

KPU



Your Community, Your Utility

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7b(1)

TRANSMITTAL MEMORANDUM

TO: The Honorable Mayor and City Council

FROM: Karl R. Amylon, General Manager

DATE: June 22, 2020

RE: **Accepting Alternative Water Main Alignment – Contract No. 19-45, Schoenbar Road Raw Water Transmission Main Design, DOWL**

At its meeting of December 19, 2019, the City Council adopted a motion authorizing a professional services agreement for Contract No. 19-45, Schoenbar Road Raw Water Transmission Main Design, between the City of Ketchikan d/b/a Ketchikan Public Utilities and DOWL at a cost not to exceed \$337,500. The motion adopted by the City Council also established a ten percent contingency in the amount of \$33,750, bringing the total project cost to \$371,250. As the City Council will recall, the design was based on DOWL's prior water main sizing analysis, which determined that a single permanent, buried 42-inch HDPE pipeline generally aligned on the west side of Schoenbar Road under the existing sidewalk was the cost effective route between Schoenbar Middle School and the Ketchikan Charter School.

The motion detailed below was prepared at the request of Water Division Manager John Kleinegger, who asked that it be placed before the City Council for consideration at its meeting of July 2, 2020. If adopted, the motion provides for accepting an alternative alignment of the water main due to cost considerations. The motion also directs staff to secure the necessary easements from the Ketchikan Gateway Borough and the Ketchikan Gateway Borough School District as a result of the alternative alignment. The rationale for the alternative alignment of the water main is detailed in Mr. Kleinegger's transmittal memorandum and requires no elaboration on the part of my office. I concur with the Water Division Manager's recommendation.

The City Council should note that should KPU be successful in securing the easements for the alternative alignment to go forward, a change order to DOWL's design contract will be required.

Mr. Kleinegger will be attending the City Council meeting of July 2, 2020, in order to address any questions and/or concerns that Councilmembers may have.

A motion has been prepared for City Council consideration.

RECOMMENDATION

It is recommended the City Council adopt the motion accepting the alternative water main alignment for Contract No. 19-45, Schoenbar Road Raw Water Transmission Main Design, as detailed in the Water Division Manager's report dated June 18, 2020; and authorizing the General Manager to pursue the acquisition of easements as necessary from the Ketchikan Gateway Borough and the Ketchikan Gateway Borough School District.

Recommended Motion: I move the City Council accept the alternative water main alignment for Contract No. 19-45, Schoenbar Road Raw Water Transmission Main Design, as detailed in the Water Division Manager's report dated June 18, 2020; and authorize the General Manager to pursue the acquisition of easements as necessary from the Ketchikan Gateway Borough and the Ketchikan Gateway Borough School District.



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Memorandum

TO: Karl R. Amylon, General Manager

FROM: John C. Kleinegger, Water Division Manager/Project Engineer

DATE: June 18, 2020

SUBJECT: **Contract 19-45, Schoenbar Raw Water Transmission Main - Design**

DOWL Engineers, who have completed the earlier design work for replacement of the Schoenbar Road disinfected water & sewer mains, are now designing a replacement for the portion of the existing 36-inch ductile iron main in Schoenbar Road located between the westerly edge of Norman Walker Field and the Ketchikan Charter School. This critical water transmission main is the sole water supply for the entire City conveying raw water from the Chlorination Plant up to the UV Disinfection Facility for further disinfection before being distributed throughout the community.

As illustrated in the attached Figure 1, since October 2018 this ductile iron main has experienced three catastrophic failures due to the presence of highly corrosive, acidic, muskeg soils that exist between the westerly edge of Norman Walker Field and the Ketchikan Charter School. Due to the amount of both electrolytic and electrochemical corrosion that has already occurred, approximately 1,250-feet of 36-inch ductile iron main has reached the end of its useful service life and is in dire need of replacement with modern, non-corrodible HDPE pipe.

At its meeting of December 19, 2019, the City Council awarded the design of this replacement water main to DOWL. The design to be based upon DOWL's Alternative 1 from their prior water main sizing analysis which determined that a single permanent, buried 42-inch HDPE pipeline generally aligned along the west side of Schoenbar Road under the existing sidewalk is the most cost-effective route between the Schoenbar Middle School and the Ketchikan Charter School. DOWL's initial design routing followed this alignment but then began encountering severe complications as the pipe profile was established.

The available geotechnical information is highly variable throughout this project even from test hole to test hole. Deep sections of muskeg are present as well as loose gravel and sand within the project area. Safety protection for personnel will be required using trench boxes which greatly complicates construction. There are also several segments where the bottom of the new HDPE pipe would be buried over 15-feet deep and the proximity of new pipe trench to the existing

unrestrained 36-inch ductile iron pipe is not accurately known. The existing main is operating at 100 psi in this area without significant thrust restraint other than being buried in compacted, crushed rock. Should the trench excavation for the new 42-inch HDPE pipe inadvertently become too close to this rock envelope, it amplifies the potential for the ductile iron pipe's sudden deflection with possible injury.

Once the crossing of Schoenbar Creek was considered, there was also the extreme hazard working under energized 34.5 kVA power lines and utility poles at the same location. Simply de-energizing the 34.5 kVA line during this construction period is not a viable option since this will also affect the Ketchikan Plant Substation. It requires splitting the electrical distribution system into two components, each with their own individual generation controls rather than operating as a combined system. One system being supplied by Beaver Falls/Whitman generation and the other by Swan Lake and Bailey Power House generation.

While the 34.5kVA line is energized, there has to be a minimum safety separation of 20-feet for any crane work. Similarly, for an excavator or other machinery, there has to be a minimum of 10-feet of separation and this project will require multiple large 35 or 45 ton excavators to lift the heavy concrete I-beam support spanning the creek. The trench sections will also encroach into the stream bank, will likely require sheet piles for restraint, and substantial dewatering will be required and discharging into an anadromous fish stream.

As a result, the combination of these compounding challenges caused DOWL to question the feasibility, the risks, and the resulting additional costs that would be necessary to construct the 42-inch HDPE pipeline along this proposed route. Instead, they began looking at another route which is highlighted in a light blue solid line shown on Figure 1. This route avoids the power lines (along with other conflicting utilities), and eliminates the need for an I-beam supported creek crossing.

For these reasons, DOWL's latest proposed route doesn't follow the Schoenbar Road sidewalk alignment. Instead, it crosses the Ketchikan Charter School's playground, passes through the School District's Maintenance Shop parking area, and the Schoenbar Middle School's driveway before crossing Schoenbar Creek adjacent to where Schoenbar Creek's 96-inch multiplate culvert begins. With fewer bends, there is less pipe to be installed and eliminates an estimated 130-feet of 42-inch HDPE pipe, omits the difficulty of working under the energized 34.5 kVA transmission line, and provides other estimated savings that are described in the attached Table I.

Three test pit holes were dug this past February in Norman Walker Field with another test pit excavated adjacent to the Ketchikan Charter School to determine the present condition of the remainder of the 36-inch ductile iron main. Built in 1994, each exposed segment appeared to still be in good condition despite the presence of substantial ground water. Regardless of its good appearance in 2020, not only does ground water contribute dissolved oxygen to accelerate corrosion to the ductile iron pipe, there are possibly other dissolved metals present including copper which will create a corrosive galvanic cell.

Although there is heightened community interest to have Walker Field covered with artificial grass, the Ketchikan Gateway Borough's (KGB) management are planning on recommending to the Assembly that they put off their planned October ballot measure for Walker Field Improvements due to the KGB's current fiscal status that is constricted by the effects of the coronavirus pandemic.

Despite this proposed delay, prudent risk management suggests that the existing ductile iron water main beneath the field be replaced with properly installed HDPE pipe which has an estimated service life of at least 100 years. It will eliminate the potential for any future damage being caused to the planned artificial grass surface which, depending on the material chosen, will have an estimated useful service life of 15-25 years.

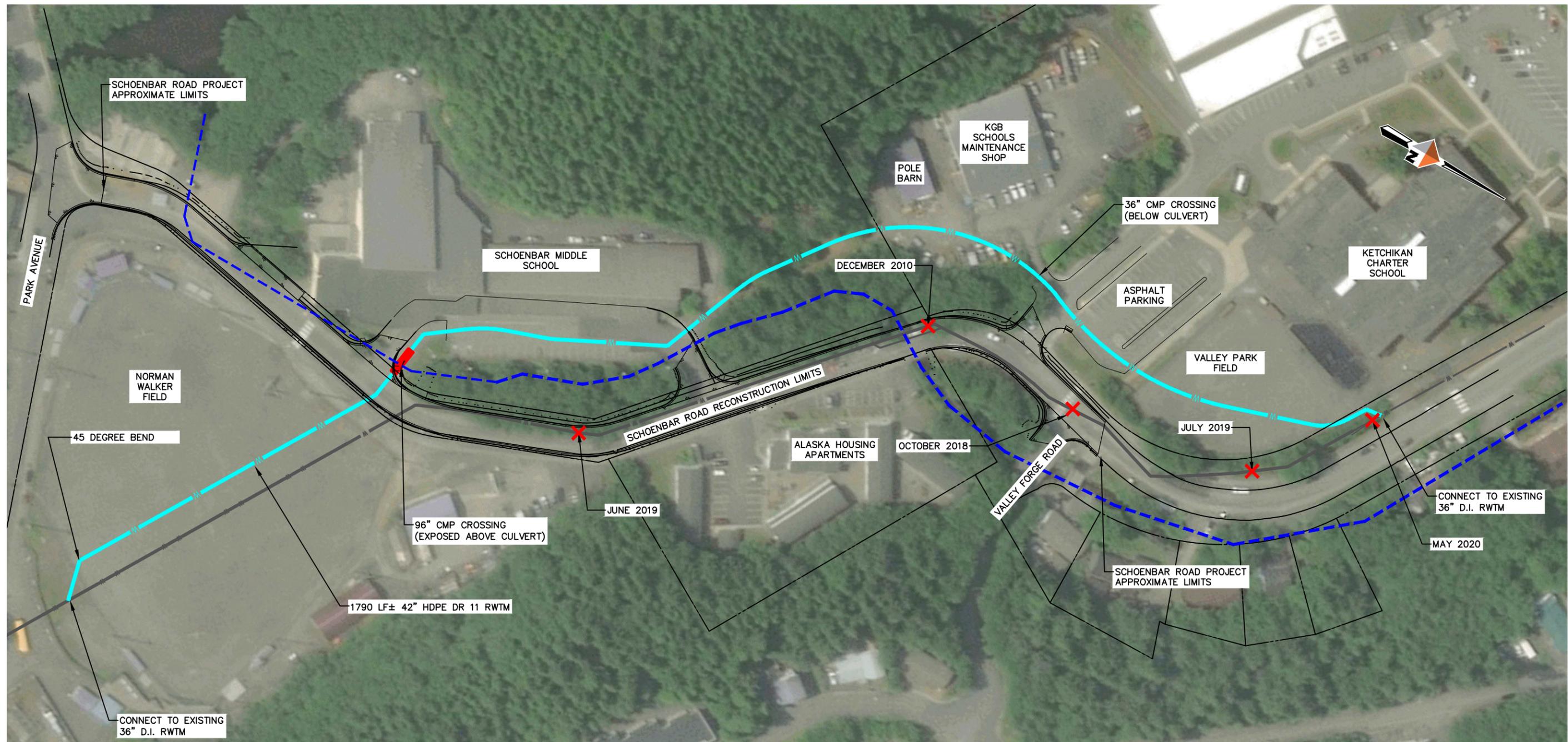
If the necessary property easements including the realignment across Norman Walker Field were granted by KGB and the School District, the attached Table I shows the estimated reduction in total construction cost for the proposed alternative alignment route to be realistically comparable to the estimated overall construction cost of the original route that terminated instead at the southwesterly juncture of Schoenbar Road before it entered Walker Field.

This would provide sufficient savings that would allow another 400-foot of 42-inch HDPE distribution main to be built across Walker Field along with the other necessary property restoration items. This would eliminate KGB's concerns about the possibility of future failures of the existing 36-inch ductile iron main below their planned artificial turf, would still be within KPU's budget for this project, and becomes a win-win opportunity for everyone within the community who uses Norman Walker Field for recreation.

Recommendation:

It is recommended that the City Council direct the General Manager to accept the proposed alternative alignment of the 42-inch HDPE Raw Water Transmission Main being prepared by DOWL; and secure from the Ketchikan Gateway Borough and the School District all necessary property easements that are required for its construction along the route illustrated in Figure 1.

FIGURE 1 KPU RAW WATER TRANSMISSION MAIN - PROPOSED ALIGNMENT



LEGEND

- SCHOENBAR CREEK (APPROXIMATE)
- W— EXISTING 36" DUCTILE IRON RAW WATER TRANSMISSION MAIN
- X EXISTING RAW WATER TRANSMISSION MAIN BREAK OR LEAK REPAIR
- W— PROPOSED 42" HDPE RAW WATER TRANSMISSION MAIN
- ▭ PROPOSED CULVERT CROSSING WITH PARTIALLY EXPOSED PIPING

OVERALL PLAN VIEW - SCHOENBAR ROAD RECONSTRUCTION & 42" RWTM REPLACEMENT



CONCEPT ALIGNMENT



No.	Date	By	Revision

SCHOENBAR ROAD
WATER AND SEWER MAINS REPLACEMENT
KETCHIKAN, ALASKA



Date:	05/22/2020	Scale:	1"=60'
Drawn By:		Station:	
Checked By:		Sheet No.	OF 79

Table I

Proposed HDPE Raw Water Transmission Main Alignment
Further West of Schoenbar Road with an Extension Across Walker Field

Deducts and Adders Are Compared to the Previous Alignment within Schoenbar Road

Item	Unit	Quantity	Unit Price	Total Price
Deducts from Previous Schoenbar Alignment				
Reduced Length - Schoenbar to Schoenbar Tie Points	LF	130	\$ (750.00)	\$ (97,500.00)
Utility Pole Support Provisions (Temp Poles; Shoring; Protection, etc.)	EA	3	\$ (50,000.00)	\$ (150,000.00)
Reduction in Dewatering	LS	1	\$ (37,500.00)	\$ (37,500.00)
Traffic Control Duration Reduced (Full Duration of the Raw Water Transmission Main Installation)	LS	1	\$ (70,000.00)	\$ (70,000.00)
Delete Pre-cast Channel Beam for Pipe Bridge	LS	1	\$ (80,000.00)	\$ (80,000.00)
Remove/Replace Rock Retaining Wall	LS	1	\$ (30,000.00)	\$ (30,000.00)
Remove/Replace Driveway	SY	224	\$ (100.00)	\$ (23,000.00)
Productivity Factor; Improved productivity given new alignment.	LF	1350	\$ (50.00)	\$ (67,500.00)
			Subtotal	\$ (555,500.00)
Additions for Alternate Western Alignment				
Added Length Across Walker Field	LF	400	\$ 750.00	\$ 300,000.00
Additional Restoration - Middle School Parking Lot (Asphalt)	SY	200	\$ 100.00	\$ 20,000.00
Additional Restoration - Charter School Parking Lot (Asphalt)	SY	300	\$ 100.00	\$ 30,000.00
Additional Restoration - Retaining Wall Repair	LS	1	\$ 9,000.00	\$ 9,000.00
Additional Restoration - Gravel Road	SY	400	\$ 50.00	\$ 20,000.00
Air Release Valves & Enclosures	EA	2	\$ 10,000.00	\$ 20,000.00
			Subtotal	\$ 399,000.00
			Total Change	\$ (157,000.00)

Division: Water		Project Priority: 2			Project Number:				
Project Title: Schoenbar Water Mains (Charter School - Middle School)		Start Date: 01/18			Estimated Project Cost:				
Description:		End Date: 12/20			Design 62,280				
<p>Repairs are needed to the 36-inch ductile iron water main in Schoenbar Road which is the sole municipal water supply. Although this entire main is cathodically protected, due to a lack of electrical bonding to a segment by the contractor, there was an electrolytic failure in 2011. In addition, during the last 12 months there have been three further major failures which appears to be caused by severe electrochemical galvanic corrosion to the ductile-iron pipe. Further failures are imminent which requires its immediate replacement with non-corrosive HDPE pipe. In addition, this project will also allow 650 feet of undersized and fragile cast-iron mains in the same portion of the roadway to be replaced beginning at Valley Forge and continuing south towards the northerly entrance to Schoenbar Middle School. This work will be done in conjunction with the Wastewater Division to replace the sewers in the same roadway using funds authorized in the SFY 2018 Clean Water Fund Priority List. The State of Alaska Municipal Grants & Loans program for SFY 2018 authorized Ketchikan's submittal of a loan request in the amount of \$1,591,967 and will be funded through use of a portion of the \$5-million bond funding amount authorized by the voters at the October 2014 election. In addition to a loan subsidy offer of \$662,400, ADEC has also offered to amend and combine both Schoenbar Phases into a single loan amount upon the submission of a revised scope and amount by August 31, 2019. Based upon current engineer's estimates, the amended amount requested will be \$5,973,779.</p>		Land/Right-of-Way			Construction Management				
		Construction			6,857,099				
		Equipment			Other (Loan Subsidy) 662,400				
		Project Total			7,581,779				
Source of Funds	Prior Years	Adopted 2020			Projected Requirements				Total Project
		Reappropriated	New Funding	Total	2021	2022	2023	2024	
Revenue Generating Fund	16,000								16,000
Revenue Bonds - ADWF Loan	46,280	1,545,720	5,973,779	7,519,499					7,565,779
Total	62,280	1,545,720	5,973,779	7,519,499					7,581,779

December 19, 2019

Manager Amylon said after the Council authorized staff to begin discussions with ADEC he had a conversation with the city attorney, and he recommended the City bring in outside Counsel to represent us relative in the negotiations that will have to take place with ADEC .

Motion passed with Flora, Bergeron, Kiffer, Coose and Gage voting yea; Zenge absent; one seat vacant.

**Professional Services Agreement for Contract No. 19-45 –
Schoenbar Road Raw Water Transmission Main Design –
DOWL**

Moved by Flora, seconded by Kiffer the City Council authorize a professional services agreement for Contract No. 19-45, Schoenbar Road Raw Water Transmission Main Design, between the City of Ketchikan d/b/a Ketchikan Public Utilities and DOWL at a cost not to exceed \$337,500; establish a ten percent contingency in the amount of \$33,750, bringing the total project cost to \$371,250; approve funding from the Water Division's Schoenbar Road Phase I Capital Account; and direct the general manager to execute the contract documents on behalf of the City Council.

Mayor Sivertsen questioned the pipe size and flow.

Councilmember Bergeron questioned the cost of the design by DOWL.

Water Division Manager Kleinegger answered questions from the Council.

Mayor Sivertsen said he was looking forward in seeing the design work, and felt getting it out of the roadway has advantages. He said he would like us to consider what is coming at us in the future and suggested a blind flange in regards to a separate pipe to Walker Field, noting in the future that may also need to be replaced.

Water Division Manager Kleinegger said they would like to dig at some point when the field is not in use to be able to inspect the pipe.

Motion passed with Bergeron, Kiffer, Coose, Gage and Flora voting yea; Zenge absent; one seat vacant.

VOUCHERS - None

CITY MANAGER'S REPORT

Manager Amylon said he had a few items tonight.

Port and Harbors Director Corporon updated the Council on the blasting of the rock pinnacle that kicked off on Tuesday, December 17, 2019. He said they have located seismic monitors throughout the downtown area to take readings of their test shots. He stated things went well today and tomorrow there will be one more production level shot. He said if all goes well with the test shots they will shut down and come back on January 2, 2020 to start drilling in two, 12 hour shifts, and 24 hours a day. He said things seem to be going very well, and explained some of the effects that may happen.

October 17, 2019

Assistant Manager Simpson clarified there are two main items staff needs direction on; one is perform the hazmat/environmental survey; and the other is seek a fair market appraisal on the property.

Mayor Sivertsen asked for a show of hands to give direction to staff to move forward with the fair market appraisal and environmental survey; motion was declared carried by a show of a least four hands.

Exempting the Procurement of Electric Division Wartsila Cylinder Heads from Competitive Bidding/Written Quotation Requirements of the Ketchikan Municipal Code – Wartsila North America, Inc.

Moved by Williams, seconded by Kiffer pursuant to subparagraph 6 of Section 3.12.050(a) of the Ketchikan Municipal Code, the City Council exempt the procurement of three Wartsila cylinder heads for Bailey Power Plant Generator No. 4 from the competitive bidding/written quotation requirements of the Ketchikan Municipal Code; authorize the procurement of such cylinder heads from Wartsila North America, Inc. at a cost of \$143,780.99, including shipping; establish a contingency in the amount of \$1,219.01, bringing the total project cost to \$145,000; approve budget transfers in the amounts of \$13,000 and \$132,000 respectively from the division's 2019 Electric System Modernization Program and Ward Cove Substation Improvements Capital Accounts to the Wartsila Generator Parts and Repairs Capital Account; and direct the general manager to execute the contract documents on behalf of the City Council.

Electric Division Manager Donato answered questions from the Council.

Motion Passed with Flora, Zenge, Gage, Williams, Kiffer, Bergeron and Coose voting yea.

Professional Services Agreement for a Ketchikan Raw Water Transmission Main Sizing Feasibility Analysis – DOWL

Moved by Kiffer, seconded by Flora the City Council authorize a professional services agreement between the City of Ketchikan d/b/a Ketchikan Public Utilities and DOWL for a Ketchikan raw water transmission main sizing feasibility analysis at a cost not to exceed \$17,000; approve funding from the Water Division's Schoenbar Road Phase 1 Capital Account; and direct the general manager to execute the contract documents on behalf of the City Council.

Water Division Manager Kleinegger answered question from the Council.

Motion Passed with Flora, Zenge, Gage, Williams, Kiffer, Bergeron and Coose voting yea.

Exempt the Procurement of Electric Division Beaver Falls Generator No. 1 Repair Services and Material From the Competitive Bidding/Written Quotation Requirements of the Ketchikan Municipal Code – Delta Electric Motors, Inc.

Moved by Flora, seconded by Coose pursuant to subparagraph 6 of Section 3.12.050(a) of the Ketchikan Municipal Code, the City Council exempt the procurement of service and associated materials for the repair of Generator No. 1 at Beaver Falls from the competitive bidding/written quotation requirements of the Ketchikan Municipal Code; authorize the procurement of such