W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

65% DESIGN
Invitation to Bid No. 2020C0XX

PROJECT NUMBER
16-29

Municipality of Anchorage
PROJECT MANAGEMENT & ENGINEERING DEPARTMENT
PO Box 196650
Anchorage, Alaska 99519

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

MASTER INDEX

MUNICIPALITY OF ANCHORAGE

PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

I

INVITATION TO BID

MUNICIPALITY OF ANCHORAGE
PURCHASING DEPARTMENT

Invitation to Bid

No. 2020C0_____

Sealed bids will be received in accordance with the time schedule shown below by the Municipality of Anchorage at the Purchasing Department, 632 W. 6th Avenue, Suite 520; Anchorage, Alaska, 99501, for:

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES

ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

Consisting of approximately 74,300 C.Y. of Excavation; 116,300 Tons of Classified Fill and Backfill; 3,970 Tons of Leveling Course; 13,470 L.F. of Curb and Gutter Removal; 33,200 S.Y. of Pavement Removal; 4,675 S.Y. Remove Sidewalk or Concrete Apron; 6,630 Tons A.C. Pavement; 15,375 L.F. Inlaid Traffic Markings (Methyl Methacrylate, Varying Width and Thickness); 16,000 L.F. Curb and Gutter Installation; 845 S.Y. Curb Ramp Installations; 347,250 S.F. Insulation Installation (R-9); 22,250 S.F. Insulation Installation (R-4.5); 47,600 S.Y. Geotextile (Type A); 6,350 S.Y. P.C.C. Sidewalk (Varying Thickness); 2,080 S.Y. Colored Concrete (Varying Thickness); 170 C.Y. P.C.C. Retaining Walls; 225 S.Y. High-Performance Concrete (8-inch Thick); 5,000 L.F. of Storm Drain Pipe; 34 Storm Drain Manholes; 43 Storm Drain Catch Basins; 63 Roadway Luminaires (including spares); 8 Pedestrian Light Columns (including spares); 5 Type 1A Load Centers; 230 L.F. Remove and Reset Fence; 1 Remove and Reset Bollard Gate; 669 S.F. Standard Signs; Landscaping and related work.

ESTIMATED CONSTRUCTION COST: Between $10,000,000 and $15,000,000

Site Visit(s) at _____

_____

Pre-Bid Conference at _____

REQUEST ANY QUESTIONS BE SUBMITTED IN WRITING TO WWPUR@MUNI.ORG. BEFORE THE PRE-BID CONFERENCE. Please reference the Project Title and Invitation to Bid No. 2020C0_____

Bids Opened at _____

Post-Bid Conference at _____

An electronic (.pdf) copy of the Invitation to Bid is available at Municipality of Anchorage, Purchasing Office's website; (http://purchasing.muni.org). Should you choose to obtain a copy of the Invitation to Bid from the website; it is your responsibility to periodically check the website for addenda.

At the above-indicated time, the bids will be opened publicly and read. Bids must be received by the Purchasing Officer prior to the time fixed for opening of the bids to be considered. Time of receipt will be as determined by the time stamp in the Purchasing Office, Suite 520.

Drawings, specifications, and contract documents may be examined and will be available for pickup at 632 W. 6th Avenue, Suite 520; Anchorage, Alaska; Monday through Friday, 8 a.m. until 12 noon and 1 p.m. until 5 p.m. These documents are available for sale on a non-refundable basis at $_____ per set (cash or check only).

Fees stated above include parcel post charges (1st class mail). Should expedited handling be desired, Federal Express or equivalent service will be utilized on a reverse billing basis only.

The Municipality of Anchorage reserves the right to reject any and all bids and to waive any informalities in the bids. No bidder may withdraw his bid after the hour set for the opening of bids or before the Award of Contract unless said award is delayed for a period exceeding forty-five (45) days from the time of the opening.

The Municipality shall not be responsible for bid preparation costs, nor for costs, including attorney fees, associated with any (administrative, judicial, or otherwise) challenge to the determination of the lowest responsive and responsible bidder and/or award of contract, and/or rejection of bids. By submitting a bid, each bidder agrees to be bound in this respect and waives all claims to such costs and fees.

Contracts shall be awarded by written notice issued by the Purchasing Officer to the lowest responsive and responsible bidder; however, preference will be given to local bidders in compliance with Anchorage Municipal Code, Section 7.20.040.

A pre-bid conference will be held at the above-indicated time in the Purchasing Office for the purpose of answering any questions bidders may have and to consider any suggestions they may wish to make. Any changes resulting from this conference will be made by Addendum immediately following the conference. This conference is held for the benefit of the bidders. It is requested that some person of authority from the office of the prospective bidder attend this meeting.

The Municipality of Anchorage assumes no responsibility for any interpretations or presentations made by any of its officers or agents unless such interpretations or presentations are made by written addendum to this Invitation to Bid.

Bonding requirements are per M.A.S.S.B./M.A.S.S. or as per Special Provisions.

PUBLISH ONE TIME

Date _____

_____
Ronald S. Hadden
Purchasing Officer

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

II

SPECIAL PROVISIONS

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

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INDEX TO SPECIAL PROVISIONS

MUNICIPALITY OF ANCHORAGE
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SPECIAL PROVISIONS

SECTION 95.01 LOCATION AND SCOPE

All proposed Work is located within the Municipality of Anchorage corporate limits and is more particularly located on West 32nd Avenue, Calais Drive, E. 33rd Avenue, Fairbanks Street, E. 34th Avenue, and undeveloped property between Arctic Boulevard and Old Seward Highway, see Drawings for detailed location. The Work included under this Contract consists of but is not limited to:

- Reconstructing W. 32nd Avenue, Calais Drive, E. 33rd Avenue, Fairbanks Street, and E. 34th Avenue roadways within the project limits with a new insulated roadway structural section and installing high/low spots in the roadway profile as shown on the Drawings.
- Reconstructing the adjacent driveways with a new structural section to match the new roadway profile.
- Installing sidewalks, curb ramps, protected bike lanes, and pathways at locations shown in the Drawings.
- Installing retaining walls at selected locations along the project corridor as identified in the drawings.
- Removing and replacing portions of the existing storm drain system and extending the storm drain system as shown on the Drawings.
- Installing new roadway lighting and pathway lighting.
- Intersection signal improvements at the intersections of W. 32nd Avenue and C Street, W. 32nd Avenue and A Street, and Calais Drive and Denali Street as shown on the Drawings.
- Installing signing and striping and landscaping as shown on the Drawings.
- Furnishing all labor, materials, equipment, supervision, and other facilities necessary to successfully complete the Work set forth in the Drawings and Specifications.

It is the responsibility of the bidder to prepare the bid so that all materials and/or fittings shall harmoniously conform to the intent of the Contract Drawings, Specifications, and Special Provisions.

Below are the schedules of Work that are presented in the Bid Proposal of this Contract:

SCHEDULE	DESCRIPTION	
A.	Roadway Improvements	Base Bid
B.	Drainage Improvements	Base Bid
C.	Illumination Improvements	Base Bid
D.	Landscaping Improvements	Base Bid

SECTION 95.02 REFERENCE TO MUNICIPALITY OF ANCHORAGE STANDARD SPECIFICATIONS

This Contract is subject to and hereby incorporates by reference the Municipality of Anchorage Standard Specifications, dated 2015, hereinafter referred to as M.A.S.S.; the Alaska Sign Design Specifications (ASDS) as adopted and amended by the Municipality; the Municipality of Anchorage Sign Manual; the Alaska Traffic Manual (ATM)-Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition, with the Alaska supplement, dated 1/13/12; the National Electrical Safety Code (NESC) as amended and adopted by the Municipality; the National Electrical Code as amended and adopted by the Municipality of Anchorage; and the Edition of the Standard Specifications for Structural Supports for Highway Sign, Luminaires and Traffic Signals provided in the appropriate divisions. When conflicts exist between M.A.S.S. and MUTCD, the requirements of M.A.S.S. and these Special Provisions shall govern.

SECTION 95.03 TIME OF COMPLETION

This Project shall be completed within one hundred twenty (120) calendar days after the Notice to Proceed is issued.

SECTION 95.04 MODIFICATIONS AND/OR ADDITIONS TO MUNICIPALITY OF ANCHORAGE STANDARD SPECIFICATIONS

The following listed provisions of M.A.S.S. are amended as hereinafter stated:

A. DIVISION 10 STANDARD GENERAL PROVISIONS

Add the following Section:

SECTION 10.00 ALL APPLICABLE M.A.S.S. ARTICLES

Delete all references to and requirements for compliance with Anchorage Municipal Code Chapter 7.60 the Disadvantaged/Women Owned Business (DBE/WBE) program and specifications.

SECTION 10.01 DEFINITIONS

Add the following item to the list of definitions:

BMP – Best Management Practices

CEA – Chugach Electric Association

FHWA - Federal Highway Administration

NPDES – National Pollutant Discharge Elimination System

Record Drawings – Detailed drawings which accurately depict all changes in location (both horizontal and vertical), material, equipment, and other elements of Work accomplished by Contractor. The drawings shall also depict the horizontal and vertical locations of all other utilities and obstructions encountered during construction. Final elevations and locations shall be clearly marked with actual dimensions, or existing dimensions shall be noted with "ASB" if no changes occur.

UL – Underwriters Laboratories, Inc.

SECTION 10.04 SCOPE OF WORK

Article 4.8 Work Incidental to the Contract

Add the following items which shall be incidental to the cost of the Contract:

14. Asphalt for tack coat.
15. Sawcutting, unless otherwise noted to be paid for.
16. Repair of existing infrastructure or areas outside of demolition limits that are damaged by Contractor.
17. Furnishing and installing grounding conductors, ground rods, and ground rod clamps.
18. Installation of flexible delineators at the end of culverts, ends of retaining walls, field inlets, and other locations that may be hazardous or should be delineated for snow removal operations as determined by the Engineer.
19. Removal and/or abandonment of soil boring caps, borings and piezometer tubes.
20. Remove and salvage existing signs.

21. Removal and disposal or replacement of private improvements within construction limits unless Pay Item is specifically identified on the Drawings.

22. Dewatering as required for construction.

Article 4.17 Utilities

Add the following sentence to the end of the seventh paragraph:

Utilities are the responsibility of the Contractor to request locates for, coordinate with the Work, maintain, and protect.

Add the following after the first sentence of the ninth paragraph:

Contractor shall have no right to proceed first with the Work under this Contract in advance of any utility company. Utility work being done by others within the project area will generally take place while the Contractor is performing Work necessary for this project. In the event that the Contractor is unable to continue Work without interfering with utility relocation or protection Work by others, the Engineer will direct the Contractor to Work in a different area. The Engineer may choose to suspend Work until the conflict is resolved. The Contractor shall not be entitled to additional compensation resulting from suspension of work because of conflicts with existing utilities or work incidental to utility relocation activities by others.

Below is a summary of contacts names and numbers and the work to be performed by utility companies within the project area. Once received by utility companies, Appendix C will include drawings of proposed utility work available at time of bidding but is not all inclusive of the utility relocation work required for this project. Field conditions of existing utilities may vary including depth of cover and location. Additional conflicts with utility lines and facilities may be present that will require relocation by others. No additional money will be owed to the Contractor due to any delay caused by utility companies work even if work is not specifically stated below.

Chugach Electric Association, Inc. (CEA): CEA has existing electrical facilities in the project area including lines, pedestals, poles, switch cabinets, transformers and junction boxes. CEA will be relocating their facilities as shown in their drawings in Appendix C. The following is a brief summary of their work:

1. Will be provided at 95% design submittal

The CEA contact is Gary Meadows at 762-4618.

Alaska Communications (ACS): ACS has existing telephone facilities within the project area, including lines and pedestals. ACS will be relocating their facilities as shown in their drawings in Appendix C. The following is a brief summary of their work:

1. Will be provided at 95% design submittal

The ACS contact is Rod Reyes at 564-7028.

Enstar Natural Gas (Enstar): Enstar has existing plastic and/or steel underground gas mains and services in the project area. Enstar will be relocating their facilities as shown in their drawings in Appendix C. The following is a brief summary of their work:

1. Will be provided at 95% design submittal

The ENSTAR contact is Jeff Hebert at 334-7756.

General Communications, Inc. (GCI): GCI has existing underground coaxial cable, fiber optics lines, and structures within the project area. GCI will be relocating their facilities as shown in their drawings in Appendix C. The following is a summary of their work:

1. Will be provided at 95% design submittal

The GCI contact is David Blehm at 868-6769.

Add the following paragraph:

Underground utilities shall be continuously supported during backfill placement and compaction. Geotextile shall be separated from nearby utilities with a minimum of 1 foot of backfill material to prevent undue stress during the compaction and settlement process.

C. Gas

Add the following paragraph:

The Contractor shall download and follow the most current construction guidelines published by ENSTAR. Those guidelines can be downloaded from:

https://www.enstarnaturalgas.com/safety-education/natural-gas-safety/safety-for-excavators-contractors/

(Click on the link in the last sentence of the first paragraph.)

The Final Rule from the PHMSA website can be obtained from:

http://www.phmsa.dot.gov/nprm-anprm/PHMSA-2009-0192

(Click on the "Excavation Damage 80 FR 43836 Final Rule" link on the right hand side.)

D. Electrical and Telecommunications

Add the following paragraph:

The Contractor shall download and follow the most current construction guidelines published by CEA. Those guidelines can be downloaded from:

http://www.chugachelectric.com/media-room/publications-request

Click on the link titled "Electrical facility Clearance Requirements".

Replace the list of Utility Companies after Article E with the following:

The following contact information is provided as a courtesy to the Contractor and is the most current list available.

Alaska Communications (ACS) – Rod Reyes, 564-7028

Anchorage Water & Wastewater Utility (AWWU) – Joe Sanks, 564-2717

AT&T – Mike Barsalou, 264-7325

Chugach Electric Association (CEA) – Gary Meadows, 762-4618

ENSTAR Natural Gas – Jeff Hebert 334-7756

GCI, Inc. – David Blehm, 868-6769

Municipal Light & Power (ML&P) – Lance Cluff, 263-5244

Municipal Street and Storm Drain Maintenance – Eric Hodgson, 343-8100 or 317-7059

Municipal Street Light Maintenance – Paul VanLandingham, 343-8372

Municipal Traffic Signals Section – Mike Sickler, 343-8335

Solid Waste Services (SWS) – Evalu Filitaula, 343-6258 or 317-6863

Alaska Waste – Josh James, 688-4446

Add the following Articles:

Article 4.22 Project Information Signs

Prior to beginning of any Work on the project, Contractor shall install two owner-furnished project information signs and posts, in accordance with Section 70.12, Article 12.7 - Traffic Control Devices, in a location directed by the Engineer. The skid mounted project information signs, frames, and post skids shall be available for pick up at 5701 Northwood Drive, Monday through Thursday from 8:00 a.m. to 4:00 p.m. Owner-supplied materials for each sign assembly are as follows:

- Project Information Sign - one (1) 4'x8'x¾" MDO wood sign
- Sign Frame - one (1) 2"x4" Pressure Treated (PT) lumber pre-assembled in a rectangular shape measuring 4-foot by 8-foot
- Post Skids - two (2) 4"x4" PT Lumber pre-assembled measuring 6-foot at the base and standing 8-foot in height

Signs shall be affixed to frame; frame and sign shall be affixed to the post skids accordingly. Once assembled and positioned as directed by the Engineer, the Contractor shall supply and secure each post skid with two (2) each 50-pound sand bags, or provide equivalent anchoring system as approved by the Engineer.

Following final completion of the project, Contractor shall disassemble the signs and return the owner-provided materials to 5701 Northwood Drive. This Work shall be considered incidental to the project.

Article 4.23 Responsibility of Contractor to Act in Emergency

In case of an emergency that threatens loss and/or injury of property and/or safety of life, the Contractor shall act, without previous instructions from the Engineer, as the situation may warrant. The Contractor shall notify the Engineer thereof immediately thereafter. Any claim for compensation by the Contractor, together with substantiating documents in regard to expense, shall be submitted to the Owner through the Engineer. The amount of compensation shall be determined by agreement.

The Contractor shall supply the Engineer, prior to commencement of Work, with an emergency telephone number through which a responsible Contractor's representative can be contacted on a twenty-four (24) hour a day basis, seven (7) days a week.

Article 4.24 Coordination with Other Projects in the Area

It shall be the responsibility of the Contractor to coordinate with and minimize impact to other projects in the area including, but not limited to, the following:

A. Utility Relocation/Protection Work by others, per Section 10.04.17 of these Special Provisions.

The Contractor shall be responsible for affirmatively coordinating with other projects in the area so as to not unreasonably interfere with the performance of the other projects.

If the Work of the Contractor is delayed or disrupted because of the construction or transportation activities of other projects in the area, the Contractor shall not be entitled to additional compensation from the Owner, but may be entitled to an extension of time in accordance with Article 5.23 – Delays and Extension of Time.

Except with regard to a possible entitlement to an extension of time, the Contractor shall hold harmless, defend, and indemnify the Owner from and against any and all claims by the Contractor arising directly or otherwise out of the other projects in the area.

Work required to coordinate with and minimize impact to other work in the Project area shall be considered incidental to the Project.

Article 4.25 Payment for Common Work Items

The following Common Work Items may be necessary for more than one Work Schedule within the project Base Bid. For these Common Work Items, all of the necessary Work for all Schedules in the Base Bid will be considered part of Schedule A - Roadway Improvements.

MASS Section	Common Work Item
20.02	Storm Water Pollution Prevention Plan (Type 3)
20.04	Clearing and Grubbing
65.02	Construction Survey Measurement
70.12	Traffic Maintenance

The following Common Work Items may be necessary for more than one Work Schedule within the project Base Bid. For these Common Work Items, all of the necessary Work for all Schedules in the Base Bid will be considered part of Schedule B – Drainage Improvements.

MASS Section	Common Work Item
55.27	Storm Drain Bypass System

SECTION 10.05 CONTROL OF WORK

Article 5.27 Liquidated Damages

Add the following paragraph:

The Owner may withhold from any progress payment the sum of Five Hundred Dollars ($500.00) per day as Liquidated Damages for each and every calendar day that the Substantial Completion Date is delayed beyond Contract Completion Date. The Owner may withhold out of any progress payment the sum of Five Hundred Dollars ($250.00) per day as Liquidated Damages for each and every calendar day that the Final Acceptance Date is delayed beyond the Contract Completion Date. If no money is due Contractor, the Owner will have the right to recover said sums from Contractor, the Surety, or both.

Article 5.31 Winter Suspension

C. Suitable Conditions for Winter Maintenance

Add the following paragraphs:

8. Contractor shall install temporary flexible delineators at the end of culverts, end of retaining walls, field inlets, and other locations as determined by the Engineer.

Add the following Article:

Article 5.34 Work Plan

Contractor shall prepare a Work Plan for approval by the Engineer prior to beginning construction. The goals of the Work Plan shall include the following:

- Maintain a safe transportation corridor through the project area for vehicles and pedestrians.
- Minimize impacts to existing utilities and protect existing utilities where required.
- Minimize impacts to vehicular and pedestrian traffic.
- Minimize impacts to operations at AWWU facilities.
- Coordinate with and minimize impacts to other Contractors working in the area.
- Minimize dust and erosion generated by Construction activities.
- Minimize overall construction noise.
- Finish the project within the time of completion requirement.

Contractor shall submit a project Work Plan for approval by the Engineer within seven (7) days after signature of the Contract. Contractor shall coordinate the Work Plan with the Traffic Control Plan, Dewatering/Trench Dewatering Plan, SWPPP Plan, Storm Drain Bypass System Plan, Creek Diversion Plan and adhere to all permit requirements. Work shall not proceed until the Engineer has approved in writing the Work Plan. The Work Plan shall include estimated dates of completion for each significant element of Work.

No separate payment shall be made for the Work described in this Article and all Work required to provide an approved Work Plan is incidental to the Contract. The Work Plan shall be updated as the work progresses.

At a minimum, the Work Plan shall include the following requirements:

A. The Project shall be divided into 3 phases:

- Phases 1 shall consist of:
  - Conference with the Engineer and Contractor's Arborist to review tree protection procedures and responsibilities and install temporary tree protection fencing.
  - Performing utility test pits for utility locates to determine elevations of existing utilities at locations as determined by the Engineer in the field.
- Phase 2 shall consist of all work, except for landscaping, as identified by the Contractor that can be completed in total before winter suspension.

- Phase 3 shall consist of all work that is not included in Phase 2.

B. Phases 2-4 shall be completed prior to beginning any other construction within an individual phase other than removal of existing asphalt surfacing.

C. Activity in a Phase, including demolition and/or construction, shall not begin until after receiving written approval from the Engineer. Minor work necessary to prepare a Phase prior to active construction, such as utility relocation and similar construction, may take place outside of the current active Phase upon written authorization of the Engineer and only if the asphalt surfacing is maintained. Asphalt surfacing removed in any area in an inactive Phase shall be replaced with temporary asphalt or RAP surfacing within 48 hours of asphalt removal.

D. Incidental Work beyond the edge of the existing roadway, that does not impact traffic flow, is allowed in areas outside of the active construction Phase with written approval from the Engineer.

E. A transition between Phases shall be constructed in order to maintain a consistent, smooth, and safe grade for the traveling public between the new and old roadway surfaces. The transition work may require temporary regrading, pavement surfacing or curb and gutter. The actual limits of the transition area will be as directed by the Engineer. Work and materials necessary to provide transitions or temporary roadway surfacing including backfill, asphalt, or curb and gutter shall not be measured separately and shall be considered incidental to the pay item “Traffic Maintenance”.

F. Disruption of driveways shall be kept to a minimum. Driveway surfacing shall not be removed until necessary for excavation or regrading. Contractor shall provide and maintain access to all adjacent properties and side streets in accordance with M.A.S.S. 10.04.10 and 10.04.12.

G. Contractor shall provide for emergency vehicle access at all times in accordance with M.A.S.S 10.04.10.

H. The Contractor shall protect existing surfaces located beyond the limits of the proposed improvements identified in the demolition plan.

I. Contractor shall maintain at least two lanes, two-way traffic along the areas of the project except within the active construction phase. Contractor shall not allow traffic delays in excess of 10 minutes per incident unless a full road closure is approved.

J. Contractor shall coordinate with utility companies performing other work in the project area as described in Section 10.04.17. The utility work schedule may require that the Contractor perform some work tasks, including implementing the SWPPP Plan, removing fences, and installing temporary fences outside of the active Work zone.

K. Contractor shall provide for uninterrupted utility service to nearby residents and shall accommodate trash collection, paper delivery and mail delivery in a manner satisfactory to the utility provider.

L. Contractor shall provide proper notification to residents of impending construction activities. Contractor shall provide residents with contact name(s) and phone number(s) for Contractor personnel with responsibility to inform and coordinate with residents. The Contractor shall give written notice to the residents of any adjacent property having direct driveway or parking access to the project area, 48 hours in advance of installing curb and gutter, sidewalk, or approach aprons across the driveway, or driveways serving the adjacent property.

SECTION 10.06 LEGAL RELATIONS AND RESPONSIBILITIES

Article 6.1 Laws to be Observed

Add the following paragraph:

Owner is not aware of any contaminated material within the project limits. If such material is encountered, Contractor shall notify the Engineer immediately for direction. This will be treated as a changed condition, unless the contamination was caused by Contractor's operation.

Article 6.6 Permits

Add the following paragraphs:

The Municipality plans to attain Temporary Construction Permits and easements from property owners for the purpose of constructing the proposed improvements on or near adjacent property. These permits are included in Section VI, Temporary Construction Permits and Easements.

The Contractor shall confine his operations to the existing right-of-way, existing easements, or designated Easements/Temporary Construction Permit areas. The Contractor shall comply with all special conditions, stipulations and restrictions thereof. Prior to the start of construction, the Contractor shall verify that all easements and permits necessary for construction of the project have been obtained. The Contractor shall have a copy of all permits on the job site at all times.

The Contractor shall comply with the terms of the Temporary Construction Permits. The permits are granted for the construction of the improvements as shown on the Drawings. The Contractor shall not use the permitted areas for any other construction activities including stockpiling materials, storing equipment, or performing equipment maintenance.

No private property within the permitting areas shall be damaged except as necessary to construct the proposed improvements and the Contractor shall repair or replace damaged property to pre-project conditions to the satisfaction of the Engineer.

The Contractor shall order the Work such that the permitted areas are occupied only for brief intervals and that the permitted construction is progressing at a normal rate during the time the areas are occupied.

The Engineer reserves the right to limit the Contractor access and use of the permitted areas.

B. DIVISION 20 STANDARD CONSTRUCTION SPECIFICATIONS FOR EARTHWORK

SECTION 20.01 GENERAL

Article 1.6 Subsurface Investigation

Add the following paragraph:

The soils information for the project is located in Section V.

SECTION 20.02 STORMWATER POLLUTION PREVENTION PLAN

Article 2.1 General

Add the following paragraph:

Utilities: Utilities will be relocated/protected in place by others concurrently with construction of this project. All utility companies performing ground disturbing activity on the project shall be identified in the SWPPP. The Contractor shall be responsible for controlling sediment and erosion and stabilizing areas disturbed during all underground and overhead utility relocation/removal/protection work.

Article 2.14 Construction Requirements

A. Prior to Construction

Add the following item:

9. Coordinate with each utility company prior to submitting the SWPPP to determine scope of utility relocation/removal/protection work and schedule for relocation/removal/protection work. The SWPPP shall identify any ground disturbing activity in the project area by the utility company and shall include a detailed plan to prevent pollution and minimize erosion by the utility's work effort.

Delete Section 20.03 Exploratory Test Pits in its entirety and replace it with the following:

SECTION 20.03 EXPLORATORY TEST PITS FOR UTILITIES

Article 3.1 General

Work under this Section consists of furnishing an excavator, vactor truck, operators, surveyors and all related supplies/materials in order to excavate and fill test pits for locating and surveying the location of utilities as directed by the Engineer prior to the commencement of below grade construction activities.

Article 3.2 Materials

Contractor shall furnish an excavator and vactor truck capable of excavating to a maximum depth of twelve feet (12').

Article 3.3 Construction

Contractor shall excavate to locate utility as directed by the Engineer. Engineer shall be on site during duration of exploratory test pit for utility work. Excavation

shall be accomplished with vactor truck unless otherwise directed by the Engineer. Contractor shall be responsible for coordinating with and calling for utility companies to mark the location of the utility in question prior to excavation.

Once utility is located and exposed, Contractor shall survey the horizontal and vertical location of the utility and provide the data to the Engineer. Excavated material shall be disposed of by the Contractor.

After excavation and location of the utilities is complete, Contractor shall backfill test pits with Type II Classified Fill and compact them so that the ground is returned to its original condition. If directed by the Engineer, Contractor shall segregate the cast piles to avoid contamination. Excavations in roadways shall be capped with AC pavement placed to match surrounding pavement.

Contractor shall locate utilities at locations as determined by the Engineer in the field.

Article 3.4 Measurement

Work performed under this Section is measured per hour for utility location completed as directed by the Engineer. Pay Item shall include all Work related to excavating test pits for locating utilities including coordination, preparation, excavation, survey, Type II Classified Fill and Backfill, compaction, AC pavement, traffic control, disposal of excavated materials and any other ancillary items necessary to complete the Work. Down time or delays caused by equipment failure is not included in the measurement and no additional payment shall be made.

Article 3.5 Basis of Payment

Payment for Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following item:

ITEM	UNIT
Test Pit for Utility Locate	Hour

SECTION 20.04 CLEARING AND GRUBBING

Article 4.2 Construction

Delete this Article in its entirety and replace with the following:

The Contractor shall do all clearing and grubbing necessary in the construction of roadways, sidewalks, landscaping, storm drainage, culverts, temporary creek diversion, utilities & other work shown on the Drawings. Prior to clearing and grubbing, the Contractor shall stake the clearing limits per Section 20.04, Article 4.2.A below. Trees, brush, roots and root mat removed in the clearing, and grubbing operations shall be hauled to a disposal site provided by the Contractor as delineated in Division 10, Section 10.04, Article 4.9 – Disposal Sites.

A. Clearing Limits

The Contractor shall clearly delineate the limits of clearing and grubbing using survey staking and tape. Limits of Clearing and Grubbing shall be as shown on the Drawings. After the site has been staked for clearing limits, the limits shall be field verified jointly by the Engineer, the Contractor and the Contractor's Arborist. No clearing shall begin until written approval for the clearing limits is given by the Engineer. Written approval for clearing will not be provided in advance of joint field verification of clearing limits. Damage associated with the removal of trees shall be kept to a minimum practical area within the approved limits. The Engineer reserves the right to adjust clearing limits by up to eight feet to save trees or up to eight feet to remove trees. The Engineer may elect to alter grades, or adjust the plans to save trees. No additional payment will be made for clearing limits adjusted in the field either during the initial staking or for additional clearing required beyond the limits shown on the Drawings as required for Contractor to complete the Work. The Contractor shall provide the Engineer a minimum of 24 hours of notice following delineation of the clearing limits and prior to starting clearing operations. Clearing operations shall not be commenced or continued in the absence of the Engineer.

For existing trees to remain, that are in close proximity to the clearing limits, the Contractor shall establish a Tree Protection Zone (TPZ) with temporary tree protection fencing as shown on the Drawings and as specified in Section 75.12. Ensure that the temporary fencing associated with tree protection zones is clearly visible throughout the duration of the project. Work required to delineate the clearing and grubbing limits shall be considered incidental to other work in this section and will not be paid for separately. Work required to establish tree protection zones and install temporary tree protection fencing is addressed in Section 75.12. Root pruning is addressed in Section 75.13.

All trees cut within the clearing limits shall be felled and dropped into the areas where clearing and grubbing is to occur. Trees shall not be felled into areas outside the clearing limits. All trees and brush shall be disposed of off-site.

Any trees removed outside of the approved clearing limits shall be replaced by the Contractor with new trees of similar species and of the largest practical size similar to the tree removed in increments of either 3-inch caliper (deciduous) or 6-foot height (evergreen). For example, a 12-inch caliper birch tree shall be replaced with four 3-inch caliper birch trees. A 20-foot tall spruce tree shall be replaced with four 6-foot tall spruce trees. All replacement trees shall meet specifications and shall be included in the maintenance period. Contractor shall not be entitled to any additional payment for trees replaced outside of the clearing limits.

Any trees larger than 4-inches in diameter, approved in advance for cutting and removal, shall be limbed and sawed into 4-foot lengths and hauled off

site and properly disposed of, unless directed by the Engineer to be neatly stacked on-property.

B. Migratory Bird Treaty Act

Tree removal scheduling must comply with the Migratory Bird Treaty Act. The habitat avoidance window for nesting song birds is May 1 to July 15. The window for raptors and ravens is April 10 to August 10. Additionally, Contractor shall notify the Engineer immediately if any active nests are found at any time during construction of the project.

SECTION 20.07 REMOVAL OF SIDEWALK AND CONCRETE APRON

Article 7.4 Basis of Payment

Add the following pay item:

ITEM	UNIT
Remove Sidewalk or Concrete Apron	Square Yard

SECTION 20.09 REMOVAL OF PAVEMENT

Article 9.1 General

Add the following to the first paragraph after the word 'pavement':

…or RAP

Article 9.2 Construction

Delete the second paragraph and replace with the following:

Contractor shall keep pavement including asphalt concrete and RAP which is designated for removal free from objectionable material (concrete, steel, etc.) and shall dispose of pavement, asphalt concrete, and RAP designated for removal at the Kloep Maintenance Station, 5701 Northwood Street. Contractor shall coordinate exact location and time of delivery with Paul VanLandingham with MOA Street Maintenance at 343-8372 or 317-7054. If the removed pavement material under this Section contains objectionable material, as identified by the Engineer, then Contractor shall dispose of this material in accordance with Division 10, Section 10.04, Article 4.9 – Disposal Sites at no additional cost to MOA.

SECTION 20.10 EXCAVATION FOR TRAFFIC WAYS

Article 10.1 General

Replace the first paragraph with the following paragraph:

The Work under this Section consists of furnishing all plant, labor, equipment, supplies, and material in performance of all operations pertaining to the excavation of unsuitable and/or surplus material for street, alleys, access roads, parking lots, sidewalks, curbs, gutter, and pathways.

SECTION 20.11 GRADING EXISTING SURFACES

Delete this Articles 11.3 and 11.4 in their entirety and replace it with the following:

Article 11.3 Measurement

Grading of existing surfaces as shown on the Drawings or as necessary to maintain positive drainage patterns shall be considered incidental to the contract and no separate measurement for payment shall be made.

SECTION 20.13 TRENCH EXCAVATION AND BACKFILL

Article 13.2 Trench Excavation and Backfill - Description

Add the following paragraph after the fifth paragraph:

Payment to the Contractor for Work resulting from any trench excavation required for this project, whether paid for on a cubic yard, ton, or linear foot basis, shall not exceed the pay limits as shown on the Contract Drawings.

E. Locator Tape

Delete the fourth sentence and replace with the following:

The Contractor shall install the locator tape at least 18 inches but no more than 36 inches above the crown of the pipe.

SECTION 20.21 CLASSIFIED FILL AND BACKFILL

Article 21.2 Material

Add the following paragraph after the second paragraph:

Crushed waste glass (cullet) may be combined with soil-aggregate material and used in Type II or Type II-A classified fill and backfill. If glass cullet is incorporated, classified fill and backfill shall contain not more than ten percent (10%) by weight glass cullet smaller than three-eighths-inch (3/8”). Contractor shall ensure that glass cullet is uniformly blended with natural soil aggregate material prior to project delivery and placement. Glass cullet must conform to the specifications in SubArticle G – Glass Cullet of this Article. In addition to the normal gradation documentation for classified fill or backfill, when glass cullet is used the Contractor shall provide documentation certifying that the glass cullet (1) is comprised only of eligible types of glass, (2) does not contain prohibited materials, (3) meets debris content requirement, and (4) meets blending percentage requirements to the Engineer prior to placement of the material.

Add the following SubArticle G:

G. Crushed Waste Glass (Cullet)

Glass cullet shall be free of prohibited or hazardous substances and the cullet shall contain no more than two percent (2%) debris as determined in AASHTO M318.

Eligible glass products from which glass cullet may be produced include:

- food and beverage container glass;
- plain ceramic or china dinnerware; and
- building window glass.

Prohibited glass products include:

- automobile windshields or other glass from automobiles;
- light bulbs of any type;
- porcelain products;
- laboratory glass; or
- television, computer, or other cathode ray monitor tubes.

Article 21.3 Construction

Add the following after the last paragraph:

Contractor shall not use classified fill and backfill incorporating glass cullet:

- within 4 feet (4') from the face of any embankment slope;
- within one hundred and fifty feet (150') of any surface water body;
- in embankment areas where culvert placement is required;
- in contact with any geotextile or geosynthetic material; or
- in any soil-aggregate base or subbase courses that are not covered by surfacing material.

Article 21.4 Measurement

Add the following after the last paragraph:

Use of glass cullet is incidental to the bid item Classified Fill and Backfill and no additional payments shall be made.

SECTION 20.22 LEVELING COURSE

Article 22.2 Material

Add the following paragraph after the second paragraph:

Crushed waste glass (cullet) may be combined with soil-aggregate materials and used in leveling course. If glass cullet is incorporated, leveling course shall contain not more than ten percent (10%) by weight glass cullet smaller than three-eighths-inch (3/8"). Contractor shall ensure that glass cullet is uniformly blended with natural soil aggregate material prior to project delivery and placement. Glass cullet must conform to the specifications in SubArticle D – Glass Cullet of this Article. In addition to the normal gradation documentation for classified fill or backfill, when glass cullet is used the Contractor shall provide documentation certifying that the glass cullet (1) is comprised only of eligible types of glass, (2) does not contain

prohibited materials, (3) meets debris content requirement, and (4) meets blending percentage requirement to the Engineer prior to placement of material.

Upon written approval by the Engineer, recycled concrete aggregate (RCA) may be substituted for leveling course, on an inch for inch basis. RCA shall conform to this specification.

Add the following SubArticles:

D. Crushed Waste Glass (Cullet)

Glass cullet shall be free of prohibited or hazardous substances and the cullet shall contain no more than two percent (2%) debris as determined in AASHTO M318.

Eligible glass products from which glass cullet may be produced include:

- food and beverage container glass;
- plain ceramic or china dinnerware; and
- building window glass.

Prohibited glass products include:

- automobile windshields or other glass from automobiles;
- light bulbs of any type;
- porcelain products;
- laboratory glass; or
- television, computer, or other cathode ray monitor tubes.

E. Recycled Concrete Aggregate

RCA shall consist of a manufactured aggregate material and natural aggregate particles derived from the crushing, processing, and classification of Portland cement concrete construction debris recovered from roadways, sidewalks, building, bridges and other sources, which conforms to AASHTO M-319 - Reclaimed Concrete Aggregate for Unbound Soil-Aggregate Base Course, and this specification. This material shall not contain deleterious substances in excess of the following amounts by mass-weight:

Deleterious Material	%, By weight
Bituminous concrete materials	5%
Brick or concrete masonry unit block	5%
Solid waste or hazardous materials	0%
Wood,metal,plaster,gypsum	0.1%

Both Coarse and Fine Aggregate shall conform to this specification and the quality requirements from AASHTO M-147 - Materials for Aggregate and Soil-Aggregate

Subbase, Base, and Surface Courses. Additionally RCA shall have a minimum of seventy percent (70%) of particles with one or more mechanically fractured faces when the RCA is tested in accordance with AASHTO TP-61.

The Maximum Moisture Content is four percent (4.0%) for RCA.

The RCA Liquid Limit shall not exceed 35 when tested in accordance with AASHTO T-89 and the Plasticity Index of the fraction of RCA passing the No. 40 sieve shall not exceed 6 when tested in accordance with AASHTO T-90.

In accordance with ASTM 306, the percent of flat and elongated pieces in RCA shall not exceed eight percent (8%).

Restrictions to Use of Recycled Concrete Aggregate: RCA shall not be placed over a geotextile layer, gravel drain fields, drain field piping, subdrains, or open soil-lined stormwater retention or detention facilities, because soluble minerals rich in calcium salts and calcium hydroxide can be hydraulically transported from the recycled concrete aggregate. RCA is not approved for use within five feet (5') of metal culverts due to its high alkalinity and because recycled concrete aggregate in contact with aluminum or galvanized steel pipes can cause corrosion in the presence of moisture.

Article 22.3 Construction

Insert the following paragraph at the end of subArticle C. Placing:

If used, any portion of the RCA which becomes segregated and/or develops zones of paste or crushed conglomerates during the distribution/compaction process shall be corrected by the Contractor. This correction process shall be conducted full depth and continue until the on-grade RCA meets this specification. The Engineer reserves the right to sample (or resample) the RCA for acceptance after it has been placed, watered and compacted.

Add the following SubArticle F:

F. Crushed Waste Glass (Cullet)

Contractor shall not use classified fill and backfill incorporating glass cullet:

- within 4 feet (4') from the face of any embankment slope;
- within one hundred and fifty feet (150') of any surface water body;
- in embankment areas where culvert placement is required;
- in contact with any geotextile or geosynthetic material; or
- in any soil-aggregate base or subbase courses that are not covered by surfacing material.

Article 22.4 Measurement

Remove the first sentence and replace with the following:

The leveling course shall be measured in tons of materials delivered and placed in accordance with these Specifications and adjusted for excess moisture as provided.

Add the following after the last paragraph:

Use of glass cullet or recycled concrete aggregate is incidental to the bid item Leveling Course and no additional payments shall be made.

SECTION 20.26 INSULATION

Article 26.2 Materials

Add the following sentence after the first sentence:

Insulation board shall be provided in one inch-thick increments as required to meet the specified R-Value. Insulation board provided with fractional inch thickness shall be rejected.

SECTION 20.28 RECONSTRUCT DRIVEWAY

Article 28.3 Construction

Add the following in the second sentence of the third paragraph after the word "asphalt":

(Class E)

Replace the second sentence of the sixth paragraph with the following:

Contractor shall notify and coordinate with the affected resident(s) a minimum of 48 hours prior to any necessary driveway work.

Article 28.4 Measurement

Delete this Article in its entirety and replace with the following:

Driveway reconstruction shall not be measured separately for payment. Measurement and payment for unusable excavation, classified backfill, geotextile fabric, insulation, leveling course, PCC concrete, and asphalt will be made under the appropriate pay items. No payment shall be made for temporary relocation of driveways or required driveway maintenance during construction. Removal and replacement of vegetation, structures, landscaping, planting beds, retaining walls and other private improvements, on private property or within the right-of-way, as is necessary to reconstruct driveways shall be considered incidental to the Project and no additional payment shall be made unless otherwise noted.

SECTION 20.30 SHORING, SHEETING, AND BRACING/SHORING AND SHEETING LEFT IN THE TRENCH AND PORTABLE

Article 30.1 General

Add the following:

The Work under this Section also includes all operations necessary to shore, brace and protect from harm existing utilities located within the project area. Utilities include underground facilities as well as overhead facilities and supporting structures.

The Work under this Section also includes all operations to furnishing and installing temporary or permanent sheeting, shoring, and bracing to support temporary excavations behind retaining walls to prevent any movement that might damage adjacent facilities, structures, or injure workman or the public.

Article 30.3 Construction

Add the following:

The shoring shall be sufficient to avoid impacting areas or facilities outside of the existing ROW, PUEs or TCPs. Methods and materials used to shore or brace utilities shall be reviewed and approved by the affected utility company before it is submitted to the Engineer for approval.

The Contractor shall prepare and submit to the Engineer for approval a Shoring Plan. The Shoring Plan shall be submitted a minimum of three (3) working days prior to work involving shoring. The Shoring Plan shall detail the methods and materials to be used for trench shoring as well as utility pole shoring, if necessary. The Plan shall be prepared by and sealed by a Professional Engineer registered in the State of Alaska.

When, in the opinion or the Engineer or affected utility company, shoring is inadequate, improper, or conditions exist such that damage may occur, the Contractor shall be notified in writing by the Engineer. Such notification shall be accompanied by a statement of corrective action. If the Contractor fails to promptly comply with such instruction, the Engineer may suspend any or all Work on the project until satisfactory corrective action is taken. Notification or lack of notification shall in no way relieve the Contractor of the responsibilities established in Section 10.04, Subsection 4.17 – Utilities.

C. DIVISION 30 STANDARD CONSTRUCTION SPECIFICATIONS FOR PORTLAND CEMENT CONCRETE

SECTION 30.01 GENERAL

Article 1.3 Materials

B. Welded Steel Wire Fabric

Add the following paragraph:

Welded Steel Wire Fabric shall be used in all concrete driveways and in sidewalks at all driveway crossings and shall be 6x6-W4.0xW4.0.

SECTION 30.03 PORTLAND CEMENT CONCRETE SIDEWALKS

Article 3.4 Measurement

Add the following Sentences:

Welded Steel Wire Fabric in concrete sidewalks and driveways shall be considered incidental to the P.C.C. Sidewalk Pay Item and no separate measurement or payment shall be made.

SECTION 30.04 PORTLAND CEMENT CONCRETE CURB RAMPS

Article 4.1 General

Add the following Sentence:

The Work covered under this Section shall also include construction of backing curb, as required.

Article 4.2 Materials

Add the following Subsection:

C. Backing Curb

Backing curb materials and installation shall conform to the requirements of MASS Section 30.02 Portland Cement Concrete, Curb and Gutter and Valley Gutter, the Drawings, details and these specifications. Location and height of backing curb shall be as required to retain the neighboring ground, as approved by the Engineer.

Article 4.5 Measurement

Add the following paragraph:

The Work paid for under “P.C.C. Curb Ramp (6” Thick)” shall be measured as 6” thick curb ramp as furnished, constructed, finished and accepted in place for the actual square yardage of curb ramp (including curb ramp under detectable warnings) and backing curb.

Article 4.6 Basis of Payment

Add the following to the second paragraph:

No separate payment shall be made for backing curb. Backing curb shall be incidental to the contract.

Add the following pay item:

ITEM	UNIT
P.C.C. Curb Ramp (6" Thick)	Square Yard

SECTION 30.10 COLORED CONCRETE

Article 10.2 Materials

A. Concrete

Replace the paragraph entirely with the following:

Concrete mix for colored concrete shall conform to M.A.S.S. requirements for Class AA-3, normal weight concrete. Coloring shall be integral for the full depth of the concrete. It shall be added at the redi-mix concrete manufacturer plant per the manufacturer's instructions and uniformly distributed throughout the mix.

Red concrete shall be made from integral color pigment "Baja Red" RG-2827R 7% (of cement material) as manufactured by Interstar or approved equal. The red color noted above may be modified by the Engineer. No separate payment shall be made if the red color is modified to color as requested and approved by the Engineer. Contractor shall submit color for approval by Engineer prior to ordering material.

Green concrete shall be made from integral color pigment "Moss" VT-2244R 7% (of cement material) as manufactured by Interstar or approved equal. The green color noted above may be modified by the Engineer. No separate payment shall be made if the green color is modified to color as requested and approved by the Engineer. Contractor shall submit color for approval by Engineer prior to ordering material.

Add the following Subsections:

D. Sealer

Sealer shall be a water-based acrylic sealer designed to provide UV protection, waterproofing, and chemical resistance. Sealer shall be manufactured by Interstar or approved equal.

E. Broom Finish

Where broom finish is called for on the Drawings, Contractor shall provide a standard broom finish.

Article 10.3 Construction

Add the following paragraphs at the end of this Article:

Where Broom Finish is called for on the Drawings, Contractor shall finish the concrete as follows: After final finishing of the concrete surface with wood and steel floats the surface shall be brushed with a fiber hair brush. The brushing shall be performed transverse to the predominant direction of pedestrian travel. The resulting surface shall be smooth with a linear texture resulting in a slip-resistant surface.

All colored concrete shall be sealed in accordance with the manufacturer of the sealer product. It may be necessary to seal the concrete approximately 28 days after the concrete has cured.

All vehicular traffic shall be kept off the colored concrete slab for the entire cure period. Pedestrian traffic may be allowed to travel on the concrete after 3 days upon approval by the Engineer. Concrete shall be protected against damage or defacement of any kind until it has been accepted by the Owner. Concrete which is not acceptable to the Engineer because of damage or defacement shall be removed and replaced at no additional cost to the Owner.

Install Welded Steel Wire Fabric in all colored concrete driveways.

Article 10.4 Measurement

Add the following paragraph:

Welded Steel Wire Fabric, sealers and other miscellaneous items required for colored concrete driveways shall be considered incidental to the Colored Concrete Pay Item and no separate measurement or payment shall be made.

Article 10.5 Basis of Payment

Add the following pay items:

ITEM	UNIT
Colored Concrete (Thickness, Color, Finish)	Square Yard

Add the following NEW Sections:

SECTION 30.12 HIGH-PERFORMANCE CONCRETE

Article 12.1 General

The Work under this Section consists of providing all operations, materials and labor necessary to install high-performance concrete in accordance with these Specifications at the locations shown on the Drawings or as directed by the Engineer.

The concrete shall be a special high-performance design intended to have the following special characteristics:

- increased strength and durability

- increased resistance to spalling and freeze/thaw cycles
- increased workability during placement

The high-performance concrete shall be a redi-mix concrete in conformance with M.A.S.S. Section 30.01 General and Section 30.06 Concrete-Building Structures with the following exceptions:

Article 12.2 Materials

A. Cement

The cement shall be Type I/II in accordance with ASTM C-150. Only one brand of cement shall be used for the high-performance concrete to minimize variations in overall appearance.

The cement shall be standard grey.

B. Aggregates

The aggregates shall meet the requirements of ASTM C-33.

The aggregates shall be standard grey.

C. Admixtures

All admixtures shall be added to the concrete mix at the manufacturing plant. The following admixtures shall be used in the concrete mix:

1. Viscosity modifying admixture - The admixture shall be designed to produce concrete with enhanced viscosity and stability and increased resistance to segregation to facilitate placement and consolidation. The admixture shall be Rheomac VMA 362 as manufactured by BASF or approved equal.

2. Silica fume - The admixture shall be designed to produce extremely strong durable concrete meeting the requirements of ASTM C 1240. The admixture shall be Rheomac SF 100 as manufactured by BASF or approved equal.

3. High-range water-reducing admixture - The admixture shall be designed to create a concrete with a slump as specified free from segregation and with relatively low water/cement ratio. The admixture shall be Rheobuild 1000 as manufactured by BASF or approved equal.

4. Air entraining admixture - The admixture shall be in accordance with ASTM C-231 (AASHTO T-152).

D. Evaporation Reducer

An evaporation reducer shall be used to reduce surface moisture evaporation and reduce plastic shrinkage cracking. The material shall be Confilm as manufactured by BASF or approved equal applied in accordance with the manufacturer's recommendations. The product should not be considered a finishing aid.

E. Coloring

Coloring shall be integral for the full depth of the concrete. It shall be added at the redi-mix concrete manufacturer plant per the manufacturer's instructions and uniformly distributed throughout the mix.

The concrete shall be provided with integral color pigment as follows:

Color	Description
Red	"Baja Red" RG-2827R 6% (of cement material) as manufactured by Interstar or approved equal with standard grey cement, standard grey sand and standard grey aggregate
White	Titanium dioxide 15% (of cement material) with white cement, white sand and standard grey aggregate

Article 12.3 Mix Requirements

Below are general mix requirements for high-performance concrete:

Property	Value
Cement (sacks/CY) min	7.0
Water Content Ratio (gal./sack) max	.35
Slump (inches)	3-5
Entrained Air (%)	4-6
Silica Fume (% of cement material)	5-8
Coarse Aggregate (ASTM C33)	Grade 67
Medium Aggregate (ASTM C33)	Grade 8
Fine Aggregate (ASTM C33)	Concrete Sand
Integral Color	as required
Viscosity Modifying Admixture	as required
High-range water-reducing admixture	as required

The concrete shall have the following minimum compressive strengths as tested in accordance with AASHTO T-141:

Cure Time (days)	Minimum Compressive Strength (psi)
1	2,500
3	3,500
7	4,500
28	7,000

A detailed mix design shall be submitted to the Engineer for approval with the following information:

1. Design designation for which the substitution is intended.
2. Design strength.
3. Air Content.
4. Slump.
5. Aggregate gradation and maximum size.
6. Maximum water/cement content.
7. Minimum cement content.
8. List of admixtures, strength overdesign, and other special features.
9. Fine aggregate weight/percent moisture of fine aggregate.
10. Intermediate aggregate weight/percent moisture of intermediate aggregate.
11. Coarse aggregate weight/percent moisture of coarse aggregate.
12. Weight of cement.
13. Weight of water.
14. Unit weight.

Water shall not be used to increase slump. If additional slump is desired, additional plasticizing agent shall be used.

Article 12.4 Mock-up Sample

A mock-up sample of the concrete shall be provided at an off-site location as directed by the Engineer. The area shall be at least 4 feet square and 4 inches thick. The sample slab shall be used to test the acceptability of the overall mix design, workability, release agents, colors, curing methods and overall appearance. A separate mock-up sample shall be provided for each mix design.

A separate mock-up sample is not necessary to demonstrate a broom finish pattern if a sample is provided with the same mix design. Mock-up samples that do not result in the required surface pattern or do not meet minimum strength requirements will be rejected. The Engineer may require the Contractor to provide additional samples if the sample is unacceptable.

Concrete samples for test cylinders shall be taken for each mock-up concrete mix in accordance with AASHTO T-141. Testing and sampling shall be performed by the Engineer. Compressive testing shall be made at the intervals listed in the table in Article 12.3.

The mock-up samples shall be constructed at least 7 days before the planned installation of the final concrete slab. The final concrete slab shall not be installed before the Engineer approves the mock-up samples.

Article 12.5 Construction

A. Concrete Placement

High-performance concrete shall be placed to the lines and grades shown on the Drawings. Contractor shall remove and replace concrete not installed in accordance with the Drawings and Specifications at no additional cost to the Owner.

AC pavement shall not be used to form concrete. Where AC pavement is located adjacent to intended concrete location, the AC pavement and subgrade shall be removed to the full depth of the concrete thickness and standard concrete forms installed.

Contractor shall provide survey notes verifying lines and grades to the Engineer prior to placement of concrete.

Contractor shall reconstruct subgrade and asphalt to the required grade.

B. Evaporation Reducer

An evaporation reducer shall be applied to the surface of the concrete while it is the plastic state before the finishing phase. The product should not be considered a finishing aid. It shall be applied in accordance with the manufacture's recommendations and it shall not be allowed to remain on the surface of hardened concrete.

C. Finishing Phase

The finishing operations should not begin until the water sheen on the surface is gone and excess bleed water on the surface has had a chance to evaporate. If this excess water is worked into the concrete because the finishing operations are begun too soon, the concrete on the surface will have too high a water content and will be weaker and less durable. Special care shall be taken to make sure that the concrete is not overworked while finishing which can result in discolorations and fewer aggregates near the surface resulting in a less durable material.

D. Broom Finish

After final finishing of the concrete surface with wood and steel floats the surface shall be brushed with a fiber hair brush. The brushing shall be performed transverse to the predominant direction of pedestrian travel. The resulting surface shall be smooth with a linear texture resulting in a slip-resistant surface.

E. Curing

After finishing has been completed, provide a moist-cure topping to attain the proper design strength, surface impermeability, and wear resistance without cracking. Mist spray the surface with water and cover it with weighted polyethylene sheeting for minimum of 7 days. When mist spraying is not possible, use soaker hoses with burlap or 2 layers of saturated burlap (or similar moisture-retaining sheet material) and cover surface with polyethylene for 7 days. The cure time may be extended if the concrete slab is expected to be exposed to studded tire traffic.

F. Protection

All vehicular traffic shall be kept off the concrete slab until 3-day minimum compressive strength is achieved. Concrete minimum compressive strength shall be determined by breaking concrete sample cylinders taken in accordance with Section 30.01 General, Article 1.8 Sampling and Testing. Pedestrian traffic may be allowed to travel on the concrete after 3 days upon approval by the Engineer. Concrete shall be protected against damage or defacement of any kind until it has been accepted by the Owner. Concrete which is not acceptable to the Engineer because of damage or defacement shall be removed and replaced at no additional cost to the Owner.

Article 12.6 Measurement

High-performance concrete slab shall be measured per square yard, complete and accepted in place in the specified thickness, and finish. There shall be no separate measurement or payment for subbase preparation, samples, mock-ups, forms, reinforcing, dowels, joints, concrete mix, pigment, finishing or curing as they will be considered incidental to this Work item. If slab is installed adjacent to existing AC pavement, removal and replacement of subgrade material and AC pavement for concrete form work shall be subsidiary.

Article 12.7 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment and shall include full payment for all Work described in this Section.

ITEM	UNIT
High-Performance Concrete (Thickness, Natural, Finish)	Square Yard

D. DIVISION 40 STANDARD CONSTRUCTION SPECIFICATIONS FOR ASPHALT SURFACING

SECTION 40.01 GENERAL

Add the following Articles:

Article 1.7 Asphalt Price Adjustment

This provision provides a price adjustment for asphalt material by:

1. an increase to the contract amount, or
2. a deduction from the contract amount.

The provision shall apply to asphalt concrete pavement which:

- is a major bid item as defined in M.A.S.S. Division 10, Section 10.04, Article 4.5 – Increased Quantities;
- is placed in the second or later year of the contract;
- conforms to M.A.S.S. Division 40, Section 40.06 – Asphalt Concrete Pavement; and
- is paid pursuant to M.A.S.S. Division 40, Section 40.06 – Asphalt Concrete Pavement

This provision shall only apply to cost changes in the asphalt material that occurs between the date of bid opening and the date the asphalt material is incorporated into the project.

The asphalt price adjustment shall only apply when there is more than a seven and one-half percent (7.5%) increase or decrease in the Alaska Asphalt Material Price Index from the date of the bid opening to the date the asphalt material is incorporated into the project.

As used in this Article, the Alaska Asphalt Material Price Index is calculated bi-monthly on the first and third Friday of each month, and will remain in effect from the day of calculation until the next bi-monthly calculation. The Alaska Asphalt Material Price Index is posted on the ADOT&PF's Statewide Materials website and is calculated according to the formula posted therein.

The Asphalt Price Adjustment (APA) payment is cumulative and is calculated with each progress payment. Asphalt material price index in effect on the last day of the pay period is used to calculate the price adjustment for asphalt material incorporated into the project during that pay period. The Municipality will increase or decrease payment under this contract by the amount determined with the following asphalt material price adjustment formula:

APA {price $^{increase}/_{decrease}$}* = [($\pm$ IPP $\mp$ IB) - (0.075 $*$ IB)] $*$ Q $*$ % AC

Where,

Q = quantity of asphalt concrete pavement incorporated into the project during the pay period, in tons, and documented by weight tickets;

IB = Index at bid: the bi-monthly Alaska asphalt material price index in effect on date of bid, in dollars per ton;

IPP = Index at Pay Periods: the bi-monthly Alaska asphalt material price index in effect on the last day of the pay period, in dollars per ton; and

%AC = percentage asphalt cement content in the asphalt concrete pavement, as determined by the average asphalt cement content in project's asphalt concrete quality control testing.

*Note: a negative price adjustment (APA) results in a price reduction to the Contract.

Method of measurement for determining quantity, Q, is the weight of asphalt concrete pavement material that conforms to M.A.S.S. Division 40, Section 40.06 – Asphalt Concrete Pavement and is incorporated into the project.

No asphalt price adjustment will be paid based on estimated quantities.

Contingent Sum payment shall be made on the following basis:

The final asphalt price adjustment on a project is the aggregate of the price adjustments paid on a project's respective progress pay estimates, i.e.,

$APA = APA_1 + APA_2 + \ldots + APA_n$

Where n = partial payment estimate number.

SECTION 40.04 TACK COAT

Article 4.5 Measurement

Delete this Article in its entirety and replace with the following:

Tack Coat shall not be measured as it is considered incidental to pay Item 40.06 – Asphalt Concrete Pavement.

Article 4.6 Basis of Payment

Delete this Article in its entirety.

E. DIVISION 50 STANDARD CONSTRUCTION SPECIFICATIONS FOR SANITARY SEWERS

SECTION 50.06 EXISTING MANHOLE MODIFICATIONS

Article 6.6 Basis of Payment

Add the following pay items:

ITEM	UNIT
Remove and Replace Manhole Cover and Frame	Each
Remove and Replace Manhole Cone Section	Each

Add the following new section:

SECTION 50.09 ADJUST CLEANOUT TO FINISH GRADE

Article 9.01 General

The Work under this Section consists of providing all operations pertaining to adjustment of existing cleanouts to finish grade. All broken and/or missing cleanout components are to be replaced with new materials furnished and installed by the Contractor in accordance with these Specifications.

Article 9.02 Material

Material used in the construction of sanitary sewer cleanouts shall conform to the requirements of AWWA C-151, for Class 50 ductile iron pipe, or equal material approved by AWWU, and AWWA C104/ANSI A21.4 fittings. Fittings to be restrained joint pipe and shall be EBAA Iron MEGALUG®, Romac Industries RomaGrip, U.S. Pipe Field LOK® Gasket, or approved equal.

Article 9.03 Construction

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 shall be repaired or the damaged portion replaced at the Contractor's expense. All joints and fittings shall be restrained.

Article 9.04 Measurement

Cleanout adjustments will be measured per unit, complete in place.

Article 9.05 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 - Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Adjust Cleanout to Finish Grade	Each

F. DIVISION 55 STANDARD CONSTRUCTION SPECIFICATIONS FOR STORM DRAIN SYSTEMS

SECTION 55.02 FURNISH AND INSTALL PIPE

Article 2.2 Material

A. General

Article 2.3 Construction

A. Excavation and Backfill

Add the following:

A trench box shall be used for all open trenching for storm drain pipe to limit the extents of excavation and impacts to adjacent property and vegetation. Furnishing and installing trench box shall be incidental to the project.

Article 2.4 Measurement

Add the following:

This Work includes the following MASS Work items:

- Mechancial Compaction

No separate payment for the above Work items will be made since they will be considered incidental to the Work included in this Section.

SECTION 55.04 CONNECTIONS TO EXISTING MANHOLES OR CATCH BASINS

Article 4.1 General

Add the following:

The Work under this Section shall also include the performance of all operations pertaining to the construction required for connections to existing storm drain pipes.

Article 4.3 Measurement

Delete this Article in its entirety and replace it with the following:

Connection to existing storm drain systems (pipes, manholes and/or catch basins) shall be measured as complete units in place.

Reconstruction of existing manhole penetrations for installation of new pipe and plugging existing unused holes in manhole from removed pipe is considered incidental to the pay item and no separate payment shall be made.

Article 4.4 Basis of Payment

Add the following Pay Item:

ITEM	UNIT
Connect to Existing Storm Drain System	Each

SECTION 55.05 MANHOLES AND CATCH BASIN MANHOLES

Article 5.1 General

Add the following sentence to the first paragraph:

The Work also includes constructing bypass manholes complete with a gate, frames and cover.

Article 5.2 Materials

Article 5.3 Construction

B. Storm Drain Manholes and Catch Basin Manholes

Add the following paragraph after the first sentence in the first paragraph:

Catch Basin Manholes shall be constructed as detailed in the Drawings with manhole access and catch basin functionality. All construction details and requirements not specified in the Drawings that are associated with Catch Basin Manholes shall be per M.A.S.S. Standard Details and Standard Specifications.

Delete the second paragraph and replace it with the following:

After connecting the storm drain pipe to reinforced concrete manhole or catch basin, seal annular space around pipe penetrations with cement mortar or boot style connector, or approved equal. Cement mortar shall conform to the requirements of ASTM C-150, Type II. Boot style connector shall conform to the requirements of this Section. After the mortar has firmly set, Contractor shall cut the pipe evenly so that no more than two inches (2") of the pipe protrudes into the manhole. Boot style connectors shall be installed at all locations where watertight storm drain pipe connects to manholes.

Article 5.4 Measurement

Insert the following paragraphs immediately following the first paragraph:

No separate measurement for payment will be made for multiple frames and/or covers on a single manhole.

Foundation material for storm drain structures shall not be measured for payment and shall be considered incidental to the contract.

SECTION 55.09 CONSTRUCT CATCH BASIN

Article 9.4 Measurement

Add the following to the end of the first paragraph:

Foundation material for catch basins shall not be measured for payment and shall be considered incidental to the contract.

Add the following New Sections:

SECTION 55.27 STORM DRAIN BYPASS SYSTEM

Article 27.1 General

The Work under this Section consists of providing all planning, coordination, materials and operations pertaining to rerouting storm drainage flows around those portions of the storm drainage facilities to be replaced/reconstructed or as required to perform other necessary items of Work. The existing flows include those from groundwater base flow and from upstream collection system components that contribute to the subject storm drainage mains or manhole facilities.

Article 27.2 Construction

The storm drainage flows shall be bypassed around sections of pipe or manholes designated for replacement/reconstructed or as required to perform other necessary items of Work on an as-required basis. The Contractor shall ensure that pumps and bypass lines are of appropriate capacity and size to accommodate the anticipated storm drainage flows during the duration of all operations requiring such bypass.

The estimated peak flow for the 10-year, 24-hour storm event for the storm drain system impacted by the Work are as follows:

- W. 32nd Avenue (Arctic Boulevard to Dawson Street) – 5.8 cfs at W. 32nd Avenue & Arctic Boulevard intersection.
- W. 32nd Avenue (Eide Street to Eureka Street) – 5.9 cfs at W. 32nd Avenue & Eureka Street intersection
- Calais Drive (180 feet west of Denali Street to Denali Street) – 9.3 cfs (at Calais Drive & Denali Street Intersection)
- E. 33rd Avenue, Fairbanks Street, & E. 34th Avenue (Old Seward Highway to Denali Street) – 18.8 cfs (at E. 33rd Avenue & Denali Street Intersection)

Prior to construction, the Contractor shall submit to the Engineer a Storm Drain Bypass Plan detailing the scheduled deployment of pumps, hoses, pipes and other equipment necessary to maintain storm drainage flows during construction. Acceptance of Contractor's plan by the Engineer shall not relieve the Contractor of responsibility for the exercise of reasonable precaution, sound engineering judgment, prudent construction practices, overloading or misuse of existing or new structures, the adequacy and safety of such Works, and potential damage or undermining of existing or completed Work. Acceptance of the Storm Drain Bypass Plan by the Engineer does not relieve the Contractor of the responsibility for providing additional Storm Drain Bypass infrastructure if implementation of the accepted Storm Drain Bypass Plan does not result in a dry and stable construction environment throughout the project. Contractor's Storm Drain Bypass Plan shall be in accordance with MOA and State of Alaska regulations.

The pumping system shall be such that the hydraulic gradient both upstream and downstream of the piping being bypassed will not reach elevations that will cause damage to the properties being served. This will require close attention to the elevation of the upstream head needed to actuate the pumping cycle and the rate of discharge flow from the pumps. The Contractor shall be liable for all damages which result from storm drainage flows not properly maintained during the progress of the Work, including all damages to private property which occur as a direct or indirect result of inadequate control of the storm drainage flow while the storm drainage bypass operation is ongoing. The Contractor is reminded that after-hours pumping may require a permit to exceed the allowable noise levels. Should such permit not be available for certain locations, the lack of availability shall not be cause for claim for additional compensation but may be eligible for a time extension.

This Work may include the installation of temporary drainage facilities including pipes or manholes. The Contractor shall remove all temporary drainage facilities prior to completion of this project.

The bypass plan needs to consider ways to quickly accommodate a storm event by using the existing storm drain system. This may affect the pipe installation methods used. The bypass plan should minimize damage to pipes, structures and excavations and to reduce erosion and sedimentation.

Article 27.3 Measurement

The method of measurement for furnishing and installing a storm drainage bypass system shall be lump sum for all Work described in this Section. There will be no separate payment for additional systems to accomplish bypass of flows. There will be no separate measurement or payment for the installation and removal of temporary drainage facilities used for bypass flows since they will be considered incidental to this Work item.

Article 27.4 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 - Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Storm Drain Bypass System	Lump Sum

G. DIVISION 60 STANDARD CONSTRUCTION SPECIFICATIONS FOR WATER SYSTEMS

SECTION 60.03 FURNISH AND INSTALL VALVES

Article 3.4 Measurement

Add the following paragraph after the fourth paragraph:

The Remove and Replace Valve Box Top Section pay item shall be measured as complete units in place. The Remove and Replace Valve Box Top Section pay item includes removal and replacement of the valve box top section, dust pan and lid with new components. The Remove and Replace Valve Box Top Section pay item also includes furnishing and installing polyethylene encasement around the valve box top section as shown on MASS Standard Detail 60-8. The Remove and Replace Valve Box Top Section pay item shall also include adjustments of the valve box top section to the Engineer approved final elevation. Multiple adjustments of the valve box top section if required by Engineer shall not be measured separately regardless of the number of adjustments.

H. DIVISION 70 STANDARD CONSTRUCTION SPECIFICATIONS MISCELLANEOUS

SECTION 70.01 GENERAL

Add the following Article:

Article 1.3 Utility Facilities

Prior to commencing any Work covered under this Division or impacting utility facilities the Contractor shall contact the Utility and obtain any permits, approvals, or other requirements as required by the Utility to complete any Work on or in the vicinity of their facilities.

SECTION 70.07 REMOVE PIPE

Article 7.1 General

Delete this Article in its entirety and replace it with the following:

The Work under this Section consists of performing all operations pertaining to the removal and disposal or salvage of existing pipes including culverts (of whatever size of pipe or culvert encountered), when encountered in the excavation and/or as directed by the Engineer or as shown on the Drawings. Work also includes removal and disposal of existing heat trace and/or heat trace conduit within the pipes or culverts, when encountered in the excavation and/or as directed by the Engineer or as shown on the Drawings.

Article 7.3 Measurement

Delete this Article in its entirety and replace it with the following paragraphs:

Removal of pipes including culverts is measured per linear foot without regard to pipe or culvert size. Removal of heat trace and/or heat trace conduit shall not be measured as it will be incidental to the Remove Pipe pay item.

There will be no separate measurement or payment for the disposal of unusable excavation or installation of Type II Classified Fill and Backfill necessary for the removal of pipe as it will be considered incidental to this Work item.

SECTION 70.08 RESET FENCE

Article 8.1 General

Add the following sentence:

Work under this Section shall also include the removal of existing fence materials, posts, foundations, slats, and materials mounted on fences as indicated on the Drawings, and the proper disposal of material not reset.

Article 8.3 Construction

Add the following paragraph:

Any excavation required in the removal of fence posts or foundations shall be considered incidental to this bid item. Contractor shall backfill the excavation with suitable, non-frost-susceptible material and compact it to 80% of maximum density or as directed by the Engineer. Method of foundation abandonment, if necessary and approved, shall be approved by the Engineer, prior to performing Work.

Article 8.4 Measurement

Add the following paragraph:

Removal and proper disposal of existing fence materials, posts, foundations, slats, and materials mounted on fence shall be measured by length in linear foot without regard to fence type. Signs mounted directly to fence shall be reinstalled on reset fence in the same location as originally mounted. Removal and remounting signs on fence shall be considered incidental to the Remove and Reset Fence pay item.

Remove and Reset Gate shall be for all work remove existing gate access to Arctic Benson Park, store and protect fence during driveway construction, and reinstall gate in new location including any new gate materials, foundations, and all hardware necessary for to complete installation.

Article 8.5 Basis of Payment

Add the following Pay Item:

ITEM	UNIT
Remove Fence	Linear Foot
Remove and Reset Gate	Lump Sum

SECTION 70.10 TRAFFIC MARKINGS

Article 10.1 General

Add the following:

The Work shall also include installation of Pre-formed Thermoplastic Pavement Markings t at Bicycle Detector Marking on Street Level Bike Lanes.

Article 10.2 Materials

Add the following:

D. Pre-formed Thermoplastic Pavement Markings

1. Pre-formed Thermoplastic Pavement Markings shall be composted of an ester modified rosin resistant to degradation by motor fuels and lubricants with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a project, and meets the requirements for the current edition of the Manual of Uniform Traffic Control Devices for

Streets and Highways. The thermoplastic material shall conform to AASHTO designation M249-98.

2. The material must contain a minimum of 30% intermixed graded glass beads by weight. The intermixed beads shall be clear and transparent.
3. White pigment shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6. All pigments shall be heavy-metal free.
4. The top surface of the material shall have regularly spaced indents that act as a visual cue during application that the material has reached a molten state necessary for proper installation.
5. There surface of the preformed retroreflective marking materials shall provide a minimum skid resistance of 60 BPN when tested according to ASTM E 303.
6. White preformed retroreflective marking materials shall have minimum retroreflectivity of 275 mcd-m^{-2}-lx^{-1} as measured using a Delta LTL 2000 or LTL-X Retroreflectometer.
7. The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and be impervious to oil and gasoline.
8. Manufacturer: Premark by Ennis-Flint, or approved equal.

Article 10.3 Construction

G. Application

3. Methyl Methacrylate

Delete the first sentence in paragraph b and replace it with the following.

Contractor shall apply methyl methacrylate pavement markings in vehicular traffic ways at a minimum thickness of 250 mils.

Add the following paragraph:

4. Pre-formed Thermoplastic Pavement Markings

Pre-formed thermoplastic pavement markings shall be applied at a minimum thickness of 90-mils. Markings shall be inlaid to the same depth as the minimum thickness.

Material shall be applied using the propane torch method or as recommended by the manufacturer. The material must be able to be applied without minimum requirements for ambient and road temperatures and without any preheating of the pavement. The pavement shall be clean, dry, and free of debris prior to application.

Article 10.5 Basis of Payment

Add the following Pay Item:

ITEM	UNIT
Pre-formed Thermoplastic Pavement Marking	Each

SECTION 70.11 STANDARD SIGNS

Article 11.1 General

Delete the third sentence and replace it with the following:

Work under this Section shall also include the removal and relocation, as well as the removal and proper disposal of existing signs, sign posts, markers and foundations, as indicated on the Drawings.

Article 11.2 Materials

Add the following paragraph:

Contractor shall provide shop drawings of each sign to be installed for Engineer to review prior to fabrication. Shop drawings shall show all dimensions and fonts to be used. Signs fabricated or installed prior to attaining approval of sign shop drawings from the Engineer shall be removed and replaced with approved signs at no cost to Owner.

Article 11.3 Construction

Add the following paragraph:

Where existing signs designed to be removed and relocated are attached to the tops of existing fence posts and/or face of existing fences, the relocated sign shall be installed on a new fence post or face of fence at the location designated in the drawings or as directed by the Engineer in the field.

Article 11.4 Measurement

Add the following paragraph:

New fence post attachments, bases, and all hardware necessary to install relocated signs from the tops of existing fence posts and/or face of existing fences shall be considered incidental to the Remove and Relocate Sign pay item.

SECTION 70.12 TRAFFIC MAINTENANCE

Article 12.1 General

Add the following paragraphs:

Contractor shall provide MOA Signal Maintenance personnel with all required Traffic Control whenever they are called to the project to locate signal components located within the vehicular traveled way.

Utilities will be relocated/protected in place by others concurrently with construction of this project. Contractor shall incorporate traffic control required for utility work in

the Traffic Control Plan. The Contractor will be responsible for implementing and maintaining traffic control during relocation/protection of utilities in the project area.

Article 12.5 Materials

Delete items 8 and 9 and replace with the following items:

8. Portable Concrete Barriers. Provide portable concrete barriers that conform to ADOT&PF Standard Drawing G-46.11 and are equipped with warning lights.

9. Work Zone Pavement Markings. Work zone pavement markings shall be either paint with glass beads or preformed marking tape.

10. Street Sweeping. Street sweeper shall be capable of collecting and storing materials for later disposal rather than ejecting them to the shoulder of the road.

11. Watering. Watering trucks shall be capable of providing both a high-pressure water stream to flush the pavement and a light-water spray to control dust.

12. Plastic Safety Fence. Use 4-foot high construction orange fence manufactured by one of the following companies or an approved equal:

a. "Safety Fence" by Services and Materials Company, Inc., 2200 South "J" Street, Elwood, Indiana, 46036. Phone (800) 428-8185.

b. "Flexible Safety Fencing" by Carsonite, 1301 Hot Springs Road, Carson City, Nevada, 89706. Phone (800) 648-7974.

c. "Warning Barrier Fence" by Plastic Safety Systems, Inc. P.O. Box 20140, Cleveland, Ohio, 44120. Phone (800) 662-6338.

Article 12.6 Public Notice

Delete the first paragraph, inclusive of the list of local officials and transportation organizations, and replace with the following:

The Work Site Traffic Supervisor shall give notices of changes, delays, or lane/road closures to the following local officials and transportation organizations including, but not limited to:

1.	Alaska Court System	264-8232
2.	Alaska State Troopers	428-7200
3.	Alaska Travel Industry Association	929-2842
4.	Alaska Trucking Association	276-1149
5.	Anchorage Chamber of Commerce	272-2401
6.	Anchorage Fire Department	267-4950
7.	Anchorage Police Department	786-8500

8. Anchorage Public Transportation	343-8253, 343-8386
9. ASD Pupil Transportation	742-1207
10. Commercial Vehicle Enforcement	365-1203
11. Local Emergency Medical Services	267-4950
12. Local Schools and Universities	Varies
13. Local Solid Waste Utilities	563-3717
14. MOA Parks and Recreation	343-4297
15. U.S. Postal Service	266-3261

SECTION 70.13 BOLLARDS

Article 13.3 Construction

Add the following:

Gate and bollards for Remove and Reset Bollard Gate shall be placed at the edge of right-of-way, on Park property. Bollards shall be installed in accordance with MASS Detail 70-34. Bollards and all hardware shall be new.

Article 13.4 Method of Measurement

Add the following:

Measurement for Remove and Reset Bollard Gate shall be for removal of existing gate, protection during construction, furnishing and installing two new wooden bollards, furnishing and installing new hardware, and reinstallation of removed gate.

Article 13.5 Basis of Payment

Add the following Pay Item:

ITEM	UNIT
Remove and Reset Bollard Gate	Lump Sum

Add the following New Sections:

SECTION 70.22 REMOVAL/DISPOSAL AND/OR SALVAGE OF OBSTRUCTIONS

Article 22.1 General

The Work under this Section consists of performing all work associated with removal/disposal and/or salvage of obstructions encountered in the ROW and/or on private property within the work zone. Obstructions may include but are not limited to the following features: jersey barriers, retaining walls, timbers, landscaping rock, planters, landscape edging, landscaping pavers, lawn ornaments, refuse, debris, abandoned vehicles, shopping carts, etc.

Article 22.2 Construction

Contractor shall remove existing obstructions as shown in the Drawings or as directed by the Engineer in the field. In each case, the Contractor and the Engineer shall coordinate with the property owner if they are the owners of the obstructions. If property owner wishes to retain items that are currently in the ROW and not allowed to be re-installed in the ROW, Contractor shall place items on owner's property. If owner does not want items placed on property or installed back in ROW, Contractor shall dispose of removed items at a Contractor-supplied location. Materials to be salvaged shall be carefully removed, protected and placed on property.

It shall be the Contractor's sole responsibility to notify the Engineer of existing damage to items to be salvaged prior to removal. Unless otherwise directed by the Engineer in writing prior to removal, if any salvaged items item are damaged, the Contractor shall replace those items in kind including matching type, color and manufacturer.

Article 22.3 Measurement

All Work described in this section as necessary to complete this Work item shall be measured by lump sum and shall consist of all labor, materials, coordination, equipment and personnel required for removal/disposal and/or salvage of obstructions encountered in the ROW and/or on private property within the work zone. If any salvaged items are damaged, the Contractor shall replace those items in kind including matching type, color and manufacturer and no separate payment shall be made.

Article 22.4 Basis of Payment

Payment for this work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Removal/Disposal and/or Salvage of Obstructions	Lump Sum

SECTION 70.23 BANNERS

Article 23.1 Description

This work shall consist of furnishing and installing Banners comprised of aluminum sandwich board with applied graphics.

Article 23.2 Materials

Banners: 1/8" aluminum sandwich board/ double sided aluminum composite with a polyethylene core as manufactured by DiBond or approved equal. Color shall be black/black.

Graphic Film: Scotchcal IJ35-10 as manufactured by 3M or approved equal.

Overlaminant: Scotchcal 8510 Matte Overlaminate 8510 as manufactured by 3M or approved equal.

Article 23.3 Construction

The banner designs as shown on the plans will be provided in AutoCAD format drawings to the contractor by the engineer. Graphics will be provided in an Adobe Illustrator CS5.5 version file. All materials and finished signs are subject to inspection and acceptance in place. All surfaces exposed to weathering shall be free of any defects in the coating that may detract from the general appearance or color match. The finished banners shall be clean and free from all chatter marks, burrs, sharp edges, and delaminated matte lamination. No repairs shall be made to the face sheet. Graphic film and overlaminate shall be affixed to aluminum sandwich material per the manufacturer's specifications. All banners not conforming to these specifications shall be rejected.

Article 23.4 Measurement

The Banners shall be measured per each complete and installed.

Provide the designated quantity of surplus banners and deliver them to MOA Pole Yard near East 3rd Avenue and Orca Street during regular business hours. Contact TBD (343-8242) 48 hours before delivery.

Article 23.5 Basis of Payment

Payment for this work shall be in accordance with division 10 – Standard General Provisions, Section 10.7 – Measurement and Payment of these Specifications, and shall include full payment for all work described in this Section.

Payment to be made under:

ITEM	UNIT
Banner	Each
Furnish Surplus Banner (Designation)	Each

SECTION 70.24 TEMPORARY FENCING

Article 24.1 General

The Work covered under this Section shall consist of all operations pertaining to furnishing, installing and removing temporary fencing at properties where fencing has been removed as indicated on the Drawings.

Article 24.2 Materials

Temporary fencing shall be six (6) feet in height and consist of new or previously used chain-link fencing materials in good condition. Posts shall be galvanized steel pipe of diameter to provide rigidity and be suitable for anchoring with base plates or inserting in precast concrete blocks. Fabric shall be woven galvanized steel wire mesh provided in continuous lengths and wire tied to prefabricated pipe-framed fence panels. Gates shall be fabricated of the same material used for fencing and be capable of manual operation by one person. Gates shall be lockable.

Where removed fencing includes barbed wire and arms at the top of the fence, temporary fencing shall include barbed wire supported on arms at a 45-degree angle similar in appearance to the removed fence.

Article 24.3 Construction

Fence and gates shall be installed at locations where existing fencing has been removed. At least one gate shall be installed for each property for which temporary fencing is provided. Fencing shall extend the full width of the property and prevent ingress and egress of personnel and animals through, under or around the fence. Temporary fence shall be installed immediately outside the construction area within 12-hours of removal of existing fences. Temporary fencing shall remain in place until permanent fence is installed.

Contractor may temporarily install the removed barbed wire and arms on the temporary fence until the permanent fence is installed.

Article 24.4 Measurement

All work described in this Section pertaining to the furnishing, installing, maintaining and removing Temporary Fencing shall be measured for payment per linear foot of temporary fence installed. There shall be no additional payment made for relocating temporary fencing on the same property during construction as may be necessary to accommodate construction activities or to facilitate property use by the property owner. Barbed wire and support arms, where required, shall not be measured for payment and shall be considered incidental to the Temporary Fencing pay item.

Article 24.5 Basis of Payment

Payment of this Work shall be in accordance with MASS, Division 10 Standard General Provisions, Section 10.07 Measurement and Payment as amended in these specifications and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Temporary Fencing	Linear Foot

SECTION 70.24 DECORATIVE FENCE

Article 24.1 General

A. This Work item includes but is not limited to all labor, materials, transportation, testing and maintenance necessary to fabricate and install.

1. Decorative Fence comprised of panels and posts fabricated from steel to be mounted on Retaining Wall

B. Submittals: Contractor shall provide submittals for all metal fabrications and ancillary structural items in accordance with MASS Section 10.05, Article 5.5, *Shop Drawings*, and as specified in this section.

1. Shop Drawings: Metal fabrications, including welding and fabrication information.
2. Specific instructions for all phases of installation including hole size, preparation, placement, procedures, and instructions for safe handling of anchoring systems.

C. Quality Assurance:

1. Welders Qualifications: Certified in accordance with American Welding Society (AWS) D1.1-92, Chapter 5.
2. Welding Procedures: Follow the requirements of AWS D1.1-92 and AWS D1.2-90.
3. Delivery, Storage and Handling:

   d. Preparation for Shipment: To the extent practicable, factory-assemble items specified in this Section.

   e. Package and clearly tag parts and assemblies that are of necessity shipped unassembled, in a manner that will protect materials from damage, and facilitate identification and field assembly.

Article 24.2 Materials:

Unless otherwise indicated, meet the following requirements:

A. Steel

Item	ASTM Specification
Steel Shapes, Bars and Plates	A36-90
Steel Pipe	A501-89 or A53-90b, Type E or S, Grade B
Structural Steel Tubing	A500-90a, Grade B
STEEL BOLTS AND NUTS:	
Carbon Steel	A307-91 or A36-90
High-Strength	A325-91b, Type 3
Galvanized Steel Bolts and Nuts	A307-91 or A36-90, with A153-82 Zinc Coating, and ANSI B1.1-89
Eyebolts	A489-90
Threaded Rods	A36-90
Flat Washers (Unhardened)	F844-90; use A153-82 for Zinc Coating
Flat Washers (Hardened)	F436-91

B. Graphic Templates

Graphic templates for decorative elements in fence panel shall be provided by Landscape Architect in Adobe Illustrator format.

C. Concrete

The Portland Cement Concrete and curing materials shall conform to M.A.S.S. Section 30.01 General, Article 1.3 Materials. Concrete mix shall conform to M.A.S.S. requirements for Class A-3, normal weight concrete.

D. Antiseizing Lubricant

Lubricant shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc, or copper. Use Loc Tite Co., Permatex.

E. Fabrication

1. General:

   f. Finish exposed surfaces smooth, uniform, sharp, and true to well-defined lines. Provide fabricated product free of warps, kinks, dents, scrapes and other damage or unsightly condition.

   g. Horizontal elements shall be fabricated perpendicular to vertical elements. Vertical elements shall be constructed to be installed plumb.

   h. Furnish necessary rabbets, lugs, and brackets so work can be assembled in neat, substantial manner.

   i. Conceal fastenings where practical; where exposed, flush countersink.

   j. Drill metalwork and countersink holes as required for attaching hardware or other materials.

   k. Round sharp edges to small uniform radius. Grind burrs, jagged edges, and surface defects smooth. Flame cutting is not permitted.

   l. Steel Material Thinner than 1/8-Inch: Either galvanize before fabrication in accordance with ASTM A525-91a, Coating Designation G210, or after fabrication in accordance with ASTM A123-89a, except the weight of zinc coating shall average minimum 1.2 ounces per square foot of actual surface area with no individual specimen having a weight of less than 1 ounce per square foot.

2. Assembly:

   a. Fit and assemble in largest practical sections for delivery to site.

   b. Fabricate as shown on Drawings and in accordance with ASTM A385-80.

   c. Weld connections and grind exposed welds smooth. When required to be watertight, make welds continuous.

   d. Use fasteners as shown or scheduled.

   e. Grind cut edges smooth and straight.

3. Welding:

a. Meet requirements of ANSI/AWS D1.1-92 for techniques of welding employed, appearance, quality of welds made, and the methods of correcting defective work.

b. Meet visual acceptance standards of ANSI/AWS D1.1-92, paragraph 8.15.1. Welds shall be ground smooth to required size and be free of putty, pits, pinholes and debris.

c. Complete welding before applying finish.

d. All welds shall be continuous unless shown otherwise.

4. Finish. Powdercoat meeting the following:

Item	Specification
Color	As provided in drawings
Metal Treatment	Prior to powder coating, non-galvanized steel shall be cleaned according to SSPC-SP10 Near White Sand Blast. All non-galvanized parts shall be immersed in an iron phosphate bath, rinsed and sealed using a non-chrome final rinse. All parts shall be backed dry to remove moisture from fabrications.
Film Thickness	Min. 3.0 mil (75µm)
Gloss (60°)	ASTM D 523/ 60° ± 5 units
Humidity resistance	ASTM D 4585 4000 h/38°/100% Few /No. blisters (No. 4 ASTM D-714
Hardness	ASTM D3363, 2H Slightly perceptible marring by Gardco Pencil Hardness Gauge
Salt spray resistance.	ASTM B 117 3000 h/5% Na. Cl few No. 8 blisters No removal of film
Score Test (Cross Cut Tape Test)	ASTM D3359 5B No lifting of squares.

Item	Specification
	Instrument: Scratch All and 6” Steel Rule
Natural weathering	Florida/10 year 45° South/wash A Color change <5 Hunter Units ASTM D4214 Chalking < No. 8 Gloss retention min 50% Erosion >10% film loss

Article 24.3 Construction:

A. Installation:

1. General:

e. Install metal fabrications plumb or level, accurately fitted, free from distortion or defects.

f. Erect steel in accordance with applicable portions of AISC Code of Standard Practice, except as modified.

g. Install manufactured products in accordance with manufacturer’s recommendations.

h. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

i. Obtain Engineer’s acceptance prior to site cutting or making adjustments not scheduled.

j. After erection, apply prime or galvanize coating to welds, abrasions, and surfaces not in contact with concrete.

2. Erection Tolerances:

k. Maximum Variation from Plumb: 1/4-inch in 10 feet

l. Maximum Offset from True Alignment: 1/4-inch.

3. Fall Protection Requirements

Careful consideration of adjacent finish grade, installed panel height and installation of panels shall be considered in order to meet fall protection requirements for this Project. Immediately notify the Owner Representative of any discrepancies observed during construction.

m. Minimum Height: Forty-Two Inches (42”). The minimum nominal height of Decorative Fence as fall protection shall be forty-two inches as measured from adjacent finish grade to the top of the shortest height

of the assembly. Decorative Fence shorter than forty-two inches (42") will not be accepted.

n. Maximum Opening: Four Inch (4") sphere. In areas where Decorative Fence is installed as fall protection no gaps in, below, or between the Decorative Fence allowing passage of a four-inch sphere will be accepted.

4. General Appearance

Runs of decorative fence shall be level, plumb and present the same general appearance. Maximum lengths of decorative fence that maintains the top elevation of posts and panels are desired for a consistent aesthetic.

Article 24.4 Measurement

Measurement for Decorative Fence regardless of mounting or foundation requirements shall be measured per linear foot along the installed and accepted fence. The unit bid price includes all work, materials, transportation, equipment and labor as required to install the fences as shown on the Drawings.

Article 24.5 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Decorative Fence	Linear Foot (LF)

SECTION 70.25 KIOSK.2

Article 25.1 Description

This Work item includes but is not limited to all labor, materials, transportation, testing and maintenance necessary to furnish and install a Kiosk.2, type shall be KIOSK.2 sign per Anchorage Trails Design Intent Drawings dated July 5, 2015.

Article 25.2 Materials

Kiosk.2 Materials shall be per the drawings, unless otherwise stated here.

A. Delivery, Storage, and Handling

1. Store materials to permit easy access for inspection and identification. Keep metal members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect metal members and packaged materials from erosion and deterioration.

    o. Store fasteners in a protected place. Clean and lubricate bolts and nuts that become dry or rusty before use.

    p. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

2. Store all moisture sensitive materials in a secure and weatherproof location per manufacturer recommendations.
3. Transport, store and handle Kiosk.2 materials with extreme care to prevent warping and damage to components, finishes, materials, connections, and welds.
4. Sign 1

    a. Materials for Sign 1 shall meet Division 70, Section 70.11.

    b. Graphic template for Sign 1 will be provided by the Landscape Architect in a PDF or Adobe InDesign file format.

5. Sign 2

    a. Materials for Sign 2 shall be as manufactured by Fossil Industries Inc., 44 Jefryn Boulevard, Deer Park, NY 11729. (https://fossilgraphics.com/other/contact-us) or equal. Equal shall be pre-approved by owner.

    b. Graphic template for Sign 2 will be provided by the Landscape Architect in a PDF or Adobe InDesign file format.

B. Coordination

1. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

Article 25.3 Construction

Kiosk.2 Construction shall be per the drawings.

All materials and finished signs are subject to inspection and acceptance in place. All surfaces exposed to weathering shall be free of any defects in the coating that may detract from the general appearance or color match. The finished signs shall be clean and free from all chatter marks, burrs, sharp edges, and delaminated matte lamination. No repairs shall be made to the face. All materials and construction not conforming to these specifications and construction drawings shall be rejected.

Article 25.4 Method of Measurement

The Kiosk.2 shall be measured per each unit for a complete installation including all materials, transport and labor.

Article 25.5 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 Measurement and Payment, and shall include full payment for all Work described in this Section.

No additional payment shall be made for excavation and backfill around the Kiosk.2. Payment for disposal of unusable excavation shall be in accordance with Division 20, Section 20.10, Excavation for Traffic Ways. Payment for classified fill shall be incidental to construction of the feature.

Payment shall be made under the following unit:

ITEM	UNIT
Kiosk.2	Each

SECTION 70.26 RAIL

Article 26.1 General

A. This Work item includes but is not limited to all labor, materials, transportation, testing and maintenance necessary to fabricate and install.
   1. Rail, custom fabricated from stainless steel

B. Submittals: Contractor shall provide submittals for all metal fabrications and ancillary structural items in accordance with MASS Section 10.05, Article 5.5, *Shop Drawings*, and as specified in this section.
   1. Shop Drawings: Metal fabrications, including welding and fabrication information.
   2. Specific instructions for all phases of installation including hole size, preparation, placement, procedures, and instructions for safe handling of anchoring systems.

C. Quality Assurance:
   1. Welders Qualifications: Certified in accordance with American Welding Society (AWS) D1.1-92, Chapter 5.
   2. Welding Procedures: Follow the requirements of AWS D1.1-92 and AWS D1.2-90.

3. Delivery, Storage and Handling:

   c. Preparation for Shipment: To the extent practicable, factory-assemble items specified in this Section.

   d. Package and clearly tag parts and assemblies that are of necessity shipped unassembled, in a manner that will protect materials from damage, and facilitate identification and field assembly.

Article 26.2 Materials:

A. Unless otherwise indicated, meet the following requirements:

1. SAE-Grade 316 Stainless Steel

Item	ASTM Specification
Steel Shapes and Plates	A240, A666
Stainless Steel Tubing	A240, A666
STAINLESS STEEL BOLTS AND NUTS:	
Stainless Steel Bolts and Nuts	ASTM A276

B. Steel:

Item	ASTM Specification
Steel Shapes and Plates	A36-90
Steel Pipe	A501-89 or A53-90b, Type E or S, Grade B
Structural Steel Tubing	A500-90a, Grade B
STEEL BOLTS AND NUTS:	
Carbon Steel	A307-91 or A36-90
High-Strength	A325-91b, Type 3
Galvanized Steel Bolts and Nuts	A307-91 or A36-90, with A153-82 Zinc Coating, and ANSI B1.1-89
Eyebolts	A489-90
Threaded Rods	A36-90
Flat Washers (Unhardened)	F844-90; use A153-82 for Zinc Coating
Flat Washers (Hardened)	F436-91

C. Antiseizing Lubricant: Lubricant shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc, or copper. Use Loc Tite Co., Permatex.

D. Fabrication:

1. General:
    a. Finish exposed surfaces smooth, uniform, sharp, and true to well-defined lines. Provide fabricated product free of warps, kinks, dents, scrapes and other damage or unsightly condition.
    b. Horizontal elements shall be fabricated perpendicular to vertical elements. Vertical elements shall be constructed to be installed plumb.
    c. Furnish necessary rabbets, lugs, and brackets so work can be assembled in neat, substantial manner.
    d. Conceal fastenings where practical; where exposed, flush countersink.
    e. Drill metalwork and countersink holes as required for attaching hardware or other materials.
    f. Round sharp edges to small uniform radius. Grind burrs, jagged edges, and surface defects smooth. Flame cutting is not permitted.
    g. Steel Material Thinner than 1/8-Inch: Either galvanize before fabrication in accordance with ASTM A525-91a, Coating Designation G210, or after fabrication in accordance with ASTM A123-89a, except the weight of zinc coating shall average minimum 1.2 ounces per square foot of actual surface area with no individual specimen having a weight of less than 1 ounce per square foot.
2. Assembly:
    a. Fit and assemble in largest practical sections for delivery to site.
    b. Fabricate as shown on Drawings and in accordance with ASTM A385-80.
    c. Weld connections and grind exposed welds smooth. When required to be watertight, make welds continuous.
    d. Use fasteners as shown or scheduled.
    e. Grind cut edges smooth and straight.
4. Welding:
    a. Meet requirements of ANSI/AWS D1.1-92 for techniques of welding employed, appearance, quality of welds made, and the methods of correcting defective work.
    b. Meet visual acceptance standards of ANSI/AWS D1.1-92, paragraph 8.15.1. Welds shall be ground smooth to required size and be free of putty, pits, pinholes and debris.
    c. Complete welding before applying finish.

d. All welds shall be continuous unless shown otherwise.

5. Galvanized Finish: Perform work in accordance with safety regulations and guidelines of Federal, state and local agencies having jurisdiction.

a. Meet requirements of ASTM A123-General Iron and Steel Products

b. Meet requirements of ASTM A153-small parts

Article 26.3 Construction:

A. Installation:

1. General:

a. Install metal fabrications plumb or level, accurately fitted, free from distortion or defects.

b. Erect steel in accordance with applicable portions of AISC Code of Standard Practice, except as modified.

c. Install manufactured products in accordance with manufacturer's recommendations.

d. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

e. Obtain Engineer's acceptance prior to site cutting or making adjustments not scheduled.

f. After erection, apply prime or galvanize coating to welds, abrasions, and surfaces not in contact with concrete.

2. Erection Tolerances:

a. Maximum Variation from Plumb: 1/4-inch in 10 feet

b. Maximum Offset from True Alignment: 1/4-inch.

Article 26.4 Method of Measurement

Metal fabrications for Rail shall be measured by each for the complete and working unit, in place.

Provide the designated quantity of Rail Panels and deliver them to MOA Pole Yard near East 3rd Avenue and Orca Street during regular business hours. Contact Kathy Bourque-Parker (343-8242) 48 hours before delivery.

Article 26.5 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Rail	Linear Foot

SECTION 70.27 BICYCLE FIXIT STATION

Article 27.1 General

The Bicycle Fixit Station provides all the tools necessary to perform basic bike and maintenance. Hanging the bike from the hanger arms allows the pedals and wheels to spin freely while making adjustments.

Article 27.2 Materials

Bicycle Fixit Station shall include manual air pump provided by the manufacturer and securely attached. Bicycle Fixit Station and manual air pump shall have a powder coated finish. Color shall be Deep Red, RAL 3003. Submit shop drawings for approval prior to fabrication.

Tools shall be securely attached to Bicycle Fixit Station via a stainless steel cable. Included tools shall include:

- Philips head screwdriver
- Flat head screwdriver
- 2.5, 3, 4, 5, 6, and 8 mm Allen wrenches.
- 8, 9 10, 11, 15, and 32 mm box wrenches
- Two tire levers.

Bicycle Fixit Station shall be Dero Fixit with Air Kit 2, or approved equal.

Article 24.3 Method of Measurement

Bicycle Fixit Station shall be measured by the complete unit constructed and installed in locations identified in the plans including all mounting hardware and Bicycle Fixit Station tools.

Article 24.4 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

Payment shall be made under the following unit:

ITEM	UNIT
Bicycle Fixit Station	Each

G. DIVISION 75 STANDARD CONSTRUCTION SPECIFICATIONS FOR LANDSCAPING IMPROVEMENTS

SECTION 75.02 LANDSCAPING

Article 2.1 General

B. A. Scope of Work

Add the following paragraph:

The Work shall also include an extended maintenance period and all equipment, labor, materials and transportation necessary to Prune Existing Trees, and to maintain the Landscape and Moose Protection Fence.

1. Installation of Tree Protection Zone Fences shall be per Section 75.12 Tree Protection Zone Fence.
2. Installation of Moose Protection Fence shall be per Section 75.14 Moose Protection Fence.

Article 2.2 Materials

Add the following paragraph:

Mulch shall not be integral to the cost of new plantings and shall be paid as a separate pay item as described in Article 2.7 below.

In instances noted in the drawings where mulch shall match existing materials, the contractor shall submit two pounds of proposed mulch for inspection by Engineer prior to installation.

Article 2.3 Construction

Delete and replace the existing Paragraph with the following:

M. Pruning and Repair

For new plantings, the only pruning allowed at planting shall be removal of dead, damaged, or broken branches and roots. Pruning shall conform to the American National Standard for Tree Care Operation, ANSI A300. No pruning paint or other wound dressing shall be used.

Article 2.4 Maintenance

A. General

Add the following:

1. Extended Maintenance: The plant establishment period shall be extended one year. The Contractor shall furnish all labor, materials, supplies and equipment required to maintain the Landscape and the Moose Protection Fence one year beyond the standard one-year plant establishment period from the date of acceptance of the initial planting operations. Contractor shall conduct periodic visual inspections and repair any damage due to moose, other wildlife or vandalism immediately. The Engineer may notify the Contractor about damages in which case the repairs shall be made

within 24 hours. The Contractor shall repair and replace all materials damaged or destroyed within the scope of the Work, regardless of cause.

2. The Contractor shall also furnish all labor, materials, supplies and equipment required remove the Moose Protection Fence two years from the date of acceptance of the initial planting operations.

Article 2.5 Landscaping Acceptance

Delete the second paragraph and replace with the following:

A Landscaping Acceptance Inspection of the project will occur after completion of the Plant Establishment Period. Engineer shall verify that Contractor performed maintenance functions as identified in Article 2.4 – Maintenance of this Section. Additional conditions governing Landscaping Acceptance of the planted and seeded areas are that, in the opinion of the Engineer, all plants are in a live, uniform, and sound and healthy and flourishing condition; free of disease, insect infestation and physical damage, and free of weeds, rubbish and construction debris. The Engineer shall verify that all Moose Protection Fencing has been removed as identified in Article 2.4 Maintenance of this Section. If the Engineer does not accept the plantings and removal of Moose Protection Fencing, the Contractor shall correct all deficiencies. All costs associated with correcting the deficiencies and extending the Plant Establishment Period shall be paid by the Contractor without additional cost to the Owner.

Should required corrections not be made within thirty (30) days after the initial Landscaping Acceptance Inspection, the Contractor shall be assessed liquidated damages per Division 10, Section 10.05, Article 5.27 – Liquidated Damages, until all Work is complete and accepted by the Engineer.

Article 2.7 Basis of Payment

Add the following pay item:

ITEM	UNIT
Extended Maintenance	Lump Sum
Rock Mulch	Cubic Yard
Shredded Bark Mulch	Square Yard

Add the following New Sections:

SECTION 75.12 TREE PROTECTION ZONE FENCE

Article 12.1 General

The Work under this Section includes but is not limited to all equipment, labor, and transportation necessary to provide and remove Tree Protection Zone Fences as specified herein. Tree Protection Zone Fences are required where all work abuts mature tree plantings that are to remain in place. Tree Protection Zone Fences are to be removed when construction is complete.

Tree Protection Zone (TPZ): Tree Protection Zones shall be per Section 75.02.

The Contractor is responsible for the verification of all existing utilities or requesting locates of underground utility lines.

Article 12.2 Submittals

A. Certification: provide a certification from a certified arborist that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

B. Maintenance Recommendations: From certified arborist, for care and protection of trees affected by construction during and after completing the Work.

Article 12.3 Quality Assurance

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to project site during execution of tree protection and trimming.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.

C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

D. Pre-installation Conference: Before tree protection operations begin, meet with the Engineer, Arborist to review tree protection procedures and responsibilities and determine tree protection fencing limits on site.

E. Prior to any excavation, tree protection limits will be staked by the Contractor and approved by the Engineer.

F. Provide written acceptance from a certified arborist that trees indicated to remain and protected by Tree Protection Zones have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

Article 12.4 Materials

A. Topsoil: Topsoil shall be per Section 75.03

B. Temporary Construction Fencing: 4’ High, high visible orange safety fence.

C. Steel T-Posts: with pointed end and reflective safety caps, green color.

Article 12.5 Construction

A. Construction Fencing: Install fencing around Tree Protection Zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused

by dewatering operations. Root pruning shall be per Section 75.13 ROOT PRUNING.

C. Do not store construction materials, debris, or excavated material inside Tree Protection Zones. Do not permit vehicles or foot traffic within Tree Protection Zones; prevent soil compaction over root systems.

D. Ensure that branches of trees within the Tree Protection Zone are not broken by equipment.

E. Maintain Tree Protection Zones free of trash.

F. Do not allow fires within Tree Protection Zones.

Article 12.6 Tree Repair

Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to Contractor Arborist's written instructions.

Article 12.7 Measurement

Measurement for Temporary Tree Protection Fence shall be by the linear foot.

Article 12.8 Basis of Payment

Payment for the Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Unit cost payment shall be made on the following basis:

ITEM	UNIT
Temporary Tree Protection Fence	Linear Foot

SECTION 75.13 ROOT PRUNING

Article 13.1 General

The Work under this Section includes but is not limited to all equipment, labor, and transportation necessary to provide root pruning as shown on the Drawings and specified herein. Root Pruning is required where all work abuts mature tree plantings that are to remain in place.

The Contractor is responsible for the verification of all existing utilities or requesting locates of underground utility lines.

Article 13.2 Materials

Burlap: A strong woven fabric made of jute, hemp, or flax fibers.

Article 13.3 Quality Assurance

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that

required for this Project and that will assign an experienced, qualified arborist to project site during execution of tree protection and trimming.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.

Article 13.4 Construction

A. Workmanship and Procedure

Root Pruning shall be performed when below ground construction occurs within 16 feet of a mature tree. Mature trees are trees that are 4" diameter at breast height (DBH) or greater in size. Root Pruning shall be done to a depth of 18 inches. The distance to prune away from the base of a tree shall be determined by providing 1 foot of horizontal distance from the trunk of the tree for every 1 inch of DBH of that tree.

1. All roots 1" in diameter or greater shall be cut clean with a root pruner, a sharp saw, and/ or hand pruners.
2. Roots must not be pruned or removed from more than one side of a tree.
3. All pruned roots are to be covered by wet burlap and kept moist for the duration of time that the root is exposed.
4. Topsoil shall be used to backfill the excavated area around the root.

B. Maintenance

Keep the burlap that is covering pruned roots moist for the duration of time that the root is exposed.

Article 13.5 Measurement

Measurement for Root Pruning shall be by the linear foot.

Article 13.6 Basis of Payment

Payment for the Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Unit cost payment shall be made on the following basis:

ITEM	UNIT
Root Pruning	Linear Foot

SECTION 75.14 MOOSE PROTECTION FENCE

Article 14.1 General

The work under this section includes but is not limited to all labor, materials, transportation, and maintenance necessary to furnish and install temporary fencing for moose protection as shown on the drawings and specified herein. Moose Protection Fence is required around all new individual deciduous trees and/or deciduous tree groupings.

The Contractor is responsible for the verification of all existing utilities or requesting locates of underground utility lines.

Article 14.2 Materials

Posts: Steel T- posts with pointing, green color, 9' height.

Fabric: Fabric shall be 1-3/4 inch opening black nylon netting with 5/16" black polyester rope border. Use metal ties to secure to posts.

Article 14.3 Construction

A. Workmanship and Procedure

Moose protection fencings shall be erected immediately following the tree installation. The moose protection fencing shall be place at the outside edges of individual deciduous trees and/or all deciduous tree groupings. All deciduous trees shall be enclosed within the fencing without damaging branches or allowing branches to protrude.

B. Detail Drawings:

All assemblies specified herein shall be installed in accordance with the drawings.

C. Maintenance:

Maintenance of the Moose Protection Fence shall be per Section 75.02.

Article 14.4 Measurement

Measurement for Moose Protection Fence shall be by the linear foot.

Article 14.5 Basis of Payment

Payment for the Work shall be in accordance with Division 10, Section 10.07 – Measurement and Payment, and shall include full payment for all Work described in this Section.

Unit cost payment shall be made on the following basis:

ITEM	UNIT
Moose Protection Fence	Linear Foot

J. DIVISION 80 STANDARD CONSTRUCTION SPECIFICATIONS FOR TRAFFIC SIGNALS AND ILLUMINATION

SECTION 80.01 GENERAL

Article 1.1 Scope of Work

Add the following at the end of the first paragraph:

The General requirements of this Section shall apply to all Sections within Division 80.

Article 1.2 Regulations and Codes

Add the following to the first paragraph:

For all Division 80 items furnish listed or labeled components, including individual components as well as complete assemblies, whenever those components are available with the listing or labeling.

SECTION 80.04 FOUNDATIONS

Article 4.1 General

Delete the first paragraph and add the following:

Install cast-in-place Portland Cement Concrete foundations for traffic signal poles, signal pedestal poles, and pedestrian pushbutton posts. Install driven pile foundations for luminaire poles.

Article 4.5 Driven Pile Foundation

Add the following after the second paragraph:

For fixed base pile caps, 1/8” plasma cut from edge to hole is acceptable for plasma cut bolt holes.

Add the following to the end of the Article:

Contractor shall pre-excavate holes with vactor truck when proposed pole location is within 10-feet of an existing buried utility. Excavation depth shall be a minimum of 12-inches below the anticipated depth of the utility before driving pile. Excavation shall be backfilled and compacted after pile driving is complete.

Article 4.6 Measurement

Append the following to the last paragraph:

All survey and staking work required to locate the foundations shall be incidental to the work. All work to pre-excavate for driven pile foundations shall be considered incidental to the work.

Article 4.7 Basis of Payment

Add the following pay item:

ITEM	UNIT
Cast-In-Place Light Column Foundation	EA

SECTION 80.08 JUNCTION BOXES

Article 8.4 Measurement

Append the following to the last paragraph:

All survey and staking work required to locate the junction boxes shall be incidental to the work.

SECTION 80.13 BONDING AND GROUNDING

Article 13.1 General

Add the following after the first paragraph:

In junction boxes, provide enough slack in the grounding conductors to ensure the conduits remain securely bonded to ground should the conduits move for whatever reason.

SECTION 80.18 VEHICLE DETECTORS

Article 18.3 Radar Detectors

Replace this Article in its entirety with the following:

For vehicle detection, provide a Wavetronix digital wave radar vision system or approved equivalent that consist of the following components:

A. Stop bar detector (SBD). For all approaches, provide an above-ground stop bar detector (SBD) equivalent to the Wavetronix SmartSensor Matrix® that will detect all vehicles, including bicycles for reliable and accurate presence detection.

1. Physical Properties. The SBD shall not exceed 5 lbs. in weight. The SBD shall not exceed 14 in. x 12 in. x 4 in. in its physical dimensions. All external parts of the SBD shall be ultraviolet-resistant, corrosion resistant, and protected from fungus growth and moisture deterioration.
2. Enclosure. The SBD shall be enclosed in a Lexan EXL polycarbonate. The enclosure shall be classified "f1" outdoor weather ability in accordance with UL 746C, watertight according to the NEMA 250 Standard, and conform to test criteria set forth in the NEMA 250 standard for type 4X enclosures.
3. Power. The SBD shall consume less than 10 W, operate with a DC input between 9 VDC and 28 VDC, and have an onboard surge protection.

4. Communication. The SBD shall have two half-duplex RS-485 com ports support for dedicated detection comms; and for configuration, verification, or traffic display without disrupting detection comms. The SBD shall support the upload of new firmware into the SBD's non-volatile memory over Ethernet communication port. Both communication ports shall support all of the following baud rates: 9600, 19200, 38400, 57600 and 115200 bps.
5. Operating Conditions. The SBD shall maintain accurate performance in all weather conditions, including: Rain, freezing rain, snow, wind, dust, fog and changes in temperature and light, including direct light on sensor at dawn and dusk. SBD operation shall continue in rain up to 1 in. (2.5 cm) per hour; capable of continuous operation over an ambient temperature range of -40°F to 165°F, and a relative humidity range of 5% to 95% (non-condensing).
6. Testing. Each SBD shall be Federal Communications Commission (FCC) certified under CFR 47, Part 15, section 15.249 as an intentional radiator and a FCC certification shall be displayed on an external label on each SBD according to the rules set forth by the FCC. The SBD shall also be tested under IEC 61000-4-5 class 4 and NEMA TS2-2003 Testing. The SBD shall comply with the applicable standards stated in the NEMA TS2-2003 Standard. Third party test results shall be made available when requested.
7. Manufacturing. The SBD shall be manufactured and assembled in the U.S.A.
8. Support. The SBD manufacturer shall provide both training and technical support services.
9. Training. The manufacturer-provided training shall be sufficient to fully train installers and operators in the installation, auto-configuration, and use of the SBD to ensure accurate SBD performance.
10. Technical Assistance. A manufacturer-provided technical representative shall be available to assist with the physical installation, alignment, and configuration of each supplied SBD. Technical support shall be provided thereafter to assist with troubleshooting, maintenance, or replacement of SBDs should such services be required.
11. Documentation. SBD documentation shall include an instructional training guide, a comprehensive user guide, as well as an installer quick-reference guide and a user quick-reference guide. The SBD manufacturer shall supply the following documentation and specification test results at the time of the bid submittal:

    e. FCC CFR 47 certification

    f. IEC 61000-4-5 class 4 test report

B. Continuous tracking advance extended range detector (CTAD). For all northbound and southbound intersection approaches, provide a CTAD

equivalent to the Wavetronix SmartSensor Advance Extended Range® for enhanced dilemma zone detection.

The CTAD shall be able to detect and report information on the roadway located with the near boundary at 50 feet and a far boundary of up to 900 feet from the base of the pole on which the CTAD is mounted.

1. Physical Properties. The CTAD shall not exceed 5 lbs. in weight. The CTAD shall not exceed 14 in. x 12 in. x 4 in. in its physical dimensions. All external parts of the CTAD shall be ultraviolet-resistant, corrosion resistant, and protected from fungus growth and moisture deterioration.
2. Enclosure. The CTAD shall be enclosed in a Lexan EXL polycarbonate. The enclosure shall be classified "f1" outdoor weather ability in accordance with UL 746C, watertight according to the NEMA 250 Standard, and conform to test criteria set forth in the NEMA 250 standard for type 4X enclosures.
3. Power. The CTAD shall consume less than 8 W, operate with a DC input between 12 VDC and 28 VDC, and have an onboard surge protection.
4. Communication. The CTAD shall have two serial communication ports, and both ports shall communicate independently and simultaneously. The CTAD shall support the upload of new firmware into the CTAD's non-volatile memory over Ethernet communication port. Both communication ports shall support all of the following baud rates: 9600, 19200, 38400, 57600, and 115200 bps.
5. Windows Mobile®-based Software. The CTAD shall include graphical user interface software that displays the current traffic pattern using a graphical traffic representation.
    a. The graphical user interface shall also display all configured alerts and provide visual representation of their actuation.
    b. The graphical user interface shall provide a means of logging the vehicular track files with an update rate of greater than five times per second.
    c. The graphical interface shall operate on Windows Mobile, Windows 2000, Windows XP and Windows Vista in the .NET framework.
    d. The software shall support the following functionality:
        - Automatically find the correct baud rate
        - Automatically find the correct serial communication port
        - Operate over a TCP/IP connection
        - Provide a virtual sensor connection for software usability without a sensor

- Give the operator the ability to save/back up the CTAD configuration to a file or load/restore the CTAD configuration from a file

6. Operating Conditions. The CTAD shall maintain accurate performance in all weather conditions, including: Rain, freezing rain, snow, wind, dust, fog and changes in temperature and light, including direct light on sensor at dawn and dusk. CTAD operation shall continue in rain up to 1 inch per hour; capable of continuous operation over an ambient temperature range of -40°F to 165°F, and a relative humidity range of 5% to 95% (non-condensing).
7. Testing. Each CTAD shall be Federal Communications Commission (FCC) certified under CFR 47, Part 15, section 15.249 as an intentional radiator and a FCC certification shall be displayed on an external label on each SBD according to the rules set forth by the FCC. The SBD shall also be tested under IEC 61000-4-5 class 4 and NEMA TS2-2003 Testing. The SBD shall comply with the applicable standards stated in the NEMA TS2-2003 Standard. Third party test results shall be made available when requested.
8. Manufacturing. The CTAD shall be manufactured and assembled in the U.S.A.
9. Support. The CTAD manufacturer shall provide both training and technical support services.

   Training. The manufacturer-provided training shall be sufficient to fully train installers and operators in the installation, auto-configuration, and use of the detector unit to ensure accurate CTAD performance.

   Technical Assistance. A manufacturer-provided technical representative shall be available to assist with the physical installation, alignment, and configuration of each supplied detector unit. Technical support shall be provided thereafter to assist with troubleshooting, maintenance, or replacement of the detector unit should such services be required.
10. Documentation. Documentation shall include an instructional training guide, a comprehensive user guide, as well as an installer quick-reference guide and a user quick-reference guide. The manufacturer shall supply the following documentation and specification test results at the time of the bid submittal:

    a. FCC CFR 47 certification

    b. IEC 61000-4-5 class 4 test report

C. Click 650 cabinet interface device (CIB). For each temporary signal cabinet, provide a Click 650 that will provide a streamlined communication for SmartSensor Matrix, Smartsensor Advance, and Smartsensor Advance Extended Range to traffic controllers in one compact case. This module communicates directly to the controller through SDLC, and supports contact

closure devices as well. It also provides power, surge protection, and Ethernet connectivity for all sensors.

1. Included components.
    a. Click 650, AC power cord, Extra fuse, Terminal blocks for attaching to cable, and 4 jumper cables
2. Physical.
    a. Weight: 4.9 lbs.
    b. Physical dimensions: 7.8 in. × 10.3 in. × 3.9 in.
    c. Ambient operating temp: -29°F to 165°F
    d. Humidity: up to 95% RH
3. Mounting.
    a. Shelf-mount
4. Power.
    a. Power supply voltage: 90 to 260 VAC
    b. AC frequency: 50–60 Hz
    c. Max power: 75 W @ 80ºC
    d. 24 VDC output on sensor connectors
5. Connections and Communications.
    a. One RJ-45 10/100 Ethernet jack
    b. One SDLC port
    c. Four terminal block connectors on back of device for connecting to sensors
    d. Four RJ-11 jacks on faceplate of device for connecting to contact closure devices
    e. Four communication ports on faceplate
        - DB-9 port for communicating via RS-232
        - Two RJ-11 jacks for communicating via RS-485
        - USB mini-B connector
        - T-bus port
6. Testing.
    a. Complies with the applicable standards stated in the NEMA TS2- 2003 Standard
    b. FCC-compliant
    c. Passes manufacturer’s test before shipping

D. SmartSensor Manager Matrix (SSMM) software

E. SmartSensor Manager Advance software for automatic and manual sensor configurations

F. SmartSensor Mount

1. General. Provide traffic sensor mounting assembly equivalent to the Wavetronix SmartSensor mount.
2. Mounting. The mounting assembly shall provide at least two axes of rotation to ensure proper installation.
   a. The mounting assembly shall be able to support at least a 15-lb. load.
   b. The mounting assembly shall feature a symmetric hole pattern that mates with fixed and rotational SmartSensor back plates.
   c. The mounting assembly shall have two contact points with the pole.
   d. The mounting assembly shall be slotted for 3/4" banding.
3. Construction. The mounting assembly shall be constructed of 0.1875" thick or thicker aluminum with 316 stainless steel hardware. The mounting assembly shall be powder coated for oxidation resistance.

G. Installation Kit

General. Provide an installation kit equivalent to the Wavetronix Install Kit, for use while installing and configuring radar vehicle sensing devices or continuous tracking advance detectors, equivalent to the Wavetronix SmartSensor products, or in-cabinet contact closure and communication connectivity devices equivalent to the Wavetronix Click! Products.

H. For each radar sensor, provide a Type 4X cable junction box enclosure to connect the Wavetronix 6-conductor pigtail cable to the APT Matrix 2 homerun cable.

I. Wavetronix SmartSensor 6-conductor cable. For each detector provide a cable of length indicated in the plans.

J. APT Matrix Type 2 Home Run cable. For each detector provide a cable of length to run from the in-line terminal enclosure at the pole base handhole to the Click 650 unit inside the controller cabinet. Provide 15 feet of neatly coiled slack cable in the base of the controller foundation. Provide sufficient slack at pole, so the in-line terminal enclosure can be pulled out of the handhole for maintenance work.

SECTION 80.23 LUMINAIRES

Delete this Section in its entirety and replace with the following:

Article 23.1 General

Provide the luminaire(s) specified on the Drawings. Furnish luminaires with the light distribution and light source specified, i.e. color enhanced high pressure

sodium, metal halide, or induction lamps or light emitting diodes (LEDs). Furnish lamps of the wattages specified, number of lumens and/or the number of LEDs to be furnished. The light sources shall feature a color rendering index of at least 65 as determined by their manufacturer.

Provide LED luminaires that produce light with a color correlated temperature (CCT) specified on the Drawings.

After the luminaire poles have been installed and plumbed, the Contractor shall level each luminaire to ensure it provides the light distribution used to design the system.

When allowed on the Drawings, the Contractor may furnish approved equal luminaires. The Contractor shall submit the following documents for approval:

A. Luminaire specifications, including dimensions, and a photograph,

B. Electronic photometric data in Illuminating Engineering Society (I.E.S.) format, preferably by a link to the manufacturer's web site, including the photometric identification number(s),

C. The input and output of a lighting analysis program,

D. The input shall include each lamp or LED bars lumen output, lumen maintenance factors, and each luminaire's photometric identification number, drawing pole number, mounting height, spacing, and offset from the traveled way.

E. The output shall verify each luminaire provides the average light levels, uniformity ratios, and veiling luminance criteria for the roadways, pedestrian facilities, and intersections listed on the Drawings.

F. Manufacturer's Warranty information for the substituted fixture. Ten year minimum is required.

Article 23.2 Light Distribution

The luminaires furnished shall provide the light distribution(s) specified on the Drawings in the following terms as defined by the Illuminating Engineering Society (IES). The distribution along a roadway (longitudinal) shall be short, medium, or long; the luminaire cutoff angle cutoff angle shall be full cutoff for all fixtures and the distribution across a roadway (lateral) shall be Type 1, Type 2, Type 3, Type 4, or Type 5.

Prior to installation, Contractor shall check the socket position in the luminaire to verify it corresponds to the setting indicated in the instructions for the light distribution type shown on the Drawings.

Article 23.3 Luminaire Features

Luminaires shall feature:

A. Corrosion-resistant enclosures with space for the driver or ballast and a gray or silver paint finish.

B. Third party certification for use in wet locations.

C. Terminal blocks for attaching the illumination tap conductors.

D. Optical components free of substances that affect photometric performance, e.g. paint.

E. Housings cast with no provision for a photoelectric control receptacle, except those luminaires specified to be furnished with a photoelectric control.

F. Gaskets that are securely held in place and are composed of material capable of withstanding the temperatures generated by an operating luminaire on the hottest day.

G. 7-pin twist-lock receptacle compliant with NEMA standard C136.41 to provide ON/OFF and dimming control with shorting cap.

Article 23.4 Measurement

Luminaires will be measured as units complete, leveled, and in place, including all labor, equipment, and materials to provide a complete and functioning unit.

Spare Luminaire will be measured as complete units delivered to the MOA Orca Street Pole Yard (Contact: Paul VanLandingham at 343-8372 for specific delivery instructions).

No measurement for payment will be made until a functional field test has been completed in accordance with Section 80.16, Article 16.2 Field Tests.

Article 23.5 Basis of Payment

Payment of this Work shall be in accordance with Division 10 Standard General Provisions, Section 10.07 Measurement and Payment, of this Specification, and shall include full payment for all Work described in this Section.

Payment shall be made under the following units:

ITEM	UNIT
Luminaire (No. of Lumens) (Longitudinal) (Lateral)	Each
Spare Luminaire (No. of Lumens) (Longitudinal) (Lateral)	Each

SECTION 80.28 SALVAGING ELECTRICAL EQUIPMENT

Article 28.1 General

Delete the eighth paragraph in its entirety and replace with the following paragraph:

Unless specified otherwise in the Contract Drawings or Specifications, dispose of the following items that are not being reused as indicated in the following list.

A. Completely remove the following:
   1. Junction boxes
   2. Overhead conductors feeding luminaires

3. Conductors from conduit
4. Load center and controller cabinet foundations
5. Foundations for poles with shaft lengths less than 15 feet long
6. Luminaire pole and signal pole foundations that conflict with the completion of the work
7. Surface mounted conduit
8. Surface mounted junction boxes

B. Remove conduits and detectors that conflict with the completion of the work and abandon those that do not.

1. Luminaire pole and signal pole foundations that do not conflict with the completion of the work may be abandoned after removing the top of the foundations, including the concrete, rebar, conduits, and anchor bolts, to a depth at least one foot below finished grade.
2. Remove all items specified to be removed from the project Right-of-Way. Backfill the holes resulting from the removal of the following items with material equivalent to the original material compacted to the density of the surrounding ground.

Article 28.2 Measurement

Delete the first paragraph in its entirety and replace with the following paragraphs:

Except for the pay items established in Article 28.3, the work specified in this Section will not be measured for payment and will be considered incidental to other items of work.

Measurement for removal of each luminaire pole or combination pole is per each unit removed.

Measurement for all materials specified to be removed in this Section and on the Contract Drawings includes:

- all work necessary to remove, disassemble, salvage, and load the materials onto a delivery vehicle,
- delivery of all salvaged materials to the Municipality of Anchorage Pole Yard or other location that may be specified in the Contract Drawings,
- cutting poles and mast arms rejected by MOA personnel ten feet above the base or anchor plate,
- allowing MOA personnel to select the materials they would like to keep,
- disposal of all materials rejected by MOA personnel, and
- removal and immediate disposal of all materials not specified to be salvaged, including underground conduits, conductors, loop detectors, and foundations.

When the Contract Drawings or the Special Provisions are unclear as to the method of pole removal, salvage, or disposal, Contractor shall contact the Engineer to receive specific instructions.

Add the following New Section

SECTION 80.29 PEDESTRIAN LIGHT COLUMN

Article 29.1 General

The Work under this Section consists of all labor, equipment, and materials necessary to install pedestrian light columns, as indicated on the Drawings and as specified herein.

Install the necessary conduit, Type 1A J-box and conductors to the electrical supply designated on the Drawings.

The foundations for pedestrian light columns shall conform to the requirements of Section 80.04, Foundations.

For the item Pedestrian Light Column provide Phillips Lumec SoleCity LED Light Column as specified in the Drawings or equal.

Article 29.2 Spare Pedestrian light column

Spare Pedestrian Light Column will be measured as complete units delivered to the MOA Orca Street Pole Yard (Contact: Paul VanLandingham at 343-8372 for specific delivery instructions).

Article 29.3 Measurement

The Pedestrian Light Column shall be measured as a single unit, complete, and in place including all hardware and all wiring within the pole. No measurement for payment will be made until a functional field test has been completed in accordance with Section 80.16, Article 16.2 Field Tests.

Method of measurement for furnishing spare pedestrian light column shall be per each unit delivered and accepted.

Article 29.4 Basis of Payment

Payment for this Work shall be in accordance with M.A.S.S. Section 10.07 Measurement and Payment, as amended in these specifications, and shall include full payment for all Work as described in this Section.

ITEM	UNIT
Pedestrian Light Column	Each
Spare Pedestrian Light Column	Each

*****END OF SPECIAL PROVISIONS*****

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

APPENDIX A

ENVIRONMENTAL PERMITS

ENVIRONMENTAL PERMITS (IF REQUIRED)

WILL BE PROVIDED FOR 95% DESIGN

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

APPENDIX B

UTILITY CLEARANCE REQUIREMENTS

Safety Requirements For Excavation Adjacent To Natural Gas Pipelines

ENSTAR Natural Gas Company/Alaska Pipeline Company

Safety

ENSTAR Natural Gas Company provides natural gas service through 3080 miles of gas mains to over 140,000 customers in South Central Alaska. ENSTAR's gas pipeline system is designed, installed, and maintained with the highest regard for safety in compliance with applicable federal, state, and local government statutes and regulations. ENSTAR is regularly inspected to ensure that its operation meets industry standards.

The US Department of Transportation, Pipeline & Hazardous Materials Safety Administration (PHMSA) oversees minimum safety regulations for the transportation of natural gas by pipelines. The DOT safety regulations are currently published in Title 49, Part 190, 191, 192 & 199 of the Code of Federal Regulations (CFR).

As an operator of a natural gas system, ENSTAR is required by the DOT regulations to:

1. Deliver gas safely and reliably to customers.
2. Provide qualification training and written instruction for employees.
3. Establish written procedures to minimize hazards resulting from gas pipeline emergencies.
4. Keep records of inspections and testing.
5. Test employees in safety-sensitive positions for prohibited drugs and alcohol.

Damage Prevention Law Enforcement Program

As of 1 January, 2016, standards for excavation in Alaska will be enforceable by PHMSA. *The enforcement program protects the public from the risk* of pipeline ruptures caused by excavation damage. Should an excavator operate in violation to 49 CFR parts 196 and 198, they may face civil and or criminal penalties under this new rule. More information about the PHMSA ruling can be found at http://www.phmsa.dot.gov/.

Pipeline Reliability

Safety is and always will be unequivocally the number one priority for the natural gas industry. The industry spends billions of dollars each year to ensure the safety and reliability of the natural gas infrastructure. Natural gas utilities are subject not only to their own stringent internal controls, but also must meet rigorous federal and state oversight. Inspections are performed regularly by PHMSA regulators to ensure that compliance is being met.

Historically, excavation damage is the leading cause of most serious pipeline failures. Over 30% of the 284 damages to ENSTAR's pipelines last year were done by excavators that failed to obtain locates. Call before you dig, it's free and it's the law. Calling for locates is now as simple as dialing **811** or go online to www.akonecall.com . Dialing **811** anywhere in the United States connects you with the Locate Call Center for that area. In Alaska, dialing **811** connects you with Alaska Digline Inc. Alaska Digline Inc. will take your excavation information and notify all affected utilities. Utilities have two business days to mark their utilities after receiving your call.

Pressure Classification

Natural gas is a potentially dangerous, compressible gas. Gas pipelines with the highest pressure contain the highest stored potential energy and present the greatest risk. Caution is always warranted when working around natural gas facilities. **Extreme caution must be exercised whenever transmission pipelines are encountered. Contact ENSTAR Engineering Dept., (907) 334-7740 for specific instructions before working within 10 feet of any transmission pipeline.**

Pressure Classification	Pressure Rating Range	Pipeline Material
Transmission Pressure	Over 100 psi	Steel
Distribution Pressure	100 psi and under	Polyethylene, Steel, Copper

Recognizing ENSTAR's Pipelines

ENSTAR transmission pipelines are generally marked above ground with pipeline markers similar to the one shown. Transmission pipelines are located in the vicinity of the pipeline markers. Transmission pipelines are steel and range in size from 2" to 20" in diameter. They are typically coated with a protective coating. There is no single color but yellow and black are the predominant color while some are green or brown.

Typical ENSTAR Pipeline Marker

Distribution pipelines are steel, or High Density polyethylene with locate wire. These pipelines range in size from 1" diameter to 12" in diameter. Gas "Mains" are typically found in street right-of-ways or utility easements and supply the natural gas to an entire street or subdivision.
Natural gas "service lines" are connected to the gas main. Service lines generally serve a single building or small group of buildings on private property. Service lines are typically ½" to 1" in diameter. Service lines can be rigid steel, steel tubing, copper or polyethylene with locate wire. Gas mains and service lines are generally black or yellow in color.

Excavation Requirements for Natural Gas Pipelines

1 **Line Locating is a Free Service:** To request a locate, dial **811** the new Nationally recognized One-Call number and you will be connected to Alaska Digline Inc. Call at least two but not more than 15 working days before the date scheduled for beginning the excavation. Hand digging is advised when excavating within 2 feet of a marked facility. After ENSTAR has field marked with yellow paint, or flagged the location of an underground facility, the excavator is responsible for maintaining the markings. **Failure to call is a violation of state statutes and federal regulations "PHMSA" could result in fines well in excess of the cost of the damage.**

2 **Support for Steel Pipeline Crossings:** If an excavation below a **steel gas** pipeline leaves the pipeline unsupported for a distance of more than 20 feet, the excavator must provide additional support for the pipeline. Support must be provided in a way as to not damage the pipe or its coating during construction, backfill placement, and compaction. Generally, a support spacing of 5 feet or less will provide the needed bracing. ENSTAR Engineering must approve all excavations crossing steel pipelines above 4-inch diameter. If support is required, ENSTAR engineering written approval is required prior to beginning construction. Call ENSTAR Engineering (907)334-7740 for further information. Extra care must be taken when geotextile fabric and/or rigid insulation are used. Geotextile fabric and/or rigid insulation shall be sufficiently separated from steel pipeline and in addition to continuous support under the pipeline, compacted fill material shall be placed between the geotextile fabric/rigid insulation and the pipeline (see item 8 clearance). Care shall be taken to insure stability for the ENSTAR facility. Failure to properly protect ENSTAR's facilities could result in future damage if differential settlement occurs.

3 **Support for Polyethylene Line Crossings:** If an excavation is below a **polyethylene gas pipeline** the excavator must continuously support such pipeline during construction, backfill placement, and compaction. Geotextile fabric and/or rigid insulation shall be sufficiently separated from the polyethylene gas pipeline to prevent undue stress during the compaction/settlement process. (see item 8 clearance)

4 **Excavation Parallel to Pipeline: Whenever an excavation (horizontal or vertical) is performed within 5 feet of a distribution pressure pipeline and 10 feet of a transmission pressure pipeline, the gas pipeline must be exposed to visually determine the exact location.** When parallel excavations are expected to expose or undermine sections of pipeline, the excavator must notify ENSTAR engineering in advance. Care must be taken not to damage the pipeline, or to induce stresses due to differential settlement following construction. **Long parallel excavations exposing pipelines can be very dangerous if not properly performed and shall**

not be attempted without prior approval by ENSTAR. Unless otherwise approved by ENSTAR engineering, all excavations parallel to a gas pipeline shall be exposed at intervals no greater than every 25 feet to visually determine the pipeline's exact location. Contact ENSTAR Engineering at (907)334-7740 for additional information.

5 **Blasting:** All blasting that is to be done within 500' of any Company Facility, shall be reviewed by an ENSTAR engineer, with the person performing the blasting and appropriate measures, (i.e. require minimum distance from facilities, minimize blasting charge intensity, etc.) shall be taken to protect the integrity of the Company's Facilities. A leak survey shall be performed before and after any blasting activity, which is within 500' of any Company Facility. The leak survey zone shall include all Company Facilities within 500' radius of the blasting.

6 **Trenchless Excavation (Vertical or Horizontal): Whenever a trenchless excavation (horizontal or vertical) is performed within 5 feet of a distribution pressure pipeline and 10 feet of a transmission pressure pipeline, the gas pipeline must be exposed to visually determine the exact location.** If the trenchless excavation is expected to cross the pipeline within the aforementioned distances, the pipeline in question shall be fully exposed to a minimum of 1 foot beneath the pipeline prior to the expected crossing to ensure that the pipeline is not unduly damaged due to ground movement in the immediate vicinity of the pipeline. **When performing a trenchless excavation parallel to a gas pipeline, the gas pipeline must be exposed at intervals of 25 feet or less to visually determine the pipeline's exact location.** Trenchless excavation is defined as drilling, directional drilling, boring, pile installation etc.

7 **Clearance:** Natural Gas pipelines require a **12 inch minimum separation from other underground structures** not associated with ENSTAR's pipeline system. Additional clearance from other underground structures may be required to allow proper maintenance and reduce the possibility of damage due to the proximity of other structures (49 CFR § 192.325.) This clearance requirement includes rigid insulation and geotextile fabrics. **ENSTAR requires a 36-inch minimum separation from certain electrical facilities, including any grounded components i.e. ground rods, non-insulated conductors and associated structures.**

8 **Pipeline Cover:** ENSTAR pipelines in public rights-of-way are generally installed with 36 inches to 48 inches of cover, and in private rights-of-way with 12 inches to 36 inches of cover. Projects that decrease cover or increase cover in excess of 60 inches must receive prior approval from ENSTAR Engineering Department (907)334-7740. ENSTAR has limited ability to prevent the removal of cover over gas pipelines. Increasing pipeline cover more than 5 feet or decreasing pipeline cover to less than 3 feet may be considered a damage that may result in relocation of the gas pipeline at the expense of the Excavator. The depth of cover listed above cannot be assumed after installation. The excavator is responsible for any damage to ENSTAR pipelines regardless of the depth at which they are encountered.

9 **Inspection/Standby Requirements:** All excavations in the immediate vicinity of ENSTAR Natural Gas facilities (including backfill, compaction, temporary support, and shoring), is subject to prior approval and inspection by ENSTAR personnel. Transmission pipeline inspections are provided whenever an excavator is working within 10 feet of a transmission pipeline. If it has been determined that there was excavation either by hand or machinery within 5 ft. of ENSTAR Natural Gas Distribution mains or 10 ft. from ENSTAR Natural Gas Transmission Pipelines without either locates or standby (qualified ENSTAR personnel), ENSTAR Natural Gas reserves the right to excavate to determine if there has been any damage to ENSTAR Natural Gas facilities. If damage has occurred ENSTAR Natural Gas has the right to charge the excavator for repairs.

10 **Landscaping-** Most landscaping activities require locates, and when it is determined that landscaping activities are within 5 feet of a distribution pipeline, or 10 feet of a transmission pipeline, Inspection/Standby requirements as listed above are applicable. Planting of trees and shrubs over existing pipelines is not permissible and can present a safety and reliability hazard to the pipeline.

Pipeline Components

Pipe Wall Protection

Dents, scrapes, gouges and scratches reduce pipeline wall thickness and affect the safety of the facility in two ways. First, the reduced wall thickness decreases the pressure at which the pipeline can safely operate. Second, the damage serves as a stress concentration that can cause a future brittle failure of the

pipeline. **An ENSTAR representative must inspect each dent, scrape, gouge or scratch, no matter how small, before it is reburied.**

Corrosion Protection

ENSTAR's **steel** pipelines are protected from corrosion by a dielectric coating and an impressed current or galvanic anode cathodic protection system. Direct contact with metallic objects (a short) or removal of the protective coating can compromise this system. Contact the ENSTAR Engineering Department (907)334-7740, whenever coating damage or a short is encountered. **An ENSTAR representative must inspect each short or section of damaged coating before it is reburied.**

Locate Wire Protection

ENSTAR's **polyethylene** pipelines are installed with a parallel copper wire, which is used to locate the pipeline. If the locate wire or wire coating is damaged, ENSTAR's ability to properly locate the pipeline may be severely compromised. Electrical continuity must be maintained. **An ENSTAR representative must inspect and/repair each possible locate wire damage before it is reburied,** accidental locate wire damage repair is free of charge.

Service Line Excess Flow Valves

An Excess Flow Valve (EFV) is a safety device installed in a natural gas service line near the gas main that is designed to automatically shut off the flow of natural gas in the event that the service line is broken. Effective February 12, 2010, all gas companies nationwide are required to install an EFV in any newly installed service line that serves one single family dwelling.

What does this mean to you as an Excavator?

Should you damage a natural gas service line that has an EFV, the gas will blow for a short duration and shut off automatically if the flow of gas is sufficient to close the EFV. Damages that do not sever the service line completely may not cause the EFV to close and the gas will continue to blow. Regardless, **you must report all damages to ENSTAR immediately**. EFVs are designed to allow a small amount of "bleed-by" so they can be reset without excavating the gas main. Backfilling a damaged service line with gas bleeding underground is extremely dangerous and could fuel an explosion if it is not repaired timely. **Do not assume a damaged service is dead or abandoned if it is not blowing gas.** The EFV may have shut down the flow of gas. Report all damages immediately by calling (907)277-5551.

Please remember that the vast majority of ENSTAR service lines WILL NOT have an EFV. Should you damage a service line without an EFV, gas will blow at full line pressure until ENSTAR can arrive to shut it off. Your best protection against damaging underground utilities is to call **811** for locates and hand dig within 2 feet of the locate marks.

What to do if You Damage a Gas Line or Smell Gas

If you damage a pipeline facility, call ENSTAR's 24-hour dispatch number at (907)277-5551 or 1-844-Smell-Gas (1-844-763-5542). Call ENSTAR any time a gas line is broken, scraped, pulled, cut or otherwise damaged. **If the damage results in a release of natural gas and there is a danger to life and/or property, immediately call 911 from a gas-free area.** If it can be done safely, eliminate all ignition sources and evacuate the area of the damage. Wait for an ENSTAR representative/crew to shut off the flow of gas and make repairs.

Gas lines that have been pulled, stretched, kinked or bent could be damaged underground away from where the line is connected. If you pull or stretch gas lines call ENSTAR at (907)277-5551 and an ENSTAR Representative will investigate for possible underground leakage.

CHUGACH
POWERING ALASKA'S FUTURE

April 2014

ELECTRICAL FACILITY CLEARANCE REQUIREMENTS

Enclosed is a copy of the Chugach Electric Association, Inc. (Chugach) Electrical Facility Clearance Requirements policy. Periodically, copies of the policy are mailed out to various companies and agencies whose activities may bring their personnel in close proximity to electrical facilities. Chugach distributes copies of this policy in an effort to help minimize and identify potential hazards for construction personnel and the general public. In addition, we are concerned with preventing possible damage to our electrical facilities and disruption of electrical service to our customers. Please note that the Electrical Facility Clearance Requirements publication is now on Chugach's web site at: www.chugachelectric.com. Click on the "Customer Service" tab and go to either "For your Home" or "For Your Business", click on "Electrical Facility Clearance Requirements" (April 2014).

For your additional information, Alaska State Statute ("Article 6. Locating Underground Facilities") has been included as an attachment.

Please thoroughly read and understand the entire document. It could save your life or the life of your employees, and the general public. We request that particular attention be paid to the following provisions:

(Paragraph B. 2.) "Under no circumstances will Chugach allow any of its underground cable(s) to remain energized after it has been exposed, unless it is protected by supplementary mechanical protection approved by Chugach or unless a *qualified person* is on site at all times".

(Paragraph H. 7.) "Chugach defines a *qualified person* as a journeyman lineman who holds a current Certificate of Fitness in the Journeyman Lineman category issued by the State of Alaska". These two provisions clearly emphasize Chugach's position relating to the exposure and approach to energized facilities.

Chugach strongly recommends that prior coordination with us, either during the design phase of a project or prior to the start of actual construction, can help eliminate or minimize conflicts. If you have questions please contact the Line Operations Division at 762-7655 and your call will be directed to the appropriate department for assistance.

Sincerely,

William J. Bernier
Director, Substations and Line Operations
Enclosures

cc: Statewide Bonding Companies; State of Alaska OSHA Inspector; State of Alaska Electrical Inspector; Alaska General Contractors

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, Alaska 99519-6300 • (907) 563-7494 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com • info@chugachelectric.com

CHUGACH ELECTRIC ASSOCIATION, INC.

ELECTRICAL FACILITY CLEARANCE REQUIREMENTS FOR CONSTRUCTION OR MAINTENANCE NEAR ELECTRICAL FACILITIES

Chugach's concern for the safety of non-qualified personnel working adjacent to its electrical facilities, its concern for the public in general, and its requirement that only *qualified personnel* under the employ of *qualified electrical contractors* handle electrical facilities such as cable, poles, padmounted equipment, etc., is based upon the following considerations:

- The potential for serious injury and resulting liability is extremely high when dealing with voltages as high as 230,000 volts on overhead and underground lines.

- Certain types of equipment, particularly cable, can easily be damaged by improper handling. For example, when cable is hit or improperly suspended (common during excavation adjacent to cables), the scraped, cut, or over-stressed insulation will almost always result in premature failure of the cable. The highest risk to personnel is a failure while the cable is being handled during excavation or construction. Undetected construction damage may result in a subsequent cable failure with consumer outages for periods of up to 48 hours during winter conditions.

- The stability of overhead pole lines or padmounted equipment is jeopardized with improper excavation and backfill. This may expose the public, as well as maintenance or construction personnel, to high voltages and create consumer power outages.

The above concerns can be minimized or eliminated by the use of properly trained, licensed, and certified electrical outside linework personnel. The National Electrical Safety Code (NESC), the United States Occupational Safety and Health Administration (OSHA) and the Alaska State OSHA support this position as well as the clearances addressed herein.

NESC, Section 2, *Definitions of Special Terms* defines *"qualified"* as *"Having been trained in and having demonstrated adequate knowledge of the installation, construction, or operation of lines and equipment and the hazards involved, including identification of and exposure to electric supply and communication lines and equipment in or near the workplace."* Only qualified persons are permitted to handle or work on or adjacent to energized electrical facilities. This includes not only overhead pole lines but also padmounted and underground facilities. Within the NESC, two rules specifically address the need for qualified persons to perform work on or near energized facilities:

> Rule 420B1 states, *"Employees whose duties require working on or in the vicinity of energized equipment or lines shall perform only those tasks for which they are trained, equipped, authorized, and so directed. Inexperienced employees shall:*

(a) work under the direction of an experienced and qualified person at the site; and (b) perform only directed tasks."

Rule 420B4 states, *"Employees who do not normally work on or in the vicinity of electric supply lines and equipment but whose work brings them into these areas for certain tasks shall proceed with this work only when authorized by a qualified person."*

OSHA 29CFR 1910.269 contains the training and documentation requirements for a qualified person.

OSHA 29CFR 1926.550 (a) (15) addresses crane operations near electrical lines. For lines rated over 50 kilovolts (kV), minimum clearance between the lines and any part of the crane or load must be 10 feet plus 0.4 inch for each 1 kV over 50 kV -- or twice the length of the line insulator, but never less than 10 feet.

CHUGACH SYSTEM VOLTAGES	
Normal Voltage (Phase-to-Phase)	**Minimum Clearance Required**
Operations Near High-Voltage Overhead Power Lines to 50 kV	10 Feet
Over 50 kV to 200 kV	15 Feet
Over 200 kV to 350 kV	20 Feet

Specifically, 29CFR1926 (a) (15) (iv) requires a "Safety Observer" during crane operations if the equipment is operating where it is difficult for the operator to maintain the desired clearance to the overhead power line(s) by visual means. Alaska Statutes (AS) Sections 18.60.670 through Section 18.60.695 govern placement and operation of equipment near overhead electrical lines or conductors. 29CFR1926, Subpart P addresses the specific requirements involved with trenching operations. These include prior notice to utility companies, prior location of utility facilities, and proper supports once the facilities are exposed. Furthermore 29CFR Sections 1910.180; 1910.333; 1926.416; 1926.550; and 1926.651 regulate activities relative to job site electrical facilities.

Again, Chugach's concern for the safety of all personnel affected by work adjacent to its energized facilities has led to the development of the attached policy.

ELECTRICAL FACILITY CLEARANCE REQUIREMENTS

The following requirements have been developed to help provide a safer work site to those personnel working adjacent to Chugach's electrical facilities and to protect Chugach facilities that are located in the area of work being done by State or Municipal entities and private construction and maintenance projects.

A. NOTIFICATION

It is recommended that Chugach be informed of construction/maintenance activities as early as possible in the design process and be included in timely plan reviews. Any work that needs to be performed on Chugach facilities must have prior Chugach approval.

1. Overhead Facilities

   Any work in the proximity of overhead power lines shall be preceded by a call to Chugach at 762-7659 or 762-7669, 48 hours in advance, to notify the Line Construction and Maintenance Department of the planned work and be in compliance with OSHA 29CFR1926 (a) (15), and AS 18.60.670. If equipment, tools, machinery, or material must work in proximity closer than the minimum clearances outlined in OSHA 29CFR1926 (a) (15), and AS 18.60.670, the requirements of AS 18.60.680 shall be complied with before work can proceed. All necessary arrangements to be made with Chugach by the requesting party for compliance with AS 18.60.680 shall be arranged in advance of the project start date.

2. Underground Facilities

   Alaska Statutes 42.30.400 through 42.30.490, Anchorage Municipal Code, 24.40 and 26.90, and 29CFR1926, Subpart P place requirements on contractors who will be excavating around or adjacent to underground utilities. Advance notification requirements, underground facility locates, and the responsibilities for protection of utility facilities by contractors are specified in these regulations. All requests for locates of Chugach underground facilities are to be made through the Alaska Digline at 811. In addition, prior to excavating, Chugach shall be contacted a minimum of two (2) business days in advance. Contact the Line Operations Division at 762-7655 and your call will be directed to the appropriate department for assistance.

   Locate surface markings are only reasonably accurate to +/- two (2) feet. As a general rule, Chugach requires hand-digging within two (2) feet of locate marks but in some cases may require three (3) or four (4) feet, depending on the actual facility involved and field conditions at the project site. Maintaining locate marks is the responsibility of the party requesting the locate. Chugach may charge for re-locating and re-marking facilities that were previously marked.

B. UNDERGROUND CABLE EXCAVATION

1. Any excavation which is within a three (3) foot radius of a cable and parallels a cable for a distance greater than twenty (20) feet in length (see Section H-1 below) may require relocation of that cable. Excavations shorter in length and/or closer may also require relocation. At a minimum, cables that will require exposure must be exposed by *hand-digging* only, by a *qualified person* under the employ of a *qualified electrical contractor* (see Section H). See Drawing No. F-062388 attached.

2. Any excavation, such as a trench which crosses cable and/or conduit, shall be limited to twenty (20) feet in width and have provisions for the exposed cable/conduit to be supported every two (2) feet on a cross beam in such a manner that the outer cable jacket and/or conduit shall not be damaged in any way. The cable support work and excavation within the three (3) foot radius (see Section H-1) shall be done by a *qualified* person under the employ of a *qualified electrical contractor*.

   NOTE: When excavation must occur within the limits specified in B.1, and B.2, above, reasonable efforts will be made by Chugach to de-energize the direct buried cable if system conditions and personnel requirements allow. Even if the cable has been de-energized, a "Cable Watch" by a qualified person under the employ of a qualified contractor is still required. To request the de-energization of the cable, contact the Line Operations Division at 762-7655 and your call will be directed to the appropriate department for assistance. Requests must be made three (3) working days in advance of the outage date requested. After hours, contact Chugach's Power Control Center at 762-4660.

   Under no circumstances will Chugach allow any of its underground cable(s) to remain energized after it has been exposed, unless it is protected by supplementary mechanical protection approved by Chugach or unless a qualified person is on site at all times.

3. Should any cable be exposed by non-qualified personnel, Chugach must be immediately contacted for field investigation before work may resume in the immediate area of such exposed cable.

   Chugach recognizes that reasonable continuation of work may be required around energized underground cables after Chugach inspects the site. When this occurs, it is the responsibility of the construction contractor working at the site to arrange for qualified personnel as well as payment of the costs of said personnel and/or equipment. Chugach will neither arrange for, nor provide qualified personnel to satisfy this requirement unless it determines it is in its best interest on a case-by-case basis. Where Chugach is otherwise forced to subsequently take

steps to ensure the safety of the site, it will advise the construction contractor that it will pass these costs to the construction contractor.

4. In all cases, a final minimum burial depth of 40 to 60 inches (depending on the operating voltage) for high-voltage (above 1000 volts) primary cable/conduit and 30 inches for secondary low-voltage cable/conduit shall be maintained. If, however, existing Federal, State, or Municipal permit conditions require depths in excess of the 40 inches, then the cable/conduit shall be buried at the depth required in the permit. The depth is measured from the top of the cable/conduit to final grade at the shallowest depth. Burial shall be in compliance with Chugach Construction Standard SUR2-3 through 6 (supplied upon request).

5. Projects which increase the final grade over Chugach underground distribution cable that are direct buried shall require relocation if the final depth of burial exceeds 60" from the proposed final grade. Where the distribution cables are in conduit a review and written approval by Chugach are required for proposed grade increases resulting in a depth of burial above 60".

6. Projects which propose to modify the grade over Chugach underground transmission cables (voltages above 25kV) require review and written approval by Chugach.

7. In addition to the foregoing, excavations near transmission underground cable/conduit will require the following:

   a) Excavation Adjacent to Transmission Voltage Level Power Lines: Chugach will require its Locate Contractor to notify excavators when a locate request includes the locating of cables that exceed 25kV distribution voltages.

      When excavation is planned that will come within close proximity (ten (10) feet), expose, parallel or undermine sections of Chugach's transmission underground cables (voltages above 25kV), special precaution and safety consideration must be taken. These cables operate at voltages between 34,000 volts and 230,000 volts phase-to-phase, provide power to tens of thousands of Chugach customers and require extraordinary protection. The following guidelines shall apply:

      Chugach Operations Department shall be contacted at (907) 762-7655 in advance of the planned excavation a minimum of five (5) business days prior to beginning excavation. Chugach requires that a *qualified person* be on site at all times during excavation activity that comes within ten (10) feet of any transmission cable. The contractor shall arrange and pay for a *qualified person* from Chugach or, with approval, from one of Chugach's approved and *qualified contractors*. Excavations closer than ten (10) feet

shall require exposure of the cables at the intersecting point or at intervals of not less than every twenty-five (25) feet for parallel excavations by *qualified personnel* to determine the exact location of the cable prior to machine excavation.

Because of the high voltage, excavations within ten (10) feet of a transmission cable can expose unqualified workers to extremely unsafe conditions. Prior planning by the excavator with coordination through Chugach and Chugach approval of construction activity within ten (10) feet of transmission cable is required.

Chugach shall approve, in advance, any plan for directional drilling, boring, pile driving or other type of "trenchless" construction in the vicinity of its transmission cables prior to any construction activity.

Chugach may require a special locate utilizing Ground Penetrating Radar to locate critical facilities. "Pothole" locates utilizing vacuum excavation in conjunction with an air-knife tool may be used, with Chugach approval.

C. STRUCTURE EXCAVATION

1. Equipment Pads or Vaults

Temporary excavation is allowed with a maximum slope of 1:1 beginning three (3) feet from the exterior edge of a concrete pad or vault. The final grade shall consist of a level area radiating out a minimum of four (4) feet, measured from the exterior edge of the pad or vault, and a maximum slope of 2:1 beginning from that four (4) foot distance from the exterior edge of the pad or vault. For both temporary and final grade situations, a level area extending ten (10) feet out from the edge of the concrete pad in front of equipment doors or access panels is necessary. Refer to Drawing No. F-062388 attached.

If the slope cannot be maintained at the grades specified above, additional protection such as barriers or piling is required. All shoring and excavation (closer than the above limits) shall be done by a qualified person(s) under the employ of a qualified electrical contractor.

2. Concrete-Encased Duct

Excavation under a concrete-encased duct requires a method designed and certified by an Alaska-registered civil engineer and approved by Chugach. Installation of the temporary shoring or bracing shall be done under the supervision of a qualified person under the employ of a qualified electrical contractor.

D. POLE/GUY ANCHOR EXCAVATION

Excavation beginning no closer than a three (3) foot radius from a pole or guy anchor in stable soil conditions or a ten (10) foot radius from a pole or guy anchor in organic/unstable soil conditions is allowed, provided the slope from that point does not exceed 1:1. Refer to Drawing No. F-062388 attached.

Excavation closer than the limits defined above or within a ten foot radius of more than one consecutive pole where excavation will be open while more than one pole is affected, may require shoring of each pole. Chugach review and approval of shoring plan is required for all excavations where more than one pole is subject to an open excavation. Pole shoring shall conform to Chugach specifications XP-X/Y (steel pile shoring) or XM40/XM40A (wood pole shoring) as approved by Chugach for the specific excavation. Specifications will be supplied upon request. All work for installing the piles must be performed within the OSHA guidelines. Shoring by other methods requires prior approval by Chugach on a case-by-case basis. Street light poles may be temporarily removed, subject to a written agreement with Chugach, prior to excavation.

Any excavation that may expose the pole butt requires a structural analysis of the pole shoring method. The analysis shall be performed by an Alaska-licensed professional engineer familiar with electrical transmission and distribution design standards in use by Chugach.

All shoring and excavation (closer than the above limits) shall be done by a qualified person under the employ of a qualified electrical contractor.

E. RELOCATION REQUIRED

Where protection of the cable and structures cannot be maintained, as required in Sections A, B, and C, relocation of those facilities will be required prior to the intended work and at the contracting agency's expense.

F. BACKFILL

Replacement backfill for electrical facilities must be in accordance with Chugach specifications and done by a qualified person under the employ of a qualified electrical contractor.

A damaged underground facility may not be reburied until it is repaired or relocated to the satisfaction of Chugach.

G. INSPECTION AND APPROVAL

All work on or in the immediate vicinity of Chugach facilities, such as backfilling, temporary support, shoring, and relocations are subject to prior approval and

inspection by Chugach. On large projects where inspection time is substantial, all costs for inspection shall be the responsibility of the agency or entity contracting for the work. Reimbursement to Chugach shall be in accordance with Chugach's tariff, Section 8.

For any questions or approvals involving these requirements contact the Line Operations Division at 762-7655 and your call will be directed to the appropriate department for assistance.

H. MISCELLANEOUS

1. Depending on the soil type, depth and length of the excavation, type of Chugach facility involved, and the certainty of the cable locate, excavations can be approved within a two (2) foot radius of cable on a case-by-case basis.

2. Stable soil conditions are defined as all dry and non-organic. Soil conditions shall be evaluated and approved on a case-by-case basis by Chugach. The evaluation will be done using 29CFR1926, Subpart P, "*Excavations*" as a guide.

3. Excavation, except as noted, shall be defined as mechanically done by a backhoe, scraper, grader, auger, or other piece of equipment.

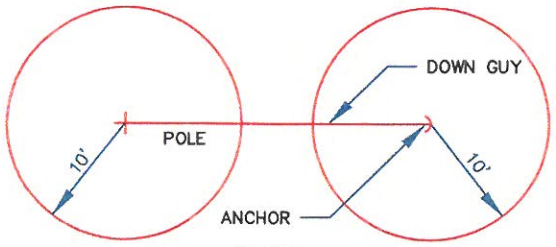
4. Cables are defined as insulated cable whether buried directly or in conduit. The guidelines for cables also include 600-Volt pedestals and other small electrical apparatus associated with cable but not included under pads or vaults.

5. Spare conduit is not included in these provisions except to the extent of providing temporary support when exposed and inspected by Chugach prior to the placement of proper backfill.

6. Chugach defines a *qualified electrical contractor* as a contractor registered in the State of Alaska who has an Electrical Administrator's License in the Outside Linework category; or who has an employee with an Electrical Administrator's License in the same category registered with the contractor.

7. Chugach defines a *qualified person* as a journeyman lineman who holds a current Certificate of Fitness in the Journeyman Lineman category issued by the State of Alaska.

8. Chugach defines *hand-digging* as the removal of soil with hand tools or with an air-knife tool (compressed air jet).

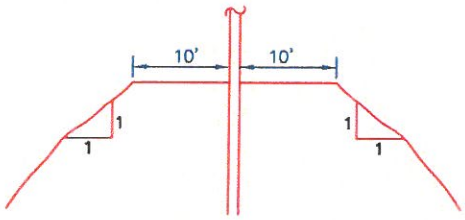


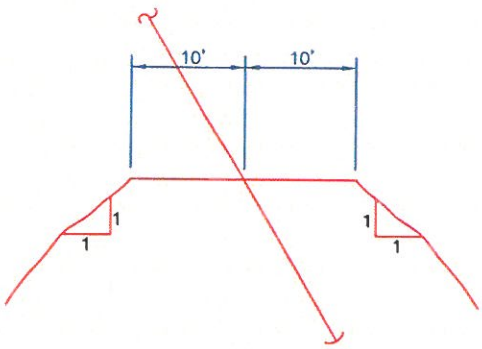
PLAN

(RADIUS OF UNDISTURBED SOIL)

NOTE:

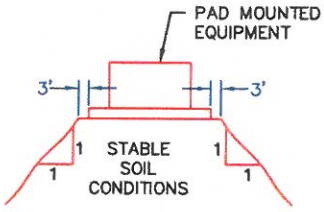
FOR VERY UNSTABLE SOIL CONTACT CHUGACH ELECTRIC.





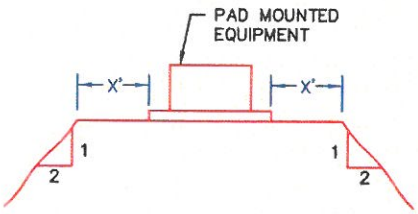
PROFILE

POLES/GUYS



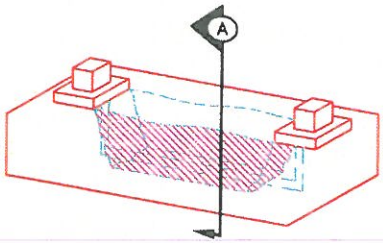
DURING CONSTRUCTION

SUPPLEMENTAL SUPPORT REQUIRED FOR EXCAVATIONS WITHIN 5' OF PADMOUNTED EQUIPMENT LOCATED ON UNSTABLE SOIL CONTACT CHUGACH ELECTRIC

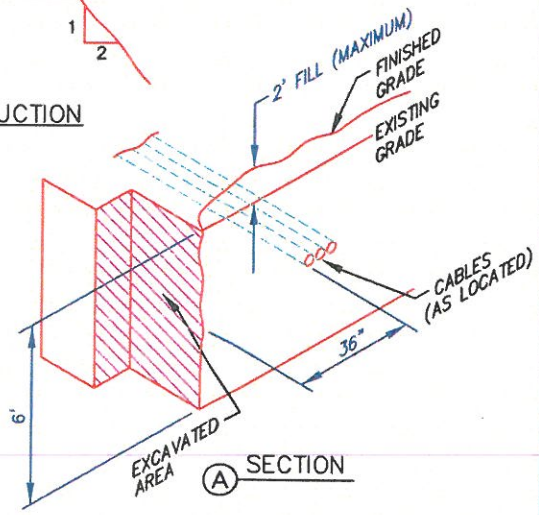


AFTER CONSTRUCTION

X': 10' ON DOOR/ACCESS SIDES. 4' ON OTHER SIDES.



PARALLEL EXCAVATION



STRUCTURES/CABLES

REV. NO.: 3 DATE: 1/28/98

Standards Engineer: _____

Mgr., Dist. Engineering: _____

Mgr., Const. & Maint.: _____

Dir., T&D Services Div.: _____

Chugach Electric Association, Inc.

EXCAVATION LIMITS

DEFINITION OF LIMITS REQUIRING NO ADDITIONAL STRUCTURAL SUPPORT

DRAWING NUMBER F-062388

SHEET 1 OF 1

Sec. 42.30.450. Waiver of requirements by written agreement.

An operator and an excavator may, by written agreement, waive the requirements of AS 42.30.400 - 42.30.490 that the excavator notify the operator of planned excavations and that the operator locate underground facilities. The agreement must identify the geographic areas to which the waiver applies and the time period for which the waiver is valid.

Sec. 42.30.460. Underground facility owner.

If the operator of an underground facility is not the owner of the facility and if the operator cannot be identified or has been identified but cannot be reached in a reasonable amount of time, the excavator may give the notice required by AS 42.30.400 - 42.30.490 to the owner of the underground facility and the owner shall assume the duties and responsibilities of the operator under AS 42.30.400 - 42.30.490.

Sec. 42.30.490. Definitions.

(1) "damage" means

(A) the substantial weakening of structural or lateral support of an underground facility;

(B) penetration, impairment, or destruction of any underground protective coating, housing, or other protective device; and

(C) the partial or complete severance of an underground facility to the extent that the project owner or facility operator determines that repairs are required;

(2) "emergency" means

(A) a condition that constitutes a clear and present danger to life, health, or property; or

(B) an unplanned service interruption;

(3) "excavation" means

(A) an activity in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means;

(B) road maintenance that changes the original road grade;

(C) demolition or movement of earth by equipment, tools, or explosive device except tilling of the soil less than 12 inches in depth for agricultural purposes;

(4) "excavator" means a person who conducts excavation in the state;

(5) "inaccessible" means impossible or unreasonably difficult to reach due to conditions beyond the control of the underground facility operator;

(6) "notification center" or "center" means a service through which a person is able to call one number to notify member operators of underground facilities that an excavation is proposed and to request the operators to mark facilities located inside of the proposed excavation area;

(7) "operator" means a person who supplies a service for commercial or public use by means of an underground facility;

(8) "person" means any individual, public or private corporation, political subdivision, government agency, municipality, industry, partnership, copartnership, association, firm, trust, estate, or any other entity whatsoever;

(9) "remote" means not accessible by road;

(10) "underground facility" means a pipe, sewer, conduit, cable, valve, line, or wire, including attachments and those parts of poles or anchors that are below ground, for use in connection with the storage or conveyance of water, sewage, telecommunications, cable television, electricity, petroleum, petroleum products, hazardous liquids, or flammable, toxic, or corrosive gas;

(11) "unstaffed" means not normally staffed with employees;

(12) "working day" means a day on which an underground facility operator is open for regular business.

ALASKA STATUTES

TITLE 42

PUBLIC UTILITIES & CARRIERS

Sec. 42.30.400. Excavator's notice of proposed excavation.

(a) Before beginning an excavation, an excavator shall give notice of the proposed excavation to each underground facility operator who has an underground facility in the area of the proposed excavation and request the operator to field mark the location of its underground facility. The excavator shall notify an underground facility operator who subscribes to a notification center by giving notice to the center. The excavator shall notify an underground facility operator listed in the applicable telephone directory who is not a subscriber to a notification center by giving notice directly to the operator.

(b) Except in the case of an emergency locate request or a request to locate in a remote, unstaffed, or inaccessible location, the excavator shall notify an underground facility operator who may have a facility in the area of a proposed excavation at least two but not more than 15 working days before the date scheduled for beginning the excavation. In the case of a request to locate in a remote or unstaffed location, the excavator shall notify the operator at least 10 but not more than 20 working days before the scheduled date for beginning excavation.

(c) In an emergency, the excavator shall immediately notify each underground facility operator in the area of the emergency and of the need for the excavation and request prompt location of underground facilities.

Sec. 42.30.410. Operator's response to request to locate; immunity related to unmarked or inaccurately marked facilities.

(a) An underground facility operator shall accept requests to locate underground facilities during the operator's regular business hours. An operator who receives a request to locate shall maintain for at least one year an accurate record of the request and responses to the request.

(b) When an underground facility operator receives a request to locate, it shall notify the excavator of the location of the underground facilities that the operator is able to field mark with reasonable accuracy and field mark those facilities. If the operator owns, uses, or operates an underground facility that is identified as being in the area of the proposed excavation but that the operator cannot field mark with reasonable accuracy, the operator shall provide the excavator with the best information available to the operator about its location and shall provide on-site assistance until the facility is located or until the excavator no longer needs assistance in locating that facility.

(c) The field marks for an underground facility buried 10 feet deep or less must be located within 24 horizontal inches of the outside dimensions of the facility. For a facility buried deeper than 10 feet, the operator shall locate the field marks within 30 horizontal inches of the outside dimensions of the facility. The operator shall use stakes, paint, or other clearly identifiable material to show the field location of the underground facility. The marker used to designate the approximate location of an underground facility must follow the current color code standard used by the American Public Works Association.

(d) Except for an underground facility in a remote, unstaffed, or inaccessible location, an underground facility operator shall respond to a request to locate promptly. A response is considered to be prompt if it is made within two working days after the operator receives the request or at a later time so long as the response occurs before the beginning of the excavation. For an underground facility in an accessible remote or unstaffed location, the operator shall respond within 10 working days after the operator receives the request or at a later time so long as the response occurs before the beginning of excavation.

(e) After an operator has field marked an underground facility, the excavator is responsible for maintaining the markings.

(f) An excavator may not begin to excavate until each underground facility has been field marked.

(g) When an operator has field marked an underground facility once at the request of an excavator, the operator has the right to receive compensation from the excavator for costs incurred in responding to subsequent requests to locate the same underground facility during the same excavation project if the excavator failed to maintain the original marking.

(h) If an excavator discovers an underground facility that was not field marked or was inaccurately field marked, the excavator shall immediately stop excavating in the vicinity of the facility and shall notify the operator of the discovery. The excavator may notify the operator by means of a notification center. The operator shall treat the notification as a request to locate in an emergency and shall respond accordingly. An excavator may not be held liable for inadvertent damage caused to an unmarked or an inaccurately marked underground facility.

(i) Unless the request to locate is made in response to an emergency, an underground facility operator has the right to receive compensation for costs incurred in responding to a request to locate that gives the operator less notice than the minimum notice required by this section. This subsection may not be interpreted to require the operator to respond to the request to locate within the time requested in the notice.

Sec. 42.30.420. Responsibility of construction project owners.

The owner of a construction project that will require excavation shall indicate in bid documents or contracts for construction the existence of underground facilities that the project owner knows are located inside of the proposed area of excavation. This requirement does not release the excavator from the excavator's responsibility under AS 42.30.400 - 42.30.490.

Sec. 42.30.430. Obligations concerning the conduct of excavations.

(a) An excavator shall use reasonable care to avoid damaging an underground facility. The excavator shall

(1) determine, without damage to the facility, the precise location of an underground facility whose location has been marked;

(2) plan the excavation to avoid damage to and minimize interference with an underground facility in or near the excavation area; and

(3) to the extent necessary to protect a facility from damage, provide support for an underground facility in and near the construction area during the excavation.

(b) An excavator who, in the course of excavation, contacts or damages an underground facility shall notify the operator. If the damage causes an emergency, the excavator shall also alert appropriate local public safety agencies and take reasonable steps to ensure public safety. A damaged underground facility may not be reburied until it is repaired or relocated to the satisfaction of the operator. The operator of an underground facility that was damaged during excavation shall arrange for repair or relocation of the facility as soon as practical.

Sec. 42.30.440. Penalties; injunctive relief.

(a) In addition to all other remedies provided by law, a person who violates a provision of AS 42.30.400 - 42.30.490 is subject to a civil penalty of not less than $50 nor more than $1,000 for each offense if the violation results in or significantly contributes to damage to an underground facility.

(b) If the court finds that an excavator is violating or threatening to violate a provision of AS 42.30.400 - 42.30.490 and the violation may result in damage to an underground facility, the court may grant injunctive relief to the underground facility operator.

Qualified Personnel Requirements

Only qualified individuals meeting all applicable requirements may perform work on ENSTAR Natural Gas Company facilities. At a minimum, such individuals must comply with applicable federal, state and local regulation, statutes, and ordinances.

Additional pipeline information can be found on the following websites:

PHMSA/DOT	http://primis.phmsa.dot.gov/comm/Index.htm
Common Ground Alliance	http://www.commongroundalliance.com
Pipeline 101	http://www.pipeline101.com
Alaska Digline, Inc.	http://www.akonecall.com/

For further information about ENSTAR, visit our web site @ www.enstarnaturalgas.com

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

APPENDIX C

UTILITY COMPANY RELOCATION DRAWINGS

UTILITY COMPANY RELOCATION DRAWINGS

TO BE PROVIDED FOR FINAL DESIGN

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

III

SUBMITTAL LIST

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

SUBMITTAL LIST

Job #: 16-29 Contractor:

Submittal Number	Rev.	Description
10.04.9		Private Property Disposal Site Permission; Fill Permit
10.04.13		Street Closures; Traffic Control Plan
10.04.15		Temporary Erosion Control and Storm Water Pollution Prevention Plan
10.04.17		Utility Notification Verification
10.04.19		Record Drawings
10.04.22		Contractor's Emergency Contact Data
10.05.3		Construction Progress Schedule
10.05.3		Schedule of Values
10.05.3		Submittal Schedule
10.05.4		Notice of Unusual Working Hours
10.05.6		Product Data
10.05.7		Proposed Substitutions
10.05.9		Contractor's Authorized Representatives and Employees
10.05.10		Subcontractor's List
10.05.34		Work Plan
10.06.9		Certificate of Insurance
10.06.12		Certified Payroll
20		All Imported Earthwork Materials Required from this Contract

Submittal Number	Rev.	Description
20.02		Storm Water Pollution Prevention Plan
20.12/20.13		Dewatering/Trench Dewatering Plan
20.12		ADEC Dewatering Plan Permit Approval
20.25		Geotextile (all types)
20.26		Insulation Board
20.30		Trench Sheeting/Shoring Submittal
20.31		Stream Armor Substrate
20.31		Riprap Armor
30.01.9		Concrete Temperature Maintenance Procedure Proposal
30.01		All concrete mix designs
30.10		Colored concrete
30.12		High Performance Concrete Mix Design
40.04.2		Certified Analysis of Asphalt for Tack Coat from Refining Laboratory
40.04.3		Tack Coat Test Strip and Notification
40.06.2		Certified Analysis of Asphalt for A.C. Pavement from Refinery Lab.
40.06.3		Asphalt Job Mix Formula for A.C. Pavement Laboratory
40.06.4		Contractor's Certificate of Compliance for bituminous paver segregation mechanism installation.
55.02		Storm Drain Televising Documentation
55.02		Storm Drain Pipe
55.05 & 55.09		Storm Drain Structure Shop Drawings
55.05		Bypass Gate Control Shop Drawings

Submittal Number	Rev.	Description
55.22		Oil and Grit Separator Shop Drawings
55.27		Storm Drain Bypass System Plan
70.11		Sign Shop Drawings
70.12		Traffic Control Plan
70.12.4		Identify I.M.S.A./A.T.S.S.A. Person and Telephone Number
70.12.6		Proof of Advertisements
70.24		Decorative Fence Shop Drawings
70.25		Kiosk2 Shop Drawings
70.26		Rail Shop Drawings
70.27		Bicycle Fixit Station Shop Drawings
75.02		Landscape Maintenance Schedule
75.02		Tree Service Firm & Arborist Certification
75.02		Mulch
75.03.2		Topsoil Analysis Test Reports
75.03		Topsoil Mix
75.04		Seed Certification
75.12		Tree Protection Zone Arborist Certification and Maintenance Recommmendations
80.00		All Electrical/Signal Equipment and Materials Submittals
80.18		Stop Bar Detector Documentation
80.23		Luminaire Documentation

NOTE: The above list of submittals is not all inclusive. In addition to the above, the Contractor is required to comply with all submittal requirements as required or identified in the Drawings, specifications, M.A.S.S., or as directed by the Engineer.

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

IV

SPECIAL DETAILS

SIGN DETAIL

1:10

SIGN NUMBER	D11−1−SP
WIDTH x HGHT.	2′−0″ x 2′−0″
BORDER WIDTH	0.63″
CORNER RADIUS	1.5″
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT
Bicycle	0	2	12	13.8	8
Pedestrian	0	13.6	12	4.2	8

Letter locations are panel edge to lower left corner

LETTER POSITIONS (X)																				LENGTH	SERIES/SIZE
P	A	T	H	W	A	Y															D 2000
3	5.3	8	10.3	12.8	15.6	18.4														17.9	3

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

V

SOILS INFORMATION

LEGEND

2018 GEOTECHNICAL BOREHOLE LOCATION AND NAME

REFERENCE

1. BASEMAP PROVIDED BY CRW ENGINEERING GROUP, LLC ON 2018-10-25.
2. ORTHOIMAGERY ACQUIRED IN JULY 2015 BY THE ANCHORAGE LIDARAND IMAGERY PROJECT AND WAS DISTRIBUTED BY ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS (DGGS) ONLINE MAP.

DRAFT

0 50 100
1" = 100' FEET

CLIENT
CRW ENGINEERING GROUP, LLC

CONSULTANT
GOLDER

YYYY-MM-DD	2019-03-05
DESIGNED	-
PREPARED	APG
REVIEWED	AMM
APPROVED	JDT

PROJECT
WEST 32ND AVENUE AND EAST 33RD AVENUE UPGRADES

ANCHORAGE, ALASKA

TITLE
BOREHOLE LOCATION MAP - WEST 30TH AVENUE

PROJECT NO.	CONTROL	REV.	FIGURE
1773748		B	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

0

LEGEND

- ## — 2018 GEOTECHNICAL BOREHOLE LOCATION AND NAME
- HISTORICAL GEOTECHNICAL BOREHOLE LOCATION AND NAME

REFERENCE

1. BASEMAP PROVIDED BY CRW ENGINEERING GROUP, LLC ON 2018-10-25.
2. ORTHOIMAGERY ACQUIRED IN JULY 2015 BY THE ANCHORAGE LIDARAND IMAGERY PROJECT AND WAS DISTRIBUTED BY ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS (DGGS) ONLINE MAP.

DRAFT

0 50 100
1" = 100' FEET

CLIENT
CRW ENGINEERING GROUP, LLC

CONSULTANT
GOLDER

YYYY-MM-DD	2019-03-05
DESIGNED	-
PREPARED	APG
REVIEWED	AMM
APPROVED	JDT

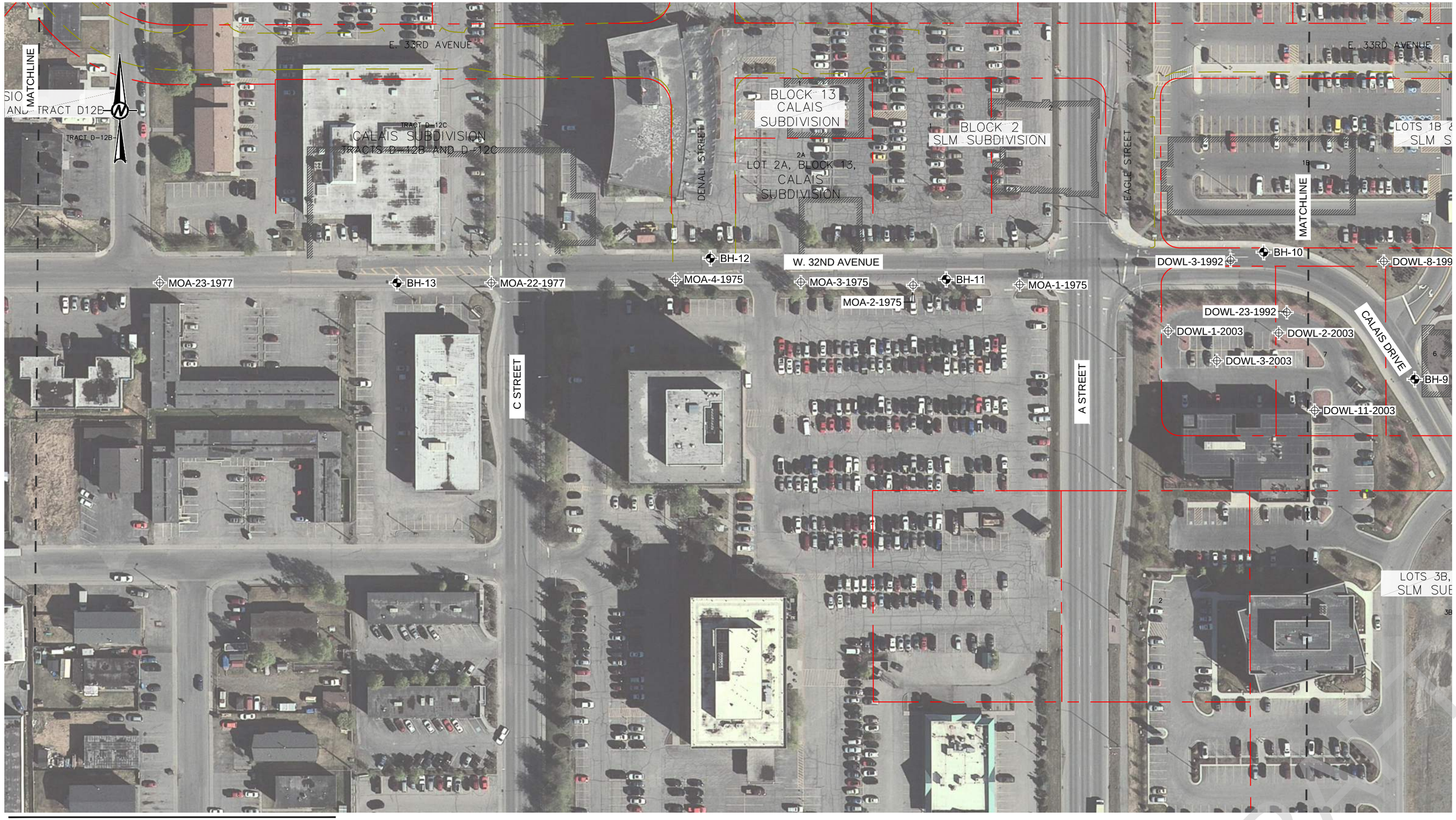
PROJECT
WEST 32ND AVENUE AND EAST 33RD AVENUE UPGRADES

ANCHORAGE, ALASKA

TITLE
BOREHOLE LOCATION MAP - WEST 32ND AVENUE

PROJECT NO.	CONTROL	REV.	FIGURE
1773748		B	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

2018 GEOTECHNICAL BOREHOLE LOCATION AND NAME

HISTORICAL GEOTECHNICAL BOREHOLE LOCATION AND NAME

REFERENCE

1. BASEMAP PROVIDED BY CRW ENGINEERING GROUP, LLC ON 2018-10-25.
2. ORTHOIMAGERY ACQUIRED IN JULY 2015 BY THE ANCHORAGE LIDARAND IMAGERY PROJECT AND WAS DISTRIBUTED BY ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS (DGGS) ONLINE MAP.

DRAFT

0 50 100
1" = 100' FEET

CLIENT
CRW ENGINEERING GROUP, LLC

CONSULTANT
GOLDER

YYYY-MM-DD	2019-03-05
DESIGNED	-
PREPARED	APG
REVIEWED	AMM
APPROVED	JDT

PROJECT
WEST 32ND AVENUE AND EAST 33RD AVENUE UPGRADES

ANCHORAGE, ALASKA

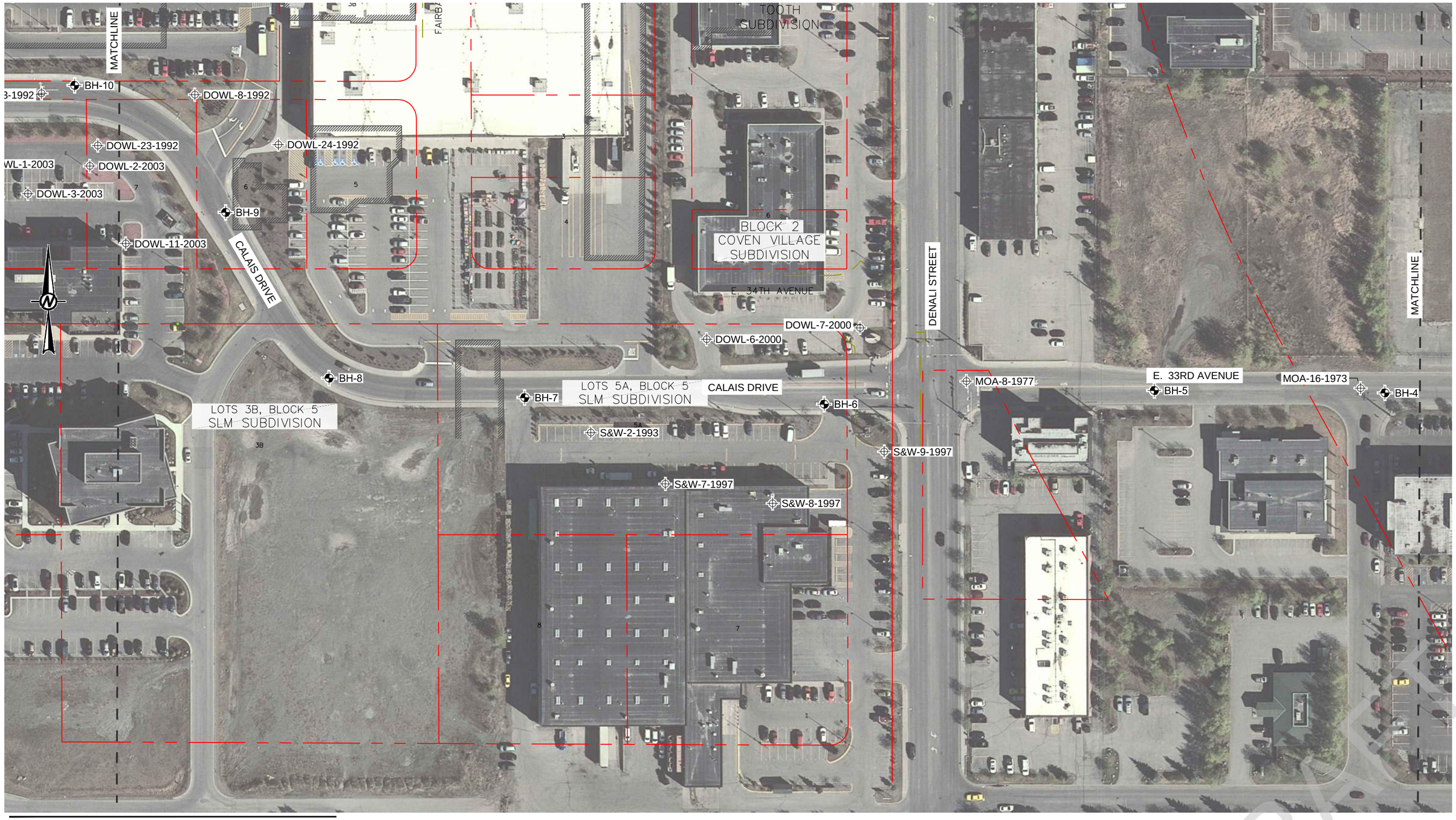
TITLE
BOREHOLE LOCATION MAP - WEST 32ND AVENUE

PROJECT NO.	CONTROL	REV.	FIGURE
1773748		B	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

0



LEGEND

2018 GEOTECHNICAL BOREHOLE LOCATION AND NAME

HISTORICAL GEOTECHNICAL BOREHOLE LOCATION AND NAME

REFERENCE

1. BASEMAP PROVIDED BY CRW ENGINEERING GROUP, LLC ON 2018-10-25.
2. ORTHOIMAGERY ACQUIRED IN JULY 2015 BY THE ANCHORAGE LIDARAND IMAGERY PROJECT AND WAS DISTRIBUTED BY ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS (DGGS) ONLINE MAP.

DRAFT

0 50 100
1" = 100' FEET

CLIENT
CRW ENGINEERING GROUP, LLC

CONSULTANT
GOLDER

YYYY-MM-DD	2019-03-05
DESIGNED	-
PREPARED	APG
REVIEWED	AMM
APPROVED	JDT

PROJECT
WEST 32ND AVENUE AND EAST 33RD AVENUE UPGRADES

ANCHORAGE, ALASKA

TITLE
BOREHOLE LOCATION MAP - EAST 33RD AVENUE

PROJECT NO.	CONTROL	REV.	FIGURE
1773748		B	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

0

LEGEND

##
2018 GEOTECHNICAL BOREHOLE LOCATION AND NAME

HISTORICAL GEOTECHNICAL BOREHOLE LOCATION AND NAME

REFERENCE

1. BASEMAP PROVIDED BY CRW ENGINEERING GROUP, LLC ON 2018-10-25.
2. ORTHOIMAGERY ACQUIRED IN JULY 2015 BY THE ANCHORAGE LIDARAND IMAGERY PROJECT AND WAS DISTRIBUTED BY ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS (DGGS) ONLINE MAP.

DRAFT

0 50 100
1" = 100' FEET

CLIENT
CRW ENGINEERING GROUP, LLC

CONSULTANT
GOLDER

YYYY-MM-DD	2019-03-05
DESIGNED	-
PREPARED	APG
REVIEWED	AMM
APPROVED	JDT

PROJECT
WEST 32ND AVENUE AND EAST 33RD AVENUE UPGRADES

ANCHORAGE, ALASKA

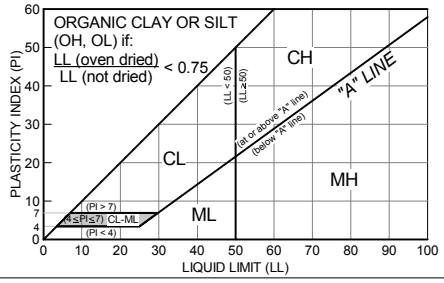
TITLE
BOREHOLE LOCATION MAP - EAST 33RD AVENUE

PROJECT NO.	CONTROL	REV.	FIGURE
1773748		B	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

UNIFIED SOIL CLASSIFICATION (adapted from ASTM D2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES AND GROUP SYMBOLS USING LABORATORY TESTS			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND	
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	$C_U \geq 4$ AND $1 \leq C_C \leq 3$	GW	WELL-GRADED GRAVEL	If soil contains ≥15% sand, add "with sand"
			$C_U < 4$ AND/OR [$C_C < 1$ OR $C_C > 3$]	GP	POORLY GRADED GRAVEL	
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR MH	GM	SILTY GRAVEL	
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL	
	SANDS ≥50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	$C_U \geq 6$ AND $1 \leq C_C \leq 3$	SW	WELL-GRADED SAND	If soil contains ≥15% gravel, add "with gravel"
			$C_U < 6$ AND/OR [$C_C < 1$ OR $C_C > 3$]	SP	POORLY GRADED SAND	
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR MH	SM	SILTY SAND	
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND	
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT <50	PLASTICITY CHART		CL	LEAN CLAY	If soil contains coarse-grained soil from 15% to 29%, add "with sand" or "with gravel" for whichever type is prominent, or for ≥30%, add "sandy" or "gravelly"
				ML	SILT	
				OL	ORGANIC CLAY OR SILT	
	SILTS AND CLAYS LIQUID LIMIT ≥50			CH	FAT CLAY	
				MH	ELASTIC SILT	
				OH	ORGANIC CLAY OR SILT	
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT	



$$C_U = \frac{D_{60}}{D_{10}} \qquad C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

NOTES:
Gravels or sands with 5% to 12% fines require dual symbols (GW-GM, GW-GC, GP-GM, GP-GC, SW-SM, SW-SC, SP-SM, SP-SC) and add "with clay" or "with silt" to group name. If fines classify as CL-ML for GM or SM, use dual symbol GC-GM or SC-SM. The coefficient of uniformity, C_U, and coefficient of curvature, C_C, equations are given above where $D_{(X\%)}$ is soil particle diameter where X% is % finer. *Optional Abbeviations:* Lower case "s" after USCS group symbol denotes either "sandy" or "with sand" while "g" denotes either "gravelly" or "with gravel"

CRITERIA FOR DESCRIBING MOISTURE CONDITION (adapted from ASTM D2488)

DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

COMPONENT DEFINITIONS BY GRADATION

COMPONENT	SIZE RANGE
BOULDERS	GREATER THAN 12 in.
COBBLES	12 in. to 3 in.
GRAVEL	3 in. to #4 Sieve (4.76 mm)
COARSE GRAVEL	3 in. to 3/4 in.
FINE GRAVEL	3/4 in. to #4 (4.76 mm)
SAND	#4 (4.76 mm) to #200 (0.074 mm)
COARSE SAND	#4 (4.76 mm) to #10 (2.0 mm)
MEDIUM SAND	#10 (2.0 mm) to #40 (0.42 mm)
FINE SAND	#40 (0.42 mm) to #200 (0.074 mm)
SILT & CLAY (FINES)	SMALLER THAN #200 (0.074 mm)

DESCRIPTIVE TERMINOLOGY FOR PERCENTAGES (ASTM D2488)

DESCRIPTIVE TERMS	RANGE OF PROPORTION
TRACE	0 - 5%
FEW	5 - 10%
LITTLE	10 - 25%
SOME	30 - 45%
MOSTLY	50 - 100%

RELATIVE DENSITY / CONSISTENCY ESTIMATE USING STANDARD PENETRATION TEST (SPT) VALUES (adapted from Terzaghi and Peck 1967 and NAVFAC DM 7.1)

COHESIONLESS SOILS [a]		COHESIVE SOILS [b]		
RELATIVE DENSITY	$(N_1)_{60}$ (blows/ft) [c]	CONSISTENCY	$(N_1)_{60}$ (blows/ft) [c]	UNCONFINED COMPRESSIVE STRENGTH (TSF) [d]
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
COMPACT (MEDIUM DENSE)	10 - 30	FIRM	4 - 8	0.50 - 1.0
		STIFF	8 - 15	1.0 - 2.0
DENSE	30 - 50	VERY STIFF	15 - 30	2.0 - 4.0
VERY DENSE	OVER 50	HARD	OVER 30	OVER 4.0

(a) Soils consisting of gravel, sand, and silt, either separately or in combination possessing no characteristics of plasticity, and exhibiting drained behavior.
(b) Soils possessing the characteristics of plasticity, and exhibiting undrained behavior.
(c) Refer to ASTM D1586 for a definition of N value. $(N_1)_{60}$ is the N value corrected for hammer energy and overburden pressure, and is detailed in ASTM D6066. N values may be affected by a number of factors including: material size, sampler size, hammer weight and type, depth, drilling method, and borehole disturbance. N values are only an approximate guide for cohesive soil and do not apply to frozen soil.
(d) Undrained shear strength, s_u= 1/2 unconfined compression strength, U_c. Note that Torvane (TV) measures s_u and pocket penetrometer (PP) measures U_c

SAMPLER ABBREVIATIONS

AR Air Rotary cuttings	**GB** Grab sample (disturbed from surface/test pit)	**SC** Soil core (continuous sampler)
AS Auger Sample, cuttings	**LS** LPT sampler (3-in. OD split spoon, 300 or 340-lb hammer)	**SS** SPT sampler (2-in. OD, 140-lb hammer)
CS Chunk/block sample (undisturbed from surface/test pit)	**MS** Modified Shelby tube	**TO** Thin-walled, open (Shelby tube)
DO Drive Open (split spoon other than SS or MC)	**R** Refusal when driving	**TP** Thin-walled, piston
DP Direct Push (Geoprobe)	**RC** Rock core	**WS** Wash sample

LABORATORY TEST AND NOTES ABBREVIATIONS / SYMBOLS

Con	Consolidation	**PID**	Photoionization Detector	**TXCD**	Triaxial, Consolidated Drained
Dd	Dry Density	**PM**	Modified Proctor (D1557)	**TXCU**	Triaxial, Consolidated Undrained
K	Thermal Conductivity	**PP**	Pocket Penetrometer (Field)	**TXUU**	Triaxial, Unconsolidated Undrained
MA	Sieve and Hydrometer	**PTLD**	Point Load	**W_L**	Liquid Limit (LL)
NP	Non-plastic	**SA**	Sieve Analysis	**W_P**	Plastic Limit (PL)
OLI	Organic Loss	**SpG**	Specific Gravity	**Ω**	Soil Resistivity (Res.)
P200	Passing #200 Sieve (D1140)	**TC**	Thaw Consolidation/Strain	▼	Water Level
pH	Soil pH	**TV**	Torvane (Field)	▽	Water Level at time of drilling
PI	Plasticity Index (D4318)				

GOLDER

SOIL CLASSIFICATION / LEGEND

Figure A-1

RECORD OF BOREHOLE BH-01

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/13/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19075° N 149.86922° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25 in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2-inches thick)				0.2	1	LS	26 18 7	18/18		PID = 4.0 ppm, Gravel = 29%, Sand = 58%, Fines = 12.8%, MA
		0.2 - 3.8 Loose to compact, moist, light brown, SILTY SAND with gravel; fine to coarse-grained sand, little to some rounded to angular gravel up to 1.5 inch diameter, few to little silt (SM, F2) [FILL]		SM			2	LS	5 2 3	18/18		
		3.8 - 6.3 Loose, moist, dark brown, silty sandy PEAT; mostly fine to coarse-grained sand, trace to little silt, trace gravel up to 0.38 inch diameter, mostly fibrous organic material (PT)		PT		3.8						103 PID = 2.0 ppm, Gravel = 5%, Sand = 78%, Fines = 17.9%, SA
5							3	LS	2 1 2	6/18		PID = 3.0 ppm 185
		6.3 - 8.5 Compact, moist, brown, SILTY SAND; fine to coarse-grained sand, little to some silt, little subrounded to subangular gravel up to 0.5 inch diameter (SM)		SM		6.3	4	LS	8 8 9	18/18		PID = 3.1 ppm, Gravel = 13%, Sand = 59%, Fines = 27.7%, OLI = 3%, SA
		8.5 - 16.5 Compact, moist to wet, dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, few to some subrounded to subangular gravel up to 1 inch diameter, trace silt, gravel content increases with depth (SP)		SP		8.5						PID = 1.4 ppm, Gravel = 7%, Sand = 89%, Fines = 3.9%, SA
10							5	LS	7 7 10	18/18		PID = 3.9 ppm
15							6	LS	8 9 11	12/18		PID = 2.5 ppm, Gravel = 31%, Sand = 65%, Fines = 3.4%, SA
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 15 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-2

DRAFT

1773748_MOA TWO ROADS PROJECT.GPJ LIBRARY-ANC(5-30-18) - NEW LOGO, LS FOR LPT SAMPLE.GLB [ANC BOREHOLE AUTO-THERM&WELL] JKarp 1/11/19

RECORD OF BOREHOLE BH-02

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/12/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19072° N 149.87072° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-inch ID Hollow Stem Auger	VEGETATION: Asphalt										
		0.0 - 0.2 ASPHALT (2.25-inches thick)		SM		0.2	1	LS	26 32 19	18/18	>> ■	PID = 0.9 ppm, Gravel = 30%, Sand = 49%, Fines = 20.8%, MA
		0.2 - 1.5 Dense, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded gravel up to 1.5 inch diameter, little silt (SM, F2) [FILL]		GP-GM		1.5					○	PID = 5.0 ppm, Gravel = 55%, Sand = 36%, Fines = 9.1%, SA
		1.5 - 2.5 Dense, moist, brown, poorly graded GRAVEL with silt and sand; subrounded gravel up to 1.5 inch diameter, some fine to coarse-grained sand, few silt (GP-GM) [FILL]				2.5	2	LS	7 11 12	18/18	○ ■	PID = 3.2 ppm, Gravel = 12%, Sand = 77%, Fines = 10.9%, SA
5		2.5 - 7.5 Compact, moist, brown, poorly graded SAND with silt; fine to coarse-grained sand, little subrounded to subangular gravel up to 1.5 inch diameter, little silt (SP-SM)		SP-SM			3	LS	31 13 15	18/18	○ ■	PID = 4.3 ppm
		7.5 - 8.2 Compact, moist, brown, SILTY SAND; fine to coarse-grained sand, little silt, trace subrounded to subangular gravel up to 0.5 inch diameter (SM)		SM		7.5 8.2	4	LS	15 13 13	18/18	○ ■ ○	PID = 4.9 ppm, Gravel = 3%, Sand = 79%, Fines = 17.3%, SA PID = 20.0 ppm
10		8.2 - 16.5 Compact to dense, moist to wet, gray, well-graded SAND with silt; fine to coarse-grained sand, few subrounded gravel up to 1 inch diameter, few silt (SW-SM)		SW-SM			5	LS	13 15 17	18/18	■ ○	PID = 3.0 ppm, Gravel = 6%, Sand = 86%, Fines = 7.6%, SA
15							6	LS	11 12 16	18/18	■ ○	PID = 0.4 ppm, Gravel = 10%, Sand = 81%, Fines = 9.2%, SA
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with 7-inch steel flushmount and coldpatch asphalt.										
25												
30												

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: J. Karp/A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

GOLDER

Figure A-3

RECORD OF BOREHOLE BH-03

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/12/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19073° N 149.87227° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) W (W_P 10 20 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt										
		0.0 - 0.2 ASPHALT (2-inches thick)		SP-SM		0.2						
		0.2 - 0.7 Dense, moist, dark brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subangular to subrounded gravel up to 0.75 inch diameter, few silt (SP-SM) [BASE COURSE]		SP-SM		0.7	1	LS	23 23 15	18/18		PID = 2.2 ppm, Gravel = 31%, Sand = 61%, Fines = 8.1%, SA PID = 1.1 ppm, Gravel = 34%, Sand = 55%, Fines = 10.9%, MA
		0.7 - 2.5 Dense, moist, light brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subangular to subrounded gravel up to 1.5 inch diameter, few silt (SP-SM, F2) [FILL]		SP		2.5	2	LS	7 8 9	18/18		PID = 0.8 ppm, Gravel = 16%, Sand = 79%, Fines = 4.8%, SA
5		2.5 - 5.0 Compact, moist, light brown, poorly graded SAND with gravel; fine to coarse-grained sand, little subangular to subrounded gravel up to 1 inch diameter, trace silt (SP) [FILL]		SP		5.0	3	LS	6 7 9	18/18		PID = 1.7 ppm, Gravel = 6%, Sand = 89%, Fines = 4.2%, SA
		5.0 - 7.5 Compact, moist, gray, poorly graded SAND; fine to coarse-grained sand, few subangular to subrounded gravel up to 0.75 inch diameter, trace silt (SP)				7.5	4	LS	13 9 7	18/18		PID = 1.6 ppm, Gravel = 28%, Sand = 63%, Fines = 9.1%, MA PID = 1.5 ppm
10		7.5 - 15.0 Compact, wet, gray to dark gray, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little to some subrounded to subangular gravel up to 1 inch diameter, few silt, gravel content decreases with depth (SP-SM, F2)		SP-SM			5	LS	14 9 9	18/18		PID = 1.0 ppm, Gravel = 13%, Sand = 81%, Fines = 6.4%, SA
15		15.0 - 16.5 Very dense, wet, dark gray, well-graded SAND with silt; fine to coarse-grained sand, little subangular to subrounded gravel up to 1 inch diameter, little silt (SW-SM)		SW-SM		15.0	6	LS	21 33 37	18/18	>>	PID = 4.1 ppm, Gravel = 10%, Sand = 80%, Fines = 10.1%, SA
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 8.8 feet below ground surface while drilling. 2) Borehole backfilled with cutting and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

GOLDER

Figure A-4

DRAFT

1773748_MOA TWO ROADS PROJECT.GPJ LIBRARY-ANC(5-30-18) - NEW LOGO, LS FOR LPT SAMPLE.GLB [ANC BOREHOLE AUTO-THERM&WELL] JKarp 1/11/19

RECORD OF BOREHOLE BH-04

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/12/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19073° N 149.87390° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0		VEGETATION: Asphalt										
	3.25-in ID Hollow Stem Auger	0.0 - 0.2 ASPHALT (2.25-inches thick)				0.2						
		0.2 - 2.5 Very dense, moist, brown to dark gray, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SP-SM) [FILL]		SP-SM			1	LS	34 30 34	18 18	>> ■	PID = 2.5 ppm, Gravel = 34%, Sand = 55%, Fines = 11.7%, SA
		2.5 - 5.0 Compact, moist, brown to dark gray, SILTY SAND; fine to coarse-grained sand, little silt, little subrounded to subangular gravel up to 0.75 inch diameter (SM, F2) [FILL]		SM		2.5	2	LS	24 7 7	18 18	■	PID = 2.1 ppm, Gravel = 12%, Sand = 76%, Fines = 12.1%, MA
5		5.0 - 8.4 Loose, moist, brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 1.5 inch diameter, few silt, trace organic material (SP-SM)		SP-SM		5.0	3	LS	5 5 5	18 18	■	PID = 2.6 ppm, Gravel = 19%, Sand = 76%, Fines = 5.9%, SA
							4	LS	10 3 2	18 18	■	PID = 2.3 ppm
		8.4 - 10.0 Loose, moist, gray, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 0.75 inch diameter, trace silt (SP)		SP		8.4						PID = 2.6 ppm, Gravel = 19%, Sand = 77%, Fines = 4.8%, SA
10		10.0 - 16.5 Loose to compact, moist, gray, poorly graded SAND with silt; fine to coarse-grained sand, little subrounded to subangular gravel up to 1 inch diameter, few silt (SP-SM)		SP-SM		10.0	5	LS	2 2 1	18 18	■	PID = 2.2 ppm, Gravel = 14%, Sand = 79%, Fines = 6.8%, SA
15							6	LS	9 9 8	18 18	■	PID = 1.4 ppm
20		Borehole completed at 16.5 ft.										
25		NOTES: 1) Groundwater not observed while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-5

RECORD OF BOREHOLE BH-05

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/13/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19074° N 149.87532° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.3 ASPHALT (4-inches thick)				0.3	1	LS	20 25 12	18 18		PID = 3.8 ppm, Gravel = 36%, Sand = 50%, Fines = 14.3%, MA
		0.3 - 2.5 Dense, moist, light brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SM, F2) [FILL]		SM								
		2.5 - 5.0 Dense, moist, dark brown, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded gravel up to 0.75 inch diameter, trace silt (SP) [FILL]		SP		2.5	2	LS	14 17 14	18 18		PID = 1.2 ppm, Gravel = 21%, Sand = 75%, Fines = 4.6%, SA
5		5.0 - 15.0 Compact, moist to wet, brown to dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, little to some subrounded gravel up to 1 inch diameter, trace silt (SP)				5.0	3	LS	5 6 8	18 18		PID = 1.4 ppm
							4	LS	5 6 6	18 18		PID = 1.6 ppm, Gravel = 29%, Sand = 67%, Fines = 3.9%, SA
10				SP			5	LS	12 7 8	12 18		PID = 1.1 ppm
15		Borehole completed at 15.0 ft. NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										15 ft: Approximately 3 ft of sand heave in augers prevented sampling at this depth.
20												
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-6

RECORD OF BOREHOLE BH-06

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/13/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19070° N 149.87737° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt										
		0.0 - 0.5 ASPHALT (5.75-inches thick)										
		0.5 - 3.3 Compact, moist, light brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SM, F2) [FILL]		SM		0.5	1	LS	23 18 12	18/18		PID = 2.4 ppm, Gravel = 30%, Sand = 55%, Fines = 14.2%, MA
		3.3 - 5.5 Compact, moist, dark brown, poorly graded SAND with silt; fine to coarse-grained sand, little subrounded gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM		3.3	2	LS	15 7 6	18/18		PID = 1.2 ppm, Gravel = 11%, Sand = 83%, Fines = 6.1%, SA
5		5.5 - 10.0 Compact, moist to wet, dark gray, poorly graded SAND; fine to coarse-grained sand, few subangular gravel up to 0.75 inch diameter, trace silt, coal interbeds to 2-inches thick (SP)		SP		5.5	3	LS	6 6 7	18/18		PID = 1.8 ppm, Gravel = 8%, Sand = 88%, Fines = 3.9%, SA PID = 3.3 ppm
							4	LS	14 8 7	18/18		PID = 1.5 ppm
10		10.0 - 16.5 Dense to compact, wet, dark gray, poorly graded SAND with silt; fine to coarse-grained sand, few silt, trace subrounded to subangular gravel up to 0.75 inch diameter (SP-SM)		SP-SM		10.0	5	LS	5 19 18	18/18		PID = 1.9 ppm, Gravel = 2%, Sand = 89%, Fines = 8.2%, SA
15							6	LS	7 9 9	18/18		PID = 1.4 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

GOLDER

Figure A-7

DRAFT

1773748_MOA TWO ROADS PROJECT.GPJ LIBRARY-ANC(5-30-18) - NEW LOGO, LS FOR LPT SAMPLE.GLB [ANC BOREHOLE AUTO-THERM&WELL] JKarp 1/11/19

RECORD OF BOREHOLE BH-07

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/13/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19072° N 149.87922° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ 10 20 30 40; SALINITY (ppt) △ WATER CONTENT (%) W_P W W_L 10 20 30 40	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.75-inches thick)										
		0.2 - 2.5 Very dense, moist, light brown, well-graded SAND with silt and gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SW-SM, F2) [FILL]		SW-SM		0.2	1	LS	37 40 26	18/18	○ >>■	PID = 4.9 ppm, Gravel = 42%, Sand = 47%, Fines = 11.3%, MA
		2.5 - 5.0 Compact, moist, dark brown, poorly graded SAND with gravel; fine to coarse-grained sand, some subangular gravel up to 1.5 inch diameter, trace silt (SP)		SP		2.5	2	LS	5 8 6	18/18	○ ■	PID = 2.7 ppm, Gravel = 31%, Sand = 65%, Fines = 4.4%, SA
5		5.0 - 7.5 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, some silt, some subrounded gravel up to 1.5 inch diameter, slightly plastic (SM)		SM		5.0	3	LS	6 6 12	18/18	○H ■	PID = 2.6 ppm, Gravel = 28%, Sand = 39%, Fines = 33.0%, PI = 1, SA,
		7.5 - 16.5 Compact, wet, dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded gravel up to 1 inch diameter, trace silt (SP)		SP		7.5	4	LS	5 7 7	18/18	■ ○	PID = 2.6 ppm
10							5	LS	5 6 7	18/18	■ ○	PID = 2.3 ppm, Gravel = 19%, Sand = 76%, Fines = 4.5%, SA
15							6	LS	3 6 6	6/18	■ ○	PID = 1.7 ppm
20		Borehole completed at 16.5 ft. NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-8

RECORD OF BOREHOLE BH-08

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/13/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19078° N 149.88043° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ 10 20 30 40; SALINITY (ppt) △ WATER CONTENT (%) W_P W W_L 10 20 30 40	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.5-inches thick)				0.2	1	LS	14 33 15	18/18	○ ■	PID = 1.1 ppm, Gravel = 44%, Sand = 46%, Fines = 9.9%, MA
		0.2 - 2.5 Dense, moist, brown, well-graded SAND with silt and gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 2 inch diameter, few silt (SW-SM, F2) [FILL]		SW-SM								
		2.5 - 16.5 Compact, moist, dark brown to dark gray, poorly graded SAND; fine to coarse-grained sand, few subrounded gravel up to 0.75 inch diameter, trace silt (SP)				2.5	2	LS	6 9 10	18/18	○ ■	PID = 1.2 ppm
5							3	LS	6 9 10	18/18	○ ■	PID = 2.0 ppm, Gravel = 8%, Sand = 87%, Fines = 4.4%, SA
							4	LS	8 6 6	18/18	○ ■	PID = 1.8 ppm
10				SP			5	LS	7 8 7	12/18	○ ■	PID = 2.9 ppm, Gravel = 7%, Sand = 89%, Fines = 4.0%, SA
15							6	LS	4 10 11	12/18	○ ■	PID = 26.8 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-9

RECORD OF BOREHOLE BH-09

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/13/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19127° N 149.88107° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.5-inches thick)										
		0.2 - 2.5 Very dense, moist, light brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 2 inch diameter, little silt (SM, F2) [FILL]		SM		0.2	1	LS	41 60/6	12 18	○ >>■	PID = 5.9 ppm, Gravel = 38%, Sand = 50%, Fines = 12.3%, MA
		2.5 - 5.0 Compact, moist, dark brown, poorly graded SAND with silt and gravel; fine to medium-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, few silt (SP-SM) [FILL]		SP-SM		2.5	2	LS	47 11 11	18 18	○ ■	PID = 1.6 ppm, Gravel = 31%, Sand = 61%, Fines = 7.2%, SA
5		5.0 - 7.5 Compact, moist, dark brown, well-graded SAND with silt and gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 0.75 inch diameter, few silt (SW-SM)		SW-SM		5.0	3	LS	3 6 8	18 18	○ ■	PID = 1.4 ppm, Gravel = 16%, Sand = 76%, Fines = 7.5%, SA
		7.5 - 10.8 Compact, moist, dark gray, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little to some subrounded gravel up to 1.5 inch diameter, few silt (SP-SM)		SP-SM		7.5	4	LS	7 6 7	18 18	○ ■	PID = 3.3 ppm, Gravel = 26%, Sand = 65%, Fines = 8.8%, SA
10		10.8 - 16.5 Compact, moist, dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded gravel up to 0.75 inch diameter, trace silt (SP)		SP		10.8	5	LS	7 6 5	18 18	○ ■	PID = 3.9 ppm, Gravel = 17%, Sand = 78%, Fines = 4.9%, SA
15							6	LS	16 13 12	18 18	○ ■	PID = 2.0 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater not observed while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings 4)Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-10

RECORD OF BOREHOLE BH-10

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/14/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19166° N 149.88200° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES: TESTS: WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt										
		0.0 - 0.2 ASPHALT (2.25-inches thick)				0.2						
		0.2 - 2.5 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SM, F2) [FILL]		SM			1	LS	26 14 10	18/18	○ ■	PID = 40.7 ppm, Gravel = 35%, Sand = 53%, Fines = 12.1%, MA
		2.5 - 5.0 Loose, moist, dark brown, well-graded SAND with silt and gravel; fine to coarse-grained sand, little subangular gravel up to 1 inch diameter, few silt (SW-SM) [FILL]		SW-SM		2.5	2	LS	5 3 3	18/18	■ ○	PID = 0.9 ppm, Gravel = 18%, Sand = 73%, Fines = 9.8%, SA
5		5.0 - 8.3 Compact to loose, moist, dark brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subangular gravel up to 2 inch diameter, few silt (SP-SM) [FILL]		SP-SM		5.0	3	LS	2 4 8	14/18	■ ○	PID = 1.9 ppm, Gravel = 35%, Sand = 57%, Fines = 7.5%, SA
		8.3 - 10.0 Loose, moist, dark gray to black, well-graded SAND with silt; fine to coarse-grained sand, few silt, coal interbeds (SW-SM)		SW-SM		8.3	4	LS	2 3 3	18/18	■ ○	PID = 1.1 ppm 189 PID = 1.5 ppm, Gravel = 0%, Sand = 91%, Fines = 9.0%, SA
10		10.0 - 10.5 Firm, wet, gray, SILT; few fine to coarse-grained sand, thin layers of white ash (ML)		ML		10.0	5	LS	1 3 3	18/18	■ ○	58 PID = 2.8 ppm 65 PID = 1.1 ppm PID = 1.8 ppm
		10.5 - 10.8 Loose, wet, brown, PEAT; moslty fibrous organic material, trace silt (PT)		PT		10.8						
		10.8 - 16.5 Loose to compact, wet, dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded gravel up to 1 inch diameter, trace silt (SP)		SP			6	LS	10 8 8	18/18	■ ○	PID = 2.8 ppm, Gravel = 24%, Sand = 72%, Fines = 3.8%, SA
15		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-11

RECORD OF BOREHOLE BH-11

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/14/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19158° N 149.88397° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.5-inches thick)				0.2	1	LS	25 16 15	18/18		PID = 19.5 ppm, Gravel = 28%, Sand = 55%, Fines = 17.3%, MA
		0.2 - 2.5 Dense, moist, light brown, SILTY SAND with gravel; fine to coarse-grained sand, little to some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SM, F2) [FILL]		SM								
		2.5 - 5.0 Compact, moist, brown, poorly graded SAND with silt and gravel; fine and coarse-grained sand, little subrounded to subangular gravel up to 1 inch diameter, few silt (SP-SM)		SP-SM		2.5	2	LS	4 6 6	18/18		PID = 2.8 ppm, Gravel = 20%, Sand = 75%, Fines = 5.3%, SA
5		5.0 - 7.5 Loose, moist, dark gray, SILTY SAND; fine to coarse-grained sand, little silt (SM)		SM		5.0	3	LS	3 3 6	12/18		PID = 4.6 ppm
		7.5 - 16.5 Loose to compact, wet, dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, little to some subrounded gravel up to 1.5 inch diameter, trace silt, gravel content decreases with depth (SP)				7.5	4	LS	8 12 13	14/18		PID = 1.6 ppm, Gravel = 36%, Sand = 59%, Fines = 4.9%, SA
10							5	LS	4 3 6	18/18		PID = 3.4 ppm, Gravel = 14%, Sand = 82%, Fines = 4.9%, SA
				SP								
15												15 ft: Approximately 3.5 ft of sand heave in augers prevented sampling at this depth.
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-12

RECORD OF BOREHOLE BH-12

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/14/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19164° N 149.88542° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.5-inches thick)				0.2	1	GB				PID = 1.7 ppm, Gravel = 12%, Sand = 64%, Fines = 24.6%, MA
		0.2 - 2.5 Moist, brown, SILTY SAND; fine to coarse-grained sand, little silt, little subrounded to subangular gravel up to 0.75 inch diameter (SM, F3) [FILL]		SM								
		2.5 - 5.0 Compact, moist, brown, well-graded SAND with silt and gravel; fine to coarse-grained sand, little angular to subrounded gravel up to 1.5 inch diameter, little silt (SW-SM) [FILL]		SW-SM		2.5	2	LS	11 7 7	18/18		PID = 2.0 ppm, Gravel = 19%, Sand = 70%, Fines = 11.3%, SA
5		5.0 - 8.3 Compact, moist, gray, well-graded SAND with silt; fine to coarse-grained sand, little subrounded gravel up to 0.75 inch diameter, little silt, silt lenses to 2-inches thick (SW-SM)		SW-SM		5.0	3	LS	7 11 13	18/18		PID = 2.0 ppm, Gravel = 14%, Sand = 74%, Fines = 11.9%, SA
		8.3 - 16.5 Compact, wet, dark gray, poorly graded SAND with silt and gravel; fine to coarse-grained sand, trace to some subrounded gravel up to 1 inch diameter, few silt, gravel content decreases with depth (SP-SM)		SP-SM		8.3	4	LS	8 12 15	18/18		PID = 2.0 ppm, Gravel = 30%, Sand = 63%, Fines = 6.5%, SA
10							5	LS	9 9 11	12/18		PID = 3.0 ppm
15							6	LS	10 14 15	18/18		PID = 4.2 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-13

DRAFT

RECORD OF BOREHOLE BH-13

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/14/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19157° N 149.88736° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ 10 20 30 40; SALINITY (ppt) △ WATER CONTENT (%) W_P W W_L 10 20 30 40	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2-inches thick)				0.2	1	GB				PID = 2.5 ppm, Gravel = 28%, Sand = 51%, Fines = 20.8%, MA
		0.2 - 5.0 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, little to some subrounded gravel up to 2 inch diameter, little silt (SM, F2) [FILL]		SM			2	LS	32 17 2	18/18		PID = 2.7 ppm, Gravel = 41%, Sand = 46%, Fines = 12.6%, SA
5		5.0 - 6.4 Compact, moist, brown, poorly graded GRAVEL with silt and sand; rounded to subrounded gravel up to 2 inch diameter, some fine to coarse-grained sand, little silt (GP-GM) [FILL]		GP-GM		5.0	3	LS	16 13 12	18/18		PID = 2.1 ppm, Gravel = 48%, Sand = 42%, Fines = 10.1%, SA
		6.4 - 8.3 Compact, moist, gray, SILTY SAND; fine to coarse-grained sand, some silt, few subrounded to subangular gravel up to 0.5 inch diameter (SM)		SM		6.4	4	LS	12 11 8	18/18		PID = 3.2 ppm, Gravel = 9%, Sand = 48%, Fines = 43.5%, SA PID = 2.3 ppm
10		8.3 - 10.0 Compact, moist, dark gray, poorly graded SAND; medium to coarse-grained sand (SP)		SP		8.3	5	LS	5 6 7	1/18		PID = 2.3 ppm, Gravel = 2%, Sand = 90%, Fines = 8.2%, SA
		10.0 - 16.5 Compact, wet, dark gray, poorly graded SAND with silt; fine to coarse-grained sand, few silt, trace gravel up to 0.5 inch diameter (SP-SM)		SP-SM		10.0	6	LS	4 6 5	3/18		PID = 2.0 ppm
15		Borehole completed at 16.5 ft.										
		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
20												
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-14

RECORD OF BOREHOLE BH-14

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/15/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19304° N 149.90494° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.3 ASPHALT (3-inches thick)				0.3	1	GB				PID = 2.1 ppm, Gravel = 6%, Sand = 82%, Fines = 11.9%, MA
		0.3 - 3.0 Compact, moist, brown, well-graded SAND with silt; fine to coarse-grained sand, little silt, few subrounded gravel up to 0.75 inch diameter (SW-SM, F2) [FILL]		SW-SM								
		3.0 - 10.0 Compact, moist, brown, poorly graded SAND; fine to coarse-grained sand, few subrounded gravel up to 0.75 inch diameter, trace silt (SP)				3.0	2	LS	14 10 11	18 18		PID = 3.5 ppm
5				SP			3	LS	7 8 9	18 18		PID = 20.3 ppm, Gravel = 8%, Sand = 90%, Fines = 2.5%, SA
							4	LS	13 9 10	18 18		PID = 2.9 ppm
10		10.0 - 15.0 Compact, moist, brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little subrounded gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM		10.0	5	LS	24 16 10	18 18		PID = 4.0 ppm, Gravel = 23%, Sand = 71%, Fines = 5.4%, SA
15		15.0 - 16.5 Very stiff, wet, gray, sandy SILT; some fine to coarse-grained sand, trace gravel (ML)		ML		15.0	6	LS	14 6 10	18 18		PID = 5.4 ppm, Gravel = 1%, Sand = 35%, Fines = 64.3%
20		Borehole completed at 16.5 ft.										
25		NOTES: 1) Groundwater observed at 15 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-15

RECORD OF BOREHOLE BH-15

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/15/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19306° N 149.90151° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2-inches thick)				0.2	1	GB				PID = 19.4 ppm, Gravel = 15%, Sand = 59%, Fines = 26.0%, MA
		0.2 - 3.0 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, little to some silt, little subrounded gravel up to 1 inch diameter (SM, F3) [FILL]		SM								
		3.0 - 15.0 Compact, moist to wet, brown to gray, poorly graded SAND with gravel; fine to coarse-grained sand, little to some subrounded gravel up to 1 inch diameter, trace silt (SP)				3.0	2	LS	21 9 11	18 18		PID = 5.5 ppm
5							3	LS	7 9 10	18 18		PID = 3.6 ppm, Gravel = 21%, Sand = 75%, Fines = 3.9%, SA
				SP			4	LS	18 9 12	18 18		PID = 4.0 ppm
10							5	LS	5 8 11	12 18		PID = 5.3 ppm, Gravel = 30%, Sand = 67%, Fines = 3.6%, SA
15		15.0 - 16.5 Compact, wet, gray, SILTY SAND; fine to medium-grained sand, little to some silt (SM)		SM		15.0	6	LS	11 8 9	6 18		PID = 6.0 ppm, Gravel = 0%, Sand = 74%, Fines = 25.6%
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 8 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-16

RECORD OF BOREHOLE BH-16

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/14/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19166° N 149.89181° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Grass 0.0 - 3.0 Loose, moist, brown, Topsoil; mostly organic material, few subrounded gravel up to 1 inch diameter (Topsoil)		Topsoil			1	GB				PID = 2.5 ppm
		3.0 - 5.0 Loose, moist, brown, PEAT; fibrous organic material (PT)		PT		3.0	2	LS	3 1 2	18/18	■ ○283	PID = 2.0 ppm
5		5.0 - 5.8 Soft, moist, gray, sandy SILT; some fine to coarse-grained sand, trace gravel up to 0.5 inch diameter, slightly plastic (ML)		ML		5.0	3	LS	2 1 1	18/18	■ ⊢○⊣	PID = 4.1 ppm, Gravel = 1%, Sand = 36%, Fines = 63.2%, PI = 5, SA, PID = 4.2 ppm, Gravel = 8%, Sand = 84%, Fines = 8.4%
		5.8 - 16.5 Loose to compact, moist to wet, gray to brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, trace to some subrounded to rounded gravel up to 0.75 inch diameter, few silt, gravel content generally increases with depth (SP-SM)		SP-SM		5.8	4	LS	7 9 2	12/18	■ ○	PID = 4.4 ppm, Gravel = 3%, Sand = 91%, Fines = 6.4%
10							5	LS	6 8 10	15/18	■ ○	PID = 6.8 ppm
15							6	LS	10 11 14	12/18	■ ○	PID = 6.0 ppm, Gravel = 26%, Sand = 68%, Fines = 6.4%, SA
20		Borehole completed at 16.5 ft.										
25		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface with 49 inches of stick-up, hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings and excess cuttings mounded at the surface.										
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-17

RECORD OF BOREHOLE BH-17

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/15/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19157° N 149.89347° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (1.75-inches thick)				0.2	1	GB				PID = 12.4 ppm, Gravel = 30%, Sand = 51%, Fines = 18.7%, MA
		0.2 - 2.5 Moist, dark brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SM, F2) [FILL]		SM								
		2.5 - 3.5 Compact, moist, dark brown, SILTY GRAVEL with sand; subrounded to subangular gravel up to 1.5 inch diameter, some fine to coarse-grained sand, little silt (GM) [FILL]		GM		2.5	2	LS	32 15 14	18/18		PID = 11.2 ppm, Gravel = 45%, Sand = 40%, Fines = 15.3%, SA PID = 5.2 ppm
5		3.5 - 10.0 Compact, moist to wet, dark gray, well-graded SAND with silt; fine to coarse-grained sand, few silt, few subrounded gravel up to 0.75 inch diameter (SW-SM)		SW-SM		3.5	3	LS	18 10 12	18/18		PID = 5.3 ppm, Gravel = 8%, Sand = 84%, Fines = 8.1%, SA
							4	LS	20 10 10	18/18		PID = 9.7 ppm
10		10.0 - 15.0 Compact, wet, dark gray, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 0.75 inch diameter, trace silt (SP)		SP		10.0	5	LS	13 9 11	18/18		PID = 9.2 ppm, Gravel = 21%, Sand = 74%, Fines = 4.8%, SA
15		15.0 - 16.5 Compact, wet, dark gray, poorly graded SAND with silt; fine to coarse-grained sand, little subangular gravel up to 0.5 inch diameter, few silt (SP-SM)		SP-SM		15.0	6	LS	10 10 11	18/18		PID = 5.6 ppm, Gravel = 12%, Sand = 81%, Fines = 7.1%
20		Borehole completed at 16.5 ft.										
25		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-18

RECORD OF BOREHOLE BH-18

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/14/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19158° N 149.89526° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) ○ (W_P 10 20 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2-inches thick)				0.2						
		0.2 - 3.0 Compact, moist, brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1.5 inch diameter, little silt (SP-SM, F2) [FILL]		SP-SM			1	GB		30/30		PID = 1.3 ppm, Gravel = 40%, Sand = 48%, Fines = 11.4%, MA
		3.0 - 16.5 Compact, moist to wet, gray, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little to some subrounded to subangular gravel up to 0.75 inch diameter, few to little silt (SP-SM)				3.0	2	LS	21 15 15	18/18		PID = 4.6 ppm, Gravel = 40%, Sand = 50%, Fines = 10.5%, SA PID = 1.8 ppm
5							3	LS	23 9 8	18/18		PID = 2.2 ppm, Gravel = 14%, Sand = 79%, Fines = 7.1%, SA
							4	LS	8 8 10	12/18		PID = 2.6 ppm
10				SP-SM			5	LS	10 10 12	12/18		PID = 1.8 ppm
15							6	LS	10 9 13	18/18		PID = 6.5 ppm
20		Borehole completed at 16.5 ft. NOTES: 1) Groundwater observed at 7.5 feet below ground surface during drilling. 2) The borehole was backfilled with cuttings and tamped with the rig and rods, then capped with cold patch asphalt and hand-tamped.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-19

RECORD OF BOREHOLE BH-19

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/15/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19157° N 149.89703° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P ○ W W_L) (10 20 30 40)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2-inches thick)				0.2	1	GB				PID = 5.7 ppm, Gravel = 34%, Sand = 48%, Fines = 18.4%, MA
		0.2 - 3.0 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1 inch diameter, little silt (SM, F2) [FILL]		SM								
		3.0 - 7.5 Compact, moist, brown, poorly graded SAND; fine to coarse-grained sand, few subangular gravel up to 0.75 inch diameter, trace silt, silt interbeds to 1-inch thick (SP)		SP		3.0	2	LS	18 7 6	18/18		PID = 3.7 ppm
5							3	LS	6 8 8	12/18		PID = 3.6 ppm, Gravel = 8%, Sand = 88%, Fines = 4.2%, SA
		7.5 - 15.0 Compact, wet, dark gray, poorly graded SAND with silt; fine to coarse-grained sand, few subrounded gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM		7.5	4	LS	8 5 6	12/18		PID = 3.2 ppm
10							5	LS	15 14 11	6/18		PID = 6.0 ppm, Gravel = 7%, Sand = 87%, Fines = 6.1%, SA
15		Borehole completed at 15.0 ft.										15 ft: Several feet of sand heave in augers prevented sampling at this depth.
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-20

RECORD OF BOREHOLE BH-20

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/16/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19157° N 149.89851° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Grass 0.0 - 2.5 Moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 1 inch diameter, little silt, trace organic material (SM, F2) [FILL]		SM			1	GB			○	PID = 0.7 ppm, Gravel = 25%, Sand = 62%, Fines = 12.7%, MA
		2.5 - 7.8 Compact, moist, brown, poorly graded SAND with gravel; fine to coarse-grained sand, trace to little subrounded gravel up to 0.75 inch diameter, trace silt, gravel content increases with depth (SP)		SP		2.5	2	LS	4 6 7	18/18	○ ■	PID = 1.0 ppm, Gravel = 4%, Sand = 92%, Fines = 4.1%, SA
5							3	LS	7 8 7	18/18	○ ■	PID = 1.3 ppm, Gravel = 23%, Sand = 73%, Fines = 4.8%, SA
		7.8 - 16.5 Compact, wet, gray, poorly graded SAND with gravel; fine to coarse-grained sand, little subrounded to subangular gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM		7.8	4	LS	8 8 10	18/18	■ ○	PID = 1.2 ppm
10							5	LS	5 9 10	18/18	■ ○	PID = 1.5 ppm, Gravel = 17%, Sand = 76%, Fines = 6.6%, SA
15							6	LS	11 11 11	18/18	■ ○	PID = 1.4 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-21

RECORD OF BOREHOLE BH-21

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/16/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19160° N 149.89999° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES: TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Grass 0.0 - 2.7 Moist, brown, poorly graded SAND with silt; fine to coarse-grained sand, few silt, trace subrounded gravel up to 0.5 inch diameter, trace organic material (SP-SM) [FILL]		SP-SM			1	GB				PID = 0.3 ppm
		2.7 - 5.0 Loose, moist, brown, SILTY SAND; fine to coarse-grained sand, some silt, trace gravel up to 0.38 inch diameter (SM)		SM		2.7	2	LS	3 3 3	12/18		PID = 0.3 ppm, Gravel = 2%, Sand = 59%, Fines = 38.4%, SA
5		5.0 - 7.8 Compact, moist, brown, poorly graded SAND; medium-grained sand, trace silt (SP)		SP		5.0	3	LS	6 6 7	18/18		PID = 0.5 ppm
		7.8 - 10.0 Compact, moist, brown, poorly graded SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1 inch diameter, trace silt (SP)		SP		7.8	4	LS	16 13 11	18/18		PID = 0.4 ppm, Gravel = 37%, Sand = 59%, Fines = 3.6%, SA
10		10.0 - 15.0 Compact, wet, brown, poorly graded SAND with silt; fine to coarse-grained sand, little subrounded to subangular gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM		10.0	5	LS	20 7 11	12/18		PID = 0.7 ppm, Gravel = 11%, Sand = 84%, Fines = 5.6%, SA
15		15.0 - 15.3 Compact, wet, brown, SILTY SAND; fine to coarse-grained sand, little silt, trace subrounded to subangular gravel (SM)		SM SW		15.0 15.3	6	LS	11 9 8	12/18		PID = 0.3 ppm, Gravel = 3%, Sand = 81%, Fines = 15.6% PID = 0.7 ppm, Gravel = 31%, Sand = 65%, Fines = 4.0%, SA
		15.3 - 16.5 Compact, wet, gray, well-graded SAND with gravel; fine to coarse-grained sand, some subrounded to subangular gravel up to 1 inch diameter, trace silt (SW)										
20		Borehole completed at 16.5 ft.										
25		NOTES: 1) Groundwater observed at 8 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. Excess cuttings were mounded at the surface.										
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-22

RECORD OF BOREHOLE BH-22

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/16/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19171° N 149.90159° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.5 ASPHALT (7-inches thick)				0.5	1	GB				PID = 0.7 ppm
		0.5 - 3.9 Loose, moist, dark brown, sandy ORGANIC SILT; some fine to coarse-grained sand, little fibrous organic material (OL)		OL							96	
							2	LS	5 2 4	12/18		PID = 0.3 ppm, Gravel = 0%, Sand = 36%, Fines = 64.2%, OLI = 13%
		3.9 - 5.0 Soft, moist, gray, SILT; trace organic material (ML)		ML		3.9						
5		5.0 - 5.8 Compact, moist, gray, SILTY SAND; fine to coarse-grained sand, little silt, few gravel up to 0.75 inch diameter (SM)		SM		5.0	3	LS	5 8 6	18/18		PID = 0.5 ppm, Gravel = 8%, Sand = 61%, Fines = 30.9% PID = 0.4 ppm, Gravel = 9%, Sand = 82%, Fines = 9.0%, SA
		5.8 - 7.5 Compact, moist, gray to brown, well-graded SAND with silt; fine to coarse-grained sand, few silt, few gravel up to 0.75 inch diameter (SW-SM)		SW-SM		5.8 7.5	4	LS	8 9 11	18/18		PID = 0.5 ppm, Gravel = 3%, Sand = 89%, Fines = 7.3%, SA
10		7.5 - 15.0 Compact, wet, dark gray, poorly graded SAND with silt; fine to coarse-grained sand, trace to little subrounded to subangular gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM			5	LS	9 8 9	12/18		PID = 0.6 ppm
15		15.0 - 16.5 Compact, wet, dark gray, poorly graded SAND; medium-grained sand, trace silt (SP)		SP		15.0	6	LS	7 8 10	12/18		PID = 0.6 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-23

DRAFT

1773748_MOA TWO ROADS PROJECT.GPJ LIBRARY-ANC(5-30-18) - NEW LOGO, LS FOR LPT SAMPLE.GLB [ANC BOREHOLE AUTO-THERM&WELL] JKarp 1/11/19

RECORD OF BOREHOLE BH-23

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/15/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19171° N 149.90305° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (1.75-inches thick)				0.2	1	GB				PID = 5.3 ppm, Gravel = 3%, Sand = 80%, Fines = 17.7%, SA
		0.2 - 3.0 Compact, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, trace to little subrounded to subangular gravel up to 0.75 inch diameter, little silt (SM, F2) [FILL]		SM								
		3.0 - 10.0 Compact, moist, brown, poorly graded SAND; fine to medium-grained sand, few subangular gravel up to 1 inch diameter, trace silt (SP)				3.0	2	LS	9 8 10	18/18		PID = 11.0 ppm, Gravel = 20%, Sand = 56%, Fines = 24.0%, MA PID = 4.8 ppm
5							3	LS	6 7 9	18/18		PID = 6.7 ppm, Gravel = 7%, Sand = 88%, Fines = 4.3%, SA
				SP			4	LS	14 8 6	18/18		PID = 6.9 ppm
10		10.0 - 15.0 Compact, wet, gray, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little subrounded gravel up to 1 inch diameter, few silt (SP-SM)				10.0	5	LS	15 7 9	18/18		PID = 6.3 ppm, Gravel = 17%, Sand = 77%, Fines = 5.6%, SA
				SP-SM								
15		15.0 - 16.5 Compact, wet, gray, gravelly SILTY sand; fine to coarse-grained sand, little subrounded gravel up to 0.5 inch diameter, little silt (SM)		SM		15.0	6	LS	8 8 10	18/18		PID = 6.0 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-24

DRAFT

1773748_MOA TWO ROADS PROJECT.GPJ LIBRARY-ANC(5-30-18) - NEW LOGO, LS FOR LPT SAMPLE.GLB [ANC BOREHOLE AUTO-THERM&WELL] JKarp 1/11/19

RECORD OF BOREHOLE BH-24

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/16/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19171° N 149.90437° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △ WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.25-inches thick)				0.2	1	GB				PID = 0.7 ppm, Gravel = 10%, Sand = 67%, Fines = 23.8%, MA
		0.2 - 2.5 Moist, brown, SILTY SAND; fine to coarse-grained sand, little silt, little subrounded gravel up to 0.75 inch diameter (SM, F3) [FILL]		SM								
		2.5 - 15.3 Loose to compact, moist to wet, brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, few to little subrounded to subangular gravel gravel up to 1 inch diameter, trace to few silt (SP-SM)				2.5	2	LS	11 3 3	12/18		PID = 0.2 ppm, Gravel = 11%, Sand = 83%, Fines = 6.0%, SA
5							3	LS	10 8 9	18/18		PID = 0.6 ppm
												PID = 0.3 ppm, Gravel = 22%, Sand = 71%, Fines = 7.6%, SA
							4	LS	5 3 3	18/18		PID = 0.7 ppm, Gravel = 6%, Sand = 89%, Fines = 5.0%
				SP-SM								
10							5	LS	8 8 6	18/18		PID = 0.6 ppm
15		15.3 - 16.5 Compact, wet, gray, poorly graded SAND; medium-grained sand, trace silt (SP)		SP		15.3	6	LS	6 5 9	10/18		PID = 1.0 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 15 feet below ground surface whiledrilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

1773748_MOA TWO ROADS PROJECT.GPJ LIBRARY-ANC(5-30-18) - NEW LOGO, LS FOR LPT SAMPLE.GLB [ANC BOREHOLE AUTO-THERM&WELL] JKarp 1/11/19

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-25

RECORD OF BOREHOLE BH-25

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/12/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.18995° N 149.87091° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ 10 20 30 40; SALINITY (ppt) △ WATER CONTENT (%) W_P W W_L 10 20 30 40	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.2 ASPHALT (2.25-inches thick)				0.2	1	LS	38 35 13	18/18		PID = 0.5 ppm, Gravel = 45%, Sand = 41%, Fines = 14.3%, MA
		0.2 - 2.5 Dense, moist, gray, SILTY GRAVEL with sand; subangular to subrounded gravel up to 2 inch diameter, some fine to coarse-grained sand, little silt (GM) [FILL]		GM		2.5	2	LS	24 13 13	18/18		PID = 1.1 ppm, Gravel = 33%, Sand = 59%, Fines = 7.2%, SA
5		2.5 - 7.5 Compact, moist, brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, little to some subangular to subrounded gravel up to 1.5 inch diameter, few silt, gravel content decreases with depth (SP-SM) [FILL]		SP-SM			3	LS	9 9 8	18/18		PID = 0.6 ppm, Gravel = 12%, Sand = 82%, Fines = 6.1%, SA
		7.5 - 16.5 Loose to dense, wet, gray, poorly graded SAND with silt; fine to coarse-grained sand, little subrounded gravel up to 1 inch diameter, few silt (SP-SM)		SP-SM		7.5	4	LS	6 5 5	18/18		PID = 0.9 ppm
10							5	LS	4 4 4	18/18		PID = 0.6 ppm, Gravel = 13%, Sand = 80%, Fines = 6.5%, SA
15							6	LS	8 18 13	18/18		PID = 0.6 ppm
20		Borehole completed at 16.5 ft. NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: J. Karp
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-26

RECORD OF BOREHOLE BH-26

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/12/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.18948° N 149.86943° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt										
		0.0 - 0.2 ASPHALT (2.5-inches thick)				0.2	1	LS	43 50/5	11 11	>> ■	PID = 4.2 ppm, Gravel = 36%, Sand = 52%, Fines = 12.0%, SA
		0.2 - 2.5 Very dense, moist, brown, poorly graded SAND with silt and gravel; fine to coarse-grained sand, some subrounded gravel up to 1.5 inch diameter, little silt (SP-SM) [FILL]		SP-SM								
		2.5 - 5.0 Dense, moist, brown, poorly graded GRAVEL with silt and sand; subangular to subrounded gravel up to 2 inch diameter, some fine to coarse-grained sand, little silt (GP-GM, F1) [FILL]		GP-GM		2.5	2	LS	20 15 26	18 18	■	PID = 6.0 ppm, Gravel = 48%, Sand = 41%, Fines = 11.2%, MA
5		5.0 - 5.5 Dense, moist, brown, SILTY SAND with gravel; fine to coarse-grained sand, little subangular to subrounded gravel up to 1 inch diameter, little silt (SM) [FILL]		SM		5.0	3	LS	21 21 19	18 18	■	PID = 3.7 ppm, Gravel = 21%, Sand = 65%, Fines = 14.4%, SA PID = 5.0 ppm, Gravel = 6%, Sand = 84%, Fines = 9.7%, SA
		5.5 - 7.5 Dense, moist, gray, poorly graded SAND with silt; fine to coarse-grained sand, few silt, few subrounded gravel up to 0.75 inch diameter (SP-SM)		SP-SM		5.5						
		7.5 - 10.0 Compact, wet, gray, poorly graded SAND; fine to coarse-grained sand, little subrounded gravel up to 0.25 inch diameter, few silt (SP)		SP		7.5	4	LS	8 9 12	18 18	■	PID = 0.7 ppm
10		10.0 - 15.0 Compact, wet, gray, well-graded SAND with silt; fine to coarse-grained sand, little subrounded gravel up to 0.75 inch diameter, few silt (SW-SM)		SW-SM		10.0	5	LS	10 11 9	18 18	■	PID = 1.4 ppm, Gravel = 14%, Sand = 78%, Fines = 7.6%, SA
15		15.0 - 16.5 Compact, wet, gray, poorly graded SAND; fine to coarse-grained sand, trace silt (SP)		SP		15.0	6	LS	17 11 13	18 18	■	PID = 15.0 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 7.5 feet below ground surface while drilling. 2) Borehole backfilled with cuttings and tamped using rig and rods. 3) Borehole completed with cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: J. Karp
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-27

RECORD OF BOREHOLE BH-27

SHEET 1 of 1

PROJECT: West 32nd Avenue & East 33rd Avenue Upgrades
PROJECT NUMBER: 1773748
LOCATION: Anchorage, AK
CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 11/15/2018
EQUIPMENT: CME-75, Truck Mount
DATUM: NAD 83
ELEVATION: n/a
COORDS: 61.19306° N 149.90323° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) ○ (W_P 10 20 W 30 40 W_L)	NOTES, TESTS, WATER LEVELS
0	3.25-in ID Hollow Stem Auger	VEGETATION: Asphalt 0.0 - 0.5 ASPHALT (6-inches thick)				0.5	1	GB				PID = 8.3 ppm, Gravel = 6%, Sand = 79%, Fines = 15.4%, MA
		0.5 - 2.5 Moist, brown, SILTY SAND; fine to coarse-grained sand, little silt, few subrounded gravel up to 0.75 inch diameter (SM) [FILL]		SM								
		2.5 - 5.0 Compact, moist, brown, poorly graded SAND; fine to coarse-grained sand, few gravel up to 0.75 inch diameter, trace silt, silt interbeds to three-inches thick from 2.5 to 4.5 feet (SP)		SP		2.5	2	LS	5 7 8	18 18		PID = 10.1 ppm, Gravel = 7%, Sand = 89%, Fines = 4.4%, SA
5		5.0 - 7.5 Compact, moist, brown, poorly graded SAND with silt; fine to coarse-grained sand, little gravel up to 0.75 inch diameter, few silt (SP-SM)		SP-SM		5.0	3	LS	17 7 8	18 18		PID = 9.4 ppm, Gravel = 14%, Sand = 81%, Fines = 5.3%, SA
		7.5 - 16.5 Compact, moist to wet, gray, poorly graded SAND with gravel; fine to coarse-grained sand, some subrounded gravel up to 1 inch diameter, trace silt (SP)		SP		7.5	4	LS	8 6 6	18 18		PID = 11.4 ppm
10							5	LS	8 8 8	12 18		PID = 1.3 ppm, Gravel = 30%, Sand = 66%, Fines = 3.9%, SA
15							6	LS	12 10 12	12 18		PID = 265 ppm
		Borehole completed at 16.5 ft.										
20		NOTES: 1) Groundwater observed at 10 feet below ground surface while drilling. 2) 1-inch, Schedule 40 PVC installed to 15 feet below ground surface and hand-slotted from 5 to 15 feet below ground surface. 3) Annulus backfilled with cuttings. 4) Borehole completed with a 7-inch steel flush mount and cold patch asphalt.										
25												
30												

GOLDER

DEPTH SCALE: 1 inch to 3.75 feet
DRILLING CONTRACTOR: Discovery Drilling Inc.
DRILLER: G. Erickson

LOGGED: A. Mathers
CHECKED: J. Karp
CHECK DATE: 1/4/2019

Figure A-28

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

VI

TEMPORARY CONSTRUCTION PERMITS AND EASEMENTS

Some of the easements or permits obtained for the construction of the project contain restrictions or special considerations. The Contractor shall be responsible for complying with all restrictions or special considerations. The Contractor shall not begin work until all easements or permits necessary for construction of the project have been acquired. The Contractor shall ensure that all easements and permits are available on the job site at all times.

TEMPORARY CONSTRUCTION PERMITS AND EASEMENTS

TO BE PROVIDED FOR 95% DESIGN

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

VII

EQUAL EMPLOYMENT OPPORTUNITY SPECIAL PROVISIONS

CONTRACT COMPLIANCE SPECIFICATIONS

EQUAL EMPLOYMENT OPPORTUNITY

SPECIAL PROVISIONS

The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, marital status, or physical or mental disability. The contract will comply with all laws concerning the prohibition of discrimination including, but not limited to, Title 5 and Title 7 of the Anchorage Municipal Code.

Every municipal contract shall state, in all solicitations or advertisements for employees to work under the contract, that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, marital status, or physical or mental disability.

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

VIII

MINIMUM RATES OF PAY

Laborers' & Mechanics' Minimum Rates of Pay

Title 36. Public Contracts AS 36.05 & AS 36.10 Wage & Hour Administration Pamphlet No. 600 (Pamphlet 600) is hereby incorporated in its entirety. Pamphlet 600 is available for free download at http://labor.state.ak.us/lss/pamp600.htm.

The Municipality of Anchorage will include a paper copy of the wage rates in the signed Contract.

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IX

CONTRACT

C O N T R A C T

Invitation to Bid No. **2019C**_____

Contract No. **C-2019**_____

NAME AND ADDRESS OF CONTRACTOR:

_____

_____

_____

Check appropriate box:

☒ **Incorporated in the State of**

MUNICIPALITY OF ANCHORAGE, acting through _____ (hereinafter the Owner).

Contract for _____

BID SCHEDULES	**ITEMS**	**PLAN SHEET FILE NUMBERS**	**AMOUNT**
			$ _____

Total Amount : $ _____

THIS CONTRACT, entered into by the MUNICIPALITY OF ANCHORAGE, ALASKA, acting through the Owner named above, and the individual, partnership, or corporation named above, hereinafter called the Contractor, WITNESSETH that the parties hereto do mutually agree as follows:

Statement of Work: The Contractor shall furnish all labor, equipment and materials and perform the Work above described, for the amount stated, in strict accordance with the Contract Documents.

CONTRACT DOCUMENTS

I. This CONTRACT consisting of 4 pages.

II. The Bid Proposal Section ___ consisting of ____ pages numbered as ____, **as contained in ITB 2019C_____.**

III. The Contract Performance and Payment Bond _____.

IV. The Contractor's Certificate of Insurance Dated _____.

V. Municipality of Anchorage Standard Specifications dated 2015 (MASS) Incorporated by Reference, **as contained in ITB 2019C_____.**

VI. Specifications consisting of the following:

Supplemental Provisions Section _____ consisting of _____ pages, with attachments Exhibit A through F, **as contained in ITB 2019C_____.**

VII. Equal Opportunity Special Provisions and Forms Section _____ consisting of _____ pages, **as contained in ITB 2019C_____.**

VIII. Disadvantaged/Women-Owned Business Enterprise (DBE/WBE) Specification Section _____ consisting of _____ pages, **as contained in ITB 2019C_____.**

IX. The Laborers' and Mechanics' Minimum Rates of Pay dated September 1, 2015 Section _____ consisting of _____ pages, **as contained in ITB 2019C_____.**

X. Submittal List Section _____ consisting of _____ page, **as contained in ITB 2019C_____.**

XI. The Drawings consisting of _____ sheets numbered _____, **as contained in ITB 2019C_____.**

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the Contract Date entered below.

MUNICIPALITY OF ANCHORAGE, ALASKA

BY _____
Signature

Purchasing Officer or designee
Title

Date of Signature and Contract Date:

_____

VENDOR _____

BY _____
Signature

_____
Printed Name

_____
Title

_____
Date of Signature

CONTRACT AND PERFORMANCE AND PAYMENT BOND SIGNATURE INSTRUCTIONS

1. The full name and business of the Contractor shall be inserted on Page 1 of the Contract and on the Performance and Payment Bond, hereinafter the Bond.
2. Two copies of the Contract and the Bond shall be manually signed by the Contractor. If the Contractor is a partnership or joint venture, all partners or joint ventures shall sign the Contract and the Bond except that one partner or one joint venturer may sign for the partnership or joint venture when all other partners or joint venturers have executed a Power-of-Attorney authorizing one partner or joint venturer to sign. The Power-of-Attorney shall accompany the executed contract and the Bond.
3. If the Contractor is a corporation, the President of the corporation shall execute the Contract and the Bond unless a Power-of-Attorney or corporate resolution shall accompany the executed Contract and Bond.
4. The Bond shall be returned to the Purchasing Division undated. The Contract Date shall be inserted on the Contract when the Municipality signs the Contract and the Bond shall be dated the same as the Contract Date.

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

X

CONTRACT PERFORMANCE AND PAYMENT BOND

CONTRACT PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____
_____ of _____
as Principal, and _____
a corporation organized under the laws of the _____
_____ and authorized to transact surety business in the State of Alaska, of _____
as Surety, are held and firmly bound unto the MUNICIPALITY OF ANCHORAGE, as Obligee, in the full and just sum of _____
($_____) Dollars, lawful money of the UNITED STATES, for the payment which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION IS SUCH, that whereas the principal has entered into a certain contract dated the _____ date of _____ 20_____, with the Obligee for the construction of _____
_____
which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract, and shall promptly make payments to all persons supplying labor and material in the prosecution of the work provided for in said contract, during the original term of said contract and any extensions or modifications thereof that may be granted by the Municipality, with or without notice to the Surety, then this obligation to be void; otherwise to remain in full force and effect.

This obligation is made for the use of said Obligee and also for use and benefit of all persons who may perform any work or labor or furnish any material in the execution of said Contract and may be sued on thereby in the name of said Obligee.

The said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same, shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

Whenever Principal shall be, and declared by Obligee to be in default under the Contract the Obligee having performed Obligee's obligations thereunder, the Surety may promptly remedy the default or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for submission to Obligee for completing the Contract in accordance with its terms and conditions and upon determination by Surety of the lowest responsible bidder, or, if the Obligee elects, upon determination by Obligee and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Obligee and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder the amount set forth in the first paragraph hereof. The term "balance of the contract price" as used in this paragraph, shall mean the total amount payable by Obligee to Principal under the Contract and any amendments thereto, less the amount properly paid by Obligee to Principal.

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hereof in _____ _____ original counterparts as of the _____ day of _____, 20_____.

WITNESS AS TO PRINCIPAL:

_____ _____
Principal Name

_____
Principal Signature

_____
Corporate Surety

(AFFIX CORPORATE SEAL)

_____

_____
Surety Business Address

BY: _____
(Attorney-In-Fact)

(AFFIX SURETY SEAL)

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

XI

CERTIFICATE OF INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
INSURED	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
	☐ ☐ CLAIMS-MADE ☐ OCCUR						MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
							GENERAL AGGREGATE	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$
	☐ POLICY ☐ PRO-JECT ☐ LOC							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	☐ UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	☐ EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ WC STATU-TORY LIMITS ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ (Mandatory in NH)	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

ADDITIONAL INSURED:

1. ADDITIONAL INSURANCE: The Municipality of Anchorage is an additional insured on all policies, and shall contain a WAIVER OF SUBROGATION against the Municipality except Professional Liability and Worker's Compensation.
2. CANCELLATION: "Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the Policy Provisions."

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

XII

BID BOND

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we, _____

as Principal, and _____ a corporation organized under the laws of the _____ and authorized to transact surety business in the State of Alaska, of _____ _____ as Surety, are held and firmly bound unto the MUNICIPALITY OF ANCHORAGE, as Obligee, in the full and just sum of _____ _____ ($_____) Dollars, lawful money of the UNITED STATES, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by the presents.

WHEREAS, the said Principle is herewith submitting its proposal for _____ _____.

The condition of this obligation is such that if the aforesaid Principal will, within the time required enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this Obligation to be void; otherwise the Principal and Surety will pay unto to the Obligee the amount stated above.

Signed, sealed, and delivered _____, 20_____.

WITNESS AS TO PRINCIPAL:

_____ _____
Contractor Name

_____
Contractor Signature

(AFFIX CORPORATE SEAL) _____
Corporate Surety

_____

_____
Surety Business Address

BY: _____
(Attorney-In-Fact)

(AFFIX SURETY SEAL)

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

XIII

BIDDER'S CHECKLIST

BIDDER'S CHECKLIST

INSTRUCTIONS TO BIDDER

I. GENERAL

Bidders are advised that, notwithstanding any instructions or implications elsewhere in this Invitation to Bid, only the documents shown and detailed on this sheet need be submitted with and made part of their bid. Other documents may be required to be submitted after bid time, but prior to award. Bidders are hereby advised that failure to submit the documents shown and detailed on this sheet shall be justification for rendering the bid nonresponsive. Evaluation of bids for responsiveness shall be accomplished in accordance with Anchorage Municipal Code, Title 7.

II. REQUIRED DOCUMENTS FOR BID:

NOTE: Only the following listed items as marked with an "X" are required to be completely filled out and submitted with the bid.

__X__ Bid proposal consisting of pages BP-1 through BP-10. BPs-2 and BP-9 must be manually signed.

__X__ Erasures or other changes made to the Bid Proposal Sheet must be initialed by the person signing the bid.

_____ Two identical sets of descriptive literature, brochures, and/or data must accompany the bid where specifically requested or when in support of an "or equal" offer.

__X__ Bid bond, certified check, cashiers check, money order or cash shall be submitted with the bid in the amount indicated.

__X__ All Addenda issued shall be acknowledged in the space provided on the Bid Proposal sheet or by manually signing the Addenda sheet and submitting it prior to the bid opening in accordance with Anchorage Municipal Code 7.20.020C.

_____ Disadvantaged and Women-Owned Business Enterprises, Form 10-029

_____ Others

MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

XIV

BID PROPOSAL

BID PROPOSAL
(CERTIFICATION)

TO: MUNICIPALITY OF ANCHORAGE _____, 2020
PURCHASING DEPARTMENT
632 W. 6TH AVENUE, SUITE 520
ANCHORAGE, ALASKA 99501

SUBJECT: Invitation to Bid No. **2020C0**

PROJECT TITLE: **W. 32ND AVENUE & E. 33RD AVENUE UPGRADES - ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY**

Pursuant to and in compliance with subject Invitation to Bid, and other bid documents relating thereto, the bidder hereby proposes to furnish all labor and materials and to perform all work for the construction of the above referenced project in strict accordance with the bid documents at the prices established in the Bid Proposal, pages **BP-1 of 15 through BP-15 of 15** submitted herewith.

The bidder agrees, if awarded the contract, to commence and complete the work within the time specified in the bid documents.

The bidder acknowledges receipt of the following addenda:

Addenda No._____ Date of Addenda_____

Addenda No._____ Date of Addenda_____

Addenda No._____ Date of Addenda_____

Enclosed is a Bid Bond in the amount of _____.
(Dollar Amount or Percentage of Bid)

Type of Business Organization
The bidder, by checking the applicable box, represents that it operates as ( ) a corporation incorporated under the laws of the State of ____, ( ) an individual, ( ) an LLC, ( ) a partnership, ( ) a nonprofit organization, or ( ) a joint venture. If a partnership or joint venture, identify all parties on a separate page.

_____
Company Name

(CERTIFICATION)
Continued

SUBJECT: Invitation to Bid No. **2020C0**

PROJECT TITLE: **W. 32ND AVENUE & E. 33RD AVENUE UPGRADES– ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY**

Date

Alaska Contractor's License Number

Company Name (Printed)

Employer's Tax Identification Number

Authorized Representative Signature

Printed Name & Title

Company **Mailing** Address

Company Phone Number

City, State, Zip Code

Company Fax Number

Company Email Address

Company **Physical** Address
(if different from mailing address)

City, State, Zip Code

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway

MOA Project No. 16-29

Bid Proposal

BASE BID

Schedule	Description	Bid Amount
A	Roadway Improvements	
B	Drainage Improvements	
C	Illumination and Signalization Improvements	
D	Landscaping Improvements	

Total Project: _____

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
MOA Project No. 16-29

Bid Proposal

Schedule: A Roadway Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
A-1	20.02 95.04	Storm Water Pollution Prevention Plan (Type 3)	Per LS	1		
A-2	20.03 95.04	Test Pit for Utility Locate	Per Hour	24		
A-3	20.04 95.04	Clearing and Grubbing	Per LS	1		
A-4	20.07 95.04	Remove Sidewalk or Concrete Apron	Per SY	4,677		
A-5	20.08	Remove Curb and Gutter	Per LF	13,471		
A-6	20.09 95.04	Remove Pavement	Per SY	33,214		
A-7	20.10	Unusable Excavation	Per CY	74,300		
A-8	20.21 95.04	Classified Fill and Backfill (Type II)	Per Ton	61,100		
A-9	20.21 95.04	Classified Fill and Backfill (Type II-A)	Per Ton	55,200		
A-10	20.22 95.04	Leveling Course	Per Ton	3,970		
A-11	20.25	Geotextile (Type A)	Per SY	47,620		
A-12	20.26 95.04	Insulation Board (R-4.5)	Per SF	22,260		
A-13	20.26 95.04	Insulation Board (R-9)	Per SF	347,270		
A-14	30.02	P.C.C. Curb and Gutter (All Types)	Per LF	15,132		
A-15	30.02	P.C.C. Curb & Gutter (Type 1, Steel Curb Facing)	Per LF	846		
A-16	30.02	Curb Nose	Per EA	13		
A-17	30.03 95.04	P.C.C. Sidewalk (4" Thick, Standard Finish)	Per SY	5,047		
A-18	30.03 95.04	P.C.C. Sidewalk (6" Thick, Standard Finish)	Per SY	1,321		
A-19	30.04 95.04	P.C.C. Curb Ramp (6" Thick)	Per SY	845		

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
MOA Project No. 16-29

Bid Proposal

Schedule: A Roadway Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
A-20	30.04	Detectable Warnings	Per SF	1,366		
A-21	30.05	P.C.C. Retaining Wall Class (AA-3)	Per CY	168		
A-22	30.10	Colored Concrete (4" Thick, Red, Running Bond Tile)	Per SY	160		
A-23	30.10	Colored Concrete (4" Thick, Green, Running Bond Tile)	Per SY	1,437		
A-24	30.10	Colored Concrete (4" Thick, Green, Broom Finish)	Per SY	552		
A-25	30.10	Colored Concrete (6" Thick, Green, Running Bond Tile)	Per SY	93		
A-26	30.12	High-Performance Concrete (8" Thick, Red, Broom Finish)	Per SY	122		
A-27	30.12	High-Performance Concrete (8" Thick, Natural, Broom Finish)	Per SY	104		
A-28	40.06	A.C. Pavement (Class E)	Per Ton	3,390		
A-29	40.06	A.C. Pavement (Class D)	Per Ton	3,240		
A-30	50.06 95.04	Remove and Replace Manhole Cone Section	Per EA	5		
A-31	50.06 95.04	Remove and Replace Manhole Cover and Frame	Per EA	6		
A-32	50.09 95.04	Adjust Cleanout to Finish Grade	Per EA	3		
A-33	55.07	Adjust Storm Drain Manhole Cone	Per EA	3		
A-34	55.08	Adjust Storm Drain Manhole Ring	Per EA	7		
A-35	55.12	Adjust Catch Basin to Finish Grade	Per EA	9		
A-36	60.03	Remove and Replace Valve Box Top Section	Per EA	54		
A-37	60.04	Furnish and Install Fire Hydrant Assembly (Single Pumper)	Per EA	3		

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
MOA Project No. 16-29

Bid Proposal

Schedule: A Roadway Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
A-38	60.05 95.04	Adjust Key Box	Per EA	13		
A-39	60.08	Decommission Fire Hydrant Assembly	Per EA	3		
A-40	65.02	Construction Survey Measurement	Per LS	1		
A-41	65.02	Two-Person Survey Crew	Per Hour	60		
A-42	70.08 95.04	Remove and Reset Fence	Per LF	230		
A-43	70.10 95.04	Inlaid Traffic Markings (Paint, 4" Yellow, 60 Mil)	Per LF	838		
A-44	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, 4" Yellow, 250 Mil)	Per LF	10,661		
A-45	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, 4" White, 250 Mil)	Per LF	1,481		
A-46	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, 8" White, 250 Mil)	Per LF	644		
A-47	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, 18" White, 250 Mil)	Per LF	58		
A-48	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, 24" White, 250 Mil)	Per LF	1,695		
A-49	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, Words & Symbols, 250 Mil)	Per EA	27		
A-50	70.10 95.04	Inlaid Traffic Markings (Methyl Methacrylate, Words & Symbols, 90 Mil)	Per EA	62		
A-51	70.10 95.04	Preformed Thermoplastic Pavement Markings	Per EA	6		
A-52	70.11	Remove and Relocate Signs	Per EA	6		
A-53	70.11 95.04	Standard Sign	Per SF	669		
A-54	70.12 95.04	Traffic Maintenance	Per LS	1		
A-55	70.13	Remove Bollard	Per EA	31		

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
MOA Project No. 16-29

Bid Proposal

Schedule: A Roadway Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
A-56	70.13	Remove and Reset Bollard Gate	Per LS	1		
A-57	70.22	Removal/Disposal and/or Salvage of Obstructions	Per LS	1		
A-58	70.24	Temporary Fencing	Per LF	230		

Total Schedule A _____

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
MOA Project No. 16-29

Bid Proposal

Schedule: B Drainage Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
B-1	20.13	Trench Dewatering	Per LS	1		
B-2	20.13 95.04	Trench Excavation and Backfill (Various Depths)	Per LF	5,006		
B-3	20.15	Furnish Trench Backfill (Type II)	Per Ton	173		
B-4	20.16	Bedding Material (Class D)	Per LF	5,006		
B-5	20.26	Insulation Board (R-20)	Per SF	1,125		
B-6	20.27	Disposal of Unusable or Surplus Material	Per CY	2,438		
B-7	55.02	Furnish, Install, and Televise Pipe (12-Inch, Type S, CPEP)	Per LF	1,443		
B-8	55.02	Furnish, Install, and Televise Pipe (15-Inch, Type S, CPEP)	Per LF	786		
B-9	55.02	Furnish, Install, and Televise Pipe (18-Inch, Type S, CPEP)	Per LF	1,792		
B-10	55.02	Furnish, Install, and Televise Pipe (24-Inch, Type S, CPEP)	Per LF	986		
B-11	55.04	Connect to Existing Storm Drain System	Per EA	10		
B-12	55.05	Construct (Type I) Manhole	Per EA	19		
B-13	55.05	Construct (Type II) Manhole	Per EA	2		
B-14	55.05	Construct (Type III, 96" ID) Manhole	Per EA	1		
B-15	55.05	Construct (Type II) Catch Basin Manhole	Per EA	12		
B-16	55.09	Construct Catch Basin	Per EA	43		
B-17	55.11	Remove Manhole	Per EA	11		
B-18	55.11	Remove Catch Basin	Per EA	21		
B-19	55.27	Storm Drain Bypass System	Per LS	1		

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway

MOA Project No. 16-29

Bid Proposal

Schedule: B Drainage Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION	EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
B-20	70.07	Remove Pipe Per LF	2,140		

Total Schedule B _____

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway

MOA Project No. 16-29

Bid Proposal

Schedule: C Illumination and Signalization Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
C-1	80.01 95.04	Temporary Illumination	Per LS	1		
C-2	80.01 95.04	Temporary Signalization	Per LS	1		
C-3	80.02 95.04	Trench and Backfill (2'W x 3.5'D)	Per LF	9,560		
C-4	80.04 95.04	Driven Pile Luminaire Pole Foundation	Per EA	41		
C-5	80.04 95.04	Controller Cabinet Foundation (TS2)	Per EA	3		
C-6	80.04 95.04	Signal Mast Arm Pole Foundation	Per EA	3		
C-7	80.04 95.04	Signal Pedestal Pole Foundation	Per EA	2		
C-8	80.04 95.04	Load Center Foundation (Type 1A)	Per EA	5		
C-9	80.04 95.04	Cast-In-Place Light Column Foundation	Per EA	7		
C-10	80.04 95.04	24" Dia Precast Reinforced Concrete Collar (4')	Per EA	1		
C-11	80.05 95.04	Combination Signal/Luminaire Pole (40' Height)	Per EA	3		
C-12	80.05 95.04	Signal Pedestal Pole - Flange Base	Per EA	2		
C-13	80.05 95.04	Fixed Base Luminaire Pole	Per EA	41		
C-14	80.06 95.04	Signal Mast Arm (30 ft Length)	Per EA	1		
C-15	80.06 95.04	Signal Mast Arm (40 ft Length)	Per EA	1		
C-16	80.06 95.04	Signal Mast Arm (45 ft Length)	Per EA	1		
C-17	80.06 95.04	Luminaire Arm (18 ft Length)	Per EA	50		
C-18	80.07 95.04	GRC Steel Conduit (3 inch)	Per L.F.	1,620		
C-19	80.07 95.04	GRC Steel Conduit (2 inch)	Per LF	11,110		

Contractor's Name: _____

Date: _____

W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
MOA Project No. 16-29

Bid Proposal

Schedule: C Illumination and Signalization Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
C-20	80.08 95.04	Remove Junction Box	Per EA	32		
C-21	80.08 95.04	Junction Box (Type IA)	Per EA	74		
C-22	80.08 95.04	Junction Box (Type II)	Per EA	14		
C-23	80.10 95.04	3 Conductor 14 AWG IMSA 20-1 Cable	Per LF	4,430		
C-24	80.10 95.04	5 Conductor 14 AWG IMSA 20-1 Cable	Per LF	4,340		
C-25	80.10 95.04	7 Conductor 14 AWG IMSA 20-1 Cable	Per LF	6,250		
C-26	80.10 95.04	3 Conductor 20 AWG IMSA 20-1 Cable	Per LF	1,850		
C-27	80.10 95.04	3 Conductor 8 AWG Type XHHW-2 Cable	Per LF	15,500		
C-28	80.10 95.04	3 Conductor 6 AWG	Per L.F.	30		
C-29	80.10 95.04	25 Pair 19 AWG PE-39 Telemetry Cable	Per LF	1,390		
C-30	80.10 95.04	7 Pair 18 AWG Tray Cable	Per LF	3,870		
C-31	80.10 95.04	Conductor, Communication Cable	Per LF	2,143		
C-32	80.14	Single-Meter Load Center Enclosure, Type 1A	Per EA	5		
C-33	80.17 95.04	TS2-1 Controller Unit	Per EA	3		
C-34	80.18	Install Loop Detector - New Work	Per EA	70		
C-35	80.18	Install Optical Preemption Detector (721 Opticom with Single Confirmation)	Per EA	3		
C-36	80.18 95.04	Install Radar Detecor	Per EA	12		
C-37	80.19	12 Inch 3 Face LED Signal Head (Overhead Mount)	Per EA	4		

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W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
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Schedule: C Illumination and Signalization Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
C-38	80.19	12 Inch 3 Face LED Signal Head (Side Mount)	Per EA	4		
C-39	80.19	12 Inch 5 Face LED Signal Head (Overhead Mount)	Per EA	4		
C-40	80.19	12 Inch 5 Face LED Signal Head (Side Mount)	Per EA	4		
C-41	80.19	Remove and Relocate Existing Signal Head	Per EA	3		
C-42	80.20	Pedestrian Signal Head	Per EA	12		
C-43	80.21	Pedestrian Pushbutton Assembly	Per EA	12		
C-44	80.23 95.04	Luminaire (9,000 Lm, Medium, Type 2)	Per EA	4		
C-45	80.23 95.04	Luminaire (12,000 Lm, Medium, Type 2)	Per EA	6		
C-46	80.23 95.04	Luminaire (15,000 Lm, Medium, Type 2)	Per EA	7		
C-47	80.23 95.04	Luminaire (18,000 Lm, Medium, Type 2)	Per EA	7		
C-48	80.23 95.04	Luminaire (6,000 Lm, Medium, Type 3)	Per EA	3		
C-49	80.23 95.04	Luminaire (9,000 Lm, Medium, Type 3)	Per EA	5		
C-50	80.23 95.04	Luminaire (11,000 Lm, Medium, Type 3)	Per EA	5		
C-51	80.23 95.04	Luminaire (14,000 Lm, Medium, Type 3)	Per EA	8		
C-52	80.23 95.04	Luminaire (17,000 Lm, Medium, Type 3)	Per EA	5		
C-53	80.23 95.04	Luminaire (30,000 Lm, Medium, Type 3)	Per EA	4		
C-54	80.23 95.04	Spare Luminaire (9,000 Lm, Medium, Type 2)	Per EA	1		
C-55	80.23 95.04	Spare Luminaire (12,000 Lm, Medium, Type 2)	Per EA	1		

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W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway

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Schedule: C Illumination and Signalization Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
C-56	80.23 95.04	Spare Luminaire (15,000 Lm, Medium, Type 2)	Per EA	1		
C-57	80.23 95.04	Spare Luminaire (18,000 Lm, Medium, Type 2)	Per EA	1		
C-58	80.23 95.04	Spare Luminaire (6,000 Lm, Medium, Type 3)	Per EA	1		
C-59	80.23 95.04	Spare Luminaire (9,000 Lm, Medium, Type 3)	Per EA	1		
C-60	80.23 95.04	Spare Luminaire (11,000 Lm, Medium, Type 3)	Per EA	1		
C-61	80.23 95.04	Spare Luminaire (14,000 Lm, Medium, Type 3)	Per EA	1		
C-62	80.23 95.04	Spare Luminaire (17,000 Lm, Medium, Type 3)	Per EA	1		
C-63	80.27 95.04	Protective Post Assembly	Per EA	2		
C-64	80.28 95.04	Remove Signal Mast Arm or Combination Pole	Per EA	4		
C-65	80.28	Remove Luminaire Pole	Per EA	8		
C-66	80.29 95.04	Pedestrian Light Column	Per EA	7		
C-67	80.29 95.04	Spare Pedestrian Light Column	Per EA	1		

Total Schedule C _____

Contractor's Name: _____

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W. 32nd Avenue / E. 33rd Avenue Upgrades - Arctic Boulevard to Old Seward Highway
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Bid Proposal

Schedule: D Landscaping Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
D-1	70.23 95.04	Banner	Per EA	48		
D-2	70.23 95.04	Furnish Surplus Banner	Per EA	8		
D-3	70.24 95.04	Decorative Fence	Per LF	734		
D-4	70.25 95.04	Kiosk.2	Per EA	2		
D-5	70.26 95.04	Rail	Per LF	641		
D-6	70.26 95.04	Furnish Surplus Rail	Per LF	72		
D-7	70.27 95.04	Bike Fix-it Station	Per EA	2		
D-8	75.02 95.04	Extended Maintenance	Per LS	1		
D-9	75.02 95.04	Tree, Acer rubrum 'Landsburg', 2" caliper	Per EA	6		
D-10	75.02 95.04	Tree, Betula papyrifera, 2" caliper	Per EA	23		
D-11	75.02 95.04	Tree, Betula pendula 'Gracilis', 2" caliper	Per EA	19		
D-12	75.02 95.04	Tree, Pinus contorta var. latifolia, 8' height	Per EA	11		
D-13	75.02 95.04	Tree, Populus tremula 'Erecta', 2" caliper	Per EA	19		
D-14	75.02 95.04	Shrub, Cornus alba 'Siberica', 18" height	Per EA	31		
D-15	75.02 95.04	Shrub, Cornus sericea 'Kelseyi', 18" height	Per EA	204		
D-16	75.02 95.04	Shrub, Pinus mugo 'Pumillio', 18" height	Per EA	58		
D-17	75.02 95.04	Shrub, Potentilla fruticosa 'Uman', 18" height	Per EA	59		
D-18	75.02 95.04	Shrub, Rosa acicularis, 18" height	Per EA	48		
D-19	75.02 95.04	Shrub, Spiraea japonica 'Walbuma', 18" height	Per EA	123		

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Schedule: D Landscaping Improvements

ITEM NO.	SPEC. NO.	WORK DESCRIPTION		EST. QUANT	UNIT BID PRICE	TOTAL BID PRICE
D-20	75.02 95.04	Shrub, Viburnum edule, 18" height	Per EA	14		
D-21	75.02 95.04	Perennial, Hosta sieboldiana 'Elegans', 3 gallon	Per EA	17		
D-22	75.02 95.04	Perennial, Iris setosa, 3 gallon	Per EA	372		
D-23	75.02 95.04	Rock Mulch (6-inch depth)	Per CY	97		
D-24	75.02 95.04	Shredded Bark Mulch (3-inch depth)	Per SY	995		
D-25	75.03	Topsoil (4-inch depth)	Per 1000 SF	22		
D-26	75.04	Seeding, Schedule A	Per 1000 SF	15		
D-27	75.04	Seeding, Schedule B	Per 1000 SF	7		
D-28	75.06	Landscape Edging	Per LF	42		
D-29	75.12 95.04	Tree Protection Zone Fence	Per LF	4,145		
D-30	75.13 95.04	Root Pruning	Per LF	1,854		
D-31	75.14 95.04	Moose Protection Fence	Per LF	399		

Total Schedule D _____

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MUNICIPALITY OF ANCHORAGE
PROJECT MANAGEMENT AND ENGINEERING DEPARTMENT

W. 32ND AVENUE & E. 33RD AVENUE UPGRADES
ARCTIC BOULEVARD TO OLD SEWARD HIGHWAY

16-29

XV

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