 11.04.060(f) shall require dedication of a sufficient construction and maintenance easement on each side of the road to allow the roadway to be constructed in accordance with Chapter 11.20 and the City of Homer Design Criteria Manual.)

Article 5.6 Excavation and Backfill

A. General

1. Except as otherwise described in this section, excavation and backfill requirements shall be in accordance with the Design Criteria Manual and appropriate chapters of the Homer Municipal Code.

2. Where soils investigations show that organic material is present within the proposed roadway prism, the plans shall call for its removal unless surcharging or other provisions have been approved.

B. Structural Design

1. Where frost susceptible soils are encountered in the subgrade, design criteria for frost conditions shall be used to determine the combined thickness of leveling course and subbase. The frost design reference for street improvements is the Corps of Engineers Manual TMS-818-2(EM1110-1-306) Pavement Design for Frost Conditions, May 15, 1962.

The primary basis for design is the Reduced Subgrade Strength Method; however, the results of the Limited Subgrade Frost Penetration Method should be considered for F3 and F4 soils. Design nomographs assume the use of non-frost susceptible material (less than 3% by weight finer than 0.02 mm) as backfill. Where the backfill is frost susceptible material, allowances should be made by the designer.

For design purposes, the frost classification system is as follows:

Group	Description
F1	Gravelly soils containing between 3 and 20 percent finer than 0.02 mm by weight.
F2	Sands containing between 3 and 15 percent finer than 0.02 mm by weight.
F3	(a) Gravelly soils containing more than 20 percent finer than 0.02 mm by weight; (b) sands, except very fine silty sands, containing more than 15 percent finer than 0.02 mm by weight; (c) clays with plasticity indexes of more than 12; (d) varved clays existing with uniform subgrade conditions
F4	(a) All silts including sandy silts; (b) very fine silty sands containing more than 15 percent finer than 0.02 mm by weight; (c) clays with plasticity indexes of less than 12; (d) varved clays existing with nonuniform subgrade conditions.

Method 1: Limited Subgrade Frost Penetration Method

The procedure to determine the design thickness by the Limited Subgrade Frost Penetration Method is as follows:

a. Estimate the average moisture contents in the base and subgrade (see sketch, Figure 12) at the start of the freezing period and the dry weight of the base.

n b. From Figure 11 determine the frost penetration "a" which will occur in a base material of unlimited depth beneath a bituminous pavement kept free of snow and ice. The Air Freezing Index for Homer, based on average daily temperatures for the three coldest winters in 30 years is 1,850 frost degree days.

c. Compute the base thickness "c" (see sketch, Figure 12) required for zero frost penetration into the subgrade.

d. Compute "r" by dividing the water content of the subgrade by the water content of the base. For design purposes the maximum value for "r" is 2.

e. After computing "c" and "r" use Figure 12 to determine the design base thickness "b" and the allowable frost penetration "s". For design purposes "b" should not exceed 72 inches.

1. Where a high water table or a high soil moisture content occur with F3 and F4 soils, a filtration type fabric should be considered at the bottom of the excavation to keep the base from being contaminated by frost susceptible material.

2. Abrupt changes in subbase thickness shall be avoided. Transitions shall be used to minimize tendencies toward step displacement and interference with surface drainage.

Method 2 - Reduced Subgrade Strength

This design criterion assumes frost will penetrate into subgrade, reducing capacity of subgrade during spring breakup. Generally, this method permits less combined depth of pavement and base than Limited Subgrade Frost Penetration Method. Provides sufficient thickness to protect against breakup at that time. For F4 soils it is generally not recommended that this method be used unmodified except in low volume roads; heaving may be excessive.

Minimum frost overlay may be obtained from choosing traffic index and entering chart on Figure 10.

TYPE OF FACILITY	TRAFFIC INDEX
Minor residential streets and cul-de-sacs.	4
Average residential streets.	4.5
Residential collectors and minor or secondary collectors.	5
Major or primary collectors providing for traffic movement between minor collectors and major arterials.	6
Farm-to-market roads providing for the movement of traffic through agricultural areas to major arterials.	5.7
Commercial roads (arterials serving areas which are primarily commercial in nature).	7.9

Connector roads (highways and arterials connecting two areas of relatively high population-density).	7.9
Major city streets and thoroughfares.	7.9
Streets and highways carrying heavy truck traffic. This would include streets in heavily industrialized areas.	9+

Alternate Methods (Conventional Design)

The designer may also examine as alternate design methods other generally accepted engineering methods. Examples of such methods (for both subbase and structural pavement design) include the California Bearing Ratio method, the Hveem stabilometer method, AASHTO interim method, Asphalt Institute method, the State of Alaska DOT/PF 1982 method. Each of these design methods includes a design paving thickness as part of the design. If the end product of any of these design methods will be approved as a gravel road, the paving component must be converted to a structural capacity of additional base and surface course equivalent to the structural capacity of the design component of asphalt.

In all cases the design engineer's paramount responsibility is to achieve sound structural designs. While economy is to be encouraged, it shall not provide justification for inferior design. The burden of proof shall be on the design engineer to demonstrate that the structural design method chosen should provide a stable roadbed, and specifically should according to test results and their interpretation via generally accepted engineering methods withstand the deleterious effects of frost penetration, spring thaws and saturated subgrades.

Acceptance of alternate design methodologies is discretionary; approval or disapproval will be made by the City Public Works Engineer based upon the design method presented.

Alternate Design (minimum 24" 2-Inch Crusher Run Gravel

Any alternate design submitted to the Public Works Engineer (utilizing this design method) shall be based upon the following criteria and conditions:

1. In no case shall the thickness of crushed gravel be less than 24" overlaying an approved geotextile fabric.

2. Material shall be crushed aggregate material, with at least 50 percent of the coarse aggregate having mechanically fractured faces, and conforming to the following gradation:

Sieve Size	Percent Passing by Weight
Coarse Aggregate	
2-inches	100
1-1/2-inches	90-100
1-inch	70-100
3/4-inch	60-90
3/8-inch	45-75
Fine Aggregate	
No. 4	30-60
No. 8	22-52
No. 40	8-30
No. 200	0-6

Crushed material shall contain no muck, frozen material, roots, sod or other deleterious matter. It shall have a liquid limit not greater than 25 and plasticity index not greater than 6 as determined by AASHTO T89 and T90.

Quality Control: Ten days prior to the time the material will be required in the work, all tests necessary for the Developer-Contractor to locate an approved source of materials shall be made by the Developer-Contractor, and certified copies of the test results from an approved laboratory shall be furnished to the City's Engineer. Final approval of the aggregate material will be based on tests of material taken from the compacted roadway section.

C. Alternate Design Structural Warranty

Should the Developer choose to utilize a City approved alternate design, the Developer will be responsible for all repair of structural road failures other than routine maintenance through two (2) complete freeze-thaw cycles (24 months from date of finish construction). At the end of the warranty period the City will assume all maintenance responsibility if the road exhibits no structural defects.