Homer City Hall

491 E. Pioneer Avenue Homer, Alaska 99603 www.cityofhomer-ak.gov



City of Homer Agenda

Planning Commission Regular Meeting Wednesday, July 20, 2022 at 6:30 PM Cowles Council Chambers and Via Zoom Webinar Webinar ID: 979 8816 0903 Passcode: 976062 Dial: 346-248-7799 or 669-900-6833; (Toll Free) 888-788-0099 or 877-853-5247

CALL TO ORDER, 6:30 P.M.

AGENDA APPROVAL

PUBLIC COMMENTS ON ITEMS ALREADY ON THE AGENDA The Public is invited to speak to the Commission regarding matters on the agenda that are not scheduled for public hearing or plat consideration. If you are attending in person please sign in and state your name for the record. Members of the public attending via Zoom please use the raise hand option and the Clerk will un-mute your connection. Please state your name for the record. All members of the public will be allotted three minutes to speak.

RECONSIDERATION

CONSENT AGENDA All items on the consent agenda are considered routine and noncontroversial by the Planning Commission and are approved in one motion. There will be no separate discussion of these items unless requested by a Planning Commissioner or someone from the public, in which case the item will be moved to the regular agenda.

- A. Unapproved Regular Meeting Minutes for June 1, 2022.
- B. Preliminary Plat Time Extension Request for Jack Gist Subdivision No. 3

PRESENTATIONS / VISITORS

REPORTS

A. Staff Report 22-42, City Planner's Report

PUBLIC HEARINGS

A. Staff Report 22-43, a Request for Conditional Use Permit 22-04 to Replace Underground Petroleum Tanks with above ground tanks at 843 Fish Dock Rd.

PLAT CONSIDERATION

PENDING BUSINESS

NEW BUSINESS

- A. Memorandum from Public Works Director re: Update Water/Sewer Design Criteria Manual and Standard Construction Specifications
- B. Staff Report 22-44, Review of Conditional Uses and Structures

INFORMATIONAL MATERIALS

- A. City Manager's Reports for June 13, 2022 & June 27, 2022
- B. Planning Commission 2022 Annual Calendar

COMMENTS OF THE AUDIENCE The Public is invited to speak to the Commission on any subject. If you are attending in person please sign in and state your name for the record. Members of the public attending via Zoom please use the raise hand option and the Clerk will un-mute your connection. Please state your name for the record. All members of the public will be allotted three minutes to speak.

COMMENTS OF THE STAFF

COMMENTS OF THE COMMISSION

ADJOURNMENT

Next Regular Meeting is Wednesday, August 3, 2022, at 6:30 p.m. A worksession is scheduled for 5:30 p.m. All meetings are scheduled to be held in the City Hall Cowles Council Chambers located at 491 E. Pioneer Avenue, Homer, Alaska and via Zoom Webinar. Meetings will adjourn promptly at 9:30 p.m. An extension is allowed by a vote of the Commission

Session 22-09, a Regular Meeting of the Planning Commission was called to order by Chair Scott Smith at 6:30 p.m. on June 1, 2022 at the Cowles Council Chambers in City Hall, located at 491 E. Pioneer Avenue, Homer, Alaska, and via Zoom Webinar.

PRESENT:	COMMISSIONERS BARNWELL, VENUTI, SMITH, CHIAPPONE, BENTZ, HIGHLAND
ABSENT:	COMMISSIONER CONELY (EXCUSED)
STAFF:	CITY PLANNER ABBOUD DEPUTY CITY CLERK KRAUSE

AGENDA APPROVAL

HIGHLAND/BARNWELL MOVED TO APPROVE THE AGENDA AS PRESENTED.

There was no discussion.

VOTE: NON OBJECTION: UNANIMOUS CONSENT.

Motion carried.

PUBLIC COMMENTS ON ITEMS ALREADY ON THE AGENDA

Bradley Parsons, city resident, thanked the Commissioners for the work that they do recognizing at times how hard that work can be. He commented on placement and inclusion of sidewalks in the proposed connection to Fairview. He then provided recommendation on providing sidewalks and aesthetics noting that it is a heavily used pedestrian way. He further commented on the inappropriate design for pedestrian travel along Soundview, which according to the non-motorized plan on the map was to be separated pathway. What resulted was an area that is nowhere near wide enough and in winter is non-existent. Mr. Parsons stated that Soundview Avenue has become a shortcut to the medical center and believes that the same thing will occur when the Fairview Avenue connection is completed and urged the city to build accordingly.

RECONSIDERATION

CONSENT AGENDA

A. Planning Commission Regular Meeting Minutes of May 18, 2022

Chair Smith requested a motion to approve the Consent Agenda.

HIGHLAND/VENUTI MOVED TO APPROVE THE CONSENT AGENDA AS PRESENTED.

Commissioner Bentz noted that the minutes under adjournment reflected the next meeting incorrectly.

It was noted that the Clerk can make that minor correction.

VOTE: NON OBJECTION: UNANIMOUS CONSENT.

Motion carried.

PRESENTATIONS / VISITORS

STAFF & COUNCIL REPORT/COMMITTEE REPORTS

A. Staff Report 22-39, City Planner's Report

City Planner Abboud provided a summary of Staff Report 22-39. He noted the following:

- Ordinances approved by City Council at the May 23, 2022 meeting
- Training has been scheduled for the new permitting software
- CUP reform
- Housing issues and the lack thereof of affordable housing problems
- Hazard Mitigation Plan will be presented to Council for approval
- A Presentation will be provided on the rezone
- Recent EDC Meeting and upcoming meeting schedule and vacancy

City Planner Abboud requested volunteers to make the report to City Council.

Chair Smith volunteered for the June 27th meeting.

City Planner Abboud provided information on the minor changes that were made to the Hazard Mitigation Plan.

B. Memorandum from Chair Smith re: Mayor's Roundtable Meeting with Advisory Body Chairpersons.

Chair Smith reported to the Commission that they briefly described challenges that each body is or has been addressing as follows:

- Port & Harbor – Housing for employees and reviewing the Spit Comprehensive Plan

- Library –Information Technology separate from Library Services, educating homeless people and providing educational platforms for Homer.

- PARCAC – ADA upgrades to trails and pathways

- EDC – encouraging Homer to grow wisely facilitating new businesses commercial and private but keep Homer, Homer

Chair Smith reported that Mayor Castner and Julie Engebretsen attended and Ms. Engebretsen who is now the Economic Development Manager cited that it is believed the Planning Commission was that there is a wall at the top of Baycrest and they only support certain things coming in. He further reported to the group that the Commission is working in the green infrastructure and storm water planning. Some of the items that may come forward to the Commission is a recommendation to amend city code to allow employee housing.

Chair Smith responded to questions on the following:

- parking study

- challenges to find housing for short term summer employees

City Planner Abboud facilitated questions and answers regarding to spit parking study, resulting information and where the Commission could review that report.

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PUBLIC HEARINGS

PLAT CONSIDERATION

A. Staff Report 22-40, Lillian Walli Estate 2022 Replat Preliminary Plat

Chair Smith introduced the item by reading of the title and deferred to the City Planner.

Commissioner Venuti declared he had a conflict.

HIGHLAND/BENTZ MOVED THAT COMMISSIONER VENUTI HAD A CONFLICT OF INTEREST.

Commissioner Venuti stated that he is expecting remuneration for services on this particular property, has a business relationship with the applicant that will exceed allowable limits.

VOTE. YES. CHIAPPONE, HIGHLAND, BENTZ, BARNWELL, SMITH

Motion carried.

Commissioner Venuti muted his connection and departed the meeting (room).

City Planner provided a summary of Staff Report 22-40.

There was no applicant present.

Chair Smith opened the floor for public comment seeing no public present wishing to comment he closed the public comment period and opened the floor to questions from the Commission.

Chair Smith requested a motion and second.

BENTZ/HIGHLAND MOVE TO ADOPT STAFF REPORT 22-40 AND RECOMMEND APPROVAL OF THE LILLIAN WALLI ESTATE 2022 REPLAT PRELIMINARY PLAT

There was a brief discussion on the small amount of wetland, noted a drainage easement which will require development in accordance with regulations.

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VOTE. NON-OBJECTION. UNANIMOUS CONSENT.

Motion carried.

Commissioner Venuti returned to the meeting.

B. Staff Report 22-41, Yah Sure Preliminary Plat

Chair Smith introduced the item by reading of the title and deferred to the City Planner.

City Planner Abboud provided a summary of Staff Report 22-41.

There was no applicant present.

PLANNING COMMISSION REGULAR MEETING JUNE 1, 2022

Chair Smith opened the floor for public comment seeing no public present wishing to comment he closed the public comment period and opened the floor to questions from the Commission.

Chair Smith requested a motion and second.

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VENUTI/HIGHLAND MOVED TO ADOPT STAFF REPORT 22-41 AND RECOMMEND APPROVAL OF THE YAH SURE PRELIMINARY PLAT
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Commissioner Highland noted a correction on page 28 of the packet, item G is missing the B for block number. She then questioned the lot line that is being removed. City Planner Abboud provided that it may not have been a good copy and that is why the vacated lot line is not being depicted.

VOTE. NON-OBJECTION. UNANIMOUS CONSENT.

Motion carried.

PENDING BUSINESS

NEW BUSINESS

INFORMATIONAL MATERIALS

- A. City Manager's Report for May 23, 2022
- B. Planning Commission Calendar 2022
- C. Public Comment Received re: Installation of Sidewalk and Traffic Calming Measures Along Fairview Avenue as Construction Occurs to Connect to Eric Lane.

Chair Smith noted the informational materials provided.

City Planner Abboud provided clarification what the "fast forward" of the Comp Plan would look like for the Commission. He stating that typically they would begin review in 2025. It will be setting the stage to look at staging things for the future. Noting such items regarding the housing issues such as density, building taller, etc.

Commissioner Bentz responded that it was a good idea, since it took them at least two years, she then commented that it would be ideal to have Council and the Commissions review the different planning components to make sure they all work together.

City Planner Abboud provided additional information on working with Public Works Department regarding the permitting, NMT, drainage, etc. It has been challenging and very enlightening on how it all intersects with the overall aspect.

Commissioner Barnwell commented on spending two years on the last review of the plan and questioned if that was the expected time frame for the Fast Forward plan.

City Planner Abboud stated that it will depend, noting the last time they did it in house, it did not have the public commentary, and will be contingent on funding availability and staff time.

Commissioner Bentz suggested that it would be great to have that road map in order to facilitate review and worksession with the commissions and that would provide some directive.

Discussion ensued on the benefits of these planning documents, obtaining funding, Council decisions to implement, as a city what can be done to address traffic calming measures, implementing the design guidelines that are available and enforcing them; sometimes paving and straightening out a road encourages speed; Fairview Avenue project will be happening this season and is dependent on Public Works Department; how can the public be involved in a project and have their say before a project is started; current progress on addressing concerns expressed by public comment; planning department not implementing visionary planning is a missed opportunity and what was done in the past which set the basis and developed these plans and it is time to update those plans; resulting plans will require amendments to city code which over time ends up in a "dirty" city code; how things get worked out is that it must be included in the Comp Plan and if it is not in there then they cannot do it; referencing past projects that did not have green corridors or sidewalks, etc.; establishing set standard requirements in developments; referencing title 22 when a subdivision agreement is entered; the comp plan shows what the future will hold and as an investor they should know that; the Commission can recommend what items should be in the comp plan before it is ratified.

Commissioner Bentz commented that she believed the Comp Plan was a guiding document and flexible while the City Code is more concrete.

City Planner Abboud commented that the 2018 Comp Plan has a lot of things in it, commenting that there is room for improvement. There is still opportunity as they get different demands as time goes on.

Chair Smith noted the brochure as a result of the Public Works Task Force and expressed appreciation for the tsunami brochure.

Commissioner Barnwell recognized the work of Donna Aderhold and Caroline Venuti and Elena Suleiman on the tsunami brochure coming forward.

COMMENTS OF THE AUDIENCE

COMMENTS OF THE STAFF

Deputy City Clerk Krause provided the last name for the person Commissioner Barnwell was thinking of that worked for DGGS and expressed her appreciation for a good meeting.

COMMENTS OF THE COMMISSION

Commissioner Chiappone commented that he appreciated the Tsunami hazard work, it was very eye opening.

Commissioner Highland expressed her appreciation for the work done by City Planner Abboud and Deputy City Clerk Krause and advised everyone to watch for fried brain syndrome in this weather.

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Chair Smith expressed his appreciation for a great meeting.

ADJOURN

There being no further business before the Commission, the meeting was adjourned at 7:56 p.m. The next Regular Meeting is Wednesday, June 15, 2022 at 6:30 p.m. A worksession is scheduled for 5:30 p.m. All meetings scheduled to be held in the City Hall Cowles Council Chambers located at 491 E. Pioneer Avenue, Homer, Alaska and via Zoom webinar.

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RENEE KRAUSE, MMC, DEPUTY CITY CLERK II

Approved:____

Kenai Peninsula Borough Planning Department 144 North Binkley Street Soldotna, Alaska 99669 Phone: (907) 714-2200 Fax: (907) 714-2378

TIME EXTENSION REQUEST FORM

\checkmark	Name of Subdivision:							
\checkmark	Location of Subdivision:							
\checkmark	KPB Number: 2020-107							
\checkmark	Date of Planning Comm	ission Approval(s)						
	09/28/2020							
\checkmark	Reason for time extension request.							
	that the completion of const	ruction and approval by DEC and the City of Homer will not						
	be finalized by the time that	the current preliminary approval expires.						
	2							
Date:	7/7/2022							
Signature of Surveyor/Property Owner: Styph C. Smith								

Source: Resolution 89-27

REVISED 051617

<u>NOTES</u>

1. BASIS OF BEARING FOR THIS SURVEY WAS DETERMINED BY A HIGH PRECISION GPS SURVEY USING TOPCON DUAL-FREQUENCY HiPer V RECEIVERS, DIFFERENTIALLY CORRECTED AND PROCESSED WITH MAGNET OFFICE VERSION 3.1 SOFTWARE. NAD83 ALASKA STATE PLANE GRID COORDINATES (U.S. SURVEY FEET) OBTAINED FROM THE GPS OBSERVATIONS WERE BASED ON THE NGS PUBLISHED VALUES FOR FEDERAL BASE NETWORK CONTROL STATION "HOMAIR" (PID TT0155).

2. TRUE BEARINGS AND DISTANCES WERE DETERMINED BY ROTATING AND SCALING FROM GRID USING FEDERAL BASE NETWORK CONTROL STATION "HOMAIR" AS A SCALING POINT. TRUE BEARINGS WERE DETERMINED BY ROTATING GRID INVERSE AZIMUTHS -1'17'13.4". TRUE DISTANCES WERE OBTAINED BY DIVIDING GRID INVERSE DISTANCES BY 0.999986696.

3. THE RESULTING SCALED COORDINATES WERE TRANSLATED TO A LOCAL COORDINATE SYSTEM BASED ON FEDERAL BASE NETWORK CONTROL STATION "HOMAIR" N=100,000 E=100,000. ALL COORDINATE VALUES REPRESENT GROUND DISTANCES IN U.S. SURVEY FEET ORIENTED TO TRUE NORTH.

4. THE 15 FEET FRONTING THE SPRUCE LANE, JACK GIST LANE, NORTH COURT, SOUTH COURT AND BOTTOM CIRCLE RIGHT-OF-WAYS, AND THE FRONT 20 FEET WITHIN 5 FEET OF THE SIDE LOT LINES IS A UTILITY EASEMENT. THE ENTIRE 20 FEET FRONTING THE EARLY SPRING STREET RIGHT-OF-WAY IS A UTILITY EASEMENT. NO PERMANENT STRUCTURE SHALL BE CONSTRUCTED OR PLACED WITHIN A UTILITY EASEMENT WHICH WOULD INTERFERE WITH THE ABILITY OF A UTILITY TO USE THE EASEMENT.

5. ANY PERSON DEVELOPING THE PROPERTY IS RESPONSIBLE FOR OBTAINING ALL REQUIRED LOCAL, STATE, AND FEDERAL PERMITS, INCLUDING A U.S. ARMY CORPS OF ENGINEERS WETLAND DETERMINATION IF APPLICABLE.

6. THESE LOTS ARE SERVED BY CITY OF HOMER SEWER AND WATER.

7. ALL LOTS WITHIN THIS SUBDIVISION ARE SUBJECT TO CITY OF HOMER ZONING REGULATIONS. REFER TO THE HOMER CITY CODE FOR ALL CURRENT SETBACK AND SITE DEVELOPMENT RESTRICTIONS. OWNERS SHOULD CHECK WITH THE CITY OF HOMER PLANNING DEPARTMENT PRIOR TO DEVELOPMENT ACTIVITIES.

8. SET A 5/8" X 30" REBAR WITH 2" ALCAP (7538-S 2020) AT ALL LOT CORNERS AND RIGHT-OF-WAY POINTS OF CURVATURE UNLESS INDICATED OTHERWISE.

9. EXISTING DRAINAGES ARE SUBJECT TO 20 FOOT WIDE DRAINAGE EASEMENTS CENTERED ON THE CENTERLINE OF THE EXISTING DRAINAGES. APPROXIMATE LOCATIONS OF DRAINAGES ARE SHOWN.

10. THE LOT IS AFFECTED BY AN EASEMENT OF RECORD WITH NO DEFINED LOCATION GRANTED TO HOMER ELECTRIC ASSOCIATION (BK18, PG 97 HRD).

11. SEWER, WATER AND PEDESTRIAN TRAIL EASEMENTS ARE CENTERED ON THE LOT LINES UNLESS INDICATED OTHERWISE.

CURVE 1	TABLE				
CURVE	DELTA	RADIUS	LENGTH	CHORD BRNG	CHORD DIS
C1	81°25'17"	25.00'	35.53'	S 49°15'29" E	32.61'
C2	10°56'45"	170.00'	115.68'	S 10°56'45" W	113.46'
C3	30°29'28"	230.00'	122.40'	S 15°11'37" W	120.96'
C4	62°10'55"	25.00'	27.13'	S 31°02'21" W	25.82'
C5	152°11'07"	50.00'	132.81'	S 13°57'45" E	97.07'
C6	33°24'49"	200.00'	116.64'	S 73°15'44" E	114.99'
C7	33°29'53"	200.00'	116.93'	S 73°18'16" E	115.27'
C8	33°24'49"	170.00'	99.14'	S 73°15'44" E	97.74'
C9	28°04'55"	230.00'	112.73'	S 70°35'47" E	111.60'
C10	79°51'17"	50.00'	69.69'	N 76°49'42" E	64.18'
C11	53°53'00"	50.00'	47.02'	S 36°18'09" E	45.31'
C12	53°20'28"	50.00'	46.55'	N 17°18'35" E	44.89'
C13	51°28'15"	50.00'	44.92'	N 69°42'57" E	43.42'
C14	47°42'36"	50.00'	41.63'	N 60°41'38" W	40.44'
C15	90°00'00"	25.00'	39.27'	N 45°01'52" E	35.36'
C16	59°22'13"	50.00'	51.81'	N 23°24'50" W	49.52'
C17	65°12'51"	50.00'	56.91'	S 38°52'42" W	53.89'
C18	62°54'34"	50.00'	54.90'	N 77°03'36" W	52.18'
C19	98°45'59"	50.00'	86.19'	N 3°46'41" E	75.91'
C20	90°00'00"	25.00'	39.27'	N 44°58'08" W	35.36'
C21	25°42'48"	170.00'	76.29'	<u>S 4°18'34" W</u>	75.65
C22	13°16'23"	170.00'	39.38'	<u>S 23°48'10" W</u>	39.29'
C23	14°09'02"	230.00'	56.80'	<u>S 23°21'50" W</u>	56.66'
C24	<u> </u>	230.00'	20.27'	<u>S 13°45'49" W</u>	20.27'
C25	<u>5°08'45"</u>	230.00'	20.66'	<u>S 8°39'56" W</u>	20.65'
C26	<u>6°08'40"</u>	230.00'	24.67'	<u>S 3°01'13" W</u>	24.65'
C27	<u>62°10'55"</u>	25.00'	27.13'	<u>N 31°02'21" E</u>	25.82
C28	<u> </u>	50.00'	44.20'	<u>N 36°48'24" E</u>	42.77'
C29	<u>35°06'54"</u>	50.00'	30.64'	<u>N 6°04'27" W</u>	30.17'
C30	<u>66°25'25"</u>	50.00'	57.97'	<u>N 56°50'37" W</u>	<u>54.77</u>
C31	<u>22°19'49"</u>	<u> 170.00'</u>	66.25	<u> S 78°53'19" E</u>	65.84
C32	<u>11°10'05"</u>	170.00'	33.14'	<u>S 62°08'22" E</u>	33.08'
C33	<u> 14°15'19"</u>	230.00'	57.22	<u> S 63°40'59" E</u>	57.08
C34	19°09'30"	230.00'	76.91'	<u> S 80°23'23" E</u>	76.55'

<u>LEGEND</u>

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INDICATES 3-1/4" ALCAP MONUMENT (1301-S 1974) RECOVERED THIS SURVEY

- INDICATES 2-1/2" BRASS CAP MONUMENT \bigcirc (3686-S DATE ?) RECOVERED THIS SURVEY
- INDICATES 5/8" REBAR WITH 2" ALCAP 0
- (7968-S, 1990) RECOVERED THIS SURVEY
- INDICATES 5/8" REBAR (CAP MISSING) 0 (5780-S PER HM 2002-27) RECOVERED THIS SURVEY
- INDICATES RECORD DATA PER HM 99-63 ()

INDICATES LIMIT OF DISCHARGE SLOPE DESIGNATION PER KENAI WATERSHED FORUM WETLANDS ASSESMENT

INDICATES APPROXIMATE CENTERLINE OF DRAINAGE









Planning 491 East Pioneer Avenue Homer, Alaska 99603

www.cityofhomer-ak.gov

Planning@ci.homer.ak.us (p) 907-235-3106 (f) 907-235-3118

Staff Report Pl 22-42

TO:	Homer Planning Commission
FROM:	Rick Abboud, AICP, City Planner
DATE:	July 20, 2022
SUBJECT:	City Planner's Report

City Council 6.13.22

Memorandum 22-097 from Mayor Castner Re: Recommendation for the Homer City Seat on the Kenai Peninsula Borough Planning Commission. Recommend approval. Confirmed the submission of Heather Lewis and Franco Venuti to KPB Mayor Pierce for consideration for the Homer City Seat on the KPB Planning Commission.

Ordinance 22-31, An Ordinance of the City Council of Homer, Alaska Amending Homer City Code Chapter 21.93 Administrative Appeals to Clarify General Appeal Procedures and Related Matters. City Clerk. Recommended dates Introduction June 13, 2022 Public Hearing and Second Reading June 27, 2022.

Memorandum 22-099 from City Clerk as backup.

Memorandum 22-100 from City Planner as backup.

Ordinance 22-32, An Ordinance of the City Council of Homer, Alaska Amending Title 21.03.040 Definitions used in Zoning Code, Title 21.44 Slopes, Title 21.50.020 Site Development Standards – Level One and Title 21.50.020 Site Development Standards – Level Two. Planning Commission. Recommended dates Introduction June 13, 2022 Public Hearing and Second Reading June 27, 2022.

Memorandum 22-101 from City Planner as backup.

Resolution 22-051, A Resolution of the City Council of Homer, Alaska Adopting the City of Homer 2022 Local Hazards Mitigation Plan Update/Revision. City Manager. Recommend adoption.

Memorandum 22-105 from City Planner as backup.

Resolution 22-053, An Ordinance of the City Council of Homer, Alaska Authorizing Task Orders to Bishop Engineering, LLC to Design Non-Motorized Transportation Projects and Authorizing the City Manager to Negotiate and Execute the Appropriate Documents. City Manager/Public Works Director. Recommend adoption.

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Memorandum 22-107 from Public Works Director as backup.

<u>City Council 6.27.22</u> Committee of the Whole

Ordinance 22-35, An Ordinance of the City Council of Homer, Alaska, Amending the Homer City Zoning Map to Rezone a Portion of the Rural Residential (RR) Zoning District to Urban Residential (UR) Zoning District in the Lower West Hill Road Area. Planning Commission. Introduction June 27, 2022 Public Hearing and Second Reading July 25, 2022. Memorandum 22-116 from City Planner as backup. Memorandum 22-117 from City Manager as backup

Regular Meeting

Memorandum 22-112 from Mayor Castner Re: Appointment of Bradley Parsons to the ADA Compliance Committee and Reappointments of Franco Venuti and Brad Conley to the Planning Commission. Recommend approval.

Ordinance 22-31, An Ordinance of the City Council of Homer, Alaska Amending Homer City Code Chapter 21.93 Administrative Appeals to Clarify General Appeal Procedures and Related Matters. City Clerk. Introduction June 13, 2022 Public Hearing and Second Reading June 27, 2022.

Memorandum 22-099 from City Clerk as backup. Memorandum 22-100 from City Planner as backup. ADOPTED without discussion.

Ordinance 22-32, An Ordinance of the City Council of Homer, Alaska Amending Title 21.03.040 Definitions used in Zoning Code, Title 21.44 Slopes, Title 21.50.020 Site Development Standards Level One and Title 21.50.020 Site Development Standards – Level Two. Planning Commission. Introduction June 13, 2022 Public Hearing and Second Reading June 27, 2022. Memorandum 22-101 from City Planner as backup. ADOPTED without discussion.

Ordinance 22-35, An Ordinance of the City Council of Homer, Alaska, Amending the Homer City Zoning Map to Rezone a Portion of the Rural Residential (RR) Zoning District to Urban Residential (UR) Zoning District in the Lower West Hill Road Area. Planning Commission. Introduction June 27, 2022 Public Hearing and Second Reading July 25, 2022. Memorandum 22-116 from City Planner as backup. Memorandum 22-117 from City Manager as backup. INTRODUCED with discussion.

City Council 7.25.22

A public hearing is scheduled for the rezone area and I have created an ordinance to facilitate the transfer of portions of city property for the reconfiguration of Woodard Park on Spruceview Avenue, which will be introduced. The Commission had approved a preliminary plat that Staff Report PL 22-23 Homer Planning Commission Meeting of July 20, 2022 Page **3** of **3**

dedicated portions of Woodard Creek that were part of private property and vacated some small portions of the parklands to the adjoining reconfigured lots. While the plat recorded, the city still is still listed as a property owner until we sign a quitclaim deed. I became aware of this issue when a relator was seeking to have the City Manager sign a quitclaim for one of the two parcels that were to be in private ownership.

Permitting Software

Still working on it. Have to reschedule training until parcel and data transfer issues are resolved.

Hazard Mitigation Plan Update

It is now official, we have a current hazard mitigation plan fully approved by the city and FEMA.

Rural Residential Rezone Update:

We have mailed out the flier and created a web page for information for on the Planning page of the City website <u>https://www.cityofhomer-ak.gov/planning/proposed-zoning-map-amendment</u> Our schedule: <u>March 7: mail out flier, launch website</u> <u>March 14th-25th: Chat with a planner timeframe</u> <u>April 6th: Work session with PC</u> <u>April 7th hearing notice mailed</u> <u>April 20th Public hearing</u> June 27th City Council Introduction July 25th City Council Public Hearing

We will develop a similar process for UR opportunities to the east as we progress or finish the west depending on our experiences.

Planning Commission vacancy

As of the time of this report, we have no candidates for our vacancy.

Economic Development Advisory Commission - Does not meet until 8/23.

Commissioner Report to Council

7/25/22	
8/8/22	





Planning 491 East Pioneer Avenue Homer, Alaska 99603

www.cityofhomer-ak.gov

Planning@ci.homer.ak.us (p) 907-235-3106 (f) 907-235-3118

Staff Report 22-43

TO: FROM: DATE: SUBJECT:	Homer Plar Rick Abbou July 20, 202 Conditiona	Planning Commission Youd, AICP, City Planner 2022 Yonal Use Permit (CUP) 22-04							
Synopsis The applicant proposes replace underground petroleum tanks with abo ground tanks. A Conditional Use Permit (CUP) is required per HCC 21.30.030(d), Bulk Petroleum Storage.									
Applicant:		Petro 49, Russel Cooper							
		2101 63rd Ave							
Location		Anchorage, AK							
Location:	tion								
Legal Description:		AMENDED COAL POINT MONUMENT PARK							
Parcel ID:		18103426							
Size of Existin	g Lot:	1.09 acres (4575 Square foot lease)							
Zoning Design	nation:	Marine Industrial District							
Existing Land	Use:	Underground fuel storage							
Surrounding I	Land Use:	North: Harbor							
		South: Park/parking							
		East: Harbor entrance							
		West: Harbor							
Comprehensive Plan:		Provide for industrial uses that require direct marine access. Promote marine-dependent industries.							
Wetland Status:		Not in a designated wetland							
Flood Plain Status:		Not in a floodplain.							
BCWPD:		Not within the Bridge Creek Watershed Protection District							
Utilities:		Public utilities service the site.							
Public Notice	:	Notice was sent to 4 property owners of 6 parcels as shown on the KPB tax assessor rolls.							

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ANALYSIS: The applicant is proposing to replace underground petroleum tanks with ones that are located above ground.

This proposal is located on a portion of a city lot that is 1.09 acres. It is a long-existing facility that supports the distribution of fuel to boats in the harbor. A CUP for petroleum storage was not gained with the existing facility. In most CUP's the area of concern is that which is within a lot. The leased area is a small portion of the lot, but several features are located outside of the lease and are complementary to proposal. For this request, I am only dealing with the activities proposed within the city lot which the tanks are located.

Parking is provided within the lease area. There is room on the leased area for a fuel truck to deliver product or other vehicles that might maintain the storage facility. A great deal of parking is located on the lot, in addition to the area available within the leased area.

Landscaping requirements are measured from the lot lines. Existing foliage surrounding the leased area will not be disturbed by the project including the trees in the park area.

The applicant mentions some of the criteria for a project of this nature to ensure compliance with regulation meant to address any environmental concern with the removal of the old tanks and the placement of the new system. A certified inspector will be onsite for the tanks removal. A certified contractor will be used to install associated tank infrastructure to ensure compliance with regulations.

New fencing will be installed. I am recommending a condition that the fence use green slats to help soften and provide some concealment. For those using the park and parking area, not much view is compromised. The photographs of the existing facility (taken from standing height) show that not much view is available past the facility from the parking lot area. The view of the facility from the park area is concealed by the trees on the park.

The criteria for granting a Conditional Use Permit is set forth in HCC 21.71.030, Review criteria, and establishes the following conditions:

a. The applicable code authorizes each proposed use and structure by conditional use permit in that zoning district;

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Analysis: Bulk petroleum storage can be approved by a Conditional Use Permit, per HCC 21.30.030(d).

Finding 1: HCC authorizes each proposed use and structure.

b. The proposed use(s) and structure(s) are compatible with the purpose of the zoning district in which the lot is located.

Applicant: The purpose of the Marine Industrial District is primarily to provide adequate space for those water-dependent industrial uses that require direct marine access for their operation, such as fishing, fish processing, marine transportation, offshore oil development and tourism, giving priority to those water-dependent uses over other industrial, commercial and recreational uses.

The marina's aging underground storage tanks will be replaced with three, 12,000 gallon, above ground storage tanks.

Analysis: Providing fuel to boats in the harbor is essential to the operation of the harbor and supports industry and activities in the Marine Industrial District.

Finding 2: The uses and structures are compatible with the purpose of the zoning district.

c. The value of the adjoining property will not be negatively affected greater than that anticipated from other permitted or conditionally permitted uses in this district.

Analysis: Several uses in the Marine Industrial District have greater negative impacts than would be realized from above ground petroleum storage tanks. Extractive enterprises, helipad and heliports could have a greater impact on nearby property values.

Finding 3: An above ground petroleum storage facility is not expected to negatively impact the adjoining properties greater than other permitted or conditional uses.

d. The proposal is compatible with existing uses of surrounding land.

Applicant: Fueling commercial, charter and pleasure vessels in Homer. The new tanks will continue to support the marine vessels with new, modern equipment.

Analysis: The majority of the surround use is the boat harbor, for which the facility is providing direct support to the operations. An existing park has been coexisting with the facility for quite some time. Other surrounding use is an open parking area and further away area various operations supporting the fishing industry. The district is meant to provide support for the marine industries.

Finding 4: The proposal is compatible with existing uses of surrounding land.

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e. Public services and facilities are or will be, prior to occupancy, adequate to serve the proposed use and structure.

Analysis: Paved roads lead to the lot where the city lease is located. A large parking lot allows access to the development. Services are adequate for support of the proposal.

Finding 5: Existing public services and facilities are adequate to serve the proposed facility.

f. Considering harmony in scale, bulk, coverage and density, generation of traffic, the nature and intensity of the proposed use, and other relevant effects, the proposal will not cause undue harmful effect upon desirable neighborhood character.

Applicant: There will be no change in scale of the area, will have no impact on the neighborhood, traffic will stay the same.

Analysis: Desirable neighborhood character could be described by a portion of the purpose statement for the district listed above. The facility provides direct necessary support to the marine industries. The scale of the operation is not changing.

Finding 6: The Commission finds the proposal will not cause undue harmful effect upon desirable neighborhood character as described in the purpose statement of the district.

g. The proposal will not be unduly detrimental to the health, safety or welfare of the surrounding area or the city as a whole.

Applicant: The new, modern tanks meet operational and environmental requirements.

Analysis: The applicant is required to meet all federal, state, and local standards for a facility of this type. The replacement of the underground tanks with those above ground is currently the preferred option to more readily meeting industry standards. The removal of the underground tanks will require the investigation and remediation of any contaminants that may be found in the process (there is no indication of any problems with the performance of the current facility).

Finding 7: The proposal will not be unduly detrimental to the health, safety or welfare of the surrounding area and the city as a whole when all applicable standards are met as required by city code

h. The proposal does or will comply with the applicable regulations and conditions specified in this title for such use.

Analysis: The applicant is not requesting any exceptions to code with this application. They are required to perform the project while meeting all applicable regulations for the removal and subsequent replacement of the petroleum storage tanks and accompanying elements.

Finding 8: The proposal will comply with applicable regulations and conditions specified in Title 21.

i. The proposal is not contrary to the applicable land use goals and objectives of the Comprehensive Plan.

Applicant: The tank replacement will further minimize the environmental impact to the marina area in Homer.

Analysis: As a necessary component of industrial nature in the Marine Industrial District, the most applicable concerns with the Land Use Chapter are associated with minimizing the impact on the natural environment. While the project does not necessarily fit neatly into the plan, it is not found in conflict with the goals and objectives. It does provide improved ability to not negatively affect the natural environment. The replacement of an older technology with a facility designed to meet current industry standards does help maintain the natural environment as eluded to in Goal 2 of the Land Use Chapter of the 2018 Homer Comprehensive Plan.

Finding 9: The proposal is not contrary to the applicable land use goals and objects of the Comprehensive Plan.

j. The proposal will comply with the applicable provisions of the Community Design Manual (CDM).

Analysis: The Community Design Manual is not applicable to the Marine Industrial District. However, it is found in the best interest to comply with Lighting Standards – Level one per HCC 21.59.030.

Finding 10: Project complies with the applicable provisions of the CDM.

Condition 2: Outdoor lighting must be down lit per HCC 21.59.030.

HCC 21.71.040(b). b. In approving a conditional use, the Commission may impose such conditions on the use as may be deemed necessary to ensure the proposal does and will continue to satisfy the applicable review criteria. Such conditions may include, but are not limited to, one or more of the following:

Staff Report 22-43 Homer Planning Commission Meeting of July 20, 2022 Page 6 of 7

1. Special yards and spaces: No specific conditions deemed necessary.

2. Fences and walls: Condition 1. Install green slats in fencing surrounding the facility.

3. Surfacing of parking areas: No specific conditions deemed necessary.

4. Street and road dedications and improvements: No specific conditions deemed necessary.

5. Control of points of vehicular ingress and egress: No specific conditions deemed necessary.

6. Special provisions on signs: No specific conditions deemed necessary.

7. Landscaping: No specific conditions deemed necessary.

8. Maintenance of the grounds, building, or structures: No specific conditions deemed necessary.

9. Control of noise, vibration, odors or other similar nuisances: No specific conditions deemed necessary.

10. Limitation of time for certain activities: No specific conditions deemed necessary.

11. A time period within which the proposed use shall be developed: No specific conditions deemed necessary.

12. A limit on total duration of use: No specific conditions deemed necessary.

13. More stringent dimensional requirements, such as lot area or dimensions, setbacks, and building height limitations. Dimensional requirements may be made more lenient by conditional use permit only when such relaxation is authorized by other provisions of the zoning code. Dimensional requirements may not be altered by conditional use permit when and to the extent other provisions of the zoning code expressly prohibit such alterations by conditional use permit.

14. Other conditions necessary to protect the interests of the community and surrounding area, or to protect the health, safety, or welfare of persons residing or working in the vicinity of the subject lot.

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PUBLIC WORKS COMMENTS:

FIRE DEPARTMENT COMMENTS:

PUBLIC COMMENTS: None

STAFF COMMENTS/RECOMMENDATIONS:

Planning Commission approve CUP **Staff Report 22-43** with findings 1-10 and the following conditions.

Condition 1. Install green slats in fencing surrounding the facility.

Condition 2: Outdoor lighting must be down lit per HCC 21.59.030.

Staff Report 22-43 Homer Planning Commission Meeting of July 20, 2022 Page 7 of 7

Attachments

Application Site Photos Public Notice Aerial Photograph

20

City of Homer

Planning 491 East Pioneer Avenue Homer, Alaska 99603



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www.cityofhomer-ak.gov

Planning@ci.homer.ak.us (p) 907-235-3106 (f) 907-235-3118

Applicant
Name: Petro 49
Address: 2101 63 rd av Anchorage, AKEmail: Russellc@petro49.com
Property Owner (if different than the applicant):
Name: SameTelephone No.: 907-865-2309
Address:Email:
PROPERTY INFORMATION:
Address: _843 Fish Dock RdLot Size: _4575 sq Feet
KPB Tax ID # _180326-LH01
Legal Description of Property
LOT 13-B Homer Spit
For staff use:
Date:Fee submittal: Amount
Received by:Date application accepted as complete
Planning Commission Public Hearing Date:

Conditional Use Permit Application Requirements:

- 1. A Site Plan
- 2. Right of Way Access Plan
- 3. Parking Plan
- 4. A map showing neighboring lots and a narrative description of the existing uses of all neighboring lots. (Planning can provide a blank map for you to fill in).
- 5. Completed Application Form
- 6. Payment of application fee (nonrefundable)
- 7. Any other information required by code or staff, to review your project

Circle Your Zoning District

	RR	UR	RO	CBD	TCD	GBD	GC1	GC2	MC	М	EEMU	BCWPD
Level 1 Site Plan	X	X	x		484)(A)	X			X			X
Level 1 ROW Access Plan	x	x					ter watere wite	n en activezar de	X	weeten tek	-	nang menang persenai
Level 1 Site Development Standards	X	X							ANGAN MANGAN			
Level 1 Lighting			x	21	x	x	х	X	X	X	×	
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Level 2 Site Plan	ļ	х	х	X		х	х		х	х	
Level 2 ROW Access Plan	 	х	x	; x		x	x		х	x	
Level 2 Site Development Standards		х*	х	×	x	x	х			x	
Level 3 Site Development Standards				A 100-00 1 1 1 1 100				х	X		
Level 3 ROW Access Plan					x						
DAP/SWP questionnaire			х	X	х	x	х			х	3

Circle applicable permits. Planning staff will be glad to assist with these questions.

- Y/① Are you building or remodeling a commercial structure, or multifamily building with more than 3 apartments? If yes, Fire Marshal Certification is required. Status: No______
- Y/ Will your development trigger a Development Activity Plan? Application Status: _____
- Y/ Will your development trigger a Storm water Plan? Application Status: <u>No</u>
- YN Does your site contain wetlands? If yes, Army Corps of Engineers Wetlands Permit is required. Application Status: No
- Y/D Is your development in a floodplain? If yes, a Flood Development Permit is required.
- YN Does your project trigger a Community Design Manual review? If yes, complete the design review application form. The Community Design Manual is online at: http://www.ci.homer.ak.us/documentsandforms
- Y(N) Do you need a traffic impact analysis? No
- Y/ Are there any nonconforming uses or structures on the property? No
- Y/N Have they been formally accepted by the Homer Advisory Planning Commission?
- Y/C Do you have a state or city driveway permit? Status/NA______
- Y/N Do you have active City water and sewer permits? Status: _N/A _____
 - Currently, how is the property used? Are there buildings on the property? How many square feet? Uses within the building(s)? Under ground fuel tanks that service the marina are installed on site.
 - 2. What is the proposed use of the property? How do you intend to develop the property? (Attach additional sheet if needed. Provide as much information as possible). The marina's aging underground storage tanks will be replaced with three, new 12,000 gallon, above ground storage tanks.

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CONDITIONAL USE INFORMATION: Please use additional sheets if necessary. HCC21.71.030

- a. What code citation authorizes each proposed use and structure by conditional use permit? The purpose of the Marine Industrial District is primarily to provide adequate space for those water-dependent industrial uses that require direct marine access for their operation, such as fishing, fish processing, marine transportation, off-shore oil development and tourism, giving priority to those water-dependent uses over other industrial, commercial, and recreational uses.
- b. Describe how the proposed uses(s) and structures(s) are compatible with the purpose of the zoning district. Fueling commercial, charter and pleasure vessels in Homer
- c. How will your proposed project affect adjoining property values? No impact. Existing tanks are being replaced and upgraded.
- d. How is your proposal compatible with existing uses of the surrounding land? The new tanks will continue to support the marine vessels with new, modern equipment.
- e. Are/will public services adequate to serve the proposed uses and structures? Yes, the new, modern tanks meet operational and environmental requirements.
- f. How will the development affect the harmony in scale, bulk, coverage, and density upon the desirable neighborhood character, and will the generation of traffic and the capacity of surrounding streets and roads be negatively affected? There will be no change in scale of the area, will have no impact on the neighborhood, traffic area will stay the same
- g. Will your proposal be detrimental to the health, safety or welfare of the surrounding area or the city as a whole? No. New, modern tanks will be improve the environment safety by replacing 30 year old underground tanks.



h. How does your project relate to the goals of the Comprehensive Plan? The tank replacement will further minimize the environment impact to the marina area in Homer .

Find it online at www.cityofhomer-ak.gov/planning/comprehensive-plan

i. The Planning Commission may require you to make some special improvements. Are you planning on doing any of the following, or do you have suggestions on special improvements you would be willing to make? (circle each answer)

Ś

- 1. (VN Special yards and spaces.
- 2. QN Fences, walls and screening.
- 3. Y(N) Surfacing of parking areas.
- 4. Y/N Street and road dedications and improvements (or bonds).
- 5. CON Control of points of vehicular ingress & egress.
- 6. Y/D Special provisions on signs.
- 7. **//**N Landscaping.
- 8. CON Maintenance of the grounds, buildings, or structures.
- 9. Y/N Control of noise, vibration, odors, lighting, heat, glare, water and solid waste pollution, dangerous materials, material and equipment storage, or other similar nuisances.
- 10. Y/ Time for certain activities.
- 11/MN A time period within which the proposed use shall be developed.
- 12. M_N A limit on total duration of use.
- 13. MN Special dimensional requirements such as lot area, setbacks, building height.
- 14. CAN Other conditions deemed necessary to protect the interest of the community.

PARKING

How many parking spaces are required for your development? <u>N/A</u>

If more than 24 spaces are required see HCC 21.50.030(f)(1)(b).____N/A_____

2. How many spaces are shown on your parking plan? <u>'N/A</u>

3. Are you requesting any reductions? No

Include a site plan, drawn to a scale of not less than 1" = 20' which shows existing and

proposed structures, clearing, fill, vegetation and drainage.

24

- <u>2</u>23 - 2

a. 1

net)

I hereby certify that the above statements and other information submitted are true and accurate to the best of my knowledge, and that I, as applicant, have the following legal interest in the property:

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CIRCLE ONE: the efformer of record	Lessee	Contract purchaser
Applicant signature:	my ~~	Date: 6/29/22
Property Owner's signature:	and	Date: 6 / 8-9/2-2
Rob Dumonicu	ec, city MARAGER	29JUN 22

25





drawn by MB THIS DRAWING IS THE PROPERY OF AND CONTAINS INFORMATION WHICH BELONGS TO PETRO 49. IT IS BEING LOANED WITH THE UNDERSTANDING THAT IT MAY NOT BE REPRODUCED OR USED IN ANY WAY THAT WOULD BE INJURIOUS TO PETRO 49'S INTERESTS.

HOMER MARINA PROJECT









Project Description –

Petro Marine will be removing the two existing underground storage tanks at the marina as they are nearing the end of their life span in the ground. We plan to replace these tanks with three above ground storage tanks that are double-wall and fireguard rated.

Project Scope –

- Remove two existing 20,000 gallon underground storage tanks using third party contractor and certified UST inspector.
- Install roughly 200 yards of gravel compacted in 6 inch lifts to existing grade.
- Pour 42 ft. by 30 ft. concrete pad for tanks and equipment.
- Install tanks, catwalk, and piping using API certified third party contractor.
- Pressure test piping.
- Install new fence on south side of leased property, pushing fence line roughly 3 ft. south to use remaining property lease. According to the survey we recently conducted, we are currently using 4,396 sq. ft. and the lease covers 4,575 sq. ft.

Project Timeline -

We would like to begin work in late fall 2022 after the summer season had concluded. We will plan on using the Petro Marine Fuel Dock to provide fuel to the Homer marine community during the construction period.





New fence line





A.02





Petro Marine petroleum storage site 7.13.22, facing north-west



CITY OF HOMER PUBLIC HEARING NOTICE PLANNING COMMISSION MEETING

A public hearing on the matter below is scheduled for Wednesday, July 20, 2022 during the Regular Planning Commission Meeting. The meeting begins at 6:30 p.m. and will be conducted via Zoom webinar. Participation is available virtually or in-person at City Hall, more information below.

A request for Conditional Use Permit (CUP) 22-04, to allow above ground petroleum storage tanks at 843 Fish Dock Road, T 7S R 13W SEC 1 SEWARD MERIDIAN HM 0890034 HOMER SPIT SUB AMENDED COAL POINT MONUMENT PARK. A CUP is required for Bulk Petroleum Storage, according to Homer City Code 21.30.030(d).

In-person meeting participation is available in Cowles Council Chambers located downstairs at Homer City Hall, 491 E. Pioneer Ave., Homer, AK 99603.

To attend the meeting virtually, visit zoom.us and enter the Meeting ID & Passcode listed below. To attend the meeting by phone, dial any one of the following phone numbers and enter the Webinar ID & Passcode below, when prompted: 1-253-215-8782, 1-669-900-6833, (toll free) 888-788-0099 or 877-853-5247.

Meeting ID: 979 8816 0903 Passcode: 976062

Additional information regarding this matter will be available by 5pm on the Friday before the meeting. This information will be posted to the City of Homer online calendar page for July 20, 2022 at <u>https://www.cityofhomer-ak.gov/calendar</u>. It will also be available at the Planning and Zoning Office at Homer City Hall and at the Homer Public Library.

Written comments can be emailed to the Planning and Zoning Office at the address below, mailed to Homer City Hall at the address above, or placed in the Homer City Hall drop box at any time. Written comments must be received by 4pm on the day of the meeting.

If you have questions or would like additional information, contact Rick Abboud at the Planning and Zoning Office. Phone: (907) 235-3106, email: <u>clerk@cityofhomer-ak.gov</u>, or inperson at Homer City Hall.

NOTICE TO BE SENT TO PROPERTY OWNERS WITHIN 300 FEET OF PROPERTY

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VICINITY MAP ON REVERSE



Project Description –

Petro Marine will be removing the two existing underground storage tanks at the marina as they are nearing the end of their life span in the ground. We plan to replace these tanks with three above ground storage tanks that are double-wall and fireguard rated.

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HOMER MARINA PROJECT




Public Works 3575 Heath Street Homer, AK 99603



www.cityofhomer-ak.gov

publicworks@cityofhomer-ak.gov (p) 907- 235-3170 (f) 907-235-3145

M E M O R A N D U M

TO: Planning Commission

FROM: Janette Keiser, PE, Public Works Director/City Engineer

DATE: June 15, 2022

SUBJECT: Update Water/Sewer Design Criteria Manual and Standard Construction Specifications

Public Works has been working to update the City's *Design Criteria Manual* (DCM) and the *Standard Construction Specifications* (SCS). We have finished final draft documents, as they relate to Water and Sewer infrastructure, and are presenting them to the Planning Commission for your review, comment, and approval. After incorporating any comments you may have, Public Works will ask the City Council to formally approve them for use.

Public Works is nearing completion of other parts of the DCM and the SCS (as they relate to roads, storm drains, and other public infrastructure) and will be presenting them to the Planning Commission in the near future. As part of this effort, we will be proposing new approaches to regulating storm water runoff.

Design Criteria Manual

The purpose of the DCM is to consolidate the rules, regulations and guidelines covering the design of water and wastewater facilities and standardize design practices to facilitate cost effective operation and maintenance.

The City has not previously had a DCM for water/sewer infrastructure. The proposed DCM is based on the criteria established in the Municipality of Anchorage and by ADEC, modified to preserve Homer's specific requirements and unique standard procedures. Below is a summary of contents of the Manual:

- Section 10 General Requirements
- Section 20 Requirements Applicable to Water and Wastewater Plan Preparation
- Section 30 Design and Construction of Wastewater Facilities
- Section 40 Design and Construction of Waterworks Facilities
- Section 50 Record Drawings and Final Document Submittals

Standard Construction Specifications

SCS's were adopted by the City in 2001 and revised/updated again in 2011. The SCS establishes detailed direction on how the individual components of a project are to be constructed, measured, and paid for. SCS include technical specifications and standard detail drawings. Below is a summary of updated subject matter.

- Inclusion of new materials and products (examples: waterproofing membrane products, new couplings/fittings)
- Updated testing requirements (examples: close circuit inspections, disinfection requirements, more rigid pressure testing)
- Addition of new work items (examples: septic tank removal/disposal, restoration of existing facilities, confined space work requirements)
- Revisions to standard details (examples: improved manhole waterproofing, standardizing fire hydrant and water/sewer service line installations)
- New standard details (connecting pressure sewer services, special manhole details, internal manhole drop connections)

Recommendations:

The Planning Commission review and comment on the draft final Water and Sewer Design Criteria Manual and Standard Construction Specifications.

DESIGN CRITERIA MANUAL

CITY OF HOMER, ALASKA



Water and Wastewater

SECTION

10.00	GENERAL REQUIREMENTS			
	10.01 10.02 10.03 10.04 10.05	Purpose Acronyms Materials Engineer's Laws, Reg 10.05.01 10.05.02	, Abbreviations and Definitions and Workmanship s Certification julations and Studies General Sanitary Sewer and Water Studies	1 1 1 1 1 2
20.00	REQU	IREMENTS	APPLICABLE TO WATER AND WASTEWATER	3
	20.01 20.02 20.03	General Developer Engineer's 20.03.01 20.03.02 20.03.03 20.03.04	r s s Responsibili ty General Private Systems Main line extensions by a Developer City of Homer Capital Improvement Projects	3 3 3 4 4 5
	20.04	Approvals	and/or Permits	5
		20.04.01 20.04.02 20.04.03 20.04.04 20.04.04.01 20.04.04.02 20.04.04.03 20.04.05 20.04.06 20.04.07 20.04.08	City of Homer Permits For New Construction City of Homer Permits for Repairs City of Homer Construction Water Discharges into Sewer System Work within Rights-of-Way and Easements (ROW) State Highways and State Maintained Roads Municipal Roads and Easements Maintaining Traffic and Road Closures ADEC Water and Wastewater Approvals Non-Conforming Services Other Permits/Approvals Planned interruption of water and sewer service	5556667777 8
	20.05	Standard	Engineered Plan Submittals	9
		20.05.01 20.05.02 20.05.03 20.05.04 20.05.05 20.05.06 20.05.07 20.05.08 20.05.09	General Standard Sheets and Scales Title Block Cover Sheet Information Sheet Survey Control Sheet Plan and Profile Sheets Stationing and Orientation Drawing Standards	9 10 10 10 11 12 14 15
	20.06	Standard	Sanitary Sewer and Water Locations	16
		20.06.01 20.06.02 20.06.03	Location in Dedicated and Implied ROW Water and Sanitary Service Location Sanitary Sewer and/or Water Easements	16 16 17
	20.07	Subsurfac	e Investigations and Reports	19
		20.07.01 20.07.02	Soils Data Minimum Frequency of Routine Quality Control Soil Tests	19 20

20.08	Burial Req	uirements	20
	20.08.01 20.08.02 20.08.03	Bedding Trench Backfill Foundation Material	21 22 22
	20.08.04	Trench Plugs	22
20.09	Rigid Boar	d Insulation	22
20.10	Corrosion 20.10.01 20.10.02 20.10.03 20.10.04 20.10.05 20.10.06	Contro l Standards Materials Selection Corrosivity Evaluation Cathodic Protection Protective Coatings Standardized Corrosion Protection	23 23 23 23 24 25 26
20.11	Industrial	Coatings Standards	27
	20.11.01 20.11.02 20.11.03 20.11.04	Quality Assurance Coatings and Application Schedule Surface Preparation Coating Application	27 27 28 28
20.12`	Mainline Co 20.12.01 20.12.02	onnections to Existing Facilities Sewer Water	29 29 29
20.13	Private Systems 20.13.01 20.13.02 20.13.03 20.13.04 20.13.05 20.13.05.01 20.13.05.02 20.13.05.03 20.13.05.04 20.13.05.06 20.13.05.06 20.13.06	stems Private Systems Engineered Plans Separate Connections Branched Extensions Repairs or Replacement Type of Structure Served Single Family Residence Townhouses Zero Lot Lines Condominiums Mobile Home Parks Commercial Building Non-Conforming Services	29 30 30 31 31 31 31 31 31 32 32 32
20.14	Sanitary S 20.14.01 20.14.02 20.14.03 20.14.04 20.14.05 20.14.06 20.14.07 20.14.08	ewer and Water Inspections General Substantial Completion Inspection Final Inspection Deficiencies Partial Utilization Warranty Period on Connects Private Systems Inspections & Notices Service Connection Inspections	32 32 33 33 34 34 34 34 34 35
20.15	Abandonin Services	ng Sanitary Sewer and/or Water Mains and/or	35

30.00	DESIGN AND CONSTRUCTION OF WASTEWATER FACILITIES			36	
	30.01	General			
	30.02	Standard Sanitary Sewer Design Elements			
		30.02.01 30.02.01.02 30.02.01.03 30.02.01.04 30.02.01.05 30.02.01.06 30.02.01.07 30.02.01.08 30.02.02 30.02.02 30.02.02 30.02.02 30.02.03 30.02.03 30.02.03 30.02.03.01 30.02.03.04 30.02.03.05 30.02.03.06 30.02.03.07 30.02.03.08 30.02.03.09 30.02.03.09 30.02.04 30.02.05 30.02.06.01 30.02.06.01 30.02.06.02 30.02.06.03 30.02.06.04 30.02.07 30.02.08	Pipe Material and Size Design Requirements Design Capacity Design Flow Peak Design Flow Sanitary Sewer Main & Larger Services Slope Sanitary Sewer Services Connection and Extension Slope Minimum Pipe Size Sewer Authorized Materials and Fittings Unauthorized Materials and Fittings Standard Depth of Cover Minimum Depth of Cover Maximum Depth of Cover Deep Service Risers Manholes Location Diameter Flow Channel Connection into manholes Drop Connection Beaver Slides Watertight Manholes (Inside protective well radius) Manholes Locking Manholes Cleanouts Joints Crossings Creek Crossings Aerial Crossings Storm Drain Crossings San Sewer Mains and Services in Relation to Mains/Services Wells	366 337 338 34 42 43 44 44 45 55 56 66 66 47 47 47 48	
	30.03	Sanitary Sewer Services			
		30.03.01 30.03.02 30.03.02.01	General Connections	48 48	Off-
		Pi 30.03.02.02	roperty Connection (Main Line Taps)	49 40	Service
		30.03.03 30.03.04 30.03.05 30.03.05.01	On-Property Service (Extension) On-Property Service (Extension-stub) Sanitary Sewer Extension Appurtenance	49 49 49 50	Control
		M 30.03.05.02	annoies	50 E 1	Backwater
		30.03.05.03	alves	Private	
		30.03.05.04			Grease
		30.03.06 30.03.07	Abandonment of Private Disposal Systems Service Connection Abandonment	52 52 52	
	30.04	Sanitary Sew	age Lift Station	53	
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GENERAL REQUIREMENTS

10.00 Purpose

The purpose of this manual is to consolidate the rules, regulations and guidelines covering the design and construction of water and wastewater facilities within the service areas of the City of Homer, Alaska. Standardizing design practices will provide a consolidated guideline to facilitate cost effective maintenance of the system.

It is not the intention of this manual to limit or hinder new or innovative ideas or procedures. The City of Homer recognizes there will be cases in which connections to or extensions from existing mains may require a deviation from the criteria required in this manual. The City of Homer will consider variances provided the design reflects good engineering practices and does not violate City, State, and Federal codes/regulations.

The City of Homer's objective is to provide long-range service and minimal costs to City of Homer's rate payers. By standardizing designs, construction materials and methods we can increase the longevity of our infrastructure and reduce the cost of maintenance, thereby minimizing the cost to the rate payers.

10.01 Acronyms, Abbreviations and Definitions

Acronyms and abbreviations for general design standards and terms are found in Section 70.01 of this manual. Definitions are found in Section 70.02 of this manual. Construction terminology can be found in Section 10 of the Standard General Provisions Division of the current City of Homer Standard Construction Specifications (CHSCS).

10.02 Materials and Workmanship

All materials, workmanship and construction methods used are to conform to the current CHSCS as modified by special provision, plans, and this manual. If a developer requests use of a new type of material or construction method and/or special conditions warrant exception from the standards, there must be prior approval in writing from the City Engineer.

10.03 Engineer's Certification

All plans and documents stipulating construction requirements, soil reports and other similar documents must be stamped and signed by a registered professional engineer licensed to practice in the State of Alaska. This certification is to signify that the engineer (or a person under direct supervision of the engineer) prepared the documents in accordance with the laws of the State of Alaska governing such practice.

10.04 Laws, Regulations and Studies

10.05.01 General

The City of Homer recommends that developers, engineers, and contractors become knowledgeable on the latest edition of applicable State laws and regulations, City ordinances, rules, regulations and/or reports of all authorities having jurisdiction over construction of the project.

10.05.02

Sanitary Sewer and Water Studies

The latest editions of the following reports and studies are available for use by engineers and are used by City of Homer when reviewing designs by engineers:

1. City of Homer Water and Sewer Master Plan (2005)

20.00 REQUIREMENTS APPLICABLE TO WATER AND WASTEWATER

20.01 General

This section is dedicated to requirements that are applicable to both water and wastewater projects. Requirements specific to wastewater are found in Section 30 and requirements specific to water are found in Section 40.

Typical development/re-development projects include agencies and departments outside of the City of Homer control and authority. As such it is the responsibility of the developer to become familiar with the entire development process.

- The Kenai Peninsula Borough regulations governing land subdivision and development. The City Planning Commission reviews and comments on subdivision and development, in an advisory role, prior to review by the Borough.
- Where the improvement plans submitted cover only a portion of the ultimate development, the plans must be accompanied by an overall development plan, or a study showing the overall development.
- The City of Homer must approve plans and issue a permit for any work in the City right-of-way.
- The Alaska Department of Transportation and Public Facilities (ADOT/PF) must approve plans for any work in ADOT/PF right-of-way.

20.02 Developers

Developers are people or organizations requesting a change to the City of Homer system outside of City of Homer's own capital improvement program. When required by this manual to produce engineered drawings, the developer is required to engage an engineer to provide plans meeting the requirement of this manual.

20.03 Engineer's Responsibility

The engineer is responsible for researching existing data, writing design reports, developing plans, writing project specific specifications and many other duties. Depending on the project, the City of Homer requires differing levels of engineering involvement. The requirements listed below are the minimum expected level. Due to the variability of project complexities or special circumstances the engineer may be requested to complete additional items not listed here.

20.03.01 General

All projects requiring an engineered plan at a minimum will provide and/or complete the following:

• The engineer shall be conscientious in obtaining and reviewing record drawings, geotechnical data, consult with City of Homer about the proposed development, and comply with the requirements of this manual.

- The engineer will be responsible for compilation of record (as-constructed) information and preparation of record drawings.
- Installation and construction problems are to be coordinated with the City of

Homer Public Works Department – Engineering Division. Major proposed changes (e.g., alignment, grade, pipe material) to the approved plans during the construction phase must receive written City of Homer approval prior to installation of the change.

• The engineer or a representative designated by the engineer is required to be at the site for periodic inspection of the work. Inspection frequency is development type dependent. Inspections are to be recorded on an inspection report form acceptable to the Utility:

• Private Systems that require engineered plans – One report documenting periodic inspection of the water and/or sewer construction and any required testing results.

• Private Development – During active water and sewer utility construction, daily inspections are required. On a weekly basis the Engineer is to provide to City of Homer a report of construction activity. The report is to include, at a minimum, a summary statement, backup daily inspection reports, quality acceptance testing results, and laboratory testing results. The reports are to be turned into City of Homer at the beginning of each week.

• Prior to final acceptance of any public improvement by the City of Homer, a final inspection will be conducted as provided for in the City of Homer Standard Construction Specifications (CHSCS), with the requirement that the City of Homer Public Works Department is represented.

• Requests for final inspection are to be accompanied by the engineer's statement that the work is complete and constructed in accordance with applicable standards.

- Final inspections by City of Homer will not be performed unless test and daily inspection reports are current and satisfactory. Preparation of final utility checklists are to be done in conjunction with the final inspection process.
- Provide the subsurface investigation data at the time of initial plan review

• Private systems that do not require engineered plans are not required to complete subsurface investigations.

• Provide City of Homer copies of other agency permits associated with the construction of either water or sewer improvements.

20.03.02 Private Systems

- Comply with bullet items above.
- Where Engineered Plans are required, the engineer must submit record drawings and all quality control testing reports.
- The engineer is to submit laboratory testing results required by the City of Homer.

20.03.03 Main line extensions by a Developer

- Comply with the bullet items above.
- The developer must enter into a mainline extension agreement with City of Homer.

- The developer designated engineer must provide a written statement to City of Homer indicating their engineering services will be provided.
- The engineers and/or their firm must notify City of Homer immediately if employment is terminated or if the scope of employment is reduced to the point that they can no longer perform the services described.
- No materials shall be ordered, or any construction completed until the City of Homer has issued a "Notice to Proceed" to the construction contractor for all private developments under agreement with City of Homer.
- The engineering firm will designate the Engineer, as defined in Article 10.01 of CHSCS, and must be approved by City of Homer.
- The engineer, or a representative designated by the engineer, must be at the site to inspect the work during active construction. The engineer will provide to the City of Homer Project Inspector written daily reports documenting the progress of the work, including soils encountered, test results and action taken based on test results. Inspection reports are due to City of Homer by Tuesday at 8am (covering the previous weeks work) unless formally changed.
- The engineer is responsible for adherence to the quality control program approved for the project. Testing of water and sanitary sewer mains and services required by CHSCS, project specific specifications and/or private development agreement are to be scheduled with City of Homer.
- Provide all required submittals as stated in the main line extension agreement.
- Release of performance guarantees may be made by City of Homer after all inspection reports are received to the satisfaction of City of Homer, the project has passed final inspection, the project has passed final acceptance by other agencies and as provided for by the particular agreement.
- Where reimbursement by the City of Homer is involved, contract pay quantities must be coordinated with City of Homer Engineering Division. Periodic and final payment estimates are to denote reimbursable portions and be concurred with by the Engineering Division

20.03.04 City of Homer Capital Improvement Projects

- Comply with the City of Homer contract requirements and provisions
- Comply with general engineer responsibilities

20.04 Approvals and/or Permits

20.04.01 City of Homer Permits For New Construction

It is unlawful for any person to install or repair any portion of a service connection or extension without first obtaining a permit from City of Homer. City of Homer utility work will not be allowed prior to permit issuance.

The owner and/or their contractor must obtain all other necessary permits prior to commencement of work.

20.04.02 City of Homer Permits for Repairs

All on-property service extension repairs or replacements require an on-property permit and are to follow the same standards that apply to new construction. Repairs less than 10' in length may be completed with materials matching the existing installation.

20.04.03 City of Homer Construction Water Discharges into the Sewer System

City of Homer may permit discharges to the sewer system from a groundwater source after receipt of a written request has been reviewed and approved by the Engineering Division. City of Homer will require the submittal of the ground water treatment plan and may require laboratory testing of the effluent prior to issuing a permit. Additional treatment may be required based on laboratory testing of the discharge water.

20.04.04 Work within Rights-of-Way and Easements (ROW)

Work within a ROW will require a separate permit from the governing ROW agency. The contractor must not allow any other person to do, or cause to be done, any work under a permit secured by the permittee, except persons in their employ.

For main line taps affecting roadways, the contractor is not to start the excavation for the main tap until a partial or full road closure permit is obtained.

The contractor must not dig up or occupy with materials any portion of the Municipal street or ROW than is absolutely necessary. Travel is not to be obstructed unnecessarily and must cause as little inconvenience as possible to occupants of abutting property and to the general public. Convenient access to driveways, houses, stores and buildings along the streets must be maintained wherever possible.

Pavement must be saw cut and removed such that replacement pavement is placed upon a minimum of 12" of undisturbed existing pavement structural section. The pavement cut must not leave narrow unstable panels of asphalt. Where a pavement cut is running with the direction travel, the cut is to be parallel to and take place at the edge or center of the travel lane. Before replacing permanent pavement, the sub-grade must be restored and compacted to ninety-five (95%) percent of maximum density.

The final grade in non-paved areas must match existing grades at construction limits without producing drainage problems. Restoration of grass, shrubs, and other vegetation shall be done in conformance with construction contract documents. Tree damage is to be repaired according to good horticultural practice

20.04.04.01 State Highways and State Maintained Roads

Any water and/or sanitary sewer construction within the State of Alaska's ROW requires a DOT/PF permit. This permit will be issued after the City of Homer permit is issued. The engineer is to submit the ADOT/PF permit to City of Homer. Failure to provide the ADOT/PF permit is grounds to issue a stop work order. The Contractor is to notify ADOT&PF when work is going to begin, when it is complete and for any other stop points required by them.

The developer, or a designated representative, is responsible for coordinating and resolving any review comments with ADOT/PF. ADOT/PF requires an engineered street

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cross section within the plans.

20.04.04.02 City Roads and Easements

Any water and/or sanitary sewer construction within the City of Homer's right-of-way or easements requires a City issued ROW permit prior to commencing work. The MOA requires an engineered street cross section within the plans.

The developer or their designee must coordinate with appropriate City departments for plan review, approval and permits associated with non-utility (water and sewer) work located on private property.

20.04.04.03 Maintaining Traffic and Road Closures

The engineer or contractor must submit and obtain approval of a traffic control plan with ADOT/PF or the City of Homer – Engineering Division for working in existing traveled State and City ROWs prior to working in the ROW.

20.04.05 ADEC Water and Wastewater Approvals

ADEC approvals are required for changes to the water and sewer systems in accordance with 18 AAC Chapter 72 and Chapter 80. This includes, but is not limited to, water and sanitary sewer service services as well as mainline extension, replacement, rehabilitation and modifications.

An ADEC Construction and Operation Certificate for Public Water Systems, "Approval to Construct" is required for water main line extensions and an "Approval to Operate" is required before City of Homer will issue connection or extension permits.

When construction is completed and documentation provided to City of Homer in conformance with the plans and City of Homer requirements, City of Homer will submit, on behalf of the developer, the application for approval to operate to ADEC. The developer will be responsible for resolution of all items to obtain final certifications from ADEC.

The Contractor is to permit through ADEC all construction dewatering activities.

20.04.06 Non-Conforming Services

City of Homer prohibits any person to construct, repair or modify a service considered non- conforming, including bootlegged services. Any service that is not in compliance with City codes or City of Homer tariffs and practices is considered non-conforming.

City of Homer is not to be held liable for non-conforming services and is not obligated to perform any maintenance, repairs or rerouting because of non-conforming services freezing, breaking, or otherwise failing.

City of Homer will not allow the reconnection of a bootlegged service encountered or severed during repairs, rehabilitation, or main extension.

20.04.07 Other Permits/Approvals

Developments that encroach upon designated wetlands require a wetlands permit issued by the Army Corps of Engineers. The City of Homer maintains maps of suspected wetlands which can be found with the Planning Department. A typical project may require multiple permits. Those permits may be issued or reviewed by, but not necessarily be limited to the following:

- Anadromous/Fish Habitat Waters -- Alaska Department of Fish and Game
- Environmental Issues -- Environmental Protection Agency, ADEC
- Flood Hazard Permits/Floodplain Ordinance City of Homer
- Gravel Extraction -- AK DNR
- Injection wells (a.k.a., dry wells) -- Environmental Protection Agency
- Planning and Zoning Commission -- City/Borough Planning Commission
- Plats/Platting Issues -- City/Borough Planning Commission
- ROW/Street permits/Road Closure permits Public Works (Local), ADOT/PF (State)
- Stormwater Protection Permits ADEC (State), Planning Department (Local)
- Water Wells/Multi-Family -- Alaska Department of Environmental Conservation
- Water Rights -- Alaska Department of Natural Resources
- Wetlands, US Army Corps of Engineers
- Work in Tidal Areas US Army Corps of Engineers

20.04.08 Planned interruption of water and sewer service

Water and sewer interruptions must be minimized. All planned interruptions require notifying affected property owners and residents a minimum of seventy-two (72) hours and a maximum of one-hundred forty-four (144) hours in advance of the interruption. Each interruption requires a separate notification. Multiple interruptions to one service are to be spaced a minimum of forty-eight (48) hours apart. Interruptions not started within the planned interruption period require a new notice and waiting period. The Homer Fire Department is to be notified for all water interruptions (affecting hydrant fire flows).

If the water service is interrupted in excess of six (6) hours or without notice, the Contractor is to pay the Utility Company fifty dollars (\$50) for each impacted residential or business unit for each hour beyond the initial six-hour period or the start of an interruption without notice. If the interruption surpasses twenty-four (24) hours without reestablishing water service, then the City at its discretion will take action to make repairs to reinstate water service, back charge the Contractor and other responsible parties to reinstate water service. The City may take further action by limiting the Contractor from working on City piping and City controlled services in the future.

Temporary systems will be required for all planned interruptions in excess of six (6) hours, that City of Homer considers to pose an imminent health hazard, or for any sewer service/main interruption. Alternative arrangements to the above for temporary utility service may be made with affected property owners and residents and must be documented. Documentation at a minimum will require a written statement of when utility service interruption will begin and end, form and/or amount of compensation for impacts, responsible party twenty-four (24) hour contact information, indemnification of

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MOA and City of Homer, and signatures of both the responsible party representative and of the affected party to the agreement. A copy of the documentation is to be provided to City of Homer prior to the interruption.

Property managers/owners of buildings that potentially have fire sprinkler/alarm systems are to be notified of pending outages in addition to residence/occupants of such spaces. The property manager is to be given three working days to take necessary precautions to mitigate any potential effects to the sprinkler/alarms system.

The City of Homer project inspector is to ensure Customer Notification for Scheduled or Emergency Water Service Outages procedures are followed.

20.05 Standard Engineered Plan Submittals

20.05.01 General

Plans submitted to City of Homer are to comply with the drafting standards found in this and later sections. City of Homer may reject plan submittals based solely on nonadherence to our drafting and appearance standards. Standardization of plans allows for better records and quicker review times.

Submitted plans are to be provided with pertinent information to allow for a thorough review of the proposed work. City of Homer may request plan sheets that do not directly relate to the proposed water and sewer work, such as, but not limited to, storm drain, street improvements, electrical and mechanical plans.

Record drawings of the engineered plans must be submitted and conform to the requirements of Section 50.00. Water for domestic use will not be turned on until after City of Homer has accepted the record drawings.

All engineered plans will be:

- Based on a survey completed by a professional land surveyor registered in the State of Alaska
- Drafted with a computer aided design and drafting (CADD) program capable of producing graphics found in this manual
- Designed by a professional engineer or someone under their direct supervision
- Sealed, signed, and dated by a professional engineer registered in the State of Alaska

20.05.02 Standard Sheets and Scales

Plans submitted on sheets that are 22" x 34" (Size D) in size will be accepted. Other sizes are unacceptable and subject to rejection. Ensure plans are legible when reduced to 11" x 17".

Scales in order of preference are 1"= 50' horizontal and 1"= 5' or 10' vertical. For small, congested areas a scale of 1"= 20' horizontal may be used. Use of an alternate scale from the aforementioned requires written approval of the City of Homer plan reviewer.

All drawings are to be accurate, legible, clear, and properly detailed (suitable for copying or scanning).

Plans must be computer generated, drawn in permanent black ink. Computer generated drawings for private lines and private development main line extensions must be consistent in appearance with the criteria found in Section 60. All other projects that

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require engineered plans are to comply with all portions of the City's drawing standards.

20.05.03 Title Block

All plan sheets, at a minimum, are to include a title block with the following items:

- Sheet title
- Sheet number
- Total number of sheets
- Horizontal and vertical scale
- Engineering firm's name, address, and telephone number
- Engineer's stamp, signature, and date of signature
- The date
- Appropriate scale with a scale bar and written scale
- City of Homer Project ID number
- ADOT/PF ROW permit number (if applicable)
- Project name
- Legal description of property
- Record Drawing stamp

20.05.04 Cover Sheet

All plans with more than two sheets of design, including survey, are to have a cover sheet (see Section 60.00 of this manual) that must show:

- Vicinity Map -- include a map showing location of the project using a scale appropriate for identifying the project.
- Project name. Capital project names are to be as assigned by City of Homer
- An index of sheets
- Engineering firm's name, address, and phone number
- The date
- City of Homer's Project ID number
- Owner's name, address, and telephone number are required for all plans except for City of Homer capital project plans.
- Record Drawing stamp

20.05.05 Information Sheet

A general informational sheet should be included with all sets of plans and is required for most projects. For large subdivisions, locate the general information on the second sheet of the set; for smaller projects, put the information on an additional sheet or wherever space permits. Include the following on all sets of plans: (See Section 60.00 of this manual.)

- General Legend -- symbols used to denote existing and proposed items on the plans.
- Abbreviations--list of all abbreviations in plans with definitions.
- General Construction Notes; Sanitary Sewer Construction Notes; Water Construction Notes and General Survey Notes.--maintain the published sequence of the applicable notes from Section 60.04, followed by project specific notes.

- Specify the type of service to be provided (i.e., residential-single family; zero lot line; townhouse; condominium; mobile home park; public utility district; commercial-office building or retail store; or industrial).
- Drainage Boundary Map -- show the drainage boundary on the key map of the area served for projects involving sanitary sewer improvements. The engineer shall submit copies of all pertinent computations of the design of the sanitary sewers and sewerage facilities. Include the expected population densities, acreage, zoning, and other pertinent information. The engineer should coordinate with City of Homer on modeling.
- Key Map(s) -- include individual water and sewer key maps showing all proposed and existing utilities within five hundred (500') feet of the proposed development. At a minimum, the key maps must include subdivision names, tract names, lot and block numbers, street names, water mains, water main valves, fire hydrants, sanitary sewer mains, manholes, sanitary sewer drainage boundaries, and pressure zone boundaries.
- When space is available, provide design general detail drawings such as trench section, compaction, etc., on the information sheet. Show any specific details on the sheet where it applies. If necessary, provide a separate sheet showing the details.
- Provide a trench cross section designed by a registered engineer for projects requiring work within an existing or proposed ROW. At a minimum specify side slopes, compaction, etc. within the cross section.

20.05.06 Survey Control Sheet

Provide a survey control drawing for each project that requires an engineered plan that shows the specific legal location of the project based on record plat information and legal descriptions such as aliquot parts, or in some cases, metes and bounds descriptions. The control sheet is to include the record monuments on which the survey location and proposed improvement are based. Provide on the survey control sheet the basis of bearing and how the basis of bearing was derived. Include a list of the record document information as reference for future work on the project.

- Drawing coordinates must be North American Datum (NAD) 83, Alaska State Plane (ASP) Zone 4 coordinate determined from National Geodetic Survey (NGS), (CORS96), Epoch: 2003 datum or the latest NGS adjustment utilized by the Continuously Operating Receiver Stations (CORS)
- 2. A recovered monument or set project control monument preferably near the project mid-point shall have a coordinate value expressed in U.S. Survey feet and be the basis of the project coordinate system.
- 3. Project vertical control must include the Benchmark name, description, and published elevation. Benchmarks, temporary benchmarks, and survey control datum shall be clearly indicated on the plans and include location, description, and elevation. The vertical control datum is to be based on the 1972 National Geodetic Survey Datum or latest official update.

Any and all disturbed or damaged markers must be replaced by a licensed land surveyor. Engineered plans for private systems do not require a separate plan sheet for survey control. However, the plans are to show sufficient survey control information to locate and construct the water and sewer improvements.

20.05.07 Plan and Profile Sheets

Plans must accurately depict both existing and proposed utility, street, and site improvements. Include, at a minimum, the following on all plan and profile sheets: (See Section 60.00 of this manual.)

Plan View

- Existing water, sanitary sewer and storm drains labeled with type and diameter of pipes
- Proposed water and sanitary sewer and storm drains labeled with type, class, diameter, length and bearing of pipe
- Where tabular data is used to provide data, the table should be on the same sheet as the object being referenced in the table (e.g.: a pipe table providing the required slope, length, bearing, diameter, and material properties, would be located on the same sheet as the pipe).
- Trench section detail showing at a minimum:
 - ♦ Surface restoration
 - ♦ Pavement structural section
 - ◊ Pipe bedding
 - ♦ Pipe foundation
 - ♦ Insulation (where needed)
 - ♦ trace wire and locator tape
 - ◊ compaction requirements
- Dimension
 - ◊ ROW lines (from center to edges)
 - ♦ Service connection end (property/easement line) to nearest property corner
 - Service line to the nearest building corner when the service line enters a building
 - ♦ Easement widths
 - ♦ Temporary construction easements
 - ♦ Property lines; section lines and corners
 - Horizontal dimensions from utilities to center lines, edge of easement, edge of ROW
 - ◊ Separation of proposed utility to adjacent utilities
- Land grant lines
- All lot lines of the parcel(s) with associated water and sewer work
- Wells, class, separation distances
- Septic systems
- Existing and proposed building footprints with finish floor elevation
- Subdivision names
- Street names
- Lot and block numbers
- North arrow
- Street lights
- Finish grades in easement are to be accurately depicted with the uses of proposed and existing contours or methods acceptable to City of Homer
- Cross sections at a minimum of fifty foot (50') intervals must be included where

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cross slopes exceed ten (10%) percent grade

- One or two foot (1'-2') contours labeled at an interval of five feet (5') where an elevation change of twenty feet (20') or greater is shown with contours, at an interval of two feet (2') where an elevation change of ten feet (10') and less is shown with contours
- Show the minimum separation distance (radii) for sanitary sewer pipe-to-well and sanitary sewer manhole/cleanout-to-well for each well within 200' of the project
- Match lines at breaks of streets or on multiple sheets

Show the following if located within thirty (30') feet of utilities:

- trees two (2") inches in diameter and larger
- fences
- retaining walls
- planters and other landscaping improvements
- buildings and/or structures
- light, utility, sign poles

Profile View

- Existing and proposed water, sanitary sewer and storm drains labeled with type, class, diameter, length, and grade of pipe
- Existing utilities, such as but not limited to, electrical, communication, and gas that could be or are in the trench excavation zone, assuming a trench excavation having no shoring, side slopes of 2H:1V, and a minimum 4' wide bottom.
- Existing and finish grade lines (and surface elevations at fifty (50') foot intervals for irregular surfaces and at any abrupt change or break in elevation)
- Vertical separation at all utility crossings
- Soil bore logs with the following information
 - Two letter USCS soil designation
 - Depth to groundwater
 - PID readings
 - o Delineation lines showing the approximate soil strata
- Basement elevations of existing structures for sanitary sewer projects (See Section 30. of this manual)
- Other utilities and underground obstructions
- Location and length of required thrust restraint (if applicable)

Plan and Profile Views

- Label all utilities with existing or proposed; type of utility; type, class and diameter of pipe. Include match lines with references to utility continuations onto other sheets
- The plan and profile must be shown on the same plan sheet for each section of proposed sanitary sewer or water pipe.
- Dimensions consist of a fine solid line terminated by arrowheads with a text identifier. The spacing of dimension lines should be uniform throughout the drawing.
- Leaders are a fine solid line leading from a note or dimension and terminated by an arrowhead touching the object. A leader line should be an inclined

straight line with a short horizontal line. A leader line to a circle should be radial, so that if extended it would pass through the center of the circle. If leader lines are near each other, the leader lines should be drawn parallel for a more appealing drawing. Leader lines should cross as few lines as possible and should never cross each other. Leader lines should not be drawn parallel to nearby object/hidden lines or pass through a corner of an object. Leader lines should not be drawn at small angles to the object if possible.

- Text and numbers must not be bisected by any line
- Sewer elevations reflect invert elevation (INV) and water elevations reflect bottom of pipe elevation (BOP)
- Plan view pipe lengths break at all horizontal deflections, horizontal bends, tees, and crosses
- Profile pipe length that is broken at all grade breaks, vertical bends, tees, and crosses. Hydrant legs may be omitted for this requirement
- Service connection chart—include a table with columns for the following design and record drawing information on each water and sewer sheet: Lot and block numbers; pipe station of the connection at the main; invert/bottom of pipe (BOP) elevation of the service connection at the main; invert/BOP elevation of the service connection at property line; lineal footage of the service connection; finish grade, slopes and service offset measured from the nearest property corner
- The service connection chart must be filled out with design information and change if with redline information if additional columns are not provided on the drawing. The revision is to be noted at the chart and in the title block.
- Anode location table—include labeled columns to record constructed location of each anode by pipe station and right or left side of main
- Soil test pits, borings, and soil log information
- On the plan and profile sheets, show the inverts, manhole numbering, stationing, and top elevation
- The plan view and profile view are to reside on the same sheet and be aligned such that plan view is on top and profile view is on bottom.

20.05.08 Stationing and Orientation

The stationing on plans and profiles should read from beginning to end of proposed improvements where practical.

Stationing is to be pipe centerline, increase in numbers from left to right, and have a station number ending in "00.00" at any of the following locations:

- 1. Foundation Wall
- 2. Property Line
- 3. Connection point

All plan views are to have a north arrow and be arranged such that the north arrow is pointed towards the top of the page or to the right of the page. The north arrow may be skewed 15° from vertical or horizontal to improve the orientation of pipe alignment on the sheet.

20.05.09 Drawing Standards

Section 60.00 of this manual contains an accompaniment and examples of the City of Homer AutoCAD standard drawings. The standards and example drawings were created in AutoCAD 2015 and may not be usable in previous versions of AutoCAD or other CADD software. All 'or equal' products must have the ability to create and save files in a .DWG format. These standards were developed to establish base criteria for drawings to be used on projects that contribute to or upgrade City of Homer assets. City of Homer capital improvement project AutoCAD drawing submittals must have all water and sewer facilities ready for GIS asset import as stated below in this section.

All AutoCAD drawings produced for City of Homer are to follow standard layer naming convention found in Section 60.00. The naming convention is a hierarchical system reflecting the most distinctive features of the drawing first, with a single character for each subsequent further definition.

<u>Level 1</u> – The first letter of the layer name indicates which general type of information is contained on that layer. (i.e., plan view (P), profile view (R), and notes (N))

<u>Level 2</u> – The second character of the layer names indicate the accuracy or condition of the entities represented. (i.e., proposed (P), existing (E), etc.)

<u>Level 3</u> – The third character of the layer names identifies the type of AutoCAD entity that is shown. (i.e., text (T), lines (L), symbols (S), hatch (H) and points (P))

<u>Level 4</u> – The fourth character identifies a general grouping for the entity. (i.e., property (P), utility (U), topo (T), etc.)

<u>Level 5</u> – The last characters of the layer name are used to give specific information about the entity

<u>Customizing Layer Names</u> – Occasions may arise when an entity cannot be properly described using the City of Homer standard layer naming convention beyond the fourth level or when additional descriptive information in the layer name may be useful. In these cases, the designer may add other information to the end of the standard name. The customized information is to be preceded by the characters "-".

GIS Asset Import Requirements

<u>All water and sewer facilities shown in CAD drawings must adhere to the following guidelines:</u>

- All entities representing proposed facilities must be drawn on the layers pplus, ppsus, pptus, ppluw, ppsuw, and pptuw.
- All entities representing existing facilities must be drawn on the layers pelus, pesus, petus, peluw, pesuw, and petuw.
- Entities on these layers may be lines, polylines, text, or the supplied symbols found in the template drawings.
- All point symbols must be drawn using the symbols from the template drawings (Reference Section 60).
- All lines must be drawn using the custom 'linetypes' from the template drawings. $\begin{bmatrix} 63 \\ 63 \end{bmatrix}$

- All lines must be snapped at endpoints leaving no gaps or overshoots.
- Lines must not be broken for text annotations or symbols.

20.06 Standard Sanitary Sewer and Water Locations

All public sanitary sewer and water utilities shall be designed and constructed in the Municipal or State ROWs. ADOT&PF may require mains in state ROW to be outside the road prism where space permits, or with the manholes and valve boxes outside of the wheel paths. City of Homer will not approve sanitary sewer and water mains located in easements unless there is no feasible way to locate them in the street or traveled way (construction cost difference between ROW and easement is not a consideration). Sanitary sewer and water lines are to be located in ROW's per CHSCS details. Obtain exceptions to the standard horizontal location from the City of Homer City Engineer, or designated representative, prior to approval of the drawings. Branched extensions or private utility lines should be installed in private traveled ways whenever possible and must be accessible for maintenance access.

20.06.01 Location in Dedicated and Implied ROW

CHSCS requires designing the sanitary sewer mains ten feet (10') south or west of center line and water mains twelve (12') feet north or east of center line. There must be a minimum of ten (10') feet horizontal and eighteen (18") inches of vertical separation (measured outside of the pipes) between water and storm or sanitary sewer mains and services. Wherever it is necessary for water and storm or sanitary sewer mains and services to cross each other, the crossings are to be at an angle of approximately ninety (90°) degrees.

A parcel will be considered served and eligible for service when the sanitary sewer and/or water mains extend along the full frontage of said parcel. Exceptions to this rule may be granted when an engineered analysis justifies less than full lot frontage (e.g., end of the distributions system, geographical constraints, etc.) and after issuance of a waiver by City of Homer.

When required by City of Homer, all waiver requests to the standard locations must be in writing, supported by engineered analysis, and approved by the City of Homer Engineering Division Director.

In a new subdivision with planned future extensions, the sanitary sewer and/or water mains are to be extended a minimum of fifteen (15') feet beyond the pavement limits. Sewer lines are to terminate with a permanently installed manhole.

Water and sewer mains located in cul-de-sacs are to be extended to within four (4') feet horizontally off the front of the curb.

20.06.02 Water and Sanitary Service Location

All service connections extend from the utility main to the property or water/sewer easement line whichever is furthest from the main. All services must be installed no closer than five

(5) feet to a side lot line and must be a minimum of fifteen (15) feet from a fire hydrant, utility/power pole, signal pole or transformer pad; ten (10) feet from a water main; twenty- five (25) feet from a private well; and a minimum of ten (10) feet from any structural foundation or other appurtena such as, but not limited to, light poles or

electrical/telephone/cable boxes.

20.06.03 Sanitary Sewer and/or Water Easements

When City of Homer allows sanitary sewer and water mains in permanent easements, City of Homer requires a minimum width of thirty feet (30') for a single sanitary sewer or water main. If both sanitary sewer and water mains are located within a common easement, the easement must be a minimum of forty feet (40') wide. Easement widths must be increased and approved by the City of Homer City Engineer when the main is greater than twelve inches (12") in diameter.

City of Homer may require permanent easements larger than mentioned above if necessary for proper operation and maintenance of the sanitary sewer and water systems. Extend easements fifteen (15') feet beyond last appurtenance.

For mains larger than twelve inches in diameter, the designer must consider that City of Homer requires a minimum ten (10') foot separation (measured horizontally to the outside of the pipes) between the main lines and a minimum of fifteen (15') feet from the outside of the main to each easement line.

Valves and/or manholes are to be located outside of the easement area, in an established ROW, whenever possible. City of Homer will not permit sanitary sewer and water service extensions within easements if the service can be extended from a main line in a ROW.

When water or sewer mains and associated appurtenances are located in an easement, those appurtenances must have an accessible driving route for maintenance. The driving route must be capable of supporting AASHTO HS20 truck loads and allow maneuvering of a WB-40 design vehicle. Where an accessible route is not contained within the water and/or sewer easement, then the developer is to provide a dedicated access easement to City of Homer to cover the additional area needed for access.

City of Homer requires sanitary sewer, water and/or access easements shown on a final plat or recorded document prior to plan approval. If the easement is acquired by a document, the recorded document number will be required to be shown and labeled on the construction plans.

20.07 Subsurface Investigations and Reports

20.07.01 Soils Data

A subsurface soils investigation is to be performed and submitted to City of Homer on projects with water and sewer components. Test holes spacing and depth must be determined based on existing site conditions and project needs. In addition to the project needs, when the site is known or suspected to be on or near a former contaminated site City of Homer may require additional test holes, soil testing, and groundwater analysis. Test holes and subsurface soil data must be shown on the plans. Subsurface information will include, but not be limited to; classification of soils, moisture content, grain size gradation, depth of frost (if present), depth of water table (if present), depths of different soil classifications, soil corrosivity characteristics (when required), field screening results from a photo ionization detector (PID) and other pertinent information.

Projects that will install mainlines require a maximum spacing of test holes of 200', with a minimum of two test holes. Private systems have a maximum spacing of 300' with a minimum of one test hole. Test holes are to be within twenty feet (20') of the water and/or sewer line alignment. Trenchless rehabilitation with liners should have one test hole.

Trenchless designs using horizontal directional drilling, auger boring or other drilling methods are to have one test hole every 100' with a minimum of two test holes.

Test holes are to reach at least fifteen feet (15') below planned finish grade and five feet below the water or sewer pipe being installed. Soil samples should be retrieved at maximum 2.5-foot intervals to 10-feet below the ground surface. Subsequent samples should be taken at 5-foot intervals or less to characterize soil stratigraphy.

Where roadway construction will take place as part of a project, the number of test holes is also to meet the minimum required in the current edition of the City of Homer's Design Criteria Manual (Chapter 1).

Projects proposing to install non-metallic water lines are required to screen for petroleum contamination utilizing a PID. PID readings greater than ten (10) ppm or projects within five hundred (500') feet of a documented contaminated site will require additional laboratory testing. Laboratory testing of soils and ground water is to include, but not be limited to, Alaska Method 101 (GRO), 102 (DRO), 103 (RRO), and EPA methods 8260 (VOC) & 8270 (SVOCs) and other tests necessary to calculate the activity of the organic contaminate. Activity is defined as:

$$a = \frac{C_w}{C_{w,m}}$$
$$a = \frac{C_v}{C_{v,m}}$$

in which *a* is the activity ($0 \le a \le 1$), C_w is the concentration in water (mg/L), $C_{w,m}$ is the solubility (saturated) in water (mg/L), C_v is the concentration in the vapor phase (mg/L), and $C_{v,m}$ is the solubility (saturated in the vapor phase (mg/L)¹.

In areas within or adjacent to known or possible contamination, provide analytical data sufficient to determine the absence or presence of contamination. If contamination is found, provide the information on the type and concentration of the contaminate(s).

Water and sewer projects that do not require engineered plans will not need to perform an initial subsurface soils exploration. The City of Homer Engineering Division may require a subsurface soils investigation as needed to ensure the integrity of the water and sewer system.

20.07.02 Minimum Frequency of Routine Quality Control Soil Tests

Following are the minimum construction test frequencies for projects constructing City of Homer assets. Private systems should provide quality control testing. Additional testing may be necessary depending on circumstances and failure rate and must be addressed in the Engineer's quality control plan specific for the development and as required in CHSCS.

Mechanical Analysis on Imported Material:

Collect one sample for approval, prior to use of the following, plus regular checks as shown:

Classified backfill	one per 2000 tons
Foundation material	one per 500 L.F.
Bedding, all types	one per 500 L.F.
Leveling course	one per 1000 tons
Seal coat aggregate	one per 1000 tons

Frequency of density testing of trench backfill:

- Dedicated ROW and City of Homer accessible routes: One (1) per three hundred (300') LF of trench at spring line, mid-trench, and surface for a total of three (3) tests.
- Easements: One (1) per three hundred (300') LF of trench at spring line, midtrench and surface for a total of three (3) tests.

Street and Road Construction - All work within public streets and roads are to conform to City of Homer and/or ADOT/PF requirements. City of Homer does not provide quality control testing of soils for the developer.

Any existing utility or facility disturbed is to be backfilled and tested in accordance with new construction, as directed by the Engineer, or by a representative of the impacted utility.

¹ Feng Mao, James A. Gaunt and Say Kee Ong, May 2009, Permeation of organic contaminates through PVC Pipes, Journal AWWA 101.5

20.08 Burial Requirements

Consideration must be given in the specifications and plans for the type of pipe; methods of bedding and backfill so as not to damage the pipe or its joints. The engineer shall review the soils data and design the bedding and trench backfill accordingly. Specify bedding material that is compatible with the type of pipe being installed (DI, HDPE, PVC etc.).

Sanitary sewer and water mains must be designed to prevent damage from superimposed loads. Where necessary to withstand extraordinary superimposed loading, special bedding, concrete cradling, or special construction shall be used. Installation specifications must contain appropriate requirements based on the criteria, standards and requirements established by industry in technical publications and according to CHSCS.

Allowance for future loads on the mains must be made considering the width and depth of trench and planned projects. Future loads must be estimated based on final grades obtain from the City or ADOT/PF prior to establishing the depth of bury. The engineer is encouraged to review the City's Transportation Plan and the State of Alaska STIP planning documents for future road projects in the vicinity of the planned development. Final and future street grades are to be shown and labeled on the drawings

Under no circumstances will water or sewer mains or services be constructed over frozen material, organic matter or other unstable or unsuitable materials. The following are typical bedding and trench backfill standards.

20.08.01 Bedding

Bedding is to consist of Class E bedding as outlined in CHSCS. The bedding is to be uniformly placed the full extent of the ditch and completely cover the pipe a minimum of 6- inches above and below the pipe and one foot (1') to each side of the pipe. Bedding must be laid the full width of the ditch and compacted to ninety-five percent (95%) of the maximum density.

Exceptions to the requirement to use Class 'E' Bedding material will be considered by City of Homer based on the pipe manufacturer's recommendation, engineering judgement, loading of the pipe, and the requirements of ASTM D2321 and D2774. City of Homer will not approve or allow the use of "pea gravel" as pipe bedding. For the purpose of this manual, "pea gravel" is considered a poorly or gap graded gravel product that that has anything other than angular faces.

The engineer for projects with engineered plans must submit pipe manufacture bedding recommendations that correlate to, soil gradation of and proctor test results of the proposed alternate bedding material to City of Homer for consideration. Approval of alternate bedding must come from the City Engineer.

Where dewatering is anticipated to use pipe bedding as a type of french drain and the use of an alternate bedding material to the required Class 'E' bedding is requested to facilitate the flow of water, the alternate bedding material is to consist of crushed aggregate. Crushed aggregate is to consist of fractured rock particles with at least one fractured face, sharp edges, and rough surfaces. The gradation of the crushed aggregate is to have 100% pass the 3/4" sieve, no less than 50% pass the No. 4 sieve and no more than 12% pass the No. 200 sieve measured by weight. When crushed aggregate is used as

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bedding, it is to be separated from surrounding soils with the use of CHSCS Type A nonwoven geotextile with a permeability greater than that of the native material. The geotextile material may be omitted if the gradation of the pipe bedding and surrounding soils meet the requirements to prevent migration as outlined is ASTM D2321 X1.8. Trench plugs may be required to prevent draining of other areas.

Projects that do not require an engineered plan may use alternate bedding material approved by the City Engineer on a case-by-case basis.

20.08.02 Trench Backfill

Trench backfill must be placed in accordance with CHSCS.

- Trench backfill is to be material obtained from trench excavation if the material is suitable and conforms to the specifications for backfill as defined in CHSCS. Debris, broken bituminous pavement, Portland Cement Concrete, frozen material, large clods or stones, organic matter, and other unstable or unsuitable materials must not be used for backfill. All backfill shall be compacted to ninety-five (95%) percent of maximum density as defined in CHSCS.
- Trench backfill must be placed in a manner to avoid disturbance to pipe bedding and alignment.
- Compaction of backfill must not disturb, move, or affect the pipe. It is recommended that bedding above a sound base be compacted with the use of "jumping-jack" compactors until a minimum of 12" of cover over the pipe is in place and compacted. Between 12"to 36" small vibratory, "turtle" is recommended, and above 36" of cover standard large vibratory compactors, hydro hammers, and hoe-pacs can be used.

Exceptions will be reviewed and approved when presented to the City of Homer City Engineer or their designated representatives in writing on a case-by-case basis. Final decisions will be provided in writing to the requesting party.

20.08.03 Foundation Material

Under no circumstances will water or sewer mains or services be constructed over frozen material, organic matter or other unstable or unsuitable materials. This material may include peat, roots, large rocks, soft or yielding soil, cesspools, privy pits, or any other material, which in the opinion of City of Homer is objectionable.

If the trench material at the bottom of bedding does not furnish a suitable foundation, the contractor shall remove the unsuitable material to whatever depth the City Engineer determines and replace with foundation material as specified in CHSCS. Foundation material must be placed the full width of trench, in lifts not to exceed twelve (12") inches in thickness and compacted to a minimum of ninety-five percent (95%) of maximum density.

20.08.04 Trench Plugs

Trench plugs are required to prevent the draining of wetlands, lakes, streams, the movement of contaminates, and from creating French drains in low permeable in-situ soils. Trench plugs, when required, are to be placed a maximum of three hundred feet

(300') apart. Clay or weak (100psi - 1,500 psi) cementitious material should be used to construct trench plugs. The designer must consider the effects of trench plugs, such as, but not limited to, the buildup of hydrostatic pressure that may cause ground surface failures, flooding of floors, slope failure, pipe failure and infiltration.

20.09 Rigid Board Insulation

Rigid board insulation required for frost protection of water and sanitary sewer mains and services must be high density extruded or expanded polystyrene, minimum sixty (60) PSI compressive strength, equivalent to R-20 per four (4") inch thick insulation meeting ASTM C578 Type VII.

When groundwater is encountered or is suspected to exist during design data acquisition the designer must take into consideration the impacts that groundwater may have on the insulation R-factor properties over time.

20.10 Corrosion Control

All material proposed for incorporation into the construction of water and wastewater systems must be designed to protect against potential corrosion. The soils in Homer have not proven to be especially corrosive to underground water distribution/sewer collection piping and appurtenances. Aboveground facilities require design to minimize corrosion.

This section discusses the corrosion control design criteria required to be used on new or retrofitted City of Homer pipelines, including fittings and services. The corrosion control portion of the design includes pipe materials selection and coating selection.

20.10.01 Standards

- 1. American Water Works Association (AWWA)
- 2. National Association of Corrosion Engineers (NACE International)
- 3. Steel Structures Painting Council (SSPC)
- 4. Ductile Iron Pipe Research Association (DIPRA)

20.10.02 Materials Selection

Material selection for corrosion control requires that the overall system be evaluated for the intended service and environment that the piping is being installed.

If non-metallic materials are installed, such as HDPE and PVC piping, cathodic protection (CP) and protective coatings are not required on the pipe. Ferric fittings with the installation of the non-metallic pipes must be epoxy coated. The installation of a polyethylene (PE) encasement(barrier) with Vbio[™] is not required on epoxy coated ferric fittings when installed as part of non-ferric pipe system.

If metallic piping is installed, the pipelines must have an adequate corrosion control system. Adequate corrosion control systems must include installation of a protective coating on aboveground lines or underground lines that are periodically or consistently submerged in ground water. In cases of aboveground lines or lines being installed in periodically or consistently submerged in ground water, the pipe must have a tightly bonded coating.

20.10.03 Corrosivity Evaluation

No special corrosion evaluation is normally required for City of Homer underground pipelines.

20.10.04 Cathodic Protection

The cathodic protection (CP) is normally not required on City of Homer underground pipelines.

20.10.05 Protective Coatings

Where a protective coating is required as described in Section 20.10.03, a tightly bonded coatings must be used.

Acceptable forms of tightly bonded coatings for buried applications include plural component polyurethane per AWWA C222, fusion bonded epoxy per AWWA C116 and C213, cement mortar coating per AWWA C205 and tape coating per AWWA C209 and C214. Polyethylene encasement is a barrier, it is not accepted as a tightly bonded coating.

Wax tape per AWWA C217 and heat shrink sleeves per AWWA C216 are acceptable forms of tightly bonded joint coating protection typically used at joints. Zinc coated pipe is considered a tightly bonded coating for underground piping systems.

Metallic components exposed to the atmosphere must be coated with a tightly bonded coating system.

In cases where the pipe coating is to be submerged in an environment with hydrocarbon contaminated soils, the coating manufacturer must provide a chemical resistance chart and a letter certifying that the coating will perform successfully in the environment.

Additional quality assurance requirements are outlined in Section 20.11 Industrial Coating Standards.

20.10.06 Standardized Corrosion Protection

In recognition of City of Homer's commitment to ensure the longevity of our underground pipe assets while creating efficiencies in the design and construction of those assets, the design of all City of Homer pipelines shall include the following items:

- 1. Require protective tightly bonded coatings on all metallic pipe unless the engineer can demonstrate that groundwater is not present at the proposed burial depth of the pipeline during the life of the pipe.
- 2. Stainless steel bolts are specified for all bolts used to construct valves
- 3. Stainless steel bolts or blue bolts are specified for water fittings
- 4. Stainless steel operating rods for copper water services

20.11 Industrial Coatings Standards

The design of structures that include reservoirs, buried and above ground piping and appurtenances, pressure reducing equipment, booster pumps, wells, metering equipment, sewage lift pumps, and electrical equipment and controls, must include specifications for industrial coatings. These specifications must include quality assurance requirements, surface preparation requirements, primers, surface coatings, number of coats, and dry film thickness of applied product and will address both interior linings as well as exterior coatings. Typical facilities to which this applies to include all buried metallic piping, pressure reducing stations, booster stations, well houses, meter facilities, submerged and atmospherically exposed concrete, lift station, and pump stations.

Surfaces to be coated include:

- All piping and appurtenances within facilities
- All galvanized metal surfaces
- All other ferrous metal surfaces
- All other surfaces are to be coated per this section, except potable water storage reservoirs and submerged concrete structures other than manholes, for which the designer must confer directly with City of Homer Engineering Division.

20.11.01 Quality Assurance

Specify that the Contractor must provide a NACE Level 3 Certified Coatings Inspector to examine any and all phases of the work to be performed during the surface preparation and coating application as outlined for the project. The contractor must be responsible for furnishing access to prepared and painted surfaces sufficiently to allow the inspector to verify the product meets the requirements of the specifications.

The inspector shall supply to the Engineer report(s) that include these minimum elements on a daily basis when surface preparation and coating work is taking place: Environmental conditions, wet and dry bulb temperatures, steel temperatures, surface profiles, dew points, humidity, tests, dates, and times of work performed, wet and dry coating thickness (mils), pre- cleaning preparation, holiday testing procedures and results coating problems, and a final PA2. The contractor must be required to remedy all deficiencies identified by the inspector and all rework must be subject to re-inspection and testing.

20.11.02 Coatings and Application Schedule

The designer must specify coating "systems" that include minimum requirements for surface preparation (cleaning, profile), primers, and intermediate and topcoat film thickness. While there are many coatings system available in the marketplace, the following outlines basic guidance on coating selections for various environments.

- For submerged metal in municipal sewage specify SP-5 cleaning criteria and polyamide or coal tar epoxies
- For submerged metal in potable water applications specify SP-5 cleaning criteria and NSF-61 approved epoxy.
- For exposed metal in highly corrosive environments or in exterior applications specify SP-10 cleaning criteria, epoxy undercoats and aliphatic polyurethane topcoats for UV resistance, durability, and color and gloss retention.
- For exposed metals in non-corrosive environments specify SP-10 cleaning criteria, all- purpose primers, and alkyd enamel topcoats.
- For inside valve bodies and other in-line appurtenances specify NSF-61 approved fusion-bonded epoxies or elastomeric linings suitable for the intended service. See other standards in this manual regarding the selection of materials for these in-line appurtenances.
- For galvanized and non-ferrous (copper, alloys) metal surfaces meet cleaning criteria recommended by the coating manufacturer including any recommended wash primers and use epoxies, (pol<u>y)uret</u>hanes, or alkyd enamels as dictated by

the service conditions.

- Concrete coatings must be application specific and be approved by City of Homer City Engineer.
- For wood and gypsum wallboard meet cleaning criteria recommended by coating manufacturer, use primer appropriate to the substrate, and apply semi-gloss acrylic latex or alkyd enamel topcoats.

The designer may propose alternative coatings systems on an application specific basis. City of Homer Engineering Division will review these alternatives to ensure they meet or exceed the performance of the systems and applications described above. The designer may propose only those alternatives that have a proven track record under similar service conditions.

20.11.03 Surface Preparation

In general, specify the surface preparation requirements recommended by the coating manufacturer that conform to the standards of the Steel Structures Painting Council (SSPC). However, the minimum SSPC cleaning criteria is to be as noted above. Surface preparation specifications must address treatment of surface defects (pits, weld spatter, etc.) removal of oils and similar foreign substances, the abrasion-blast criteria, and the desired surface profile.

Some surfaces require the use of nonabrasive cleaning techniques during the cleaning process. This may include solvent cleaning, high-pressure water with surfactants, and acid etching. Specify those combinations of methods appropriate to the substrate, the coating, and the ultimate service conditions.

20.11.04 Coating Application

The coatings manufacturer publishes product information specific to the various products it markets. It is essential that the designer be aware of the environmental conditions, application rates, time between coats, time to cure, pot life, shelf life, thinners, and other elements affecting the application process. Also, conditions during the cure period vary for solvent and water-borne coatings – this must be addressed in the specifications. Refer to any special ventilation or personal protective equipment (PPE) required by federal, state, or local regulations.

The designer must also address those surfaces not intended to receive coatings, such as factory finished motors, rotating-equipment, data nameplates, electrical enclosures, stainless alloys, etc. Protection of this equipment during coating application is essential to project quality standards and the specifications must be developed describing how the Contractor is to tape, cover, or otherwise protect these surfaces from being coated.

Address the qualifications of the applicator in performing work under conditions similar to those anticipated during construction. Address touch-up of holidays and postapplication defects, as well as proper handling, storage, cleanup, and disposal of coatings and the related materials.

Project specifications must also indicate that spare coating materials must be provided for touchup and re-coating by the facility Owner. Finish coat colors must be coordinated with the facility Owner to provide a uniform appearance with other City of Homer facilities.
20.12 Mainline Connections to Existing Facilities

The contractor shall provide an OSHA compliant trench for City of Homer crews to perform a main line tap and inspections. The trench must be compliant with City of Homer safety requirements. All cost associated with complying with OSHA and/or City of Homer safety requirements is to be borne by the contractor performing the work.

20.12.01 Sewer

Connections to existing manholes must be made by core drilling the new penetration into the manhole and providing a NPC Kor-N-Seal pipe to manhole connector to produce a water tight seal. The use of impact tools to form new penetrations is prohibited.

Connections to existing sewer trunks must be made by core drilling the new penetration into the pipe and installing a tapping saddle centered over the hole. The use of impact tools to form new penetrations is prohibited.

Connections to existing cleanouts must be made by removing the cleanout and installing a manhole.

20.12.02 Water

Connections to existing water mains must utilize existing stubs, tees, crosses, and valves. New valves may not be installed within close proximity of existing valves unless an active service or branch exists downstream of the existing valve or is required for a service line. Existing valves found to be unacceptable for use must be removed and replaced with a new valve supplied by City of Homer. City of Homer will not be responsible for direct or ancillary costs associated with the replacement of the unacceptable valve. A live tap will be required where an existing point of connection does not exist on the main.

20.13 Private Systems

Private Systems are water or sanitary sewer connections and extensions (also known as a private line or branched extension) that are privately owned and maintained.

A private line is a water and/or sewer service connection and extension that connects to the City of Homer distribution/collection system and is intended to serve a single or multi-family dwelling, single industrial establishments, single institution, or single commercial establishment

Except where excluded, all private systems must be designed by an engineer registered in the State of Alaska.

Private Systems are to be constructed and tested in accordance with testing procedures identified in CHSCS as if the private system lines were main lines.

Private systems are to be connected to mains in a City right-of-way or easement that fronts the parcel being served. If it is not possible to serve a parcel from the MOA ROW or easement, then the owner will be required to substantiate the claim prior to being allowed to obtain service from a main in an ADOT&PF ROW

City of Homer will not issue a connection permit until a City right-of-way permit is obtained and presented with the application for the water and/or sewer permit.

ADOT/PF requires City of Homer to issue a connection permit prior to issuing a ROW permit.

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20.13.01 Private Systems Engineered Plans

Engineered Plans are required by City of Homer for all modifications, extensions, repairs and alterations to water and sewer systems outside of the building. City of Homer may waive engineered plans for repairs if the repair is limited to ten (10') linear feet or less and for single family and duplex structures.

At a minimum, engineered plans must show all information required in Sections 20.05.04, 20.05.06, utilizing applicable standard symbols and construction notes provided in Section 60 and the following:

- 1. The intended use of the building(s) being served and the building(s) foundation footprint with building dimension are to be shown on the plans.
- 2. Provide horizontal dimensions to existing City of Homer facilities (i.e., fire hydrants, valves, manholes).
- 3. Owner's name, address, telephone number and signature are required to be shown on the plan set using the City of Homer signature block.

All submittals of plans are to include three (3) sets of drawings that are sealed and signed by a Professional Engineer registered in the State of Alaska. Private system plans are to be submitted to the City of Homer Customer Service Division, Permit Section for review.

For all private development pipeline projects, the applicant must complete and submit for approval to City of Homer.

20.13.02 Separate Connections

Every parcel is to have a separate service connection. Generally, a lot is limited to a single service connection. Multiple service connection to one lot, will only be allowed with just cause and with the approval of the City of Homer Public Works Director. The size of the connection is dependent upon the development plan with a minimum diameter for water being one inch (1") and four inches (4") for sanitary sewers. Where a branch extension can be used, a second connection will not be allowed.

City of Homer prohibits services crossing property lines. Lease lines are treated as if they are property lines.

If the lot is subdivided the owner must relocate the service connections or extend main lines to comply with City of Homer standards.

On each applicable engineered plan sheet showing more than one service, provide a Service Connection Chart in accordance with the City's Standard Drawing Submittal requirements. The Engineer and Construction contractor are to update the Service Connection Chart at the completion of the project and included in the record drawing information.

It is prohibited to inter-tie two or more buildings into a single and/or common service connection except for branched extensions approved by the City.

20.13.03 Branched Extensions

Branched extensions are all services that are private lines that generally have branched collection and distribution lines that connect to the municipal systems. City of Homer

Engineering Division will determine if the system is a branched extension. All applications for water and sewer service connections and extensions that are classified as branched extensions must provide engineered plans in accordance with private systems.

The minimum size of a branched sanitary sewer extension is six (6) inches and is to be large enough to carry maximum flows. Branches off the extension are to be installed from on-site manholes or mechanical wyes; as service saddles will not be permitted.

The minimum diameter of branched water extensions is six (6") inches, with a minimum of eight (8") inches if fire hydrants are required.

All branched extensions are to be designed, constructed, and inspected and pass the same testing procedures as main line extensions. Water extensions must be pressure tested to the curb stop or valve in accordance with CHSCS. Any proposed changes to the approved plans during construction must receive City of Homer approval prior to installation of the change

The Engineer shall furnish City of Homer copies of recorded easements and/or any City of Homer, ADOT/PF, or ADEC required submittals, prior to final approval.

20.13.04 Repairs or Replacement

Existing materials must be brought up to current standards, except that existing cast iron pipe and fittings may be replaced with like material where the repair is less than ten (10) linear feet.

Replacement of portions longer than ten feet (10') may require engineered plans for approval of the repair.

20.13.05 Type of Structure Served

20.13.05.01 Single Family Residence

Each building structure on a single-family lot must have individual service connection.

20.13.05.02 Townhouses

Townhouses that have property lines passing through the structure must have an individual sanitary sewer and water service connections for each unit.

20.13.05.03 Zero Lot Lines

Zero lot line dwellings are treated in the same manner as townhouses. Structures classified or lots designed as zero lot line are to have individual services to each lot. The services cannot cross adjoining lot lines to receive service.

20.13.05.04 Condominiums

Condominiums are permitted one service extension or branch per building regardless of the number of units. The Homeowner's Association or condominium by-laws are to establish their responsibility for maintaining the on-property service/branch service. When constructing a condominium development, the following stipulations must be met:

1. The developer shall submit engineered drawings, sealed, signed, and dated by a professional engineer registered in the State of Alaska, to the City of

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Homer for review and approval.

- 2. The service is to tie into a City of Homer main with a single service connection and be branched on-property. The Homeowner's Association is to maintain the entire branched service extension.
- 3. Services to each building are to be extended from the branched service extension on- property. The number of fixture units in each building will determine the size of the service. Each building must have a separate service and be required to have an on- property permit. Services running under buildings tying two (2) or more buildings together is not allowed. All services will be inspected by City of Homer.
- 4. It must state in the Homeowner's Association Bylaws that the homeowners will be responsible for maintaining the on-property (private) system and funds are to be allocated for repairs. A copy of the bylaws must be submitted to City of Homer when the Association applies for billing.
- 5. All on-property mains will be clear of any permanent ground level obstructions for maintenance access. It is desired these mains be in traveled rights-of-way.
- 6. During and upon completion of the project, the lines are required to be inspected by City of Homer.
- 7. After the project is complete, record drawings must be submitted in accordance with Section 50.00.

20.13.05.05 Mobile Home Parks

Mobile home parks, as defined by and in accordance with the City/Borough Zoning Ordinances, are to have privately maintained water distribution and sewer collection systems where only one sanitary sewer and water connection are made into City of Homer systems. This will be approved only if the connection is made into a manhole and the size of the connection is at least eight (8) inches in diameter. The water connection is to be metered with a backflow prevention device and sized to meet both domestic and fire flow requirements. Mobile Home Park plans must be reviewed and approved in accordance with this manual.

20.13.05.06 Commercial Building

A commercial building is building that is used for commercial use. Types can include office buildings, warehouse, tri-plex and larger living dwellings, or retail. A commercial service will be allowed only one service connection per lot and then branch the service extension to accommodate more than one building. More than one service connection is possible with approval by the City of Homer Public Works Director with proof of just cause.

20.13.06 Non-Conforming Services

City of Homer prohibits any person to construct, repair or modify a service considered non-conforming (a.k.a., bootlegged). Any service that is not in compliance with City codes or practices is considered non-conforming.

City of Homer cannot be held liable for non-conforming services and will not be obligated to perform any maintenance, repairs or rerouting because of nonconforming services freezing, breaking, or otherwise failing. City of Homer will not allow the reconnection of a bootlegged service encountered or severed during repairs, rehabilitation, or construction of new mains.

20.14 Sanitary Sewer and Water Inspections

20.14.01 General

Arrangement for City of Homer inspections are the responsibility of the applicant and/or permitee. City of Homer may inspect all work to City of Homer facilities whether or not prior arrangements have been made. City of Homer will inspect water/sewer utility work within the City rights-of-way (or easements) and on property without exception. Service taps are not to be made by any permittee without the City of Homer inspector being present.

The City of Homer inspector must be allowed access to all parts of the work, at all times, and be furnished with every reasonable facility for ascertaining whether or not the work is performed in accordance with the requirements and intent of CHSCS, this document, the approved plans and specifications. Inspections that require entry into confined spaces or excavations must meet City of Homer safety requirements at no additional cost to City of Homer.

The contractor's responsibility for work performed shall be in accordance with the contract, permit stipulations, and CHSCS. The presence or absence of an inspector will not relieve the contractor of deficiencies in work performed.

Unless specified separately and approved by the City Engineer, the contractor shall replace any existing materials damaged within the road prism (i.e., utilities, insulation, fabric material, etc.) with an equal or better material. The contractor shall restore any existing surface features disturbed during construction.

The contractor shall abide by any special conditions required by the permitting agencies (i.e., ADOT/PF, ADF&G, ACOE, etc.)

Inspectors are authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the work and to the preparations, fabrication, or manufacture of the materials to be used. The inspector will not be authorized to alter or waive the provisions of the contract, permit stipulations, this document or CHSCS. The inspector will not be authorized to issue instructions contrary to the plans and specifications, or to act as foreman for the contractor.

When connecting to a sanitary sewer line, the contractor shall take precautions to allow no sewage to enter the new sanitary sewer line until it has been inspected, tested, and accepted for operation and maintenance by City of Homer.

Water and sewer main and service trenches must be substantially backfilled and compacted prior to witness of testing by City of Homer.

20.14.02 Substantial Completion Inspection

Upon substantial completion of all work involved, the owner's engineer shall notify the City of Homer inspector of substantial completion and request a pre-final inspection of the project. This inspection should be performed in the presence of representatives of the owner, the design engineer, and the contractor. City of Homer will accept substantial completion testing after deficiencies have been corrected.

20.14.03 Final Inspection

Upon completion of all work involved, the owner's engineer shall notify the City of Homer inspector of completion and request a final inspection of the project. This inspection should be performed in the presence of representatives of the owner, the design engineer, and the contractor.

When all corrective action has been completed, the owner must notify the City of Homer inspector and another inspection will be performed. When the results of this inspection verify correction of the listed deficiencies and any additional noted deficiencies, the engineer may accept requests for a Final Pay Estimate.

Final inspections will not be performed unless test and daily inspection reports are current and approved by the City of Homer Project Inspector. Preparation of final utility checklists will be done in conjunction with the final inspection process.

20.14.04 Deficiencies

Any deficiencies found during inspections will be listed and furnished to the contractor for corrective action. When all corrective actions have been completed, the contractor must notify City of Homer for an inspection of the corrected deficiencies. When the reinspection verifies correction of all deficiencies, the inspector will approve the appropriate step of construction.

20.14.05 Partial Utilization

Partial utilization is the use of a facility prior to substantial completion as defined in CHSCS. Request for partial utilization must be submitted in writing to the City of Homer Engineering Division Director. Approval of a partial utilization request will not constitute substantial completion nor mark the beginning of the Warranty described in CHSCS Division 10, Article 3.7, Contractor's Warranty, or the specific Private Development Agreement. Maintenance of the facility for which partial utilization is designated remains the responsibility of the contractor and/or developer.

20.14.06 Warranty Period on Connects

For permits issued other than through a Subdivision or Private Development Extension Agreement, a one (1) year warranty period on main line taps begins when construction has been completed and inspection approved by City of Homer. Permits must be signed off by City of Homer at completion and acceptance of main line tap.

20.14.07 Private Systems Inspections & Notices

City of Homer will not approve any service connection and/or extension that is not in accordance with the current edition of the Uniform Plumbing Code, CHSCS or this manual. The inspection permit must be at the project location and available for review to the scheduled inspection.

The permitee and/or contractor must notify City of Homer a minimum of twenty-four (24) hours prior to any inspection. Inspectors are available Monday through Friday by advance appointment between 8:30 am and 4:30 pm. After hour inspections will be performed on a reimbursable basis upon the permitee's approval and at their expense.

All time associated with the arrangement of personnel, departure, return and after hours inspection will be charged to the reimbursable account in the permitee's name and is additive to the permit fee.

No private system or part thereof is to be covered, concealed, or put into use until it has been inspected and accepted by City of Homer or their designated representative. Excavations with standing water must be pumped out and maintained in a dewatered state prior to and during inspections.

Any private system or part thereof which is installed, covered, or concealed before being inspected and approved as prescribed in CHSCS and this manual must be uncovered for inspection after notice to uncover the work has been issued by City of Homer to the responsible person.

Prior to placement of the backfill, an authorized representative of City of Homer must inspect all installations.

• Any installations not inspected by a City of Homer authorized representative will not be accepted by City of Homer for service.

20.14.08 Service Connection Inspections

Without exception, an inspector of City of Homer must be present when the initial tap is made to an existing City of Homer line.

The main line tap inspection includes, but is not limited to, the necessary excavation, pipe laying to the main, backfilling, compacting, and resurfacing of the roadway and easements to equal or better than original condition (as existed prior to excavation).

City of Homer will not approve any main line tap which is not in accordance with UPC and CHSCS.

The contractor performing the excavation for a main line tap is fully liable and responsible for restoring property disturbed by construction to a condition similar or equal to that which existed prior to construction. The contractor shall at all times keep the construction area free from accumulations of waste materials. At the completion of the project, the construction site must be clean, neat and in satisfactory condition.

20.15 Abandoning Sanitary Sewer and/or Water Mains and/or Services

The City of Homer Engineering Division will review and approve any sanitary sewer or water main proposed for abandonment.

Any sanitary sewer or water abandonment work in a City ROW or easement must be permitted by the City Engineer, or by ADOT/PF when in the State of Alaska's ROW.

The abandon in place method for sanitary sewer or water mains typically includes the following: placing one foot of concrete at the beginning of the pipe, calculating the total internal volume of the pipe, filling the pipe with sand slurry equal to the total calculated volume, and placing one foot of concrete at the end of the pipe. The concrete plugs the pipe and the slurry fills the pipe. Work is typically started on the downhill end of the pipe. The total lineal footage of the sanitary sewer and water mains abandoned in place must be shown on the record drawings.

30.00 DESIGN AND CONSTRUCTION OF WASTEWATER FACILITIES

30.01 General

Sanitary sewers must be designed to remove domestic sewage from the lowest elevation of houses, business buildings, and other public and private establishments. Sanitary sewers must not be designed to collect any runoff from precipitation or ground water intrusion. Non-polluted cooling waters must be kept out of sanitary sewers. Any deviation of this policy requires approval from the City of Homer Public Works Director.

Improvements to the sanitary sewer trunk and/or interceptor systems are made primarily through the Capital Improvements Program (CIP). If a developer desires to proceed ahead of the CIP, the developer must finance the cost of the portion of the CIP project required to reach and front the desired property to be served. The size of the sanitary sewer trunk and/or interceptor lines and/or associated pumping stations will be determined by a facility and/or master plan adopted by City of Homer. If the required size exceeds the needs of the development, City of Homer will participate in oversizing when the funds for the specified CIP project are available.

Sanitary sewer systems are to be designed to handle future loads that may reasonably be expected within a period of thirty (30) to fifty (50) years.

30.02 Standard Sanitary Sewer Design Elements

30.02.01 Pipe Material and Size Design Requirements

30.02.01.01 Design Capacity

Sanitary sewer capacities must be designed for the ultimate tributary population, except in parts of the systems that can be readily increased in capacity.

Consideration should be given to the maximum anticipated capacity of institutions, industrial parks, etc. When programming future relief sanitary sewers, economic analysis of alternatives must accompany initial permit applications.

Consider the following factors when determining the required capacities of sanitary sewers:

- Maximum hourly domestic sewage flow
- Additional maximum sewage or waste flow from industrial plants
- Inflow and ground water infiltration
- Topography of area
- Location of sewage treatment plant
- Depth of excavation
- Pumping requirements

The basis of design for all sanitary sewer projects must accompany the design documents.

30.02.01.02 Design Flow

The basis of design for new sanitary sewer systems is an average per capita flow of sewage of not less than one hundred fifty (150) gallons per day. This figure is assumed to

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cover normal infiltration and does not include commercial or industrial usage. Commercial and industrial flow estimates are based upon the building usage and planned future development.

For existing sanitary sewers, actual daily per capita flows must be used with an additional per capita allowance where average annual flow exceeds the above value.

It is prohibited to discharge any storm water, surface water, surface runoff, groundwater, roof runoff, subsurface drainage, cooling water or other similarly polluted water to the Municipal sanitary sewer system.

30.02.01.03 Peak Design Flow

Design new sanitary sewers on a peak design flow basis using the ratio of peak to average daily flow or the values established from an infiltration and/or inflow study approved by City of Homer.

Use of other values for peak design flow will be considered if justified on the basis of supporting documentation.

The following table is provided as a guideline to calculate peak flow calculations. As a general rule, estimate a discharge of one hundred fifty (150) gallons per person per day and take that value times a peaking factor of two (2). Then, calculate the total number of people per acre of the entire development drainage cell and multiply by the estimated discharge (including the peaking factor), then convert the gallons per acre to cubic feet per second.

ZONING	UNITS/	PEOPLE/	PEOPLE/	CFS/
	ACRE	UNIT	ACRE	ACRE*
SINGLE	1 2	4.0	8	.0037
FAMILY	3 6	3.5	21	.0097
MULTI-FAMILY	7 10	3.3	33	.0153
(MEDIUM DENSITY)	11 20	3.0	60	.0278
MULTI-FAMILY	21 35	2.8	98	.0455
(HIGH DENSITY)	> 35	2.5	> 120	> .0557
COMMERCIAL	N/A	N/A	N/A	.0097
HOTEL/MOTEL	N/A	N/A	N/A	.0005/Room
INDUSTRIAL	N/A	N/A	N/A	.0196
UNKNOWN	3 3.5	3.0	10	.0046

WASTEWATER SYSTEMS BASIS OF DESIGN FOR FUTURE DEVELOPMENT

*The CFS/ACRE includes a peaking factor of 2

30.02.01.04 Sanitary Sewer Main & Larger Services Slope

All sanitary sewer mains must be designed and constructed to give mean velocities, when flowing full, of not less than two (2.0) feet per second based on the following Manning equation using an "n" value of 0.013:

Q =
$$(0.46316/n) * D^{2.67} * S^{0.5}$$

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Where:

Q	=	Flow rate, cfs
n	=	Manning Roughness Coefficient D
	=	Pipe Diameter, ft
S	=	Pipe Slope

The following are the minimum slopes and minimum number of homes, with approximate design capacities (at 2/3 full) and a minimum velocity of two (2.0) feet per second, which should be provided. However, slopes greater than these are desirable.

	Slope /	2/3 full	Min. #
Pipe Size	100 Ft	(CFS)	
	Homes		
8 inch	0.40	0.65	N/A
10 inch	0.28	0.86	0071
12 inch	0.22	1.26	0102
14 inch	0.17	1.69	0153
15 inch	0.15	1.92	0192
16 inch	0.14	2.21	0198
20 inch	0.10	3.42	0338
24 inch	0.08	5.01	0492
30 inch	0.058	7.77	0760
36 inch	0.046	11.28	1101
42 inch	0.037	15.27	1489

Slopes slightly less than those required for the two (2.0) feet per second velocity when flowing at peak capacity will be permitted only with written approval from ADEC. Such decreased slopes will be considered only where the depth of flow will be 0.3 of the diameter or greater for design average flow. Whenever such decreased slopes are selected, the design engineer must furnish a report of computations of the anticipated flow velocities of average and daily or weekly peak flow rates. The pipe diameter and slope must be selected to obtain the greatest practical velocities to minimize settling problems. Oversizing sewers will not be approved to justify using flatter slopes.

Where soil conditions so warrant, sanitary sewer on slopes in excess of twenty (20%) percent must be secured through the use of concrete anchor walls or other anchor protection. For slopes of twenty (20%) to thirty-five (35%) percent, anchors are to be placed at least every thirty-five (35') feet. The design engineer shall review the soils conditions and design the anchors accordingly. For slopes in excess of thirty-five (35%) percent, the engineer shall submit to City of Homer design calculation justifying a recommendation for anchor spacing.

Energy dissipation is required when the maximum slope exceeds fifteen (15%) percent. The design engineer shall consider a means of energy dissipation at the manholes and secure approval from City of Homer Engineering Division.

30.02.01.05 Sanitary Sewer Services Connection and Extension Slope

Each run of pipe is to be laid at a uniform grade between appurtenances. The minimum slope for a four (4") inch service is two (2%) percent from the structure to the service stub or main line. The minimum slope for a six (6") inch service is one (1%) percent. For larger sanitary sewer services, the minimum slope is equivalent to the requirements of mainlines.

30.02.01.06 Minimum Pipe Size

Gravity Sewer Mains

Gravity sanitary sewer mains minimum size is eight (8") inches nominal diameter (unless approved by the City Engineer and ADEC in writing).

Force Sewer Mains

Force sanitary sewer mains minimum size is four (4") inches nominal diameter(unless

approved by the City Engineer and ADEC in writing).

Private Sewer Lines

The minimum size of the gravity service is four (4") inches. Commercial and industrial connects are to be sized based on calculation of the maximum available use of the building or planned development. Residential connects must conform to the following table:

<u>Cor</u>	nnect to Main	Living Units
4"	service connect	0-4
6"	service connect	5-29
<u>Cor</u>	nect to Manhole	Living Units
<u>Cor</u> 8"	nect to Manhole service connect	Living Units 30-106
<u>Cor</u> 8" 10"	service connect service connect	Living Units 30-106 107-187

The engineer is required to receive approval from City of Homer Engineering for sizes other than those listed above.

Private force sewer services minimum size is two inches (2") in diameter (unless approved by the City Engineer and ADEC in writing).

30.02.01.07 Sewer Authorized Materials and Fittings

Sewer mains, sewer service connections and sewer extensions are to be constructed with authorized materials and fittings listed in this section. Sanitary sewer service connections and service connections must be installed and tested in accordance with CHSCS.

Pipe Materials

- Ductile Iron with "Tyton" joints, Class 50 (DIP CL50) a. May be used for all sewer piping
- Zinc coated Ductile Iron Class 52 pipe (DIP CL52) a. DIP for pressure mains and services only
- HDPE (High Density Polyethylene) pipe
 - a. may be used for pressure mains and pressure services only
 - b. manufactured in accordance with AWWA C906
 - c. outside diameters conforming to iron pipe size (IPS).
 - d. manufactured from PE4710 polyethylene compounds that meet or exceed ASTM D3350
 - e. SDR 11 or SDR 9

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- f. material cell classification of 445574.
- g. HDPE pipe and fitting material compound must contain color and ultraviolet (UV) stabilizer meeting or exceeding the requirements of code C per ASTM D3350.
- h. Electrofusion fittings must comply with ASTM F1055. All fittings must have pressure class ratings not less than the pressure class rating of the pipe to which they are joined.
- PVC Polyvinyl Chloride (PVC) pipe
 - a. may be used for gravity sewer systems
 - b. must meet requirements of AWWA C900. C900 Polyvinyl Chloride pipe is to be DR 18
 - c. must meet requirements of AWWA C905. C905 PVC pipe is to be DR 21must have a minimum two hundred (200) psi pressure rating
 - d. Gravity sewer bends may be made of PVC for sewer services. Bends and fittings to construct sewer cleanouts must be restrained
 - e. Standard length is twenty feet (20'), shorter lengths will be permitted on smaller (4"-6") services
 - f. C905 Pipe is to be iron pipe size equivalent (IPS)
 - g. C900 Pipe is to be iron pipe size equivalent (IPS)
 - h. PVC pipe are to be blue or green in color
 - i. The pipe must have certifying markings at regular intervals identifying the AWWA standard C900 or C905
 - j. Bending and/or deflecting of PVC Pipe is not allowed. All changes in direction must use metallic fittings, deflection couplings or manholes.
 - k. All fittings and apparatus attachments must be restrained in cleanout and pressure pipe construction
- Cast Iron with "Ty-seal" or "No-hub" joints (sewer service extensions only)

Fittings

- 1. Romac 501 coupling or equal where the type of pipe changes
- 2. Romac CB sewer saddle or equal
- 3. Romac repair clamps(SS1) or equal where the pipe type does not change
- 4. PVC fittings with gaskets meeting AWWA C907 for AWWA C900 pipe or equal for non-pressurized systems
- 5. MJ Sleeve w/ Romac MJxSDR35 gasket for PVC/DIP connection to CI
- 6. 4"&6" PVC cleanout wye with a groove on the vertical riser for Certa-Lok C900/RJ pipe by CertainTeed manufactured by specified fittings or equal

Detectable underground warning tape is required for installation of all pipe types. Warning tape must not be less than five (5) mil, foil backed, six inches (6") wide vinyl tape, colored green, with "Caution Buried Sewer Line Below" continuously printed in black along the tape length. The warning tape must be continuously laid with the pipe and be at least eighteen inches (18") above the pipe.

Tracer wire must be installed on all non-metallic pressure sewer main. Tracer wire must be continuous, suitable for direct bury, 10 AWG and with 30-mil HDPE jacket colored green. When allowed by the Engineer, splices are to use a Copperhead Industries, LLC connector, part #3WB-01 or equal. Tracer wire must be brought to the surface near sewer structures.

30.02.01.08 Unauthorized Materials and Fittings

- ABS (Acrylonitrile-Butadiene-Styrene)
- Aluminum or steel corrugated metal pipe
- Asbestos cement
- Concrete cylinder
- Galvanized or black iron pipe
- Mild steel or seamless conduit
- Orange-burg
- Vitrified clay
- Wood stave
- Caulder type couplings
- Non-gasketed PVC pipe

Pipe types and fittings not listed here may only be incorporated into a design or work after the product has received approval from the City of Homer City Engineer.

30.02.02 Standard Depth of Cover

All sewer pipes are to be designed with the standard depth of cover delineated below:

On the Spit: Gravity sewer mains – 8'

Gravity sewer services - 8'

Pressure and Force mains and services - 9'

Other Areas Off the Spit: Gravity sewer mains – 6'

Gravity sewer services - 6'

Pressure and Force mains and services – 7'

Gravity sewer service connections and sewer mains are to be designed to have a standard depth of cover to the furthest serviceable point of the area that may be developed or served, be sufficiently deep to receive sewage from basements and to prevent freezing.

The designer should consider future and/or re-development of a parcel prior to designing service extensions.

30.02.02.01 Minimum Depth of Cover

If the standard depth of cover is unattainable, City of Homer will require insulation.

Depth of cover is considered to be unattained when:

- <u>On the Spit</u>, gravity sewer mains/services have 7.5' of cover or less (force mains/services 8.5' of cover or less).
- <u>Other Areas Off the Spit</u>, gravity sewer mains/services have 5.5' of cover or less (force mains/services have less than 6.5' of cover).

Sanitary sewer main with less than the standard depth of cover must be installed with arctic protection and enough warm sewer flow to maintain a thawed state. No pipe shall be installed with less than four feet (4') of cover. If this minimum depth of cover cannot be achieved, then a lift station is required.

Arctic protection may be one of the following options:

- Arctic insulated pipe that consists of an outside jacket pipe that provides a minimum three inches (3") of annular space that is completely filled with low-density rigid closed cell urethane foam. The inner core pipe is to meet the requirements of this section and the outer jacket pipe is to be strong enough to prevent damage to the insulation from external earth loading and typical construction handling.
- 4" thick insulation board that is a minimum width of 2' beyond the outside diameter with 2" of insulation a minimum of 4' beyond the outside of the pipe. The 4" thick insulation must be constructed of two pieces of insulation board with joints offset. The insulation is to be 6" above the top of the pipe, laid flat.
- 4" of insulation board above the pipe that is a minimum width of 2' beyond the outside diameter and another 4" of insulation laid vertical on both sides of the pipe to at least 6" below the pipe. All horizontal insulation board is to be between 6" and 12" from the pipe wall and must be close fitting. Vertical insulation is to be set at the edges of the horizontal insulation.
- Arctic protection approved by the City of Homer City Engineer.

Sewer flow considerations

- Is the anticipated sewer flow occurring on a regular and daily basis? Irregular flows can be problematic as the pipe and trapped air can go below freezing temperature and cause the sewer flow to freeze without enough sewer flow adding heat on a regular basis.
- Does the sewer flow consist of heated water such as from dishwashers, showers, food preparation areas? City of Homer water temperature is in the mid 40°F range from the main and does not add a lot of heat to the sewer system by itself.
- Is the shallow pipe flowing at 2/3 full and/or at a minimum of two feet per second (2ft/sec) on a regular basis? Low and/or slow flows may lose heat too quickly and freeze.
- Is the building heated at all times? Warm air from the building may exchange with cold air coming in from the sewer vents. This warm air may heat the air in the sewer line. If a building is not heated, then this source of heat and having a possible source of cold air coming in from a vent may cause the sewer pipe to freeze
- Is there equipment discharging low volume flows, such as condensers from high efficient furnaces? Trickle flows may cause glaciation within the pipe. The glaciation will continue until the sewer pipe is frozen solid.

30.02.02.02 Maximum Depth of Cover

Pipe manufacturers supply the mathematical formulas for determining the necessary pipe thickness for a given combination of internal pressure and external load. They also supply graphs for the quick determination of pipe thickness for various combinations of standard conditions. Pipe may not be bu<u>ried deeper than recommended by the pipe</u>

manufacturer.

30.02.02.03 Deep Service Risers

Deep service risers may be installed where the sanitary sewer is in excess of twelve (12') feet deep and eight (6') feet of cover can be maintained over the service and service riser (see CHSCS, Standard Details). Deep service risers are to be fully restrained. A maximum of two (2) sanitary sewer service connections per service riser will be allowed.

30.02.03 Manholes 30.02.03.01 Location

Mainline manholes must be installed at all changes in grade, size, or alignment, and at all intersections. Manholes are to be brought to finish grade as indicated in CHSCS. The distance between mainline manholes will not be greater than four hundred (400') feet for sanitary sewer mains less than thirty (30") inches in diameter. Greater spacing may also be permitted for larger sanitary sewers on a case-by-case basis.

Any user discharging nondomestic pollutants into the municipal sewerage system shall, construct and maintain an on-property control manhole to allow inspection, control, and flow measurement of each wastewater discharge.

30.02.03.02 Diameter

The minimum inner diameter of manholes is forty-eight (48") inches. The minimum access diameter is twenty-five (25") inches.

Sanitary sewer manhole Type A (see CHSCS Standard Details) is required for sanitary sewer mains with diameters eight (8") inches to twenty-four (24") inches. Type B manholes may be required by City of Homer based on the connecting pipe configuration, fittings, location, or other factors. Two examples where a Type B manhole would be required are for an internal drop connect and for fitting clearances for special manholes with sealed pipes and cleanouts.

Sanitary sewer manhole Type B (see CHSCS Standard Details) is required for sanitary sewer mains with diameters thirty (30") inches to thirty-six (36") inches.

30.02.03.03 Flow Channel

Flow vectors for the main and lateral connecting to a manhole will be at or less than ninety (90°) degrees to prevent opposing flow conditions. Where this condition cannot be avoided, the lateral must enter the manhole through an outside drop connection. The flow channel is to be constructed through the manholes to conform in shape and slope to that of the sanitary sewers.

When the slopes of the inlet and outlet sanitary sewer are equal, the slope through the manhole must also be the same, allowing the pipe to be run straight through the manhole. The invert of a third or fourth pipe penetrating a manhole is to enter at an elevation at least

0.05 feet higher than the outlet inverts. When the slopes of the inlet and outlet are not equal, the minimum drop through the manhole must be 0.05 feet. In manholes where lateral sanitary sewers are intercepted by mains, trunks or interceptors, the lateral sanitary sewers must be laid such that under normal flow conditions in the interceptor

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sanitary sewer there will be no backing up of sewage in the lateral sanitary sewer. All smaller sanitary sewers must match crowns of larger sanitary sewers. In some cases, the invert of the smaller sanitary sewer may be required to match the crown of the larger.

30.02.03.04 Connection into manholes

Use an NPC Kor-N-seal or approved equal, pipe to manhole connector when connecting into existing manholes. Core drill new penetrations when connecting into manholes in a neat workman like manner. Adjust ladder rungs (removed/replaced/moved) to a location that is not above a pipe penetration.

New manhole pipe connections must meet the requirements of CHSCS.

Sewer services may not connect into a mainline manhole unless they are 8" in nominal diameter or greater. Where branched sanitary sewer service extensions are permitted, a service extension connecting into an on-property manhole may be smaller in diameter than the branched extension.

30.02.03.05 Drop Connection

Construct drop connection manholes with an outside drop connection as required and shown in CHSCS.

Inside drop connections require approval from City of Homer City Engineer and must be installed in a Type B or larger manhole. Secure the drop connect to the interior wall of the manhole and ensure access to the drop connect is achievable for cleaning. See CHSCS for additional requirements.

30.02.03.06 Beaver Slides

City of Homer requires beaver slides where the invert of the connecting sanitary sewer is above the crown of the receiving sanitary sewer and the drop into the manhole is short enough not to require a drop connection. Beaver slides are to be called out on the plans and shown in the profile view. Avoid beaver slides wherever possible. See CHSCS Standard Details for typical beaver slide.

30.02.03.07 Watertight Manholes (Inside protective well radius)

Manholes within the protective radius of a well must be designed and constructed to prevent groundwater contamination. Use of the special manhole and cleanout detail as well as a locking watertight manhole frame and cover as described in CHSCS is a standard protective practice but is not a guarantee of plan approval.

Flow channels within watertight manholes must be constructed of pipe and fittings that are mechanically restrained or flanged in accordance with CHSCS.

An approved ADEC waiver of separation is required for City of Homer to approve construction plans not meeting the separation distances required under 18 AAC 80.020 – Minimum Separation Distances.

30.02.03.08 Manhole Waterproofing

All manholes must have a minimum number of base and barrel joints. The first step in the required manhole waterproofing requirement is to externally seal all manhole and chimney joints with CCI Pipeline Systems WrapidSeal product or equal per manufacturers recommendations. All frames and covers must have Parson Environmental - SSI Manhole inserts or Cretex – Inflow Dish or approved equal installed between the frame and cover. Drain holes in manhole inserts are not allowed.

In addition to the waterproofing efforts described above, the final step in of the manhole waterproofing requirement will consist of spirally wrapping the exterior of the manhole with 2' wide strips of self-adhesive, rubberized asphalt/polyethylene waterproofing membrane (Bituthene 3000 or equal), specifically designed to adhere to cured concrete surfaces. Strips shall be overlapped a minimum of three inches (2"). See CHSCS detail.

30.02.03.09 Locking Manholes

Locking, watertight manhole covers are to be used in the construction of manholes that tops may be flooded by street runoff or high-water table or where needed for security purposes.

30.02.04 Cleanouts

Cleanouts will not be approved as substitutes for manholes on sewer mainline, but manholes may be substituted for cleanouts.

The horizontal distance between a manhole and a mainline cleanout must not exceed one hundred fifty (150') feet in length.

Sanitary sewer services require a cleanout:

- Per one hundred feet (100') of constructed service line without a manhole
- At grade breaks
- At a single bend that is greater than 45 degrees (horizontal)
- combination of bends within an interval not greater than ten feet (10') that is greater than forty-five degrees (45°) (horizontal)
- Within twenty-four inches (24") of the building structure

All cleanout fittings (both standpipe and wye) must be restrained and wrapped with at least one layer of 8 mil thick polyethylene sheeting and tape wrapped at the top, middle and bottom. The cleanout at the structure is required to meet the Uniform Plumbing Code (UPC).

30.02.05 Joints

Pipe joints are to be bell and spigot manufactured for use with rubber gaskets. Connection of new pipe to existing pipe where utilizing a spigot is not feasible, a gasketed repair clamp or coupling must be used.

Approved gasket materials are Styrene Butadiene Rubber (SBR), Nitrile Butadiene Rubber (NBR) and Viton flouroelastomer (FKM) compounded for sewer service.

30.02.06 Crossings

Sanitary sewers crossing water mains must be laid to provide a minimum vertical separation of eighteen (18") inches between the outside of the water main and the outside of the sanitary sewer main. In cases where the water main is either above or below the sanitary sewer, the crossing will be arranged such that the sanitary sewer joints will be equidistant (a minimum of nine (9') feet) and as far as possible from the existing

water main joints. Where both water and sewer are being installed, the joints for both lines are to nine feet (9') from the crossing point. In addition to City of Homer requirements, sanitary sewer and water crossings must be in accordance with ADEC regulations.

30.02.06.01 Creek Crossings

The top of all sanitary sewers crossing streams must be at a sufficient depth below the natural bottom of the stream bed to protect the sanitary sewer line. The following cover requirements must be met:

- A minimum of one (1') foot of cover is required where the sanitary sewer is located in rock.
- A minimum of three (3') feet of cover is required in other material. In major streams, more than three (3') feet of cover plus rip rap may be required and the scour depth of the stream should be considered in the design.

Less than the minimum cover will be considered only if the proposed sanitary sewer crossing will not interfere with any future improvements to the stream channel. Other reasons for requesting lesser cover will be considered on a case-by-case basis.

Sanitary sewer pipe in creek beds must be encased in concrete where the cover is less than three (3') feet below scour depth.

Where freezing conditions are anticipated, frost protection and/or arctic insulated pipe must be used. Only passive freeze protection systems will be acceptable.

30.02.06.02 Aerial Crossings

Provide support for all joints in pipes utilized for aerial crossings. Design pipe supports to resist frost heave, overturning and settlement.

Precautions against freezing, such as insulation and increased slope, will be considered. Expansion joints must be provided between above-ground and below-ground sanitary sewers.

For aerial stream crossings, the impact of flood waters and debris must be considered. The bottom of the pipe must be placed no lower than the estimated elevation of the one hundred

(100) year flood plain plan adopted by the City Planning Department.

30.02.06.03 Inverted Siphons

Inverted siphons must be installed with no less than two (2) parallel mains, with a minimum pipe size of six (6") inches and be provided with necessary appurtenances for convenient flushing and maintenance. The influent and effluent manholes must have adequate clearances for rodding/jetting. Sufficient head is to be provided and pipe size selected to secure velocities of at least three (3.0) feet per second for average flows. The inlet and outlet details must be so arranged that the normal flow is diverted to one (1) main, and that either main may be isolated from service for cleaning. The vertical alignment must permit cleaning and maintenance.

30.02.06.04 Storm Drain Crossings

Where the sanitary sewer main crosses the storm drain, a vertical separation of three (3') feet is to be maintained. If this minimum cannot be maintained, then four (4") inches of insulation (high density extruded polystyrene board stock or equivalent as defined in CHSCS is required between the lines. When the storm drain is within three (3') feet of a manhole, the ladder in the manhole must be rotated opposite the storm drain or insulation placed between the storm drain and sanitary sewer manhole to prevent icing on the manhole ladder.

The minimum horizontal separation between sanitary sewer mains and storm sewer mains is three (3') feet measured from the outside of the pipes when the pipes are at the same elevation. When the sanitary sewer mains and storm sewer mains are at different elevations, the horizontal separation distance must be such that neither pipe is located within the trench cross section of the other pipe. The cross section to use shall be OSHA compliant without the use of shoring or sheeting.

30.02.07 Sanitary Sewer Mains and Services in Relation to Water Mains and Services

A minimum ten (10') foot horizontal and eighteen (18") inch vertical separation (measured from the outside of pipe) between sanitary sewer and water mains and services is required.

30.02.08 Wells

All wells located within two hundred (200') feet of the project limits must be clearly and accurately shown on the plans. The State of Alaska Department of Environmental Conservation (ADEC) well classification (A, B, C, Private Water Source), and the minimum separation distance (radii) for sanitary sewer pipe-to-well and sanitary sewer manhole/cleanout-to-well is to be graphically shown for each well.

The minimum separation distances must be in accordance with the State of Alaska Wastewater Disposal Regulations 18 AAC 72, and the State of Alaska Drinking Water Regulations 18 AAC 80.020, Table A.

All wells within two hundred (200') feet of the project limits should be located by a field survey.

If the minimum separation distances cannot be maintained, the engineer is required to prepare all necessary waiver requests for submittal to ADEC. City of Homer is requiring review and concurrence of the waiver request prior to the engineer submitting to ADEC. The engineer will be required to comply with all conditions of approval.

30.03 Sanitary Sewer Services

30.03.01 General

Sanitary sewer service lines must be laid in straight runs, except for the beginning sweeps, unless prior approval in writing is received from City of Homer Engineering Division.

Sanitary sewer service connections extend from the sanitary sewer main to the property line or easement. Sanitary sewer service extensions extend from the sewer service connection to the terminus of the service.

In new development, where the mainline sewer and sewer connections are constructed by one entity and a different entity will most likely construct the sewer service extension, the City of Homer may allow a portion of the sewer service extension to be constructed in conjunction with the sewer service connection. The purpose of the partial sewer service extension construction is to extend the sewer service extension beyond planned and/or constructed adjacent utilities, sidewalks, pathways and/or other permanent surface improvements to limit reconstruction/disruption of newly installed improvements. The development team must submit such requests in writing during the review and approval process.

30.03.02 Connections

Service connections are typically located five (5') to fifteen (15') feet from the property corner in the downhill one-third of the lot. Service connections are be stubbed out to the furthest extent of City of Homer maintenance requirements which is typically at the property and/or easement line of each lot that the proposed sanitary sewer main extension serves.

It is the responsibility of the developer to properly size the sewer service line for current and/or future development plans. The designer must coordinate with City of Homer to ensure that the capacity of the sewer main is acceptable for the planned and/or future flows.

Sanitary sewers should be sufficiently deep to receive sewage from basements and to prevent freezing. If the standard depth of cover cannot be achieved to the furthest extent of the lot being served, then the service must come off the main at minimum slope to the property line.

30.03.02.01 Off-Property Connection (Main Line Taps)

An epoxy coated Romac Style "CB" sewer saddle or equal must be used when connecting a service to the main. The manufacturer's installation instructions must be followed. Special care is to be taken to open the correct size hole in the sewer main and it must be no larger than one-eighth (1/8") inch greater than the outside diameter of pipe to be inserted or the inside diameter of the gasket saddle

Adjoining taps to the main line are not to be closer than three (3') feet.

Service connections into the sewer main that are closer than five feet (5') to the mainline manhole will not be accepted and the service must be relocated. Service connections must not be closer than one (1') foot from a pipe joint.

Service connections are to end with a bell at or past the property line fronting the mainline. If a pressure test of the main or service is required, a pipe pup with plug and connection marker is to be installed. Upon connection to the stub, the contractor is to remove the pup, plug and marker and utilize the existing bell.

30.03.02.02 Service Connection Markers

Services stubbed to the property line or beyond for future use must be marked at the end of the service with a 2" X 4" X 8' marker, protruding three (3') feet above grade, painted green, and stenciled with the word "SEWER" in white two (2") inch high letters.

30.03.03 On-Property Service (Extension)

The contractor shall verify the alignment and grade of the existing stub out from the main. Contractor shall make sure the line is free and clear of any obstruction prior to connecting with the service extension. If the contractor notes any deficiencies, City of Homer must be notified immediately.

- The lines must be laid in straight runs between fittings
- Each run is to be laid at a uniform grade
- Sanitary sewer cleanout(s) are to be constructed (see cleanout section)
- A control manhole may substitute for a building sanitary sewer cleanout if the control manhole is located within five (5') feet of the building.
- Romac coupling (or equal) is to be used at any joint where the type of piping changes
- There must be a minimum of five (5') feet of pipe upstream of the building cleanout and the next fitting.
- Sewer service lines must be tested in accordance with CHSCS between manhole structures. Where a service line is not bound by two manholes then the exfiltration/infiltration testing will not be required. Line and grade checking procedures will be modified as needed where only one manhole is provided. The modification may require the use of CCTV to locate bellies.

30.03.04 On-Property Service (Extension-stub)

In new development, where the mainline sewer and sewer connections are constructed by one entity and a different entity will most likely construct the sewer service extension, City of Homer may allow a portion of the sewer service extension to be constructed in conjunction with the sewer service connection.

The purpose of the partial sewer service extension construction is to extend the sewer service extension beyond planned and/or constructed adjacent utilities, sidewalks, pathways and/or other permanent surface improvements to limit reconstruction/disruption of newly installed improvements.

Sewer extension stubs must meet the following list of requirements:

- The end of the stub must be plugged and clearly marked with a service connect marker
- Stubs must be pressure tested with the sewer main and sewer service connection
- The design plans, contractor redlines, and record drawings are to provide the planned and constructed location and elevation of the stub at the property line and at the end of the stub.
- Stubs must be a minimum of 10' in length measured from the property line
- Stubs must not change in direction from the service connection until past the planned improvements
- Stubs are to be terminated with a bell and pup w/plug (for pressure testing).

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• Upon connection to the stub, the contractor is to remove the pup and plug and utilize the existing bell

The development team is to submit stub extension requests to City of Homer in writing during the review and approval process. The development team installing the sewer mainline and service connections shall also be responsible for the construction, maintenance, and warranty of the stubs under the same terms and conditions as stated in the mainline extension agreement.

30.03.05Sanitary Sewer Extension Appurtenance30.03.05.01Control Manholes

On-property control manholes are required for all commercial and industrial structures discharging sewage containing industrial waste into City of Homer's system. The control manhole must be installed on existing or new sanitary sewer extensions to facilitate observation, sampling, and measurement of wastes. The manhole must be constructed in accordance with plans approved by City of Homer. The design plans, at a minimum, must include the horizontal location and vertical dimensions of the control manhole. Flow channel construction through a control manhole may not change the direction of flow by more than fifteen degrees (15°) unless approved on a case-by-case basis by City Engineer.

Control manholes are to be installed on the service extension by the owner(s) at the owner's expense and be maintained by them so as to be safe and accessible at all times.

Control manholes must not be installed in easements, ROW's or within a protective well radius.

City of Homer requires the owner to submit a "Notice of Intent to Discharge Industrial Wastewater" form to the City of Homer Engineering Division prior to approval of plans. A determination of the necessity of control manhole will be made based on information provided on the form.

30.03.05.02 Backwater Valves

City of Homer and the UPC require a backwater/check valve to be installed within the structure when the lowest outlet is below the elevation of the top of the upstream manhole nearest to the service connection. The backwater/check valve is the responsibility of the owner of the structure.

City of Homer may require installation of a backwater valve within existing structures that have a history of backups.

30.03.05.03 Private Sewage Lift Stations

Where practicable, all plumbing fixtures should be drained to public sanitary sewer. Where a parcel is served by a City of Homer gravity sewer main, but the sewer main is too shallow to provide a gravity service, a private lift station may be used. All private lift stations exterior to a building shall be approved by City of Homer.

The service and pumping mechanism(s) must be provided and maintained by the property owner. All costs related to the installation, operation and maintenance of private sewage lift stations are the sole responsibility of the property owner.

Unless otherwise stated by written agreement, a developer of a subdivision requiring a temporary lift station (until gravity sanitary sewer is available) is to be responsible for operation and maintenance of the lift station and all sanitary sewer lines leading into and away from the lift station to the point of connection to public sanitary sewer.

The provisions for pressure mains apply to all on-property, private sanitary sewers, and private systems.

Administrative authority is to be in accordance with the latest edition of the UPC and local amendments thereto.

- If the lift station is for a commercial use and located on private property but outside the foundation wall, and if liquid waste is discharged to a private treatment system, the administrative authority rests with the Alaska Department of Environmental Conservation.
- If the lift station is located on private property but outside the foundation wall and if liquid waste is discharged to a public wastewater collection system, the administrative authority rests with City of Homer Engineering Division.

The owner of a lift station and plumbing system approved by City of Homer may be requested to file with the City of Homer Operations and Maintenance Division all plans and literature that pertain to the lift station. This information will be used to compile a reference library.

Engineers must submit detailed plans for lift stations for review prior to installation. These plans are to include all the following information:

- A drawing showing the dimensions and capacity of the lift station tank (wet well), and the specific level of the "pump on", "pump off", and "high water alarm".
- For tri-plex and greater, commercial, and industrial dischargers, the lift station will require duplex pumps.
- Where duplex pumps are required the installation of two force service lines will be required.
- Construction materials, manufacturing details, insulation details (where applicable), and corrosion protection.
- The make and model of the pump, and the criteria or data used in sizing the pump for the specific application.
- Grinder pump is required where a S.T.E.P. system is not installed and for lift stations serving commercial business and industrial sites
- Pump(s) is/are to be retrievable and replaceable from the surface.
- Control panel with:
 - Explosion proof rating
 - Duplex pump operation (where duplex pumps are used)
 - High level alarm must be visual and auditory
- Electrical controls protection from corrosive environments and/or weather.
- The high-water alarm located inside the structure being served and, on a circuit, separate from the pump.
- Lift stations must be protected from damage, including but not limited to,

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traffic loading, and snow clearing.

- Estimated flows and storage capacity.
- Two force service lines are not required for single to quad complex residential structures, but they are recommended. Two force service lines are the standard for other service lines.

30.03.05.04 Grease Traps

Administrative authority for the use and maintenance of grease traps is with City of Homer. Grease traps must be installed when required by the City of Homer Engineering Division.

30.03.06 Abandonment of Private Disposal Systems

Every abandoned on-property disposal system (cesspool, septic tank, seepage pit, drain field, etc.) must comply with the UPC Appendix K. The contractor shall schedule inspection of the abandoned systems with City of Homer Engineering Division. The abandoned disposal system must be shown on the record drawings.

30.03.07 Service Connection Abandonment

The abandonment method for disconnection of a sanitary sewer service connect must include one of the following:

- Open Cut Excavation
 - i. Service must be disconnected at the property line
 - ii. Cut pipe and plug with a watertight cap or end plug
 - iii. Install a sanitary sewer service connection marker
 - iv. Provide City of Homer a record drawing of the abandoned service connection
- Trenchless
 - i. The service line must be surface located with the use of a sonde locator device within the pipe
 - ii. The trenchless plug is to be set at the property line.
 - iii. The service is to be pre-CCTV'd and post CCTV'd to confirm trenchless plug is secure and located at the property line. All video is to be turned over to City of Homer.

A disconnect permit will be required from City of Homer. The contractor shall schedule inspection with City of Homer and furnish the following information:

- Date when disconnect was made
- Where disconnect was made, including but not limited to lot, block, subdivision, address, swing ties, depth, type of pipe and size
- Who disconnected the service
- Owner's name, address, and telephone number

A City of Homer inspector must observe the disconnection to ensure quality.

30.04 Sanitary Sewage Lift Station

30.04.01 General

This section contains information relevant for designing lift stations and pump stations with a capacity of commonly less than one million gallons per day (MGD). The design and

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installation of these stations must conform to City of Homer requirements and all work is to be in accordance with the latest editions of IBC, IMC, UPC and NEC, all as revised and accepted by the City. City of Homer has created specification templates for use in the design of lift stations that are to be owned and operated by City of Homer.

Stations larger than 1 MGD require special design considerations (e.g., generators, fuel facilities, etc.). Design of these stations is to be coordinated through City of Homer Engineering Division and conform to CHSCS, IMC, UPC and NEC, all as revised and accepted by the City.

30.04.02 Design

30.04.02.01 Equipment Removal

Provisions must be made to facilitate removal of pumps, motors, and other mechanical and electrical equipment.

30.04.02.02 Accessibility and Access

The pumping station must be readily accessible by maintenance vehicles during all weather conditions. The facility must not be located in traffic ways. Where necessary the station must be in a dedicated easement. Stations must not be located in a ditch or snow storage area. The top elevation of the lift station and the elevation of the electrical junction box must be sufficiently above surrounding ground and be protected from any water runoff or any accumulation of infiltration.

Suitable and safe means of access must be provided into dry wells, and to wet wells containing mechanical equipment requiring inspection or maintenance. All controls, sensors and pumps must be removable without entering the wet well.

Plan references will be made to all local, State, and federal safety codes with the most stringent code taking precedence.

30.04.02.03 Construction Materials

Due consideration must be given to the selection of materials because of the presence of hydrogen sulfide and other corrosive gases, greases, oils, and other constituents frequently present in wastewater.

30.04.03 Pumps

All pumps are to be three (3) phase. Where three (3) phase power is not available, a frequency drive unit will be required to add the third phase.

30.04.03.01 Multiple Units

Each station must be designed with at least two wastewater pumps. A minimum of three (3) pumps must be provided for stations handling flows greater than one (1) MGD.

When only two (2) units are provided, they are to have the same capacity. Each unit must be capable of handling maximum flows based on project population and existing data. Where three (3) or more units are provided, they must be designed to fit actual flow conditions and be of such capacity that, with the largest unit out of service, the remaining units must have capacity to handle maximum sewage flows.

30.04.03.02 Pump Openings

Pumps must be capable of passing spheres of at least three (3") inches in diameter. Pump suction, discharge and piping is to be at least four (4") inches in diameter.

30.04.03.03 Priming

Pumps must be of the self-priming type.

30.04.03.04 Electrical Equipment

Electrical systems and components (e.g., motors, cables, conduits, switch boxes, control circuits, etc.) in raw sewage wet walls, or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors may be present, must comply with the National Electrical Code (NEC) requirements for Class 1, Group D, Division I locations. In addition, equipment located in the wet well must be suitable for use under corrosive conditions. Each flexible cable must be provided with watertight seal and separate strain relief. A fused disconnect switch located above ground is to be provided for all pumping stations.

Electrical panels and equipment not located in the wet wells or confined spaces do not need to meet Class I, Division 1, NEC. When such equipment is exposed to weather, it must meet the requirements of weatherproof equipment (NEMA Type 4).

30.04.03.05 Intake

Each pump must have an individual intake. Turbulence should be avoided near the intake. Intake piping must be as straight and short as possible.

30.04.04 Level Controls

In all wet wells, install a US Filter D-153 Duplex Level Controller using the A1000 Level Transducer, or equal. Any substitution to transducer or controller equipment will require review and approval by both City of Homer's Engineering and Operations and Maintenance Divisions. The transducer must have the capacity to control pumps, regulate speed drives (if necessary), and indicate and telemeter liquid levels. A typical two (2) pump station requires low wet well alarm, high wet well alarm with redundant high wet well float, lead pump start/stop, lag pump start/stop.

30.04.04.01 Location

The control system must be located away from the turbulence of incoming flow and pump suction.

30.04.04.02 Alternation

In stations designed to handle flows of less than one (1) MGD, provisions are to be made to automatically alternate the pump in use.

30.04.05 Valves

30.04.05.01 Suction Line

Shut-off valves must be placed on the suction line of each pump for a dry pit operation. A wet pit with submersible pump does not require valves on the suction.

30.04.05.02 Discharge Line

Mueller spring and lever type check valves (Model A-2600-6-02 or equivalent) and Mueller non-rising stem gate valves (Model A-2370-6 with hand wheel or equivalent) must be

placed on the discharge line of each pump. The check valve is to be located between the shut-off valve and the pump. Check valves are to be suitable for the material being handled and must be capable of withstanding normal pressure and water hammer and be of the spring and level type to allow manual back flushing of pumps. The gate valve and check valves must be designed for installation above wet pit liquid levels during normal operation.

30.04.06 Wet Wells

30.04.06.01 Size

The wet well size and control setting must be appropriate to avoid heat build-up in the pump motor due to frequent starting and to allow a minimum of two (2) hours detention time at peak flows. In cases where the drainage area is larger than the current number of homes to be served, the station must be designed for both maximum density and current service area.

To size wet wells in residential areas, multiply the maximum number of homes in the service area of the lift station by fifty (50). This value plus the discharge piping drainage will be the total volume in gallons required for the wet well. The wet well controls will then be adjusted for current number of homes in the service area. For business, commercial, or industrial areas, the wet well is to be designed to handle the peak flows with two (2) hour retention.

Deviation will require justification by the design engineer and approval by the City of Homer City Engineer.

30.04.06.02 Floor Slope

The wet well floor must have a minimum slope of one (1) to one (1) to the pump suction. The horizontal area of the hopper bottom must not be greater than necessary for proper installation and function of the inlet.

30.04.07 Ventilation

Adequate ventilation is to be provided for all pump stations. Where the pumps are located in a dry pit, mechanical ventilation is required.

Wet wells must not be mechanically vented. Wet wells are to have a standpipe for air ventilation. No mechanical or powered ventilation is to be installed in the wet well portion of the station. All exterior ventilation piping is to be Schedule 40, steel pipe primed and painted to match exterior color of the facility, or forest green as approved by City of Homer. The exterior end of the ventilation piping is to be screened with a minimum of one-quarter (1/4") inch stainless steel screen.

30.04.08 Water Supply

There must not be a physical connection between any potable water supply and a sewage pumping station to prevent contamination of the potable water supply. If a potable water supply is brought to the station, it must comply with all applicable standards and codes.

30.04.09 Suction Lift Pumps

Sewage suction lift pumps are prohibited.

30.04.10 Submersible Pump Stations

30.04.10.01 Construction

Submersible pumps and motors are to be designed and supplied by the same manufacturer specifically for raw sewage use, including totally submerged operation during a portion of each pumping cycle. The motor must be of squirrel-cage type design without brushes or other arc-producing mechanisms.

30.04.10.02 Pump Removal

Submersible pumps must be readily removable and replaceable without dewatering, disconnecting any piping, or personnel entry.

30.04.11 Electrical

30.04.11.01 Power Supply and Control

Electrical supply and control and alarm circuits must be designed to provide strain relief and to allow disconnection from outside the wet well. Terminals and connectors are to be protected from corrosion by location outside the wet well or through use of watertight seals. If located outside, weatherproof equipment is to be used.

30.04.11.02 Controls

The motor control center is to be located outside the wet well and protected by a conduit seal, or other appropriate measures meeting the requirements of NEC, to prevent the atmosphere of the wet well from gaining access to the control center. The seal must contain two spare conductors as a backup so the seal will not need to be broken should a conductor fail. The seal must be located so that the motor can be removed and electrically disconnected without disturbing the seal. The location of the wet well junction box is to be identified at the motor control center.

30.04.11.03 Power Cord

Pump motor power cords are to be designed for flexibility and serviceability and must meet the requirements of the Mine Safety and Health Administration for trailing cables. Power cord terminal fittings must be corrosion-resistant and constructed to prevent the entry of moisture into the cable, be provided with strain relief appurtenances, and are to be designed to facilitate field connection. Power cords are to have the ability to be disconnected without entering the wet well or submerged station. This will require construction of an external junction box vault.

30.04.12 Alarm Systems

Electrical contacts, as specified by City of Homer Engineering Division, must be provided in addition to electrical interfacing specific to the project.

30.04.13 Emergency Operation

Pumping stations and collection systems must be designed to prevent or minimize bypassing of raw sewage. A four (4") inch female cam lock fitting is to be provided on the discharge piping to facilitate emergency by-passing. For use during possible periods of extensive power outages, mandatory power reductions, or uncontrolled storm events, consideration should be given to providing a controlled, high-level wet well overflow to supplement alarm systems and emergency power generation. This will prevent backup of sewage into basements, or other discharges that may cause severe adverse impacts to public interests, including public health and property damage. Where a high-level overflow is utilized, consideration must also be given to the installation of storage and/or detention tanks, or basins, which is to be made to drain to the station wet well. Where such overflows affect public water supplies, surface water or waters used for culinary or food processing purposes, storage and/or detention basin, or tanks, are to be provided having two (2) hour detention capacity at the anticipated overflow rate as directed by the City Engineer.

30.04.14 Equipment Nameplates and Manuals

For each sanitary sewage lift station and pumping station, provide thee (3) complete sets of operation and maintenance manuals and one electronic copy that matches the paper copies. In addition to the record drawings of the facility, provide a record drawing of all the electrical schematics and drawings (see Section 50.0l). Each operation and maintenance manual must include operational procedures to be followed in case of blockage, power outage, circuit overload, or emergency; station shut down and start up procedures, including lock out/tag out requirements; routine maintenance tasks and a schedule for all equipment and assemblies; a list of any special tools required to operate or maintain the station; and mechanical and electrical drawings of the facility.

In addition to the facility manuals, provide six (6) complete sets of equipment manuals for each item of equipment and each instrument panel in the facility. Each equipment manual , at a minimum, must contain:

Summary showing:

• Make, model, style, serial number, description, manufacturer's specifications, and location in the construction.

• Full names and addresses of manufacturer, vendor, prime contractor, and installer. Manufacturer's literature properly marked to identify the specific item. The literature is to include:

- Instruction for installation, operation, maintenance, and repair.
- Shop drawings, wiring diagrams, and system layouts, where such drawings are required in other sections of the specifications.
- Each piece of major equipment in the station must have nameplates affixed in an accessible location which includes make, model, serial number, manufacturer, and power requirement.

30.04.15 Station Cover

Station cover must be of a suitable material for each application, (e.g., reinforced steel meeting H-loading requirements for vehicle traffic, aluminum for standard no load applications). Lid must be sized large enough to allow straight pulls for removing and resetting pumps.

30.04.16 Electric Disconnects

There must be an electrical disconnect within twelve (12') feet of the station.

30.04.17 Control Panels

All panels exposed to weather must be NEMA Type 4 (or equal) lockable enclosures. Panels are to be self-supporting pad mounted or electrical pole mounted and approximately five (5') feet at center elevation. All frost susceptible materials under pad location must be removed to a minimum depth of four (4') feet and replaced with a nonfrost susceptible material with a fine granular texture containing material not larger than one-half (½") inch in diameter. This material must be compacted to a minimum of ninetyfive percent (95%) maximum density compaction. The control panel's meter base must be located as close as possible to the wet well in order to comply with NEC regulations and eliminate the need for a wet well mounted disconnect switch.

30.04.18 Sensors

Displacement type liquid level sensors should be of Flygt Company manufacture (or equal) and is to consist of a mercury switch in a smooth chemical resistant casing. The sensors must detect low wet well and high wet well. The sensors are to be suspended by cable from a stainless steel hanger securely mounted in the wet well. The hanger must be accessible from the hatch.

30.04.19 Wet Well Lighting

Each wet pit control panel is to have at least one grounded twenty (20) amp duplex outlet. City of Homer will supply portable lighting to the station. Lights and outlets are forbidden from the wet well environment.

30.04.20 Corrosion

All equipment in manholes and/or wet wells is to be water-tight and corrosionprotected as defined in the specifications for the project and the manufacturer's specifications for equipment.

The designer should anticipate the presence of hydrogen sulfide and bacteria that consume hydrogen sulfide to produce sulfuric acid. Structures associated with pressure mains and lift stations should account for lower PH levels on the walls, ceilings, and floors of the structure.

30.04.21 Controls

The fluid level controls are to be adjustable so that a minimum restart time of five (5) minutes for the pumps may be obtained.

Each facility must be equipped with dry contacts to accommodate City of Homer's Supervisory Control And Data Acquisition (SCADA) system. Additional dry contact criteria may be obtained from the City of Homer Engineering Division.

30.04.22 Supervisory Control And Data Acquisition (SCADA)

All lift stations must be designed and constructed with SCADA equipment that is compatible with City of Homer's SCADA system. The City will coordinate the design of all SCADA systems associated with public lift stations to maintain uniformity

30.05 Pressure Sanitary Sewer (Force) Mains

30.05.01 Size of Pipe

The minimum size for DIP, HDPE and PVC piping is four inches (4"). Copper pipe must be used for pipes 3" or smaller. Designs using HDPE and PVC material must show through

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calculations or manufacturer data that the pipe material will not fatigue to the point of failure because of cyclical loading for the life of the pipe. The type of pipe selected for force mains is to comply with the authorized material list.

All bends are to be restrained and be capable of withstanding water hammer created by the wastewater pumps and other sources. Where the pressure mains enter or exit a manhole or other collection or discharge area, it is to be secured to prevent separation from such area.

30.05.02 Continuity Straps

All ductile iron pressure sanitary sewer mains are to have continuity straps installed as directed by City of Homer (e.g., thawing, cathodic protection, or future connections to cathodic protection). Straps must be installed in accordance with standard specification for water systems. A continuity test will be made on the completed system. On-property DIP and copper pressure sanitary sewer systems must have continuity for purposes of thawing.

30.05.03 Testing

Pressure sanitary sewer mains are to be hydrostatic pressure tested. The hydrostatic pressure test will be one hundred fifty (150) psi, or fifty (50) psi above the surge rate for the wastewater pump, whichever is greater.

30.05.04 Draining of Force Main

Where applicable to prevent sewage from becoming septic, pressure mains must be designed to backflow into the wet well. The wet well pump discharge line is to have a spring and lever type check valve which can be manually operated once the pumping stops. The wet well is to be sized to handle the backflow sewage from the force main in addition to the normal sizing.

30.05.05 Force Main

At least two force mains are to be provided for all stations. The second force main is to be used for maintenance, alternating flows, and emergencies.

Both force mains must have the capacity to handle maximum sewage flows when one or the other is out of service. Plans and record drawings are to include the pipe type, pipe class, size horizontal dimension between pipes, horizontal dimension to easement lines, lot lines, ROW, etc.

30.05.06 Air-Relief Device

All high points of the force main are to have an appropriate air relief device. Plans must include the horizontal location and vertical elevation of all air relief devices. Record drawings are required to include manufacturer, make and model of all air relief devices.

30.06 Wastewater Treatment

30.06.01 General

Each plant is subject to such requirements as the City of Homer Engineering Division may indicate based upon locale, degree of treatment, safety, layout, auxiliary equipment required for proper operation and maintenance, access, or any other item peculiar to that plant which may be required by City of Homer.

30.06.02 Treatment Plant

City of Homer operates and maintains the wastewater treatment plant.

30.06.03 Pretreatment Facilities

All public sanitary sewer users must meet requirements as stated in Homer City Code; federal Pretreatment Requirements (40 CFR Part 403) and federal Categorical Pretreatment Standards.

Subject to review, City of Homer may require equalization units to prevent peak flow conditions from adversely affecting operation of the sanitary sewer system. Said equalization or holding unit must have a capacity suitable to serve its intended purpose and be equipped with acceptable outlet control facilities to provide flexibility in operation and accommodate changing conditions in the waste flow.

It is the responsibility of the customer to install and satisfactorily operate and maintain pretreatment units at the owner's expense.

40.00 DESIGN AND CONSTRUCTION OF WATERWORKS

40.01 General

All property desiring water service from the City of Homer must be located within City of Homer's service area as certified by the Regulatory Commission of Alaska (RCA), unless a special exception is authorized by the RCA. The Homer City Council must also approval extending service to areas outside of the City limits.

The developer or a designated design engineer shall submit water demands for the development and City of Homer will model the projected demands. If the existing water distribution system is not adequate to serve the proposed development, the project will not be approved for construction until the capacity of the distribution system has been augmented.

Improvements to the transmission main system are made primarily through City of Homer's Capital Improvements Program (CIP). If a developer desires to proceed ahead of the CIP, the developer must finance the cost of the portion of the CIP project required to reach and front the property. The size of the water line or pumping station will be determined by a facility or master plan adopted by City of Homer. If the required size exceeds the needs of the development, the participation of oversizing will be available when the funds for the specific CIP project are available.

Estimate water use requirements in accordance with UPC, AWWA and sound civil engineering practice. The Homer Fire Department shall determine the minimum fire flow requirements.

40.02 Standard Water Design Elements

40.02.01 Design Data

Water main design data and calculations may be required by the City of Homer Engineering Division. The design data and computations for water typically include average and peak demands, fire demand, future requirements, probable pressures, losses, calculations, computations for determining pipe sizes, project cost estimates, and proposed construction schedule.

40.02.02 Distribution System

Design of new water extensions will need to ensure that it is compatible with the existing grid network of the established transmission and distribution system. Interties to the existing system will be required wherever possible to establish loops. Refer to the large diameter water transmission mains section for additional requirements.

When evaluating the existing system for flow and pressure, the following criteria is to be used:

- 1. The Hazen-Williams equation where C = 100.
- 2. Hydrant flow test data, orifice size, and assumed coefficient of discharge.
- 3. Fire flow available at twenty (20) pounds per square inch residual pressure.
- 4. Minimum and maximum pressures as defined in the latest edition of the City of Homer Water Master Plan and any ADEC requirements.

40.02.03 Authorized Materials and Fittings

The following materials are approved for water mains and services and must be installed

and tested in accordance with CHSCS.

- 1. Ductile Iron, Class 52 pipe
 - a. must have a cement mortar lining
 - b. must conform to the requirements of AWWA C-150 ("Thickness Design of DIP")
 - c. must conform to the requirements of AWWA C-151 ("Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids")
- 2. "Tyton" joints (for ductile iron)
- 3. Type K seamless copper tubing
- 4. HDPE (High Density Polyethylene) pipe
 - a. must conform to the requirements of AWWA C906
 - b. must be manufactured from PE4710 polyethylene compounds that meet or exceed ASTM D3350 Cell Classification 445574
 - c. must have a minimum two hundred (200) psi pressure rating
 - d. must be certified by the NSF for potable water service
 - e. must contain color and ultraviolet (UV) stabilizer meeting or exceeding the requirements of Code C per ASTM D3350
 - f. electrofusion fittings must comply with ASTM F1055
 - g. fittings must have pressure class ratings not less than the pressure class rating of the pipe to which they are joined
 - h. outside diameters must conform to iron pipe size (IPS)
 - i. HDPE pipe will not be allowed for use at sites with contaminates or have the potential to have soils with contaminates above the most stringent ADEC cleanup levels
 - j. minimum size must be four inches (4")
 - k. inner diameter must be approximately the same as Class 52 DIP (e.g., 10" HDPE SDR 11 pipe would be used to replace 8" CL 52 pipe)
- 5. Fusible PVC pipe (for areas of potential soil/groundwater contamination)
- 6. PVC Polyvinyl Chloride (PVC) pipe
 - a. must conform to the requirements of AWWA C900 or C905
 - b. that meets AWWA C900 and have a DR of 18
 - c. that meets AWWA C905 PVC have a DR of 18
 - d. PVC pipe must have a minimum two hundred (200) psi pressure rating
 - e. All bends must be constructed with ductile iron fittings and have restrained joints
 - f. Concrete thrust blocks are to be used at all fittings that change the direction of water flow by more than 5° in addition to the restraint requirements.
 - g. Standard length should be twenty feet (20'), shorter lengths may be permitted for 4" and 6"pipe
 - h. C900 & C905 Pipe must have an outside diameter equivalent to DIP sizes
 - i. must be blue in color
 - j. must not be bent or flexed
 - k. must not be deflected at a bell and spigot
 - 1. must be deflected through the use of ferric fittings and deflection couplings, including PVC deflection couplers. Deflection within in the joint may take place at a metallic fitting at 80% of the manufacturers recommend deflection

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allowance.

- m. must not be over stabbed
- n. over-insertion devices must be used. EBAA Iron Mega-Stop[™] or equal must be used to prevent over-insertion. North American Specialties Products Certa-Lok[®] pipe and IPEX Terrabrute[®] CR pipe do not need permanent over-insertion protection as the built-in pipe restraint system prevents over insertion.
- o. all fittings and apparatus attachments must be restrained
- 7. Pipe gaskets must be selected based on the service environment of the pipe
- 8. Mechanical joints
- 9. All appurtenant piping materials must conform to the requirements of CHSCS or as specified within this manual
- 10. All pipes and fittings must be NSF 61 certified for potable water systems
- 11. AWWA C110 & C153 fittings
- 12. Brass components in contact with potable water are to comply with Public Law 111-380 (No Lead Rule).

All designers submitting plans for water projects must, at a minimum, review the Alaska Department of Environmental Conservation (ADEC) Division of Spill Prevention and Response maintained data base of Contaminated Sites for nearby contaminated sites and perform soil data collection as described in Section 20.

Engineered plans for projects in areas of known or suspected hydrocarbon, semi-volatile organic compounds, or volatile organic compound contamination are to be submitted with an engineered analysis supporting the pipe, coating, and gasket material selection.

Detectable underground warning tape is required for installation of all pipe types. Warning tape must not be less than five (5) mil, foil backed, six inches (6") wide vinyl tape, colored blue, with "Caution Buried Water Line Below" continuously printed in black along the tape length. The warning tape must be continuously laid with the pipe and be at least eighteen inches (18") above the pipe.

Tracer wire must be installed on all non-metallic water mains. Tracer wire must be suitable for direct bury and be 10 AWG with 30-mil HDPE jacket colored blue. Trace wire must be continuous. When allowed by the Engineer, splices must use Copperhead Industries, LLC connector, part #3WB-01 or equal.

40.02.04 Unauthorized Material and Fittings

- 1. ABS (Acrylonitrile Butadiene-Styrene)
- 2. Aluminum or steel corrugated metal
- 3. Galvanized or black iron pipe
- 4. Mild steel or seamless conduit
- 5. Two inch (2") or smaller HDPE and PVC Pipe for water services
- 6. Concrete Pipe
- 7. Transite
- 8. Wood stave
- 9. Lead or non-silver solder.


40.02.05 Pipe Material Selection Flow Chart

40.02.06 Minimum Size 40.02.06.01 Main lines

The minimum diameter of water mains for providing fire protection and serving fire hydrants must be equivalent to eight (8") inch diameter Class 52 ductile iron pipe (DIP). Larger size mains will be required if necessary to allow the withdrawal of required fire flow while maintaining minimum residual pressure of twenty (20) psi at ground level at all points in the distribution system.

For commercial and industrial districts, mains on collector streets are to be a minimum equivalent to twelve (12") inch diameter Class 52 DIP. A minimum of an eight (8") inch diameter Class 52 DIP may be used on streets designated smaller than collector if fire flows permit.

Smaller mains may be allowed for cul-de-sacs and dead end mains, as justified by hydraulic analysis. No water main is to be less than the equivalent of six (6") inch diameter Class 52 DIP.

If City of Homer desires mains larger than the maximum development needs including fire protection requirements, City of Homer may pay oversizing costs as described in the current Homer City Code.

40.02.06.02 Commercial and industrial service connections and extensions

The minimum size service for commercial and industrial connects is to be based on the planned and future use of the site. On-site fire hydrants and building fire protection systems should be included in calculating the size of the water service.

40.02.06.03 Residential service connections and extensions

The minimum size of residential service connections and extensions is one (1) inch. All service connections must be sized in accordance with the latest edition of the UPC. Supporting information used to determine the size of the service may be required for plan approval.

The following guideline for service connections and extensions should be used:²

- 1 2 living units: one (1") inch service connect
- 3 4 living units: one and one-half (1 ½") inch service connect

5 or more living units, industrial, commercial, or business serving twenty-five (25) or more employees or the general public at a minimum is to be sized based on the submitted engineering recommendation. City of Homer may require a larger service based upon potential lot development.

² This guideline is based upon typical development needs. Larger than average structures, fire suppression systems, large building setback from water main and other needs may require an increase in service size.

Existing service connections must be upgraded to meet the current edition of the Uniform Plumbing Code when;

- calculated peak velocities within the water service connection and extension exceeds ten feet per second (10ft/sec). Required flows are to be based upon fixture counts and engineering judgment
- less than 15 psi of residual pressure can be maintained at the furthest fixture

The owner and/or applicant can request a waiver from this requirement. All waiver requests must be in writing, supported by engineered analysis, and be approved by the City of Homer Public Works Director.

40.02.07 Depth of bury

Standard depth of bury is seven feet (7'); except on the Spit where the standard depth is ten feet (10') to the top of pipe. Deviations with less than the standard depth will require prior approval of the City of Homer Engineering Division. When cover on existing pipe becomes less than the standard due to road improvements that cause a permanent grade change, grading within easements, erosion, etc., the existing water line is to be lowered or insulated, as directed by City of Homer. Additional depth of bury is recommended in cul-de-sacs and other permanent dead end situations to protect against freezing.

The maximum sustained depth of cover for water services and mains (longer than 20') is 9 feet (9'); except on the Spit where the standard is twelve (12') feet.

The use of vertical grade breaks is required when lowering existing shallow water mains to attain standard depth of cover. Four (4") inches of 60 psi rated insulation board must be used over the transition area from shallow main to standard depth main.

40.02.07 Dead Ends

The designer must consider water turnover and impacts dead ends have on water quality. Water quality discharge points are to be installed at the end of every dead end main. Water quality discharge points are sized based on the size of the dead end main. Water quality discharge point for a typical dead main in a cul-de-sac may have a minimum of two service connections within 6' of the end of the line. Fire hydrants may be an acceptable water quality discharge point. The discharge point is to be called out for and placed into the design. All water quality discharge points must be reviewed and approved by City of Homer Engineering Division.

40.02.08 Fire Hydrants and Flow requirements 40.02.08.01 General

The Homer Fire Department must approve the location (whether installed in the street or on the premise, number and performance requirements of fire hydrants connected to the water supply for the purpose of providing fire protection (delivering fire flow). Typical spacing between fire hydrants is five hundred (500') feet in residential areas. Reference the current edition of the International Fire Code, Appendix C, Table No. C105.1 for required number and distribution of fire hydrants. The table on the next page represents minimum number of fire hydrants and average spacing between fire hydrants. This table is provided by City of Homer for assistance in design and stationing of fire hydrants. Consult the Homer Fire Department for updates or additions to this table or current codes.

The City of Homer Engineering Division (with input from the Homer Fire Department) approves all fire hydrant locations. The engineer must submit approved plans to Engineering Division for review/approval. A connection permit will not be issued prior to Engineering Division approval.

FIRE-FLOW REQUIREMENTS (gpm)	MINIMUM NO. OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS ^{a,b,c} (FEET)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT ^d
1,750 or less	1	500	250
2,000-2,250	2	450	225
2,500	3	450	225
3,000	3	400	225
3,500-4,000	4	350	210
4,500-5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500-7,000	7	250	150
7,500 or more	8 or more ^e	200	120

For SI: 1 foot = 304.8mm, 1 gallon per minute = 3.785 L/m

^{a.} Reduce by one hundred (100') feet for dead-end streets or roads

- ^{b.} Where streets are provided with median dividers that can be crossed by firefighters pulling hose lines, or arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing is to average five hundred (500') feet on each side of the street and be arranged on an alternating basis up to a fire flow requirement of 7,000 gallons per minute and four hundred (400') feet for higher fire flow requirements.
- ^{c.} Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants are to be provided at spacing not to exceed one thousand (1,000') feet to provide for transportation hazards.
- ^{d.} Reduce by fifty (50') feet for dead-end streets or roads.
- ^{e.} One hydrant for each one thousand (1,000) gallons per minute or fraction thereof.

Fire hydrants are to be placed at common lot lines five (5') feet inside the ROW from the property line and shown as such on the plans. State whether the fire hydrant is a single or a double pumper. Plans must provide a horizontal dimension measured from the property line to the fire hydrant. Plans must provide the pipe type, size, class and bearing of the fire hydrant leg. Plans must provide the lineal footage of the fire hydrant leg as measured horizontally from the center of the fire hydrant to the center of the tee. Valves for the fire hydrants must be installed on all fire hydrant leads per CHSCS Standard Details.

Hydrants and fittings must be installed a minimum of fifteen (15') feet from power poles or transformer pads and a minimum of ten (10') feet from any structural foundation or

other appurtenance such as sanitary sewer lines, storm drains, footing drains, light poles, or electrical/telephone/cable boxes.

Hydrants must not be placed within sidewalks, proposed or existing drives, or within other utilities' easements without an encroachment permit. When Municipal maintained fire hydrants are placed outside of the Municipal ROW, a permanent maintenance easement around the hydrant must be provided. In addition to the maintenance easement around the fire hydrant, an access easement must be provided to the hydrant. The maintenance easement is to be a minimum of twenty feet (20') wide, centered on the hydrant lead and extending five (5') feet beyond the back side of the hydrant. Access easements are to be of sufficient size and width to remove and replace the hydrant and hydrant leg.

All single-pumper hydrant leads are to be six (6") inches in diameter and installed on both eight (8") and ten (10") inch water mains.

All double-pumper hydrant leads are to be eight (8") inches in diameter and installed on mains twelve (12") inches and larger. Exception may be granted in residential areas where fire flows do not require double pumper and the main has been oversized for distribution.

Hydrants must be always readily accessible to the Fire Department. During construction, material or equipment must not be placed within five (5') feet of an active fire hydrant.

40.02.08.02 Private Fire Hydrant

Any fire hydrant located on private property will be classified as a private fire hydrant. These hydrants are owned by, and are the responsibility of, the owners of the property. City of Homer will provide a winter check and servicing to private hydrants for operational readiness. Any repair work or other major service may be provided pursuant to written agreement with City of Homer on a cost reimbursement basis. All private fire hydrants must be adjusted to grade in accordance with CHSCS. The adjustment to grade may be done by the owner with City of Homer inspection or adjusted by City of Homer on a reimbursable basis.

40.02.08.03 Fire Hydrant Guard Posts

Guard posts or equivalent protection must be installed around each fire hydrant in accordance with CHSCS Details. The only exception will be in a residential development where the fire hydrant is placed behind the curb and sidewalk areas or on the back side of the road drainage ditch, and the location is approved by City of Homer.

40.02.08.04 Fire Flows

Fire flow must be sustained for the duration listed in Appendix B, Table No. B105.1 of the current edition of the International Fire Code. The City of Homer Engineering Division (with input from the Homer Fire Department and the State Fire Marshal) will make the final determination of the specific fire flow required. In most cases, the fire flow duration cannot come from a single well source. Therefore, mains and reservoirs may be required.

The minimum fire flow requirements for one (1) and two (2) family dwellings having a fire area that does not exceed 3,600 square feet shall be one thousand (1,000) gallons per minute. Fire flow and flow duration for d<u>wellings</u> having a fire area in excess of 3,600

square feet must not be less than that specified in Table B105.1 of the International Fire Code, including any local amendments.

The following table was extracted and is reprinted from Appendix B, Table B105.1 of the current edition of the International Fire Code. Consult the Homer Fire Department for updates or additions to this table or current codes.

FIRE AREA (square feet)						FIRE	FLOW
						FLOW	DURATION
	TYPE IA and IB ^a	TYPE IIA and IIIA ^a	TYPE IV and V-A ^a	TYPE IIB and IIIB ^a	TYPE V-B ^a	(gallons	(hours)
						per	
	0.22.700	0 12 700	0.8.200	0.5.000	0.3.600	$\frac{1}{1}$ 500	
	0-22,700	12 701 17 000	8 201 10 000	5 001 7 000	2 601 4 800	1,500	
	22,701-30,200	12,701-,17,000	10 001 12 000	7 001 0 800	<i>4</i> 801 6 200	2,000	
	30,201-38,700	21 801 24 200	12,001,17,400	0.801 12.600	4,801-0,200	2,000	2
	38,701-48,300 48,201,50,000	21,801-24,200	12,901-17,400	9,801-12,000	0,201-7,700	2,230	2
	48,301-39,000	24,201-33,200	17,401-21,300	12,001-15,400	7,701-9,400	2,500	
	59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
	70,901-83,700	39,701-47,100	25,501-30,100	18,400-21,800	11,301-13,400	3,000	
	83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
	97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	3
	112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
	128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	
	145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-23,600	4,250	
	164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	23,601-29,300	4,500	
	183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
	203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
	225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
	247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
	271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
	295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	4
			115,801-125,500	83,701-90,600	51,501-55,700	6,250	
			125,501-135,500	90,601-97,900	55,701-60,200	6,500	
			135,501-145,800	97,901-106,800	60,201-64,800	6,750	
			145,801-156,700	106,801-113,200	64,801-69,600	7,000	
			156,701-167,900	113,201-121,300	69,601-74,600	7,250	
			167,901-179,400	121,301-129.600	74,601-79,800	7,500	
			179,401-191,400	129,601-138,300	79,801-85,100	7,750	
			191,401-Greater	138,301-Greater	85,101-Greater	8,000	
	1			*			1

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa. ^a Types of construction are based upon the International Building Code

^b Measured at twenty (20) psi

40.02.08.05 Fire Lines

Fire lines must be sized for fire flow requirements of sprinkler systems, fire hydrants, and domestic services if provided. Fire lines are to be installed in accordance with CHSCS. Newly constructed fire lines that fail testing procedures as defined in CHSCS cannot be repaired with a bell repair clamp. Repairs must be made with mechanical joint sleeves rated at a minimum of two hundred (200) psi. Fire lines are to be fully restrained.

40.02.09 Crossings

40.02.09.01 Sanitary Sewer Lines

In the planning and design of a water main extension, encountering existing sanitary sewer mains is possible and probable. Many of the existing sanitary sewer systems will be of construction materials other than ductile iron pipe.

Existing sanitary sewer mains above water mains being installed, that are less than twenty- four (24") inches in diameter and are fabricated of material that typically have pipe segments shorter than eighteen feet (18') must be replaced. The crossing is to conform to the City of Homer modified CHSCS detail for water line lowering. The replacement pipe is to extend ten (10') feet on both sides of the water crossing, with the joints equidistant and as far as possible from the water main joints. Water mains are to be designed and constructed to provide a minimum of eighteen (18") inches vertical separation, measured outside to outside of pipe.

Survey the existing sanitary sewer main inverts upstream and downstream of the proposed crossing to ensure that a minimum of eighteen inches of vertical separation is maintained between the planned water and existing sewer. If the water main is calculated to be within twenty-four (24") inches of the sewer main or if the water pipe bedding material is within eighteen (18") inches of the sewer main, then the sewer main must be exposed and surveyed to confirm that eighteen (18") inches of vertical separation is achieved.

Existing sanitary sewer mains twenty-four (24") inches and greater in diameter will be reviewed individually by the City of Homer Engineering Division for replacement requirements.

Where a water main crosses under an existing sanitary sewer, adequate structural support must be provided for the sanitary sewer to prevent damage to the sanitary sewer main.

Sanitary sewer and water crossings must be in accordance with ADEC regulations (18AAC 80.20.f.3.D & 18AAC 72.20.g.2.D). The more stringent of the ADEC or City of Homer requirements will govern. Use the provided ADEC waiver flow chart in section 20 to figure out if an ADEC separation waiver would be required.

40.02.09.02 Storm Drains

Water lines crossing storm drains require a minimum vertical separation of three (3') feet. If this minimum cannot be attained, then four (4") inches of extruded or expanded polystyrene insulation is required between the lines. Eighteen (18") inches is the minimum insulated separation distance. If eighteen (18") inches cannot be obtained, the water line will have to be relocated. The more stringent of the ADEC or City of Homer requirements will govern. Use the provided ADEC waiver flow chart in section 20 to figure out if an ADEC separation waiver would be required.

40.02.09.03 Rivers/Streams

Water lines crossing streams with a top width greater than ten (10') feet require valves on each side of the crossing. Valves will be located back from the banks to prevent damage from lateral bank migration.

40.02.09.04 ADOT/PF Crossings

Water facilities and public facilities located within ADOT/PF rights-of-way must be installed in accordance with ADOT/PF permits.

40.02.10 Valves

Valves requirements for four inch (4") and larger services and mains are as

follows: General:

- Valves are to have the same diameter as the pipe on which they are installed.
- A sufficient number of valves must be installed so that a break or other failure will not affect more than one thousand (1000') feet of main.
- Valves should be installed on the loop network at such places as to isolate branch sections as may be necessary.
- A minimum of two (2) valves must be installed at tees and a minimum of three (3) valves at crosses, with one valve on the downstream side of the fitting.
- Three (3) valves are required at tees, and four (4) valves are required at crosses where water may be supplied from more than one direction. Tees and crosses installed for a single user or fire hydrant will not be subject to this requirement.
- Valves in street intersections are to be set at the fitting, such as a tee or cross.
- Valves are to be located inside the paved area where pavement exists.
- All valve cans material must be wrapped with a minimum of one layer eight (8)mils of polyethylene encasement.
- Existing valves intended to serve new extensions are to be used unless unserviceable. New valves must not be installed in sequence with existing valves except where active services exist downstream of the existing valve.

Valves on Fire Hydrants:

• Valves must be installed on all fire hydrant leads and, in all cases, must be tied back to the main with restrained joints. Refer to CHSCS details for location.

Valves on Stub Outs:

- Provide a valve at the main for stub outs with (with continuity straps installed if required), and restrained joints placed the entire length from the main to the plug at the end of the stub out.
- A valve will be required at the end of the service connection for the on-property portion of the service when:
 - a. a valve does not exist at the main
 - b. the valve at the main is in a road classified as an arterial (major or minor) or higher designation as provided in the City of Homer Transportation Plan
 - c. the permit holder and/or contractor want to separate new construction from existing pipe for the purpose of pressure testing

Gate Valves:

• All water pipe between four inches (4") to sixteen inches (16") in diameter must have resilient seat gate valves furnished and installed in accordance with CHSCS.

Butterfly Valves:

- Butterfly valves are to be installed on all mains larger than sixteen (16") inches.
- Butterfly valves are to be installed with the operating nut located on the side of the main to the nearest property line and must be furnished in accordance with CHSCS.

40.02.11 Mainline Live Taps

Main line taps twelve inches (12") in diameter and smaller are to be done by a licensed and bonded contractor. The mainline tap must be accomplished with an appropriate tapping or drilling machine which has the appropriate capability of drilling, threading, and inserting a corporation stop under pressure with a minimal loss of water. Tapping saddles are to be used for taps two inches (2") and smaller with the exception that one (1") inch taps into ductile iron pipe can be direct tapped. Stainless steel tapping sleeves are to be used for taps larger than two inches (2"). Main line branch connections larger than twelve inches (12") in diameter require the installation of a fully restrained tee or cross in the existing main, unless City of Homer approves use of a twelve (12") inch live tap with a reducer to connect to the new main line branch.

Taps are to be made at sufficient distances from other each other, tees, bells, and other areas to prevent compromising the structural integrity of the pipe being tapped. The engineer should provide direction based on manufacturer's information and construction industry standards on the plans. In lieu of direction given on the plans, taps are not to be made any closer than three feet (3') to each other or to a bell, with the exception of ductile iron pipe, where taps may be made at twelve inches (12") apart.

All connects require a permit issued by the City of Homer Engineering Division. Live taps completed by a contractor must be witnessed by a City of Homer inspector on a cost reimbursement basis. The Contractor is to schedule live taps to be performed by City of Homer through the City of Homer Engineering Division a minimum forty-eight hours in advance of the anticipated need. Live taps proposed on mains larger than twelve inches (12") may require additional time for ordering and receiving of parts.

The contractor who completes the tap is responsible for all trench excavation, shoring, bracing, backfill and compaction to achieve an acceptable live tap trench. Trenching and excavation is to be completed such that it meets the most stringent requirements of OSHA. When shoring is used, the shoring certificates and/or engineered shoring designs (stamped by a registered engineer) are to be on-site and available for review.

The live tap trench must be long enough and of sufficient width at the bottom to allow installation of the valve and live tap connection. Typical live taps require a minimum of seven feet (7') from the face of the main being taped and a minimum clearance of one foot (1') around the remainder of the water main being tapped. The minimum trench width is four feet (4') when the tapping machine is centered in the tapping trench. The contractor is to excavate for live tap connections in such a manner that the excavation is ninety degrees (90°) to the main water line. Different configurations may be acceptable to City of Homer personnel, but they must be approved by the City Inspector.

The contractor is responsible for installing all parts and providing other items necessary to pass inspection. The Contractor shall provide all necessary equipment and manpower to assist Utility Company personnel in moving piping, valves, tapping machines and miscellaneous items into and out of the trench during the entire time Utility Company personnel are working to complete the installation of the water live tap.

Taps will not be permitted on some classes of asbestos cement pipe and PVC pipe unless approved by the City of Homer Engineering Division.

40.02.12 Thrust Restraint

Thrust Restraints:

- Bends, tees, crosses, fire hydrant legs and dead ends must have designed and installed thrust restraint.
- It is the responsibility of the engineer to review soil conditions and design the thrust restraint applicable for the project. Poor soil conditions will require special consideration.
- For DIP, thrust restraint must be provided through the use of mechanical thrust restraint devices such as EBAA Iron MEGALUG® fittings (or equal) on all mechanical joints and U.S. Pipe FIELD LOK® gaskets (or equal) on all push-on joints. The engineer is to calculate and show on construction plans the total distance from the fitting that will require restraint. Use of a computer model such as DIPRA Computer Restraining model is recommended. The profile view is to show the beginning and end stationing of the calculated length of pipe that is to be restrained.
- The constructed location of thrust restraint must be shown on the record drawings.
- Thrust blocks must be installed behind the existing main for all live taps.
- The engineer is to provide thrust restraint calculations for HDPE and connections of HDPE to existing pipe.
- All pipe types will require thrust restraint if tied into existing non-restrained pipe The engineer must calculate the total distance from the connection that will require restraint and provide thrust restraint recommendations.
- Pipe sections less than ten feet (10') in length cannot be incorporated into the work, unless required for alignment changes.

40.02.13 Special Structures

Special structures, such as pumping stations, storage tanks, diversion valves, meter vaults, PRV, etc., are subject to special thrust restraint consideration and must be designed in close coordination with City of Homer.

40.02.14 Large Diameter Transmission Mains

The following includes general guidelines for large diameter transmission mains and is not all inclusive. These systems, defined as pipelines twenty (20") inches in nominal diameter and larger, must be specifically designed by qualified engineers experienced in the design and construction of large diameter pipelines in Alaska. This experience, at a minimum, should include seismic, corrosion, thermal, water surges/transient analysis, and materials considerations for transmission piping. Information in this section that is contrary to information in other sections overrides the information furnished in those other sections. Accepted pipe materials for large diameter transmission mains are limited to welded steel pipe, concrete pressure pipe, and ductile iron pipe as the corrosion analysis (see Section 20.10) allows. Alternate materials must be approved in writing by the City of Homer City Engineer.

The system must be designed in accordance with the following AWWA manuals:

AWWA M9 Concrete Pressure Pipe Design AWWA M11 Steel Pipe Design AWWA M41 Ductile-Iron Pipe and Fittings

The design needs to include pipe bedding and backfill material, thrust restraint, pipe wall thickness, fittings, freeze protection and depth of bury, pressure ratings of fittings and appurtenances, test heads and connections for pressure and disinfection testing, utility crossings, surge/transient analysis, soil corrosivity evaluation, coatings and cathodic protection systems, linings, blowoffs and combination air release valve assemblies (CARVs) for draining and filling the line, pipe locations markers, cathodic protection test stations, easement and TCP width, access manways and other O&M access concerns, future connections, surface restoration, dewatering plans, and erosion control and stormwater pollution and prevention plans.

Thrust restraint on steel and CCP is to be done through the use of double fillet welds or CJP butt welds. Thrust restraint with DIP is to be done with U.S. Pipe TR-FLEX[®] (or equal), as

U.S. Pipe FIELD LOK[®] gaskets (or equal). EBAA Iron MEGALUG[®] fittings (or equal) are not acceptable for thrust restraint on large diameter pipelines, unless given prior written approval through City of Homer. Thrust blocks and thrust collars will be considered on a case by case basis and must receive prior approval through City of Homer.

A soil corrosivity evaluation (Section 20.10) must be done as part of the design and include both AC and DC stray current analysis. As a result of the soil corrosivity evaluation, a report of the evaluation and proposed corrosion control design and calculations must be submitted to City of Homer for approval. At a minimum, the pipe system must be designed with a sacrificial anode cathodic protection system with test stations and must be installed in conjunction with a tightly bonded coating system. The pipe and CP system must be designed for a combined minimum 70-year service life. The CP system must be designed by a cathodic protection specialist that must co-stamp the cathodic protection drawing and detail sheets.

Acceptable forms of tightly bonded coatings for buried applications include plural component polyurethane per AWWA C222, fusion bonded epoxy per AWWA C116 and C213, cement mortar coating per AWWA C205 and tape coating per AWWA C209 and C214. Polyethylene (PE) encasement is a barrier and is not an acceptable coating system. Wax tape per AWWA C217 and heat shrink sleeves per AWWA C216 are acceptable forms of tightly bonded joint coating protection for coating joints.

All large diameter transmission main design and installations must follow the coating requirement in section 20.11 Industrial Coating Applications and section 20.10.04 Protective Coatings.

40.03 Water Services

40.03.01 General

The criteria in this section apply to service connections and extensions.

All water services connections extend from the water main to the property line or to the edge of the easement whichever is greater from the mainline. Copper water services are to have a key box installed at the end of the connection (i.e. - property or easement line). Larger service connects typically have a valve near the main with a plug at the property or easement lines.

Care must be taken to construct services that are free of scrapes, nicks, gouges, dents, or kinks. Copper thaw wires must not contact copper service lines. Trench excavation is to be done in such a manner as to prevent damage to the service line and backfill will be of material outlined in CHSCS. The service lines must achieve minimum depth and be bedded with material to prevent damage to the service line.

- The service connections must be laid in straight runs, perpendicular to the property line.
- Copper pipe within the ROW and/or easement must be continuous. Use of three (3) part unions is prohibited unless otherwise approved by the City of Homer City Engineer.
- The lines must be set at a uniform grade except where grade changes are necessary to maintain minimum/maximum cover, maximum depth of key box and/or to avoid other underground utilities.

40.03.02 Meters

All properties require a meter per Homer City Code to receive water service. The Owner of such property shall obtain a water meter permit from the Public Works Department. A meter shall be installed prior to providing any water service to a customer.

Install water meters in accordance with the UPC, best plumbing practices, and the requirements of this section using a licensed and bonded Contractor.

Water meter sizing is based on expected (average daily) demands which is nominally fifty (50%) percent of maximum flows (demand).Selection of meter size will be determined by City of Homer based on the expected demand and maximum flows supplied by the Owner.

The following table represents maximum meter flows:

Size (Displacement Meter)	Max Normal Flows (GPM)
5/8-inch	20
3/4-inch	30
1-inch	50
1 ½-inch	100
2-inch	160
Size (Compound Meter)	Max Normal Flow (GPM)
2-inch	200
3-inch	450
4-inch	1000
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Selection of meter size will be based on expected demand, regardless of service extension diameter, and is subject to approval of the City of Homer Engineering Division.

Meters are to be installed in a horizontal, upright position; in a warm, dry, easily accessible place.

The applicant is responsible for purchasing a pressure reducing valve and one way check valve, to be placed in line with all meter installations as shown in the diagram below:



Compound and Turbine meters: All compound and turbine meters must have a length of horizontal pipe that is no less than five (5) times the diameter of the meter size immediately before the meter strainer and a length of horizontal pipe that is also no less than five (5) times the diameter of the meter size immediately after the meter. Any and all valves, fittings, taps, etc. must be installed before and after the horizontal pipes that are connected to the meter and strainer assembly.

40.03.03 Water Connections into Transmission Mains

Water service connections less than six (6") inches in diameter are prohibited from connecting to water transmission mains. City of Homer may allow connection into a transmission main with a six (6") inch or larger service connection if no other source of service is available.

To minimize damage by future construction, it is expected that the first customer to install a transmission main connection will install the service connection to the adjoining lot. There will be no reimbursement for the installation to the adjoining lot.

40.03.03.01 Procedures

Any proposed water service connection to a City of Homer transmission main must be approved by the City of Homer Public Works Director.

All requests for connections are to be in writing from the legal owner of the parcel. Requests will be reviewed on a case-by-case basis with a written response for approval or denial.

Eligibility for connections will be limited to parcels having no alternative solution or source of service. For example, corner lots where a lateral main can extend in another ROW will be denied direct connection to the transmission main and will require a lateral extension.

Connections will be limited to transmission mains with adequate pressure and type of

material suitable for tapping (i.e., DIP or CIP). Method of tapping into an HDPE pipe will be assessed on a case-by-case basis and requires prior approval from City of Homer.

The owner of the parcel requesting service will be liable for all costs in permitting, assessing, constructing (including the live-tap cost), and inspecting the connection. NOTE: Because of warehouse limitations, City of Homer may not have the tap materials on hand. Therefore, some lead time may be required for ordering the materials.

40.03.04 Service Connect Markers

Services stubbed to and/or on property for future use must be marked with a wooden 2" x 4" a minimum of eight feet (8') long protruding above the ground three (3') feet, painted blue and stenciled with the word "WATER" in white two (2") inch high letters.

40.03.05 On-Property Service (Extension) 40.03.05.01 General

The contractor is to ensure that the key box is in good working condition prior to installing the service extension. If the key box is not in good condition, the contractor must not tie the extension on to the key box, City of Homer is to be notified immediately.

40.03.05.02 Property and Easement Line Fittings

Property line fittings must be consistent with material outlined in the standard details of CHSCS.

City of Homer will require larger services (typically services other than copper) to install a gate valve at the property/easement line when the gate valve installed during a live tap will be in a major arterial as defined in the City's Transportation Plan.

40.03.06 On-Property Service (Extension-stub)

In new development, where the mainline water and water connections are constructed by one entity and a different entity will most likely construct the water service extension, City of Homer may allow a portion of the water service extension to be constructed in conjunction with the water service connection.

The purpose of the partial water service extension construction is to extend the water service extension beyond planned and/or constructed adjacent utilities, sidewalks, pathways and/or other permanent surface improvements to limit reconstruction/disruption of newly installed improvements.

Water extension stubs must meet the following list of requirements:

- The keybox must be installed at the standard location.
- Stubs are to maintain minimum cover from planned and/or existing grades, whichever provides the deepest cover to the point of terminus and then extend vertically to a minimum of three feet (3') above ground for flushing and testing
- Stubs are to be pressure tested with the main and service connection
- The end of the stub must be clearly marked with a service connect marker
- The design plans, contractor redlines, and record drawings are to provide the planned and constructed location and elevation of the stub at the property line and at the end of the stub.

- Stubs must be a minimum of 10' in length measured from the property line
- Stubs must not change in direction from the service connection until past the planned improvements
- Connection to the stubs for the completion of the service extension is to be accomplished by making a clean cut in the copper pipe one foot (1') from the vertical bend and joining the copper pipe with a flared 3-part union or swaged silver solder joint.
- The curb stop used to complete the pressure test cannot be used as the union.
- The existing stub is to be flushed prior to connection of the remaining portion of the extension by utilizing the service keybox.

The development team is to submit stub extension requests to City of Homer in writing during the review and approval process. The development team installing the water mainline and service connections shall also be responsible for the construction, maintenance, and warranty of the stubs under the same terms and conditions as stated in the mainline extension agreement.

40.03.07 Keyboxes

Keyboxes with a curb stop are required to be installed at the property line or easement line, whichever is a greater distance from the water mainline. The keybox typically designates where City of Homer responsibility for maintenance and repairs stops. The keybox must not be installed closer than ten feet (10') to a known or proposed structure. Keyboxes located within pavement or concrete are to be adjusted to finish grade and installed in a valve box adjustment sleeve per CHSCS details. Adjustment of keyboxes is to be accomplished by removing the keybox lid, installing a black iron pipe coupling, installing a section of black iron pipe, and replacing the keybox lid at the finish grade.

Keyboxes are to be telescoping, furnished with a lid, have an arch pattern base and may be constructed of cast or ductile iron. The operating rod and connection pin are to be constructed of stainless steel alloy type 304 or 316. The connection pin is to be a minimum of 3/16"Ø by two inches (2") long.

40.03.08 Service Connection Abandonment

City of Homer requires the contractor to obtain a disconnect permit and allow City of Homer to inspect the disconnect to ensure quality. Contractors performing the work are required to provide the following information to City of Homer:

- When disconnect is scheduled
- Where disconnect will be made, including, but not limited to, lot, block, subdivision, address, swing ties, and pipe depth, type, and size
- Who disconnected the service
- Obtaining a right-of-way permit

The abandonment method for disconnection of a copper water service at the main line will include the following:

- 1. Turn off corporation stop
- 2. Cut or disconnect copper

- 3. For three-quarter (¾") and one (1") inch services, placement of a solid copper retainer disc (Mueller Co. Catalog No. H-15535 or equal) on the end of the corporation stop and securely tighten with the flair nut
- 4. For greater than one (1") inch services, cut copper pipe within one (1') foot of corporation stop, crimp cut end of copper and securely tighten the flair nut
- 5. Cut or disconnect thaw wire
- 6. Remove keybox and operating rod
- 7. Record drawing of the abandoned service connection

Abandonment of larger services requires that the service line must be capped and or blind flanged at or cut out of the main. This may include, but not be limited to, removal and replacement of water main pipe, blind flanging tapping sleeves, capping tees. This work will most likely require a water turnoff.

40.04 Pumping Plants

40.04.01 General

Criteria related to pumping plant design can be found in "Improving Well and Pump Efficiency", Otto J. Helweg, Scott, Verne H., and Scalmanini, Joseph C., 1983, published by the American Water Works Association and the "Recommended Standards for Water Works" (a.k.a. "10 States Standards"), Great Lakes-Upper Mississippi River Board of State Sanitary Engineers, current edition. By reference, the above documents, or an alternate approved in writing by City of Homer, are made a part of this manual.

40.04.02 Pump Design

Consideration is to be given to the existing and future service area when designing pumping equipment. When areas are not at maximum development, pumps are to be designed to meet the ratio-to-peak flows for the current users.

40.05 Booster Stations

All booster station facilities shall be designed as above ground structures to maintain the sanitary quality of pumped water. Subsurface package stations, pits or pump rooms and inaccessible installations are to be avoided. Use of a subsurface station requires written approval from the City of Homer Public Works Director.

The design and installation of these stations shall conform to the latest edition of CHSCS, and all work is to be in accordance with the latest editions of IBC, IMC, UPC and NEC. (All, as amended and accepted by the City).

40.05.01 Location Considerations

The station must be located so that the proposed site will meet the requirements for sanitary protection of water quality, hydraulics of the system and protection against interruption of service by fire, flood, or any other hazard. Additional design considerations are:

- Functional aspects of the building layout
- Provisions for future building expansion
- Site grading and drainage elevated to a minimum of three feet above the highest recorded flood elevation, or protected to such elevation

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- Graded around the station so as to lead surface drainage away from the station
- Designed with a site plan to include secondary access roads with level parking for maintenance trucks and equipment and with access to the doors of the station and related walkways
- Compatibility with surrounding architectural designs
- Exterior fencing and snow storage

40.05.02 Building Layout

Design must provide for:

- Adequate space for the installation of additional units if needed, and for the safe servicing of all equipment
- Durable construction, fire, and weather resistant, with outward-opening doors
- A floor elevation of at least six (6") inches above finished grade and drained in such a manner that the quality of potable water will not be endangered. Floors must slope at least three (3") inches in every ten (10') feet to a suitable drain
- A suitable outlet for drainage from pump glands without discharging onto the floor
- Accessibility of equipment for operation, servicing, and removal
- Hydro-pneumatic tanks

40.05.03 Standby Power

If power failure results in cessation of minimum essential service, power supply must be provided from at least two (2) independent sources, a standby or an auxiliary source may be required by City of Homer.

Standby power may be required by City of Homer. If not, the station is to be wired for external hook up for a portable generator. Electrical supply and control and alarm circuits are to be designed to provide strain relief and to allow disconnection from outside the booster station. Terminals and connectors must be protected from corrosion and located outside the booster station. When located outside, weatherproof equipment is to be used. The booster station must have a disconnect switch with a manual transfer switch including an external plug to match portable generation. Contact City of Homer Engineering Division for correct generator receptacle connection. The electrical disconnect and transfer switch must be within twelve (12') feet of the station.

40.05.04 Meters

When required by City of Homer, booster stations are to have meters installed per City of Homer and CHSCS details and meet SCADA requirements.

40.05.05 Equipment Nameplates and Manuals

For each station, provide six (6) complete sets of operation and maintenance manuals. Each operation and maintenance manual must include operational procedures to be followed in case of blockage, power outage, circuit overload, or emergency; station shut down and start up procedures, including lock out/tag out requirements; routine maintenance tasks and schedule for all equipment and assemblies; a list of any special tools required to operate or maintain the station; and mechanical and electrical drawings of the facility.

In addition to the facility manuals, provide six (6) complete sets of equipment manuals

for each item of equipment and each instrument panel in the facility. Each equipment manual must contain:

Summary showing:

• Make, model, style, serial number, description, manufacturer's specifications, and location in the construction.

• Full names and addresses of manufacturer, vendor, prime contractor, and installer. Manufacturer's literature properly marked to identify the specific item. The literature must include:

- Instruction for installation, operation, maintenance, and repair.
- Shop drawings, wiring diagrams, and system layouts, where such drawings are required in other sections of the specifications.

Each piece of major equipment in the station is to have nameplates affixed in an accessible location which includes make, model, serial number, manufacturer, and power requirement.

40.05.06 Equipment Servicing

City of Homer Engineering Division will review and approve all equipment necessary for servicing a booster station. At a minimum, booster stations must be provided with:

- 1. Crane-ways, hoist beams, eyebolts, or other adequate facilities for servicing or removal of pumps, motors, or other heavy equipment
- 2. Openings as needed (i.e., roof penetration) for removal of heavy or bulky equipment (largest)
- 3. A convenient tool board or other facilities as needed, for proper maintenance of the equipment

40.05.07 Heating

Stations must have a natural gas heater as the primary heat source with an electric heater for back-up heating. Heating equipment must meet all applicable codes.

40.05.08 Ventilation and Dehumidification

Ventilation and dehumidification must conform to existing local, state and/or federal codes. All ventilation switches are to be located at the entryway.

40.05.09 Lighting

Pump stations must have adequate lighting for installation, removal, and maintenance of all equipment. All electrical work is to conform to NEC.

40.05.10 Pumps

At least two (2) pumping units are to be provided. More than two pumps may be required to meet all flow conditions. With any pump out of service, the remaining pump or pumps must be capable of providing the maximum daily pumping demand of the system. The pumping units are to be approved by City of Homer and:

- 1. Have ample capacity to supply the peak demand without dangerous overloading
- 2. Be driven by a prime mover able to operate against the maximum head and air temperature which may be encountered

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- 3. Be low maintenance pumps
- 4. Have any unique spare parts or tools readily available

40.05.11 Booster Pumps

Booster pumps must be located or controlled so that:

- 1. They will not produce negative pressure in the suction lines
- 2. The intake pressure must be at least twenty (20) psi when the pump is in normal operation
- 3. Automatic cutoff pressure must be at least ten (10) psi in the suction line
- 4. Automatic or remote control devices are to have a range between the start and cutoff pressure which will prevent excess cycling
- 5. A bypass is available

40.05.11.01 In-line Booster Pumps

In addition to the other requirements of this section, in-line booster pumps must be accessible for servicing and repairs.

40.05.12 Supervisory Control And Data Acquisition (SCADA)

All stations must be designed and constructed with SCADA equipment compatible to City of Homer' system which will report data from the station in both operation and out of service modes. All stations must be electrically operated and controlled and have a signaling apparatus of proven performance. Installation of electrical equipment is to conform to the applicable State and local electrical codes and the National Electric Code. Section 70.04 of this document lists the minimum SCADA equipment necessary. Telemetry requirements in the sanitary sewer lift station must also be met.

40.05.13 Appurtenance

s 40.05.13.01 Valves

Pumps are to be adequately valved to permit satisfactory operation, maintenance, and repair of the equipment. Each pump is to have a positive-acting pressure reducing valve on the pump discharge prior to the shut-off valve. All valves are to be epoxy coated. The valve harness design must be determined by City of Homer.

40.05.13.02 Piping

In general, piping must:

- Be designed so that the friction losses will be minimized
- Not be subject to contamination
- Have watertight joints
- Be protected against surge or water hammer
- Be such that each pump has an individual suction line have a manifold ensures similar hydraulic and operating conditions
- Adequate vibration dampers
- Paint coating per Section 20.11 of this manual

44.05.13.03 Gauges

Each pump is to have standard pressure gauges on the suction and discharge lines and telemetry lines to measures and discharge (when required by City of Homer) flows. All gauges are to be high quality four (4") inch glycerin filled with one-quarter (1/4") inch

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national pipe threads (Ashcroft or equal). The pressure range of the gauges must be specific so that the normal system working pressure does not exceed sixty (60%) percent of the pressure range of the gauge.

44.05.13.04 Water Seals

Water seals must not be supplied with water of a lesser sanitary quality than that of the water being pumped. Where pumps are sealed with potable water and are pumping water of lesser sanitary quality, the seal must:

- Be provided with a break tank open to atmospheric pressure
- Have an air gap of at least six (6") inches or two (2) pipe diameters, whichever is greater, between the feeder line and the spill line of the tank.

44.05.13.05 Controls

Pumps, their prime movers, and accessories must be controlled in such a manner that they will operate at rated capacity without dangerous overload and should provide for lead/lag operation of multiple pumps. Where two (2) or more pumps are installed, provision must be made for independent alternation. Provisions are to be made to prevent energizing the motor in the event of a backspin cycle. Electrical controls must be located above grade.

44.05.13.06 Water Pre-lubrication

When automatic pre-lubrication of pump bearings is necessary and an auxiliary power supply is provided, the pre-lubrication line must be provided with a valved bypass around the automatic control so that the bearings can, if necessary, be lubricated manually before the pump is started.

40.05.14 Painting

All booster stations must be completely painted inside and outside including, but not limited to, all walls, piping, equipment, appurtenances, etc. The facility must be painted in accordance with the best building practices of the International Building Codes. (Reference Section 20.11 of this manual)

40.06 Pressure Regulating Valve (PRV) Stations

40.06.01 General

PRV stations must be designed to maintain the sanitary quality of the water system. Inaccessible installation must be avoided. The PRV station must be generally an above ground facility so located that the proposed site will meet the requirements for sanitary protection of water quality, hydraulics of the system and protection against interruption of service. No PRV station shall be subject to flooding. The design and installation shall conform to the latest edition of CHSCS, and all work shall be in accordance with the latest editions of IBC, IMC, UPC and NEC. (All, as amended and accepted by MOA).

All PRV stations shall be designed with the same considerations as provided in Section 40.05 of this manual. Underground vaults shall only be designed on special conditions approved by the City of Homer Public Works Director.

40.06.02 PRV Station Design

The station shall be:

- 1. Readily accessible at all times
- 2. Graded around the station so as to lead surface drainage away from the station
- 3. Designed with a site plan to include level parking of maintenance trucks and equipment, including a site for snow storage
- 4. Protected to prevent vandalism and entrance by unauthorized persons or animals
- 5. Designed with adequate space for the installation of additional units if needed, and for the safe servicing of all equipment
- 6. Of a prefabricated or cast in place durable construction, weather-resistant and waterproofed as required by City of Homer. Precast manhole sections may not be considered as an acceptable alternate
- 7. Provided with sump pumps, crane-ways, hoist beams, eyebolts, or other adequate facilities for servicing heavy equipment
- 8. Completely painted inside and outside including, but not limited to, all walls, piping, equipment, appurtenances, etc.
- 9. Key locked entries
- 10. Sump pumps and discharge lines
- 11. Stairway access whenever possible.

40.06.03 Stairways, Ladders and Bilco Hatches

When a PRV station is approved as a vault; stairways, ladders and lockable "Bilco" hatches must:

- 1. Be provided in pits or compartments which must be entered
- 2. Have handrails on both sides, and treads of non-slip material
- 3. Be designed per IBC

Stairs are preferred in areas where there is frequent traffic. They must have risers not exceeding nine (9") inches and treads wide enough for safety.

40.06.04 Heating

Provisions must be made for heating in <u>accord</u>ance with the IBC, UPC and NEC.

Whenever possible, install gas heating. In PRV stations not occupied by personnel, only enough heat need be provided to prevent freezing of equipment or treatment process.

40.06.05 Ventilation

Ventilation must conform to existing local, State and/or federal codes. Adequate ventilation must be provided for all PRV stations. Forced ventilation of at least six (6) changes of air per hour shall be provided for:

- 1. All compartments, pits, and other enclosures below ground floor
- 2. Any area where an unsafe atmosphere may develop or where excessive heat built up
- 3. Ventilation switched at the access entry of the facility

Ventilation plans are to be submitted with the preliminary station design plans.

40.06.06 Dehumidification

In areas where excess moisture could be hazardous to human safety or could cause damage to equipment, means for dehumidification are to be provided.

40.06.07 Lighting and Electrical

PRV stations are to be adequately lighted throughout. All electrical work is to conform to the requirements of any related agency and to the relevant local, State and/or federal codes. Lighting and electrical plans must be submitted with preliminary design plans.

40.06.08 Dual Valve Installation

Isolating butterfly valves are required to service the reducing valves.

The battery or compound installation is desirable when a wide range of flows is required. Usually, the smaller valve is adjusted for a discharge pressure setting of three (3) to five (5) psi above the setting of the large valve so that the small valve will handle the low flow requirements. The large valve opens only when the demands exceed the capacity of the smaller valve and pressure drops to the pressure setting of the large valve. While initially more expensive, savings in maintenance costs make this a more economical installation over the long run.



Advantages:

- 1. Reduces maintenance costs and noise which result from a large valve operating at low flows
- 2. Avoids hunting action of a single large valve operating at low flows and the resulting pressure fluctuations

3. Provides uninterrupted service while servicing or replacing one of the reducing valves

40.06.09 Design Check List for Reducing Valve

- 1. Have the inlet and outlet pressures been determined?
- 2. Have the maximum and minimum flow rates been determined?
- 3. Is there adequate differential pressures for proper valve action (ten (10) psi for four (4") and six (6") inches, five (5) psi for eight (8") inches and larger)?
- 4. Are there quick acting valves in the system? (This may require a separate cushioning device.)
- 5. Design maximum continuous line velocity at fifteen (15) fps.
- 6. If a single reducing valve is used, is a manual bypass installed?
- 7. Does wide range of flows call for dual installation (large and small valve in parallel)?
- 8. Does a high differential or low flow rate call for special trim materials (i.e., stainless steel)?
- 9. Does high differential and low outlet pressure make cavitations likely?
- 10. Is valve sized properly for differential pressure and flow rates (not necessarily line size)?
- 11. Is the valve properly supported (under flanges and not under bottom cap)?
- 12. Is there adequate clearance above and around the valve to facilitate servicing?
- 13. Are there inlet and outlet pressure gauges?
- 14. Proper gauges and telemetry devices?

40.06.10 Sizing Reducing Valve

The correct sizing of a pressure regulating valve depends on several factors: differential pressure, maximum and minimum flow rates, anticipated future requirements, etc. Each application must be investigated using its own conditions.

The maximum flow rates are intended to limit the line velocity to approximately fifteen (15) fps. The valve should be capable of passing larger quantities of water for relatively short periods of time.

All valves (when in good operating condition) must be capable of drip-tight shut-off. Wide fluctuations in flow are best handled by using the dual valve installation illustrated in Section

40.06.08 of this manual.

40.06.11 Supervisory Control And Data Acquisition (SCADA)

All PRV's must be designed and constructed with SCADA equipment compatible to City of Homer which will report data from the PRV both operation and out of service modes. All PRVs must be electrically operated and controlled and have a signaling apparatus of proven performance. Installation of electrical equipment is to conform to the applicable State and local electrical codes and the National Electric Code. Section 70.04 of this document lists the minimum SCADA equipment necessary. Telemetry requirements for the PRV is to meet the same requirements as stated in the section covering sanitary sewer lift stations

50.00 RECORD DRAWINGS AND FINAL DOCUMENT SUBMITTALS

50.01 General

City of Homer requires approved record drawings, survey notes and contractor field installation notes as a condition of final acceptance for all constructed or partially constructed sanitary sewer and water improvement projects. All record drawings to be submitted should be done so in accordance with the procedures set forth in this section. Furthermore, record drawings must also be in accordance with those regulations as set forth by the State of Alaska Department of Environmental Conservation for both wastewater and/or water systems (Wastewater Disposal Regulations 18 AAC 72 and Drinking Water Regulations 18 AAC 80, latest editions). Submitted record drawings not meeting ADEC regulations will not be considered approved.

50.02 Record Drawing Information

Record drawing information required in the submittal for acceptance includes a complete set of drawings, construction contractor's field installation notes of the facilities asconstructed, engineer's inspection reports, all lab and on-site materials testing reports/results, original construction field survey notes, and the original copy of the approved "Certificate of Construction for Domestic Wastewater Systems" and/or "Construction and Operation Certificate for Public Water Systems" as required by State of Alaska Department of Environmental Conservation.

50.03 Drawings

Record drawings submitted for acceptance are to be in electronic AutoCAD and pdf formats. The record drawing must contain the same data shown on the construction contractor's field installation notes, appropriate symbols and identifiers of data provided by the construction contractor, and data provided by the engineer.

Record drawings are to identify or include:

- 1. Construction Contractor's name.
- 2. Engineering firm's name and address.
- 3. All certifications and professional seals as required by the State of Alaska Department of Environmental Conservation's regulations as stated in the foregoing.

50.04 Procedures for Changes to Original Drawings

All revised work must be electronically incorporated into the plans, in size, type and scale of the original drawing. City of Homer will reject record drawing done with ball point and nonblack ink pens. A straight line must be drawn through any changes in stationing, elevations and other notes that have been revised. The correction must be in italic (or within a "cloud") and show any changes, deletions, or omissions, and must be followed with the appropriate symbol. Any utility line or construction note that has been deleted or relocated must be crosshatched with the original information remaining legible.

The scale and line weight of new utilities, as-built information or new construction must conform to the scale of original drawings.

Reference information used in preparation of record drawings, such as inspector's prints and field installation books, must be noted on drawings.

Profile changes must be made with elevations or stationing only. The original profile line

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need not be modified unless the change is greater than one (1') foot.

50.05 Revisions

Revisions to drawings are defined as all changes made between the dates the project plans are approved by City of Homer and the date the record drawings are accepted as complete by City of Homer.

The particular area of the drawing where a major revision has been made must be clouded, and the appropriate revision number placed in a triangle must be shown in that location. The clouded area must not be shaded or in any form of grey tones.

Revisions must be listed in the title block of the drawing and show:

- The revision number in a triangle (revisions must be consecutively numbered on each drawing beginning with number one (1)) Note: A particular set of revisions which may affect several drawings will not necessarily be identified with the same revision number, depending on the number of prior revisions made to each particular drawing.
- 2. The date the revision was made on the drawing Note: A particular set of revisions which may affect several drawings must be assigned the same date even though the actual work involved may take several days to complete.
- 3. The initials of the person making the revision
- 4. A brief description of the revision

50.06 Survey and Field Installation Notes

Construction surveys must be accomplished by a surveyor licensed in the state of Alaska and the notes must include:

- 1. Contractor's name and address
- 2. Line and grade survey notes
- 3. Surveyor's firm's name and address
- 4. Construction survey notes

Field installation notes from the Contractor must contain the horizontal and vertical location information as constructed including, but not limited to:

- 1. Manholes and cleanouts, horizontal station, and vertical elevations.
- 2. Valves, fire hydrants, key boxes, PRV's and mechanical joint fittings.
- 3. Make, model and location of all thrust restraint fittings and total footage of pipe restrained.
- 4. Service connections at the mains and stationing.
- 5. Special fittings.
- 6. All encountered utilities, any pipe or street insulation and limits of all fabric material.
- 7. Changes in pipe size, slope, or type; and,
- 8. Service locations at property lines swing-tied to above-ground facilities, such as fire hydrants, houses, light poles, or water key boxes. For sanitary sewer, give the invert elevation of the connection at the property line or easement line.

50.07 Record Drawing Submittal and Acceptance

Final acceptance of the development will not occur until the Record Drawing has been approved by City of Homer. Continual service will not commence until Record Drawings have been approved by City of Homer and have met the requirements of ADEC Regulations

18 AAC 72 and 18 AAC 80.

50.08 Buried or Unmarked Appurtenances

Buried or unmarked appurtenances are not justifiable reasons for not submitting Record Drawings. If necessary, to provide the proper information, the developer, contractor, or engineer shall, at their expense, uncover or expose the appurtenances and all utilities encountered to effect survey measurements required for proper records. The Record Drawings should state who provided the record information.

50.09 Sanitary Sewer and Water Record Drawings

Minimum record drawing information to be obtained is as follows:

- 1. Vertical and horizontal location on all tees, bends, valves, restrained piping and fittings, hydrants, manholes, cleanouts, changes in alignment, and ends of pipe. Vertical and horizontal location at minimum intervals of three hundred (300') feet on extended runs without alignment change or fittings.
- 2. Lineal footage of pipe installed, including revisions to stationing and elevations.
- 3. Vertical and horizontal location on all existing utilities exposed by the trench excavation. Horizontal location may be relative to the line being installed.
- 4. Horizontal location on new surface features such as valves, hydrants, key boxes, manholes, cleanouts, any repair coupling, etc. This information should be relative to street center lines and/or property lines. Key boxes and sanitary sewer service connections are to be measured from property corners.
- 5. Horizontal location or stationing from the nearest feature at any change in pipe material (i.e., transite to ductile, change in pipe class, etc.).
- 6. Areas where foundation material is used and/or where bedding material is imported.
- 7. Water and sewer service connection chart data.
- 8. Vertical elevation of the service connection at the main and at the property line. Horizontal offset measurement of the service connection to the property line on the plan view.
- 9. Information on subsurface soil conditions encountered in trenches every three hundred (300') feet or where significant changes occur. Emphasis must be placed on native materials at the bottom of the trench. Show and delineate areas of over-excavation and foundation material installation.
- 10. Location and stationing of all pipe abandonment. Include both length of pipe removed, and pipe abandoned in place.
- 11. Horizontal and vertical location of any approved sanitary sewer or water service connection pigtail(s).
- 12. Location size and type of all cathodic protection devices.
- 13. Horizontal dimensions of building footprints.
- 14. Horizontal dimensions of all easements.

Any changes authorized in the field shall be shown and noted as "field change".

50.10 As-Constructed Survey Notes

Post-construction survey shall be performed by a surveyor licensed in the state of Alaska and shall include the items addressed in this section and Division 65.00 of CHSCS. The post construction survey notes, the construction contractor's field installation notes, the engineer's daily inspection notes, and the record drawings shall be submitted to City of

Homer for review and approval.

50.11 Engineer's Responsibility on Record Drawings

At a minimum, the engineer shall transfer to the original approved construction plans the following information:

- The construction contractor's redline drawings of the facilities as constructed.
- The field installation notes from the line and grade books.
- Station and elevation of all utilities encountered in the trench.

The engineer shall certify that the record drawing reflects accurate as-constructed information. The engineer shall resolve any errors in the calculations with the construction contractor prior to submittal to City of Homer for approval.

The engineer shall put all numbers for permits issued during design and construction (i.e., ADOT/PF, ROW, Wetlands, Recorded Easements, etc.) on the record drawing.

The engineer shall verify that any waivers acquired either during the design or construction are noted on the record drawings.

50.12 Horizontal and Vertical Attribute Values

The engineer or contractor shall submit horizontal and vertical attribute values in accordance with Section 70.03 of this document.

60.00 (Not Utilized)

70.00 APPENDICES

70.01 Acronyms and Abbreviations

NOTE: When acronyms or abbreviations are used on the plans, they shall be indicated and shown in the legend.

DEFINITION	ABBR	DEFINITION	ABBR
Α		Alaska Water & Wastewater	
Ale and an ad		Management Association	AWWMA
Abandoned		Alignment	ALIGN
Abbroviation		Alkalinity	ALKY
Above Finished Floor		Alternate	ALT or
Acoustical	AFF		ALTN
Acousticat	ACCOUST or ACT	Alternating Current	AC
Acoustical Board		Altitude	AL
Acoustical Tile	ACGD	Altitude Valve	ALV
Acro	ACST	Aluminum	AL or ALUM
Acryl-Butadiene-Styrene		Aluminum Cap (Survey Marker)	ALCAP
Activated Biological Filter	AB5 ABE	Ambient	AMB
Activated Sludge	Δς	American Water Works Association	nAWWA
Actual	ACT	American Wire Gage	AWG
Actuators	ACC	Americans with Disabilities Act	ADA
Additional	ADDI	Ammeter	Δ
Additive	ADD	Anchor Bolt	AR
Adjacent	ADJ	Anchorage International Airport	
Adjust	ADJ	Anchorage Municipal Code	
Adjustable	ADJ	Anchorage School District	
Adjustable Speed	AS	Anchorage School District	ASD
Adjustable Speed Manual	ASM	Anchorage Sewer Utility	ASU
Aerial	AER	Anchorage Water &	
Aeration	AER	Wastewater Utility	City of
After Midnight	AM	Homer Anchorage Water Utility	AWU
Ahead	AH	Angle	<
Air Compressor	AC	Angle Point	AP
Air Conditioning	AC	Anode	ANOD
Air Handler	AH	Anodized	ANOD
Air Release Valve	ARV or AV	Apartment	APT
	or AVAR	Application	APP or
Air Supply Unit	ASU		APPLI
Air Vacuum & Air Release Valve	AVAR	Approved	APPD
Air Vacuum Relief Valve	AIRV	Approximate	APPROX
Air Vacuum Valve	AVAR	Architectural	ARCH
Air Valve	AV	Area Control Console	ACC
Air Vault	AIRVI T	Area Control Panel	ACP
Alaska	AK	Area Drain	AD
Alaska Department of Environmen	tal	As Built Achastas Coment	ASR
Conversation	ADEC	Aspestos Coment Dina	
Alaska Department of Transportat	ion	Aspestos Cement Pipe	AC
And Public Facilities	ADOT&PF	Asphalt Cement	AC

DEFINITION	ABBR	DEFINITION	ABBR
Acabalt Concrete		Bolt Circle	BC
Asphalt Concrete	AC	Booster	BST
Asphalted Concrete	AC	Booster Station	BSTSTN
Anchorage Fire Department	AFD	Bore Hole	BH
Assembly	ASSY	Bottom	вот
Assembly Ordinance	AO	Bottom Face	BF
At	@	Bottom of Duct	BOD
Auto Manual	AM	Bottom of Line	BOI
Auto Transformer Temp Switch	TSS	Bottom of Pine	BOP
Automatic Sampler	SAM	Bottom of Slope	BOS
Automatic Transfer Switch	ATS	Boulovard	
Avenue	AVE	Brake Horsepower	
Average	AVG	Brace Cap	
Azimuth	AZ	Diass Cap British Thormal Unit	
D			BIU
D		Buddler	BBL
Back	BK	Building	BLDG
Back Flow Preventer	BFP	Bureau of Land Management	BLM
Back Of Curb	BOC	Butterfly Valve	BFV or BV
Back Pressure Valve	BPV	С	
Back Water Valve	BWV	-	
Ball Valve	BLV	Cabinet	CAB
Basement	BSMT	Cabinet Unit Heater	CUH
Basin	BSN	Cable (TV)	С
Bath	B	Capacity	CAP
Beam	BM	Capital Improvement Budget	CIB
Bearing	BRG	Capital Improvement Program	CIP
Bedroom	BDRM	Carpet	CAR
Begin Curb Return	BCR	Cast In Place	CIP
Begin Curve	BC	Cast Iron	CL
Bogin Horizontal Cunyo		Cast Iron Pine	CIP
Begin Vortical Curve	BVC	Catch Basin	CB
Beginning of Payomont	BOD	Cathodic	CATH
Poginning of Pino	POP	Cathodic Protection Equipment	САТН
	DOF		
Dell & Spigot			
Bench Mark	DQ3 DM	Centing Compart Martar Lined	CLG
Between		Cement Mortar Lineu	
Detween		Center	
Deturner Contour		Center Food	
Between Centers	BC	CenterLine	
Biochemical Oxygen Demand	BOD	Center Line	
Black	BLK	Center To Center	CCOrC
Blind Flange	BF or		тос
	BLD FLG	Centered	CTRD
Block	BLK	Centerline	С
Blocking	BKG or	Centimeter	СМ
	BLKG	Central Control System	CCS
Blower	BLR or BLW	Ceramic	CER
Blow-Off (Assembly)	BO	Ceramic Tile	СТ
Board	BD	Chain Link	CL
Boiler	BLR		
Bollard	BOL		

DEFINITION	ABBR	DEFINITION	ABBR
Check Valve	CV or	Construct	CONST
	CHK V	Constructio	CONST
		n	
Checked	CHKD	Construction Joint	CJ
Checkered	CHKD	Construction Manual	СМ
Checkered Plate	CHKD PL	Construction Specifications	
Chemical	CHEM	Institute	CSI
Chemical Oxygen Demand	COD	Continue or Continued	
Chlorinated Polyvinyl Chloride	CPVC	or Continuous	CONT
Chlorinator	CL	Contractor	CONTR
Chlorine	CL	Control Board	CB or CFCB
Chlorine Contact	C/C	Control Cable	CC
Chlorine Contact Basin	CLCB	Control Joint	CJ
Chlorine Gas	CL	Control Power Transformer	CPT
Circuit Circuit Deceler	CKI	Control Relay	
Circuit Breaker	CB	Control Relays	RELAY
Circular		Controlled Density Fill	CDF
Circulating		Condinate	CUORD
Clarifier		Copper Copper Ding	COR
Class		Corper Fipe	COP
Class Clay Pipe		Corps of Engineers	COF
Cleanout	$C \cap \alpha r \cap \Omega$	Corridor	CORR
Clear		Corrugated Metal Pine	CMP
Clearance	CL	Countersunk	CTSK
Close	C	Coupling	CPLG
Closed Circuit Television	CCTV	Cove Base	CB
Closet	CLST	Creek	СК
Column	COL	Crossing	XING
Combination Air Vacuum		Cubic	CU
Release Valve	CARV	Cubic Feet	CF or CU FT
Comminutor	СОМ	Cubic Feet per Hour	CFH
Commutator	COMTR	Cubic Feet per Minute	CFM
Compacted	COMP	Cubic Feet per Second	CFS
Composite Plastic Material	СРМ	Cubic Yard	CY
Compressor	CMPR	Culvert	CULV
Computed	COMP	Curb & Gutter	C&G
Computer Auto Manual	CAM	Cured In Place Pipe	CIPP
Computer Manual	CM	Current Transformer	CT
Concentric	CONC	Cylinder	CYL
Concrete	CONC	D	
Concrete Cylinder	CONC-CYL	Descent	DN
Concrete Cylinder Pipe	ССР	Decant	DN
Concrete Masonry Units	CMU	Deck	DK
Concrete Pipe		Deflection	
Conductivity		Deflection Defermed Par Ancher	
Conformer			
Connection		Debumidifier	
Constant Speed		Demonstration	DEMO
constant speed	63		

DEFINITION	ABBR	DEFINITION	ABBR
Delete	DEL	Elapsed Time Meter	ETM
Demolition	DEMO	Elbow	ELB or ELL
Department of Environmental		Electric	E
Conservation	DEC	Electric Motor	MOTOR
Department of Public Works	DPW or PW	Electrical	ELEC
Detail	DET or DTL	Electromagnetic Starter	MAGST
Design and	DCPM	Electronic	ELEC
Construction Practices		Elevation	EL or ELV
Manual			
Diagonal	DIAG		or ELEV
Diagram	DIAG	Elevator	ELEV
Diameter	DIA	Emergency	E
Diaphragm	DIAPH	Empty	E
Differential Measuring Equipment	DIFF	Enclosure	ENCL
Diffuser	DIF	End Curb Return	ECR
Digital Control Unit	DCU	End Curve	EC
Dimension	DIM	End of Pipe	EOP
Dining Divert Comment	DIN	End of Project	EOP
Direct Current	DC	End Vertical Curve	EVC
Direction	DIR	Energy Recovery Station	ERS
Discharge	DISCH	Engineer	
Disnwasner		Engineer	
Dispenser Discelved Ovygen	DISP	Environmental Protection Agency	EPA EO or EOI
Dissolved Oxygen	DU	Equal Equally Spaced	
Distance		Equation	EQL SP
Diversion Box	DD	Equation	
Door	DR	Equipment	
Double	DRI	Escalator	
Dowel		Estimate	FST
Downspout	DS	Excavation	FXC
Drain	DR	Exhaust Air	F/A
Drainage Pit	DP	Exhaust Fan	FF
Drawer	DRWR or	Existing	EXIST
	DWR		or EXST
Drawing	DWG F	xpansion	EXP
Drinking Fountain	DF	Expansion Joint	EXP JT
Ductile Iron	DI	Explosion Proof	EP
Ductile Iron Pipe	DIP	Extension	EXT
Ductile Iron Pipe Polvethylene	DIPL	Exterior	EXT
Lined			
E		External	EXT
Fach	ΕΛ	Extra Strong	XS
Each Face	EF	F	
Each Way	EW	Fabricate	FABR
Easement	ESMT	Fabricated	FABR
East	Е	Fabrication	FAB or FABR
Eccentric	ECC	Face of Concrete	FOC
Edge of Pavement	EOP	Face Of Wall	FOW
Effluent	EFF	Face To Face	F TO F
Effluent	EFL	-	
Ejector	EJT or EJTR 14		

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DEFINITION	ABBR	DEFINITION	ABBR
Facility	F or FACIL	Floor Beam	FB
Factory	FCTY	Floor Drain	FD
Fahrenheit	F	Flooring	FLG
Fail Closed	FC	Flow Control Valve	FCV
Fail Last Position	FLP	Flow Indicator	FI
Fail Open	FO	Flow Line	FI
Fan	FN	Flow Measuring Equipment	
Far Face	FF		
Far Side	FS		
Fast Off Slow	FOS		FS
Fast Off Slow Auto	FOSA	Fluorida	FLUUR
Fast Off Slow Remote	FOSR	Fluonde	
Feeder	FDR	Fact	FLUUR
Feet	FT	Fool	
Feet per Minute	FPM	Footing	
Feet per Second	FPS	Force Main Forceight	
Female Pipe Thread	FPT	Foresignt	F3 FC
Ferric	FE	Forged Steel	F3
Ferric Sulfate	FE	Forward Oli Reverse	
Field Book	FB	Forward Reverse	
Field Change	FC	Found	
Figure	FG FIG	Foundation	
Finish	F or FNSH	Frequency Drive	FUDR
Finish Floor	FF	Full Vollage Reversing	
Finished	FIN or FN	Fund	
Finished Floor Elevation	F FL EL	Fuse	
Finished Grade	FG	Future	FUI
Finished Surface	FS	G	
Fire Alarm Equipment	FIRE	Gage	GA
Fire Damper	FD	Gallon	GAI
Fire Extinguisher	FE	Gallons per Capita per Day	GPCD
Fire Extinguisher	FEXT	Gallons per Day	GPD
Fire Hydrant	FH	Gallons per Hour	GPH
Fire Line Valve	FLV	Gallons per Minute	GPM
Fire Retardant Panel	FRP	Galvanized	GALV
Fire Retardant Treated	FRT	Galvanized Iron	GI
Fire Retardant Treated Plywood	FPW	Galvanized Steel	GALVS
Fixture	FIXT	Galvanized Steel Pipe	GSP
Flange	FLG	Gas (Natural)	G
Flanged	FLGD	Gas Fired Make Up Heater	GFMUH
Flanged Coupling	FC	Gate Valve	GV
Flanged Coupling Adapter	FCA	Gauge	GA
Flashing	FLASH	General	GEN
Flat Bar	FB	General Manager	GM
Flat Face	FF	Generator	GEN
Flexible	FLEX	Geographic Information System	GIS
Flexible Pipe Coupling	FPC	Glass	GL
Float Switch	FS	Glass Fiber Reinforced Cement	GFRC
Flocculation	FLOC	Global Positioning System	GPS
Flocculation Basin	FLOCBSN	Globe Valve	GLBV
Floor	FLR or FL		

DEFINITION	ABBR	DEFINITION	ABBR
Government	GOV	High Strength Bolt	HSB
Grab Bar	GB	High Water Level	HWL
Grade	GR or GRD	Hollow Metal	НМ
Grade Break	GB or GR	Horizonta	HORIZ
	BRK GR	l Horn	Н
Grade Change	CHG	Horsepower	HP
Granular	GR	Hose Bibb	НВ
Grating	GRTG	Hour	HR
Gravel	GVL	Household Appliances	APPLI
Gravity Belt Thickener	GBT	Howler	Н
Gravity Thickener	GTK	Hub Drain	HD
Grinder	GDR	Hydrant	HYD
Grooved Coupling	GC	Hydrant Improvement District	HID
Ground	G or GND	Hydrant Leg	HYDL
	Or GRD	Hydrant Valve	HYDV
Ground Fault Interrupter	GFI	Hydraulic	HYD
Ground Fault Relay	GFR	Hydraulic Accumulator	HA
Guard Gate	GG	Hydraulic Snubber	HS
Guard Rail	RAIL	Hydrogen Ion Concentration	рн
Gutter	G	1	
Gypsum	GYP	•	
Gypsum Plaster	GYP PLAS	Incandescent	INCAND
Gypsum Wallboard	GWB	Inch	IN
н		Incineration	INC
···		Incinerator	INC
Hand Held	HH	Incline	INCL
Hand Wheel Operated	HWO	Include or Included	
Handicannad		Including	
Hand Off Auto	НСР	Increase	
Hand-Off-Remote		Influent	
Hardener	HDNR	Injector	
Hardness	HDNS	In-Place	INJ IP
Hardware	HDW	Inside Diameter	חו
Headed Anchor Stud	HAS	Inside Face	IF
Header	HDR	Inside Face of Vault	IFV
Heater	HTR	Install	INSTL
Heating	HTG	Instrument	INSTR
Heating and Ventilation	H&V	Instrumentation And Control	1 & C
Heating, Ventilation and		Insulated	INSL
Air Conditioning	HVAC	Insulated Tempered Glass	ITG
Height	HGT or HT	Insulating	INSL
Heritage Land Bank	HLB	Insulation	INSUL
High	Н	Integrated Systems Control	ISC
High Density Polyethylene Pipe	HDPE	Intergovernmental Charge	IGC
High Molecular		International Building Code	IBC
Weight Polyethylene	HMWPE	International Fire Code	IFC
High Intensity Discharge	HID	International Mechanical Code	IMC
High Point	HP	International Residential Code	IRC
High Pressure	HP	Interior	INT

DEFINITION	ABBR	DEFINITION	ABBR
Interrupting Capacity	IC	Lightning Arrester	LA
Intrusion Switch	IS	Limit Switch	LS
Invert	INVT	Line Of Sight	LOS
Invert Elevation	IE	Lineal Foot or Lineal Feet	LF
Invert Elevation (Sewer),	INV	Lintel	LNTL
for Water, see BOP		Liquid Propane	LP
Inverted Roof Membrane Assembl	v IRMA	Liter	L
Inverted Siphon	ÍVS	Loading Relav	LDR
Iron Pipe	IP	Local at Drive Motor	LOC
Iron Pipe Size	IPS	Local Control Panel	LCP
Irrigation	IRRG	Local Remote	LR
Irrigation Service	IS	Location	LOC
J		Lockout Stop	LOS
		Lockout Stop Pushbutton	LOS
Janitor	JAN	Long	L or LG
Joint	JI	Long Leg Vertical	LLV
Junction	J	Longitudinal	LONG
Junction Box	JB	Low Point	LP
Junction Terminal Box	JIB	Low Water Level	LWL
К		Lower	LWR
Key Interlock	K	Μ	
Keybox	KB	Machine Bolt	MB
Kilovolt-Amp	KVA	Magnetic	MAG
Kilowatt	KW	Magnetic Contactor Coil	М
Kilovolt	KV	Mailbox	MB
Kilowatt Hour	KWH	Main	MN
Kitchen	KIT	Main Control Board	MCB
L		Main Operating Console	MOC
		Main line Valve	MLV
Laboratory	LAB	Maintenance	MAINT
LagScrew	LS	Make Up Air Unit	MA
Laminated	LAM	Male Pipe Thread	MPT
Latching Relay	LR	Malleable Iron	MI
Lateral	LATL	Manhole	MH
Lateral Improvement District	LID	Manual	MAN
Lavatory	LAV	Manual Auto	MA
Left	L	Manual of Practice	MOP
Left	LT	Manufacturer	MFR
Length	L or LG	Mark	MK
Length of Cord	LC or LG	Masonry Opening	МО
Length of Curve	L	Material	MATL
Less Than	<		or MTL
Level	LEV	Maximum	MAX
Level Control Valve	LCV Level	Measured	М
Measuring Equipment	LEVEL	Mechanical	MECH
Lift Station	LIFTSTN	Mechanical Joint	MJ
	or LS	Mechanical Mounting Panel	MMP
Lighting	LGT	Mechanical Type Coupling	MTC
Lighting Contactor	L	Member	MBR
Lighting Panel	IP		

DEFINITION	ABBR	DEFINITION	ABBR
Men	М	Non-Frost Susceptible	NFS
Mercury Vapor	MERC	Non-Rising Stem	NRS
Metal	MTL	Normal	NORM
Metal Faced Plywood	MFP	Normally Closed	NC
Meter	M or MTR	Normally Open	NO
Meter Equipment	METER	North	Ν
Meter Station	MS or MSTN	Northeast	NE
Metering	MTRG	Northwest	NW
Metering Vault	MV	Not Applicable or Not Available	NA
Mile	M or MI	Not In Contract	NIC
Milligrams per Liter	MG/L	Not To Scale	NTS
Millimeter	MMP	Number	NO
Million Gallons	MG	0	
Million Gallons per Day	MGD		
Minimum	MIN	Office	OFF
Minute	MN	Oil, Water, Gas	OWG
Miscellaneous	MISC	On Center	OC
Mixer	MXR	On Off	00
Model	Μ	On Off Auto	OOA
Modify	MOD	On Off Remote	OOR
Modulate Close	МС	Open Close	OC
Month	M or MO	Open Close Auto	OCA
Monument	MON	Open Close Remote	OCR
Mortar Lined and Coated Steel Pipe	e MLCP	Opening	OPNG
Motor	MTR	Open-Stop-Close	OSC
Motor Control Center	МСС	Operating	OPER
Motor Operated	MO	Operations and Maintenance	O&M
Motor Starter	MS	Operator	OPER
Motor Starter Panel	MSP	Operator Interface	OPIF
Motorized Damper	MTRD	Opposite	OPP
Mounted	MTD	Opposite Hand	ОН
Mounting	MTG	Oriented Stand Board	OSB
Municipality of Anchorage	МОА	Original	ORIG
Municipality of Anchorage		Ounce	OZ
Standard Specifications	CHSCS	Out To Out	0 TO 0
	chieco	Outside Air	O/A
N		Outside Diameter	OD
Nameplate	NP	Outside Face	OF
National Pipe Thread	NPT	Outside Face of Wall	OFOW
National Pollutant Discharge		Outside Screw & Yoke	OSY
Elimination System	NPDES	Over	0/
National Sanitation Foundation	NSF	Over Flow Drain	OFD
NearFace	NF	Overflow	OF or OVF
Near Side	NS	Overflow Drain	
Neutral	N	Overhead	O/H or OH
Night Light	NL	Overhead Door	OHD
прре	NIP	Overload Relay	UL
Nominal	NOM	Ρ	
Nominal Pipe Size (Formerly IPS)	NPS	D	D D2
Non-Automatic	NA	Page	P or PG
		Pair	РК

DEFINITION	ABBR	DEFINITION	ABBR
Panel	PNL	Portland Cement	PC
Paper Towel Dispenser	PTD	Portland Cement Concrete	PCC
Paper Towel	PTD/R	Potential Transformer	PT
Dispenser/Receptacle			
Parts per Million	PPM	Pound	PND or LB
Pavement	PVMT	Pounds per Day	PPD or LB/D
Pedestal	PED	Pounds per Hour	PPH
Pedestrian	PED	Pounds per Square Foot	PS or PSF
Percent	PCT	Pounds per Square Inch	PSI
Perforated	PERF	Pounds per Square Inch Absolute	PSIA
Petroleum, Oil and Lubricants	POL	Pounds per Square Inch Gauge	PSIG
Phase	PH	Power Pole	PP
Pid Control Station	PID	Precast	PRCST
Pipe	Р	Prefinished Wall Paneling	PWP
Pipeline	PL	Pre-molded Joint Filler	PJF
Place	PL	Pressure	PRESS
Plain End	PE	Pressure Gauge	PG
Plan and Profile	P&P	Pressure Indicating Transmitter	PT
Plans and Specifications	P&S	Pressure Main	PRESM
Plant Control Panel	PCP	Pressure Measuring Equipment	PRESS
Plant Indicating Panel	PIP	Pressure Reducing Valve	PRV
Plant Intercom	PIC	Pressure Regulating Valve	PRV
Plant Operations Panel	POP	Pressure Relief Valve	PRV or PSV
Plastic	PL	Pressure Sustaining Valve	PSV
Plastic Laminate	PLAM	Pressure Switch	PS
Plastic Tubing	TUB	Primary Clarifier	P/C or
Plate	PL		PCLFR
Plug Valve	PV	Process and Instrumentation	
Plywood	PLWD or	Diagram	P&ID or PID
	PLYWD	Professional Engineer	PE
Point of Beginning	POB	Programmable Controller	PC
Point of Compound Curvature	PCC	Programmable Logical Controller	PLC
Point of Control	POC	Propeller Meter	PM
Point of Curvature	PC	Property Line	P or PL
Point of Ending	POE	Pump	PMP
Point of Intersection	PI	Pump Station	PS or
Point of Tangent	PT		PMPSTN
Point of Vertical Curvature	PVC	Push Button Switch	РВ
Point of Vertical Intersection	PVI	Q	
Point of Vertical Tangency	PVT		000N/T
Point on Curve	POC	Quadrant	QDRNT
Point on Line	POL	R	
Point on Tangent	POT	Dadius	
Pole	Р	Radius	
Policy & Procedure	P&P	Railroad	
Polyelectrolyte	PE	Rain leader	RL
Polyethylene	PE	Kaised Access Floor	KAF DØD
Polymer	POLY	Renabilitation and Repair	K&K
Polyvinyl Chloride	PVC	Receptacie	
Porcelain Ceramic Tile	PCT	Record Drawing	
		Record Drawing	кD
DEFINITION	ABBR	DEFINITION	ABBR
-----------------------------------	------------	-------------------------------	-------------
Recorded	REC	R-Value	R
Recording Equipment	REC	S	
Reduced Voltage Non Reversing	RVNR		
Reduced Voltage Reversing	RVR	Safety Glass	SG
Reducer	RED or	Sample	SA
Reddeer	RDCR	Sanitary Sewer	55
Reducing	RED	Sanitary Sewer Manhole	SSMH
Refer or Reference	REE	SCADA Equipment	SCADA
Reference Point	RP	Schedule	SCH
Refrigerator	REER	Schedule	SCHED
Regulating	REG	Screwed	SCD
Regulatory Commission Of	NEO	Screwed	SCR
Alaska (Formerly APLIC)	RCA	Sealed System Manhole	SSMH
Pohabilitation		Second	S or SEC
		Secondary	SEC
Reinforce or Reinforced	REIN OF	Secondary Clarifier	SCLRFR
	REINF	Secretary	SEC
Reinforced Concrete	RC	Section	SEC or SECT
Reinforced Concrete Cylinder Pipe	RCCP	Sedimentation	SED
Reinforced Concrete Pipe	RCP	Sedimentation Basin	SEDBSN
Reinforced Plastic Mortar Pipe	RPM	Septage Disposal Station	SDSTN
Reinforced Steel	RST	Seward Meridian	SMN
Remote Multiplexer	RM	Sewer	S or SWR
Remote Telemetry Unit	RTU	Sewer Main	SMN
Remove	REM	Shear Wall	SW
Remove and Replace	R&R	Sheathing	SHTG
Required	REOD	Sheet	SH or SHT
Reserve	RESV	Sheet Vinyl	SV
Reservoir	RESV	Sheeting	SHTG
Resilient	RESIL	Shelf & Pole	S/P
Resilient Seat Gate Valve	RGV	Ship Creek Energy	
Retaining	RTG	Recovery Station	SCERS
Return Activated Sludge	RAS	Short Leg Vertical	SLV
Return Air	R/A	Shower	SHWR
Revised	REV	Shutoff	SO
Revision	REV	Similar	SIM
Revolutions per Minute	RPM	Sleeve Type Coupling	STC
Right	R or RT	Sleeve Valve	SLV
Right of Way	ROW or R/W	Slide Gate Valve	SLGV
Rigid Steel	RS	Slope	S or SL
Risers	R	Slower Faster	SF
Road	RD	Sludge	SL
Road Improvement District	RID	Sluice Gate Valve	SGV
Roof	RF	Soap Dispenser	SD
Roof Drain	RD	Soft Start	SFST
Room	RM	Solenoid Valve	SV
Rotary Strainer	RS	Solids Handling Control Board	SHCB
Rotating Biological Contactors	RBC	South	S
Rough Opening	RO	Southeast	SE
Rubber Tire Tile	RTT	Southwest	SW

DEFINITION	ABBR	DEFINITION	ABBR
Spacing	SPG	Tank	TK or TNK
Special Provisions	SP	Techite Reinforced Plastic	RP
Specifications	SPECS	Technical or Technician	TECH
Specified	SPECD	Telegraph Pole	TP
Speed Control Unit	SCU	Telephone	T or TEL
Square	SQ	Telephone Pole	TP
Square Feet	SF	Television Cable	TV
Square Yard	SY	Temperature Detector Relay	TD
Stainless	STN	Temperature Indicating Transmitter	TT
Stainless Steel	SS or SST or	Temperature Measuring	TEMP
	STN STL	Equipment	TEMP
		Tempered	
Standard	STD	Tempered Glass	TG
Standard Cubic Feet per Minute	SCFM	Temporary	TEPM
Start Stop	SS	Temporary Bench Mark	ТВМ
Static Pressure	SP	Temporary Construction Permit	ТСР
Station	STA or STN	Terminal Board	ТВ
Steel	STL	Terminal Junction Box	TJB
Steel Pipe	ST	Test Hole	TH
Stiffener	STIF	Test Pit	TP
Storage	STOR	Thermometer Wall	TW
Storm Drain	SD or SDR	Thermostat	Т
Straight	STR	Thick	THK
Street	ST	Thickened Waste Activated Sludge	TWASLG
Structural	STRUCT	Thread	T or TRD
Structure	STRUCE	Thread One End	TOE
Suction	SUCT	Threaded	THRD
Suction Valve	SV	Thrust Block	ТВ
Sulfunator	SLF	Time Clock	тс
Sulphur Dioxide	SO2	Time Delay Relay	TDR
Supervisory Control And		Timer Repeat Cycle	TR
Data Acquisition	SCADA	Timing Relay	ТМ
Supervisory Set Point	SSC	Tinted	Т
Supply Air	S/A	Toilet	Т
Supply Fan	SPFN	Toilet Paper	TP
Surge	SRG	Toilet Tissue Dispenser	TTD
Survey Monument	SMN	Ton	T or TN
Suspended	SUSP	Tongue & Groove	T&G
Suspended Acoustical Ceiling	SAC	Tons per Day	TPD
Suspended Acoustical Tile	SAT	Тор	т
Suspended Solids	SSD	Top & Bottom	T&B
Switch	SW	Top Face	TF
Symbol	SYM	Top Of	то
Symmetrical	SYM	Top of Back-Of-Curb	ТВС
Symmetrical	SYMM	Top of Concrete	тс
System	SYS	Top of Curb	TC or TOC
т		Top of Slope	TOS
Tool Doord	тр	lop of Steel	IST
	IB T	I op of Wall	IW
Langent		lorque	IORQ
i angent Length	I _		
		-	

DEFINITION	ABBR	DEFINITION	ABBR
Total Suspension Solids	TSS	Velocity	V
Traffic Control Plan	TCP	Vent	V or VT
Transformer	TRANS	Vent through Roof	VTR
	or XFMR	Venturi Meter	VM
	or XSMR	Vertical	V or VERT
Transition	TRANS	Vertical Bond	VB
Transmitter	TRANS	Vertical Curve	VC
Transverse	TRANSV	Vertical Feet	VF
Traveling Screen	TRVSC	Vertical Point of Intersection	VPI
Treads	TR	Vestibule	VEST
Trunk Improvement District	TID	Vibration	VIB
Tunnel	TN	Vibration Monitoring Equipment	VIB
Turbidity	TURB	Vinyl Asbestos Tile	VAT
Turning Point	TP	Vinyl Covered Gypsum Wallboard	VGWB
Turnout Point of Intersection	TPI	Vinyl Tile	VT
Twisted Shielded Pair	TSP	Vinyl Wall Covering	VWC
Twisted Shielded Triad	TST	Vitrified Clay Pipe	VCP
Typical	TYP	Volt	V
		Voltmeter	V
0		Volume	V or VOL
Ultra Violet	UV	W	
Ultrasonic Generator	UG	••	
Under Voltage Relay	UVR	Wainscot	WSCT
Underground	UG	Wall Hydrant	WH
Underground Conduit	UGC	Waste Activated Sludge	WASLG
Underlayment	UL	Waste Receptacle	WR
Underwriters Laboratory	UL	Waste Water	WW
Uniform Building Code	UBC	Waste Water Treatment Facility	WWTF
Uniform Fire Code	UFC	Water	H2O or W
Uniform Mechanical Code	UMC		or WTR
Uniform Plumbing Code	UPC	Water Closet	WC
Unit Heater	UH	Water Column	WC
Unknown	UNK	Water Heater	WH
DEFINITION	ABBR	Water Improvement District	WID
Unless Noted Otherwise		Water Main Line	WMN
Urinal	Unc	Water Pollution Control Federation	n WPCF
offilat	0 01 01	Water Resistant	WR
v		Water Resistant Gypsum Wallboar	d WBWB
Vacuum	V	Water Stop	WS
Vacuum Relief Valve	VV	Water Surface	WS
Valve	V	Water Tight Manhole	WTMH
Valve Box	VB	Water Transmission Main	WTM
Valve Box Marker	VBM	Water Treatment Facility	WTF
Valve Vault	VVLT	Waterproof	WP
Vapor Proof	VP	Watt	W
Vapor Retarder	VR	Watthour Demand Meter	WHD
Variable	VAR	Weatherproof	WPF
Varies	VAR	Week	WK
Vault	VLT	Weight	WT
		<u>W</u> elded Steel	WS
		148	

ABBR
WSP
WWF
WWM
WH
W
W
WI
W
WG
WG
W or W/
W/O
W or WMN
WD
WS
WK
WO
WP
YD
YR

70.02 Glossary

BACKWATER VALVES are valves which will provide a positive mechanical seal and remains closed except when discharging wastes.

BRANCHED SERVICE EXTENSION means two (2) or more service extensions diverging from a single service connection.

NON-CONFORMING SERVICES are lines constructed of un-approved or unacceptable material; or constructed without permits and/or approval letters; or utilized without being accepted by City of Homer, including service lines crossing adjacent property lines.

DESIGN CAPACITY is the existing measured flow plus capacity for future development.

DISTRIBUTION MAIN is a water conduit whose inside diameter may range in size from four (4) (inclusive) to twenty-four (24) (exclusive) inches.

EXTENDED SERVICE CONNECT is a connection for a lot which does not have mains currently available to provide legal service to the property.

INDUSTRIAL WASTES are wastes discharged by an industrial user, generally having characteristics distinct from commercial and domestic wastes, and having a BOD of two hundred fifty (250) ppm or greater and/or a TSS of two hundred fifry (250) PPM or greater.

INTERCEPTOR SEWER is the sanitary sewer conduit which carries flow from the TRUNK SEWER to the point of treatment.

LATERAL SEWER is a wastewater conduit of eight (8) inches in nominal diameter which collects flows from SERVICE CONNECTIONS and carries it to TRUNK SEWERS.

MAIN is that part of the sanitary sewer or water system intended to serve more than one

(1) SERVICE CONNECTION.

ON-PROPERTY SYSTEM is a private distribution or collection system solely on private property. ON-PROPERTY SYSTEMS are not owned or operated by City of Homer.

PRIVATE SYSTEM – is a water or sewer system on privately owned property that is maintained by that property owner.

RECORD DRAWING is a plan and profile reproducible drawing verified by a licensed professional engineer depicting the location of improvements constructed as reflected on survey notes, construction contractor's field installation notes, line and grade notes and/or engineer's notes (see Section 50.00 of this manual).

SERVICE CONNECTION is the sanitary sewer or water pipe and appurtenances extending from a main to a property line or easement.

SERVICE EXTENSION is the sanitary sewer or water pipe and appurtenances required

to extend the SERVICE CONNECTION to the structure.

TRANSMISSION MAIN is a water conduit whose inside diameter is twenty-four (24") inches or greater. Service connections smaller than six (6") inches diameter will not be permitted.

TRUNK SEWER is a sanitary sewer conduit which collects flow from LATERAL SEWERS or SERVICE CONNECTIONS and carries it to the INTERCEPTOR SEWER

Final Droft 6-22-22

CITY OF HOMER, ALASKA STANDARD CONSTRUCTION SPECIFICATIONS

DIVISION 50 SANITARY SEWERS



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STANDARD CONSTRUCTION SPECIFICATIONS FOR SANITARY SEWERS DIVISION 50

SECTION 50.01 GENERAL

This Section is to be applied and used for all Sections in Division 50.

Article 1.1 Scope of Work

The Work covered by these Specifications consists of providing all plant, labor, equipment, supplies, material, transportation, handling, and storage, and performing all operations necessary to complete the construction for pipe laying, jointing, and testing of sanitary sewers.

Construction is to be completed according to the Standard Details, Drawings, these specifications, and special provisions.

Requirements for earthwork including, but not limited to trench excavating and backfill are specified in Division 20 - Earthwork.

The Contractor is to locate and treat utilities as described in Division 10, Section 10.04, Article 4.17 – Utilities.

The Contractor, by providing a Bid Proposal and entering into a Contract with the Owner has found that the access, easements, rights-of-way, and other work areas designated in the Drawings are adequate to perform the work and/or the Contractor has secured additional work areas at their own expense that is included in the Bid Proposal to complete the work.

Additional areas secured by the Contractor from parties not associated with the Contract are to be memorialized in the form of a right of entry agreement between the Contractor and party having authority to enter an agreement for the work area. A copy of the right of entry agreement is to be provided to the Owner. The right of entry agreement is to extend the indemnification requirements found in the Contract to Contractor obtained work areas.

The Contractor is to restore the area of Work to preconstruction conditions or better except where shown different on the Drawings or required by the Contract Documents. Where preconstruction conditions cannot be obtained such as items that require growth to obtain height, thickness, and other prized attributes then they are to be replaced with standard nursery stock plant material of the same species and type that will grow back to preconstruction conditions and maintained in accordance with the Contract. The Contractor is to secure written approval by the Engineer for replacement material that does not match preconstruction conditions.

Where the requirements in this division call out for an Engineer and there is not anyone assigned the duties of the Engineer, then the City Public Works Department is to be consulted for direction.

Article 1.2 Applicable Standards

The most recent revision of the following standards are made a part of these Specifications:

AASHTO M45	Standard Specification for Aggregate for Masonry Mortar AASHTO
M306	Standard Specification for Drainage, Sewer, Utility, andRelated Castings
ASTM A48	Specifications for Gray Iron Castings
ASTM A74	Standard Specification for Cast Iron Soil Pipe & Fittings
ASTM 438	Traverse Testing of Gray Cast Iron
ASTM A746	Specification for Ductile Iron Gravity Sewer
ASTM C150	Specification for Portland Cement
ASTM C206	Specification for Finishing Hydrated Lime
ASTM C478 or ASTM C478M [Metric]	Specification for Precast Reinforced Concrete Manhole Sections
ASTM C564	Standard Specifications for Rubber Gaskets for Cast Iron Soil Pipe & Fittings
ASTM C923	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes &Laterals
ASTM D256	Test Methods for D-C Resistance of Plastics and Electrical Insulating Materials
ASTM D2321	Recommended Practice for Underground Installation of Thermoplastic Sewer Pipe
ASTM D3034	Specification for Type of PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3035	Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter
ASTM D3350	Specification for Polyethylene Plastic Pipe and Fittings Materials
AASHTO M45	Sand for Cement Mortar

AWWA C104/ ANSI A21.4	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105/ ANSI A21.5	Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids
AWWA C110/ ANSI A21.10	Ductile-Iron and Gray-Iron Fittings, 3 inch through 48 inch, for Water and Other Liquids
AWWA C111/ ANSI A21.11	Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
AWWA C151/ ANSI A21.51	Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand- Lined Molds, for Water or Other Liquids
AWWA C600	AWWA Standard for Installation of Ductile-Iron Water Mainsand Their Appurtenances
AWWA C901	Standard for Polyethylene (PE) Pressure Pipe and Tubing, 1/2 inch through 3 inch, for Water Service
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inch through 12 inch for Water Transmission and Distribution
AWWA C905	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 inch through 48 inch for Water Transmission and Distribution
UPC	Uniform Plumbing Code, latest edition adopted bythe Municipality, and current local amendments

Article 1.3 Surveys

Survey must be performed by the Contractor per Division 65 - Construction Survey. Survey is to be incidental to items under construction unless a pay item for Construction Survey Measurement is provided. The Contractor is to as-built and record at a minimum the following items based on the design survey horizontal and vertical control:

- Each pipe invert and length of pipe segment
- Manholes, inverts, cleanouts, service stubs
- Other buried utility conduits, vaults, utilidors, wires, manholes, catch basins
- Other utility surface features such as pedestals, junction boxes, power poles, light poles

Before working in developed areas, the Contractor is to take photographs and video documenting existing conditions. Photographs are to include major construction areas and their boundaries as well as a zone fifty feet (50') outside the furthest anticipated impact. Photo documentation is incidental to the Work.

Article 1.4 Definitions

The definitions provided within this Article are supplemental to definitions provided in Division 10 and are to govern in the interpretation of all disputes. Industry standard definitions are to apply if a definition is not provided. Where a term, word or phrase has varying meanings, the Engineer will have final say on the interpretation. Sewer Connection – sewer pipe and associated apparatuses from the point of connection to a collector, trunk, or interceptor to the terminus of the City maintenance responsibility, usually the property or City easement.

- Sewer Extension sewer pipe and associated apparatuses from the terminus of the Sewer Connection to a point five feet outside the building foundation
- Building Sewer Sewer piping inside the building to five feet outside of the building foundation
- Service connection, extension and/or building sewer from the City sewer collection system to private property and typically to one structure
- Collection system series of pipes and structures to collect and convey sewer to a treatment facility
- Collector Typically 8" and larger sewer pipe where the majority of sewage is from individual services.
- Trunk Typically 12" and larger sewer pipe where the majority of sewage is from collectors.
- Interceptor Typically 24" and larger sewer pipe where the majority of sewage is from trunks and collectors to a point of treatment.

Article 1.5 Concrete and Mortar

A. Miscellaneous Concrete

All concrete used in the construction of sanitary sewer systems with the exception of precast manholes, manhole risers, cones, and reinforced concrete pipe is to be Class AA-3. Concrete Work is to conform to Division 30 - Portland Cement Concrete.

B. Mortar

Cement for mortar used in the construction of sanitary sewer systems is to conform with the requirements of ASTM C-150, Type II. Sand is to conform with the requirements of AASHTO M-45. The mortar is to be composed of one (1) part cement and three (3) parts sand. The addition of lime is not permitted. The use of five (5) minute or fast-cure mortar requires prior approval of the City prior to use.

Article 1.6 Payment - General

Payment for all Work included in this Division is to be paid for in accordance with Division 10, Section 10.07 - Measurement and Payment and includes full payment for all Work described.

SECTION 50.02 FURNISH AND INSTALL PIPE

Article 2.1 General

The Work under this Section consists of the performance of all operations pertaining to furnishing and installing pipe for sanitary sewer systems.

The Work under this Section consists of performing all Work required for furnishing and installing an operational piping system in a workman like manner meeting applicable standards. The Contractor is to install piping systems in accordance with these Specifications, manufacturer's recommendations, the City's Design Criteria Manual and in conformity with the lines and grades as shown on the Drawings. Where the previously stated requirements are in conflict the more stringent requirement is to govern.

Article 2.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. The Contractor is to clearly demarcate items to be incorporated into the Work. Submittals for pipe and fittings should include, but is not limited to the following information:

- Manufacturer pipe submittal cutsheets
- Manufacturer fitting submittal cut sheets
- Detectable underground warning tape and trace wire
- HDPE welder certificates (pressure sewer pipe only)
- Trace wire (pressure sewer pipe only)

Article 2.3 Materials

A. General

All piping is to be in accordance with the Contract Documents conforming to the size and class shown and specified. Changes in class are to be made within one- half of a pipe length of the station indicated on the Drawings. The use of pipe containing asbestos materials is prohibited.

Detectable underground warning tape is required for installation of all pipe types. Warning tape must not be less than five (5) mil, foil backed, six inches (6") wide vinyl tape, colored green, with "Caution Buried Sewer Line Below" continuously printed in black along the tape length.

B. Ductile Iron Pipe

Ductile iron pipe is to conform to ASTM A 746 (AWWA C 151) with a cement mortar lining conforming to AWWA C-104. Cast and ductile iron fittings and pipe bells are to conform to AWWA C110 or AWWA C-153. Rubber gasket joints for ductile iron pipe fittings are to conform to AWWA C-111.

C. Cast Iron Pipe

All cast iron pipe and fittings (used for service extensions) are to be hub and spigot service weight soil pipe conforming to the requirements of ASTM A74. Gaskets are to conform to the requirements of ASTM C564.

D. High Density Polyethylene Pipe (HDPE)

High Density Polyethylene Pipe (HDPE) and fittings (used for force mains and pressure sewer services and extensions) are to be manufactured in accordance with AWWA C906. In addition to the requirements of AWWA C906, HDPE is to be manufactured from PE4710 polyethylene compounds that meet or exceed ASTM D3350 Cell Classification 445574. All HDPE pipe and fittings must be certified by the NSF for potable water service. HDPE pipe and fitting material compound are to contain color and ultraviolet (UV) stabilizer meeting or exceeding the requirements of Code C per ASTM D3350. Electrofusion fittings are not allowed. All fittings will have pressure class ratings not less than the pressure class rating of the pipe to which they are joined.

The pipe is to be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other injurious defects. It is to be uniform in color, opacity, density, and other physical properties.

Butt fusion of the pipe and fittings is to be performed in accordance with the pipe manufacturer's recommendations as to equipment and technique. The fusion operation is to be performed by an individual who has demonstrated the ability to fuse polyethylene pipe in the manner recommended by the pipe supplier.

E. Polyvinyl Chloride Pipe (PVC)

Four inch (4") through twelve inch (12") Polyvinyl Chloride Pipe must conform to the requirements of AWWA C900 and as otherwise required by the Contract Documents. DR 18 pipe must be used for C900 PVC pipe, unless otherwise specified.

Fourteen inch (14") through sixteen inch (16") Polyvinyl Chloride Pipe must conform to the requirements of AWWA C905 and as otherwise required by the Contract Documents. DR 21 must be used for C905 PVC pipe, unless otherwise specified. Pipe greater than sixteen inches (16") in diameter will not be allowed unless approved by the Utility Company's Engineering Director.

F. Cleanouts

Building sewer cleanouts are to be restrained at the wye to the surface. Horizontal piping does not need to be restrained.Polyethylene Encasement

Polyethylene encasement material for pipe is to be eight (8) mils thick and conform to AWWA C105. Polyethylene encasement is to include a VBio film system incorporating corrosion control additives and MIC control additives as provided by US Pipe or approved equal.

G. Trace Wire

Tracer wire for sewer lines is to be #10 AWG high-strength copper clad steel with a 30mil HDPE insulation jacket (color blue) and have a 600-pound average tensile break load. Tracer wire is to be manufactured by Copperhead Industries or an approved equal.

Grounding rods are to a minimum of twenty four inches (24") long and copper clad.

The direct burial grounding clamps are to be EK17 as manufactured by Erico or approved equal.

All splice connections are to be constructed using 3M DBR watertight connectors or approved equal.

DryConn Waterproof Direct Bury Lugs as manufactured by King Innovation, or approved equal, are to be used to splice into the main line tracer wire.

H. Material Limitations

Cast iron pipe may be used for repairs that are less than ten feet (10') long for sewer extensions.

Repair clamps or pipe couplers are to be ridged with at least three inches (3") bearing on each side of the coupled pipe joint.

Article 2.4 Construction

A. Excavation and Backfill

Excavation and backfill for furnishing and installing of sanitary sewer pipe is to be in accordance with Division 20, Section 20.13 - Trench Excavation and Backfill.

The Contractor must remove and dispose of all sewage-saturated soils encountered within the trench area. All sewage-saturated soils are to be considered unsuitable material, not to be used as fill material anywhere within the City and must be disposed of at the Borough Landfill. There is to be no separate payment and is considered incidental to the pay item under construction for removal and disposal of sewage-saturated soils.

B. Pipe Grade and Alignment

Piping is to be laid at the grade and alignment shown on the Drawings. For projects that do not require Drawings, the Contractor must ensure a functioning sanitary sewer system meeting the minimum separation, slope, and burial requirements.

Minimum slopes for gravity sewers are as follow:

<u>Pipe Diameter</u>	<u>Slope</u>		
4"	2.08%		.0208 feet per foot
6"	1.00%		.0100 feet per foot
8"	0.40%		.0040 feet per foot
10"	0.28%		.0028 feet per foot
		162	

The minimum standard depth of bury for gravity sewer main is six feet (6'). Where this cannot be achieved, the sewer pipe is to be laid at the minimum slope to achieve the greatest depth of bury possible. Where the depth of bury is reduced to less than six feet (6'), but greater than four feet (4'), the sewer pipe is to be fully encapsulated with a minimum of three inches of rigid foam or protected from freezing utilizing four (4) inches of rigid board insulation above the pipe per the Standard Detail 20-9. Pressure sewer main is to have a minimum cover of seven feet (7') with no reduction allowance for insulation.

Pipe installation with less than minimum separation, slope or bury will be cause for rejection.

Allowable variances for individual pipe sections from established line and grade must not be greater than those listed in the table below, provided that such variance does not result in a level or reverse sloping invert.

Diameters <u>(Inches)</u>	Allowance Tolerance <u>(Feet)</u>
8-12	0.03
14-16	0.04
18+	0.05

During the progress of the Work, the Contractor shall provide instruments such as transits, levels, laser devices, and other facilities for transferring grades from offset hubs or for setting of batter boards or other construction guides from the control points and benchmarks provided by the Contractor. The Contractor is to provide qualified personnel to use such instruments and who have the duty and responsibility for placing and maintaining such construction guides.

Backfill over a section of pipe to provide a platform for transit, level alignment and grade observations is subject to the approval of the Engineer. If intermittent backfilling is allowed, backfilling is to be accomplished in accordance with Division 20, Section 20.13 - Trench Excavation and Backfill.

C. Pipe Laying

In all cases pipe installation is to proceed from lower to higher elevations with the spigot ends of the pipe at the lower end of each pipe segment. Each pipe is to be laid true to line and grade. Joints may not deflect or be offset. The alignment of the installed pipe is to appear visually straight so that a full circle of light can be seen between manholes.

Each section of pipe is to be handled carefully, placed accurately; and joined in accordance with the pipe manufacturer's recommended standards. Each section of pipe is to be properly supported to ensure true alignment and an invert which is smooth and free from roughness or irregularity.

The Contractor is to stagger the joints for sanitary sewer pipe such that no sewer pipeline joint is closer than nine feet (9') measured horizontally (outside of pipe to outside of pipe) from its intersection with water mains encountered in the Work.

The Contractor shall take every precaution to preclude foreign debris from entering the sanitary sewer system. Temporary screening techniques of the downstream manholes proposed for use by the Contractor must first be reviewed and approved by the Engineer prior to their use in the Work. Contractor is responsible for removing and cleaning any foreign debris that enters the sanitary sewer system. All costs associated with the removal of foreign debris from the sanitary sewer system resulting from the Contractor's activities is considered incidental to the Contract.

At all times, when Work is not in progress, open ends of pipe and fittings are to be securely and satisfactorily closed so that no undesirable substance will enter the pipe or fittings.

The pipe is to be laid in trenches when the trench bottom and sides to one foot (1') above the pipe are in a thawed state. The trench is to be immediate backfilled with completely thawed material. The trench is to be backfilled at the end of the work shift during freezing and near freezing temperatures to prevent the pipe zone from freezing.

Tracer wire must be installed on all non-metallic pressure sewer pipes. Tracer wire must be brought to the surface near sewer structures.

The warning tape must be continuously laid with the pipe and be at least twenty four inches (24") and no more than thirty six inches (36") above the pipe.

D. Bedding of Sanitary Sewer Pipe

All pipe is to be bedded with Class E bedding unless another material is authorized in writing by the City. Bedding is to be laid the full width of the ditch and compacted to a minimum of ninety-five percent (95%) of the maximum density.

Sanitary sewer pipe bedding is to extend six (6) inches below and above the pipe and constructed in accordance with Standard Detail 20-8.

E. Laying Instructions for Concrete Pipe with "O" Ring Bell End Joint

To allow a watertight joint and to ensure an installation which will allow the pipe to perform as designed, the following recommendations of the pipe manufacturer are to be observed:

- 1. Spigot groove and bell surface is to be clean and free of foreign material.
- 2. Apply joint lubricant freely to the bell including the tapered surface and completely coat the rubber gasket.

- 4. Exercise care at first contact of the pipe. Avoid bumping which may damage spigot. Stop any swaying motion before contact is made.
- 5. To couple pipe, insert spigot slowly and carefully straight into bell, to allow the gasket to cushion the initial contact and center the spigot as it enters the tapered portion of the bell.
- 6. Completed joints should have spigot inserted into the bell in conformance with the pipe manufacturer's recommendations. Sewer collectors are to be laid in a straight run with no deflections or alignment changes except at manholes. Sewer services alignment changes are to happen through fittings.
- 7. Check all around pipe for rolled or "fish mouthed" gaskets after coupling.
- 8. Do not pick up and drop coupled pipe to adjust grade.
- 9. Ensure that the pipe is not supported only at the bell nor is the pipe barrel resting on a high spot. The bottom quarter of the pipe is to be uniformly supported through its length in order for the pipe to resist the designloads.

F. Laying Instructions for Other Pipe

All other pipe is to be laid in accordance with the manufacturer's published recommendations and as directed by the Engineer.

Article 2.5 Testing

A. General

The Contractor is to provide all materials, equipment and labor related to testing that is acceptable to the Engineer and City of Homer Public Works Department. Testing, retesting, and any required repairs to pass testing of the installed sewer pipe is an obligation of the Contractor to perform and is incidental to the bid item under construction. After testing, if repairs are needed then the previous testing will be considered void and the segment of pipe in which the repair took place is to be retested.

The Contractor may test any portion of the installed sewer pipe at any time for their convenience, but acceptance testing is to be performed in the presence of the Engineer or Inspector and a Utility Company representative. The Engineer will provide the Contractor written confirmation that acceptance testing is satisfactory.

All sanitary sewer pipe installed is subject to either an infiltration test or an exfiltration test and lamping or CCTV inspection.

The Contractor is to clean and flush all sanitary sewer pipe installed prior to testing and substantial completion inspection. Testing for the purpose of acceptance will be done after trenches are backfilled, planned surrounding utilities have been installed and the road structural section is in place. It is recommended to complete testing prior to installation of curb and gutter and pavement.

Exfiltration testing is the standard method of testing. Infiltration testing may occur when requested by the Contractor and if the Engineer finds that the groundwater and soil conditions are satisfactory to complete an infiltration test.

All wyes, tees, and pipe ends are to be plugged or capped and secured to withstand the test pressures. Plugs or caps are to be readily removable, and their removal is to provide a bell suitable for extending the sanitary sewer extension.

The Contractor shall take precautions to prevent sewage from entering the new sanitary sewer pipeline until it has been inspected, tested, and accepted for operation by the Engineer. The Contractor may request inspection, testing and acceptance of incremental segments of the Work. An incremental segment is considered buried sewer pipe between two completed manholes.

Before the Contractor requests the Inspector to perform conformance testing on any portion of the Work, the Contractor is to complete tests and observations to assuage themselves that the Work is ready for inspection. At the discretion of the Engineer, the Contractor will be required to pay for all Owner related costs associated with conformance testing when the inspection fails more than once.

B. Hydrostatic Exfiltration Test

Upon completion of a section of sanitary sewer between manholes the Contractor is to plug all ends of the pipe, including service piping prior to commencing testing.

A minimum head of six feet (6') of water above the crown at the upper end of the test section is to be maintained for a period of four (4) hours during which time it will be presumed that full absorption of the pipe body has taken place and thereafter for a further period of one (1) hour for the actual test of leakage. During this one-hour period, the measured loss must not exceed the rate of fifty (50) gallons per inch diameter per mile per twenty-four (24) hours.

The above listed leakage rate is also to be applied to infiltration from ground water and infiltration or exfiltration in greater amounts will be cause for rejection of the sanitary sewer. The maximum length of sanitary sewer for the above allowable leakage test is one thousand feet (1,000'). If it is not apparent that leakage test results between any two (2) manholes is satisfactory, then the Engineer may require subsequent tests to establish the more exact location of the leakage areas. Any section of sanitary sewer between any two (2) manholes that does not meet the above requirements will be rejected.

C. Low Pressure Pneumatic Exfiltration Test

Safety braces are required to hold plugs in place and to prevent a sudden release of compressed air. Due to the large forces that could be exerted by an escaping plug during the testing of the pipe, workmen must not be allowed in the manholes in which plugs have been placed while internal pipe pressure is above atmospheric pressure such as while testing is in progress. The Contractor's testing equipment is to be arranged in such a manner that a pressure relief device will prohibit the pressure in the pipeline

from exceeding ten pounds per square inch (10psi).

All air used to pressure up the line being tested is to pass through a single above ground control panel. The above ground air control equipment is to include a shut- off valve, pressure relief valve, input pressure gauge, and a continuous monitoring pressure gauge having a pressure range from 0 to at least 10 psi. The continuous monitory gauge is to be no less than three inches (3") in diameter with a minimum division of 0.10 psi and an accuracy of plus or minus three percent (±3%) (Miljoco Part # P3508L02 or equal). Two separate hoses connected to their own dedicated plug connection are to be used to:

- connect the control panel to the sealed line for introducing low-pressure air, and
- a separate hose connection for constant monitoring of air pressure build-up in the line.

Air is to be slowly supplied to the test section until the internal air pressure reaches four (4.0) pounds per square inch. Where the groundwater table is above the sewer test section, then the air test pressure is to be increased by the head of ground water above the lowest invert of the test section to a maximum test pressure of 9 psi. A conversion of 0.43 PSI/ft of head is to be used to convert head pressure to psi. At least two (2) minutes will be allowed for temperature stabilization before proceeding further.

To obtain the groundwater table height above the lowest invert of the pipe; the Contractor is to install a temporary slotted 3/4" PVC pipe at the exterior of the manhole. The ground water level will be measured from the pipe after minimum of forty-eight hours (48hrs) have passed after installation to allow the ground water to reach equilibrium. The Contractor, as witnessed by the Inspector, is to measure the ground water level. After completion of the testing, the PVC pipe is to be cut off 1' below grade and buried.

When temperatures have been equalized and the pressure stabilized at 4.0 psi plus the groundwater pressure increase, the air hose from the control panel to the air supply is to be disconnected. The pressure is to be decreased through bleeding to the test pressure which is to be 3.5 psi plus the groundwater pressure increase. Upon reaching the test pressure the Inspector is to begin timing with a stopwatch.

If the pressure drops 1.0 PSI before time expires as found in the table below then the section undergoing testing has failed and must be repaired and/or retested.

Nominal Pipe Diameter		Minim	um test (time by le	ngth (Min	utes: Sec	conds)	
(Inches)	100ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24

Table 1

8	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	11:20	11:24	14:15	17:05	19:56	11:47	25:38
16	14:10	19:13	25:38	32:03	38:27	44:52	51:16	57:41
18	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
20	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:47	34:11	45:34	56:58	68:22	79:46 ¹	91:10	102:33

If a pipe diameter is not list in Table 1, then the Contractor is to request, receive and follow the direction provided by the Engineer.

Pipes that are thirty-six inches (36") in diameter or larger at the option of the Contractor, may reduce the testing requirements to joints only.

D. Infiltration Test

Infiltration testing may be allowed at the Engineer's option when the natural ground water table is six feet (6') above the crown of the higher end of the test section. The maximum allowable limit for infiltration is not to exceed the rate of fifty (50) gallon per inch diameter per mile per twenty-four (24) hours.

The Engineer may require the Contractor to repair obvious leaks even though the total leakage of the test section falls within the maximum allowable leakage for the test used.

E. Check Line and Grade

After backfilling and cleaning, but before final acceptance, all sections of installed line are to be checked for line and grade. At the request of the Contractor, the Utility Company inspector will lamp the sewer line to check line and grade after the Contractor makes the lines accessible and safe. A full circle of light must be seen, and no pipe misplaced in line or grade. A physical inspection of the interior of all sanitary sewer line thirty inches (30") in diameter and above will be made before acceptance. Any excess deviation in line and grade must be corrected by the Contractor prior to Final Acceptance of the Project.

Excluding service connections, all size sanitary sewer pipes thirty inches (30") and smaller in diameter may be checked for line and grade by closed circuit television per the corresponding requirements in the Contract Documents.

Article 2.6 Measurement

Measurement for furnishing and installing sewer pipe is to be per linear foot of horizontal distance of the various sizes as set forth in the Bid Schedule. Measurement will be from center to center of manholes or from center of manhole to center of cleanout, bend, or fitting. Polyethylene encasement will not be measured forpayment.

Article 2.7 Basis of Payment

Payment for this Work is to be as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Testing and any required repairs to pass testing of the installed sewer pipe is an obligation of the Contractor to perform and is incidental to the bid item under construction.

Unless specifically identified for payment under a separate bid item, the unit price bid for Furnish and Install Pipe (size, shape, type material, class, and/or gauge) includes all labor, equipment, and materials to furnish and install a functional sanitary sewer system including but not limited to the following incidental items:

- asphalt surfacing removal and/or replacement;
- concrete sidewalk removal and/or replacement;
- curb, and/or gutter removal and replacement;
- clearing and grubbing;
- trench excavation, backfill and compaction;
- excavation dewatering;
- trench support system;
- furnishing and installing Class E pipe bedding;
- installation of pipe, fittings, adapters, or other necessary appurtenances;
- surveying;
- testing;
- disposal of unusable or surplus material;
- protection, bracing and/or shoring of existing utilities;
- restoration of existing drainage patterns;
- removal and replacement of existing culverts, fences, landscaping, and other public or private improvements or natural features impacted by the Work;
- finish grading;
- cleanup

Unit cost payment is to be made on the following basis:

ITEM UNIT

Furnish and Install Pipe (Nominal Size, Material)

Linear Foot

SECTION 50.03 SANITARY SEWER CONCRETE STRUCTURES

Article 3.1 General

The Work under this Section consists of the performance of all operations pertaining to the construction and installation of sanitary sewer manholes, vaults, dry wells, wet wells, and discharge structures, complete with frames and covers.

Article 3.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. The Contractor is to clearly demarcate items to be incorporated into the Work. Submittals for concrete structures and components are to include at a minimum the following information:

- A. Structure Shop Drawing:
 - 1. Manhole or structure identification that matches plan labeling
 - 2. Elevation, size, and location of penetrations. Elevations may be from a common reference point that can be translated back to the construction Drawings.
 - 3. Number, height, width of grade rings
 - 4. Number and height of risers
 - 5. Type and height of cone
 - 6. Ability to calculate the elevation of the manhole from the bottom of the manhole base to rim of casting
 - 7. Reinforcing type and placement for all concrete components
 - 8. Ladder rung type, size, and placement
 - 9. Exterior and interior diameter or dimensions
- B. Components
 - 1. Cast in place resilient connectors between reinforced concrete manhole structures and pipe (boot connectors)
 - 2. Casting, size, type, lettering, load ratings, certifications and locking mechanism (if specified)
 - 3. Concrete mix design and compression testing (ASTM C497) of concrete cylinder samples that are representative of the mix design used in the construction of the manhole components that have been completed within thirty (30) days of casting the manhole
 - 4. Access port(s) size, type, load rating, and certification

- C. Coatings and Waterproofing
 - 1. External coatings
 - 2. Internal and external joint sealer
 - 3. Internal coatings when required
- D. Cast in place sewer structures

Submittal of formwork and shoring plan that is prepared by a qualified designer

Article 3.3 Material

A. Sewer structures, manhole cones, risers, bases, and grade rings

Materials used in the construction of manholes is to conform to the requirements of ASTM C-478 (AASHTO-199), these specifications and the Standard Details.

Concrete is to be of a suitable mixture of aggregates, cement, and water to achieve a 28day break strength of 4,000 psi per ASTM C39. Maximum aggregate size is to be no greater than one and one-half inch (1-1/2"), one fifth (1/5) the wall thickness and 1/2 of the minimum space between reinforcement to other reinforcement or forms.

Mortar is to be composed of one (1) part cement and three (3) parts sand. Sand must conform to AASHTO Specification M-45. Only enough water is to be added to provide plasticity in placing the mortar

Cement is to conform to ASTM C150 Type II or Type III. The water to cement ratio is not to exceed 0.53 by weight.

Concrete for manhole flow channel forming is to be Class A-3 concrete per Division 30.

Reinforcement steel must conform to the requirements of ASTM A-1064, ASTM A-615, Grade 40 or 60 steel, or ASTM A706, Grade 60 steel, and the Standard Details. Reinforcement steel is to be installed through the transition from the base to the vertical walls of the manhole.

Cones are to be eccentric, unless otherwise approved.

The base is to be integrally cast with the first section for all manholes and structures, except for horseshoe and type C manholes.

Grade rings are to be a minimum of three inches (3") thick and provide a clear opening that is at least as large as what the casting provides.

B. Castings

Frames and covers are to conform to the Standard Details, meet the requirements of ASTM A-48, and be rated Heavy Duty (H-20 loading minimum). Frames and covers shall East Jordan Iron Works, Model 740. Gray cast iron is to have a minimum tensile strength of 30,000 pounds per square inch (PSI).

Castings placed within airport properties and other heavy load areas are to be specified in the special provisions to resist loading forces associated with those areas. Gray iron castings are to have appropriate certifications and be individually marked in accordance with the requirements of AASHTO M-306. Castings which do not possess appropriate AASHTO M-306 certifications and markings must be replaced by the Contractor at no expense to the Owner.

C. Access portals

Access portals are concrete structure opening covers other than frames and covers and typically cover large rectangular aluminum hatches into wet and dry wells. Access portals are to be as specified in the special provision.

D. Coatings and Waterproofing

External cold joint sealant is to be WrapidSeal (18" wide), manufactured by CCI Pipeline Systems, Viscotaq ViscoWrap (12" wide) or approved equal for external joint sealing (frame and grade ring joints, cone, and barrel section joints).

Bituthene 3000 or approved equal for final external manhole waterproofing.

Cold joint gaskets are to be Ram-Nek preformed concrete joint sealant by Henry Company, Inc., or equal

Internal coatings are to be resistant to low PH (1.5), bond well to concrete, and withstand submersion in industrial sewerage, such as but not limited to a 150 mil thick Carboline "Semstone 140" 100% solids, high performance epoxy liner system with primer.

E. Pipe Connections to new manholes (boots)

Material and manufacture of water stops is to conform to applicable provision of the ASTM Standard Specifications for Resilient Connectors between Reinforced Concrete Manhole Structure and Pipes, ASTM C923. Pipe connectors' metallic components are to be stainless steel.

Z Lok Connector by A•Lok[®] Products Inc. or equal is to be cast integral with the concrete structure.

G3 Boot by A•Lok[®] Products Inc., Kor-N-Seal I and II, Wedge Style Pipe to Manhole connector or equal are to be used for core drilled penetrations.

F. Accessory components

Ladder rungs are to meet the requirements of ASTM C-478 and AASHTO M-199 constructed with Grade 60 rebar with copolymer polypropylene molded cover with footing grip pegs, contoured back side for fingers and reflective surface on each side of the rung visible from above, such as, but not limited to the polypropylene steps by Lane International Corporation.

G. Inflow Preventors

Inflow protectors shall be a standard RainGuard inflow protectors (with a pressuresensitive adhesive gasket) manufactured under ASTM Specifications D-256 (method A), D-638, D-790, D-785, D-648 (method A), and D-635.



H. Internal Drop Connect (all drop connections shall be internal)

Internal drop connect is to be a Reliner internal drop connect or equal. The drop connects are to be constructed of a fiberglass or plastic drop bowl, PVC pipe, PVC fittings, clamps, anchors, and restraints. The bowl material is to be resistant to damage from typical sewer discharge chemical and physical properties. Clamps, bolts, and wedge anchors are to be made of stainless steel. The bowl to drop pipe connect is to be a flexible external pipe coupler (Fernco or equal). The bowl is to be sized based on the inlet pipe.

Article 3.4 Construction

A. General

The precast concrete structure manufacturer is to provide timely notice (at least two working days in advance) to allow time for the Engineer to arrange for necessary inspections. Installation, of manhole sections will not be allowed without prior review by the Engineer. This approval does not relieve the Contractor of the responsibility for protection against damage during storage, handling, and installation.

Precast manholes are to comply with ASTM C478 for acceptability, including but not limited to; cracks, dimension tolerances, acceptance testing submittals and surface defects caused by pour placement and vibrating of concrete into formwork, transportation, and handling. Damaged joints may be accepted by the Engineer for incorporation into the work by written order. Additional damage of joints will not be covered by a previous order of acceptance.

The exterior surfaces of newly installed structures are to have an exterior coating field or shop applied. The coating installation is to meet the coating manufacturer's recommendations.

Precast structures are to be lifted with rigging, hoists, and machinery appropriate for the application and must not damage the structure or exterior coatings. Lifting lugs, devices, and eyes are to be rated for anticipated applied loads. Lifting devices are to be removed and holes filled with mortar prior to backfill around the structure.

Structures are to be installed at the locations and elevations shown on the Drawings. The base section is to be set on a prepared firm and stable surface. The base section and remaining precast components are to be set true and plumb. The rim elevation is to be per the standard details. Each manhole must have a minimum of one (1) six inch (6") grade ring.

Ladder rungs for manholes must align on a bench and be located on an unobstructed side of the manhole. The last rung is to be within twelve inches (12") of the landing pad, the top rung is to be within eight inches (8") of the top of the cone and the spacing is to be twelve inches (12") on center.

Preformed gasket joint sealer is to be applied per the manufacturer's recommendation between each cold joint except for grade ring joints. Gaskets are to be trimmed on the inside of the manhole to prevent the excess gasket material from entering the sanitary sewer lines. Grade rings are to be bed in mortar. Smearing of mortar to cover the joint on the inside of the grade ring will be cause for rejection. Heat shrink external joint sealer is to be applied per the manufacturer's recommendation over the casting, grade rings and over the eccentric cone joint.

Final exterior waterproofing for manholes and other unheated underground structures shall consist of a spiral wrapping of 2' wide strips of self-adhesive, rubberized asphalt/polyethylene waterproofing membrane (Bituthene 3000 or equal), specifically designed to adhere to cured concrete surfaces. Strips shall be overlapped a minimum of three inches (3").

The boot pipe connector is to be installed so that leakage between the pipe and structure is eliminated. Pipe-to-structure boot connections are to fit snugly over a pipe and be cast integrally with the structure. The boot is to be held firmly against the pipe surface by means of a stainless steel mechanical take-up device which, when tightened, will compress the boot to provide a water tight fit. The mechanical take-up device is to remain accessible from the interior of the manhole. Pipes are to be stabbed into the structure through the boots such that at least two inches (2") but no more than three (3") of pipe extend past the inside face of the manhole.

When directed by the Engineer, the Contractor may core in new penetration(s) when in the opinion of the Engineer a pre-cast pipe penetration is not feasible. Boots for cored in pipe connectors are to be secured in place with stainless steel mechanical devices that will seal the rubber boot against the concrete structure. Mortar is not to be placed on the boot inside the structure.

Excavation and backfill for furnishing and installing sanitary sewer manholes is to be as specified in Division 20, Section 20.13 - Trench Excavation and Backfill. Type IIA or Class 'E' Bedding material is to be placed a minimum of three feet (3') outside the manhole and compacted to a minimum of 95% of the modified proctor.

In the case of poured-in-place manhole construction, if the Contractor elects to accomplish the manhole construction utilizing more than one continuous concrete pour, a keyed construction joint must be used. Pre-cast bases may not be used in conjunction with poured-in-place manhole sections.

B. Sanitary Sewer Manhole Flow Channel Construction

Sewer flow channels must be smooth and semicircular in shape providing a smooth flow path from inlet pipe(s) to the outlet pipe. Changes in directions of flow are to be made by forming a smooth radius that is sized to allow adequate access for a closed-circuit camera (CCTV) and/or maintenance equipment into the served sanitary sewer pipe. Manhole benches at the top of the flow channels are to be smooth and slope towards the channels at a grade of one inch (1"/ft) perfoot.

Channels may be formed during the manhole casting process or constructed after installation by troweling the channels in place.

Where manholes are not being used to change alignment or grade the Contractor may lay a full stick of pipe through and centered in the manhole, place concrete around the pipe and then breakout the top half of the pipe after the surrounding concrete has sufficiently set.

Horseshoe manhole channels are to be constructed by placing concrete around the existing pipe and troweling in channels for new pipe penetrations. When the concrete has sufficiently set the existing pipe is to be broken out. Where pipe is to be broken out, the Contractor is to capture and remove all pipe fragments.

The use of Transite or Asbestos Cement (AC) pipe to form manhole inverts is prohibited

C. Beaver Slide Invert Construction

Beaver slides are to be constructed to provide a smooth continuous channel directed into and with the flow of the receiving sanitary sewer as shown in the Standard Details.

Beaver slides are required where the invert of the connecting sanitary sewer is above the crown of the receiving sewer and the drop in the manhole does not exceed the maximum height of twenty four inches (24").

D. External Drop Connect

Installation of an external drop connect is to be as shown in the Standard Details, Drawings and as specified.

Pipe and fittings are to be restrained and metallic which meet the requirements of Section 50.02 Furnish and Install Pipe. Over-excavation under a drop connection requires compaction of not less than ninety-five percent (95%) of the maximum density prior to installation of the pipe and fittings, or the concrete cradle. The lower invert of the exterior drop connect must be bedded in set concrete before backfill of the manhole is completed.

E. Internal Drop Connect

Installation of an internal drop connect is to be as provided in the manufacturer's instructions, in these specifications, and as shown in the Standard Details and Drawings.

The drop bowl and pipe are to be anchored into the manhole wall with clamps attached with wedge anchors. The clamps are not to be spaced more than three feet (3') and at each end. All metallic components of the internal drop connect are to be stainless steel.

One internal drop connect per manhole is allowed by the Utility Company.

F. Additional Depth for Manholes

This item is for construction of manholes deeper than twelve feet (12'). Additional depth to manholes is to be constructed per the Standard Details and Drawings.

Article 3.5 Measurement

Concrete structures are to be measured as units complete in place, including all component parts such as, but not limited to, pre-cast concrete sections, lids, frames, water proofing, coatings, joint sealants, ladders, and flow channels.

Where the use of watertight frames and covers are specified on the Drawings they are to be measured separately.

When inverts of entering pipes are greater than one pipe diameter (nominal) higher than the existing pipe invert beaver slides and external drop connects are to be measured separate from the concrete structure. Beaver Slides and External Drop Connects are to be measured as units, complete in place.

Depth of manholes will be based upon a measurement to the nearest foot, for payment purposes, from top of casting to the top of the base slab. All depths over the specified standard depth will be paid under "Additional Depth to Manholes."

Article 3.6 Basis of Payment

Payment for this Work will be as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Related component parts to the bid items under construction (including steps, etc.) as shown in the Standard Details and Drawings are incidental to that bid item.

Payment for water tight frames and covers represents the additional cost for the equipment and labor to provide a water tight frame and cover over the standard frame and cover included in the base bid for Construct Sanitary Sewer Manhole (type).

Unless specifically identified for payment under a separate bid item, the unit bid price includes all labor, equipment, and materials to furnish and install a functional sanitary sewer structure including but not limited to the following incidental items:

- asphalt surfacing removal and replacement;
- concrete sidewalk, curb, and/or gutter removal and replacement;
- clearing and grubbing;
- trench excavation and backfill;
- excavation dewatering; trench support system;
- furnishing and installing Class E pipe bedding; compaction;
- installation of pipe, fittings, adapters, or other necessary appurtenances;
- surveying;
- testing; disposal of unusable or surplus material;
- protection, bracing and/or shoring of existing utilities;
- restoration of existing drainage patterns;
- removal and replacement of existing culverts, fences, landscaping, and other public or private improvements or natural features impacted by the Work;
- finish grading;
- cleanup

Standard Cons 176 n Specifications Division 50 - Sanitary Sewers Payment is to be made on the following basis:

ITEM	UNIT
Construct Sanitary Sewer Manhole (Type)	Each
Additional Depth to Manhole (Type)	Vertical Foot
Concrete Sewer Structure (L x W x H – Wall Thickness)	Each
Construct Beaver Slide	Each
Construct External Drop Connect	Each
Construct Internal Drop Connect	Each
Watertight Manhole Frame and Cover	Each
Access Port (Material, Size)	Each

SECTION 50.04 SANITARY SEWER PIPE CONNECTIONS AND EXTENSIONS

Article 4.1 General

The Work under this Section consists of the construction of sewer sanitary sewer pipe to pipe connections, Sewer Connections and Sewer Extensions. Generally, the following conditions are covered by this Section:

- Sewer service extension to service extension
- Sewer service extension to buried building sewer
- Sewer service connection to sewer service extension
- Sewer service connection to sewer collector
- Sewer service connection to sewer trunk
- Sewer service connection to sewer interceptor
- Sewer lateral to sewer interceptor

The Contractor shall take all necessary measures to ensure that connection to the existing sewer main does not damage the existing main. The connection is to be as shown on the Drawings except where existing pipe joints or other obstacles require location adjustments. Care shall be taken not to damage or move the existing sewer main while excavating to expose the existing pipe and determine the best connection location for the new pipe being connected.

The exact location, type, and size of existing Service Connections are to be considered unknown. All information provided in the Contract Documents and provided by the Utility Company is from maintenance records, record drawings, field surveys and represents the Utility Company's best indication of location and size. The Utility Company cannot be held liable for accuracy of the information. The Contractor shall locate and confirm that the service extension will function prior to beginning the work.

Article 4.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. Submittals, at a minimum, are to include applicable items identified below:

- A. Contractor obtained sewer service permits
- B. Construction schedules
- C. By-pass plan, where required to by-pass sewer flow. See other CHSCS Sections for plan requirements
- D. Material, such as but not limited to:
 - 1. Grout
 - 2. Fittings, bolts, anchors, and gaskets
 - 3. Cleanout



- 4. Pipe
- 5. Bedding
- 6. Backfill
- 7. Surface material (asphalt pavement, concrete, topsoil and seed, turf)
- 8. Insulation

Article 4.3 Material

Pipe and fitting materials are to comply with Section 50.02 – Furnish and Install Pipe, Article 2.2 – Materials. The Contractor is to supply all necessary fittings, adapters, and other appurtenances to make a complete working system.

The minimum diameter of a gravity sewer collector is eight inches (8"), a gravity sewer service is four inches (4") and a pressure sewer service is two inches (2").

Connections of four and six inch (4" & 6") sewer pipe to non-concrete collectors, trunks and interceptors are to be accomplished with an epoxy coated ROMAC CB saddle or equal.

Connection to concrete pipe is to be accomplished with an Inserta Tee[™], Romac SST, modified Romac SST or equal. To modify a Romac SST is to remove bolts and receiver lugs so that the tee, half clamshell, and partial gasket remain. The clamshell gasket and tee are to be connected to the concrete sewer pipe with stainless steel concrete wedge anchors at each corner and fastened tightly to the concrete sewer pipe.

A connection of eight inch (8") and larger sewer pipe to larger pipe is to be accomplished with a manhole, Inserta Tee™, Romac SST, modified Romac SST or equal.

A Romac SST or equal is to be used for deep service riser connects.

When connecting a sanitary sewer connection to a sanitary sewer extension a Romac 501, Romac Macro HP or their equal is required when a satisfactory pipe bell is not present.

When making a repair to Sanitary Sewer Extensions the Romac SC or equal may be used but the ROMAC 501, Romac Macro HP or their equal is strongly recommended and is required for repairs replacing pipe longer than eight feet (8') in length.

Pressure sewer pipe connections are to utilize ROMAC 305, 306 stainless steel service saddles or equal.

Cement containing products are to comply with Section 50.01 – General, Article 1.4 Concrete and Mortar.

Article 4.4 Construction

A. General

Pipe and associated fitting construction is to comply with Section 50.02 – Furnish and Install Pipe, Article 2.3 – Construction with the following additional requirements.

The Contractor is to provide general cleanup, flush and test the system; protect/restore existing utilities, driveways, trees, utility markers, survey monuments, fences, retaining walls, buildings, walkways, gardens, landscaping, and other improvements damaged by the Contractor. The Contractor must use appropriately sized construction equipment to

minimize the impact to on-lot improvements and vegetation.

The City of Homer will not approve any installation that is not in accordance with the Uniform Plumbing Code, these Specifications, and the City of Homer Design Criteria Manual. The Contractor may not start the excavation for Work until all permits are obtained. City permits are to be posted at the job prior to earth disturbing activities.

The Contractor is to notify the Engineer and property owners seventy-two (72) hours in advance of any interruption to sanitary sewer service. The Contractor must provide temporary service during the period of interruption in accordance with their approved bypass plan.

A Public Works Engineering Division representative is to perform the field inspection of all work. The Contractor is to leave the work uncovered until it passes the City inspection. Work completed under a City mainline extension agreement is to be inspected as specified in the agreement.

The Contractor is to record and transmit to the Engineer the location of points in the Work such as but not limited to service connection at the main, connection of the service extension, service length, service invert elevations at the main and property line and distance to nearest property corner, building corner or other permanently fixed objects. The fixed point cannot be living, movable (e.g., boulders, rocks, fence posts), or changing attributes of something larger (e.g., sidewalk cracks, building paint schemes).

B. Sanitary Sewer Connections

Multiple connections are not to be made any closer together than three feet (3') to another connection or joint. Taps completed with saddles are to be made with a mechanical hole cutter or equal. Taps not using a saddle are to be pre-approved in writing and listed on the permit by the Utility Company prior to installation.

Saddles for gravity sewer connections are to be centered over a circular hole sawed oneeighth inch (1/8") larger than the inside diameter of the saddle. The hole is to be made above the spring line of the main being tapped. The strap(s) are to be tightened in accordance with the manufacturer's instructions.

Where leakage testing of the service connection is required, the connection is to have a removable plug installed at the terminus that is capable of passing the leakage test. The terminus of the Sanitary Sewer Connection is to end in a bell if it is not immediately continued by construction of the complete Sanitary Sewer Extension.

Services stubbed to the property line or beyond for future use is to terminate with a pipe bell. The bell is to be plugged and marked at the end of the service with a 2" X 4" marker of a adequate to protrude three feet (3') above final grade, painted green, and stenciled with the word "SEWER" in white two inch (2") highletters.

No portion of the sanitary sewer connection is to be closer than five feet (5') to a side lot line or manhole.

Connections with deep service risers can be installed where the service to collector connection is in excess of ten feet (10') deep and eight feet (6') of cover can be maintained over the entire service. Deep service risers must be fully restrained pipe and fittings to the edge of right-of-way or easement. No more than two sanitary sewer service connections are to be installed on a single deep service riser.

C. Sanitary Sewer Extension and Buried Building Sewer

The exact location, type, and size of existing Service Connections are to be considered unknown. All information provided in the Contract Documents and provided by the Utility Company is from maintenance records, record drawings, field surveys and represents the City's best indication of location and size. The City cannot be held liable for accuracy of information. The Contractor must locate and confirm that the service extension will function prior to beginning the work.

Upon exposing an existing sanitary sewer service connection and/or extension the Contractor must ensure that the line has proper slope, bearing, and is free and clear of obstructions prior to continuing the Work. If the service line is found to be either plugged or if a gravity sewer service is found to have reverse grade, the Contractor is required to notify the City Inspector immediately or be liable for correcting the misalignment or unplugging the line at the Contractors' expense.

Extensions are to utilize existing pipe bells, except where no bell exists, or the pipe diameter changes such that the bell does not allow a bell to spigot connection. Connection other than through a bell to spigot marriage is to be completed with a pipe coupler.

Pressure sewer service extensions are to be constructed with two inch (2") HDPE pipes and connected to the sanitary sewer connection per the Standard Detail.

Cleanouts are required on gravity sewer service lines (connection and extension) greater than one hundred feet (100') long installed without a manhole, at a single bend greater than forty five degrees (45°), and where a combination of bends adding up to more than forty five degrees (45°) in alignment change taking place within ten linear feet (10'). The cleanout assembly is to be restrained in the vertical direction from and including the wye to the surface. The horizontal piping does not need to be restrained to the wye.

The Contractor may be required to adjust more than one type of cleanout under this Contract. All adjustments will be accomplished as directed by the Engineer. Any damage to cleanouts resulting from construction under this Contract is to be repaired or the damaged portion replaced at the Contractor's expense. All vertical cleanout joints and fittings must be restrained. All vertical components of cleanouts are to be encapsulated with three layers of eight mil polyethylene.

D. Elevation Conflicts

The Contractor is to notify the Engineer where a conflict in grade occurs between a gravity sewer and another utility. Except when otherwise directed by the Engineer, the Contractor is required to excavate gravity utilities from the point of interception for a

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sufficient distance to gather elevation information such that the Engineer can provide direction to raise or lower one or both of the utilities such that the grade conflict will be eliminated.

The Contractor may not lower or raise the conflicting utilities without first providing the elevations of the conflicting utilities to the Engineer in writing and allowing the Engineer five (5) days to analyze the information and provide the Contractor direction.

Where a conflict in grade occurs between a gravity sewer and a non-gravity utility, the non-gravity utility is to be relocated unless the Engineer provides direction to raise or lower the sewer service.

E. Eight Inch (8") and Larger Diameter Pipe to Pipe Connections

Connections are to be watertight, have smooth flow surfaces, protrude less than onehalf inch past the inside wall of the existing pipe and be completed in the top quadrant of the pipe.

Holes are to be completed through drill coring a neat round penetration. Breaking into the pipes by use of a chipping gun, jackhammer, saw or other similar method will not be allowed.

Article 4.5 Measurement

Sanitary Sewer Service Connections are to be measured per linear foot.

Sanitary Sewer Service Extensions including any buried building sewer is to be measured per linear foot.

Deep service riser connections are to be measured as complete units in place regardless of the number of services connected to the riser.

Cleanouts will be measured as complete units in place adjusted to final grade.

Cleanout adjustments will be measured per unit where an existing cleanout is adjusted to grade.

Large diameter pipe to pipe connections will be paid for as a complete units in place which includes all pipe and fittings from the manhole to the existing pipe to pipe connection

Raising or lowering sewer services will be measured per linear foot of horizontal distance of pipe exposure and includes all fittings necessary to restore and make functioning the utilities impacted.

The item under construction as listed in the Bid Proposal will include all materials, excavation, import materials, installation, compaction, and backfill.

Unless specifically identified for payment under a separate bid item, the unit price bid for includes all labor, equipment, and materials to furnish and install a functional unit including but not limited to the following incidental items:

- Location and verification of customers' existing service location, size, and elevation;
- disconnection and reconnection of existing services where the Work includes replacement of existing service pipe;



- Sewer main and service flow control regardless of size;
- clearing and grubbing;
- trench excavation and backfill;
- excavation dewatering;
- trench support system;
- furnishing and installing Type II-A Classified Fill and Backfill;
- bedding; compaction;
- installation of pipe, fittings, adapters, or other necessary appurtenances;
- sanitary sewer service insulation;
- polyethylene encasement; when applicable,
- Permits, permit fees, taxes;
- disposal of unusable or surplus material;
- protection of existing utilities, removal, restoration, replacement of disturbed private or public property, drainage patterns, existing utilities, existing culverts, fences, landscaping, grass, asphalt, curb, gutter, and sidewalk, retaining walls, and any other public or private improvements;
- finish grading; and
- cleanup.

Where the Work includes disconnecting existing sanitary sewer services from an existing sewer main and reconnecting them to a new sewer main, the disconnection and reconnection of those existing sewer services will be considered incidental to the installation of the new sewer pipe.

Any conflicts with a property owner concerning the Work and restoration of the property after construction are to be resolved by the Contractor at no additional cost to the Owner.

Article 4.6 Basis of Payment

Payment for this Work will be as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Payment will be made on the following basis:

UNIT
LF
LF
Each
Each
Each
Each
Linear Foot

SECTION 50.05 SANITARY SEWER FLOW CONTROL

Article 5.1 General

The Work under this Section consists of providing all labor, equipment, materials, planning, coordination, operations, permits, and facilities to control sewer flow for inspection, maintenance, repair, or replacement of sewer assets.

Definitions:

- Bypass a diversionary flow path for sewer that will utilize pipes, pumps, tanks and other equipment to maintain an area suitable for maintenance, repair, rehabilitation, installation and/or CCTV inspection.
- Property Owner The authorized agent that can legally obligate debt and risk to real property from which sewer is being collected
- Resident person(s) occupying a property from which sewer is being collected who may or may not be the Property Owner.
- Sewer Flow Control Supervisor A Contractor personnel who has authority to make changes to the by-pass system, buy replacement parts, and assign other personnel to monitor the system.

Sewer flow control is to be completed such that it will not damage public or private property. Repair and reparations for property damage associated with the Work is the sole responsibility of the Contractor to fix, repair clean and make whole. This includes payment of all fines and penalties levied by other agencies such as the Environmental Protection Agency, Alaska Department of Environmental Conservation, or other governing bodies for unauthorized discharges of sewer.

Article 5.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data.

The Contractor is to prepare, submit and receive acceptance of a detailed sewer flow control plan that describes the measures to be used to control flows prior to implementation of such plans.

The plan, at a minimum, is to contain the following items:

- Plug types and sizes
- Pump types, sizes, and power source
- Conduit types, sizes, connections, valves, and fittings
- Name and telephone number of the Sewer Flow Control Supervisor, who is responsible for Flow Control.
- Key personnel being used for 24 hour operations
- Copy of noise permit application and approved permit when it is received

- Diagram(s) indicating pump, pipes, catch points, portable restrooms and discharge point showing applicable elevations
- Identification of structures with basements
- Diagram and state location of provisions being made for vehicular and pedestrian traffic. Provide details of ramps, trenches, temporary surfaces etc.
- Calculations used to size system
- Copy of property access agreement between the Contractor and the Property Owner (may be a delayed submittal, but must be obtained and provided prior to flow control implementation)
- Provisions for repair and re-instatement of the sanitary sewer flow control system, including but not limited to back up pumps, repair clamps, extra hosing/piping and alternate power sources.

Article 5.3 Materials

Bypass systems are to have sufficient equipment and materials on site to ensure immediate repair or modification of any part of the system.

A. Conduit and pipes

Provide watertight hoses, piping and fittings of sufficient capacity and pressure rating to accomplish the sewer bypass. The Contractor is to have replacement conduit and fittings on-site to make multiple repairs to the conduit.

Where hoses are provided, the Contractor is to have on hand two sections of replacement hose that are capable of covering the longest single hose in the flow control system.

The conduit, pipe, repair, and transition materials are to be of a common size and material that purveyors of such materials will have a ready supply as a backup to the on-site replacement conduit.

B. Pumping and suction equipment

Pumps are to be adequately sized, well maintained and of an appropriate type for sewer. They are to be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system and are to allow dry run for longer periods of time to accommodate the cyclical nature of sewer flow.

Pumps with engines or associated combustion power generation units must be in compliance with the City noise ordinance. The Contractor is to apply for and receive a noise permit when required by the City noise ordinance.

All pumps used to bypass mainlines and services six inches (6") and larger are to have a reliable standby pump of equal capacity to the primary bypass pump. These backup pumps are to be on-line and isolated from the primary system through the use of valves.

All bypass pumps for services smaller than six inches (6") in size are to have a primary pump and a backup for each lot of five operationally identical primary pumps.

Backup pumps are to be on-site and ready for replacement and incorporation into the by-pass system.

C. Plugs

All sewer line plugs are to be permanently marked with a Contractor identification marker. Secure plugs with a tag line. The tag line is to extend and be secured to a point outside of the manhole or wet well in which it is being used. Airlines are not considered tag lines.

Temporary plugs must be removed, and the flow restored after planned interruptions. If the sewer flow control work has not been completed prior to the end of the planned interruption, the Contractor is then required to restore sewer flow by providing, operating, and maintaining a sewer bypass until sewer flow is restored to normal.

D. Portable Toilets

Portable toilets are to be provided for buildings with temporarily blocked services. One portable toilet is to be provided per each two residential units or eight employees. Each business complex with a plugged sewer service is to be supplied at least one handicap accessible portable toilet with a wash station. Businesses with more than twenty four (24) employees are not eligible for portable toilet service and must have the sewer service bypass the work. Residential units housing disabled sewer customers must agree in advance and in writing to portable toilets or must have their sewer services bypass the work.

E. Holding Tanks

Tanks are to be metal or plastic, free of leaks, designed to contain fluids and closed to the atmosphere except to allow for venting. Vents are to be smaller than the feed lines and installed at the highest point of the system. The tank size is to be no less than double the anticipated daily flow. Filling and discharging of tanks is to take place through securable ports.

Article 5.4 Construction

A. General

Unless the anticipated flow is provided in the special provisions, the Contractor is to assume that the sewer flow is to be equivalent to the capacity of the sewer system being bypassed based on the as-built information. When flows are bypassed, the discharge must be to a sanitary sewer collection system.

The Contractor is to provide notice to affected parties who may be impacted by planned sewer flow control. Interruptions are not to exceed six hours.

The Contractor, at a minimum, is to provide periodic monitoring and observations of any active sewer flow control. The maximum period between observations is limited to two hours and is to be recorded in a log book that is available to the Engineer.

In addition to having the bypass system monitored, the Contractor is to provide to the Engineer and on all notices for temporary service the name and 24-hour contact

number for the person(s) responsible for continuous operation of the bypass system. This person is to be known as the Sewer Flow Control Supervisor. After approval of the sewer flow control plan, any substitutions of the Sewer Flow Control Supervisor is to be approved by the Engineer and new notices are to be sent out to sewer customers previously notified.

The Contractor is to provide a sewer flow control plan showing all components of the sewer flow control equipment, materials, location personnel and schedule.

B. Conduits

Conduits are to be constructed leak and repair band free. Repair bands may be used after the flow control system has been accepted for operation. Insertion of the conduit into the sewer collection system is to be done such that the system is not damaged. New penetrations for bypass conduits into the piping of the sewer collection system is not allowed except where the connection is to be made into pipes being removed by the project.

Sewage will not be allowed to free flow in gutters, streets, streams or over sidewalks, etc., nor is any sewage allowed to flow into storm inlets or stormwater piping.

Where conduits pass over traveled ways, the conduit is to be protected from vehicular and pedestrian traffic and vice versa.

C. Notifications

Notification is to be given to the sewer utility, Property Owner(s), business manager(s), and Resident(s) whose sewer service is being plugged, bypassed, or affected by the planned sewer flow control. Notices are to be provided a minimum of a minimum of seventy two (72) hours to a maximum of one hundred forty-four

(144) hours prior to commencement of the flow control. Notices at a minimum will require a written statement of when utility interruption will begin and end, form and/or amount of compensation for impacts, twenty four hour (24hr) emergency contacts, indemnification of the City of Homer, signatures of both the Contractor and Property Owner.

Where signatures cannot be obtained from the Property Owner after a minimum of three days of well documented attempts during the hours of 7am-8am, 12pm-1pm, and 6pm-7pm each day, the Contractor may complete the flow control Work within permitted Rights-of-Ways and easements. Work on private property may not commence without permission from the Property Owner.

D. Plugs

When plugs are inserted to control the flow, the Contractor is to monitor upstream components of the services and sewer collection system.

After the Work has been completed and restricting the flow is no longer needed for the work, then the flow is to be restored to normal. Flow is to be restored by removing the plugs in an order that permits flow to slowly return to normal without surcharging or causing other major disturbances downstream.

E. Service Disconnection

Services are to be disconnected preferably at the property line or intercepted with a vacuum at the exterior structure cleanout for all rehabilitation work. All work on property requires the Contractor to obtain written permission from the Property Owner. Disconnected and intercepted sewer service flows are to be captured, collected, and transferred to the sewer collection system downstream of the work. The Contractor is to restore all disconnected services unless it is in the Contract to abandon the sewer service.

Alternatively, the Contractor may request permission from Businesses, Property Owner(s) and Primary Resident(s) of single family and duplex structures for permission to block the service during the work or find alternative accommodations for residences.

Article 5.5 Measurement

Sewer flow control is to be measured on a lump sum basis regardless of the method used by the Contractor.

Article 5.6 Basis of Payment

Payment for this Work will be as specified in Division 10, Section 10.07 - Measurement and Payment.

All work including but not limited to disconnection, interception, plugging, bypassing, pumping around, public coordination, permitting, and repairing damage caused by sewer flow control is included in the lump sum price.

Payment will be made under the following units:

ITEM	UNIT	
Sewer Main (8"Ø-16 Ø") Flow Control	Lump	Sum
Sewer Main (16" Ø +) Flow Control	Lump	Sum
Sewer Service (4" Ø) Flow Control	Lump	Sum
Sewer Service (4" Ø +) Flow Control	Lump	Sum

SECTION 50.06 EXISTING MANHOLE MODIFICATIONS

Article 6.1 General

The Work under this Section consists of rehabilitation of existing manholes, adjusting their grade, or providing new penetrations. The Contractor is to provide all labor, materials, and supervision required to furnish and install new manhole components needed to rehabilitate existing manholes.

Rehabilitation of existing manholes can include, but are not limited to the following items of Work:

- Removal and replacement of manhole covers and frames.
- Removal and replacement of grade rings.
- Removal and replacement of manhole ladder rungs.
- Removal and replacement of cone section.
- Removal and replacement of barrel ring/riser section.
- Removal and replacement of base section.
- Removal and replacement of entire manhole assembly.
- Remove entire manhole
- Furnish and install new pipe penetration

Article 6.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data.

The Contractor will prepare and submit a Work Plan to the Engineer that identifies how the manhole rehabilitation effort will proceed without interruption of existing sanitary sewer service. Where interruption is anticipated, the work plan is to contain Sewer Flow Control as required by other Sections in this Division. The plan will also address maintenance of vehicular traffic and pedestrian traffic. Manhole rehabilitation efforts may not proceed without the Engineer's acceptance.

See Section 50.03 - SANITARY SEWER CONCRETE STRUCTURES for submittal requirements for new material.

Article 6.3 Material

The replacement component materials of construction to be deployed in the Work are to comply with the requirements of this Division, the Standard Details and Drawings. The Contractor must furnish new, unused materials for those manhole components identified in the Drawings to be replaced.

Article 6.4 Construction

A. Re-use of components

The Contractor is to reuse those manhole components that are not to be replaced in assembly of the rehabilitated manhole.

The Contractor must take due care not to destroy or damage existing component parts of manholes that are to remain or be reset in place. Damage by the Contractor that renders a component unusable is to be replaced by the Contractor with new material at no additional cost to the Owner or Utility Company.

The Engineer is to be notified when the Contractor finds that an existing component identified for re-use cannot be moved, adjusted, repaired, or worked on without damaging the component. The Engineer is to investigate and respond to the Contractor with a final determination of the component's fitness to be re-used.

B. Sewer Flow Control

The Contractor is required to maintain sanitary sewer flows during the execution of the Work. Any Sewer Flow Control required to complete the Work will be considered incidental to the manhole rehabilitation effort and will not be paid for separately.

C. Earthwork

The Contractor is to excavate the manhole as needed to access the Work. All excavation, shoring, dewatering, backfill and compaction efforts required to access the Work is to be per Division 20 – Earthwork.

D. Restoration

Upon completion of the manhole assembly effort, the Contractor is to restore the existing grades and surrounding area to preconstruction conditions including but not limited to pavement, sidewalk, curb and gutter, landscaping, and other improvements or natural features disturbed and/or damaged by the manhole rehabilitation effort.

E. Manhole Rehabilitation

The Contractor is to remove and replace those manhole components identified in the Drawings. The rehabilitated manhole is to be re-constructed as required in the Contract Documents. Where the existing manhole does not meet current requirements, the manhole is to be improved to meet the current requirements.

e.g., where a manhole scheduled to be rehabilitated and that manhole does not have polyethylene wrapping, then all new and re-used components are to be wrapped with polyethylene. Existing components not accessible are exempted from the upgrade requirements.

Where the Work requires disassembly and reuse of components that are assembled with grout and/or mastic/sealant/gasket materials, the Contractor must completely remove these materials from the components and replace them with new materials approved by the City for manhole construction in the reassembly of the rehabilitated manhole.

Where the Work requires the removal and replacement of existing ladder rungs, all

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ladder rungs within the existing manhole must be removed and replaced. The Contractor must cut off existing rungs and grind smooth against the interior wall of manhole. New ladder rungs are to be installed per the Standard Details.

The Contractor is to dispose of manhole components not used in the manhole rehabilitation effort and all other unsuitable or waste materials created in the execution of the Work.

D. Component Part Replacements

The manhole components to be removed and replaced for a specific manhole are identified in the Drawings.

The Contractor must furnish and install barrel sections and grade rings to adjust the top of sanitary sewer manholes to grade as required in this Division and per the Drawings.

Installation of new sections is to be constructed to produce a smooth, regular, watertight surface.

E. Removal of Existing Manhole and Component Parts

Upon removal of manhole component parts, the Contractor is to clean and prepare existing component parts prior to installation of replacement parts. This will include, but not be limited to, removing existing grout and Ramnek-type sealant from remaining and connecting component parts.

Materials that can be reused (manhole covers, frames, etc.) are to be salvaged and removed in a workmanlike manner and delivered to the Utility Company's Operation and Maintenance Yard. Prior to removal, salvaging, and delivery the Contractor is to confirm salvageable parts are desired. The Contractor is to provide a disposal site for non-salvageable and rejected salvageable materials.

F. Connect to Existing Sanitary Sewer Manhole

Prior to connecting to the existing manhole, the Contractor is to excavate the existing manhole to clean and prepare the exterior surface. The downstream pipe in manholes must be screened to prevent entry of mortar or other debris from entering the system. Upstream pipe inverts entering the manhole are to be cleaned prior to the removal of the downstream screen. At no additional cost to the Owner, the Contractor may elect to install a sewer by-pass system.

Connections to existing manholes are to be made by core drilling the new penetration into the manhole, modifying the existing flow channel and installing a pipe to manhole connector to produce a watertight seal for each penetration at the invert elevations shown in the Drawings. The use of impact tools to form new penetrations is prohibited and will be cause for replacement of all damaged components of the manhole at no additional cost to the Owner.

Modification of the existing flow channel includes all work to modify and remove the existing flow channel concrete and forming new flow channels.

Pipes are to be stabbed into the manhole through the boots such that at least two

inches (2") but no more than three (3") of pipe extend past the inside face of the manhole.

Connections to existing sanitary sewer manholes will be allowed only after all portions of the Contractor's Work tributary to the connection point has been cleaned and flushed, inspected and tested. Under certain conditions, connections prior to the completion of the system may be permitted subject to the Engineer's prior written approval and the provision of suitable and adequate debris and sand traps and sumps upstream from the connection.

If the connection to existing manhole occurs near the existing ladder rungs of the existing manhole, the Contractor must remove the existing ladder rungs and install new ladder rungs so that the ladder rungs are not above a pipe penetration. (The Contractor may rotate the barrel sections and cone section of the manhole rather than removing old ladder rungs and installing new ladder rungs.)

Article 6.5 Measurement

Rehabilitated manholes are to be measured as units complete in place with the components identified in the Drawings replaced, tested, and accepted by the Engineer.

Unless specifically identified for payment under a separate bid item, the unit price bid to complete the Work for includes all labor, equipment, and materials to modify an existing manhole including but not limited to the following incidental items:

- Development of a Work Plan acceptable to the Engineer;
- temporary bypass piping;
- temporary sanitary sewer service;
- excavation;
- shoring;
- dewatering;
- backfilling;
- integrity testing;
- restoration of Work area to existing preconstruction conditions;
- excavation;
- import;
- export and disposal;
- disposal fees;
- backfill;
- compaction;
- grade adjustment;
- and/or other items of Work needed to complete the manhole rehabilitation effort is to be considered incidental to the completion of the Work and will not be paid separately.

Component parts of existing or new manholes is to be included in the unit price for the bid item being constructed, reset, or replaced, and be paid for by a cumulative total of each unit constructed.

Standard Cons 192 Specifications Division 50 - samtary Sewers No measurement for Sewer Flow Control will be made. Sewer Flow Control is incidental to the bid item under construction.

Restoration of existing conditions is to be considered incidental to the manhole rehabilitation effort and will not be paid for separately.

Article 6.6 Basis of Payment

Payment for this Work is as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Payment will be made on the following basis:

ITEM	UNIT
Remove and Replace Manhole Cover and Frame (Manhole #)	Each
Remove and Replace Manhole Grade Rings	Each
Remove and Replace Manhole Ladder Rungs	Each
Remove and Replace Manhole Cone Section (Manhole #, Height)	Each
Remove and Replace Manhole Barrel Ring/Riser Section (Manhole #, Type, Number of Rings Replaced, Depth Below Grade measured to bottom of lowest ring to be replaced)	Each
Remove and Replace Manhole Base Section (Manhole #, Type, Depth of Base Section Below Grade measured to the bottom of base section)	Each
Remove Existing Sanitary Sewer Manhole	Each
Connect to Existing Sanitary Sewer Manhole (Size)	Each

SECTION 50.07 SEWER CLOSED CIRCUIT TELEVISION INSPECTIONS

Article 7.1 General

The Work under this Section consists of providing all operations associated with video inspection and recording of sewer assets.

Sewer mainline Closed Circuit Television (CCTV) work is to be completed by a currently certified National Association of Sewer Service Companies (NASSCO) camera operator in the specialty of Pipeline Assessment and Certification Program (PACP). The sewer mainline CCTV video inspection is to code observations and defects as specified in the PACP reference manual (version 6.0.1).

Video inspections for other sewer assets (non-mainline) do not require NASSCO certification.

This Work may be required multiple times and at different phases of construction. Sewer line cleaning, flow control and atmospheric conditioning will be required to obtain access, ease camera travel, remove visual impediments and remove debris. Traffic control may be required to access sanitary sewer manholes, cleanouts, pipes, and other sewer assets. The MOA makes no warranty as to the condition of the pipe, manholes or access points.

Article 7.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. Submittals, at a minimum, are to include applicable items identified below:

- Video
- PACP data
- Sewer flow control, when required
- CCTV Equipment, when requested

Article 7.3 Material

CCTV equipment includes vehicles, computers, software programs, viewing devices, cameras, cables, portable power sources, lights, blowers, winches, and all related equipment needed to satisfactorily complete a CCTV inspection.

The camera is to process video in color with a lens having a focal distance between one inch (1") and infinity (∞), be capable of autofocus, manual focus and have an adjustable iris. The in-pipe target is to be viewable with the camera at a perpendicular angle to the target and the camera at zero zoom. For cameras with zoom lens capability, calibration and in-pipe measurements are to be taken at zero zoom. Analog Video output and capture is to be a minimum of 400 lines per inch.

The camera is to be transporter mounted for six inch diameter (6"Ø) and larger pipeline inspections, have built in lighting with pan and tilt capabilities of 360° rotation and 270° tilt. Illumination is to be adjustable and capable of providing a clear and well lit picture. Lighting is to be planned and executed based upon the size and type of pipe being inspected.



Push cameras may be used to video sewer services which are typically less than eight inches (8") in diameter. Push cameras are to have built in lighting, be self-leveling, be flexible for navigating around bends, and have a sonde device. Push cameras may be used from the ground surface or transporter mounted for use from within the mainline pipe for lateral inspection. Push cameras are not to be used as the primary image source for pipes six inch diameter (6"Ø) and larger.

CCTV performed using digital high-resolution camera(s) equipped with wide angled lenses(s) that provide three hundred and sixty degree (360°) spherical and side scanning capabilities that provide "unfolded" views of the pipe and propelled by a transporter that travels faster than 30 feet per minute, may be used as an alternative to a pan and tilt camera / transporter. This alternative will only be used if the Contractor can comply with all other requirements of this specification section.

Pole mounted cameras may be used to video manholes and pipe connections.

All in pipe equipment is to be certified to operate in conditions found in wet/submerged sewer pipes and manholes without adverse effects to the equipment or the sewer system. Typically, this will require, but not limit, the camera to operate in grease, sludge, mud, gravel, one hundred percent (100%) humidity, and other adverse environments.

Article 7.4 Construction

Where required, the Contractor is to complete a CCTV inspection at the following points of construction:

- Condition Assessment The primary goal of this inspection is to document the condition of an existing sewer asset through the use of PACP codes, video and photographic documentation. This information will assist engineers and planners to plan and prioritize any needed repairs.
- Pre-rehabilitation This inspection takes place prior to the rehabilitation of a sewer asset to look for places that may interfere with the planned rehabilitation. This inspection does not require PACP coding. The video and photographic documentation is to be provided to the Engineer for review prior to beginning rehabilitation.
- Prior to Acceptance of New Pipe Prior to acceptance of newly installed pipe a CCTV inspection is to look for deficiencies in the work. If no deficiencies are found the CCTV of sewer pipe is to set baseline condition of the newly installed pipe from which future CCTV inspections will used to document changes in the condition of the pipe. PACP coding is required.
- Post rehabilitation This inspection takes place after rehabilitation of the pipe has been accomplished and will be used to determine Substantial Completion. PACP coding is required.
- Rehabilitation acceptance This inspection will take place approximately one month prior to the end of the Warranty Period. It is the responsibility of the Contractor to request CCTV the rehabilitated sewer asset. The Warranty will be automatically extended to 30 days past the Rehabilitation Acceptance CCTV or Warranty expiration

date, whichever is later. PACP coding is required.

The Engineer or their designee is to be provided unobstructed access to CCTV facilities from set up to tear down of the CCTV equipment. During the CCTV inspection the Engineer or their designee may require the Contractor to backup, adjust the camera and investigate with the CCTV equipment any points they may deem of interest.

The Engineer will review the CCTV video and PACP observations and defect codes to determine conformance with the specification. The Contractor is to correct deficiencies where the video and coding do not meet the standards stated herein at no additional cost to the Owner.

A. Sewer Main CCTV Inspection

The camera is to be centered in the pipe and move in a downstream direction at a uniform rate stopping and recording all joints and points of coding. At no time is the rate to exceed a rate of thirty feet per minute (30 ft/min). When the camera is not able to complete the inspection, after several attempts and cleaning of the sewer pipe, then the inspection of the current segment is to be abandoned and started from a reverse setup going against the sewer flow.

The camera lens is to be kept clear of condensation, oils, grease, and debris during the CCTV inspection. Lighting intensity is to be adjusted to minimize glare. Picture quality must be adjusted to provide a clear in-focus picture of the entire periphery of the pipeline.

The Contractor is to record and code the sewer mainline inspection using PACP codes in a NASSCO certified software. The Engineer will provide the sewer main names to the Contractor. The Contractor is to request a list of the NASSCO PACP non-mandatory fields that are required to successfully complete the CCTV inspection from the Engineer. If an unknown/new access point is found or created to CCTV the sewer pipe, then the Contractor is to obtain the name from the Engineer.

The Contractor is to complete a thorough examination of stopping points prior to continuing the inspection. The following partial list of required stopping points are provided below and a more complete list is provided in the NASSCO PACP requirements.

- Manholes Pipe penetrations, flow channel, bench, and barrel sections are to be videoed.
- Joints camera shall rotate 360° to provide a potential view of all portions of the joint. The rotation is to occur at a metered rate over no less than twenty seconds.
- Cracks and fractures provide a close up view of the point of interested (POI) and a perspective view indicating the extent and/or length of the POI and how close the nearest pipe joint is.
- Holes, breaks, lining failures and/or deformations provide a close up and perspective view of the POI. Adjust the view to make apparent any voids behind the POI.

- Service connects inspect the hole cut into the pipe and associated repairs at all service connections.
- Changes in alignment, sags, or crests The view should be long enough and lit such that the change can be estimated.

Video and photographs are to be captured but not coded for sewer assets that are not sewer mainlines.

B. Sewer Cleaning

The Contractor is to clean the sewer lines for sewer CCTV by removing grit, loose solids, grease, and any debris that is present. All debris is to be trapped at the end of the CCTV inspection run and properly hauled off and disposed.

Sewer line cleaning is to be accomplished using a high velocity jet or mechanically powered equipment. Selection of the equipment used is to be based on the condition of the sewer line at the time the work commences.

The Contractor is to take due care to avoid damaging the pipe or impact connected sewer customers.

Cleaning is to be completed by the Contractor within 144 hours and no less than one hour prior to inspection.

3. Flow Control

CCTV video will not be accepted when the water depth is greater than twenty percent (20%) of the pipe diameter for pipes twelve inch in diameter (12"Ø) and smaller. Larger pipes will have an additional five percent (5%) allowance.

Flow control is required for the successful completion of the CCTV inspection. The Contractor is to work with property owners, schedule inspections at low usage times, assist with a high velocity hydraulic jet, provide sewer flow control or any combination of the above to meet the water depth requirement.

4. Distance Measurement

The distance is to be measured between the exit of the start manhole and the entrance of the finish manhole for a true measurement of the length of the pipe segment, as required by PACP. It shall be recorded in standard units and the video display readout shall display units to one-tenth of a foot. The camera cable shall be retracted to remove slack to ensure an accurate footage reading. The cable footage counter is to be accurate to the nearest third of a foot (1/3') except where a higher accuracy is required to reinstate services. Accuracy to reinstate services is to be to the nearest inch.

5. Deliverables

A minimum of two digital photos are to be taken of each defect, one showing a perspective view and one showing a close up view. The photo is to have on-screen information such as the distance into the inspection, the starting asset number, and the ending asset number.

The Contractor is to submit to the Engineer within five days of completing the CCTV inspection video files, photographs, and the sewer main inspection database. The database will be in an unmodified NASSCO-PACP Certified database with a MS Access format. Photographs, video, folders, and other data will be properly referenced within the Contractor's database. This integration will provide a seamlessly export from the Contractor's NASSCO-certified PACP software and then import into the AWWU's NASSCO-certified PACP software. CCTV inspection data from the Contractor that cannot be seamlessly imported will be cause for rejection.

This may be provided on CD's, DVD's USB Thumb Drives, or portable hard drive.

Recorded images showing steam, inadequate lighting, or poor image quality will be cause for rejection.

If the Engineer determines that corrections are needed, the documentation is to be resubmitted after corrective action has taken place.

Article 7.5 Measurement

CCTV measurement is not to overlap and is to occur once per bid item under which it is being paid for regardless of the number of times the CCTV camera views any one piece of pipe during that pay item. Measurement of footage is to be based on footage counter shown in the video.

Article 7.6 Payment

Payment for this Work is to be as specified in Division 10, Section 10.07 - Measurement and Payment, and include full payment for all Work described in this Section. Payment includes all labor, tools, equipment, apparatus, and incidentals required to complete the Work. At a minimum, no additional payment will be granted for setups, reverse setups, tear downs, relocation, overlapping video footage per bid item, lost or damaged equipment, property owner coordination, and jetting during CCTV activities. Sewer flow control is considered incidental, unless provided for as a bid item.

Payment will be made under the following units:

ITEM	UNIT
Sewer line cleaning for CCTV	Linear Foot
Condition Assessment CCTV	Linear Foot
Acceptance of New Pipe CCTV	Linear Foot
Pre-rehabilitation CCTV	Linear Foot
Post Rehabilitation CCTV	Linear Foot
Rehabilitation Acceptance CCTV	Linear Foot

SECTION 50.08 REMOVE AND DISPOSE OF EXISTING CESSPOOLS OR SEPTIC TANKS

Article 8.1 General

The Work under this Section consists of providing all operations for removing and disposing of existing cesspools or septic tanks.

Disposal of Unusable or Surplus Material, import of Classified Fill and Backfill, providing Sanitary Sewer Flow Control, construction of the Sewer Service Connection and Construction of the Sewer Service Extension are to be constructed and paid for under the appropriate bid item.

Article 8.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. Submittals for this Work will include a plan for removal and disposal of the septic tank and is to include at a minimum disposal locations and approvals.

Article 8.3 Construction

The following procedures apply for removing cesspools or septic tanks:

- 1. The liquid and sludge from the existing structure is to be pumped into a watertight container and transported to and disposed of at an approved sanitary sewer dump station. Care is to be exercised in transporting cesspool liquid and sludge so that no spillage occurs during transport and disposal.
- 2. Remove and dispose of any remaining sludge, septic tank, cesspool or privy pit, logs or cribbing, and saturated gravel remaining in the trench area. Disposal of this material must be at a Contractor provided disposal area approved by the Municipality of Anchorage Department of Health and Human Services and the Engineer.
- 3. Fill the void created by removal of the cesspool with Type III material as specified in Division 20, Section 20.21 Classified Fill and Backfill.
- 4. As soon as the downstream portion of the new sanitary sewer has been tested and accepted, the Contractor is to furnish and install a sewer service connection and extension to the existing service line that drained into the cesspool or septic tank.
- 5. Schedule inspection of the abandoned systems with City Public Works Inspector. The abandoned disposal system must be shown on the record drawings.

Article 8.4 Measurement

Removal of existing cesspool or septic tank with the associated drain field is to be measured per each unit.

Disposal of logs, cribbing, tanks, and saturated gravel will be measured as unsuitable material.

Article 8.5 Basis of Payment

Payment for this Work will be as specified in Division 10, Section 10.07, -Measurement and Payment, and includes full payment for all Work described in this Section.

Payment will be made on the following basis:

ITEM	UNIT
Remove Cesspool or Septic Tank and Drain Field	Each

CITY OF HOMER, ALASKA STANDARD CONSTRUCTION SPECIFICATIONS

DIVISION 50 SANITARY SEWERS

STANDARD DETAILS

STANDARD CONSTRUCTION SPECIFICATIONS DIVISION 50 INDEX OF STANDARD DETAILS

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- 50-25 Manhole Cone Adjustment
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LANDSCAPED AREAS, GRA ALLEY AREAS WHERE TRA	VEL SIREEIS, AND VELED.			0"	2"
UNDEVELOPED AND SWAM	PY AREAS.	24"	36"		
HIGHWAY R.O.W.S OUTSIDE	IRAFFIC AREAS.	0		1/2"	1"
SCALE NTS					SECTION # 50.03
REVISED 2022	MANHOLE	HEIG	HTS		detail #






































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24+52.18	SSMH Q_#4							0.00			
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26+46.58	RT (26+43.5)	4" S/S L-2,B-2	7.74 66.70		66.03	8.41	7.66	18.10 74.13	11:15		
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APPROVED RE∨ISED 2022

CONTRACTOR FIELD INSTALLATION NOTES SANITARY EXAMPLE

SECTION # DIV 50

DETAIL # 50-24





Final Draft 6-22-22

CITY OF HOMER, ALASKA STANDARD CONSTRUCTION SPECIFICATIONS

DIVISION 60 WATER SYSTEMS



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STANDARD CONSTRUCTION SPECIFICATIONS FOR WATER SYSTEMS DIVISION 60

SECTION 60.01 GENERAL

This section is to be applied and used for all Sections in Division 60.

Article 1.1 Scope of Work

The Work covered by these Specifications consists of providing all plant, labor, equipment, supplies, material, permitting, transportation, handling, and storage, and performing all operations necessary to complete the construction of all water facilities that will be distributing water by the City having jurisdiction.

Requirements for earthwork, concrete, landscaping, and other associated work items are found in other Divisions and are complimentary to this Division.

The Contractor is to locate and treat utilities in compliance with Division 10, Section 10.04, Article 4.17 – Utilities.

The Contractor, by providing a Bid Proposal and entering into a Contract with the Owner has found that the access, easements, rights-of-way, and other work areas designated in the Drawings are adequate to perform the Work and/or the Contractor has or will secure additional work areas to complete the Work. Furthermore, all costs associated with the Contractor secured work areas is to be included in the Bid Proposal.

Additional areas secured by the Contractor from parties not associated with the Contract are to be memorialized in the form of a right of entry agreement between the Contractor and party having authority to enter an agreement for the work area. A copy of the right of entry agreement is to be provided to the Owner. The right of entry agreement is to extend the indemnification requirements found in the Contract to Contractor obtained work areas.

The Contractor is to restore the area of Work to preconstruction conditions or better except where shown different in the Contract Documents. Where preconstruction conditions cannot be obtained such as items that require growth to obtain height, thickness, and other prized attributes then they are to be replaced with standard nursery stock plant material of the same species and type that will grow back to preconstruction conditions and maintained in accordance with the Contract Documents. The Contractor is to secure written approval by the Engineer for replacement material differs from the Contract requirements.

Where the requirements in this division call out for an Engineer and there is no one assigned the duties of the Engineer, then the City is to be consulted for direction for items that require an Engineer or Inspector.

Article 1.2 Applicable Standards

The most recent revisions of the following standards are made a part of these Specifications:

AASHTO M306 Standard Specification for Drainage, Sewer, Utility, and Related Castings, Single User Digital Publication



ASTM A126	Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings
ASTM B88	Specification for Seamless Copper Water Tubing
ASTM D256	Test Methods for D-C Resistance of Plastics and Electrical Insulating Materials
ASTM D3035	Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter
ASTM D3261	Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D3350	Specification for Polyethylene Plastic Pipe and Fittings Materials ASTM
F1674	Standard Test Method for Joint Restraint Products for Use with PVC Pipe.
ASTM F4777	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
AASHTO M45	Sand for Cement Mortar
AWWA A100	Water Wells
AWWA C104/ ANSI A21.4	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105/ ANSI A21.5	Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids
AWWA C110/ ANSI A21.10	Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids
AWWA C111/ ANSI A21.11	Rubber-Gasket Joints for Ductile and Gray-Iron Pressure Pipe and Fittings
AWWA C115/ ANSI A21.15	Flanged Ductile-Iron Pipe with Threaded Flanges
AWWA C116/ ANSI A21.16	Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service
AWWA C150/ ANSI A21.50	Thickness Design of Ductile-Iron Pipe
AWWA C151/ ANSI A21.51	Ductile-Iron Pipe, Centrifugally Cast in Metal Molds, or Sand-Lined Molds for Water or Other Liquids
AWWA C153/ ANSI A21.53-84	Ductile-Iron Compact Fittings
AWWA C213	Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines

AWWA C303	Reinforced Concrete Pressure Pipe, Steel Cylinder Type, Pre-Tensioned, for Water and Other Liquids	
AWWA C500	Gate Valves for Water and Sewerage Systems	
ANSI/AWWA C502	Dry Barrel Fire Hydrants	
ANSI/AWWA C504	Seated Butterfly Valves	
AWWA C509	Resilient-Seated Gate Valves for Water Supply Service	
AWWA C515	Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service	
ANSI/AWWA C600	Installation of Ductile-Iron Water Mains and Their Appurtenances	
ANSI /AWWA Fittings C605	Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and for Water	
AWWA C651	Disinfecting Water Mains	
ANSI/AWWA C652	Disinfection of Water Storage Facilities	
ANSI/AWWA C800	Underground Service Line Valves and Fittings	
AWWA C901	Standard for Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. through 3 for Water Service	∃in.,
ANSI/AWWA D100	Welded Steel Tanks for Water Storage	
ANSI/AWWA D102	Coating Steel Water Storage Tanks	
SSPC-SP	Steel Structures Painting Council Surface Preparation Specifications	
SSPC-PA	Steel Structures Painting Council Paint Application Specifications	
NSF (Standard 61)	Drinking Water System Components – Health Effects	
UBC	Uniform Building Code	
IBC	International Building Code	
UFC	Uniform Fire Code	
IFC	International Fire Code	
ISO 8179-1	Ductile Iron Pipes-External Zinc-Based Coating – Part1: Metallic Zinc with Finishing Layer	
UMC	Uniform Mechanical Code	
IMC	International Mechanical Code	
2022 CHSCS	Standard Cons 238 Specifications Division 60 – Water Systems 6/22	2

UPC	Uniform Plumbing Code
NEC	National Electrical Code
NFPA	Other National Fire Protection Association Standards
AWG	America Wire Gauge
HMWPE	High Molecular Weight Polyethylene
NACE	National Association of Corrosion Engineers

Article 1.3 Survey

Survey must be performed by the Contractor per Division 65 - Construction Survey. Survey is to be incidental to items under construction unless a pay item for Construction Survey Measurement is provided. The Contractor is to as-built and record at a minimum the following items based on the design survey horizontal and vertical control when provided or else the use local horizontal and vertical control when not provided by a design survey:

- Each pipe bottom and length of pipe segment
- Manholes, inverts, cleanouts
- Fire hydrants, valves, key boxes, tees, fittings, restraint, pipe to pipe connections specialized fittings
- Other buried utility conduits, vaults, utilidors, wires, manholes, catch basins
- Other utility surface features such as pedestals, junction boxes, power poles, light poles

Before working in developed areas, the Contractor is to take photographs and video documenting existing conditions. Photographs and video are to include major construction areas and their boundaries as well as a zone fifty feet (50') outside the furthest anticipated impact. Photo and video documentation is incidental to the Work.

Article 1.4 Definitions

The definitions provided within this Article are supplemental to definitions provided in Division 10 and are to govern in the interpretation of all disputes. Industry standard definitions are to apply if a definition is not provided. Where a term, word or phrase has varying meanings, the Engineer will have final say on the interpretation.

- Water Connection water pipe and associated apparatuses from the point of connection to a water main to the terminus of the City maintenance responsibility, usually the property line or City easement. For copper water services the key box is normally the terminus point of City maintenance requirements.
- Water Extension typically it is water pipe and associated apparatuses on a parcel of land that begins where the Water Connection ends. A Water Extension typically ends five feet outside a building foundation.
- Water Service connection, extension, and/or building piping from the City water distribution system.
- Main Line Water pipe servicing multiple customers within an easement owned by the City or within a public right of way.

Water Distribution System – Anything that is used to distribute potable water.

Fire Line – A portion of the water service with no additional branches that has the primary purpose of providing fire protection inside of a building. Typically, a service that originates at a mainline or at a valve downstream of a fire hydrant tee continuing directly into a building with a sprinkler fire suppression system. Water extensions that are four inches (4") and larger will be considered a fire line for the purpose of pressure testing.

Sewer - Non-domestic and domestic wastewater as defined in 18 AAC 72.990.

Article 1.5 Payment - General

No separate payment will be made to the Contractor for Contractor obtained work areas or the restoration thereof.

Restoration Work not covered by bid items is to be considered incidental and no separate payment will be made. Restoration completed in Contractor secured areas is incidental to the contract.

Payment for all Work included in this Division will be paid for in accordance with Division 10, Section 10.07 - Measurement and Payment, and will include full payment for all Work described.

SECTION 60.02 FURNISH AND INSTALL PIPE

Article 2.1 General

The Work under this Section consists of performing all Work required for furnishing and installing an operational piping system in a workman like manner meeting applicable standards. The Contractor shall install piping systems as specified within these Contract Documents, the manufacturer's recommendations, the American Water Works Association (AWWA) standards, the City's most current Design Criteria Manual (CHDCM), per the Engineer's written directives and in conformity with the lines and grades as shown on the Drawings. Where the previously stated requirements are in conflict the more stringent requirement is to govern.

Article 2.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. The Contractor is to clearly demarcate items to be incorporated into the Work. Submittals for pipe and fittings should at least the following items:

- Pipe
- Fittings
- Detectable underground warning tape
- Trace and continuity wire
- Contractor thrust restraint calculations
- Polyethylene sheeting
- Coatings
 - o Pipe layout plan
 - o Storage Temperature
 - o Surface preparation requirements
 - o Coating repair plan
 - o Applicator resumes
 - o Application equipment
 - o mixing and application time of coating
 - o Curing time
- Flushing and testing plan
- Survey Personnel qualifications

Article 2.3 Material

A. Ductile Iron Pipe

Ductile iron pipe is to be cement mortar lined, conforms to the requirements of AWWA C151, and has a minimum pipe wall thickness meeting Class 52 requirements. The cement mortar lining is to conform to the requirements of AWWA C104/ANSI A24.1. At least 10% of the pipe delivered is to be gauged full length of the pipe and marked as such.

- B. Fusible Polyvinyl Chloride (PVC) Pipe (in areas of soil/groundwater contamination) Fusible polyvinylchloride pipe shall be used as manufactured under the trade names Fusible C-900[™], Fusible C-905[®], and FPVC[™] High Density Polyethylene Pipe. Fusible polyvinylchloride plastic material for pipe shall conform to AWWA C900 or C905, and/or ASTM D2241 or ASTM D1785 for IPS standard dimensionality, if applicable. Fusible polyvinylchloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe. Acceptable fittings for use with fusible polyvinylchloride pipe shall include standard ductile iron fittings conforming to AWWA/ANSI C110/A21.10 and AWWA/ANSI C111/A21.11. Restrained connections to fusible polyvinylchloride pipe may be made using a restrained retainer gland product for DIPS or IPS sizing, as well as for MJ or flanged fittings
- C. High Density Polyethylene Pipe (HDPE)

High Density Polyethylene Pipe (HDPE) and fittings are to be manufactured in accordance with AWWA C906 with the additional stipulation that the HDPE is to be manufactured from PE4710 polyethylene compounds that meet or exceed ASTM D3350 Cell Classification 445574. HDPE pipe and fitting material compound is to contain color and ultraviolet (UV) stabilizer meeting or exceeding the requirements of Code C per ASTM D3350. Electrofusion fittings will not be allowed. All fittings are to have pressure class ratings not less than the pressure class rating of the pipe to which they are joined.

D. Copper Pipe

Copper pipe must be soft-drawn Type K, seamless, annealed copper pipe suitable for use as underground service water connections for general plumbing purposes.

E. Field Applied Coatings

Where a coating is required, field applied coatings may be used for repair of, in conjunction with or substitution for other coatings. Field applied coatings are to be denso wrap system, trenton wax tape system or viscotaq viscowrap system. The term "system" requires the use of more than one product from the specified manufacturer to be used in concert to seal the pipe from corrosive and/or potentially contaminated environments and water. At a minimum, the system is to fully encapsulate the piping and fittings, fill voids/gaps and adhere to the pipe. The coating system must not interfere with the operation of moving parts.

F. Fittings and Gaskets

Iron fittings are to have exterior and interior surfaces coated with fusion bonded epoxy in accordance with AWWA C116/A21.13-09.

Romac 501 couplers are not allowed on water lines.

Unless otherwise indicated on the Drawings, rubber gaskets for iron pipe is to conform to AWWA C111 and rubber gaskets for PVC pipe joints are to conform to ASTM F477.

Ductile iron fittings are to be a minimum of two hundred fifty pound (250 lb) pressure rating, flange, mechanical joint, or bell. Fittings must conform to the requirements of

AWWA C110/ANSI A21.10 or C153 A21.53-06.

Fittings with nut and bolts are to utilize carbon steel or stainless steel nuts and bolts. Fittings with carbon steel bolts and nuts must conform to the dimensional and material standards as outlined in AWWA C111 and C115 and be factory-coated with a blue fluoropolymer coating system. Fittings with stainless steel bolts and nuts must conform to the dimensional standards as outlined in AWWA C111 and C115 and the material standards in ASTM F593 and F594 with a minimum tensile strength of 75,000psi. Bolts and nuts must have imprinted markings indicating the material and grade of the metal used in fabrication. Where bolts and nuts for fittings cannot be covered by the above references then the Contractor must submit a deviation request to the Engineer and the City.

Fittings used with copper pipe are to be rated high pressure (150 psi) per AWWA C800. Brass components in contact with potable water are to comply with Public Law 111-380 (No Lead Rule). Fittings are to accept flared copper pipe or have NPT threads for threading into other fittings. Buried Brass fittings are to be field coated in the same manner as coated copper pipe.

G. Thrust Restraint System

All thrust restraint system components are to be FM Global approved for the intended use or be UL listed.

Thrust restraint systems are required where specified on the Drawings and at fittings, valves, and piping deflection points. The length of required restraint is dependent upon the system characteristics (i.e., soils, depth of cover, pipe size, etc.) in which it is installed. The Contractor must submit restraint length computations to the Engineer. Where the Contractor provided computations and the length shown in the computations do not match the Drawings, then the greater restraint length takes precedent. When the Drawings do not show restraint length at fittings, valves and piping deflection points and the Contractor does not provide calculations; then the entire length of pipe is to be restrained.

Where the Contractor proposes to use non-certified (i.e., FM Global, Underwriter Laboratories, ASTM, AWWA) thrust restrain systems they are to field demonstrate to the Engineer and the City the installation and/or construction of each new restrained joint or restraining system. Field demonstration must show the performance and sustainability of the restraint system to such a degree as to be equal to FM Global or applicable ASTM requirements. The Engineer and the City will make the final determination of the acceptability of Contractor proposed non-certified thrust restraint. Each approval will be project specific and re-testing is required for each subsequent project proposed use. All costs for approval or rejection of non-certified thrust restraint and restraint systems are to be borne by the Contractor.

1. Additional Requirements for Ductile Iron Pipe

Tie back rods and/or tie back rod and shackle assemblies, along with thrust blocks will not be acceptable thrust restraining system.

2. Additional Requirements for High Density Polyethylene Pipe

Thrust restraint systems may be heat fusion bonding, flange fittings fusion bonded with metallic backer rings, alpha Romac coupler or equal and other couplers with pipe stiffeners.

3. Additional Requirements for Copper Pipe

Copper pipe thrust restraint systems are the use of flared fittings.

H. Pipe Material Limitations

Copper is the only pipe material allowed on small diameter (less than 2") water service connections.

Standard jointing of pipe is to be bell to spigot with a gasket appropriate for the service environment.

I. Trace Wire

Trace wire for water lines is to be #10 AWG high-strength copper clad steel with a 30-mil HDPE insulation jacket (color blue) and have a 600-pound average tensile break load. Tracer wire is to be manufactured by Copperhead Industries or an approved equal.

Grounding rods are to be a minimum of twenty four inches (24") in length and copper clad.

The direct burial grounding clamps are to be EK17 as manufactured by Erico or approved equal.

All splice connections are to be constructed using 3M DBR watertight connectors or approved equal.

DryConn Waterproof Direct Bury Lugs as manufactured by King Innovation, or approved equal, is to be used to splice into the main line tracer wire.

J. Warning Tape

Warning tape must not be less than five (5) mil, foil backed, six inches (6") wide vinyl tape, colored blue, with "Caution Buried Water Line Below" continuously printed in black along the tape length.

Article 2.4 Construction

A Water Flow Interruptions

All planned interruptions require notifying the City Engineer, the Homer Fire Department, property owners, property managers and residents a minimum of seventytwo (72) hours and a maximum of one-hundred forty-four (144) hours in advance of the interruption.

Properties with fire sprinklers require a minimum of three non-holiday and nonweekend days of notice to allow property managers time to mitigate impacts to fire suppression systems.

Each interruption requires a separate notification. Interruptions not started within the planned interruption period require a new notice and notifying period. Along with



notice requirements, planned interruptions may not affect any portion of a previous interruption until a minimum of forty eight (48) hours has passed the previous interruption.

The water service outage area is water system infrastructure and project dependent. Upon notifying the City of a planned interruption, the Contractor will allow the City up to fourteen (14) working days to clean and operate valves, operate hydrants, and complete test shutdowns to establish the limits of the shutdown area. Shutdown does not implicitly mean shut off and the Contractor is to plan for up to two hundred gallons per minute (200 gpm) of water from the water system to enter the work area after the pipes have been drained.

The Contractor is to notify the Public Works Engineering Division where an interruption impacts or has the potential to impact a business establishment that provides food or health care services. Critical health care services as shown on the Drawings or called out in the special provisions are to be provided temporary water at all times.

It shall be the Contractor's responsibility to coordinate "turn-off" and "turn-on" with the Engineer and the City.

Where the supply of water to a City customer is interrupted in excess of six (6) hours, the Contractor shall furnish and install a temporary water system. If the water service is disrupted in excess of six (6) hours or without notice, the Contractor is to pay the City fifty dollars (\$50) for each impacted residential or business unit for each hour beyond the initial six hour period or the start of an interruption without notice.

If the interruption surpasses twenty four (24) hours without reestablishing water service, then the City at its discretion will take action to make repairs to reinstate water service, back charge the Contractor and other responsible parties to reinstate water service. The City may take further action by limiting the Contractor from working on City piping and City controlled services in the future. In addition, the Engineer may consider the Contractor to have substantially violated the terms of the Contract and begin to terminate the Contract as provided for in Division 10, Section 10.05, Article5.28.

B. Excavation and Backfill

The Contractor is to provide all excavation, backfill, and compaction necessary to install the pipe. Trench excavation and backfill is to be completed in accordance with Division 20, Section 20.13 - Trench Excavation and Backfill. In addition, trenching and excavation is to meet the requirements of 29 CFR 1926.651 and 1926.652 (OSHA Trench and Excavation).

All pipes are to be bedded with Class E bedding unless another material is authorized in writing by the City. Bedding is to be laid the full width of the ditch and compacted to a minimum of ninety-five percent (95%) of the maximum density.

Water pipe bedding is to extend six (6) inches below and above the pipe and constructed in accordance with Standard Detail 20-8.

C. Materials Delivery

Pipe and appurtenances are to be handled in such a manner to ensure delivery to the trench in a sound, undamaged condition. Particular care is to be taken not to damage the pipe, pipe coating, or lining. Before, after and during installation the engineer is to be provided an opportunity to examine the pipe and appurtenances for damage and defects. Damaged or defective pipe may be rejected. Rejected pipe must be removed from the project and replaced with acceptable material at no additional cost.

The pipe is not to be strung out along the shoulders of the road for long distances if it causes inconvenience to the public. The amount of pipe strung at the job site is at the discretion of the Engineer.

Rubber gaskets are to be protected from extended exposure to direct sunlight. Gaskets are to be installed into the piping when the gasket and pipe are above freezing temperature, and the gasket is pliable.

D. Connection to Existing Waterlines

The City issues permits for, witnesses, records live tap locations and sometimes completes taps on a cost reimbursable basis.

The mainline tap must be accomplished with a drilling machine approved for use on the pipe material being tapped, capable of drilling through the tapping saddle and corporation stop and pipe wall.

Tapping saddles are to be used for all taps with the exception that one (1") inch taps into eight inch (8") and larger ductile iron pipe can be directly tapped into the pipe.

Taps are to be made at sufficient distances from each other, tees, bells, joints, and other critical areas to prevent compromising the structural integrity of the pipe being tapped. Taps are not to be made any closer than three feet (3') to each other or to a bell.

Contractor shall excavate for live tap connections in such a manner that the excavation is ninety degrees (90°) to the main water line, whenever possible.

The Contractor shall bear the expenses incurred if a water main within and directly adjacent to the project site should be damaged during construction. The City, at its option, will allow the Contractor to make repairs, or the City will make repairs; however, Contractor shall bear the cost of all material, labor, and other expenses associated with the repair.

Where the Drawings require the connection to an existing valve, the Contractor may choose to use the valve at their risk or replace it at their expense.

E. Installation

Installation is to follow the requirements of AWWA C600, C605, M23, M41 and M55, these specifications, special provisions, and the City's' construction manual and published guidance documents. The City will have final say when deciding on which requirement the Contractor is to meet where these documents conflict at no additional cost to the Owner.

Deflection at pipe-to-pipe joints is to be limited to 80% of the maximum deflection angle recommend by the pipe manufacturer for ductile iron pipe

If the alignment requires deflection in excess of the above limitations, the Contractor shall furnish fittings to provide angular deflections within the limits allowable. Short radius curves and closures are to be formed by shorter lengths of pipe, bevels, factory fittings or fabricated fittings.

Where a fitting is provided to change direction, the Contractor is to install a pipe angle marker per the standard details. The marker must be centered over of the fitting. The interior of the pipe and accessories are to be thoroughly cleaned of foreign matter before being lowered into the trench. The pipe is to be kept clean during laying operation by plugging.

Pipe and appurtenances are to be carefully lowered into the trench by means of derrick, ropes, belt slings, or other suitable equipment. Under no circumstances are any of the pipes or appurtenances to be dropped or dumped into the trench. Care is to be taken to avoid abrasion of the pipe coating. Poles used as levers or skids are to be of wood and have broad flat faces to prevent damage to the pipe and coating. Where any part of the coating or lining is damaged, a repair is to be made by the Contractor at their expense and in a manner satisfactory to the Engineer.

Damage to a factory applied coating is to be repaired with a field applied coating system.

The trench bottom is to be graded to provide uniform support for the pipe barrel. Water is to be kept out of the trench by pumping, if necessary, until the jointing is completed. When Work is not in progress, open ends of the pipe, fittings, and valves are to be securely plugged so that no trench water, earth, or other substances will enter the pipes or fittings.

At a distance of not less than forty feet (40') from a known obstacle or tie-in to an existing pipe, the Contractor is to expose and verify the exact location of the obstacle or pipe so that proper alignment and/or grade may be determined before the pipe sections are laid in the trench and backfilled.

Pipe ends left for future connections are to be capped and restrained or as directed by the Engineer. The Contractor is to install vertically an eight foot (8') long wood post, directly over the end of pipe.

Cutting of pipe is to be done in a neat and workmanlike manner without damage to the pipe.

The Contractor is required to use mechanically restrained joints and fittings on all hydrant leads. The Engineer has the option of checking any or all mechanical joints to assure proper torque as specified by the manufacturer.

All valve boxes and hydrant barrels are to be encased in three layers of polyethylene encasement.

Water mains and services are to be constructed to meet all separation requirements of 18 AAC 80.020. Variance from the separation requirements requires a waiver from the

Alaska Department of Environmental Conservation and prior approval from the City.

The Contractor is to stagger the joints for the water pipe such that no joint is closer than nine feet (9') from the centerline crossing of water to sewer. In addition, where water and sewer mains and services intersect, the vertical separation between the water and sewer pipe is to be a minimum of eighteen inches (18") between exterior pipe surfaces.

F. Alignment and Grade

All adjustments to line and grade are to be done by scraping away or filling the earth under the body of the pipe and not by blocking or wedging up.

The Contractor shall continually survey line, grade and location of the pipe and appurtenances with the use of transits and levels during pipe laying operations. Survey is to be completed by qualified personnel to transfer line, grade and record required information. The Engineer will determine qualifications based on submittal of work examples and notes being made in the field when compared to note taking requirements as outlined in Division 65. The Contractor is to replace any personnel the Engineer deems to be less than qualified based on work examples provided or work being performed.

Each piece of pipe is to be laid to within three-one hundredths (0.03) of a foot horizontally and vertically from the design elevation and alignment. Regardless of the limits applied to individual pieces of pipe the accumulated variance of pipe alignment and grade must not be greater than two-tenths foot (2/10' or 0.2'). The Contractor must re-lay the water line when alignment and grade requirements are not met.

Elevations and locations for each piece of pipe and appurtenances are to be recorded in a field book. The Contractor will furnish to the Engineer a copy of the surveyor's notes and redlined drawings for transfer to record drawings. The Contractor is to make any clarifications, corrections or fill in missing data in the survey notes and redlines when requested.

The practice of placing backfill over a section of pipe to provide a platform for instruments is to be subject to the approval of the Engineer and be accomplished in accordance with the trench excavation and backfill requirements

G. Jointing of Ferrous Metal Pipe

The Contractor has the option of using either mechanical or push-on joints. All joints are to conform to the requirements of ANSI/AWWA C600.

H. Jointing of High Density Polyethylene

All HDPE water main piping and fittings are to be butt-fused in accordance with ASTM D2657. Where the Engineer finds that joint fusion is not feasible the Contractor may connect with metallic fittings. The individual who performs the joint fusion is to have written certification from an HDPE pipe manufacturer or supplier stating he/she has successfully completed an 8-hour (minimum) certification class on joint fusion techniques and procedures. In addition, this individual is to have fused a combined total of more than 5,000 feet of HDPE piping in diameters 4- inches and larger.

The Contractor shall ensure that each joint is fused at the temperature and pressure recommended by the pipe manufacturer in order to achieve the maximum pressure rating for that joint. All fused joints for HDPE piping and fabricated fittings are to be documented by a computer data logger that records pressure and temperature applied at each fused joint, along with the date and time the joint was fused. Computer printouts, electronic data, and the project station for each field fused joint is to be submitted to the City through the Engineer.

The use of electro-fusion couplings to join HDPE piping is not allowed.

I. Jointing of Copper pipe

Within City rights-of-way/easements, copper pipe shall be joined with flared fittings. All joints are to be outside of the rights-of-ways and/or City easements, unless given prior approval by the City.

J. Detectable Warning Tape

Detectable underground warning tape is required for installation of all pipe types. The warning tape must be continuously laid with the pipe and be at least twenty four inches (24") and no more than thirty six inches (36") above the pipe.

K. Tracer Wire for Non-metallic Pipe

Tracer wire is to be grounded at all dead ends, except fire hydrant legs. The trace wire is to be connected to the grounding rod with grounding clamps.

Tracer wire is to be securely affixed to the top exterior surface of the pipe using PVC pipe tape at 5-foot intervals or less. Tracer wire is to be looped around valves, saddles, curb stops, and other appurtenances in such a manner that there is no interference with the operation of the appurtenances. Tracer wire must be continuous and without splices, breaks, or cuts except for spliced-in connections as approved by the Engineer. All spliced connections must be inspected by the Engineer before being buried.

Tracer wire must be brought to the surface at all junctions and terminals, including at all valve boxes and fire hydrant legs by splicing into the main line tracer wire. The main line tracer wire must not be broken or cut. Tracer wire is to be spiral-wrapped around the exterior of the valve box riser pipe and brought into the valve box top section. Provide three feet (3') minimum of additional wire neatly coiled within each valve box.

L. Fire Lines

No connections, other than those for additional fire protection, will be allowed on the fire line outside the building. Domestic water obtained from a fire line will be connected and metered inside the building

The fire line riser from the service piping is to be composed of metallic pipe extending vertically from a ninety degree (90°) fitting through the plane of the building floor. The fire sprinkler riser must be constructed of material in compliance with the NFPA.

M. Relocate Water Main

Where a water main line or service crosses the location of a sewer, the water main is to be raised or lowered sufficiently to permit a minimum (outside diameter) vertical

distance of eighteen inches (18") from the sewer line.

The Contractor may employ either of the following methods for raising or lowering a water main.

Raise or lower lengths of the water main as necessary on either side of an obstacle to allow the main to pass under or over the obstacle, providing the deflection at any pipe joint does not exceed the requirements of this Section, or

The water main may be raised or lowered using four (4) pipe bends. The bends are not to exceed forty-five degrees (45°). Where the configuration of lowering the water piping differs from the details provided in this Division, the Contractor is to receive prior approval of the Engineer and City.

Article 2.5 Flushing and Testing

Flushing and testing is to be completed as specified in the requirements of the referenced AWWA standards unless hereinafter modified. A City representative, the Engineer, and the Contractor must be present for all flushing and testing.

Flushing and testing is to be completed separately and sequentially starting with predisinfecting, flushing, hydrostatic testing, disinfection, and continuity. The Contractor is to provide, install and remove fittings, pipes, pumps, hoses, gauges, and other items necessary to perform the flushing and testing.

All water piping, including but not limited to main line, services, fire lines, and fire hydrant legs must be flushed and tested before the piping system can be put into service.

The only exceptions to the chlorination and pressure testing requirements are for non-fire lines constructed of one inch to two inch (1"-2") copper pipe that are:

- water extensions connected to an existing water connection or,
- water connections that are connected to an existing main that are constructed in conjunction with a water service extension.

Pipe, gaskets, mechanical joints, fittings, valves, hydrants, and other water distribution components found to be cracked or defective through flushing and testing are to be removed and replaced with sound material at the Contractor's expense. When repairs are needed to make corrections pass flushing and testing requirements, the flushing and testing procedures are to be restarted for all test section impacted by the repair.

Each request to supply water for flushing, testing, and disinfecting is to be scheduled in writing with the Engineer and the City at least forty eight (48) hours prior to obtaining City supplied water. Scheduling of flushing, testing, and disinfecting will be subject to water availability. At no additional cost, the Contractor is to modify their schedule to match water availability which may require work on non-working days or outside of normal work shifts.

If the Contractor is not prepared for flushing or testing, they are to provide a cancelation notice to the Engineer and City at least two (2) hours prior to the scheduled event or the Contractor is to reimburse the City and Engineer for all expenses incurred by said entities. Expenses will include, but not be limited to, salaries, transportation, and administrative costs. Earthwork for roadways and sidewalks as well as installation of other utilities that share the same frontage as the water distribution system being tested is to be Substantially Complete prior to flushing and testing.

The Contractor is not authorized to operate the City water distribution system. Only the City personnel are authorized to manipulate the existing pipe system to supply water for flushing and testing.

The Contractor shall submit, in writing, for the Engineer to review and approve, a schedule and procedure for the testing and flushing of all newly installed pipe. The plan is to include flush and de/chlorinated water handling and discharge procedures. Water discharge locations must receive approval from the governing authority of the discharge location.

When, in the opinion of the Engineer, the testing and flushing schedule and procedure are deficient, inadequate, improper, or conditions are such that the impact to existing water service areas are adversely affected by service interruptions, the Contractor will be notified in writing by the Engineer. Such notification is to be accompanied by a statement of the corrective action to be taken. Contractor shall adhere to the testing and flushing schedule and comply with such instruction as directed by the Engineer.

A. Pre-disinfecting

The Contractor is to place calcium hypochlorite granules/tablets in the water main as it is being constructed. The following table provides the Contractor the minimum amount of granules/tablets required at the fill point and at an interval of 500' thereafter:

<u>Pipe Diameter (inches)</u>	<u>Calcium Hypochlorite (oz)</u>		
4	1.7		
6	3.8		
8	6.7		
10	10.5		
12	15.1		
14 and larger	D ² x 15.1		

Where D is the inside pipe diameter (ft)

At the completion of the water pipe installation, but prior to flushing, the Contractor is to slowly fill the newly installed pipe, fire hydrants, services, and other appurtenance with water and limit flow velocity to less than one foot per second (1ft/sec). Upon filling the pipe, the Contractor is to wait one hour (1 hr) prior to flushing.

B. Flushing

All newly installed water pipes are to be open bore flushed through un-restricted outlets. Flush water is to achieve a minimum velocity of three feet per second (3 ft/sec) and the minimum water quantity flushed at the minimum velocity is to equal three times the quantity of water in the piping being flushed.

The Contractor is to configure the flushing operation, where possible, from higher to

lower elevation, utilizing higher pressure mains first, allowing the City to manipulate the water distribution system to achieve higher than normal pressures and flows to the newly constructed main or other appropriate measures to increase flushing velocities.

Flush piping on service water connections is to be connected to the service water extension side of the key box, extended a minimum of two feet (2') above finish grade and remain in place until the Final Acceptance Date.

Flush water must not be directly connected to the sanitary sewer system. When specifically permitted by the City, flush water discharged to the sanitary sewer system must be de-chlorinated, have flow regulation with metering, and be limited to the sewer system capacity. The sewer system capacity may exclude discharging to sewer regardless of the flow conditions at the proposed discharge point. The sewer capacity is to be provided in the Special Provisions or the Contractor must obtain the sewer capacity from the City. The flow provided is based on computer modeling. Actual conditions of the sewer piping may require the Contractor to reduce flow so that the added flow will not cause damage to property.

C. Hydrostatic Testing

All hydrostatic testing will be performed through a test copper. The test station is to be placed at the highest end of the pipe being tested when there is an elevation change in the pipe greater than ten feet (10'). The test pressure is not to exceed the maximum allowable operating pressure of the pipe, fittings, valves, thrust restraints, or other appurtenances of the test section. Use of fire hydrants for testing will not be allowed. The specified test pressure shall be applied by means of an approved pumping assembly connected to the pipe in a manner satisfactory to the Engineer.

When the pressure decreases below the required test pressure during the test period, the pipe being tested will be declared void and will require re-testing.

The Contractor is to incorporate a City provided test pressure gauge for measuring and determining results of the hydrostatic test. The gauge is to be returned to the City at the completion of the hydrostatic testing.

The Contractor shall suitably valve-off or plug the outlet to the existing or previously tested water main at his expense prior to making the required hydrostatic test. Prior to testing, all air is to be expelled from the pipe.

If permanent air vents are not located at all high points and dead ends, the Contractor must install and abandon corporation stops at such points so the air can be expelled as the line is slowly filled with water.

All intermediate valves within the section being tested will be closed and reopened during the test. Only static pressure will be allowed on the opposite side of the end valves of the section being tested.

Hydrostatic testing of water lines containing a chlorine mixture above 2 ppm will not be allowed.

The minimum hydrostatic test pressure is to be one hundred fifty pounds per square inch (150 psi) for a minimum duration of thirty (30) minutes for non-fire lines. Fire lines



are to be tested at two hundred pounds per square inch (200 psi) for a minimum duration of two hours.

Pumping will be terminated and disconnected upon starting the test. The test pressure at the start of the test is to be maintained for the duration of the test period. Any loss of pressure will be considered a failed pressure test for all pipe types except HDPE.

Newly installed HDPE water main is to be hydrostatically tested to the rated operating pressure of the pipe and appurtenances in two phases. The rated operating pressure of PE4710 HDPE SDR11 piping is two hundred pounds per square inch (200 psi).

Phase 1 - Initial Expansion (4 hours)

Pressurize the test section to the test pressure and maintain for four (4) hours. The contractor is to pump in additional test water into the pipe to maintain test pressure as the pipe expands slightly. It is not necessary to monitor the amount of water added during this phase.

Phase 2 - Pressure Testing (minimum 1 hour)

Immediately following the initial expansion phase, the Contractor is to stop adding testing fluid and then reduce pressure by 10 psi. The reduced pressure then becomes the test pressure and is to be held within five percent (5%) for one hour and show no visible leaks to be deemed as having passed the test.

The maximum test duration is eight (8) hours. If the test is not completed in the maximum duration period, then the Contractor is to depressurize the test section completely and allow it to relax for at least eight (8) hours before pressurizing the test section again.

D. Disinfection and Confirmation Testing

The Contractor is to use the Continuous Feed Method to disinfect the newly installed water distribution system:

The chlorinating agent must be applied at a point of not more than ten feet (10') from the beginning of the project. Under no conditions is the chlorinating agent to be introduced through a fire hydrant.

Water is to be fed slowly into the new water line with chlorine applied in amounts to produce an initial water and chlorine mixture in the pipe of not having less than twenty-five parts per million (25 ppm) of free chlorine. During the chlorination process, all intermediate valves and accessories are to be operated by the Contractor. The Contractor is to discharge water from the end of all main lines, branches, service connections and extensions until the Engineer verifies that all portions of the newly constructed water distribution system have the initial minimum free chlorine level of the water source supply.

The chlorinated water is to be retained in the piping for a minimum of twenty four hours (24hrs) and have a minimum residual level of free chlorine of ten parts per million (10 ppm). At the completion of the twenty four hour (24 hr) period the Engineer is to sample the water. If the free chlorine drops below ten parts per million (10 ppm) the Contractor

is to restart the flushing and testing.

The Contractor shall provide a plan for concurrence by the Engineer for disposal of chlorinated waters from the disinfection process. The plan must include a method to dechlorinate and hold the discharge prior to leaving the Contractor's control. Under no circumstances is the solution to be discharged to the sanitary sewer system without prior approval of the sewer City and the Engineer. Discharges of the spent chlorine solution is to be approved by the authorities have jurisdiction of the receiving facility/site.

After dechlorination is complete, the Contractor shall provide access and accommodate in its schedule for coliform testing. The Engineer with Contractor support are to collect two sets of acceptable samples, taken 24 hours apart, of water from the disinfected piping at the location(s) required by AWWA C651. The samples are to be tested in as specified in AWWA C651 Standard Methods for the Examination of Water and Wastewater and show the absence of coliform organisms. Samples are to be collected by a qualified person and processed in a certified lab.

All preparation and coordination required for disinfection testing and re-testing shall be the responsibility of the Contractor. Additional compensation or contract time extensions for re-testing due to inadequate disinfection will not begranted.

<u> Pipe Diameter (ID)</u>	<u>Dosage (oz.) per 100 feet</u>
4"	.34
6"	.76
8"	1.34
10"	2.10
12	3.02
14 and larger	D ² x 3.02

CHLORINATION

Where D is the inside pipe diameter (ft)

One Heaping Tablespoon = 1/2 oz.

This table is to be used as a guide for chlorinating water mains by the calcium hypochlorite and water mixture method. This dosage takes into account that contractors most frequently use granular HTH, which is sixty-five percent (65%) pure. If another chlorinating agent is used, the dosage must be adjusted. Caution should be exercised against producing too high a concentration of chlorine in the line.

Disinfection will not be allowed until all open-bore flush pipes are removed and the water system is sealed.

The Contractor may submit a deviation request to the Engineer for review and approval for alternate disinfection plans that meet the requirements of ANSI/AWWA C-651.



E. Test and Air Vent Copper Pipe Removal

The Contractor is to remove all test and air vent copper pipes upon successful completion of the flushing and testing requirements and install a copper disc in the corporation stop in the presence of the Engineer.

Article 2.6 Measurement

Measurement for furnishing and installing water main line and fire line is per linear foot of horizontal distance of the various sizes as set forth in the Bid Schedule. Measurement will be from station to station as staked in the field and as shown on the Drawings, except where the grade exceeds twenty-five percent (25%), in which case measurement will be by actual pipe length.

Connections to existing water lines are measured as a complete unit in place.

Raising or lowering of existing water line is measured as a complete unit in place that includes but not limited to piping, fittings, locator tape, disinfection, continuity wire, trace wire polyethylene encasement and the like to make a functioning water system.

Article 2.7 Basis of Payment

Payment for this Work will be in as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

All requirements for flushing and testing are incidental to the Work.

Variations from the depth of the connection point indicated in the Drawings will not be grounds for additional compensation

Unless specifically identified for payment under a separate pay item, the unit price bid to includes all labor, equipment, and materials to complete the Work including, but not limited to, the following incidental items:

- delivery of non-serviceable portions of removed pipe, valves, and fittings at a Contractor-furnished disposal site,
- delivery of serviceable portions of removed pipe, valves, and fittings to the City,
- installation of all pipe, tees, crosses, bends, caps, plugs, adapters, reducers, thrust restraint systems, and other fittings,
- installation of pipe angle markers,
- installation of thrust blocks,
- adjustment to finish grade,
- protection and/or restoration of all existing utilities,
- maintenance of existing water distribution system flows,
- trench excavation and backfill,
- compaction,
- import classified material and disposal of unusable material,
- shoring,
- protection of existing light and utility poles,
- maintenance and restoration of existing drainage patterns,

- restoration of existing private or public improvement such as but not limited to:
 - o driveways,
 - o signage, mail boxes, newspaper boxes,
 - o trees and shrubs located on private property.
- landscaping, utility markers, survey monumentation,
- cleanup, and miscellaneous items required to complete the Work as shown on the Drawings.

Where the Work includes disconnecting existing water services from and existing water line and reconnecting them to a new water line, the disconnection and reconnection of those existing water services will be considered incidental to the price bid for installation of the new water line.

Payment will be made on the following unit bid items:

ITEM	UNIT
Furnish and Install (Size/Type) Pipe	Linear Foot
Furnish and Install (Size/Type) Fire Line	Linear Foot
Connect to Existing Water Line (Connection Size)	Each Raise
or Lower Water Line (Size)	Each
SECTION 60.03 FURNISH AND INSTALL VALVES

Article 3.1 General

The Work under this Section consists of the performance of all Work required for furnishing and installing valves, including valve boxes and marker posts.

Article 3.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. The Contractor is to clearly demarcate items to be incorporated into the Work. Submittals for pipe and fittings should include, but is not limited to the following information:

- Manufacturer valve submittal cut sheets
- Valve box
 - o Lid
 - o Top Section
 - o Dust Pan
 - o Riser
 - o Bottom Section
 - o Rubber centering sleeve

Article 3.3 Material

Tie back rods and/or tie back rod and shackle assemblies are not acceptable as restrained joints or restraining system for valves and valve/pipe joint interface.

Unless otherwise detailed on the Drawings, valve and valve/pipe interface are to be push-on rubber gasket type or mechanical-joints conforming to AWWA C111 and be restrained per Section 60.02.

A. Gate Valves

Gate valves shall be iron body, fully bronze mounted, double disc, parallel or resilient seat valves as specified in AWWA C509 "Resilient-Seated Gate Valves for Water Supply Service" or AWWA C515 "Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service".

Gate valve bonnet bolts shall be Type 316 stainless steel with a minimum tensile strength of 75,000 PSI and shall conform to ASTM F593 and F594. All bolts shall be stamped with the grade marking on the head of the bolt, and shall be "T-316", "316", or "F593".

B. Butterfly Valves

Butterfly valves shall be of the rubber-seated tight-closing type. They shall meet or exceed the performance requirements of AWWA C504 for operational pressures of 150 psi working pressure and 300 psi hydrostatic pressure.

Mechanical joint valve ends shall be per AWWA C110/ANSI 21.10 and AWWA C111/ANSI 21.11 of the latest revision, and "Short-Body" in accordance with the

requirements of Table 2 of ANSI/AWWA C504. Accessories (bolts, glands, and gaskets) shall be supplied by the valve manufacturer.

Butterfly valve actuator bolts that are exposed shall be Type 316 stainless steel with a minimum tensile strength of 75,000 PSI and shall conform to ASTM F593 and F594. All bolts shall be stamped with the grade marking on the head of the bolt, and shall be "T-316", "316", or "F593".

Valves must use full ANSI/AWWA C504 Class 150 B valve shaft diameter and full Class 150 B underground service operator torque rating throughout entire travel to provide capability for operation in emergency service.

Valve body shall be high strength cast iron ASTM A126 Class B. For valves with the rubber seat mounted on the disc, the mating surface in the body shall be 304 or 316 steel. For valves containing the rubber seat in the body, the method of seat retention shall be in accordance with the requirements of ANSI/AWWA C504, except that no retaining fasteners or other hardware shall be permitted in the flow stream.

Valve operators, unless otherwise required by the Contract Documents, shall be of the traveling nut type, sealed, gasketed, and lubricated for underground service and capable of withstanding on overload input torque of four hundred fifty (450) foot-pounds at full open or closed position without damage to the valve or valve operator. The number of turns to operate the valve shall be a minimum of two (2) turns per inch of valve diameter for ninety degrees (90°) of closure travel at a maximum pull of eighty (80) pounds. All valves shall open counterclockwise and be equipped with two inch (2") square AWWA operating nut.

For butterfly valves twenty inches (20") and less, the valve shaft shall be one piece extending full size through valve bearings, disc, and shaft seal. In the event that the shaft is turned down to fit connections to the operator, the limits of ANSI/AWWA C504, Section 3.3.2 shall be strictly observed. Carbon steel shafts, if used, shall have 304 or 316 stainless steel journals with static seals to isolate the interior of the disc and the shaft from the water.

For butterfly valves over twenty inches (20"), the valve shaft shall be of two-piece stub shaft type, made of 18-8 Type 304 stainless steel. Valve bearings and shaft seals for valves of all sizes shall meet the requirements of ANSI/AWWA C504 Section 3.6 and 3.7 respectively, with the following additional requirements:

- 1. Sleeve bearings shall have a maximum coefficient of friction of 0.1.
- 2. For underground service, packing shall be pressure-energized chevron or "O" ring type, not requiring adjustment and suitable for permanent duty.
- C. Pressure Reducing Valves

Pressure reducing valves are to be supplied as shown on the plans or as directed in the Special Provisions.

D. Valve Boxes

Valve boxes are to be constructed of the following individual parts:

- Lid cast or ductile iron with lifting ears that conforms with and fits closely with the top section and is rated heavy duty.
- Top section cast or ductile iron, rated heavy duty, 18" minimum height, minimum 6" inner diameter, recessed to receive the lid.
- Dust pan cast or ductile iron, 3" minimum height, ¼" minimum thick material, lift handle/bar and fits into and rests on the riser.
- Riser cast or ductile iron pipe that fits inside the top section and over the bottom section, 10' long delivered to the Work site.
- Bottom section cast or ductile iron, rated heavy duty, 24" minimum height, with round or oval bottom hood sections to fit over the top of the valve.
- Polyethylene film 8 mil in conformance with this Division.
- Rubber centering ring –a rubber compound sleeve placed on a valve to align the valve box bottom section with the valve top, such as the Valve Box Adaptor II or equal. The centering ring must conform to the shape of the valve and valve box to seal out soil.

Tape – minimum 2" wide, 20 mil thick, UPC approved PVC Tape

Heavy duty rated items are to meet AASHTO M306 criteria. Internal diameter of the smallest section shall not be less than five inches (5"). Minimum thickness of the metal shall not be less than five-sixteenth inch (5/16"). Castings shall be smooth and the workmanship shall be acceptable to the Engineer.

E. Markers

A two and one-half inch (2.5") O.D. galvanized steel pipe, painted "navy blue", seven feet (7') in length, with three feet (3') buried in the ground is to be placed at the nearest property line to mark the location of all valve boxes outside of paved areas. Unless otherwise directed by the Engineer, the maker is to be placed no more than fifty feet (50') away from the valve being marked. The marker is to have two inch (2") "caterpillar yellow" lettering stenciled near the top of the above ground portion of the marker indicating what the marker is for, swing distance to the valve and general direction from the marker to the valve. The notation is to be presented as "VB (feet) (direction)" with "VB" being within two inches (2") of the top of the marker.

Article 3.4 Construction

Valve interiors are to be cleaned of all foreign matter before installation. If the valve is at the end of the line, it is to be plugged prior to backfilling. The valve shall be inspected by the Contractor in the open and closed positions prior to installation to ensure that all parts are in working condition.

Place the rubber centering ring inside the bottom section over the valve bonnet. Valve box components are to be plumb and centered over the operating nut.



The butterfly valve operators are to be placed on the side of the water main away from the centerline of the street or easement.

Regardless of what is shown on the Drawings, a valve is to be installed outside the building so that all fire hydrants will remain in service in the event water service to the building must be shut off.

After final inspection of valves located in unpaved areas the Contractor is to place Class 'E' bedding directly over the valve box lid to final grade elevations. The Contractor must expose and rebury all valve boxes for pre-final and final inspections in unpaved areas. Valve box lids in paved areas are to be exposed and accessible.

Locations where replacing a valve box assembly is required it is to be removed by excavating to fully expose the valve and connecting pipes then reconstructed to the requirements of this section and the standard details.

Locations where replacing a valve box riser is required it is to be removed by excavating to the top of the valve box bottom section and reconstructed to the requirements of this section and the Standard Details.

To adjust an existing valve box top section to finish grade, the valve box top section, lid and dust pan are to be removed by excavating and reconstructed to the requirements of this section and the Standard Details.

Valve box components removed are to be replaced with materials meeting this section and not re-used in any portion of the Work.

Article 3.5 Measurement

Furnishing and installing valves will be measured as a whole unit designated by type and size inclusive of all parts required to provide a functioning valve including but not limited to valve, valve connection components, bottom section, riser, top section, dust pan, lid, markers, elevation adjustments, and corrosion/intrusion/frost protection per these specifications, special provisions, standard details, and drawings.

Replacement of valve boxes will be measured as complete units in place including but not limited to the bottom section, riser, top section, dust pan, lid, markers, and corrosion/intrusion/frost protection.

Replacement of valve box risers will be measured as complete units in place including but not limited to the riser, top section, dust pan, lid, markers, and corrosion/intrusion/frost protection.

Adjustment of valve box top sections to finish grade will be measured as complete units in place at the Engineer approved elevation that includes the removal and replacement of the valve box top section, dust pan, and lid.

When the bid item includes the removal and replacement of valve box components, then those same components will not be measured for payment under any other bid item.

Disposal of removed parts will not be measured for payment and is considered incidental to the item being constructed.

Standard Cons 260 Specifications Division 60 water Systems Unless specifically identified for payment under a separate pay item, the unit price bid to complete the Work includes all costs, labor, equipment, and materials to complete the Work including, but not limited to, the following incidental items:

- Excavation,
- backfill and compaction,
- import of classified material
- markers,
- disposal of unusable material,
- Removal and replacement of ground surface features
- adjustment to finish grade,
- protection and/or restoration of all existing utilities,
- maintenance of existing water distribution system flows,
- shoring excavations,
- protection of existing light and utility poles,
- restoration of existing private or public improvement such as but not limited to:
 - o driveways,
 - o signage, mail boxes, newspaper boxes,
 - o trees and shrubs located on private property.
 - landscaping, utility markers, survey monumentation,
- cleanup, and miscellaneous items required to complete the Work as shown on the Drawings.

Article 3.6 Basis of Payment

Payment for this Work is to be as specified in Division 10, Section 10.07 - Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made on the following unit:

ITEM	UNIT
Furnish and Install (Size) Gate Valve	Each
Furnish and Install (Size) Butterfly Valve	Each
Remove and Replace Valve Box	Each
Remove and Replace Valve Box Riser	Each
Remove and Replace Valve Box Top Section	Each
Remove and Replace Valve Box Lid	Each
Remove and Replace Valve Box Dust Pan	Each

SECTION 60.04 FURNISH AND INSTALL FIRE HYDRANTS

Article 4.1 General

The Work under this Section consists of the performance of all Work required for the furnishing and installation of "L-Base" Fire Hydrant Assemblies, including the fire hydrant leg pipe, auxiliary gate valve, valve box, joint restraint, guard rails and/or posts, coatings, wrappings, and fire hydrants.

Article 4.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. The Contractor is to clearly demarcate items to be incorporated into the Work. Submittals for fire hydrants should include, but is not limited to the following information:

- Manufacturer fire hydrant submittal cut sheets with the selected ordering options clearly marked.
- Valve and valve box riser components
- Thrust restraint system

Article 4.3 Materials

A. Fire Hydrants

Fire hydrants are to conform to the requirements of ANSI/AWWA C502 for Dry Barrel Fire Hydrants. Fire hydrants are to be American Darling 5-1/4 B62B with 20" nozzle section or equal.

- 1. The operating nut of the hydrants is to be a minimum of twenty eight (28") above the traffic breakaway flange. The traffic breakaway flange is to be between three inches (3") to nine inches (9") above adjacent grades.
- 2. All single pumper hydrants are to be furnished with a six inch (6") ANSI Class 125 standard mechanical-joint end. All double pumper hydrants must be furnished with an eight inch (8") ANSI Class 125 standard mechanical joint.
- 3. All connections are to be mechanical-joint unless otherwise indicated in the Contract Documents.
- 4. Single pumper hydrants must be furnished with two (2) two and one-half inch (2.5") hose connections and one (1) four and one-half inch (4.5") pumper connection. Double pumper hydrants are to be furnished with one (1) two and one-half inch (2.5") hose connection and two (2) four and one-half inch (4.5") pumper connections.
- 5. Unless otherwise required by the Contract Documents, all hydrants are to be furnished with a barrel length that will allow a minimum of seven feet (7') of bury (ten feet (10') on the Spit). The lower barrel must be one piece to achieve the required burial depth.
- 6. The main values are to be of the compression type, where water pressure holds the main value closed permitting easy maintenance or repair of the entire barrel assembly from above the ground without the need of a water shutoff.

- 7. All fire hydrants must be furnished with a breakaway flange which allows both barrel and stem to break clean upon impact from any angle. Traffic flange design must be such that repair and replacement can be accomplished above ground.
- 8. Painting and coating are to be shop coated in accordance with cited AWWA Specifications. The paint is to be federal standard color 595B, Code 13538. After installation, the hydrant section from the traffic Flange to the top of the operating nut shall be painted "Caterpillar Yellow".
- 9. Operating and nozzle nuts are to be pentagon shaped with one and one-half inch (1.5") point to flat measurements.
- 10. Hose nozzle threading must be in conformance with NFPA #194 for National (America) Standard Fire Hose Coupling Screw Threads.
- 11. All working parts are to be bronze or noncorrosive metal in accordance with the requirements of ANSI/AWWA C502.
- 12 All hydrants are to be left hand opening (counter clockwise).
- 13. All hydrants must not drain. Drain plugs (brass) are to be securely installed.
- 14. Brass components in contact with potable water are to comply with Public Law 111-380 (No Lead Rule).
- B. Auxiliary Gate Valves

All gate valves and valve boxes are to be furnished and installed as specified in Section 60.03 - Furnish and Install Valves.

C. Thrust-Restraint System

Fire hydrants are to be fully restrained back to and include the connection to the main line. Thrust restraint is to be furnished and installed as specified in Section 60.02 – Furnish and Install Pipe.

D. Guard Posts

The Contractor shall install guard posts for each hydrant installation as shown with the Standard Details. If, in the opinion of the Engineer, the guard posts are not to be installed, they are to be delivered to the City storage yard.

Article 4.4 Construction

The Contractor is to complete all trench excavation, backfill and compaction necessary to install the fire hydrant assembly.

An eight foot (8') wide clear, slightly sloping (max 5% in any direction) access path that extends four feet (4') beyond the fire hydrant must be provided. Where a ditch is encroached upon by the access path, the ditch is to be relocated or filled and a twenty four inch (24") diameter culvert installed to pass run off by the hydrant.

The fire hydrant auxiliary value is to be closed during installation and remain closed during all main line open bore flushing operations. The Contractor is to open the auxiliary gate value for hydrostatic pressure testing, disinfection and for hydrant raising. The hydrant leg must have hydrostatic pressure for the hydrant to be raised. All fire hydrant legs are to be installed level. The fire hydrant barrel is to be installed plumb.

All fire hydrants that have yet to be approved for use must be covered and identified as being



"not in service". The cover is to be firmly secured to the hydrant. Not in service bags are to be at least 27" wide x 42" tall x 4 mil thick polypropylene material, brightly colored (e.g., orange, yellow, green) and in bold black print clearly show in large, easy- to-read lettering the words "NOT IN SERVICE".

Article 4.5 Measurement

The method of measurement to furnish and install fire hydrants is to be as follows:

Single Pumper Fire Hydrants are to be measured as complete assemblies furnished, constructed, installed, and accepted in place for each installation, including, but not limited to, fire hydrants six inch (6") leg to main, six inch (6") auxiliary gate valve and valve box, guard post installation, coatings, coverings, and thrust-restraint system. The price must include full compensation for furnishing and installing single pumper hydrants as shown in the Standard Details, required by these specifications, and shown in the Drawings.

Article 4.6 Basis of Payment

Payment for this Work is to be as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Payment is to be made under the following units:

ITEM	UNIT
Furnish and Install Fire Hydrant Assembly (Single Pumper)	Each

SECTION 60.05 WATER SERVICE LINES

Article 5.1 General

The Work under this Section consists of the performance of Work required for furnishing and installing water service lines including but not limited to tapping, connecting, piping, fittings, key boxes, and valve boxes at the location and depth required by the Contract Documents. AA mains shall be chlorinated, flushed and pressure tested by the Contractor before service connections are made.

The exact location, type, and size of existing Service Connections are to be considered unknown. All information provided in the Contract Documents and provided by the City is from maintenance records, record drawings, field surveys and represents the City's best indication of location and size. The City cannot be held liable for accuracy of the information. The Contractor shall locate and confirm that the service extension will function prior to beginning the work.

A permit must be purchased from the City permit section prior to any water service construction (either on or off property in the City service area). The permit is to be displayed at the job site. The City permit does not relieve the Contractor from obtaining all other necessary permits.

The Contractor is to notify the City a minimum of twenty-four (24) hour in advance of any required or needed inspection.

Before an on-property service line permit for a new subdivision can be released for construction, all property corners must be established and identified.

Article 5.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. The Contractor is to clearly demarcate items to be incorporated into the Work. Submittals for water service lines should include, but is not limited to the following information:

- Piping See Section 60.02
- Corporation stop
- Curb stop
- Key box
- Key box rod
- Flare nuts
- Valve and valve box riser components
- Thrust restraint system
- Continuity and trace wire

Article 5.3 Material

A. Pipe

Pipe material must comply with Section 60.02 – Furnish and Install Pipe. Water service pipe shall be ductile iron (Class 52), HDPE, or soft drawn seamless copper (Type K).

B. Key Box, Curb Stop, Corporation Stop, Valve and Valve Boxes

Keyboxes are to be telescoping, furnished with a lid, have an arch pattern base and is to be constructed of cast or ductile iron. The operating rod and connection pin are to be constructed of stainless steel alloy type 304 or 316. The connection pin is to be a minimum of 3/16" by two inches (2") long and inserted completely through cast connection head that is welded to the operating rod. Bent plate connection heads will not be allowed.

Curb stops (key box valves) are to conform to AWWA C800, be rated for 150 psi working water pressure, have a waste port, be NSF 61 certified, accept copper flare nuts on both ends and conform to the "no lead" standard for parts in contact with potable water. For one inch (1") services, the flare nut on the Utility side of the curb stop is to come with an integral wire connector for an anode connection. For services greater than one inch (>1"), a bronze direct burial compression pipe clamp is to be used in conjunction with a flare nut. Curb boxes must be furnished with stationary operating rods

Corporation stops/valves shall be brass ball valves, rated for 300 psi water pressure, conform to AWWA C800, be NSF 61 certified, and conform to the "no lead" standard. Inlet end shall have the AWWA/CC taper and outlet end shall have copper flare straight connection. The corp shall come with a flare with an integral wire connector (up to one-inch) and a bronze direct burial compression pipe clamp thaw nut for sizes greater than 1-inch. Corp shall be Mueller B25000- 07 corp and thaw nut, or equal.

Iron pipe thread corporation stops and curb stops will be used for HDPE service lines. Poly Cam HDPE/IP fittings shall be used for connection of the HDPE to the service valves.

The curb box shall provide a clear and unobstructed access to a valve or curb stop to enable the City of Homer operation of the valve or curb stop.

All valves and valve boxes must be as specified in Section 60.03 - Furnish and Install Valves.

C. Continuity and Trace Wire

Continuity and Trace wire are to meet the requirements of Section 60.02 – Furnish and Install Pipe.

Article 5.4 Construction

Water service piping and valves are to be constructed as outlined in Section 60.01, Section 60.02, and Section 60.03 with the following special considerations.

The Contractor is to familiarize themselves as to the depth of the water main for the project through Contract Documents, gathering field data and record data. The Contractor must



excavate whatever substances that are encountered to the depth required for the connections. The Contractor is to expose the main to be tapped for a minimum distance of two feet (2' on either side of the proposed tap location and below the pipe for proper clearance of the tapping saddle.

The Contractor is responsible for all costs for damaging City controlled piping included by not limited to damage during excavation, tapping or backfilling. The City will make repairs, then issue back charges and penalties to the Contractor for the repairs. If approved by the City, the Contractor may repair the damaged main.

Except where shown on City approved Drawings, The Contractor shall lay water connections at ninety degrees (90) to the street line. Water service piping is to have a minimum of seven foot (7') of bury, (ten foot (10') on the Spit), from the point of connection to a point five feet (5') inside the building footing. Where the main line has less than the required amount of bury, the service must be immediately lowered to achieve the required bury depth and insulated where there is less than the required amount of bury. Water services are not to be within a horizontal distance of ten feet (10') or have less than eighteen inches (18") of vertical separation at crossings to a sewer or footing drain. Services must not cross property lines.

Trenches are to be OSHA compliant and have a minimum of two and one-half feet (2.5') wide bottom for a single copper water service. The service is to be centered in the ditch and the thaw wire laid at the edge. Where multiple services are laid in the same trench, the services must have a minimum separation of two feet (2') and the key boxes must not be separated more than twelve feet (12').

Key boxes shall be of an acceptable construction as shown in the Standard Details and the requirements of the Specifications. Key boxes are to be installed at the furthest point of City maintenance, which is typically at the property or utility easement line, whichever is a greater distance from the water mainline. The key box must not be installed horizontally closer than:

- ten feet (10') to a known or proposed structure, street light, utility pole transformer pad, electrical/telephone/cable box, and other utility pedestals, sewer piping
- five feet (5') to a property line,
- fifteen feet (15') to a fire hydrant or hydrant leg

The Contractor will relocate any service not meeting the separation requirements at their own expense. Valve box adjustment sleeves as defined in Section 60.03 – Furnish and Install Valves are to be used for key boxes located in pavement or concrete.

Key and valve boxes are to be installed plumb, be centered over the water line valve, have an unobstructed access way, and be wrapped with eight mils (8-mils) thick polyethylene encasement. Key and valve boxes must not be in contact with other utility lines, such as but not limited to gas, electric, telephone or cable.

Where key box and valve box locations are not shown on a plan they shall be installed in the standard location as shown in the Standard Details or as found in the City's Design Criteria Manual.

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Keyboxes located within pavement or concrete are to be adjusted to finish grade and installed in a valve box adjustment sleeve. Adjustment of keyboxes is to be accomplished by removing the keybox lid, installing a black iron pipe coupling, installing a section of black iron pipe, and replacing the keybox lid at the finish grade.

Services stubbed to the property line or beyond for future use must have a bleeder pipe brought above grade, be marked at the end of the service with a 2" X 4" X 8' marker, protruding three (3') feet above grade, painted blue, and stenciled with the word "WATER" in white two (2") inch high letters near the top.

Existing key boxes identified on the Drawings for adjustment are to be adjusted to be flush with the final ground surface. If excavation is required to adjust the existing key box, the ground surface will be restored to its original condition unless otherwise indicated in the Drawings. The Contractor shall be responsible for ensuring that the key box is vertical, clean, to proper grade, and readily accessible for operation of the curb stop.

Existing key boxes to be lowered will include adjustment of the telescoping riser, cutting excessive length of key box, threading, and installing threaded unions to complete adjustments. Only threaded joints will be allowed. "Quick-connect" style connections assembled with set screws will not be accepted.

Any damage to a key box resulting from construction under this Contract will be repaired or replaced at the Contractor's expense.

The Contractor is to record the as-built vertical and horizontal locations of the water service, service length, bottom of pipe elevations at the main and property line, key box, and valves based on the survey control provided in the Drawings. When survey control is not provided to the contractor, the recording of the as-built information is to be relative to two permanent fixed points such as, but not limited to, manholes, valve boxes, building structures and property corners. The fixed point cannot be living, movable (e.g., boulders, rocks, fence posts), or changing attributes of something larger (e.g., sidewalk cracks, building paint schemes). The record information must be turned into the City prior to the City allowing the water service to be turned on.

At such time as the Engineer may direct, but only after the service lines and appurtenances have been properly completed and inspected, the trenches and appurtenant structures may be backfilled in accordance with the construction requirements found in Division 20, Section 20.13 – Trench Excavation and Backfill.

The Contractor shall exercise due care in backfilling to keep the service box and continuity wire vertical and in place. In the event the service box or continuity wire is displaced, the Contractor will be required to excavate and restore the service box and continuity wire to the proper position. Any work necessary to restore the service box and continuity wire to the proper position will be performed at the Contractor's expense.

A continuity wire is to be attached to the corporation stop on one inch (1") connections with a flare tube nut with integral wire connector. The continuity wire is to be attached to the saddle on the main for one and one-half (1 1/2") and two inch (2") connections.

Hydrostatic testing must comply with Section 60.02 – Furnish and Install Pipe. A bleeder will be installed at each service line key box and extended a minimum of two foot (2') above the existing ground. The bleeder will be capped after testing is complete. The bleeder may not be used for the on-property system and must be disconnected at the time of the on-property extension.

No unions will be allowed in the right-of-way on newly constructed service lines.

All on-property installations are to be constructed to the same standard as off-property installations.

Article 5.5 Measurement

Measurement for Furnishing and Installing Water service Lines shall be per linear foot of horizontal distance of the various sizes set forth in the Bid Schedule. Measurement will be from station to station as staked in the field and as shown on the Drawings, except where the grade exceeds twenty five percent (25%), in which case measurement will be actual pipe length.

Measurement for connection to new on-property service line or existing service line are considered incidental to the Contract, and no separate payment will be made for this Work.

Adjusting existing key boxes will be measured per unit, complete in place. Adjustment of key boxes installed with a service line will not be measured.

Article 5.6 Basis of Payment

Payment for this Work will be as specified Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Adjusting of all key boxes installed with a service will not be paid for separately from the service

Unless specifically identified for payment under a separate pay item, the unit price bid to Furnish and Install (size) Water Service Lines includes all costs, labor, equipment, and materials to furnish and install a functional potable water service including, but not limited to, the following incidental items:

- verify location of existing water services,
- disconnection and reconnection of customer's existing services where the Work includes replacement of existing services,
- clearing and grubbing,
- trench excavation and backfill,
- excess excavation and backfill,
- excavation dewatering,
- trench support system,
- furnishing and installing Class E pipe bedding,
- compaction of fill,
- installation of pipe,
- fittings, adapters, or other necessary appurtenances,
- polyethylene encasement,
- hydrostatic testing, flushing, and disinfection,

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- water service insulation,
- disposal of unusable or surplus material,
- seeding; protection of existing utilities,
- restoration of existing drainage patterns,
- removal and replacement of existing culverts, guardrail, fences, landscaping, and other public or private improvements; finish grading,
- cleanup

Where the Work includes disconnecting existing water services from an existing water line and reconnecting them to a new water line, the disconnection and reconnection of those existing water services will be considered incidental to the costs bid for installation of the new water line.

Fittings and appurtenances as shown on the Drawings or not specifically identified for payment under a separate pay item but required for normal completion of water service line installation, will be considered incidental and will be included in the linear foot cost of the water service lines.

Payment is to be made under the following unit:

ITEM	UNIT
Furnish and Install (Size) Water Service Line	Linear Foot
Remove and Replace Key Box	Each
Adjust Key Box	Each
Adjust Key Box (Concrete Slab or Asphalt Paving)	Each

SECTION 60.06 TEMPORARY WATER SYSTEMS

Article 6.1 General

The Work under this Section consists of the performance of all operations pertaining to the construction, installation, maintenance, and removal of temporary water service. It is the intent of this Section that the Contractor maintains water service during the entire period of construction activities to all current customers that would be impacted by an extended water service interruption (longer than six hours (6 hrs)).

The Contractor will not be allowed to gain access to interior plumbing, residences, commercial space, or other portions of the project outside of the right of way to assess the amount of work required to install a temporary plumbing system prior to a notice to proceed.

The Contractor is to assume that exterior plumbing connection points (e.g., hose bibs) are at the furthest distance from the main feeder line for the temporary water system. Exterior plumbing connections are to be hydrostatically tested for leaks at a test pressure equivalent to ten feet of head prior to connecting to the exterior plumbing. When a leak is detected by witnessing a loss of pressure during the test, the Contractor is to discontinue testing immediately and find the next available exterior connection point and repeat the testing procedure. Where the Contractor cannot find a suitable exterior connection point and the Contract Documents do not provide for an interior connection point, then the Contractor shall immediately notify the Engineer.

Where modifying of interior plumbing is required, the Contractor should plan for making and documenting multiple contact attempts, working outside of usual hours, and moving and replacing objects of substantial size such as but not limited to dressers, couches, washers, dryers, plants, storage boxes, etc. to gain access to interior plumbing. In addition, where the Contractor is to modify the building to gain access to the plumbing, they are to assume the removal and replacement of at most five square feet of sheet rock in addition to the plumbing. Removal and replacement shall match the existing building material to the satisfaction of the owner of the building. The Contractor is to practice "lead safe" requirements for building modifications that disturb lead-based paint in pre-1978 homes, child care facilities, and schools where the Work must be performed by an EPA Certified Renovator working for an EPA Certified Firm and specific work practices must be implemented to prevent lead contamination. The Contractor is to use the City of Homer's Geographical Information Systems or by other means to determine the year of construction prior to bidding and make this information available to their workers during the execution of the Work.

Article 6.2 Submittal

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. Submittals for temporary water systems should include, but is not limited to the following information:

• Temporary Water Plan

Where an ADEC approved temporary water plan is not provided in the Drawings, the Contractor shall create and submit a plan for any temporary water systems to

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the State of Alaska, Department of Environmental Conservation (ADEC) for review and approval prior to installing the system.

The plan must identify the type of system, the method of construction and the maintenance and operation procedures to be used. The plan must identify service to each existing customer except those who agree in writing to have their service temporarily disconnected. The Contractor shall obtain such agreement at their own expense. To be submitted with the plan are any agreements between the Contractor and property owner regarding access and use of private property. The methods to be employed in maintaining water service are left to the Contractor. Surface piping, trailer mounted supply systems, and so forth may all be considered as long as they comply with current health standards and requirements. A copy of the ADEC approved plan is to be provided to the Engineer and City, along with copies of any agreements with property owners referred to above.

The Contractor shall also submit the name and phone number of a contact person and at least one alternate who shall be available on a twenty-four (24) hour basis for repair and/or maintenance of the temporary water system to the Engineer and to the City.

Temporary Water Individual Components

See the Section on furnish and install pipe for requirements relating to pipe and fitting submittals. At a minimum the following items are to be included in the submittal:

- o Pipe
- o Fittings
- o Backflow preventer
- o Meters
- o Fire Hydrant
- o Pipe routing schematic
- For Contractor created temporary water plans, the plan is to provide calculations showing capacity of the temporary water system meeting the water demands for typical use and fire protection.
- Lead Based Painting certification

Article 6.3 Material

The Contractor shall use only those materials and equipment listed in this Section to supply temporary water service. Temporary water service is to be supplied under the service criteria outlined in this Section. All equipment used must be specifically designed and properly disinfected for the storage, handling, and delivery of potable water.

Materials used for temporary water service is to conform to the requirements of this Division. Where Work is performed for a temporary basis of less than three (3) months the requirements for stainless steel and epoxy coating will not be required. The primary water feeder pipe is to be a minimum of three inches (3") in diameter for residential temporary water systems that serve less than 25 single family residents. For all other cases the Contractor is to provide the pipe sizes supported by engineered calculations signed and sealed by an Alaskan Registered Professional Engineer.

Article 6.4 Construction

The following minimum criteria are to be used for service to each structure:

- Forty (40) psi minimum, one hundred (100) psi maximum delivery pressure measured at the connection to the structure.
- Five (5) gallons per minute flow at the above delivery pressure measured at the connection to the single-family residential structure. Multi-family residential, Commercial, and other business structures may require higher water flows.
- Potable water system and water quality is to conform to 18AAC 80 Alaska Drinking Water Standards.
- All services to structures are to have a valve and backflow preventer installed to allow individual control of service to each structure.

All temporary water service equipment is to be flushed and disinfected per MASS Section 60.02 - Article 2.5 Flushing and Testing, ANSI/AWWA C652, Disinfection of Water Storage Facilities and ANSI/AWWA C651, Disinfection of Water Mains. All bacteriological samples required under these Specifications are to be done by a testing laboratory certified by the State of Alaska. Any visible leaks in the temporary water system are to be repaired.

All temporary service equipment is to be disinfected prior to connecting to a residence or business and be disinfected each and every time the equipment is moved or connected to another residence or business.

The Engineer is to be notified twenty-four (24) hours prior to the installation of any temporary water system. The Engineer and City shall be present to inspect the disinfection process of any temporary water service system.

No residence presently service by the City system is to be without water for a period greater than six (6) hours in any twenty-four (24) hours period. Each residence or business owner is to be notified seventy-two (72) hours before they are transferred on or off the temporary water system and before any other service interruption. Prior to constructing temporary water services on private property, the Contractor shall secure a written "Right of Entry" from the property owner.

Where it is necessary to prevent the back-feeding of temporary water through the service connects to complete the Work, the Contractor shall install a functional shut-off valve on the dwelling plumbing system. The new shut-off valve is to be used to isolate the building plumbing system from the water main during the work. The Contractor will be responsible for entering the private property building and installing a new shut-off valve.

Installation of a new shut off valve that requires any work that modifies the building, including but not limited demolition, removal, replacement or reconstruction of walls, flooring, concrete slabs, or other parts of the structure and/or plumbing is to be completed to the satisfaction of the property owner and Engineer. The Contractor is to match to the greatest extent possible the existing conditions of the building. The Contractor is to obtain and provide a copy of a written verification that the property owner has accepted any reconstruction.

Modification to the building plumbing system to install a functional shut-off valve is to be accomplished by a plumber who is a licensed by the State of Alaska.

Where in the opinion of the Engineer the Contractor has done due diligence to obtain a right of entry and complete the installation of the shutoff valve but has been refused access by the property owner and/or resident of the structure then the City is to be brought in to enforce provisions that require access to premises.

The Contractor will be required to obtain a hydrant permit from the City and will be required to meet all permit conditions (winter use of a hydrant requires special permission from the City).

The Contractor shall provide a gate valve assembly and backflow prevention device at the connection point of the temporary water piping to the City piping/hydrants. The Contractor is responsible for repairing any damage caused by the connection of the temporary water system to the City's water system at no additional cost.

In the event that the Contractor fails to repair and/or maintain the temporary system and the City or Owner is required to perform repairs and/or maintenance, all costs associated with said repairs and/or maintenance may be deducted from the Contract amount.

Article 6.5 Measurement

Providing temporary water service for the project is measured as lump sum and includes installation, removal and restoration activities associated with providing a disinfected and functioning temporary water system meeting the requirements of this section.

Modification of building plumbing is paid separately from the temporary water system. Modification of building plumbing will include all costs associated with modifying the building plumbing, including but not limited to, permitting, structure demolition and reconstruction, valves, right of access agreements, and public relations.

Article 6.6 Basis of Payment

Payment for this Work is to be as specified in Division 10, Section 10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Payment is to be made under the following unit:

ITEM	Unit
Temporary Water System	Lump Sum
Modify Building Pluming (Size, Type) without Structure Demolition and Reconstruction	Each
Modify Building Pluming (Size, Type) with Structure Demolition and Reconstruction	Each

SECTION 60.07 DECOMMISSION WATER SYSTEM AND COMPONENTS

Article 7.1 General

The Work under this Section includes all operations pertaining to decommissioning water system pipe lines, wells, fire hydrants and other applicable components. Where shown on the Drawings, required for platting actions, building removal, land use changes or otherwise directed by the Engineer or City, the Contractor is to decommission and salvage identified components of the water system.

Article 7.2 Submittals

Submittals are to be provided to the Engineer for review and acceptance as stated in Division 10, Section 10.05, Article 5.6 – Product Data. Submittals for decommissioning water systems should include, but is not limited to the following information:

- Concrete, Grout, sand slurry, bentonite mixtures and placement plan
- Temporary water and shutdown plan
- See Section 60.02 Furnish and Install Pipe, for fittings required to separate the abandoned system from the active system.

Article 7.3 Material

Sand slurry consists of a mixture of water and sand with an approximate ratio of seven (7) gallons of water per cubic foot of sand. Sand may consist of native material with a particle size distribution such that one hundred percent (100%) of the material passes the No. 4 U.S. Standard Sieve and contains no lumps, frozen material, organic matter, or other deleterious material.

Grout is to consist of a Portland cement, water, lime, and sand. Portland cement is to be Type II. Sand is to meet the requirements of sand slurry.

Article 7.4 Construction

A. General

Decommissioning will require the Contractor to excavate, expose and remove different parts, pieces, and assemblies of the water system as well as salvage identified components. Salvaged pieces are to be delivered to the City. The ends of the water lines four inch and greater that are remain in service (pressurized) are to be capped, restrained, and backed up with a thrust block. A City representative must witness all decommissioning. Water lines to remain in service after abandonment of adjacent pieces are to be disinfected in accordance with AWWA C651.

The Contractor is to restore the area of Work to preconstruction conditions. The Contractor is to provide written notice to the Engineer forty-eight (48) hours prior beginning decommissioning Work.

B. Water Main

The decommission in place method of water mains requires emptying the line, placing of a one foot (1') thick concrete plug with vent tube at the higher end of the line, filling the pipe with a quantity of sand slurry or grout mixture equal to the total calculated volume from the newly installed plug to the point of injection then finally placing a one foot concrete plug at the injection end of the pipe. The concrete plugs the pipe and the slurry fills the pipe. Work is typically started on the downhill end of the pipe.

In the event the pipeline to be abandoned is cracked or crushed, the Contractor shall excavate to the next joint of pipe and install the plug. Crushed pipe sections or portions thereof are to be removed and disposed of by the Contractor.

Where the main is being decommissioned by removal, the Contractor is to excavate down to and remove the water pipe.

C. Water Service

Water service decommissioning requires a disconnect permit from the City. To obtain the City disconnect permit the Contractor is to provide to the City and Engineer a schedule, disconnect location (lot, block, subdivision name, address), and record of who will perform the service disconnect. The Contractor is to post the City permit and the Right-of- Way permit at the job site.

The abandonment method for disconnection of a copper water service at the main line will include turning off the corporation stop at the main, cutting or disconnecting the copper at the corporation stop and thaw wire, placement of a solid copper retainer disc in the corporation stop, removal of the key box with operating rod, and providing a record of the service connection location via swing ties to permanent structures.

Abandonment of larger services requires that the service line must be capped and or blind flanged at or cut out of the main. This may include, but not be limited to, removal and replacement of water main pipe, blind flanging tapping sleeves, capping tees. In most cases this work will require a water turnoff.

D. Fire Hydrant

The hydrant assembly is all pipes, fittings, valves, and other parts from the tee at the main and/or service to and including the fire hydrant.

Upon inspection of the exposed hydrant assembly components, the Engineer will determine which components are to be salvaged. Non-salvageable parts are to be transported by the Contractor to a disposal site approved for disposal of construction debris.

The hydrant assembly components to be removed and salvaged at each hydrant location where the hydrant is to be salvaged include:

- o Hydrant assembly (head, barrel, and shoe)
- o Hydrant gate valve
- o Hydrant gate valve box
- o Hydrant leg



The Contractor shall install a plug in the branch connection on the tee in the water main where the hydrant assembly is removed. If the water main is to be returned to an active state, then the plug is to be visually checked for leakage by the Engineer and City Inspector. At no additional cost, the Contractor will be required to expose the cap if it is buried, and the Engineer has not completed the visual check for leakage. In most cases this work will require a waterturnoff.

E. Well

The Contractor shall use the following procedure when abandoning wells:

- 1. Remove the existing well pump and appurtenances. The well pump and appurtenances are to be carefully removed to avoid damage and delivered to the property owner after removal.
- 2. Backfill the well casing to ten feet (10') above the screen with disinfected sand or gravel. Sand is to be used as backfill adjacent to water bearing strata consisting of sand. Gravel is to be used as backfill adjacent to water bearing strata consisting of gravel. Disinfected sand or gravel is defined as sand or gravel washed in a one part per million chlorine/water solution prior to the backfilling operation. The Contractor is to provide proof to the Engineer that any imported sand or gravel has been disinfected prior to backfilling the casing.
- 3. If the aquifer is pressurized, place a seal over the top of the disinfected sand or gravel to seal the aquifer. The seal may consist of bentonite chips or other suitable means, as approved by the Engineer.
- 4. Backfill the next section of well casing for a minimum distance of ten feet (10') with concrete or cement grout. If necessary, the depth of the concrete or cement grout may have to exceed ten feet (10') to ensure the lower aquifer is thoroughly sealed. The concrete or cement grout is to be placed from the bottom upward through a pipe or tremie tube in such a way as to avoid segregation or dilution of the material. The concrete or cement grout is to be cured for a minimum of thirty-six (36) hours prior to proceeding with the next step.
- 5. Backfill the next section of well casing to fifteen feet (15') below the ground surface with gravel. Disinfected gravel is not required in this zone.
- 6. Excavate the area adjacent to the top of the well to a depth of five feet (5') and cut the casing at this level. Then backfill the remaining ten feet (10') of well casing with bentonite, concrete, or cement grout. Weld a metal cap on top of the well casing to ensure the well is sealed. Mark the cap stating that the well is abandoned with the date of abandonment.
- 7. Backfill the area within a two foot (2') minimum radius from the center of the well casing to a level which is two inches (2") above the top of the sealed well casing with concrete or cement grout to preclude the downward migration of water along the outside of the casing. Then backfill the remainder of the excavated hole with native soils and restore the Work site.

- 8. As part of this bid item, the Contractor shall be responsible for topsoil and reseeding all lawn areas damaged by the Contractor during the well abandonment operation. In addition, the Contractor shall be responsible for the repair and/or replacement of all existing utilities, driveways, trees, utility markers, survey monuments, fences, retaining walls, buildings, sidewalks, gardens, landscaping, and other private improvements damaged by the Contractor as a result of the well abandonment operation.
- 9. The Contractor shall provide a log of the well abandonment to the Engineer prior to receiving final payment for this Work. The log is to describe the materials used in the abandonment and the depths below existing grade each type of material was used, in addition to any other pertinent information regarding the abandonment.
- 10. The Contractor is to obtain well information through investigation if the well logs are not provided herein.

The Contractor may employ, at his/her option, an alternate method of abandoning the wells that conforms to the requirements of ANSI/AWWA Standard A 100. In the event the Contractor elects to obtain approval to employ an alternate method, he/she shall first secure the approval of the ADEC and then submit a Substitution Request form to the Engineer for approval. The substitution request is to clearly identify the method the Contractor wishes to employ; clearly reference applicable sections of ANSI/AWWA Standard A 100 which allow the Contractor's proposed method of abandonment; and include written approval from the ADEC specific for these particular wells.

Article 7.5 Measurement

Salvage and disposal costs are to be included in the bid item and will not be measured separately.

Quantity measurement for pipeline to be decommissioned in place is per linear foot for each nominal pipeline size regardless of type of pipe. For pipe to be decommissioned in place no separate measurement will be made for pipe removed due to damaged ends.

Quantity measurement for pipeline to be decommissioned by removal will be made based on the Engineers measurement and observations.

Quantity measurements for decommissioning water services are on per each basis regardless of the effort required to locate the connection point to the main.

Quantity measurements for decommissioning wells are on a per each basis which includes but not limited to verifying the well construction and removal of internal and external components.

Quantity measurement for removal of fire hydrants are per each and includes costs of salvaging and delivering parts and pieces as described above.

Unless specifically identified for payment under a separate pay item, the unit price bid to complete the Work includes all costs, labor, equipment, and materials to complete the Work including, but not limited to, the following incidental items:



- Excavation,
- Backfill and compaction,
- Import of classified material,
- Disposal of unusable material,
- Removal and replacement of ground surface features
- adjustment to finish grade,
- protection and/or restoration of all existing utilities,
- maintenance of existing water distribution system flows,
- shoring excavations
- protection of existing light and utility poles,
- restoration of existing private or public improvement such as but not limited to:
 - o driveways,
 - o signage, mail boxes, newspaper boxes,
 - o trees and shrubs located on private property,
- landscaping, utility markers, survey monumentation,
- cleanup, and miscellaneous items required to complete the Work as shown on the Drawings,
- maintenance of vehicular traffic and/or pedestrian access.

Costs incurred for completion of these incidental Work items are considered including in the bid unit cost.

Article 7.6 Basis of Payment

Payment for this Work is to be in accordance with Division 10, Section10.07 - Measurement and Payment, and includes full payment for all Work described in this Section.

Payment is to be made under the following unit:

ITEM	UNIT
Decommission Pipeline in Place (Pipeline Nominal Size)	Linear Foot
Decommission Pipeline by Removal (Pipeline Nominal Size)	Linear Foot
Decommission Water Service 3/4" to 2" copper pipe	Each
Decommission Water Service (Pipeline Nominal Size) (Type of Pipe)	Each
Decommission Well (Size, Depth)	Each
Decommission Fire Hydrant Assembly (Type)	Each

MUNICIPALITY OF ANCHORAGE STANDARD SPECIFICATIONS

> DIVISION 60 WATER SYSTEMS

STANDARD DETAILS

STANDARD CONSTRUCTION SPECIFICATIONS DIVISION 60 INDEX OF STANDARD DETAILS

- 60-1 MJ Cap and Plug
- 60-2 Relocate Water Main (Sewer/Storm Drain)
- 60-3 Tracer Wire
- 60-4 Not Used
- 60-5 Typical Pipe Angle Marker
- 60-6 Thrust Block
- 60-7 Mid-Span Thrust Block
- 60-8 Typical Valve Box (VB)
- 60-9 Not Used
- 60-10 Single Pumper "L" Base Fire Hydrant Assembly
- 60-11 Not Used
- 60-12 Fire Hydrant Guard Posts
- 60-13 1" Water Service Connect
- 60-14 Water Service Connect 1-1/4" and 2"
- 60-15 Irrigation System
- 60-16 Adjust Service Key Box





3' EXTRA	WIRE		
DRYCONN® I BURY LUG (3W OR 10 AWG TRAC 2" PVC TAPE	DIRECT VB-01) EQUAL	2' COPPER CLAD GROUNDING ROD AND DIRECT BURIAL GROUNDING CLAMPON ALL DEAD ENDS	
NOTE:			
1. RUN A DIRECT CORE SOFT DRAWN TENSILE BREAK LO BLUE POLYETHYLEI RATING TRACER LI LINE, TAPING IT TO TAPE.	BURIAL #10 AWG SOLID (.1019 N HIGH STRENGTH TRACER WIRI DAD, 30 MIL HIGH MOLECULAR NE JACKET COMPLYING WITH A NE CONTINUOUSLY ALONG THE D THE PIPE EVERY 5' WITH 2"	9″ DIAMETER), STEEL E, 600# AVERAGE WEIGHT-HIGH DENSITY STM-D-1248, 30 VOLT NON-METALIC MAIN WIDE 10 MIL. PVC PIPE	
2. SPLICE A WIRE UP INTO THE VALV DIRECT BURY LUG RECOMENDATIONS.	ON AT EVERY VALVE RISER AI /E CAN WITH 3' OF EXTRA WIR (3WB—01) OR EQUAL, FOLLOW	ND BRING LOCATE WIRE E USING A DRYCONN® NG MANUFACTURES	
3. INSTALL GROUN	DING RODS ON BOTH ENDS AN	D AS REQURIED.	
SCALE NTS APPROVED REVISED 2022	TRACER	NIRE	ION #).02 IL #)()3
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Staff Report PL 22-44

TO:	HOMER PLANNING COMMISSION
FROM:	RICK ABBOUD, AICP, CITY PLANNER
DATE:	JULY 20, 2022
SUBJECT:	CUP REDUCTION

Introduction

In an effort to be more efficient with the use of planning resources and encourage developments recommended through the comprehensive plan and city code, I am performing a comprehensive review of how we may lower the prevalence of Conditional Use Permits (CUP) to consider allowing items as a permitted use, disallowing altogether, or modifying them. I will review district by district in order to provide the best context and perspective. Along the way we may start thinking or recommending a more streamlined or consistent language for uses.

We will be using a format throughout the document the first lists the intent of the district as proposed by the Comprehensive Plan then applicability of the Community Design Manual when applicable. This is to put a prospective on how a use and/or density and design concerns are be supported in a district. Next, is a list of the code that makes a use or structure a Conditional Use. I used colored font to highlight the opportunities for change. This will be a long discussion and likely take several meetings to address.

Analysis Rural Residential (RR)

Comprehensive Plan

- **Intent** The R-3 district is intended to provide areas for low density residential development and limited agricultural pursuits.
- **Primary Use** Low-density residential development in outlying locations, generally with less services and/or lower level of service than in urban areas.
- · Other Uses, Allowances, and Specifications
 - Areas generally not served by water and sewer, nor likely to be served in the near future.
 - Larger lot sizes or cluster subdivisions to preserve sense of open space.
 - Allows accessory housing units by right (subject to standards).
 - Allows bed and breakfasts by right, subject to standards (for purposes of this plan B&B defined as lodging where owner proprietor resides on site)

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- Allows home-based businesses by right, subject to standards; allows some larger non-retail business activities subject to administrative review.
- Development standards
 - Option for higher densities and cluster development. Encourage open space subdivisions as alternative to more typical lot layouts.
 - Ensure newer housing is compatible with character of older neighborhoods.

Homer City Code (HCC)

The purpose of the Rural Residential District is primarily to provide an area in the City for lowdensity, primarily residential, development; allow for limited agricultural pursuits; and allow for other uses as provided in this chapter.

a. Planned unit development, limited to residential uses only;

b. Religious, cultural and fraternal assembly;

c. Cemeteries;

d. Kennels;

e. Commercial greenhouses and tree nurseries offering sale of plants or trees grown on premises;

f. Mobile home parks;

g. Public utility facilities and structures;

h. Pipelines and railroads;

i. Storage of heavy equipment, vehicles or boats over 36 feet in length as an accessory use incidental to a permitted or conditionally permitted principal use;

j. Day care facilities; provided, however, that outdoor play areas must be fenced;

k. Group care home;

I. Assisted living home;

m. More than one building containing a permitted principal use on a lot;

n. Indoor recreational facilities;

o. Outdoor recreational facilities;

p. Public school and private school;

q. One small wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system of any capacity on the lot

a. Lot Size.

1. The minimum lot area shall be 40,000 square feet, plus 40,000 square feet for each dwelling unit in excess of one unit in areas not served by public sewer and water.

2. Each lot shall contain a minimum of 20,000 square feet, plus 20,000 square feet per dwelling unit in excess of one unit if one of the following conditions exists:

a. The lot is served by public water supply approved by the State Department of Environmental Conservation; or

b. The lot is served by public or community sewer approved by the State Department of Environmental Conservation.

3. Each lot shall contain a minimum of 10,000 square feet, plus 10,000 square feet per dwelling unit in excess of one unit if the lot is served by both public water and sewer that satisfy both conditions of subsection (a)(2) of this section.

Staff: The overwhelming amount of CUP's in the RR District are for 'more than one', 16 out of 20 in the last ten years to be exact. This is mostly a result of the extension of water and sewer services into the district. Ideally, the zoning would change as service is extended into subdivisions, especially those that are centrally located and designated on the Land Use Recommendations Map. We can consider the allowance of 'more than one" with the recommendations of the Future Land Use Map. The lot size requirements with the provision of water and/or sewer are listed above for reference.

Recommended revisions: Allow development of units according to the provision of water and sewer services subject to screening of dumpsters (screening of dumpsters for any multi-family (3 or more) is to be material for all the districts). The rest of the conditions typically addressed in CUP's for this district include a reminder to follow lighting rules and proof of compliance with DEC regulation, which is required by terms of a zoning permit. Only once did we ask that development adjust the sighting to provide an increased buffer for the existing neighbors.

While our code allows anyone in the RR district to reduce the space necessary for dwelling to one per 10,000 square feet, we should consider areas where we would want to preserve the a rural density standard. I am a proponent of creating more opportunity for density, I believe that there is room and some expectation of rural areas maintaining the rural standards of one dwelling unit per 40,000 square feet regardless of the provisioning of city water and sewer. Ideally, this is best accomplishes with reference in the comprehensive plan.

It is a good time to review the rest of the CUP's listed above. I have found that the occurrences of the other CUP's are minimal and they are structures and activities not necessarily associated with the vision for RR. It is also a time to consider if such activity should be allowed at all. Discuss.

Urban Residential (UR)

Comprehensive Plan

UR (URBAN RESIDENTIAL)

- **Intent** The R-1 district is intended to provide more intense residential development in the city core, in a manner that matches Homer's small town character and encourages increased densities near pedestrian-oriented commercial areas.
- **Primary Use** Medium and medium-high density residential including single-family, duplex, and multiple-family; allow for a variety in housing types and housing price levels.
- Other Uses, Allowances, and Specifications
 - Areas generally served by water and sewer; central locations with excellent access to a range of urban services and facilities.

- Residential is primary use; but allows for other uses where these uses maintain residential character.
- Moderate lot size minimums (for example, 6000 square foot lots for single family homes).
- Allows bed and breakfasts by right, allows second units and duplexes by right (both subject to standards). (For purposes of this plan, a B&B is defined as lodging where owner proprietor resides on site.)
- Allows home-based businesses by right (subject to standards).
- Development standards
 - Encourage attractive, diverse housing types (vs. "cookie-cutter" subdivisions).
 - Ensure newer housing is compatible with character of older neighborhoods (for example, by requiring transitional densities, buffer uses).

Homer City Code (HCC)

The Urban Residential District is primarily intended to provide a sound environment for medium-density residential occupancy including single-family, duplex and low-rise multiple-family dwellings of various types and designs and other compatible uses as provided in this chapter.

The following uses may be permitted in the Residential Office District when authorized by conditional use permit issued in accordance with Chapter 21.71 HCC:

a. Planned unit development, excluding all industrial uses;

- b. Townhouse developments;
- c. Day care facilities; provided, however, that outdoor play areas must be fenced;
- d. Religious, cultural and fraternal assembly;
- e. Hospitals;
- f. Pipelines and railroads;

g. Storage of heavy equipment or boats over 36 feet in length as an accessory use incidental to a permitted or conditionally permitted principal use;

h. Private stables and the keeping of larger animals not usually considered pets, including paddocks or similar structures or enclosures utilized for keeping of such animals as an accessory use incidental to a primary residential use; such use shall be conditioned on not causing unreasonable disturbance or annoyances to occupants of neighboring property, and on sufficient land to harbor such animals;

- i. Group care home;
- j. Assisted living home;

k. More than one building containing a permitted principal use on a lot;

l. Indoor recreational facilities;

m. Outdoor recreational facilities;

n. One small wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system of any capacity on the lot.

Dimensional requirements (these are standards commonly referred to in other districts)

2. Multiple-family dwelling containing three or more units shall meet the following standards:

a. The total floor area shall not be more than four-tenths the lot area;

b. The total open area shall be at least 1.1 times the total floor area. Open area is any portion of the lot not covered or used for parking spaces and maneuvering.

Staff: We have had 5 CUP's in the UR District in the last ten years, 2 'more than one', a daycare facility (denied), indoor recreation/more than one, and a townhouse. Not as much opportunity here for reductions.

Recommended revisions: I believe that we could consider allowing 'more than one' while applying the density standards of multi-family to 3 or more units on a lot (I suggest that this be carried forth to all other districts when served with water and sewer). This would not be out of line with the multi-family standards which are allowed outright. The only difference is that they are not found in a single structure. I also feel that this standard should also apply to townhouse.

Residential Office (RO)

Comprehensive Plan

RO (RESIDENTIAL OFFICE)

- Intent The intent of the RO district is to allow for a range of residential and residential compatible uses. While allowing office, certain commercial and other business uses, buildings and sites must have a scale and character similar to single family detached or small multi-family homes. This district serves as a transition zone between commercial and residential neighborhoods.
- Primary Use Provide a mix of low-density to medium-density residential uses with certain specified businesses and offices which may include professional services, administrative services and/or personal services, but does not include direct retail or wholesale transactions except for sales which are incidental to the provision of services.
- · Other Uses, Allowances, and Specifications
 - Areas served by public water and sewer, full range of other urban services, close to other urban services.
 - Moderate lot size minimums (for example, 7500 square feet); allows for attached housing.
 - Guide use to create/maintain an attractive highway environment
- Design and development standard
 - Required (not advisory) standards to maintain residential character/residential scale of buildings (e.g., height, setbacks, parking location, signage).
 - Advisory design guidelines regarding building style (e.g., use of materials, architectural style).

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- Allow for limited commercial signage, consistent with overall goal of retaining a largely residential character.

Homer City Code (HCC)

The Residential Office District is primarily intended for a mixture of low-density to mediumdensity residential uses and certain specified businesses and offices, which may include professional services, administrative services and personal services, but generally not including direct retail or wholesale transactions except for sales that are incidental to the provision of authorized services. A primary purpose of the district is to preserve and enhance the residential quality of the area while allowing certain services that typically have low traffic generation, similar scale and similar density. The district provides a transition zone between commercial and residential neighborhoods.

The following uses may be permitted in the Residential Office District when authorized by conditional use permit issued in accordance with Chapter 21.71 HCC:

a. Planned unit developments, excluding all industrial uses;

- b. Townhouses;
- c. Public or private schools;

d. Hospitals and medical clinics;

- e. Public utility facilities and structures;
- f. Mortuaries;

g. Day care facilities; provided, however, that outdoor play areas must be fenced;

- h. More than one building containing a permitted principal use on a lot;
- i. Group care homes;

j. Helipads, but only as an accessory use incidental to a hospital conditional use; k. One small wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system of any capacity on the lot; l. Other uses approved pursuant to HCC 21.04.020.

Dimensional requirements

e. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area, without an approved conditional use permit.

Staff: We have had 16 CUP's in the RO district in the last ten years including 7 'more than one', 5 medical clinics (one more than 8000sf, mostly found in subsequent medical district), 4 - 8000sf, and 2 daycare facilities (math does add up due to multiple CUP triggers).

Recommended revisions: Townhouses and 'more than one' can be handled as previously suggested. I see mortuaries and group care homes as something that the district can reasonable support, as it is not direct wholesale or retail which is not provisioned in the district, these along with medical clinic would only be a CUP when provisioned with more than 8,000sf

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in a lot. I see no reason require a CUP for daycare in the district. This leaves us with a discussion of the 'more than 30% building area. Perhaps we could discuss the '8000', if any are uncomfortable with the number. I do high recommend that the '30%' does not disappear in concept but we should move the bar.

Medical District (M)

Comprehensive Plan

MEDICAL DISTRICT

Intent: Acknowledge demand for medical services will increase with a larger, aging population. Enact zoning regulations that allow medical services to expand with the growing need for life long medical care, in a localized area near the hospital.

Homer City Code (HCC)

The purpose of the Medical District is to provide an area near the hospital to support medical facilities and other professional office and limited commercial uses. The district is meant to accommodate a mixture of residential and nonresidential uses. Pedestrian-friendly designs and amenities are encouraged.

The following uses may be permitted in the Medical District when authorized by conditional use permit issued in accordance with Chapter 21.71 HCC:

- a. Planned unit developments, excluding all industrial uses;
- b. Public or private schools;
- c. Hospitals;
- d. Public utility facilities and structures;
- e. Mortuaries;
- f. Group care homes;
- g. Helipads, but only as an accessory use incidental to a hospital conditional use;

h. One small wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system of any capacity on the lot;

- i. Other uses approved pursuant to HCC 21.04.020;
- j. Parking garage.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area, without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection

Staff: The Medical District is new and has not recorded a CUP. I do not suggest any amendments.

Central Business District (CBD)

Comprehensive Plan

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CBD (CENTRAL BUSINESS DISTRICT)

- **Intent** The intent of the CBD commercial district is to provide a mixed use business district in the core area of Homer, with greater allowance for vehicular use than in the Downtown district, but still with a character that encourages pedestrian use.
- Primary Use Provide a centrally located area within the City for a mixture of urban uses and activities, including general retail shopping, personal and professional services, educational institutions, entertainment establishments, restaurants and related businesses, civic uses, recreation, and residential uses. Allow a mixture of residential and commercial uses but conflicts resolved in favor of business.

Other Uses, Allowances, and Specifications

- Areas served by public water and sewer, full range of other urban services
- Allow and encourage relatively high densities (sufficient concentration of uses to encourage circulation by foot).
- On-site parking required (option for shared parking with an approved parking plan).
- Residential densities for example, multi-family up to 6 units per acre allowed by right

Development standards include:

- Create an attractive, pedestrian-oriented environment (e.g., landscaped parking, standards to humanize buildings such as clearly articulated entries).
- Advisory guidelines regarding design character, so buildings and other structures within the district are compatible with one another and with the surrounding area.
- Control signage to maintain visual quality (for example, avoid large, highly illuminated signs).

Community Design Manual – Applicable to uses and structures requiring a CUP

Chapter 1. Architecture, Chapter 2. Site Design, Chapter 3. Lighting (applicable to all uses).

These Chapter's apply to all non-residential uses and uses with more than 12 residential units in the Central Business District.

Homer City Code (HCC)

The following uses may be permitted in the Central Business District when authorized by conditional use permit issued in accordance with Chapter 21.71 HCC:

a. Planned unit developments, excluding all industrial uses;

- b. Indoor recreational facilities and outdoor recreational facilities;
- c. Mobile home parks;
- d. Auto fueling stations;
- e. Public utility facilities and structures;
- f. Pipeline and railroads;
- g. Greenhouses and garden supplies;

h. Light or custom manufacturing, repair, fabricating, and assembly, provided such use, including storage of materials, is wholly within an enclosed building;

i. Shelter for the homeless, provided any lot used for such shelter does not abut a residential zoning district;

j. More than one building containing a permitted principal use on a lot;

k. Group care homes and assisted living homes;

l. Drive-in car washes, but only on the Sterling Highway from Tract A-1 Webber Subdivision to Heath Street;

m. One small wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system of any capacity on the lot;

n. Other uses approved pursuant to HCC <u>21.04.020</u>.

4. If approved by a conditional use permit, the setback from a dedicated right-of-way, except from the Sterling Highway or Lake Street, may be reduced.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area, without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection.

Staff: There have been 25 CUP's in the CBD in the last ten years. These were for a wide variety of reasons, including many with multiple triggers. There were 9 'more than one's' (including 4 that were greater than 8000sf), 8 setback reductions, 7 'more than 8000sf' (commonly with additional triggers), 2 manufacturing, 2 'more than 30%', a greenhouse, mobile home park, group care, auto fueling station, and an amendment.

Recommended revisions: Move recreational facilities, auto fueling, greenhouses, more than one, group care and assisted living to permitted uses. Consider moving the bar for 30% building coverage, something like 50% would be more appropriate for an area where we encourage density. (This is a district under guidance of CDM, CUP requires review). I am still formulating the value of the 30% building coverage, its purpose in unclear in my understanding of our regulation and what exactly we are looking to address. It is something that rarely or possibly has never been the sole reason for a CUP.

Town Center District (TC)

Town Center Plan

The following goals and objectives from the Homer Comprehensive Plan (1999 Update) are particularly relevant to planning for development in Homer's Town Center:

- Improve the attractiveness and usability of the business core to encourage use of the area.
- Encourage a balance of open space and attractive, retail-oriented development of vacant land in the business/core area.
- Actively pursue a theme for Pioneer Avenue. Support the establishment of a Town Square and connecting green spaces through town.
- Develop an integrated system of trails, sidewalks, and walkways to connect City parks, schools, recreational areas, and the downtown core area.
- Encourage and enhance the cultural and educational amenities of Homer.
- Guide growth and development in areas planned or zoned Central Business District (CBD) to provide a centrally located business/commercial area and focal point for the community.
- The City, in cooperation with private business owners, shall research and evaluate steps involved in creating and enabling a Pioneer Avenue theme and town square to become a reality.
- Work with the community to develop a centralized Town Square that includes a cultural center, interfacing with existing organizations and institutions to explore partnerships and shared parking.
- Investigate innovative funding mechanisms to provide funding for development of the Town Square with cultural and other facilities and public art programs

Homer City Code (HCC)

The primary purpose of the Town Center District is to provide a centrally located area in Homer for a core business area and a community focal point. Pedestrian-friendly designs and amenities are encouraged.

The following uses may be permitted in the Town Center District when authorized by conditional use permit issued in accordance with Chapter 21.71 HCC:

a. Planned unit developments, limited only to uses otherwise permitted in this district;

b. Indoor recreational facilities;

c. Greenhouses and garden supplies;

d. Light or custom manufacturing, repair, fabricating, and assembly, provided such use, including storage of materials, is wholly within an enclosed building;

e. Group care homes and assisted living homes;

f. Other uses approved pursuant to HCC 21.04.020;

g. Outdoor recreational facilities;

h. Customary accessory uses to any of the permitted uses listed in the TCD district; provided, that a separate permit shall not be issued for the construction of any type of accessory building prior to that of the main building;

i. Self-service laundries;

j. Retail sales of hardware, appliances and furniture, building supplies and materials, but only if such use, including storage of goods and materials, is wholly contained within one or more enclosed buildings;

k. Plumbing, heating and appliance repair shops, but only if such use, including storage of goods and materials, is wholly contained within one or more enclosed buildings;

l. One wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system on any capacity of the lot

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area, without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection

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Staff: Only one CUP as development has never taken off in the TC district.

Recommended revisions: recreational facilities, greenhouses, group care, assisted living, and laundries should be acceptable within our regulations. The retail sales of hardware and etc. along with plumbing and etc. should be eliminated and treated as permitted equivalents (and sometime we should look at the permitted uses as to not 'pigeon hole' specific details of retail operations).

Gateway Business District (GBD)

Comprehensive Plan

G-MU (Gateway Mixed Use)

- **Intent** The intent of the G-MU district is to provide land uses that primarily cater to the tourism and visitor industry of Homer and to promote year round activity. The gateway district serves as the primary roadway entry into Homer. It will provide an attractive built environment and promote those uses that will not compete with the DT, CBD and GC districts.
- Primary Use Promote mixed-use development, with emphasis on the visitor industry. Serve needs and interests of the visitor industry, as well as year-round residents and Homer's role as the Gateway to Kachemak Bay (not to conflict w/CBD). Minimize future traffic congestion along the Sterling Highway corridor and preserve the experience residents and visitors have when entering Homer by way of the Sterling Highway.
- Commercial uses are primary objective; focus on "Gateway" appropriate businesses such as visitor amenities, hotels no gas stations, fast-food, strip development.
- · Other Uses, Allowances, and Specifications
 - Areas served by public water and sewer, full range of other urban services.
 - Allow and encourage relatively high densities (sufficient concentration of uses to encourage circulation by foot).
 - Residential densities for example, multi-family up to 6 units per acre allowed by right; higher densities with administrative review or use dimensional standards like CBD above.

Development standards

- Advisory guidelines re "Gateway" design character.
- Encourage parking behind buildings (through appropriate set-back rules).
- Design standards that create an entry point the community can be proud of attractive, pedestrian-oriented to a degree (e.g., landscaped parking).
- Control signage to maintain visual quality (for example, avoid large, highly illuminated signs).

Community Design Manual - Applicable to uses and structures requiring a CUP

Chapter 1. Architecture, Chapter 2. Site Design, Chapter 3. Lighting (applicable to all uses).

These Chapter's apply to all non-residential uses and uses with more than 12 residential units in the Central Business District.

Homer City Code (HCC)

The purpose of the Gateway Business District is primarily to promote mixed use development, with an emphasis on visitor-oriented business. Conflicts between residential and business uses are resolved in favor of business. Among the goals of the Gateway Business District regulations are the minimization of future traffic congestion along the Sterling Highway corridor, and preservation of the favorable experience residents and visitors have when entering Homer by way of the Sterling Highway.

The following conditional uses may be permitted in the Gateway Business District when authorized in accordance with Chapter 21.71 HCC:

a. More than one building containing a permitted principal use on a lot.

b. One wind energy system having a rated capacity exceeding 10 kilowatts; provided, that it is the only wind energy system of any capacity on the lot.

c. Other uses approved pursuant to HCC <u>21.04.020</u>.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area, without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection

Staff: So far, we have had one property with a CUP in the GBD for 'more than one', the same property amended the CUP.

Recommended revisions: Follow previous recommendation for dealing with more than one and consider moving the bar for 30% building area lot coverage.

General Commercial 1 (GC1)

Comprehensive Plan

- Intent The intent of the GC-1 district is to provide for auto-oriented business.
- **Primary Use** Provide for a diverse array of commercial, retail, and civic uses; commercial uses are primary objective. Applied in locations where the auto is primary means of access.
- Other Uses, Allowances, and Specifications
 - Areas served by public water and sewer, full range of other urban services.
 - Residential densities for example, residential uses up to 6 units per acre allowed by right; higher densities with administrative review or use dimensional standards like CBD above.
 - On-site parking required (option for shared parking with an approved parking plan).
 - Guide use to create/maintain an attractive highway environment.
- Development standards include:
 - Control signage to maintain visual quality (for example, avoid large, highly illuminated signs).
 - Provide for safe pedestrian circulation.

Homer City Code (HCC)

The General Commercial 1 (GC1) District is primarily intended to provide sites for businesses that require direct motor vehicle access and may require larger land area, and to provide business locations in proximity to arterials and transportation centers. It is also intended to minimize congestion and adverse effects on adjacent residential districts and on the appearance of the community.

The following uses may be permitted in the General Commercial 1 District when authorized by conditional use permit issued in accordance with Chapter <u>21.71</u> HCC:

- a. Campgrounds;
- b. Crematoriums;
- c. Multiple-family dwelling;
- d. Public utility facility or structure;
- e. Mobile home parks;
- f. Planned unit developments;
- g. Townhouses;
- h. Pipelines and railroads;

i. Shelter for the homeless, provided any lot used for such shelter does not abut an RO, RR, or UR zoning district;

j. More than one building containing a permitted principal use on a lot;

k. Day care facilities; provided, however, that outdoor play areas must be fenced; l. Other uses approved pursuant to HCC 21.04.020;

m. Indoor recreational facilities;

n. Outdoor recreational facilities.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection

Staff: We have had 9 CUP's in the GC1 District. All of these except a multi-family dwelling involved 'more than one' (5 were on Lakeshore Dr.).

Recommended revisions: Recreational facilities can be permitted uses. I recommend that 'more than one' be allowed by right using current regulations. 30% building area should be reconsidered. This district brings up the concept of consideration for me of the general thought of differences between 'multi-family' and multiple individual structures, would we ever want to think of the congregation of small structures to be treated like multi-family. This could be an approach for the inclusion of 'tiny homes' in the zoning regime.

General Commercial 2 (GC2)

Comprehensive Plan

- **Intent** The intent of the GC-2 district is to locate commercial and industrial uses where access to transportation infrastructure is a primary consideration. This district will also serve as a reserve to allow for future commercial and industrial expansion.
- Primary Use Promote a sound heavy commercial area within the community with good access to main roads, and reserve land for future industrial expansion. Designed to permit manufacturing, processing, assembly, packaging, or treatment of products within enclosed utilities and facilities required to serve these uses.

Residential uses permitted, recognizing the primacy of light industrial and commercial activities. Residential uses limited; certain retail enterprises limited. Performance standards for heavy commercial uses, especially where the district abuts other zoning districts. Allows for heavier commercial uses – manufacturing, processing, packaging, and support of airport activities / needs.

- · Other Uses, Allowances, and Specifications
 - Accessible by vehicle/direct access.
 - Allows for mixed use, live/work, provides larger lots than would be available in CBD
 - On-site parking required.
- Development standards include:
 - Minimal basic guidelines for parking, minimal setbacks
 - Encourage basic landscaping, screening

Homer City Code (HCC)

The purpose of the General Commercial 2 District is primarily to provide a sound area for heavy commercial and industrial uses within the community designed to permit manufacturing, processing, assembly, packaging, or treatment of products and other uses described in this chapter. Residential uses and certain retail enterprises are purposely limited.

The following uses may be permitted in the General Commercial 2 District when authorized by conditional use permit issued in accordance with Chapter <u>21.71</u> HCC:

a. Mobile home parks;

b. Construction camps;

c. Extractive enterprises, including the mining, quarrying and crushing of gravel, sand and other earth products and batch plants for asphalt or concrete;

d. Bulk petroleum product storage above ground;

- e. Planned unit developments, excluding residential uses;
- f. Campgrounds;
- g. Junk yard;

h. Kennels;

- i. Public utility facilities and structures;
- j. Pipelines and railroads;

k. Impound yards;

l. Shelter for the homeless, provided any lot used for such shelter does not abut an urban, rural or office residential zoning district;

- m. More than one building containing a permitted principal use on a lot;
- n. Day care facilities; provided, however, that outdoor play areas must be fenced;
- o. Group care homes and assisted living homes;
- p. Other uses approved pursuant to HCC 21.04.020;
- q. Indoor recreational facilities;
- r. Outdoor recreational facilities.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection.

Staff: No CUP's have been issued in GC2

Recommended revisions: We can transfer several conditional uses to permitted when considering the purpose of the district including petroleum storage, impound yards, more than one, and recreation facilities. A discussion can be had regarding the appropriateness of things like mobile home parks, daycares, group and assisted living homes. These uses generally would not upset the goings on of a commercial district, it's more about protecting themselves from the possible negative externalities of the allowed uses.

As the district is to support heavy commercial and industrial activities, we should eliminate CUP for spatial limits and let development regulations guide the development.

East End Mixed Use District (EEMU)

Comprehensive Plan

- **Intent** The intent of the E-MU district is to allow a wide variety of commercial, industrial, and heavy industrial uses in a district with access to the boatyard, marine services, and the airport; and to ensure such uses, which are important to Homer's economy, continue to have a viable location.
- Primary Use Mixed-use development with fewer constraints on uses than existing GC-1 and GC-2. Designed to accommodate the wide range of uses found in the area today, as well as other future uses; examples include industrial, marine-oriented, construction services (including batch plants), storage, and artist workshops. Residential and retail are allowable, but residential/retail and commercial conflicts will be resolved in favor of commercial/industrial uses.

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- Other Uses, Allowances and Specifications
 - Allows for mixed use, live/work, provides larger lots than would be available in CBD.
 - On-site parking required.
 - Guide use to create/maintain an attractive highway environment.
- Development standards
 - Minimal basic guidelines for parking, setbacks.
 - Encourage basic landscaping.
 - Properties adjacent to the Conservation zone should use best management practices when developing near the southern edge of the property. Strategies may include, but are not limited to, 100 foot buffer zones along the southern property lines adjacent to the conservation areas, tree retention (bird habitat, moose cover), habitat and vegetation retention, and storm water and pollution management techniques. Developers are encouraged to use a combination of techniques to minimize impacts within 100 feet of the south property line and to provide for storm water filtration. Development is encouraged to concentrate on the northern portions of these lots.

Homer City Code (HCC)

The East End Mixed Use (EEMU) District is primarily intended to provide sites for businesses that require direct motor vehicle access and may require larger land area. The district is meant to accommodate a mixture of existing and accessory residential with nonresidential uses. When a conflict exists between residential and nonresidential uses conflicts shall be resolved in favor of nonresidential uses.

The following conditional uses may be permitted in the East End Mixed Use District when authorized by conditional use permit issued in accordance with Chapter <u>21.71</u> HCC:

a. Construction camps;

- b. Extractive enterprises, including crushing of gravel, sand and other earth products and batch plants for asphalt or concrete;
- c. Auto fueling stations;
- d. Bulk petroleum product storage;
- e. Planned unit developments;
- f. Junk yard;
- g. Kennels;
- h. Public utility facilities and structures;
- i. Impound yards;
- j. Indoor recreational facilities;
- k. Outdoor recreational facilities;
- l. Other uses approved pursuant to HCC <u>21.04.020</u>.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection

Staff: We have had 4 CUP's in the EEMU District, 3 for the same lot that kept expanding operations, all for more than 8000sf.

Recommended revisions: As the district is noted for the support of commercial and heavy industrial, we should consider eliminating CUP for coverage. We can use developmental regulations to permit, screening is required by code.

Marine Commercial District (MC)

Comprehensive Plan

MC (MARINE COMMERCIAL) (See also 2011 Homer Spit Comprehensive Plan)

Provide adequate space for the commercial needs which service and support waterdependent industries and facilities; encourage adequate separation between allied but potentially incompatible commercial and industrial uses while providing proximate locations for the mutual benefit of such water-oriented commercial and water dependent industrial uses. Commercial enterprise permitted to the extent that it services and supports the waterdependent industries which are important to Homer's economic base (e.g., fishing, marine transportation, off-shore energy development, recreation, and tourism) and to the extent that location elsewhere creates unnecessary hardship for the users of such commercial services. Performance standards are required to minimize the impact of commercial development on the natural features on which it depends.

Homer City Code (HCC)

The purpose of the Marine Commercial District is primarily for water-related and waterdependent uses and the business and commercial uses that serve and support them, including but not limited to fishing, marine transportation, off-shore energy development, recreation and tourism. It is recognized that unique natural features of Homer's marine environment contribute significantly to the economic and social environments; therefore, performance Staff Report PL 22-44 Homer Advisory Planning Commission Meeting of July 20, 2022 Page **20** of **22**

standards are required to minimize the impact of development on the natural features on which they depend.

The following uses may be permitted in the Marine Commercial District when authorized by conditional use permit issued in accordance with Chapter 21.71 HCC:

a. Drinking establishments;

b. Public utility facilities and structures;

c. Hotels and motels;

d. Lodging;

e. More than one building containing a permitted principal use on a lot;

f. Planned unit developments, limited to water-dependent and water-related uses, with no dwelling units except as permitted by HCC <u>21.28.020(o);</u>

g. Indoor recreational facilities;

h. Outdoor recreational facilities;

i. The location of a building within a setback area required by HCC 21.28.040(b). In addition to meeting the criteria for a conditional use permit under HCC 21.71.030, the building must meet the following standards:

1. Not have a greater negative effect on the value of the adjoining property than a building located outside the setback area; and

2. Have a design that is compatible with that of the structures on the adjoining property.

b. Setbacks. No building may be located in a required setback area without an approved conditional use permit.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 70 percent of the lot area without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection.

Staff: We have had 6 CUP's in the MC District. 3 of those involved setback reductions. Also we have had a restaurant, more than one's, 2 overslope, lodging, heliport, and a 8000sf. It would

Staff Report PL 22-44 Homer Advisory Planning Commission Meeting of July 20, 2022 Page **21** of **22**

be a good process to get feedback from the Port and Harbor Commission to incorporate into our discussion.

Marine Industrial (MI)

Comprehensive Plan

MI (MARINE INDUSTRIAL) (See also 2011 Homer Spit Comprehensive Plan)

Provide adequate space for those industrial uses that require direct marine access for their operation and to encourage the most efficient utilization of land. Promote marine-dependent industries important to Homer's economic base (e.g., fishing, fish processing, marine transportation, off-shore oil development, and tourism); give priority to those uses, and minimize conflicts among industrial, commercial and recreational uses.

Homer City Code (HCC)

The purpose of the General Commercial 2 District is primarily to provide a sound area for heavy commercial and industrial uses within the community designed to permit manufacturing, processing, assembly, packaging, or treatment of products and other uses described in this chapter. Residential uses and certain retail enterprises are purposely limited.

The following uses may be permitted in the General Commercial 2 District when authorized by conditional use permit issued in accordance with Chapter <u>21.71</u> HCC:

- a. Mobile home parks;
- b. Construction camps;

c. Extractive enterprises, including the mining, quarrying and crushing of gravel, sand and other earth products and batch plants for asphalt or concrete;

- d. Bulk petroleum product storage above ground;
- e. Planned unit developments, excluding residential uses;
- f. Campgrounds;
- g. Junk yard;

h. Kennels;

- i. Public utility facilities and structures;
- j. Pipelines and railroads;

k. Impound yards;

l. Shelter for the homeless, provided any lot used for such shelter does not abut an urban, rural or office residential zoning district;

m. More than one building containing a permitted principal use on a lot;

- n. Day care facilities; provided, however, that outdoor play areas must be fenced;
- o. Group care homes and assisted living homes;

p. Other uses approved pursuant to HCC 21.04.020;

q. Indoor recreational facilities;

r. Outdoor recreational facilities.

2. If approved by conditional use permit, buildings up to 55 feet in height may be allowed.

d. No lot shall contain more than 8,000 square feet of building area (all buildings combined), nor shall any lot contain building area in excess of 30 percent of the lot area without an approved conditional use permit.

A conditional use permit is required for every use that:

a. Is estimated to generate more than 100 vehicle trips during any hour of the day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

b. Is estimated to generate more than 500 vehicle trips per day calculated utilizing the Trip Generation Handbook, Institute of Transportation Engineers, 9th Edition;

c. Is estimated to generate an increase in the traffic to more than 100 vehicle trips during any hour of the day due to a change in land use or intensity of use; or

d. Is expected to generate traffic that will detract from the safety of, or degrade by one level of service, the highway, road, street, alley or intersection.

Staff: We have had 6 CUP's in the MI District, the Harbor Building (overslope), bulk petro/8000sf/30%, 2 other similar uses (later rezoned to MC), and a PUD for a restroom/guard shack. Again, I would like to run the concept by the Port and Harbor Commission for their recommendations.

Staff Recommendation

Continue discussion on items and address new issues and any requests for additional information in subsequent meetings



r—	1	-		-	T _	-	1
	A	В	C	D	E	F	
1	<u>CUP</u>	<u>address</u>	zone	reason	disposition	special conditions* beyond required codes	<u>notes</u>
			BCWPD/Cons				
2	2011-01	n/a	ervation	buffers for timber havesting	approved	time limit/tree survey	
				bulk petroleum storage/more than 8000sf/more than 30% lot			
3	2011-02	4755 Homer Spit Rd	MI	coverage	approved	none	
4	2011-03	4136 Hohe St	RO	day care facility	approved	none	
5	2011-04	880 East End Rd	RO	more than one building/medical clinic/more than 8000sf	approved	pave/screen dumpster	
_							
6	2011-06	4241 Homer Spit Rd	мс	restaurant/hotel/more than one huilding/more than 8000sf	approved	architechtural features/design	
7	2011-07	1295 Mission Bd	RR	more than one building	approved	nonulation can w/LDEC regulation	
2 2	2011-07	522 E Diopoor Avo		amend CLIP - landscaning	approved	landscaning/scren dumpster	
0	2011-00	2406 Main St		more than one building (setback reduction	approved		
9	2011-09			more than one building/setback reduction	approved	install water	
10	2011-10	5155 Kachemak Dr	GCI	more than one building/more than 8000sr	approved		
				more than one building/more than 8000st/Public Utility or			
11	2011-11	3300 Sterling Hwy	GC1	Structure	approved	none	
12	2011-13	1033 Skyline Dr	RR	amend CUP/public utility or structure	approved	none	
13	2012-01	4744 Homer Spit Rd	MI	other similar uses found in MC	approved	fence/planters/dumpster screening	
14	2012-02	3800 Sterling Hwy	RR	commercial greenhouse	approved	time limit/lighting	
15	2012-03	4770 Homer Spit Rd	MI	other similar uses found in MC	approved	resolve setbacks/fence/boardwalk	
16	2013-01	1401 Candlelight Ct	RR	more than one building	approved	none	
17	2013-02	4667 Freight Dock Rd	MI	PUD - restroom/guard shelter	approved	none	
18	2013-03	580 E Pioneer Rd	CBD	setback reduction	approved	none	
19	2013-04	4661 Kachemak Dr	RR	more than one buildng	approved	none	
20	2013-05	1496 Lakeshore Dr	GC1	multi-family dwelling	approved	wetland buffer/screen dumpster/landscaping	
21	2013-06	265 E Pioneer Ave	CBD	setback reduction	approved	parking plan/screen dumpster/stormwater deadline	
22	2013-07	3851 Homer Spit Rd	MC	belinort	denied	n/a	
22	2013-07	1824 Kachomak Dr		more than one building	annroved	nono	
23	2013-00	2651 Storling Hung		more than one building	approved	none	
24	2013-09			more than one building	approved		
25	2013-10	4914 Kachemek Dr	KK		approved	none	
26	2013-11	203 W pioneer Ave	CBD	setback reduction	approved	landscaping/screen dumpster/landscaping time limit	
27	2013-12	5700 Easy St	RR	public utility facility and structures (communication tower)	approved*	off site impacts/lighting	project disconti
							project discontin
28	2013-13	3850 Heath St	CBD	more than one building	approved*	many	further litigation
29	2014-01	4165 Mattox Rd	UR	more than one building	approved	lighting/ screen dumpster	
30	2014-02	560 Noview Ave	UR	day care facility	denied	n/a	
31	2014-03	4725 Kachemak Dr	RR	more than one building	approved	lighting	
32	2014-04	188 Skyline Dr	BCWPD	more than one building/other similar uses	approved	none	
33	2014-05	320 W Pioneer Ave	CBD	setback reduction	approved	lighting/landscaping	appealed - preva
			MC. MI.				
34	2014-06	4311 Freight Dock Rd	SBHOD	overslope/setback reduction	approved	screen dumpster/lighting	
35	2014-07	564 E Pioneer Ave	CBD	reduced setback	approved	gain non-conforming status	
<u> </u>	2017 07						
26	201/ 10	1164 East End Pd	RO	davcare facility	annround	limit hrs/lighting/move nonconforming accessory	
50	2014-10	221E East End Dd		more than one building	approved	lighting / dopict occoments /screen dumester	
51	2013-01			more than one building more than 0000-5/mublic facilities	approved		
	2045 02		CDD	more than one building/more than 8000st/public facilities			
38	2015-02	3575 Heath St	CRD	and structures	approved	lanuscaping	
39	2015-03	4166 Homer Spit Rd	MC	setback reduction/more than one building	approved	parking design	
40	2015-04	5185 Slavin Dr	RR	more than one building	approved	lighting	

G
notes
project discontinued after remand order
project discontinued after remanded approve and
further litigation
appealed - prevailed in court

	Δ	B	C	D	F	F	
1		address	zone	reason	disposition	special conditions* beyond required codes	notes
41	2015-05	315 Klondike Ave		increase sethack	approved	narking design	
42	2015-06	4242 Calhoun St	UR	more than one building	approved	screen dumpster/driveway design/fence	
						FM approval/W&S connect/screen dumpster/time	
43	2015-07	1242 Ocean Dr	GC1	more than one building	approved	limit	
44	2016-01	3902 Shelford St	RO	medical clinic/more than one	approved	FM approval/landscaping/lighting	
						vacate lot line/lighting/screen dumpster/drainage	
45	2016-02	3936 Svedlund St	RO	more than on building/more than 8000sf	approved	plan	
						·	
46	2016-03	500 Sterling Hwy	UR	indoor rec/more than one building	approved	DEC approval/lighting/access road FM approved	
					1		
47	2016-04	4060 Heath St	CBD	more than one building/public utily facilities and structures	approved	none	
48	2016-05	5185 Slavin Dr	RR	more than one building	approved	none	
						pave parking/pedestrian path,/landscaping/screen	
49	2016-06	4136 Bartlett St	RO	medical clinic/more than 8000sf	approved	dumpster	
50	2017-01	2080 Shannon Ln	RR	more than one building	approved	lighting/screen dumpster/move development 50'	
51	2017-02	210 Olsen Ln	CBD	more than one building, decrease setback, more than 8000sf	approved	pedestrian trail/screen dumpster/lighting	
52	2017-03	61447 Florence Martin Ct	BCWSPD	more than 6000sf grading	approved	erosion control/bmp for road	
53	2017-04	3101 Kachmek Dr	RR	more than one building	approved	lighting	
54	2017-05	3301 East End Rd	EEMU	more than 8000sf	approved	stormwater plan	
55	2017-06	3965 Sterling Hwy	RR	bluff setback	approved	time limit/inspection/landscaping/limit disturbance	
56	2017-07	4300 Freight Dock Rd	MI	tower	approved	seal feed lines/no altertion w/o approval/lighting	
57	2017-08	91 Stering Hwy	CBD	more than 8000sf	approved	approve lighting plan/landscaping	
58	2018-01	94 Sterling Hwy	CBD	auto fueling station	approved	fence/lighting plan	
59	2018-02	302 E Pioneer Ave	CBD	descrease setback	approved	lighting	appealed - sustair
60	2018-03	152 W Danview	RO	more than one building	approved	lighting/ screen dumpster	
61	2018-04	680 Sterling Hwy	GBD	more than one building	approved	lighting/screen dumpster/time limit	
62	2018-05	4201 Rhonda St	RO	more than one building	approved	lighting/dumpster	
63	2018-06	1170 Lakeshore Dr	GC1	more than on building/multi-family dwelling	approved	lighting	
64	2018-08	1344 Lakeshore Dr	GC1	more than one building	approved	lighting	
65	2018-09	267 Cityview St	RO	medical clinic/more than 8000st	approved	lighting/screen dumpster/sunset	appealed - reman
66	2018-10	3301 East End Rd	EEMU	more than 8000st	approved	none	
67	2018-11	3779 Bartiett St	CBD	more than soust/more that one building	approved	lighting	
60	2018-12	3725 West Hill Ka		more than one building	approved	lighting/screen dumpster/adjust parking	
69 70	2018-13	3771 West Hill Rd	RR	motical clinic	approved	lighting/screen dumpster	
70	2018-14	203 W Fairview Ave	RO	remand CUB 2018 02	appoved	lighting/screen dumpster	
71	2019-01	625 Grubstake Ave		more than 8000sf/unlisted uses	approved	lighting/scroon dumpstor/landscaping	
72	2019-02	26/1 Storling Hwy	RR	more than one building	approved	lighting/signage/placement of leachfield	
75	2019-03				approved	EM certificate/fencing/landscaning/time limit/screen	
7/	2010-04	397 E Pioneer Ave	CBD	group care home/more than 30% building area	approved	dumpster/color palate	withdrew after int
75	2019-04	210 W Fairview	RO	medical clinic	approved	lighting/screen dumpster	
76	2019-06	3301 Fast Fnd Rd	FFMU	more than 8000sf	approved	none	
77	2019-07	Lot 31 Spit Rd Sub Amened	OSR	narking lot	denied	n/a	
78	2019-08	4155 Pennock St	RO	more than one building	approved	lighting/screen dumpster	
	00						
79	2020-01	104 E Pioneer Ave	CBD	more than one building/manufacturing/more than 8000sf	approved	parking/lighting/screen dumpster	
80	2020-02	680 Sterlig Hwv	GBD	amend - more than one building	approved	time limit/outdoor lighting/screen dumpster	
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А	В	C	D	E	F	G
1 <u>CUP</u>	address	zone	reason	disposition	special conditions* beyond required codes	notes
81 2020-03	436 Soundview Ave	UR	townhouse	approved	lighting	
82 2020-04	3385 East End Rd	EEMU	more than 8000sf	approved	landscaped screening	
83 2020-05	1081A Freight Dock Rd	MC	overslope/lodging	approved	screen trash container and electrical boxes	
84 2020-06	3935 Svedlund St	RO	morer than 8000sf	approved	lighting	
85 2020-07	62890 Skyline	BCWSPD	stream buffer	approved	sediment and erosion control plan	
86 2020-08	151 W Bayview Ave	RO	more than one building	approved	lighting/screen dumpster	
87 2020-09	3657 Main St	CBD	manufacturing/more than one building	approved	lighting	
88 2020-10	750 Nedosik Rd	RR	more than one building	approved	lighting	
89 2020-11	4936 Clover Ln	RR	more than one building	approved	lighting	
90 2020-12	3972 Bartlett St	RO	more than one building	approved	lighting	
91 2020-14	541 Bonanza Ave	CBD	moblie home park	denied	n/a	
					setback standard/lighting/screen dumpster/screen	
92 2020-15	106 W Bunnell	CBD	setback reduction/more than 30% building area	approved	parking lot	appealing - applicant withdrew
93 2021-01	1308 Lakshore Dr	GC1	more than one building	approved	no RV occupancy/lightning	
94 2021-02	89 Sterling Hwy	CBD	more than one building	approved	parking spaces/parking landscaped buffer/lighting	
95 2021-03	870 Smokey Bay Way	CBD	manufacturing	approved	none	
96 2021-04	90 Sterling Hwy	CBD	more thatn 8000sf	approved	none - design manual application	
97 2021-05	4262 Homer Spit Rd	MC	setback reduction	approved	none	
98 2021-06	1308 Lakshore Dr	GC1	amended - more than one building	approved	lighting	
99 2021-07	1554 Homer Spit Road	GC1	more than one	approved	lighting	
100 2021-08	3860 Kachemek Way	CBD	greenhouse	approved	lighting	

Office of the City Manager

491 East Pioneer Avenue Homer, Alaska 99603





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Memorandum

TO:	Mayor Castner and Homer City Council
FROM:	Melissa Jacobsen, Acting City Manager
DATE:	June 9, 2022
SUBJECT:	City Manager's Report for June 13, 2022 Council Meeting

Tsunami Warning

Thursday, June 2nd the Tsunami Warning Sirens in Homer were activated at approximately 8:30 a.m. without any indication of earthquake activity in or around Homer. Fire Chief Kirko reported he and Homer Police Department were initially challenged in getting answers because they were unable to connect KPB Office of Emergency Management. Chief Kirko connected with KPB Emergency Manager Brenda Ahlberg via cell phone, and she confirmed at approximately 9:07 a.m. that it was a National Weather Service Test that was intended to be a silent test, but was done as an audible test in error. She advised they were conducting all clear messages for the effected communities. On Friday, all stakeholders met by Zoom to go over the events, lessons learned, and steps to prevent similar mistakes in the future.

Bunnell Avenue and Kachemak Drive Fires

During the early morning hours of June 4th the Homer Volunteer Fire Department (HVFD) responded to a report of a fully involved commercial structure fire in the Old Town area of Homer. Dispatch received the first report at 2:40 a.m. and 6 trained firefighters, including the Chief, responded along with 3 EMT's from HVFD and 7 additional personnel from mutual-aid departments, Kachemak Emergency Services (KESA) and Western Emergency Services (WES). The three departments were actively engaged in suppression efforts until approximately 8:30 a.m. when Chief Kirko called the fire under control. KESA and WES units were released from the scene by 9:00 a.m. and HVFD engine-2 was released about a half an hour later. The cause of the fire is still under investigation and Chief Kirko is working with the State Fire Marshal's Office, Homer Police Department, and a Fire and Arson investigator representing the insurance carrier to try and determine the cause.

At 11:36 that same morning, HVFD was paged out to a residence on Kachemak Drive for a reported small fire on a residential deck. Chief Kirko turned command of the Bunnell fire over to Firefighter Larson and responded to the Kachemak Drive fire along with Engine-2 and Medic-2. Chief Kirko returned to the Bunnell incident at 12:15 and resumed command of the scene. Tanker-2 remained on scene at Kachemak Drive working residual hot spots until 12:54 when they were released.

Little Libraries are up!

In December 2021 Council accepted a grant from the Institute of Museum and Library Services for \$5,950 for installing Little Libraries. The Parks Division has installed them at Mariner Park, the Nick Dudiak Fishing Lagoon, Karen Hornaday Park, and WKFL Park (pictured).





Ocean Drive Loop Seawall

Public Works Director Keiser has received some positive feedback from property owners along the seawall following the first season of winter storm activity. Martin Renner shared the following comment and photos-

I've walked the length of the wall a few times since April. There is great news: this winter, waves deposited a lot of material, rather than eroding this section of coastline. The new material may be up to 1.5 me thick, covering up most, in a few cases all of the new riprap. This obviously makes for excellent protection for the time being. But what the waves give, they can also take away again. It's conceivable that the riprap helped slow down wave action near the wall, dissipating rather than reflecting wave energy, and thereby contributing to this accumulation of sediment, but that's hard to know. We'll see what the next winter will bring. In any case, the raised beach has covered all of the exposed foot of the wall and should protect it very well from wave-driven erosion. Cheers, Martin





John Szajkowski sent some historical photos and shared that this doesn't happen anymore-the armor rock revetment works!





Early and Absentee Voting

Early and Absentee Voting was open for the State Special Primary Election during regular business hours May 27th through June 10th. As of the writing of this report in person voter turnout was small, ranging between 8 voters and 22 voters per day, but that was anticipated since voters received their ballots in their mailboxes. The City provided messaging when early and absentee voting was available through the City Website and Facebook page, in the Clerk's weekly meeting notice in the paper, and on the Clerk's Calendar recording on KBBI. Clerk's office staff also coordinated with Chief Kirko for messaging and placement of the electronic reader board on the Sterling Highway. It was a good introduction to the State's early voting process and the Clerk's Office looks forward to providing support for the upcoming State Primary in August and General Election in November.

Enclosures:

1. June Employee Anniversaries

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Memorandum

TO: MAYOR CASTNER AND CITY COUNCIL

FROM: Andrea Browning

DATE: June 13, 2022

June Employee Anniversaries SUBJECT:

I would like to take the time to thank the following employees for the dedication, commitment and service they have provided the City and taxpayers of Homer over the years.

Melissa Jacobsen	Clerks	18	Years
Mike IIIg	Admin	16	Years
Rachel Tussey	Clerks	11	Years
Mike Szocinski	Public Works	10	Years
Jessica Poling	Police	5	Years
Bethany Christman	Public Works	3	Years
Russell Anderson	Public Works	3	Years
James Tingley	Public Works	2	Years
Winifred Shigley	Police	2	Years
James Young	Port	2	Years

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Memorandum

TO:	Mayor Castner and Homer City Council
FROM:	Rob Dumouchel, City Manager
DATE:	June 23, 2022
SUBJECT:	City Manager's Report for June 27, 2022 Council Meeting

Main Street Sidewalk

Based on an update from the contractor, we're expecting work on the Main Street sidewalk to commence July 12th and run through mid-August. As Main Street is a major route for public safety purposes, the contractor will be communicating regularly with dispatch to ensure they know when and where any temporary road closures may be located. To help get the word out that work is beginning soon, the City will be placing ads in local media about the project.

FY24/25 Budget Prep

June 30th marks the end of FY22 and the beginning of the planned preparation period for the FY24/25 budget. Finance Director Elizabeth Walton and I are working on our plans to kick off the first phase of this process with the leadership team. We've purposefully given ourselves a significant amount of time to produce the FY24/25 budget to allow for contemplation of new ideas and maximum opportunities for public participation.

Water/Sewer Rates

Public Works Director Jan Keiser, Finance Director Elizabeth Walton, and I have been meeting to discuss an update to water and sewer utility rates. We've learned a lot in the last year that will be factored into the next staff proposal. Our current timeline is to prepare a work session presentation for the Council meeting in July and follow that at the next meeting with legislation to enact a rate update.

Volunteer Action Plan

Staff has begun working on a first-ever City of Homer Volunteer Action Plan. This concept was pitched during the visioning session in March and is on our 2022 project list. Working together with special project coordinators Jenny Carroll and David Parker, we have the idea for the report sketched out and plans for how we will research and review relevant data. Currently, staff from Fire, Library, Parks, Recreation, and the Clerks are gathering information that will allow us to do a full inventory of volunteers, existing programs, forms, waivers, etc. We will be working on this throughout the summer and I expect to do some stakeholder outreach as part of the project once we're further along in the process.

Short Term Rentals

Short term rentals (STRs) have been a big topic this year with the externalities they've caused on the community by taking housing typically rented to seasonal workers out of circulation and repurposing it for tourist needs. Special Project Coordinator David Pa<u>rker h</u>as initiated a research project that will evaluate the

state of Homer's housing market and the impacts of STRs on the community. This research will lead to a review of City code and, most likely, the development of an STR permitting program to control the rapid expansion of this commercial enterprise. We will be integrating stakeholder engagement activities into the project at a later date.

Procurement Code Update

The Finance Stakeholder Group, consisting of representatives from all departments and led by Port Admin Supervisor Amy Woodruff, continues to work their way through existing procurement code, processes, procedures, etc. and making suggestions for improvements. As a reminder of previous updates, the group conducted an internal survey earlier this year and produced a memo with recommendations for me. I asked the group to move forward with many of the recommendations. They met June 21st and are preparing a new set of documents for me to review. We are nearing the point where I will be looking to bring Council into the conversation. Expect more later this summer.
PLANNING COMMISSION ANNUAL CALENDAR FOR THE 2022 MEETING SCHEDULE

MEETING DATE	SCHEDULED EVENTS OR AGENDA ITEM
JANUARY 2022	
FEBRUARY 2022	
	PC training: legislative vs quasi-judicial decisions; decisions and
	findings
MARCH 2022	Guest speaker and training: KPB Platting/Planning
	AK APA Conference
APRIL 2022	2018 Comprehensive Plan Review / HNMTTP
MAY 2022	Transportation work session with Public Works
JUNE 2022	Reappointment Applications Deadline
JULY 2022	Reappointments
	(One meeting this month)
AUGUST 2022	Election of Officers (Chair, Vice Chair)
	PC training: Roberts rules, OMA Capital Improvement Plan Review
SEPTEMBER 2022	Economic Development speaker
	(such as KPEDD, chamber, SBA,)
OCTOBER 2022	Floodplain or other hazard regulations overviewconnect dots
	between comp plan and our current regs
NOVEMBER 2022	(One meeting this month)
	Review and Approve the 2022 Meeting Schedule
DECEMBER 2022	(One meeting this month)
	Review Bylaws, and Policies and Procedures / Town Center Plan

Semi Annually: PW project update

- Odd Years: 2018 Comprehensive Plan (April) Homer Spit Plan, (July), Review Bylaws, and Policies and Procedures (December)
- Even Years: HNMTTP (April), Transportation Plan (July), Town Center Plan (December)