FINAL REPORT
NORTH DOUGLAS SEWER
Update to December 1998
Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

Prepared for:
CITY AND BOROUGH OF JUNEAU
Engineering Department
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R&M Project No. 061311

February 19, 2008

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1.0 INTRODUCTION

In the spring of 2006, the City and Borough of Juneau (CBJ) retained R&M Engineering, Inc. (R&M) to update the *North Douglas Sewer Conceptual Design and Technical Report, Douglas Bridge to Bonnie Brae, December 1998,* prepared by R&M, et al. The scope of the update is to create a conceptual design and prepare cost estimates for expanding the North Douglas sewer between the Juneau-Douglas Bridge and Falls Creek, where Phase I of the North Douglas Sewer project ended. Phase I was designed by Toner-Nordling and Associates, Inc. and constructed by Miller Construction in 2001.

R&M reviewed the population estimates and wastewater flow computations documented in the 1998 report, then field checked construction that has occurred in the study area. From the comparison, R&M determined that the population and flow data from the 1998 report could be reused and that additional analysis would not be warranted.

R&M submitted a preliminary report with a conceptual design to the CBJ in August 2006, which is summarized below, in order to facilitate planning and meetings. Field investigations, meetings with CBJ personnel, and public discussions evolved the conceptual sewer design, and the developed concept is detailed in the following report.

2.0 AUGUST 2006 PRELIMINARY RESULTS

The initial sewer design concept focused on a sewer main along either the beach or North Douglas Highway, and was divided into two alternatives according to where wastewater crossed the Gastineau Channel. In Alternative 1, wastewater flowed to the existing West Juneau Lift Station located on the north side of the Juneau-Douglas Bridge, where it was pumped across the bridge. Alternative 2 carried wastewater to the existing Falls Creek Lift Station on North Douglas, where it was pumped through the existing submarine line. Once across the channel, wastewater flowed through the existing sewer system to the Juneau-Douglas Treatment Plant on Thane Road.

2.1 Alternative 1

Alternative 1 was divided into five sub-alternatives: 1A, 1B, 1C, 1D, and 1E. Each sub-alternative delivered wastewater from the study area to the West Juneau Lift Station, but they varied the method or route for collecting and transporting it. Options evaluated were beach and road lines; gravity mains, lift stations with force mains, and force mains powered by pump stations within each household; and combinations of each.

All five sub-alternatives involved crossing Kowee Creek using the existing bridge on North Douglas Highway to access the lift station. Investigations, based on 1998 aerial mapping, determined that a standard gravity flow design could not cross the bridge; and that a new lift station or an inverted siphon would be required.

At the existing West Juneau Lift Station, the wastewater was pumped across the Juneau-Douglas Bridge and into the existing sewer system.

Estimated total costs, which assumed an inverted siphon to cross Kowee Creek, varied from $3.7 million to $7.4 million. For alternatives incorporating pump stations within each household, the cost of installing, operating, and maintaining each pump was assumed to be at the homeowner's expense; and mainline lift station maintenance was factored as a CBJ expense.

2.2 Alternative 2

Alternative 2 was divided into five sub-alternatives: 2A, 2B, 2C, 2D, and 2E. Each sub-alternative copied the general plan of the corresponding sub-alternative from Alternative 1 but delivered wastewater to the existing Falls Creek Lift Station. The wastewater would then be pumped across the Gastineau Channel through the existing 8-inch high density polyethylene force main anchored to the channel floor and into the existing sewer system in the Channel Drive vicinity. Kowee Creek did not need to be crossed.

Estimated total costs varied from $4.2 million to $6.6 million. The same assumptions used in Alternative 1 estimates were applied to these cost estimates.

2.3 Phasing Implementation

In addition to the ten mainline alternatives, the Preliminary Results report suggested six phasing options to construct small, stand-alone portions of the sewer system. Based on CBJ experience, smaller projects (~$1.7 million in estimated construction costs) generate lower, more competitive bids by contractors. Additionally, the phasing options could quickly address the following areas determined by the CBJ to be priorities:

- Trailer courts near Eagle Creek discharging into the Gastineau Channel
- Provide service to residents downhill of North Douglas Highway, many of which discharge into the Gastineau Channel
- Provide service to potential future subdivisions easterly and southerly of Eagle Creek, north and south of Grant Creek, and northerly of Kowee Creek

Phasing Option I was estimated at a total cost of $0.96 million to construct a portion of the gravity main on the uphill side of North Douglas Highway, cross Kowee Creek with an inverted siphon, and connect to the West Juneau Lift Station.

Phasing Option II was estimated at a total cost of $1.4 million to construct a portion of the gravity and force main along the beach from the trailer courts near Eagle Creek to existing Beach Manhole 18 of the North Douglas Sewer Phase I project.

Phasing Option III was estimated at a total cost of $0.99 million to serve the trailer court area only by constructing the lift station and force main portion of Phasing Option II and tying into existing Beach Manhole 18 of the North Douglas Sewer Phase I project.

Phasing Option IV was estimated at a total cost of $0.41 million to construct a portion of the beach line and highway line in the vicinity of Eagle Creek to provide a large area of not-yet-developed property with sewer service. This option required the force main of Option II to be in place to provide an outfall for the collected wastewater.

Phasing Options V and VI suggested combinations of the above options.

2.4 Alaska Department of Transportation & Public Facilities (DOT) Involvement

The DOT maintains North Douglas Highway, and indicated in preliminary discussions that it will not permit open cut crossing of the roadway in the project area. Therefore, all crossings must be bored under the highway. And the DOT does not anticipate improvements or repaving of the highway within the study area within the next five or more years. Additionally, the DOT indicated that construction of the sewer main on the downhill side of the roadway prism would require individual review and approval due to concern of the stability of the roadway slope.

Also, Alternative 1 requires crossing the Kowee Creek Bridge on North Douglas Highway. The bridge abutments include provisions for an 8" and a 10" utility pipe penetration. However, as stated earlier, a standard gravity flow design could not cross the bridge and a new lift station or an inverted siphon would be required.

3.0 FINAL RESULTS

As the conceptual design of the sewer plan evolved by conducting field investigations, meeting with CBJ personnel in the Engineering and Sewer departments, and addressing the comments and concerns of the public, the beach or road mainline concept was abandoned as it did not meet public expectation. The updated concept combines gravity and force mains along the beach and road to serve the properties. An overview of the study area is attached as Appendix A.

3.1 Updated Alaska Department of Transportation & Public Facilities Involvement

The DOT remains involved in the development and design of this project and is now considering previously prohibited items based on design constraints. While originally indicating that open cut crossings of North Douglas Highway will not be permitted, discussions with DOT representatives indicate that it would allow for limited pavement removal and roadway trenching on both sides of the Kowee Creek Bridge.

Additionally, present discussions with DOT representatives indicate that it will permit the construction of the sewer main on the downhill side of North Douglas Highway through a 670-foot section of a gravity main line in the midsection of Area D in order to avoid deep excavation on the uphill side of the highway through this vicinity.

However, at this time, the DOT Bridge Department will not permit the latest gravity sewer line design across Kowee Creek Bridge with the pipe penetrating the backwall on the northwest end of the bridge and the abutment on the southeast end, as the design requires the bottom of the pipe insulation to hang a maximum of 3.3 feet below the bottom of the bridge girders. The DOT general policy is for the bottom of the utility to hang no less than one inch above the bottom of the bridge girders. Since the design will not compromise the structural integrity of the bridge or any of its components, and it will result in considerable cost savings, the CBJ is currently appealing the DOT policy.

3.2 Sub-Area Concept

After updating and reviewing the 1998 concepts, the study area was reconfigured into six sub-areas separating the uphill side of the highway (Areas A, B, C, and D) and the downhill side of the highway (Areas E and F). The sewer system for each sub-area is described below, with plan view drawings depicting the detailed sewer plan attached as Appendix B. Detailed preliminary cost estimates for each sub-area are attached as Appendix C, where the Estimated Construction Cost includes a 15% contingency and the Estimated Total Project Cost includes an additional 40% for design services, inspection fees, and CBJ administration. Also, all easements needed in all six of the areas are currently being pursued together.

3.2.1 Area A (See sheet 4 of 4, Appendix B)

In this area, gravity mains along the uphill side of North Douglas Highway serve properties uphill of the highway: one main begins at the Zinn property at 5795 (from the end of the North Douglas Sewer Phase I project) and flows southeast for 0.3 miles, the other main begins at the Becker property at 5385 and flows 0.1 miles northwesterly. The gravity mains meet at a manhole at the Olsen property at 5525, where the wastewater outlets into a pipe bored under the highway and connects by gravity to a manhole on the beach within the gravity sewer system of Area E. Exact details will be dictated by data from a topographic survey; a contract is not yet in place to acquire the survey data.

Based on the conceptual design, the Estimated Construction Cost amounts to $599,000 and the Estimated Total Project Cost is $839,000.

In order for the wastewater from Area A to reach Area E an access is required for a gravity sewer line from the highway to the beach. An easement is being sought from Roxanne Stewart at 5520 North Douglas Highway to construct and maintain a gravity line trenched in the driveway, and possibly to also permit construction access of the

sewer system along the beach. This easement is believed to be the only one required for Area A based on the current concept and field investigations to date.

The CBJ's Local Improvement District (LID) process has not yet been developed for this area. It is envisioned that it will be a single LID encompassing sewer areas A, B, and C.

3.2.2 Area B (See sheets 3 and 4 of 4, Appendix B)

In this area, gravity mains along the uphill side of North Douglas Highway serve properties uphill of the highway: one main begins at the Becker property at 5357 and flows southeast for 0.4 miles, the other main begins at the Hatch property at 4755 and flows 0.3 miles northwesterly. The gravity mains meet at a manhole at the Glacier State Contractors property just southeast of Eagle Creek, where the wastewater outlets into a pipe bored under the highway and connects by gravity to a manhole on the beach within the gravity sewer system of Area E. Exact details will be dictated by data from a topographic survey; a contract is not yet in place to acquire the survey data.

Based on the conceptual design, the Estimated Construction Cost amounts to $906,000 and the Estimated Total Project Cost is $1,269,000.

In order for the wastewater from Area B to reach Area E an access is required for a gravity sewer line from the highway to the beach. An easement is being sought from Peter and Tracy Lynn Dukowitz at 4910 North Douglas Highway to construct and maintain a gravity line trenched in the driveway, and possibly to also permit construction access of the sewer system along the beach. This easement is believed to be the only one required for Area B based on the current concept and field investigations to date.

The CBJ's LID process has not yet been developed for this area. It is envisioned that it will be a single LID encompassing sewer areas A, B, and C.

3.2.3 Area C (See sheets 2 and 3 of 4, Appendix B)

In this area, gravity mains along the uphill side of North Douglas Highway serve properties uphill of the highway: one main begins near the Warfield property at 4535 and flows southeast for 0.2 miles, the other main begins at the Kasnick property at 4355 and flows 0.1 miles northwesterly. The gravity mains meet at a manhole at the Sisk/Schilly property at 4435, where the wastewater outlets into a pipe bored under the highway and connects by gravity to a manhole on the beach within the gravity sewer system of Area F. Exact details will be dictated by data from a topographic survey; a contract is not yet in place to acquire the survey data.

Based on the conceptual design, the Estimated Construction Cost amounts to $555,000 and the Estimated Total Project Cost is $778,000.

In order for the wastewater from Area C to reach Area F an access is required for a gravity sewer line from the highway to the beach. An easement is being sought from Andrew and Judy Campbell at 4420 North Douglas Highway to construct and maintain a gravity line trenched in the driveway. This easement is believed to be the only one required for Area C based on the current concept and field investigations to date.

The CBJ's LID process has not yet been developed for this area. It is envisioned that it will be a single LID encompassing sewer areas A, B, and C.

3.2.4 Area D (See sheets 1 and 2 of 4, Appendix B)

This area serves properties uphill and some properties downhill of North Douglas Highway with sewer mains along the highway, between Area C and the Douglas Roundabout. R&M is under contract with the CBJ to design this system and has completed a topographic survey. Area D is divided into two sections:

Northwest Section: Gravity mains along the uphill side of the highway serve properties uphill of the highway: one main begins at the Manolakakis property at 4305 and flows southeast for 0.3 miles, the other main begins at the Paddock property at 3925 and flows 0.05 miles northwesterly. The gravity mains meet at a manhole at the Square Knot Development property at 3915, where the wastewater outlets into a pipe bored under the highway and connects by gravity to a manhole on the beach within the gravity sewer system of Area F.

Southeast Section: Gravity mains on the uphill side of the highway between the Square Knot Development property at 3915 and the Kookesh property at 3795, and on the downhill side of the highway between the Loken property at 3860 and the Wright property at 3780 serve properties on both sides. In order to avoid deep excavation on the uphill side of the highway, preliminary discussions with DOT representatives indicate that it will permit the gravity main downhill of the highway through a 670-foot section of main line. At the extents noted above, the sewer crosses the highway twice with pipes bored under the highway, and wastewater is carried southeasterly to a gravity line along the uphill side of the highway. This single main serves additional properties uphill of the highway and flows southeasterly to the existing Kowee Creek Bridge. The gravity main crosses the creek through the abutments of the road bridge and then is open cut trenched across North Douglas Highway to connect to the existing West Juneau Lift Station. Discussions with DOT representatives indicate that it will permit full pavement removal and roadway trenching in this section.

Based on the current design, the Estimated Construction Cost amounts to $1,456,000 and the Estimated Total Project Cost is $2,038,000.

Should the DOT not permit the gravity main crossing of the bridge, alternatives include:

1. Gravity across Kowee Creek supported by a pipe bridge structure independent of the road bridge and to the southwest, upstream of the existing road bridge.
2. Bore a pipe under the highway, connect by gravity to a beach manhole within the gravity sewer system of Area F, and cross Kowee Creek with a force main in the Area F project.

In order for the wastewater from the Northwest Section of Area D to reach Area F an access is required for a gravity sewer line from the highway to the beach. Easements are being sought from Gene Cheeseman at 3920 North Douglas Highway and from Searls Properties Inc. at 3930 North Douglas Highway to construct and maintain a gravity line to the beach.

The CBJ's LID process has been approved for this area as a single LID encompassing areas D, E, and F.

3.2.5 Area E (See sheets 2, 3, and 4 of 4, Appendix B)

In this area, gravity mains along the beach carry wastewater from Areas A and B and serve properties downhill of North Douglas Highway: one main begins at the Dye/Fluetsch property at 5730 (from the end of the North Douglas Sewer Phase I project) and flows southeast for 0.7 miles, the other main begins at the Miller/Linfield property at 4470 and flows 0.6 miles northwesterly. The gravity mains meet at a new lift station called Eagle Creek Lift Station, located on the beach adjacent to the trailer courts just west of Eagle Creek. Another gravity main transports wastewater from the trailer courts directly to the lift station. R&M is under contract with the CBJ to design this system and has completed a topographic survey, geotechnical exploration, and construction plans to the 65% design level.

Wastewater is pumped southeasterly by the Eagle Creek Lift Station through a 6-inch force main. It drains into a manhole of the Area F gravity sewer system. A preliminary design memorandum for this lift station, by Tetra Tech/KCM, Inc., is attached as Appendix D.

Based on the current design, the Estimated Construction Cost amounts to $2,222,000 and the Estimated Total Project Cost is $3,110,000, which includes lift station costs.

The wastewater collected throughout Area E will flow by gravity to Eagle Creek Lift Station, which will then pump the wastewater into Area F. Easements are being sought through the trailer courts adjacent to the lift station from D&G Properties Inc. at 5050 North Douglas Highway and from Myron Klein at 5010 North Douglas Highway to construct and maintain the lift station and provide construction and maintenance access of the sewer system along the beach.

The CBJ's LID process has been approved for this area as a single LID encompassing areas D, E, and F.

3.2.6 Area F (See sheets 1 and 2 of 2, Appendix B)

In this area, gravity mains along the beach carry wastewater from Areas C, D (Northwest Section), and E, and serve properties downhill of North Douglas Highway: one main begins at the Campbell property at 4420 and flows southeast for 0.6 miles, the other main begins at the Trucano property at 3654 and flows 0.2 miles northwesterly. The gravity mains meet at a new lift station called Tower Lift Station, located on the beach at the Loken property at 3860 near the Alaska-Juneau Communications, Inc. radio tower. R&M is anticipating a contract from the CBJ and has subcontracted the survey and design of this area to Toner-Nordling and Associates.

Wastewater is pumped uphill to the highway by the Tower Lift Station through an 8-inch force main trenched in the driveway of a nearby, privately-owned property. The force main drains into a manhole of the Area D gravity sewer system and is transported to the existing West Juneau Lift Station. A preliminary design memorandum for this lift station, by Tetra Tech/KCM, Inc., is attached as Appendix D, and the actual design in memorandum form is attached as Appendix E.

Based on the current design, the Estimated Construction Cost amounts to $1,434,000 and the Estimated Total Project Cost is $2,008,000, which includes lift station costs.

Should the DOT not permit the gravity main of Area D to cross the Kowee Creek Bridge, alternative routes for the force main to reach the West Juneau Lift Station include:

1. Southeasterly along the beach through privately-owned property and up a private driveway to the highway, then through the existing utility penetrations in the abutments of the Kowee Creek Bridge and into a gravity system.
2. Southeasterly along the beach through privately-owned property, then under Kowee Creek on the Gastineau Channel side of the highway and continue with the force main on the north side of an Alaska Electric Light & Power substation.

The wastewater collected throughout Area F will flow by gravity to Tower Lift Station, which will then pump the wastewater into Area D. An easement is being sought from Kenneth Loken at 3860 North Douglas Highway to construct and maintain the lift station, partially locate the lift station on the property, construct and maintain a force main trenched in the driveway, and provide construction and maintenance access of the sewer system along the beach. An easement is also being sought from Douglas Trucano of the Trucano Family Partnership at 3560 North Douglas Highway to provide construction access of the sewer system along the beach. This easement will also include provisions to construct and maintain a force main on the property in the event that alternatives 1 or 2 noted above are required.

Additionally, an easement is being sought from Alston and Donna Fagerstrom at 4360 North Douglas Highway to construct and maintain a portion of the gravity mainline that crosses accreted property along the beach.

The CBJ's LID process has been approved for this area as a single LID encompassing areas D, E, and F.

3.3 Phasing and Scheduling

The six sub-area concept offers substantial cost savings by linking the systems, rather than constructing each area to be independent. For example, since the wastewater from Area E will be pumped through a force main into the Area F system, the phasing of the project requires Area F to be online before Area E can be online. The following presents the phasing order required and the scheduling expected based on CBJ forecasts:

1. Areas D and F construction begins in spring 2008 and are online in fall 2008
   - Areas D and F must be turned online together as the north section of Area D will outlet into the Area F gravity system, and it is anticipated that Area F will pump wastewater to the highway and outlet into the Area D gravity system
2. Area E construction begins in spring 2009 and is online in fall 2009
   - Area E force main outlets into the Area F gravity system
3. Areas A, B, and C construction could begin as early as spring 2010, depending on funding availability, and would come online the same year construction begins
   - Areas A and B outlet into the Area E gravity system
   - Area C outlets into the Area F gravity system

3.4 Existing Lift Stations

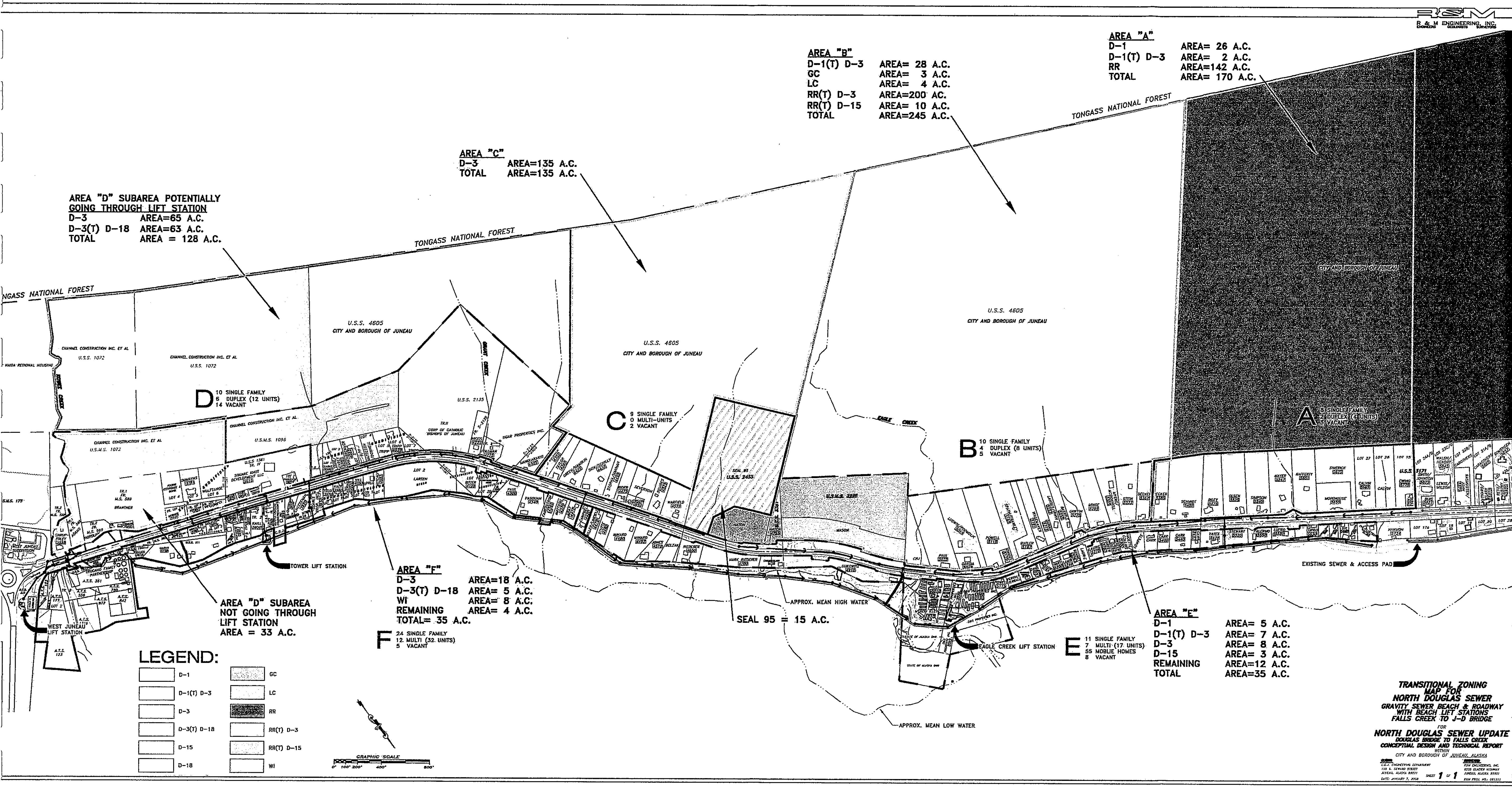
In early 2007, Tetra Tech/KCM, Inc. evaluated the existing West Juneau, Falls Creek, Channel Drive, and Channel Vista lift stations for the ability to receive wastewater from this project. Additionally, Morris Engineering Group LLC inspected the electrical systems of the Channel Drive and Channel Vista lift stations to assess the work required to increase the pump sizes. These evaluations are attached as Appendix F.

In summary, the reports state that the Falls Creek, Channel Drive, and Channel Vista lift stations would require upgrades within a few years if wastewater is directed towards the Falls Creek Lift Station, located on the beach approximately 2.6 miles towards North Douglas from the Douglas Roundabout. Upgrades to these lift stations vary in cost depending on the mechanical (pumps, impellers, etc.) and electrical (control panels, generators, etc.) improvements. The following cost ranges are reported:

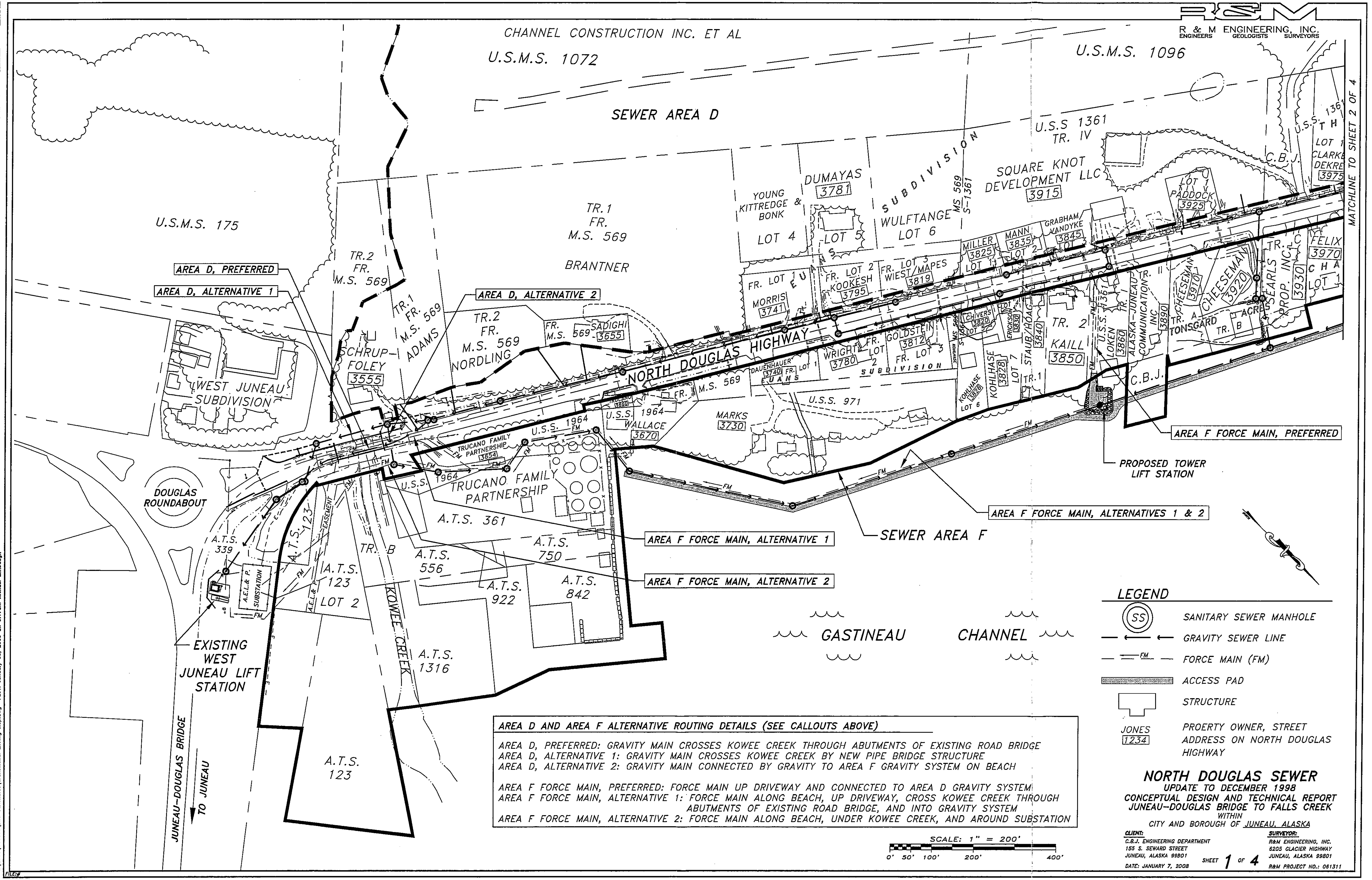
- Falls Creek Lift Station: $3,400 to $26,000
- Channel Drive Lift Station: $31,000
- Channel Vista Lift Station: $84,000 to $412,400

Tetra Tech/KCM's evaluation of the West Juneau Lift Station indicates that it would not require upgrades to accommodate the wastewater design year flow of 238,900 gallons per day from the entire study area. As the current design directs all wastewater to this lift station, no modifications to these existing lift stations are anticipated.

APPENDIX - A


R&M
R & M ENGINEERING, INC.
AREA "A"
D-1 AREA= 26 A.C.
D-1(T) D-3 AREA= 2 A.C.
RR AREA=142 A.C.
TOTAL AREA= 170 A.C.
AREA "B"
D-1(T) D-3 AREA= 28 A.C.
GC AREA= 3 A.C.
LC AREA= 4 A.C.
RR(T) D-3 AREA=200 AC.
RR(T) D-15 AREA= 10 A.C.
TOTAL AREA=245 A.C.
AREA "C"
D-3 AREA=135 A.C.
TOTAL AREA=135 A.C.
AREA "D" SUBAREA POTENTIALLY GOING THROUGH LIFT STATION
D-3 AREA=65 A.C.
D-3(T) D-18 AREA=63 A.C.
TOTAL AREA = 128 A.C.
TONGASS NATIONAL FOREST
U.S.S. 4605
CITY AND BOROUGH OF JUNEAU
CHANNEL CONSTRUCTION INC. ET AL
U.S.S. 1072
D 10 SINGLE FAMILY
6 DUPLEX (12 UNITS)
14 VACANT
C 9 SINGLE FAMILY
0 MULTI-UNITS
2 VACANT
B 10 SINGLE FAMILY
4 DUPLEX (8 UNITS)
5 VACANT
A 6 SINGLE FAMILY
2 DUPLEX (4 UNITS)
5 VACANT
EAGLE CREEK
GRANT CREEK
U.S.M.S. 1096
U.S.S. 2135
SEAL 95
U.S.S. 2453
TOWER LIFT STATION
AREA "F"
D-3 AREA=18 A.C.
D-3(T) D-18 AREA= 5 A.C.
WI AREA= 8 A.C.
REMAINING AREA= 4 A.C.
TOTAL= 35 A.C.
AREA "D" SUBAREA NOT GOING THROUGH LIFT STATION
AREA = 33 A.C.
SEAL 95 = 15 A.C.
APPROX. MEAN HIGH WATER
APPROX. MEAN LOW WATER
EXISTING SEWER & ACCESS PAD
EAGLE CREEK LIFT STATION
WEST JUNEAU LIFT STATION
F 24 SINGLE FAMILY
12 MULTI (32 UNITS)
5 VACANT
E 11 SINGLE FAMILY
7 MULTI (17 UNITS)
55 MOBLIE HOMES
8 VACANT
AREA "E"
D-1 AREA= 5 A.C.
D-1(T) D-3 AREA= 7 A.C.
D-3 AREA= 8 A.C.
D-15 AREA= 3 A.C.
REMAINING AREA=12 A.C.
TOTAL AREA=35 A.C.
LEGEND:
D-1
D-1(T) D-3
D-3
D-3(T) D-18
D-15
D-18
GC
LC
RR
RR(T) D-3
RR(T) D-15
WI
GRAPHIC SCALE
TRANSITIONAL ZONING MAP FOR NORTH DOUGLAS SEWER
GRAVITY SEWER BEACH & ROADWAY WITH BEACH LIFT STATIONS FALLS CREEK TO J-D BRIDGE
FOR
NORTH DOUGLAS SEWER UPDATE
DOUGLAS BRIDGE TO FALLS CREEK CONCEPTUAL DESIGN AND TECHNICAL REPORT
WITHIN
CITY AND BOROUGH OF JUNEAU, ALASKA
SHEET 1 OF 1

APPENDIX - B


R&M
R & M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
CHANNEL CONSTRUCTION INC. ET AL
U.S.M.S. 1072
U.S.M.S. 1096
SEWER AREA D
U.S.M.S. 175
MATCHLINE TO SHEET 2 OF 4
SQUARE KNOT DEVELOPMENT LLC
3915
DUMAYAS
3781
WULFTANGE LOT 6
YOUNG KITTREDGE & BONK
LOT 4
LOT 5
TR. 1 FR. M.S. 569
BRANTNER
NORTH DOUGLAS HIGHWAY
WEST JUNEAU SUBDIVISION
SCHRUP-FOLEY
3555
TR. 2 FR. M.S. 569 NORDLING
TR. 1 FR. M.S. 569 ADAMS
AREA D, PREFERRED
AREA D, ALTERNATIVE 1
AREA D, ALTERNATIVE 2
TRUCANO FAMILY PARTNERSHIP
U.S.S. 1964
WALLACE
3670
MARKS
3730
U.S.S. 971
KAILL
3850
AREA F FORCE MAIN, PREFERRED
PROPOSED TOWER LIFT STATION
AREA F FORCE MAIN, ALTERNATIVES 1 & 2
AREA F FORCE MAIN, ALTERNATIVE 1
AREA F FORCE MAIN, ALTERNATIVE 2
SEWER AREA F
DOUGLAS ROUNDABOUT
A.T.S. 339
A.E.L.& P. SUBSTATION
A.T.S. 123
A.T.S. 361
A.T.S. 556
A.T.S. 750
A.T.S. 922
A.T.S. 842
A.T.S. 1316
KOWEE CREEK
EXISTING WEST JUNEAU LIFT STATION
JUNEAU-DOUGLAS BRIDGE
TO JUNEAU
GASTINEAU CHANNEL
SCALE: 1" = 200'
0' 50' 100' 200' 400'

LEGEND

- SANITARY SEWER MANHOLE
- GRAVITY SEWER LINE
- FORCE MAIN (FM)
- ACCESS PAD
- STRUCTURE
- JONES 1234 — PROERTY OWNER, STREET ADDRESS ON NORTH DOUGLAS HIGHWAY

AREA D AND AREA F ALTERNATIVE ROUTING DETAILS (SEE CALLOUTS ABOVE)

AREA D, PREFERRED: GRAVITY MAIN CROSSES KOWEE CREEK THROUGH ABUTMENTS OF EXISTING ROAD BRIDGE
AREA D, ALTERNATIVE 1: GRAVITY MAIN CROSSES KOWEE CREEK BY NEW PIPE BRIDGE STRUCTURE
AREA D, ALTERNATIVE 2: GRAVITY MAIN CONNECTED BY GRAVITY TO AREA F GRAVITY SYSTEM ON BEACH

AREA F FORCE MAIN, PREFERRED: FORCE MAIN UP DRIVEWAY AND CONNECTED TO AREA D GRAVITY SYSTEM
AREA F FORCE MAIN, ALTERNATIVE 1: FORCE MAIN ALONG BEACH, UP DRIVEWAY, CROSS KOWEE CREEK THROUGH ABUTMENTS OF EXISTING ROAD BRIDGE, AND INTO GRAVITY SYSTEM
AREA F FORCE MAIN, ALTERNATIVE 2: FORCE MAIN ALONG BEACH, UNDER KOWEE CREEK, AND AROUND SUBSTATION

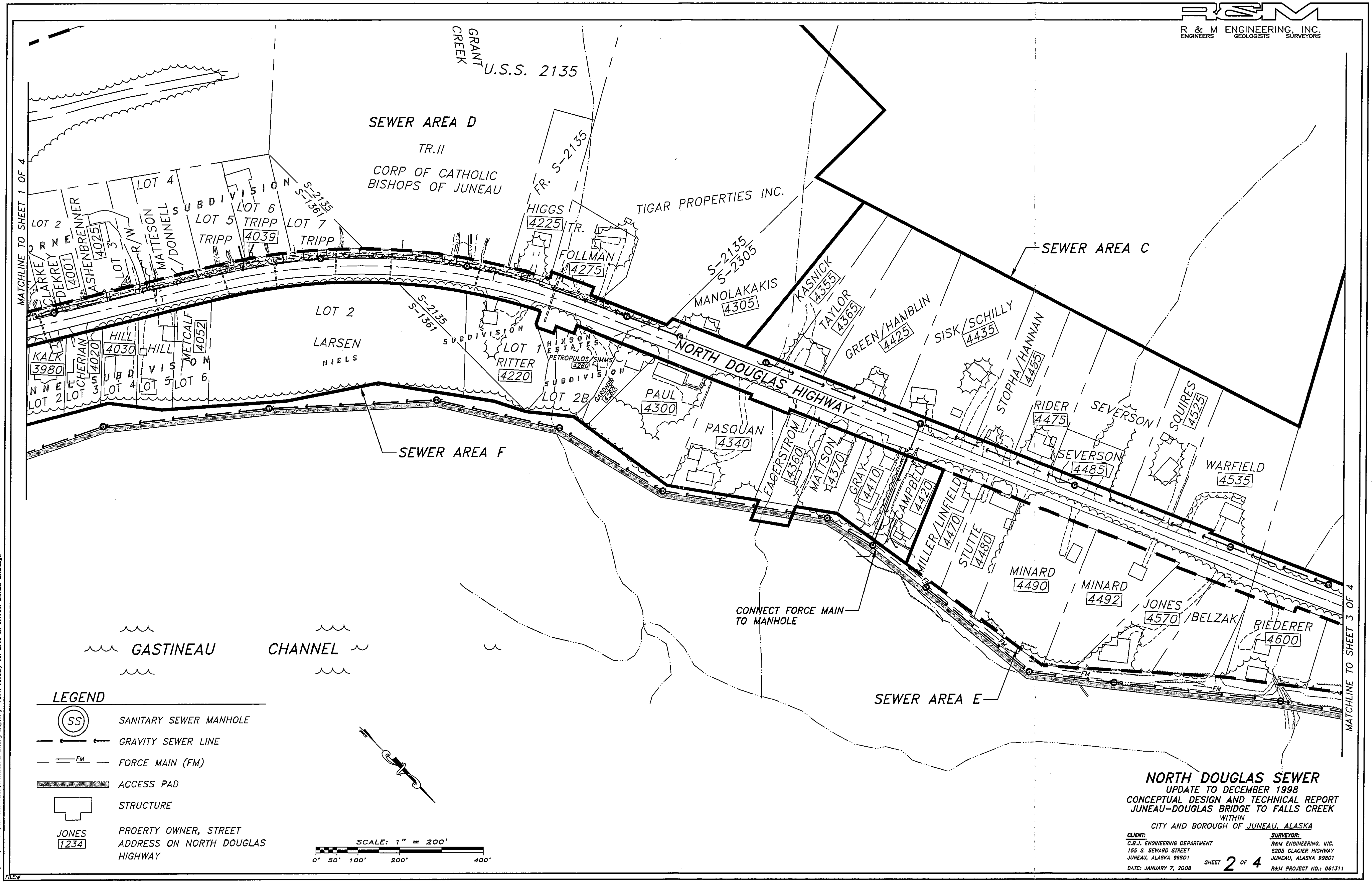
NORTH DOUGLAS SEWER

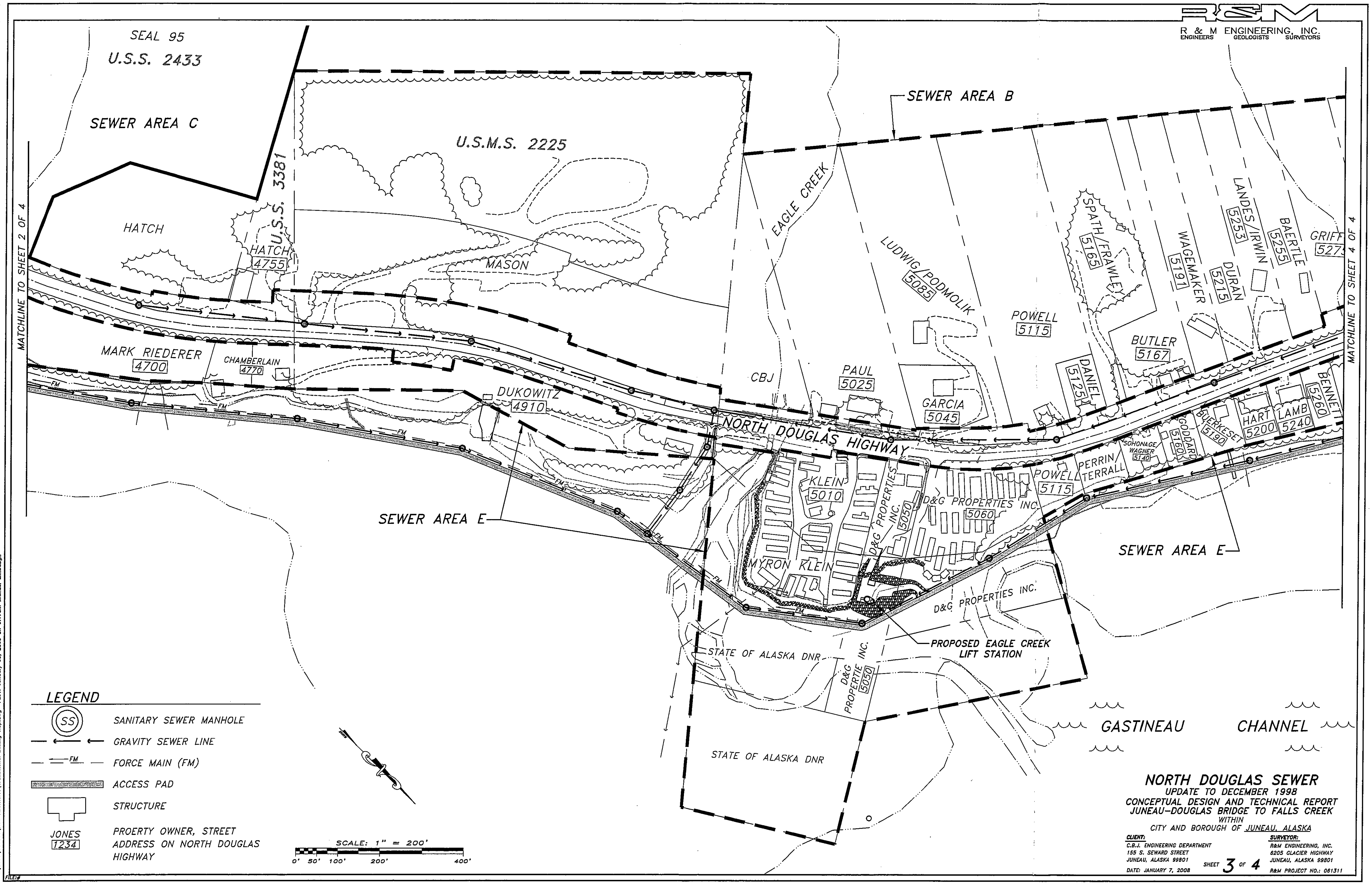
UPDATE TO DECEMBER 1998
CONCEPTUAL DESIGN AND TECHNICAL REPORT
JUNEAU-DOUGLAS BRIDGE TO FALLS CREEK
WITHIN
CITY AND BOROUGH OF JUNEAU, ALASKA

CLIENT:
C.B.J. ENGINEERING DEPARTMENT
155 S. SEWARD STREET
JUNEAU, ALASKA 99801

SURVEYOR:
R&M ENGINEERING, INC.
6205 GLACIER HIGHWAY
JUNEAU, ALASKA 99801

DATE: JANUARY 7, 2008
R&M PROJECT NO.: 061311


R&M
R & M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
GRANT CREEK
U.S.S. 2135
SEWER AREA D
TR. II
CORP OF CATHOLIC BISHOPS OF JUNEAU
FR. S-2135
HIGGS 4225
TR.
FOLLMAN 4275
TIGAR PROPERTIES INC.
S-2135 S-2305
MANOLAKAKIS 4305
KASNICK 4355
TAYLOR 4365
GREEN/HAMBLIN 4425
SISK/SCHILLY 4435
STOPHA/HANNAN 4455
SEWER AREA C
RIDER 4475
SEVERSON
SEVERSON 4485
SQUIRES 4525
WARFIELD 4535
MATCHLINE TO SHEET 1 OF 4
LOT 2
CLARKE/DEKREY 4001
ASHENBRENNER 4025
LOT 3
R/W
MATTESON/DONNELL
LOT 4
SUBDIVISION
LOT 5 TRIPP
LOT 6 TRIPP 4039
LOT 7 TRIPP
S-2135 S-1361
LOT 2
LARSEN NIELS
S-2135 S-1361
SUBDIVISION
LOT 1
RITTER 4220
HIXSON ESTATES
PETROPULOS/SIMMS 4260
SUBDIVISION
GARDNOR 4280
LOT 2B
PAUL 4300
NORTH DOUGLAS HIGHWAY
PASQUAN 4340
KALK 3980
CHERIAN 4020
HILL 4030
HILL
METCALF 4052
LOT 2 LOT 3 LOT 4 LOT 5 LOT 6
SUBDIVISION
SEWER AREA F
FAGERSTROM 4360
MATTISON 4370
GRAY 4410
CAMPBELL 4420
MILLER/LINFIELD 4470
STUTTE 4480
MINARD 4490
MINARD 4492
JONES 4570
BELZAK
RIEDERER 4600
CONNECT FORCE MAIN TO MANHOLE
SEWER AREA E
MATCHLINE TO SHEET 3 OF 4
GASTINEAU CHANNEL
LEGEND
SANITARY SEWER MANHOLE
GRAVITY SEWER LINE
FORCE MAIN (FM)
ACCESS PAD
STRUCTURE
JONES 1234
PROERTY OWNER, STREET ADDRESS ON NORTH DOUGLAS HIGHWAY
SCALE: 1" = 200'
0' 50' 100' 200' 400'
NORTH DOUGLAS SEWER
UPDATE TO DECEMBER 1998
CONCEPTUAL DESIGN AND TECHNICAL REPORT
JUNEAU-DOUGLAS BRIDGE TO FALLS CREEK
WITHIN
CITY AND BOROUGH OF JUNEAU, ALASKA
CLIENT:
C.B.J. ENGINEERING DEPARTMENT
155 S. SEWARD STREET
JUNEAU, ALASKA 99801
DATE: JANUARY 7, 2008
SHEET 2 OF 4
SURVEYOR:
R&M ENGINEERING, INC.
6205 GLACIER HIGHWAY
JUNEAU, ALASKA 99801
R&M PROJECT NO.: 061311


R&M
R & M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
SEAL 95
U.S.S. 2433
SEWER AREA C
U.S.M.S. 2225
U.S.S. 3381
SEWER AREA B
MATCHLINE TO SHEET 2 OF 4
MATCHLINE TO SHEET 4 OF 4
HATCH
HATCH 4755
MASON
MARK RIEDERER 4700
CHAMBERLAIN 4770
DUKOWITZ 4910
EAGLE CREEK
LUDWIG/PODMOLIK 5085
CBJ
PAUL 5025
GARCIA 5045
POWELL 5115
DANIEL 5125
SPATH/FRAWLEY 5165
BUTLER 5167
WAGEMAKER 5197
DURAN 5215
LANDES/IRWIN 5253
BAERTLE 5255
GRIFF 527
NORTH DOUGLAS HIGHWAY
KLEIN 5010
MYRON KLEIN
D&G PROPERTIES INC. 5050
D&G PROPERTIES INC. 5060
POWELL 5115
PERRIN TERRALL
SCHONAGE WAGNER 5140
GODDARD 5160
BJERKESET 5190
HART 5200
LAMB 5240
BENNETT 5260
SEWER AREA E
SEWER AREA E
D&G PROPERTIES INC.
PROPOSED EAGLE CREEK LIFT STATION
STATE OF ALASKA DNR
D&G PROPERTIE INC. 5050
STATE OF ALASKA DNR
GASTINEAU CHANNEL
FM
LEGEND
SS SANITARY SEWER MANHOLE
GRAVITY SEWER LINE
FORCE MAIN (FM)
ACCESS PAD
STRUCTURE
JONES 1234 PROERTY OWNER, STREET ADDRESS ON NORTH DOUGLAS HIGHWAY
SCALE: 1" = 200'
0' 50' 100' 200' 400'
NORTH DOUGLAS SEWER
UPDATE TO DECEMBER 1998
CONCEPTUAL DESIGN AND TECHNICAL REPORT
JUNEAU-DOUGLAS BRIDGE TO FALLS CREEK
WITHIN
CITY AND BOROUGH OF JUNEAU, ALASKA
CLIENT:
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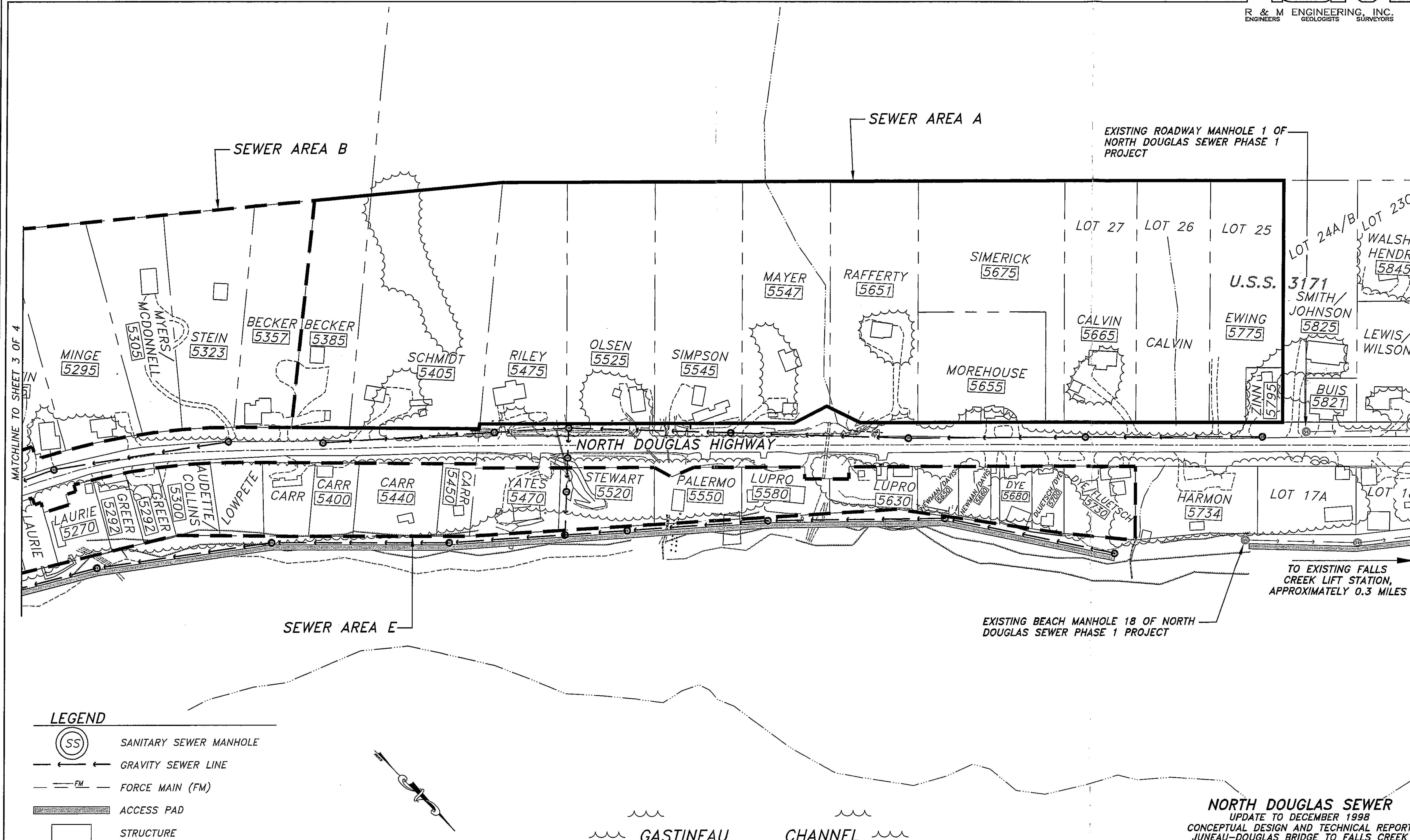
155 S. SEWARD STREET
JUNEAU, ALASKA 99801
DATE: JANUARY 7, 2008
SHEET 3 OF 4
SURVEYOR:
R&M ENGINEERING, INC.
6205 GLACIER HIGHWAY
JUNEAU, ALASKA 99801
R&M PROJECT NO.: 061311

R & M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS


SEWER AREA A
SEWER AREA B
SEWER AREA E
EXISTING ROADWAY MANHOLE 1 OF NORTH DOUGLAS SEWER PHASE 1 PROJECT
EXISTING BEACH MANHOLE 18 OF NORTH DOUGLAS SEWER PHASE 1 PROJECT
TO EXISTING FALLS CREEK LIFT STATION, APPROXIMATELY 0.3 MILES
MATCHLINE TO SHEET 3 OF 4
NORTH DOUGLAS HIGHWAY
U.S.S. 3171
LOT 27
LOT 26
LOT 25
LOT 24A/B
LOT 23C/
LOT 17A
LOT 18
MINGE 5295
MYERS/ MCDONNELL 5305
STEIN 5323
BECKER 5357
BECKER 5385
SCHMIDT 5405
RILEY 5475
OLSEN 5525
SIMPSON 5545
MAYER 5547
RAFFERTY 5651
SIMERICK 5675
MOREHOUSE 5655
CALVIN 5665
CALVIN
EWING 5775
ZINN 5795
SMITH/ JOHNSON 5825
WALSH/ HENDRY 5845
LEWIS/ WILSON
BUIS 5821
LAURIE
LAURIE 5270
GREER 5292
GREER 5292
AUDETTE/ COLLINS 5300
LOWPETE
CARR
CARR 5400
CARR 5440
CARR 5450
YATES 5470
STEWART 5520
PALERMO 5550
LUPRO 5580
LUPRO 5630
NEWMAN/DAVIS 5650
NEWMAN/DAVIS 5660
DYE 5680
DLUETSCH/DYE 5700
DYE/FLUETSCH 5730
HARMON 5734
GASTINEAU CHANNEL
SCALE: 1" = 200'
0' 50' 100' 200' 400'

LEGEND

Symbol	Meaning
(SS)	SANITARY SEWER MANHOLE
— ← — ←	GRAVITY SEWER LINE
— — FM —	FORCE MAIN (FM)
▭ (shaded)	ACCESS PAD
▭	STRUCTURE
JONES 1234	PROERTY OWNER, STREET ADDRESS ON NORTH DOUGLAS HIGHWAY

NORTH DOUGLAS SEWER

UPDATE TO DECEMBER 1998
CONCEPTUAL DESIGN AND TECHNICAL REPORT
JUNEAU-DOUGLAS BRIDGE TO FALLS CREEK
WITHIN
CITY AND BOROUGH OF JUNEAU, ALASKA

CLIENT:
C.B.J. ENGINEERING DEPARTMENT
155 S. SEWARD STREET
JUNEAU, ALASKA 99801
DATE: JANUARY 7, 2008

SHEET 4 OF 4

SURVEYOR:
R&M ENGINEERING, INC.
6205 GLACIER HIGHWAY
JUNEAU, ALASKA 99801
R&M PROJECT NO.: 061311

APPENDIX - C

NORTH DOUGLAS SEWER
Update to December 1998 Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

AREA A - Gravity Sewer along North Douglas Highway Mileposts 1.9 to 2.3, with connection to Area E Gravity Sewer along Beach

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization	LUMP SUM	1	43,166.00	$ 43,166.00
2	Construction Surveying	LUMP SUM	1	21,583.00	$ 21,583.00
3	Construction (Temporary) Traffic Control	LUMP SUM	1	12,949.80	$ 12,949.80
4	Clearing and Grubbing	LUMP SUM	1	10,791.50	$ 10,791.50
5	Individual Mining Plan	LUMP SUM	1	700.00	$ 700.00
6	Sanitary Sewer Pipe - 8-Inch HDPE	LIN. FOOT	2365	65.00	$ 153,725.00
7	Pipe Insulation	BD	25	25.00	$ 625.00
8	Mainline Trench Excavation	CY	1320	15.00	$ 19,800.00
9	Mainline Trench Excavation - Additional	CY	132	20.00	$ 2,640.00
10	Dewatering for Trench	LUMP SUM	1	1,122.00	$ 1,122.00
11	Imported Backfill	CY	140	25.00	$ 3,500.00
12	Pipe Bedding	CY	140	35.00	$ 4,900.00
13	Sheeting, Shoring, and Bracing	LUMP SUM	1	4,488.00	$ 4,488.00
14	Sanitary Sewer Manhole, Type 1, Highway	EACH	9	4,500.00	$ 40,500.00
15	Sanitary Sewer Manhole Delineator	EACH	9	90.00	$ 810.00
16	Road Boring for 20" Casing under North Douglas Highway	LIN. FOOT	60	400.00	$ 24,000.00
17	Service Lateral, Highway - 4-Inch PVC Pipe	EACH	13	2,800.00	$ 36,400.00
18	Relocate Existing Water Service	EACH	13	900.00	$ 11,700.00
19	Remove/Replace 18-Inch Culvert Pipe	LIN. FOOT	220	50.00	$ 11,000.00
20	Remove Existing Asphalt Surfacing	SY	1750	10.00	$ 17,500.00
21	AC Pavement, Type II, Class A	TON	400	90.00	$ 36,000.00
22	AC Pavement Patch, Type IA, Class B	SY	110	60.00	$ 6,600.00
23	Asphalt Treated Base	TON	390	85.00	$ 33,150.00
24	Base Course, Grading D-1	TON	550	26.00	$ 14,300.00
25	Fog Seal Coat	TON	0.5	1,000.00	$ 500.00
26	Blotting Sand	TON	35	120.00	$ 4,200.00
27	Seeding, Hydraulic Method, Type II	SU	1	1,200.00	$ 1,200.00
28	Connect to Existing Manhole	LUMP SUM	1	3,000.00	$ 3,000.00

ESTIMATED CONSTRUCTION SUB-TOTAL:	$ 520,850.30
15% CONTINGENCY:	$ 78,127.55
ESTIMATED CONSTRUCTION COST:	$ 598,977.85
40% (Design, CBJ Admin., Inspection, etc.):	$ 239,591.14
ESTIMATED TOTAL PROJECT COST:	$ 838,568.98

Revised 12/13/07

City and Borough of Juneau, Alaska

R&M ENGINEERING, INC.

NORTH DOUGLAS SEWER
Update to December 1998 Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

AREA B - Gravity Sewer along North Douglas Highway Mileposts 1.2 to 1.9, with connection to Area E Gravity Sewer along Beach

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization	LUMP SUM	1	65,340.50	$ 65,340.50
2	Construction Surveying	LUMP SUM	1	32,670.25	$ 32,670.25
3	Construction (Temporary) Traffic Control	LUMP SUM	1	19,602.15	$ 19,602.15
4	Clearing and Grubbing	LUMP SUM	1	16,335.13	$ 16,335.13
5	Individual Mining Plan	LUMP SUM	1	700.00	$ 700.00
6	Sanitary Sewer Pipe - 8-Inch HDPE	LIN. FOOT	3775	65.00	$ 245,375.00
7	Pipe Insulation	BD	25	25.00	$ 625.00
8	Mainline Trench Excavation	CY	2100	15.00	$ 31,500.00
9	Mainline Trench Excavation - Additional	CY	210	20.00	$ 4,200.00
10	Dewatering for Trench	LUMP SUM	1	1,785.00	$ 1,785.00
11	Imported Backfill	CY	210	25.00	$ 5,250.00
12	Pipe Bedding	CY	210	35.00	$ 7,350.00
13	Sheeting, Shoring, and Bracing	LUMP SUM	1	7,140.00	$ 7,140.00
14	Sanitary Sewer Manhole, Type 1, Highway	EACH	12	4,500.00	$ 54,000.00
15	Sanitary Sewer Manhole Delineator	EACH	12	90.00	$ 1,080.00
16	Road Boring for 20" Casing under North Douglas Highway	LIN. FOOT	60	400.00	$ 24,000.00
17	Service Lateral, Highway - 4-Inch PVC Pipe	EACH	20	2,800.00	$ 56,000.00
18	Relocate Existing Water Service	EACH	20	900.00	$ 18,000.00
19	Remove/Replace 18-Inch Culvert Pipe	LIN. FOOT	300	50.00	$ 15,000.00
20	Remove Existing Asphalt Surfacing	SY	2790	10.00	$ 27,900.00
21	AC Pavement, Type II, Class A	TON	630	90.00	$ 56,700.00
22	AC Pavement Patch, Type IA, Class B	SY	170	60.00	$ 10,200.00
23	Asphalt Treated Base	TON	620	85.00	$ 52,700.00
24	Base Course, Grading D-1	TON	880	26.00	$ 22,880.00
25	Fog Seal Coat	TON	0.8	1,000.00	$ 800.00
26	Blotting Sand	TON	56	120.00	$ 6,720.00
27	Seeding, Hydraulic Method, Type II	SU	1	1,200.00	$ 1,200.00
28	Connect to Existing Manhole	LUMP SUM	1	3,000.00	$ 3,000.00

ESTIMATED CONSTRUCTION SUB-TOTAL:	$ 788,053.03
15% CONTINGENCY:	$ 118,207.95
ESTIMATED CONSTRUCTION COST:	$ 906,260.98
40% (Design, CBJ Admin., Inspection, etc.):	$ 362,504.39
ESTIMATED TOTAL PROJECT COST:	$ 1,268,765.37

Revised 12/13/07

City and Borough of Juneau, Alaska

R&M ENGINEERING, INC.

NORTH DOUGLAS SEWER
Update to December 1998 Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

AREA C - Gravity Sewer along North Douglas Highway Mileposts 0.8 to 1.2, with connection to Area F Gravity Sewer along Beach

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization	LUMP SUM	1	40,023.00	$ 40,023.00
2	Construction Surveying	LUMP SUM	1	20,011.50	$ 20,011.50
3	Construction (Temporary) Traffic Control	LUMP SUM	1	12,006.90	$ 12,006.90
4	Clearing and Grubbing	LUMP SUM	1	10,005.75	$ 10,005.75
5	Individual Mining Plan	LUMP SUM	1	700.00	$ 700.00
6	Sanitary Sewer Pipe - 8-Inch HDPE	LIN. FOOT	2165	65.00	$ 140,725.00
7	Pipe Insulation	BD	25	25.00	$ 625.00
8	Mainline Trench Excavation	CY	1200	15.00	$ 18,000.00
9	Mainline Trench Excavation - Additional	CY	120	20.00	$ 2,400.00
10	Dewatering for Trench	LUMP SUM	1	1,020.00	$ 1,020.00
11	Imported Backfill	CY	130	25.00	$ 3,250.00
12	Pipe Bedding	CY	130	35.00	$ 4,550.00
13	Sheeting, Shoring, and Bracing	LUMP SUM	1	4,080.00	$ 4,080.00
14	Sanitary Sewer Manhole, Type 1, Highway	EACH	6	4,500.00	$ 27,000.00
15	Sanitary Sewer Manhole Delineator	EACH	6	90.00	$ 540.00
16	Road Boring for 20" Casing under North Douglas Highway	LIN. FOOT	60	400.00	$ 24,000.00
17	Service Lateral, Highway - 4-Inch PVC Pipe	EACH	15	2,800.00	$ 42,000.00
18	Relocate Existing Water Service	EACH	15	900.00	$ 13,500.00
19	Remove/Replace 18-Inch Culvert Pipe	LIN. FOOT	240	50.00	$ 12,000.00
20	Remove Existing Asphalt Surfacing	SY	1600	10.00	$ 16,000.00
21	AC Pavement, Type II, Class A	TON	360	90.00	$ 32,400.00
22	AC Pavement Patch, Type IA, Class B	SY	100	60.00	$ 6,000.00
23	Asphalt Treated Base	TON	360	85.00	$ 30,600.00
24	Base Course, Grading D-1	TON	500	26.00	$ 13,000.00
25	Fog Seal Coat	TON	0.5	1,000.00	$ 500.00
26	Blotting Sand	TON	32	120.00	$ 3,840.00
27	Seeding, Hydraulic Method, Type II	SU	1	1,200.00	$ 1,200.00
28	Connect to Existing Manhole	LUMP SUM	1	3,000.00	$ 3,000.00

ESTIMATED CONSTRUCTION SUB-TOTAL:	$ 482,977.15
15% CONTINGENCY:	$ 72,446.57
ESTIMATED CONSTRUCTION COST:	$ 555,423.72
40% (Design, CBJ Admin., Inspection, etc.):	$ 222,169.49
ESTIMATED TOTAL PROJECT COST:	$ 777,593.21

Revised 12/13/07

City and Borough of Juneau, Alaska

R&M ENGINEERING, INC.

NORTH DOUGLAS SEWER
Update to December 1998 Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

AREA D - Gravity Sewer along North Douglas Highway Mileposts 0.0 to 0.8, cross Kowee Creek through bridge abutments, connect to West Juneau Lift Station

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization	LUMP SUM	1	104,997.35	$ 104,997.35
2	Construction Surveying	LUMP SUM	1	52,498.68	$ 52,498.68
3	Construction (Temporary) Traffic Control	LUMP SUM	1	31,499.21	$ 31,499.21
4	Clearing and Grubbing	LUMP SUM	1	26,249.34	$ 26,249.34
5	Individual Mining Plan	LUMP SUM	1	700.00	$ 700.00
6	Sanitary Sewer Pipe - 8-Inch High Pressure PVC	LIN. FOOT	2362	75.00	$ 177,150.00
7	Sanitary Sewer Pipe - 10-Inch High Pressure PVC	LIN. FOOT	2375	80.00	$ 190,000.00
8	Pipe Insulation	BD	25	25.00	$ 625.00
9	Mainline Trench Excavation	CY	2618	15.00	$ 39,270.00
10	Mainline Trench Excavation - Additional	CY	262	20.00	$ 5,240.00
11	Mainline Trench Rock Blasting	CY	60	30.00	$ 1,800.00
12	Dewatering for Trench	LUMP SUM	1	2,315.50	$ 2,315.50
13	Imported Backfill	CY	262	25.00	$ 6,550.00
14	Pipe Bedding	CY	262	35.00	$ 9,170.00
15	Sheeting, Shoring, and Bracing	LUMP SUM	1	8,902.00	$ 8,902.00
16	Sanitary Sewer Manhole, Type 1, Highway	EACH	24	4,500.00	$ 108,000.00
17	Sanitary Sewer Manhole Delineator	EACH	24	90.00	$ 2,160.00
18	Road Boring for 20" Casing under North Douglas Highway	LIN. FOOT	180	400.00	$ 72,000.00
19	Cross Kowee Creek, Gravity through Existing Bridge Abutments	LUMP SUM	1	99,996.00	$ 99,996.00
20	Service Lateral, Highway - 4-Inch PVC Pipe	EACH	24	2,800.00	$ 67,200.00
21	Relocate Existing Water Service	EACH	22	900.00	$ 19,800.00
22	Remove/Replace 18-Inch Culvert Pipe	LIN. FOOT	100	50.00	$ 5,000.00
23	Remove Existing Asphalt Surfacing	SY	3479	10.00	$ 34,790.00
24	AC Pavement, Type II, Class A	TON	784	90.00	$ 70,560.00
25	AC Pavement Patch, Type IA, Class B	SY	210	60.00	$ 12,600.00
26	Asphalt Treated Base	TON	765	85.00	$ 65,025.00
27	Base Course, Grading D-1	TON	1090	26.00	$ 28,340.00
28	Fog Seal Coat	TON	1	1,000.00	$ 1,000.00
29	Blotting Sand	TON	69	120.00	$ 8,280.00
30	Remove and Replace Road Signs	EACH	3	200.00	$ 600.00
31	Seeding, Hydraulic Method, Type II	SU	3	1,200.00	$ 3,600.00
32	Connect to Existing Lift Station	LUMP SUM	1	10,000.00	$ 10,000.00

ESTIMATED CONSTRUCTION SUB-TOTAL:	$ 1,265,918.07
15% CONTINGENCY:	$ 189,887.71
ESTIMATED CONSTRUCTION COST:	$ 1,455,805.78
40% (Design, CBJ Admin., Inspection, etc.):	$ 582,322.31
ESTIMATED TOTAL PROJECT COST:	$ 2,038,128.09

Revised 12/13/07

City and Borough of Juneau, Alaska

R&M ENGINEERING, INC.

NORTH DOUGLAS SEWER
Update to December 1998 Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

AREA E - Gravity Sewer along Beach Mileposts 1.0 to 2.3 to Eagle Creek Lift Station,
Force Main on beach with connection to Area F Gravity Sewer along Beach

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization	LUMP SUM	1	162,291.80	$ 162,291.80
2	Construction Surveying	LUMP SUM	1	81,145.90	$ 81,145.90
3	Construction (Temporary) Traffic Control	LUMP SUM	1	24,343.77	$ 24,343.77
4	Clearing and Grubbing	LUMP SUM	1	40,572.95	$ 40,572.95
5	Individual Mining Plan	LUMP SUM	1	700.00	$ 700.00
6	Sanitary Sewer Pipe - 6-Inch HDPE Force Main	LIN. FOOT	3355	60.00	$ 201,300.00
7	Sanitary Sewer Pipe - 8-Inch High Pressure PVC	LIN. FOOT	6920	75.00	$ 519,000.00
8	Pipe Insulation	BD	25	25.00	$ 625.00
9	Mainline Trench Excavation	CY	3840	15.00	$ 57,600.00
10	Mainline Trench Excavation - Additional	CY	384	20.00	$ 7,680.00
11	Mainline Trench Rock Blasting	CY	1074	30.00	$ 32,220.00
12	Dewatering for Trench	LUMP SUM	1	4,875.00	$ 4,875.00
13	Imported Backfill	CY	390	25.00	$ 9,750.00
14	Pipe Bedding	CY	390	35.00	$ 13,650.00
15	Sheeting, Shoring, and Bracing	LUMP SUM	1	6,528.00	$ 6,528.00
16	Sanitary Sewer Manhole, Type I, Beach	EACH	22	5,050.00	$ 111,100.00
17	Sanitary Sewer Manhole Delineator	EACH	22	90.00	$ 1,980.00
18	Service Lateral, Beach - 4-Inch PVC Pipe	EACH	42	2,100.00	$ 88,200.00
19	Relocate Existing Water Service	EACH	11	900.00	$ 9,900.00
20	Seeding, Hydraulic Method, Type II	SU	3	1,200.00	$ 3,600.00
21	Access Pad Excavation	CY	3240	15.00	$ 48,600.00
22	Access Pad Shot Rock	CY	2777	30.00	$ 83,310.00
23	Lift Station Site Development	LUMP SUM	1	45,000.00	$ 45,000.00
24	Lift Station Sewer Structures	LUMP SUM	1	150,000.00	$ 150,000.00
25	Lift Station Electrical without Onsite Generator - Includes Pump Control Panel	LUMP SUM	1	225,000.00	$ 225,000.00
26	Connect to Existing Manhole	LUMP SUM	1	3,000.00	$ 3,000.00

ESTIMATED CONSTRUCTION SUB-TOTAL:	$ 1,931,972.42
15% CONTINGENCY:	$ 289,795.86
ESTIMATED CONSTRUCTION COST:	$ 2,221,768.28
40% (Design, CBJ Admin., Inspection, etc.):	$ 888,707.31
ESTIMATED TOTAL PROJECT COST:	$ 3,110,475.60

Revised 12/13/07

City and Borough of Juneau, Alaska

R&M ENGINEERING, INC.

NORTH DOUGLAS SEWER
Update to December 1998 Conceptual Design and Technical Report
Juneau-Douglas Bridge to Falls Creek

AREA F - Gravity Sewer along Beach Mileposts 0.0 to 1.0 to Tower Lift Station,
Force Main through private driveway with connection to Area D Gravity Sewer along North Douglas Highway

ITEM NO.	ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization	LUMP SUM	1	104,735.90	$ 104,735.90
2	Construction Surveying	LUMP SUM	1	52,367.95	$ 52,367.95
3	Construction (Temporary) Traffic Control	LUMP SUM	1	15,710.39	$ 15,710.39
4	Clearing and Grubbing	LUMP SUM	1	26,183.98	$ 26,183.98
5	Individual Mining Plan	LUMP SUM	1	700.00	$ 700.00
6	Sanitary Sewer Pipe - 8-Inch HDPE Force Main	LIN. FOOT	345	75.00	$ 25,875.00
7	Sanitary Sewer Pipe - 10-Inch High Pressure PVC	LIN. FOOT	3895	80.00	$ 311,600.00
8	Pipe Insulation	BD	25	25.00	$ 625.00
9	Mainline Trench Excavation	CY	2160	15.00	$ 32,400.00
10	Mainline Trench Excavation - Additional	CY	216	20.00	$ 4,320.00
11	Mainline Trench Rock Blasting	CY	1074	30.00	$ 32,220.00
12	Dewatering for Trench	LUMP SUM	1	3,447.00	$ 3,447.00
13	Imported Backfill	CY	220	25.00	$ 5,500.00
14	Pipe Bedding	CY	220	35.00	$ 7,700.00
15	Sheeting, Shoring, and Bracing	LUMP SUM	1	3,672.00	$ 3,672.00
16	Sanitary Sewer Manhole, Type I, Beach	EACH	11	5,050.00	$ 55,550.00
17	Sanitary Sewer Manhole Delineator	EACH	11	90.00	$ 990.00
18	Service Lateral, Beach - 4-Inch PVC Pipe	EACH	26	2,100.00	$ 54,600.00
19	Relocate Existing Water Service	EACH	11	900.00	$ 9,900.00
20	Seeding, Hydraulic Method, Type II	SU	3	1,200.00	$ 3,600.00
21	Access Pad Excavation	CY	1608	15.00	$ 24,120.00
22	Access Pad Shot Rock	CY	1608	30.00	$ 48,240.00
23	Lift Station Site Development	LUMP SUM	1	45,000.00	$ 45,000.00
24	Lift Station Sewer Structures	LUMP SUM	1	150,000.00	$ 150,000.00
25	Lift Station Electrical without Onsite Generator - Includes Pump Control Panel	LUMP SUM	1	225,000.00	$ 225,000.00
26	Connect to Existing Manhole	LUMP SUM	1	3,000.00	$ 3,000.00

ESTIMATED CONSTRUCTION SUB-TOTAL:	$ 1,247,057.21
15% CONTINGENCY:	$ 187,058.58
ESTIMATED CONSTRUCTION COST:	$ 1,434,115.79
40% (Design, CBJ Admin., Inspection, etc.):	$ 573,646.32
ESTIMATED TOTAL PROJECT COST:	$ 2,007,762.11

Revised 12/13/07

City and Borough of Juneau, Alaska

R&M ENGINEERING, INC.