BID PACKAGE FOR:

O'Malley Road Facilities Relocation-Phase2
W.O. E1620054 & W.O. E1613642

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Chugach Electric Association, Inc.
INVITATION TO BID

June 20, 2017

TO: Chugach Electric Association, Inc., 2017 - 2018 Outside Electrical Line Construction Contract Contractors Via Email.

You are invited to submit a proposal for Chugach Work Orders E1620054 & E1613642, O'Malley Road Facilities Relocation-Phase 2 located at O'Malley Road between Lake Otis Blvd. and New Seward Hwy.

Project work primarily consists of installing a new vault and conduit between existing vaults N3 and N5 and removal of the temp OH installed during Phase 1 (CEA) construction.

New 2", 4" and 6" conduit will be extended from existing vault N3 east through new vault N4 (standard 9' x 15' installation) and terminated in existing vault N5. New underground cable (1/0, 750MCM and 1000MCM) will be pulled through the conduit and spliced into existing cable at vaults N3 and N5. The temporary OH / UG construction installed during Phase 1 (CEA) construction must be *completely removed* This will include all poles, OH conductor, anchors, UG cable, conduit, H-Pile and any other CEA installations on TCEs (Temporary Construction Easements.) Work day will be 6-10s per ADOT.

Work will also include providing service to SOA Load Centers as outlined in Appendix J.
Bidders should incorporate Appendix J bid sheet with E1613642 for bidding purposes, actual construction (see App J) will be billed to WO E1613652.

This project is subject to the union signatory sections of Chugach's Outside or Generation Agreements contained in Exhibit N of the 2017 - 2018 Outside Electrical Line Construction Contract. Bidding is open to all contractors regardless of union signatory statues. Contractors are not required to be signatory to a current collective bargaining agreement with IBEW Local 1547 in order to bid on the project. The signatory requirement only becomes applicable to the successful bidder once a contract is awarded. The successful bidder can comply by either establishing: (1) it is signatory to a current collective bargaining agreement with IBEW Local 1547; (2) be executing a collective bargaining agreement with IBEW Local 1547; or, (3) be executing an agreement with IBEW Local 1547 to comply with the terms and conditions set forth in the most current agreement between IBEW Local 1547 and the Alaska Chapter of the National Electrical Contractors Association, Inc. If the successful bidder elects the third option the Agreement will be limited to the scope of the work and duration of the project.

The State of Alaska, Department of Labor has determined that this type of project is subject to Alaska's Little Davis Bacon Act, AS 36.05.010 *et seq*. Accordingly, all laborers, mechanics and field surveyors performing work on the project shall be compensated at the current prevailing rate of wages and fringe benefits as determined from time to time by the Alaska Department of Labor pursuant to Title 36, Chapter 5 of the Alaska Statutes. Payroll records shall be prepared and maintained as described in AS 36.05.040 and regulations for implementing provided to Chugach upon request.

Please base your bids on the following conditions:

- All Contractor bids must be valid until 5:00 PM, Alaska Time, September 4, 2017. After that time the Contractor shall have the option of retracting its bid. Projects awarded as late as and including the last day the Contractor's bids are valid are not subject to contractor claim for delay of award.

- Contractor shall begin work within 7 calendar days of Notice to Proceed.

- All work shall be completed by August 14, 2017.

- Liquidated damages in the amount of $592.88 per calendar day for each day Contractor fails to complete the work specified above.

- The SWPPP and all necessary clearing shall be administered by the General Contractor.

- As-built drawings are required.

- A Bid Bond is required.

A bid bond in the amount of 10% of the bid shall be provided with the Bid documents. A certified check made payable to "Chugach Electric Association, Inc." may be substituted for the Bid Bond.

- Written releases of liens are required
- Chugach work orders E1620054 and E1613642 will be bid together with the ACS, Enstar and GCI work orders. The Contractor with the *lowest responsive bid based on the total for all utility work* will be awarded this project.

A Pre-Bid Conference is scheduled for 2:00 p.m. Alaska Time, June 28, 2017, at Chugach's Building "A", Engineering Conference Room, 5601 Electron Drive, Anchorage, Alaska.

RFB documentation is available on Chugach's website at www.chugachelectric.com, under Inside Chugach, Bid Opportunities tab. Contractors can find the RFB documentation under the "View advertisement and associated documents" button in WOs E1620054 & E1613642.

All bids shall be delivered in person or submitted by Fax (907) 762-4699 prior to 2:00 PM Alaska Time, July 6, 2017, at Chugach's Headquarters Building, first floor Purchasing Office, 5601 Electron Drive, Anchorage, Alaska.

Notice to Proceed shall not be issued until Chugach has received all documents required by this Invitation to Bid (ITB) in the required amounts and properly executed by the appropriate individuals. The contract time allowed for completion of this contract shall not be extended or suspended by any delay by Contractor in providing these documents necessary for the Notice to Proceed to be issued.

No work shall begin until the successful bidder has been issued a written Notice to Proceed.

orders, statutes, rules and regulations.

The Contractor shall furnish all material required for the project that is not included on the Owner Furnished Materials List. Chugach must approve all Contractor-furnished material prior to installation.

The Contractor shall secure locates and assume responsibility for damage to any and all overhead and underground facilities.

Contractor shall take delivery of all available OFM within ten (10) days of Notice to Proceed.

Contractor's workmanship shall be warranted for two years following Chugach acceptance of the project completion documentation.

Payment for Contractor work is accomplished through use of a Completed Construction Report prepared by Chugach's Site Representative and signed off by the Contractor's representative. Total payment is made on actual units completed not on estimated units stated in the bid documents unless otherwise stated in writing. Chugach has no obligation to subsequently reconcile or assist in reconciling the Contractor's billing records.

Chugach reserves the right to define and waive irregularities, to accept or reject any or all proposals/bids, in whole or in part, and to reissue, withdraw or cancel the solicitation/project in its entirety for any reason including its subsequent determination to perform the Work in-house without liability of any type to bidder/proposer, including but not limited to any costs associated with proposal/bid preparations and submittal.

All questions regarding the bid documents are to be directed to the Project Engineer, Christian Vierhuff, via email at christian_vierhuff@chugachelectric.com. Questions shall be submitted no later than 5:00 PM, June 29, 2017.

CHUGACH ELECTRIC ASSOCIATION, INC.

Jon Sinclair, P.E.
Sr. Manager, Transmission and Substation Engineering

cc: Manager, Distribution Construction
Manager, Administrative Services
W.O. E1620054 & W.O. E1613642

--End of Invitation to Bid—

Bid Sheet

WORK ORDER NUMBERS: E1620054 & E1613642 CONTRACTOR: _____

LOCATION: _____ DATE: _____

BIDS ARE DUE PRIOR TO 2:00 P.M.: July 6, 2017

This bid is submitted subject to the terms of the 2017 - 2018 Outside Electrical Line Construction Contract between Chugach Electric Association, Inc. and the undersigned for the above project as set out in the Invitation to Bid.

Project Bid Quotation: _____

Quotation Expires: September 4, 2017 at 5:00 P.M.

Contractor's Alaska License No.: _____

Insurance Expires: _____

Worker's Compensation: _____

Liability: _____

Automobile: _____

Contractor Sell Rate: _____

Contractor Labor Man-Hours: _____

EXCEPTIONS AND QUALIFICATIONS
Exceptions or qualifications taken by the Bidder to any of the documents furnished with this Invitation to Bid or clarifications to the Proposal shall be stated below and, if none, Bidder shall state "NONE".

_____

_____

SUBCONTRACTORS
The Bidder shall indicate below the Work intended to be subcontracted to others.

_____

_____

By Contractor: _____

Dated: _____

BID ACCEPTED SUBJECT TO TERMS AND CONDITIONS OF THE OUTSIDE ELECTRICAL LINE CONSTRUCTION CONTRACT

By Chugach Electric Association, Inc: _____

Dated: _____

BID RECAPITULATION - CEA ONLY

34.5kV SUBTRANSMISSION, W.O. E1620054
TOTAL : $ _____

15kV DISTRIBUTION, W.O. E1613642, W.O. E1613652
TOTAL: $ _____

TOTAL BID (CEA ONLY) : $ _____

BID RECAPITULATION - ALL UTILITIES

CHUGACH ELECTRIC ASSOCIATION, INC
TOTAL (See Above) $ _____

ENSTAR
TOTAL (from Enstar Appendix) $ _____

GCI
TOTAL (from GCI Appendix) $ _____

ACS
TOTAL (from ACS Appendix) $ _____

TOTAL BID (ALL UTILITIES): $ _____

BID SCHEDULE SUMMARY

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

NEW CONSTRUCTION

SECTION 1 - NEW CONDUCTOR AND CABLE ASSEMBLY UNITS	$
SECTION 2 - NEW UNDERGROUND CONDUIT ASSEMBLY UNITS	$
SECTION 3 - NEW MISCELLANEOUS ASSEMBLY UNITS	$
TOTAL NEW CONSTRUCTION	$

ELECTRICAL RETIREMENT

SECTION 1 - RETIRE POLE ASSEMBLY UNITS	$
SECTION 2 - RETIRE POLE TOP ASSEMBLY UNITS	$
SECTION 3 - RETIRE GUY AND ANCHOR ASSEMBLY UNITS	$
SECTION 4 - RETIRE CONDUCTOR AND CABLE ASSEMBLY UNITS	$
TOTAL REMOVAL/RETIREMENT	$

SURVEY UNITS

CONSTRUCTION SURVEY	$
AS-BUILT SURVEY	$

TOTAL BID	$

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

NEW LINE CONSTRUCTION
SECTION 1 - CONDUCTOR AND CABLE ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QUANTITY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
1000 CU	INSTALL NEW 1000 MCM COPPER CABLE	5.000	KF				
XUM6-28G	INSTALL SPLICE FOR 1000 MCM CU CABLE	9	EA				

TOTAL INSTALL SECTION 1: $

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

NEW LINE CONSTRUCTION
SECTION 2- UNDERGROUND CONDUIT ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QUANTITY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
SUM5044H	INSTALL FOUR 4" HDPE CONDUIT	1.667	KF				

TOTAL INSTALL SECTION 2: $_____

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

NEW LINE CONSTRUCTION
SECTION 3 - MISCELLANEOUS ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QUANTITY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
XUM814	INSTALLATION OF ONE CONCRETE VAULT	1	EA				
+XHANDLOC	HAND DIG	10	EA				
+XMHRS	MAN HOURS	100	EA				

TOTAL SECTION 3 - MISCELLANEOUS ASSEMBLY UNITS: $_____

+ NOTE: THIS UNIT AVAILABLE ONLY BY CEA AUTHORIZATION

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

ELECTRICAL RETIRE
SECTION 1 - POLE ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QTY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
*50/H1	50', CLASS H1 WOOD POLE	1	EA				
*55/H1	55', CLASS H1 WOOD POLE	3	EA				
*70/H3	70', CLASS H3 WOOD POLE	1	EA				
*75/H3	75', CLASS H3 WOOD POLE	1	EA				
*85/H3	85', CLASS H3 WOOD POLE	1	EA				

TOTAL RETIRE SECTION 1: $_____

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

ELECTRICAL RETIRE
SECTION 2 - POLE TOP ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QUANTITY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
*TP-3A	34.5kV ON SINGLE WOOD ARM ON WOOD POLE	2	EA				
*TP-4A	34.5kV ON DOUBLE WOOD ARM ON WOOD POLE	3	EA				
*TP-7MT	34.5kV DEADEND ON STEEL ARM ON WOOD POLE	2	EA				
*TUC1X	34.5kV RISER ON WOOD POLE	2	EA				

TOTAL RETIRE SECTION 2: $_____

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

ELECTRICAL RETIRE
SECTION 3 - GUY, ANCHOR AND H-PILE ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QUANTITY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
*SF7C	CONCRETE ANCHOR, DOUBLE ROD	9	EA				
*TG-11A-2FG	SINGLE DOWN GUY WITH 2 INSULATORS	1	EA				
*TG-11A-SG	SINGLE SPAN GUY WITH 1 INSULATOR	4	EA				
*TG-11B-FG	DOUBLE DOWN GUY WITH 2 INSULATORS	8	EA				
*TG-25C	ONE GUY TEE PLATE	5	EA				
*TG-25D	TWO GUY TEE PLATES	4	EA				
*DHP1	DRIVEN H-PILE	4	EA				

TOTAL RETIRE SECTION 3: $

BID SCHEDULE

34.5kV SUBTRANSMISSION LINE
GRAVEL JUNCTION TO O'MALLEY JUNCTION
O'MALLEY FACILITIES RELOCATION PHASE 2
W.O. E1620054

ELECTRICAL RETIRE
SECTION 4 - CONDUCTOR, CABLE AND CONDUIT ASSEMBLY UNITS

BID UNIT	DESCRIPTION	QUANTITY	UNIT	LABOR	MATERIAL	LABOR & MATERIAL	EXTENDED COST
*795 ACSR	795 kcmil 26/7 ASCR "DRAKE"	3.900	KF				
*1000 CU	1000 MCM COPPER CABLE	0.780	KF				
*SUM5044H	FOUR 4" HDPE SCH 40 CONDUIT	0.26	KF				

TOTAL RETIRE SECTION 4: $

RELOCATION FOR CONFLICTING FACILITIES
BIDSHEET
for
Project: E1613642
O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
15 KV U.G. LINE EXTENSION

Design No.: 01

Capital Account: / / /

Reimbursable Account: / / /

Retirement Account: / / /

Work Plan No.:

Project Type: 15 KV UNDERGROUND

Reviewed by Designer/Project Engineer: _____ Date: 5/24/2017
Sterling Gress

Reviewed by Supervisor/Manager: _____ Date: 5/24/2017
Jack Anderson

Remarks:

ELECTRIC POWER SYSTEMS, INC.
ASSEMBLY UNITS BID SHEET
Project: E1613642
O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

Assembly Unit	Quantity	UNIT	Labor	Material	Labor & Material	Extended Labor & Material
1707	1.000	EA				
4/0 RIBB	0.388	1000 FT				
1/0 CONC Conductor	0.434	1000 FT				
750 CONC 3 PH	1.667	1000 FT				
SE1-5	1.000	EA				
SF4C	1.000	EA				
SUG6-25	1.000	EA				
SUM1	1.000	EA				
SUM1I	1.000	EA				
SUM3E-1-2FI	1.000	EA				
SUM5012H	1.857	1000 FT				
SUM5022H	0.162	1000 FT				
SUM5014H	1.424	1000 FT				
SUM5026H	3.112	1000 FT				
SUM6-10	1.000	EA				
SUM6-25C 1 PH	1.000	EA				
SUM6-25F 3 PH	4.000	EA				
SUM6-28F 3 PH	2.000	EA				
SUM6-36A	4.000	EA				
SUME245S3	1.000	EA				
SUME290S3	3.000	EA				
SUME445S4	3.000	EA				
SUME490S4	3.000	EA				
SUME645S5	8.000	EA				
SUME690S5	6.000	EA				
SHUR2-6	0.010	1000 FT				
SUR2-3	0.064	1000 FT				
SUR2-6	0.069	1000 FT				
SUR2-NT	0.062	1000 FT				
XMOB	1.000	EA				
XMHRS	100.000	EA				
XSURVEY1	1.000	EA				
XSURVEY2	1.000	EA				
XUR2-DT	1.526	EA				

Install Subtotal _____

* *336 ACSR Conductor*	1.272	1000 FT				
* *4/0 RIBB*	0.060	1000 FT				
* *750 CONC*	0.035	1000 FT				
* *SE1-3*	1.000	EA				
* *SE1-5*	1.000	EA				
* *SUC3*	3.000	EA				
* *SUM6-25F 3 PH*	2.000	EA				
* *45/1*	2.000	EA				

Retirement Subtotal _____
TOTAL

BID BOND

KNOW ALL MEN BY THESE PRESENT, That we,_____
_____
of _____
_____as Principal, and _____
_____a corporation organized under the laws of _____
_____
_____and authorized to transact surety business in the State of Alaska, of_____ as Surety, are held and firmly bound unto Chugach Electric Association, Inc., 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 these presents.

WHEREAS, the said Principal 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 the Obligee the amount stated above.

Signed, sealed, and delivered _____, 20___.

WITNESS AS TO PRINCIPAL:

_____

Signature:

_____

Print Name:

_____

Principal
By: _____

Title: _____

_____ (Seal)
Corporate Surety

_____
Business Address

_____

By: _____
Attorney-in-Fact

CONTRACTOR'S BOND

1. Know all men that we, _____, as Principal, and _____, as Surety, are held and firmly bound unto Chugach Electric Association, Inc. (hereinafter called "Chugach") and unto all persons, firms and corporations who or which may furnish materials for or perform labor on the Work known as the O'Malley Road Facilities Relocation – Phase 2 and to their successors and assigns, in the penal sum of _____ dollars ($_____), as hereinafter set forth and for the payment of which sum well and truly to be made we bind ourselves, our executors, administrators, successors and assigns jointly and severally by these presents. Said Work is described in a certain contract (hereinafter called the "Contract") between Chugach and the Principal, dated _____, 20___.

2. The condition of this obligation is such that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of the Contract and any amendments thereto, whether such amendments are for additions, decreases, or changes in materials, their quantity, kind or price, labor costs, mileage, routing or any other purpose whatsoever, and whether such amendments are made with or without notice to the Surety, and shall fully indemnify and save harmless Chugach from all costs and damages which Chugach shall suffer or incur by reason of any failure so to do, and shall fully reimburse and repay Chugach for all outlay and expense which Chugach shall incur in making good any such failure of performance on the part of the Principal, and shall promptly make payment to all persons working on or supplying labor or materials for use in the Work contemplated in the Contract and any amendments thereto, in respect of such labor or materials furnished and used therein, to the full extent thereof, and in respect of such labor or materials furnished but not so used, to the extent of the quantities estimated in the Contract and any amendments thereto to be required for the Work, and shall well and truly reimburse Chugach, as its respective interests may appear, for any excess in costs of the Work over the costs of such Work as provided in the Contract and any amendments thereto, occasioned by any default of the Principal under the Contract and any amendments thereto, then this obligation shall be null and void, but otherwise shall remain in full force and effect.

3. It is expressly agreed that this bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon any amendment to the Contract, so as to bind the Principal and the Surety to the full and faithful performance of the Contract as so amended, provided only the total amount of all increases in the costs of Work shall not exceed 20 percent of 50 percent of the amount of the maximum price set forth in the Contract. The term "Amendment," wherever used in this bond, and whether referring to this bond, the Contract shall include any alteration, addition,

extension, modification, amendment, rescission, waiver, release or annulment, of any character whatsoever.

4. It is expressly agreed that any amendment which may be made by agreement or otherwise between the Principal and Chugach in the terms, provisions, covenants and conditions of the Contract, (including, without limitation, the granting by Chugach of any extension of time for the performance of the obligations of the Principal under the Contract, or the failure or refusal of Chugach to take any action, proceeding or step to enforce any remedy or exercise any right under either the Contract, or the taking of any action, proceeding or step by Chugach, acting in good faith upon the belief that the same is permitted by the provisions of the Contract) shall not in any way release the principal and the Surety, or either of them or their respective executors, administrators, successors or assigns, from liability hereunder. The Surety hereby acknowledges receipt of notice of any amendment, indulgence or forbearance, made, granted or permitted.

5. This bond is made for the benefit of all persons, firms and corporations who or which may furnish any materials or perform any labor for or on account of the Work to be performed under the Contract and any amendments thereto, and they, and each of them, are hereby made obligee hereunder with the same force and effect as if their names were written herein as such, and they and each of them may sue hereon.

In witness whereof, the undersigned have caused this instrument to be executed and their respective corporate seals to be affixed and attested by their duly authorized representatives this _____ day of _____, 20____.

_____(SEAL)
(Principal)

Attest:

BY:_____

_____
(Secretary)

_____(SEAL)
(Surety)

_____(SEAL)
(Principal)

Attest: _____ BY: _____

_____
(Secretary)

_____
(Address of Surety's Home Office)

_____

BY: _____
(Resident Agent of Surety)

_____

Signatures: The Contractor's Bond must be signed with the full name of the Contractor. If the Contractor is a partnership the Contractor's Bond must be signed in the partnership name by a partner. If the Contractor is a corporation the Contractor's Bond must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the corporation. A typewritten copy of all such names and signatures shall be appended.

Power of Attorney: The Contractor's Bond must be accompanied by a power of attorney or corporate resolution authorizing execution on behalf of the Surety and, in jurisdictions so requiring should be countersigned by a duly Alaska authorized resident agent of the Surety.

BID UNIT DESCRIPTIONS (34.5kV ONLY)

These descriptions are provided for the units not covered in the Outside Electrical Construction Contract.

NEW LINE CONSTRUCTION

SECTION 1 –CONDUCTOR AND CABLE ASSEMBLY UNITS

UNIT	DESCRIPTION
1000 CU	This unit consists of installing 1000 feet of an owner-furnished single 1000 kcmil copper, 35 kV, 420 mil EPR insulated shielded conductor installed in conduit. It includes tagging of cables and cable installation at risers. Quantity is determined by taking the sum of all straight horizontal span distances between stakes of the riser poles and structures where the underground conductor terminates. The unit includes installation of Chugach furnished materials, and the furnishing and installation of all miscellaneous labor, materials and equipment for a complete cable installation including conductor handling, hauling and testing per the Specifications. This unit includes return to the Chugach Warehouse of excess cable, all empty reels that are returnable to the manufacturer, and disposal of reels that are not returnable.
XUM6-28G	This unit consists of the installation of one owner-furnished cable splice in 1000 kcmil copper, 420 mil EPR insulated shielded conductor in accordance with the manufacturer's instructions. The unit includes installation of Chugach furnished materials, and the furnishing and installation of Contractor miscellaneous labor, materials and equipment for a complete cable installation including conductor handling, cutting, and high-potential testing per the Specifications.

SECTION 2 –UNDERGROUND CONDUIT ASSEMBLY UNITS

UNIT	DESCRIPTION
SUM5044H	This unit consists of 1000 linear feet of four HDPE conduits of 4-inch nominal diameter installed in the trench. This unit includes the installation of all couplings, end caps, and reducers. Also included in this unit is the furnishing and installation of bushings, bell ends, tags, conductor seals, and pull rope. This unit includes the furnishing and installation of all materials and labor for cutting, mandreling, and splicing of conduit and for field bending conduit to follow trench alignment indicated on the drawing.

SECTION 3 – MISCELLANEOUS ASSEMBLY UNITS

UNIT	DESCRIPTION
XUM814	This unit consists of the installation of one owner-furnished concrete vault in accordance with the specifications. Unit includes excavation, core drilling, racking of cables, grouting, and labeling of ducts. The excavation, imported backfill and disposal of excess excavated material for the vault installation, including site restoration, are included in this unit. Also included in this unit is clearing of the easement area required for the installation of the vault. Additional shoring, excavation and backfill required for the vault construction unit shall be considered incidental to the vault construction unit and not considered as additional pay item.
XHANDLOC	This unit consists of hand dig excavation to locate a single existing underground utility where trenching or vault installation is located within the hand dig proximity required by the existing utility. Backfill of hand dug excavation material is included in this unit. By CEA authorization only.
XMHRS	This unit consists of all labor and miscellaneous support tools and equipment required to perform one (1) hour of owner-directed work. By CEA authorization only. Price for this unit shall be the same as XMHRs unit in 12.5kV Staking Sheet.

REMOVAL/RETIREMENT ASSEMBLY UNITS

These descriptions are provided for the removal units not covered in the Outside Electrical Construction Contract.

REMOVAL UNITS

Removal units include furnishing of all labor, Contractor furnished materials and equipment for disassembly, handling, and hauling necessary to provide complete removal of the unit, including returning in an orderly manner to the Chugach warehouse or disposal as required by law of items not requested to be returned to Chugach Electric or noted as being re-utilized on the project. If ground disturbance is required to remove a unit, all cost associated with the excavation, backfilling and restoring the site to as good or better condition is incidental to the affected unit.

UNIT	DESCRIPTION
*50/H1, *55/H1, *70/H3, *75/H3 *85/H3	These units consist of the retirement of one direct embedded wood pole of the height and class specified. Retirement unit does not include pole top assembly or any other appurtenances which may be on pole.
*TP-7MT,*TP-3A, *TP-4A	These units consist of the retirement of one complete primary assembly including insulators, deadends, existing ties and conductor clamps.
*TUC1X	This unit consists of the retirement of one complete 34.5 kV riser assembly, including crossarms, braces, riser conduits, conduit elbows, grounding conductor, and jumpers.
*TA-3H	This unit consists of the complete removal of one anchor, assumed to be a concrete anchor but also applies to either plate, screw or log anchors. Restoration of disturbed area is included in this unit.
*TG-11A-2FG, *TG-11A-SG, *TG-11B-FG	These units consist of the retirement of one single down guy or span guy. Removal of the guy attachment is not included in this unit.
*1000 CU	This unit includes all labor, tools, equipment and transportation required to remove and dispose of 1000 feet of a single conductor 1000 kcmil copper, 35 kV, 420 mil EPR insulated shielded conductor installed in conduit. It includes the removal of cable splices and terminations. Quantity is determined by taking the sum of all straight horizontal span distances between equipment locations. This unit includes all miscellaneous labor, materials and equipment for the complete removal of the cable, and the disposal of the cable and all associated materials.
*795 ACSR	This unit includes all labor, tools, equipment and transportation required to remove and dispose of 1000 feet of single 795 ACSR overhead conductor, including splices, armor rods, and compression deadends. Quantity is determined by taking the sum of all straight horizontal span distances between structure locations.

*SUM5044H	This unit includes all labor, tools, equipment and transportation required to remove and dispose of 1000 feet of four (4) 4 inch HDPE conduit. Excavation is not part of this unit and is covered under 12.5kV W.O. E1313328.
*TG-25C, *TG-25D	These units consist of the retirement of a single or double pole eye plate installation.
*DHP1	This unit includes all labor, equipment and tools necessary to completely remove and dispose of a H-pile installation.

SURVEY UNITS

UNIT	DESCRIPTION
CONSTRUCTION SURVEY	This unit consists of all labor, tools and equipment required to perform site surveying of 34.5kV facilities only, before and during construction activities, to verify the accuracy of the project drawings and ensure that Chugach facilities are installed as shown in the project drawings. *Survey of 12.5kV facilities is under a separate unit.*
AS-BUILT SURVEY	This unit consists of all labor, tools and equipment required to perform a post construction site survey (34.5kV facilities only) to record the actual configuration of installed Chugach facilities. *Survey of 12.5kV facilities is under a separate unit.*

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
OWNER FURNISHED MATERIAL LIST (34.5kV ONLY)
W. O. E1620054

ITEM #	ASSEMBLY UNIT	DESCRIPTION	CEA PART #	UNIT	Quantity	LOCATION OR DELIVERY DATE	WO & ACCOUNT #	Unit Price	Extended Price
1	XUM6-28G	34.5kV SPLICE	4519	ea.	9	AT CEA	E1620054 10725 000 03 7690	$ 709.00	$ 6,381.00
2	SUM5044H	(4) HDPE 4"	11877	ft.	6700	AT CEA	E1620054 10725 000 03 7690	$ 2.79	$ 18,693.00
3	1000 CU	1000 MCM CU CABLE	16219	ft.	5000	AT CEA	E1620054 10725 000 03 7690	$ 28.69	$ 143,450.00
4	XUM814	VAULT COVER (MANHOLE)	17590	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 1,050.00	$ 1,050.00
5	XUM814	RISER	17591	ea.	2	AT CEA	E1620054 10725 000 03 7690	$ 5,500.00	$ 11,000.00
6	XUM814	BASE	17592	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 2,400.00	$ 2,400.00
7	XUM814	TOP	17593	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 2,400.00	$ 2,400.00
8	XUM814	VAULT COVER (SOLID)	17594	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 625.00	$ 625.00
9	XUM814	6" COLLAR	17595	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 140.00	$ 140.00
10	XUM814	FRAME	17596	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 850.00	$ 850.00
11	XUM814	MANHOLE LID	17597	ea.	1	AT CEA	E1620054 10725 000 03 7690	$ 750.00	$ 750.00
12	XUM814	14" RACK	20550	ea.	20	AT CEA	E1620054 10725 000 03 7690	$ 33.15	$ 663.00
13	XUM814	36" STANCHION	20551	ea.	12	AT CEA	E1620054 10725 000 03 7690	53.75	$ 645.00

TOTAL COST OF OFM	$ 163,973.00

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
OWNER FURNISHED MATERIAL LIST (15kV ONLY)
W.O. E1613642

ITEM #	ASSEMBLY UNIT	DESCRIPTION	CEA PART #	UNIT	Quantity	LOCATION OR DELIVERY DATE	WO & ACCOUNT #	Unit Price	Extended Price
1	SF4C	ANCHOR, CONCRETE 4 FT	52	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 165.00	$ 165.00
2	SE1-5	DEAD-END, TEE	156	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 9.00	$ 9.00
3	750 CONC 3Φ	WIRE, AL 750 MCM	346	ft.	7000	AT CEA	E1613642 10729 000 03 7690	$ 6.89	$ 48,230.00
4	1/0 CONC	WIRE, AL 1/0	352	ft.	500	AT CEA	E1613642 10729 000 03 7690	$ 2.44	$ 1,220.00
5	4/0 RIBB	WIRE, AL 4/0 SVC	368	ft.	462	AT CEA	E1613642 10729 000 03 7690	$ 0.15	$ 69.30
6	SUG6-25	WIRE, CU 004 STR	375	ft.	20	AT CEA	E1613642 10729 000 03 7690	$ 0.51	$ 10.20
7	SE1-5	DEAD-END, AUTO 16M	817	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 13.47	$ 13.47
8	SE1-5	DEAD-END, PREFORM 16M	874	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 6.61	$ 6.61
9	SE1-5	CLEVIS, THIMBLE 5/8"	953	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 9.80	$ 9.80
10	XUM6-28G	LUG, COMP 1/0	1509	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 2.40	$ 2.40
11	SUM6-25F	LUG, COMP 750	1515	ft.	12	AT CEA	E1613642 10729 000 03 7690	$ 21.85	$ 262.20
12	SUG6-25	FASTENER, CLAMP 3/4"	1532	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 2.09	$ 2.09
13	SUG6-25	CONNECTOR, UG XFMR NEUT	1592	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 10.95	$ 10.95
14	SUG6-25	CONNECTOR, UG XFMR SEC	1601	ea.	2	AT CEA	E1613642 10729 000 03 7690	$ 41.00	$ 82.00
15	1707, SUM6-36A	FUSE, S&C SML-20	1709	ea.	4	AT CEA	E1613642 10729 000 03 7690	$ 300.00	$ 1,200.00
16	SE1-5	GUY, GUARD PLASTIC	2750	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 7.05	$ 7.05
17	SUM1	PAD, CONC. 1Φ XFMR	3742	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 445.00	$ 445.00
18	SF4C	ANCHOR, ROD 1" x 10'	4049	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 76.50	$ 76.50
19	SUM1, SUM1I	LINE, GROUND ROD 3/4" x 8'	4067	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 15.00	$ 15.00
20	SUM5012H, SUM5022H	CONDUIT, HDPE 2"	4161	ft.	2400	AT CEA	E1613642 10729 000 03 7690	$ 1.58	$ 3,792.00
21	SUME290S3	CONDUIT, GRC EL 90° 2", 36"R	4165	ea.	11	AT CEA	E1613642 10729 000 03 7690	$ 42.90	$ 471.90
22	SUME490S4	CONDUIT, FG EL 90° 4", 48"R	4169	ea.	3	AT CEA	E1613642 10729 000 03 7690	$ 169.25	$ 507.75
23	SUME690F5	CONDUIT, FG EL 90° 6", 60"R	4173	ea.	6	AT CEA	E1613642 10729 000 03 7690	$ 160.00	$ 960.00
24	SUME445S4	CONDUIT, FG EL 45° 4", 48"R	4183	ea.	3	AT CEA	E1613642 10729 000 03 7690	$ 64.70	$ 194.10
25	SUME645F5	CONDUIT, FG EL 45° 6",60"R	4185	ea.	8	AT CEA	E1613642 10729 000 03 7690	$ 128.00	$ 1,024.00
26	SUM6-28F	KIT, PRIMARY SPLICE 750 MCM	4513	ea.	6	AT CEA	E1613642 10729 000 03 7690	$ 303.60	$ 1,821.60
27	SUM6-25F	LINE, BRACKET CABLE SUPPORT	4646	ea.	12	AT CEA	E1613642 10729 000 03 7690	$ 13.70	$ 164.40
28	SUM6-25C	KIT, PRIMARY TERM 1/0	4767	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 43.60	$ 43.60
29	SUM6-25F	KIT, PRIMARY TERM 750 MCM	4773	ea.	12	AT CEA	E1613642 10729 000 03 7690	$ 92.90	$ 1,114.80
30	SUG6-25	BUSHING, UG 15KV INSERT	4793	ea.	2	AT CEA	E1613642 10729 000 03 7690	$ 22.70	$ 45.40
31	SUG6-25	XFMR, 25KVA 15KV	4907	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 2,294.00	$ 2,294.00
32	SE1-5	GUY WIRE 16M	5157	ft.	55	AT CEA	E1613642 10729 000 03 7690	$ 0.55	$ 30.25
33	SUM5014H	CONDUIT, HDPE 4"	11877	ft.	1567	AT CEA	E1613642 10729 000 03 7690	$ 2.79	$ 4,371.93
34	SUM5026H	CONDUIT, HDPE 6"	11888	ft.	6847	AT CEA	E1613642 10729 000 03 7690	$ 5.25	$ 35,946.75
35	SUM3E-1-2FI	VISTA SWITCH CABINET	14498	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 42,500.00	$ 42,500.00
36	SUM1I	PAD, SWITCH CABINET VISTA	17456	ea.	1	AT CEA	E1613642 10729 000 03 7690	$ 2,450.00	$ 2,450.00

TOTAL COST OF OFM	$ 149,573.05

PART I

SPECIAL PROVISIONS

FOR

34.5kV SUBTRANSMISSION AND 15kV DISTRIBUTION LINES

O'MALLEY JUNCTION TO NEW SEWARD HWY JUNCTION

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

W.O. E1620054
W.O E1613642

June 20, 2017

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These special provisions supplement the provisions of the 2017-2018 Chugach Electric Association, Inc. Outside Electrical Line Construction Contract and the Technical Specifications.

SECTION 1

SUMMARY OF WORK

1.1 SECTION INCLUDES

- Description of Project
- Work
- Contractor use of Premises
- Permits and Licenses
- Supplementary Instructions to Contractors.

1.2 DESCRIPTION OF THE PROJECT

Major project activities:

1. Installing approximately 1500 feet of 34.5kV underground subtransmission (1000 MCM Cu Cable) and 15kV underground distribution (750 Concentric Al Cable) in a shared trench. Trench configurations vary throughout the project with different combinations of three phase and single phase 15kV circuits, secondary services and spare ducts.
2. Installing a concrete vault of approximate dimensions 14'L x 8'W x 8'H' (Vault-N4).
3. Installation of (2) 15kV pad mounted transformers
4. Installation of (1) Vista Switch Cabinet.
5. Retiring approximately 1300 feet of overhead 34.5kV powerline with 15kV underbuild on single pole wood structures (9 structures total).
6. Retire approximately 850 feet of underground 34.5kV and 15kV circuits
7. Service to ADOT Load Centers (see Appendix J)
8. **Complete removal of all temporary structures associated with the Phase 1 CEA work. This includes removal of H-Piles, conduit, cable, anchors and any other construction related to the Phase 1 temporary installation**

The 34.5kV and 15kV installs and retirements are for the purpose of relocating the Phase 1 "temporary" facilities into their "permanent" placement adjacent to O'Malley Road, inside AKDOT ROW and CEA permanent easements.

The new underground system consists of underground 34.5 kV and 15 kV conduit systems, using HDPE duct tying into (1) new and (2) existing pre-cast vaults. The

15 kV underground system also includes installation of (2) new pad mounted transformers and a Vista Cabinet.

1.3 WORK

A. The Work consists of all obligations, duties, and responsibilities necessary to the successful completion of the Contract assigned to or undertaken by the Contractor under the Contract Documents, including all labor, materials, equipment, and other incidental operations to provide a complete facility, and the furnishing thereof.

1.4 CONTRACTOR USE OF PREMISES

The Contractor shall:

A. Limit the use of the premises to Work, storage of project materials and equipment, and access.

B. Coordinate use of premises under direction of Chugach.

C. Obtain and pay for use of additional storage and Work areas needed for operations under this Contract.

D. Furnish all temporary utilities and sanitary facilities, temporary controls, and construction facilities at the site for construction purposes and comply with all local, state, and federal codes, regulations, and laws. No additional compensation will be made for costs associated with the forgoing.

E. Ingress and Egress

1. Access to each structure will be from public roads, trails, and AKDOT right of way

2. Should use of private property be desired by the Contractor for stockpiling material, parking, field office location, ingress and/or egress to the right-of-way or other construction operations, permission must be granted in a written agreement between the property owner and the Contractor that holds Chugach Electric Association, Inc., harmless from any act of the Contractor. See Appendix C for sample Permission to Enter Property.

F. Portions of the Work will be placed in or adjacent to wetland areas. Installation and maintenance of all BMPs shall be done by others.

Contractor is required to sign the SWPPP 3rd Party Certification and comply with all requirements in the SWPPP. The SWPPP shall be provided prior to issuance of NTP. No additional compensation will be paid for the SWPPP measures.

1.5 PERMITS AND LICENSES

A. Except as otherwise provided in the Appendix F, the Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the Work. Copies of all permit-related correspondence as well as the permits are to be transmitted to Chugach.

1.6 SUPPLEMENTARY INSTRUCTIONS TO CONTRACTORS

A. Substitutions and Product Options:

1. At time of bidding, unless otherwise specified in the Specifications, Contractor may, on an "approved equal" or substitution-basis, propose other equipment that he considers comparable with or superior to the specified items. In the absence of a listing of such equipment, it will be assumed that the Contractor intends to furnish the items as specified.

2. Contractor shall provide sufficient information and data necessary for a full evaluation of any equipment proposed on an "approved equal" or substitution-basis. At a minimum, information shall include complete description, physical dimensions, manufacturer's name and model number, price, time for delivery, and a specific listing of any characteristics which differ from those specified and could require engineering changes to equipment, buildings, structures, and services. Failure to supply adequate or accurate information may result in rejection of Contractor's proposal.

3. The determination of the suitability of "approved equals" or substitutions for the service intended, and final acceptance thereof, shall be by Chugach. The successful Contractor shall be liable for the cost of any subsequent engineering changes that are clearly attributable to negligence on the part of the Contractor to furnish proper information with his proposal.

4. If any revisions to Drawings or Specifications are required to conform equipment, materials, or work to national, state, and local laws, codes, ordinances, and regulations, Contractor shall give

notice when submitting its bid and include a statement listing the additions to or deductions from the bid price required by the revisions.

5. If the Contractor fails to give notice, it shall provide the equipment, materials, and Work as intended by the above without extra cost to Chugach.

6. Per ADOT requirements, the working schedule will be (6) 10 hour days until completion of the work.

B. Surveys

1. All surveys shall be performed as specified in Section 3 of these "Special Provisions."

END OF SECTION

SECTION 2

MEASUREMENT AND PAYMENT

2.1 SECTION INCLUDES

- Measurement Methods
- Measurement by Weight
- Lump-Sum Measurement

2.2 MEASUREMENT METHODS

A. Measurement methods specified in the Bid Schedule of the Contract shall govern if they differ from methods specified in this Section.

B. The Contractor shall compute all quantities and submit calculations for approval by Chugach. Where necessary, such computations shall be based upon surveys performed by the Contractor as specified by the Special Provisions in Section 3, Part 3.4 Field Engineering.

C. All costs in connection with the Work specified herein will be considered to be included with the related item of Work in the Bid Schedule, or incidental to the Project.

D. Measurement Standards: All Work to be paid for at a Contract price per unit of measurement shall be measured by Chugach in accordance with United States Standard Measures.

2.3 MEASUREMENT BY WEIGHT

A. Material to be measured and paid for by weight, and not measured by handbook weights, shall be weighed on accurate, State of Alaska approved scales, furnished by and at the expense of the Contractor. A ton is defined as 2,000 pounds avoirdupois.

2.4 LUMP-SUM MEASUREMENT

A. Lump-sum measurement shall be for the entire item, unit of Work, structure, or combination thereof, as listed in the Bid Schedule.

B. If the Contractor requests progress payments for lump-sum items or amounts in the Bid Schedule, such progress payments will be made in accordance with a well-balanced, detailed program of payment-apportioning, prepared by the Contractor and submitted to Chugach for approval.

C. Such program for each applicable lump-sum item shall show estimated quantities and unit prices therefore as allocated by the Contractor to the different features of the Work and major subdivisions thereof. The summation of extensions of quantities and unit prices and related costs shall total, in each case, the exact amount to be paid under the lump-sum Contract Price for the item.

D. Such programs will be used for computing progress payments as provided herein, but will not be used to determine the amount of the final payment for the Work of this Contract. Final Payment will be based on actual percentage of Work completed by the Contractor.

END OF SECTION

SECTION 3

COORDINATION, OUTAGES, FIELD ENGINEERING AND PROJECT DOCUMENTS

3.1 SECTION INCLUDES

- Coordination
- Outages
- Field Engineering – Surveys
- Field Engineering - Other
- Project Record Documents

3.2 COORDINATION

A. Contractor shall coordinate scheduling, submittals, and Work for the various activities with Chugach to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Chugach's system operation may require other crafts to perform work at or near this project. Contractor shall coordinate activities with Chugach's site representative to avoid delays and interference.

C. After Chugach occupancy of premises, coordinate access to site with Chugach for correction of defective Work and Work not in accordance with Contract documents.

D. The Contractor is responsible for coordinating with all utilities for locates.

3.3 OUTAGES

A. All work around and near energized facilities shall be coordinated with Chugach's Power Control Center. Contractor should coordinate with CEA at the earliest possible date to schedule all 15kV / 34.5kV outages. The contractor shall take all required measures to ensure safety of personnel and existing facilities.

B. Outages on 15kV/34.5kV circuits must be scheduled a minimum of five (5) Chugach working days in advance of the outage and be approved by Chugach. Outage requests shall be entered through the computerized “Dispatch Outage Application (DOA)”.

C. The Contractor shall fully document all planned 15kV/34.5kV outages in the construction schedule.

3.4 FIELD ENGINEERING - SURVEYS

A. Scope

1. The Contractor shall furnish all labor, equipment, materials and services to perform all surveying and staking for the construction survey and post-construction as-built survey for the transmission line relocation. The Contractor is responsible for orientation and alignment.

2. The Contractor shall locate and protect survey control and reference points.

3. All work shall be performed under the supervision of a Land Surveyor registered in the State of Alaska and acceptable to Chugach.

4. Activities of the Surveyor are to be restricted to within the right-of-way. Obtain written permission for ingress and/or egress to the right-of–way where access to the right-of-way is across private property. Obtain written permission for use of private property by the Surveyor for parking or other work performed by the Surveyor that are not completely within the right-of-way provided for the project. Permission must be granted in a written agreement between the property owner and the Surveyor that holds Chugach Electric Association, Inc. harmless from any act of the Surveyor. See Appendix C for sample Permission To Enter Property.

B. Accuracy of Data

1. All horizontal control surveys shall be a minimum of Third Order, Class I accuracy, (1:10,000), as defined by U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

2. All horizontal control surveys required for the Work shall be based upon NAD83 CORRS, with final coordinates in NAD83 feet and the appropriate zone.

3. All vertical control surveys required for the Work shall be based on mean sea level datum. All elevations are to be established of Third Order standards.

4. All Distances shall be recorded to the nearest hundredth of a foot. All angles shall be recorded in degrees, minutes and seconds.

C. Field Notes

1. Field notes of all horizontal and vertical control surveys shall be recorded in a clear and legible manner in notebooks and shall be fully indexed.

2. The notes must be uniform in character and interpretable and usable with ease by anyone having knowledge of surveying.

3. The notes shall contain descriptions and sketches of existing control used for origin and closure and the control monuments established by this survey.

4. All field notes shall be reduced by the Surveyor.

5. Copies of all field notes shall be provided to Chugach.

D. Construction Survey

1. Chugach will furnish Plan and Profile drawings, Staking Sheets and Right-of Way drawings that shall be used to assist in staking facility locations. The surveyor shall establish centerline for new construction using information from the aforementioned drawings. The Contractor shall immediately notify Chugach of any discrepancies that occur during the survey process. Structure centerlines shall not deviate from their design locations.

2. All survey work required to confirm alignment of direct embedment structures shall be included in the construction survey.

3. For all new structure locations, a wood stake labeled with the new structure number and station shall be driven at the centerline of each structure. In addition, the stake shall be labeled with the type of facility to be installed (for structures – structure length and class).

4. Anchors shall be staked as shown on the drawings or the Structure Schedule with a wood stake marked “Guy Anchor.” In the event these criteria cannot be met, the Surveyor shall immediately notify Chugach through the Contractor.

E. Post-Construction As-Built Survey

1. After the transmission line is constructed, an as-built survey shall be completed. The as-built survey shall be directly related to the centerline established during the construction survey. All new and relocated electrical facilities shall be located. BOP and EOP structures shall be included in the as-built survey.

2. Deliverable Products:

a. Coordinates shall be based upon NAD83 CORRS with final coordinates in NAD83 feet and the appropriate zone.

b. The as-built location survey drawings shall be produced using AutoCAD Release 2016 or higher. The drawings shall be prepared per Chugach Drawing Standards provided in Appendix E.

c. The drawings shall show the centerline of the overhead line and each edge of the right-of-way, stationing at the P.I.'s, bearings and distances between P.I.'s, monuments found or set, property lines and surveyed section lines that intersect the right-of-way and all improvements within the right-of-way.

d. In addition to item "c" above, show the following information on drawings for each transmission structure:

(1) Station and offset in feet from centerline of project to face of each structure and pile.

(2) Horizontal dimension measured perpendicular in feet from MOA right-of-way to structure center and Horizontal dimension measured perpendicular in feet from side street right-of-way to structure center at structures on either side of streets.

e. The basis of horizontal and vertical control shall be shown on the drawing or referenced and described in appropriate notes.

f. The drawings shall be constructed by the Surveyor in accordance with the following requirements:

(1) All line work and lettering must be of professional quality and all line widths and lettering sizes must be of such size that all information can be clearly shown without overlap or confusion.

(2) When more than one sheet is required, an index sheet must be added showing the entire parcel, with the sheets in numerical order, and each sheet showing the sheet number and total number. When more than one sheet is submitted, only the last need have the approval certificates, but all sheets must be the same size.

(3) The drawings must be in an appropriate engineering type scale of one inch representing a multiple of 100 feet.

(4) Details, as necessary, must be shown at an appropriate indicated scale.

(5) The drawings must have a vicinity map in the upper right-hand corner. The vicinity map shall be at least four inches on each side with a scale of one inch representing one mile, showing sections, township and ranges, boundaries such as national forest or municipal boundaries, and other prominent physical or natural features such as roads, lakes, or rivers. The source of the base map must also be indicated.

(6) Nomenclature of the survey need appear in the block only, unless the division specifically states otherwise.

(7) The basis of bearings must be indicated. Bearings shown must be true bearing as oriented to the basis of bearing, and distances must be in the foot unit reduced to the true horizontal equivalent.

(8) Bearings and distances must be shown within the accuracy commensurate with the class of survey being represented, boundary line distances must be shown from monument to monument.

g. In addition to a signed, stamped paper copy of the drawings, CD's containing the drawing information shall be

submitted. The CD's shall be accompanied by the layer naming convention and other information as necessary to allow Chugach to utilize the CD's.

h. A hard copy listing of all surveyed points shall be submitted with coordinate positions listed by point number and again by like items. A separate listing for stations and offsets shall be submitted listed by station and again by like items. A CD containing these listings in ASCII format shall be submitted.

F. The Contractor shall submit a certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

3.5 PROJECT RECORD DOCUMENTS

A. As-Built Drawings

1. Maintain on the Site two separate sets of marked-up full-scale Contract Drawings and Staking Sheets indicating as-built conditions. These drawings shall be maintained in a current condition at all times until completion of the Work and shall be available for review by Chugach at all times. All variations from the Contract Drawings, for whatever reason, including those occasioned by modifications, optional materials, and the required coordination between trades shall be indicated. These variations shall be shown in the same general detail utilized in the Contract Drawings. Upon completion of the Work, the marked-up drawings shall be furnished to Chugach.

2. Store Record Documents separate from documents used for construction.

3. Record information concurrent with construction progress.

END OF SECTION

SECTION 4

SUBMITTALS AND SCHEDULES

4.1 SECTION INCLUDES

- Submittal Procedures
- Plan of Foundation Construction
- Construction Progress Schedules
- Shop Drawings
- Product Data
- Samples
- Manufacturer’s Instructions
- Manufacturer’s Certificates

4.2 SUBMITTAL PROCEDURES

The Contractor shall submit pertinent data as required in other parts of these Contract Documents for Chugach's approval:

A. Transmit each submittal with Chugach-accepted form.

B. Sequentially number the transmittal forms. Resubmittals are to have the original submittal number with an alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or Supplier, pertinent drawing sheet and detail number(s), and Specification section number, as appropriate.

D. Apply Contractor's stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Chugach will not review submittals, until the Contractor has reviewed them.

B. Schedule submittals to expedite the Project, and deliver to Chugach. Coordinate submission of related items. Allow 7 calendar days for Chugach's and Engineer's review.

F. If substitutions become necessary after Contract award and initial approval of Contractor furnished materials, the contractor shall submit all information as required in the bid and include a detailed explanation as to causes for the substitution.

G. Provide space on submittals for Contractor's and Chugach's review stamps.

H. Revise and resubmit submittals as required, identify all changes made since previous submittal.

I. Distribute copies of approved submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

J. No material and/or procedure requiring Chugach's approval shall be used or implemented until such approval has been given.

4.3 CONSTRUCTION PROGRESS SCHEDULES

A. A schedule shall be submitted with the bid and include the planned duration of the following major construction groups.

1. Mobilization of Equipment and Materials to Site
2. Surveying
3. Vault Installation
4. Conduit/Trenching Installation
5. Cable Installation
6. Cutover from Temp OH to Permanent UG
7. Removal of Entire Temp Installation
8. All Outages with Duration
9. Clean up

The schedule shall note manpower loading and cash flow. The schedule shall be submitted using a Microsoft Project format. The schedule shall be saved to a base line and submitted electronically.

B. Contractor shall incorporate the completion dates into its schedule. All work shall be completed by the date specified in the Invitation to Bid (ITB). Liquidated damages in the amounts noted in the Invitation to Bid will be assessed for failure to meet each of the completion dates due to circumstances under the control of the Contractor. Liquidated damages will be assessed for each day beyond the completion date the Work specified is incomplete.

C. The Contractor shall submit three (3) copies of an updated construction schedule for approval by Chugach not later than close of business three (3) Chugach working days before the pre-construction conference. The construction schedule shall be updated to include cash flow on a weekly basis and planned percent complete by task and overall project.

D. The construction schedule shall be updated with actual percent complete by task and manpower and three (3) copies submitted with all invoices.

E. The basic construction schedule (data on planned performance) shall not be changed without Chugach's concurrence.

4.4 PRODUCT DATA

The Contractor shall:

A. Submit the number of product data copies that the Contractor requires, plus three (3) copies that will be retained by Chugach.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to the Project.

C. After review, distribute in accordance with Submittal Procedures above and provide copies for Record Documents described in Special Provisions, Section 8 - Contract Closeout.

4.5 SAMPLES

The Contractor shall:

A. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing Work.

B. Include identification on each sample, with full product information.

C. Submit the number or samples specified in individual Specification sections, one of which will be retained by Chugach. Reviewed samples that may be used in the Work are indicated in individual Specification sections.

4.6 MANUFACTURER'S INSTRUCTIONS

The Contractor shall:

A. When specified in individual Specification sections, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start up, adjusting, and finishing, in quantities specified for product data.

B. Identify conflicts between manufacturers' instructions and Contract Documents. Notify Chugach in a timely manner to allow resolution of the conflicts without impact on the project completion.

4.7 MANUFACTURER'S CERTIFICATES

The Contractor shall:

A. When noted in individual Specification Sections, submit manufacturer’s certificates in quantities specified for product data.

B. Indicate material or product as it conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Chugach.

END OF SECTION

SECTION 5

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

5.1 SECTION INCLUDES

- Temporary Utilities
- Construction Facilities

5.2 TEMPORARY UTILITIES

The Contractor shall:

A. Supply all temporary electric power required for construction of the project.

B. Provide and maintain adequate lighting for construction operations at all times.

C. Obtain potable water as needed for the Work.

D. Provide sanitary facilities at the site as required by law or regulation.

5.3 CONSTRUCTION FACILITIES

A. Protection of Installed Work

The Contractor shall:

1. Protect installed Work and provide special protection where specified in individual Specification sections.

2. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

B. Barriers

The Contractor shall:

1. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.

2. Protect stored materials, site, and structures from damage.

C. Security

1. Provide security and facilities to protect Work, from unauthorized entry, vandalism, or theft.

D. Parking

1. All parking shall be on right-of-way or in areas that the Contractor has obtained approval to park.

E. Cleaning

1. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in a clean and orderly condition.

2. Remove waste materials, debris, and rubbish from site weekly and dispose off-site in compliance with all local, State and Federal regulations.

F. Removal of Utilities, Facilities and Controls

1. Remove temporary above grade or buried utilities, equipment, facilities, materials prior to final inspection.

2. Clean and repair damage caused by installation or use of temporary Work.

END OF SECTION

SECTION 6

MATERIAL AND EQUIPMENT

6.1 SECTION INCLUDES

- Material and Equipment Quantities
- Products
- Transportation and Handling
- Storage and Protection

6.2 MATERIAL AND EQUIPMENT QUANTITIES

A. Material and equipment quantities shown on drawings and staking sheets are the engineer's best estimate and shall be verified by the Contractor. Discrepancies shall be brought to Chugach's attention and conflicts resolved in a timely manner so to not interfere with scheduled completion of the work.

6.3 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Products do not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components authorized for reuse.

B. The Contractor shall not reuse materials, except as specifically permitted by the Contract Documents.

6.4 TRANSPORTATION AND HANDLING

The Contractor shall:

A. Exercise due care in the handling of all materials. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

6.5 STORAGE AND PROTECTION

The Contractor shall:

A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

B. For exterior storage of products, put on sloped supports, above ground.

C. Provide off-site storage and protection when Site does not permit on-site storage or protection.

D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

END OF SECTION

SECTION 7

CHUGACH FURNISHED MATERIAL

7.1 SECTION INCLUDES

- Chugach Furnished Material.
- Transfer of Material.
- Damage to Chugach Furnished Material.
- Installation of Chugach Furnished Material.

7.2 CHUGACH FURNISHED MATERIAL

A. All owner furnished material is listed in the "List of Owner Furnished Materials." If material does not appear on this list, the Contractor shall provide it.

B. The costs associated with the Owner Furnished Material listed represent original costs to Chugach and may or may not be replacement costs.

C. The Contractor shall include the Chugach furnished materials for this project in its insurance posted for the work.

7.3 TRANSFER OF MATERIAL

A. Chugach furnished materials and equipment may have been previously unpackaged for inspection. The Contractor shall repackage the material and equipment as necessary for transport and storage, subject to the approval of Chugach.

B. After the acceptance of Chugach furnished items, the Contractor shall place them at the point of installation or in areas provided by the Contractor. Chugach may direct that certain items be stored in heated storage buildings. The Contractor shall be responsible for loading/unloading all material exceeding 9,000 lbs at the Chugach Warehouse and transporting all Chugach furnished material to the jobsite. The Contractor is responsible for off loading Chugach furnished material at the jobsite.

C. After acceptance, Chugach furnished items are the Contractor's responsibility. The Contractor shall appropriately store and protect all Chugach furnished items upon acceptance.

7.4 DAMAGE TO CHUGACH FURNISHED MATERIAL

A. The Contractor shall repair or replace any Chugach furnished items damaged by the Contractor's handling and storage at no additional cost to Chugach.

7.5 INSTALLATION OF CHUGACH FURNISHED MATERIAL

A. Except as otherwise specified, installation Work shall be the responsibility of the Contractor and all mistakes in installation and damage shall be corrected at no cost to Chugach.

B. The Contractor will not be held liable for faulty manufacture of Chugach furnished items or for mistakes in the manufacturer's drawings.

END OF SECTION

SECTION 8

CONTRACT CLOSEOUT

8.1 SECTION INCLUDES

- Closeout Procedures
- Closeout Documents
- Final Cleanup

8.2 CLOSEOUT PROCEDURES

A. Notify Chugach to perform a preliminary inspection for the purpose of determining the state of completion of the Work. Contractor shall notify Chugach at least seven (7) days in advance of the time this inspection is to be performed. From the information gathered from this inspection, Chugach will prepare a punch list of Work to be performed, corrected, or completed before the project will be accepted. The Contractor, prior to final inspection shall complete all Work on the punch list.

B. Contractor shall accompany Chugach and their representatives on the final inspection tour, as well as any principal subcontractors that Chugach may request to be present.

C. If the Work has been completed in accordance with the Contract Documents and no further corrective measures are required, Chugach will issue a Certificate of Completion and will accept the project.

8.3 CLOSEOUT DOCUMENTS

A. The following documents in addition to those specified in the OELCC shall be completed and signed by authorized representatives of Chugach and/or Contractor before final payment is made:

1. Summary of Construction Units (1 set).

2. Certified as built drawings including shop drawings and other product information (1 set).

3. Cable Pulling Data Records (1 set).
Hi-Pot Test Reports (1 set)
Compaction Test Reports (1 set for Vault Install)

8.4 FINAL CLEANUP

A. The Contractor shall maintain the site in a clean and orderly condition. All equipment, packaging materials, temporary facilities, retired facilities, etc., shall be removed within 10 working days of construction completion.

END OF SECTION

PART II

TECHNICAL SPECIFICATIONS

FOR

34.5kV SUBTRANSMISSION AND 15kV DISTRIBUTION LINES

O'MALLEY JUNCTION TO NEW SEWARD HWY JUNCTION

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

W.O. E1620054
W.O E1613642

June 20, 2017

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I. GENERAL

A. TECHNICAL SPECIFICATIONS

1. The following sections form the Technical Specifications:

   I. General
   II. Right-of-way Access, Authorization and Restrictions
   III. Clearing
   IV. Duct, Conduit and Vault Construction
   V. Electrical Power Cable

B. STANDARD OF WORK AND SCHEDULES

1. All work shall be done in a thorough and workmanlike manner in accordance with the Technical Specifications and Construction Drawings.

2. The requirements of the Accredited Standards Committee C2-2012, National Electrical Safety Code (NESC), shall be followed wherever applicable to the work, except where local regulations or specification requirements are more stringent, in which case the more stringent requirements shall govern.

C. STAKING SHEETS, DRAWINGS AND MAPS

1. All staking sheets, drawings and maps accompanying this Technical Specification or listed herein shall be considered a part of this Technical Specification. The specific drawings included as part of this Technical Specification are listed, indexed and included in Appendix A. Staking Sheets are included in Appendix B.

D. LOCATIONS OF VAULTS AND OTHER MAJOR ITEMS

1. Verify that all field measurements are as indicated on the drawings.

2. Locations of vaults and other major items to be constructed or installed shall be determined and staked by the Contractor as shown on the Drawings and approved by Chugach. The Contractor shall be responsible for checking the location of vaults and other items to be installed.

E. SPECIAL REQUIREMENTS

1. Guys and Anchors shall be installed in accordance with these Technical Specifications, the Special Provisions and as indicated in the Bid Unit Descriptions and project drawings.

2. **Retirement units shall include complete removal of the unit. No portion of the unit shall remain above or below grade.**

END OF SECTION

II. RIGHT-OF-WAY ACCESS, AUTHORIZATION AND RESTRICTIONS

A. SECTION INCLUDES

1. Locations, authorization, and restrictions for accessing the Project right-of-ways.

B. AUTHORIZATION

1. Chugach has, or will obtain, all easements and right-of-way necessary for the construction of the Project as designed.

2. The Contractor shall maintain the right-of-way and access trails to the satisfaction of Chugach and all governing regulatory agencies at all times.

3. Regulatory agencies shall have a right of access and entry to the project area for inspection or monitoring purposes and for any other purpose or reason that is reasonable consistent with any right or obligation of the agencies under any law or regulation.

C. ACCESS TO THE RIGHT-OF-WAY

1. Where access to right-of-way is desired across private property, the owner, tenant or occupant shall be contacted to obtain permission for ingress and egress to the right-of-way. Such arrangements, including obtaining releases for damage, shall be made by the Contractor.

2. Chugach assumes no responsibility for the condition or maintenance of access and no payment will be made to the Contractor thereof. The cost of access maintenance shall be included in the bid items for which access is necessary.

D. RESTRICTIONS

1. The Contractor shall not enter upon any tract of land until Chugach releases it to him for construction.

2. The Contractor shall confine his activities to his working area, and conduct his work in a manner that will not infringe upon the rights of the property owner or tenants. All operations, including movement of men and equipment, shall be restricted to the area for which rights have been secured.

3. Mobile ground equipment and vehicles shall not be operated outside the boundaries of the right-of-way except in protection of life, limb, or property, or with the written approval of Chugach.

END OF SECTION

II. DUCT, CONDUIT AND VAULT CONSTRUCTION

A. SCOPE

1. This section includes requirements for installation of the conduit and vault system, including trenching, excavation, and backfill.

B. REFERENCES

1. ASTM C-1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout

2. ASTM D-1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

3. ASTM D-1556 Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method

4. ASTM D-2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

5. ASTM D-2922 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

6. ASTM D-2937 Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method

C. MATERIALS

1. 34.5 kV Conduit System:

   a. HDPE Conduit: 4” HDPE Conduit as shown on the Drawings.

   b. PVC Conduit: 4" Schedule 40 PVC Conduit as shown on the Drawings.

   c. Fiberglass Riser Conduit: 4” Heavy wall Fiberglass Conduit as shown on the Drawings.

   d. Fittings: Reducers, elbows, plugs, and couplings sized for and designed for use with conduits noted above.

   e. Accessories and Supports: All other materials for a complete conduit system, including adhesives and conduit supports, shall be sized and designed for use with the intended application.

2. Vaults:

   a. Vault: Concrete Vault 14'L x 8'W x 8'H, Utility Vault #814-8-LA with covers, risers, frames, and cable racking equipment as shown on the Drawings.

D. PROJECT RECORD DOCUMENTS

1. Accurately record actual sizes and locations of conduits and vaults on the Record Drawings, including deviations from the Project Drawings.

E. PREPARATION

1. Routings shown on the drawings are approximate locations unless dimensioned. Route as required to avoid conflicts with existing facilities in order to complete the wiring system.

F. HANDLING AND STORAGE

1. Vault and conduit shall be handled and stored so as to prevent damage to any portion of the vault or conduit. Conduit sections and vaults that are damaged in any way shall be replaced by units that are not defective. The cost for acceptance of previously accepted units shall be borne by the Contractor.

2. Vault sections shall be lifted in accordance with manufacturer's instructions from designated lift locations.

G. TRENCHING AND EXCAVATION

1. Excavation will be to the extent necessary for vault, transformer and conduit installation and routing as indicated on the drawings.

2. Contractor shall not begin excavation until all materials, equipment and personnel are present to complete the work in an expedient manner.

3. Contractor shall acquire locates for all existing buried utilities prior to beginning excavation.

4. Hand digging "pothole" excavation locate of existing buried utility shall be performed prior to excavation when existing utility is within proximity of planned excavation as required by the existing utility.

5. Hand digging trenching shall be used where trenching excavation is located within 2' of existing underground electric, gas, CATV, telephone, gas, water and sewer utilities. "Air-knife", vacuum truck or similar non-destructive excavation method may be used for these hand dig locations.

6. Trenching shall be planned so that there is no more than two hundred feet (200') of open trenching at the end of any work day. All open trench shall be barricaded with "Beacon Plus" or equal orange work fence and the end of each work day, or whenever open trench is left unattended.

7. Bottom of excavation shall be accurately graded to provide uniform bearing and support of the conduit bedding for its entire length and/or total surface area of the vault floor. Where unsuitable materials, including but not limited to organics or rock, the trench shall be over-excavated by a minimum depth of 6", and imported backfill material shall be installed as required to bring the trench bottom up to specified grade.

8. Excavation for the vault shall be as indicated on the Drawings, with imported backfill material installed as required to bring the vault bottom up to the required grade.

9. Excavated material for backfill shall be placed in an orderly manner and at a distance from the trench section which conforms with all state and/or federal safety codes. Surface organics shall be segregated from other suitable excavated backfill material to prevent contamination or removed from the site.

10. Trenching shall be coordinated with all utilities in joint use trench. Contractor is responsible for this coordination and no additional compensation shall be paid for initial installation errors or the cost of repairing those errors.

H. BACKFILLING

1. Trench or excavation shall be cleared of all debris or organic material prior to backfilling.

2. Organics, frozen material, asphalt, and similar materials are not suitable for backfill. These materials shall be disposed offsite and replaced with imported backfill material as directed by the Chugach Representative.

3. All backfill within 24" of the conduit shall be free of large rocks that may damage the conduit.

4. Place and compact backfill in excavations promptly.

5. Place backfill and upper fill soil materials in layers not more than 10 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers. Place lower fill (specified as "clean soil" in drawings) in layers not more than 12 inches in loose depth. **Compact backfill and upper fill materials to not less than 95% of maximum dry unit weight according to ASTM D 1557, and**

lower fill material to not less than 90% of maximum dry unit weight according to ASTM D 1557. ***Compaction at 95% and 90% is only applicable under the bike path between Vault N3 and Vault N4.***

6. Uniformly moisten or aerate backfill layer before compaction to within 2 percent of optimum moisture content. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

7. Provide a smooth transition between adjacent existing grades and new grades surrounding all foundations and work areas.

8. Site Grading: Establish slope grades to pre-construction grades.

I. CONDUIT INSTALLATION

1. Verify that the excavation is complete and acceptable and ready to receive conduit prior to conduit installation.

2. HDPE conduit shall be straightened and rolled as required to straighten and re-round the conduit prior to splicing and installation.

3. HDPE conduit sections shall be spliced using butt fusion splice method in accordance with the conduit manufacturer's recommendations; this requires the use of gas products HDPE pipe joining equipment. The thickness of the joint seam shall be minimized so that it does not protrude more than 1/16" inside the conduit.

4. HDPE conduit ends shall be straight cut for splices with the inside surface of the end bevel cut with a sharp knife or beveling tool.

5. PVC conduits and fittings shall be joined by means of a solvent welding cement so as to provide a water tight joint. All conduits shall be cut off square. The cut end shall be filed and properly reamed with a reamer designed for the purpose of removing the sharp edge.

6. All bending of PVC conduit will be by means of infrared heating and bending equipment, Carlon "Hotbox Bender" or equivalent. No cold bending of conduit will be allowed.

7. Inspect the completed butt splices to verify that they are free of visible defects.

8. Conduit shall be field bent to follow the trench or bore line and grade with a minimum bending radius of six feet (6'). Ninety degree angles shall be installed with preformed elbows.

9. Cap or plug each duct during construction to prevent the entrance of debris into the conduit system.

10. After completion of backfilling and compaction, electrical ducts shall be mandreled, brushed and swabbed. If conduit does not accept the mandrel, the conduit shall be removed and replaced at no additional expense.

11. Mandreling must be performed in the presence of the Chugach Representative. After completion of mandreling brushing and swabbing, cap each duct (with conduit, Jack Moon eye nut plug, or equal) at each end to ensure watertight integrity.

12. Install a polyethylene pull rope with a minimum breaking strength of seven hundred pounds (700 lbs) in each duct. Securely tie the pull rope to the conduit plugs. All pull ropes shall be new.

13. HDPE preformed elbows and fiberglass elbows shall be connected to HDPE conduits by use of Shur-Lock II or equal compression couplings.

14. At risers, trench excavation shall be deeper as required to provide a full and smooth horizontal to vertical transition. Bevel cut the inside edge of the HDPE conduits for transition to the fiberglass riser conduit.

15. Install conduit sealing bushing at top of all riser conduits.

J. ELECTRICAL VAULT INSTALLATION

1. Prior to installation, the Contractor shall verify the location of the vaults with the Chugach Representative.

2. Install vaults as indicated on the Drawings.

3. Vaults shall be waterproofed with HEY'DI K-11 concrete waterproofing with SB bonding agent. Substitute product or method will require written Chugach approval prior to installation.

4. Cable support racking and support system shall be installed in the vaults as shown on the Drawings.

5. Grout and Seal all penetrations through vault walls using non-shrink, non-corrosive, non-metallic cement based grout conforming to ASTM C-1107, type C. Duct entrances shall have bell ends grouted to a smooth finish on the inside of the vault wall. Provide forms to retain grout in place until the grout is sufficiently hardened to support itself. Keep grouted joints damp for not less than 24 hours, or as specified by the manufacturer, after initial set.

6. All unused duct openings shall be capped with approved plugs.

7. All duct openings shall have their conduit run destinations identified by three quarters inch (3/4") letters on approved engraved plastic tags secured to the wall immediately above the conduit entrance by approved stainless steel fasteners. For example "TO VAULT N-1".

K. ELECTRICAL VAULT INSTALLATION – FIELD QUALITY CONTROL

1. Testing Agency: Contractor will perform field quality control testing. Chugach may, at their option, engage a qualified independent geotechnical engineering testing agency to perform field quality-assurance testing.

2. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed on each 6" lift of material and compaction of Type II material backfill shall be at 95%.

3. When soils have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

L. SPECIAL REQUIREMENTS

1. Clearing for vault excavation shall be minimized to not exceed the excavation footprint of the vault installation.

END OF SECTION

III. ELECTRICAL POWER CABLE

A. SUMMARY

1. This section covers the furnishing and installation of electrical power cable required to complete the installation of equipment as shown on the Drawings, and as specified herein with terminations and splices required to provide functioning power systems as indicated.

B. REFERENCES

1. IESC S-97-682 Utility Shielded Power Cables Rated 5 through 46 kV

2. IEEE Standard 400 – IEEE Guide for Making Direct Voltage Tests on Power Cable Systems in the Field.

3. NESC – National Electrical Safety Code

C. SUBMITTALS

1. D.C. High Potential Test: Indicate results of cable field test in tabular form of current versus voltage for incremental voltage steps, and current at 1 minute and 15 minutes after maximum voltage is reached. Sample form in Appendix G.

2. Cable Pulling Data: Record pulling data for individual cables including, circuit information, location and direction of the pull, and maximum pulling tension. Sample form in Appendix G.

3. Product Data: For any cable or connectors not Chugach-Furnished.

D. QUALIFICATIONS

1. Manufacturer: Company specializing in manufacturing specified in this section with minimum three years documented experience.

E. PROJECT RECORD DOCUMENTS

1. Accurately record actual sizes and locations of electric power cables on the Record Drawings, including deviations from the Project Drawings.

F. QUALITY ASSURANCE

1. Handle cable in accordance with the manufacturer's instructions.

2. Do not exceed minimum bending radii for cables as well as pulling tensions.

G. FIELD MEASUREMENTS

1. Cable lengths shown on the cable schedule are estimates only. Contractor is responsible for verification of the exact lengths necessary.

H. HIGH VOLTAGE CABLE

1. Chugach-Furnished 34.5 kV, 1000 kcmil, shielded, 420 mil insulation cable.

I. EXAMINATION

1. Verify that mechanical work likely to damage cable has been completed.

J. INSTALLATION

1. Install cable and accessories in accordance with manufacturer's instructions.

2. Avoid abrasion and other damage to cables during installation.

3. Do not exceed cable pulling tensions, sidewall pressures or bending radius limitations. For Chugach supplied conductors information on these limitations will be furnished by Chugach at the time of construction.

4. Pulling tension shall be monitored continually during the pull, by the use of a dynamometer. Dynamometer installation requires prior review and approval by Chugach. If tension exceeds maximum limits, pulling operations will be stopped until the causes are corrected. All test equipment shall have calibration certificates no more than 30 days old.

5. Clean conductor surfaces before installing lugs and connectors.

6. Use suitable lubricants and pulling equipment. Lubricant shall be Lubaduk, Polywater J, or approved equal.

7. Attach cable within vaults to rack support arms with cable ties as required.

8. All cable in vaults shall be wrapped in contractor furnished fire tape.

K. IDENTIFICATION

1. Identify all power cables with plastic flag type tags. Use red, white and blue tags appropriately installed on all three phase circuits. Securely fasten tag with 88 or 37 tape to the cable before the termination, at points where the tags are clearly visible. Tags shall identify the location of the opposite end of the cable and the circuit number.

L. SPLICES

1. Install cable splices in accordance with the splice manufacturer's instructions.

2. Only install splices in vaults in locations indicated in the staking sheets.

M. FIELD QUALITY CONTROL

1. Inspect cable for physical damage and proper connection.

2. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

3. Inspect shield grounding, cable supports, and terminations for proper installation.

4. Perform continuity tests on all new facilities to establish conductor continuity across the new facilities prior to final connections to existing facilities.

5. Perform DC high potential test of each conductor in accordance with IEEE 400 for all cables 1000 V and above.

   a. Connect untested conductors in circuit to ground during test.

   b. Apply test voltage in at least eight equal increments to maximum test voltage.

   c. Record leakage current at each increment, allowing for charging current decay.

   d. Hold maximum test voltage for 15 minutes.

N. PROTECTION

1. Protect cable ends of high voltage cable with a suitable cap designed specifically for the purpose (heat shrink, etc.) Taping of cable ends is not acceptable.

O. SPECIAL REQUIREMENTS

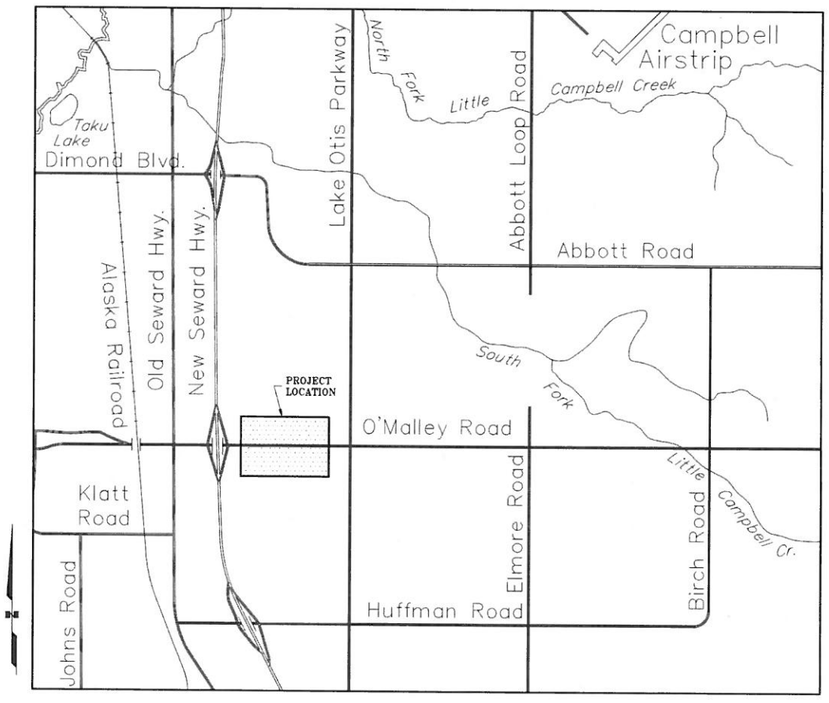
1. Testing shall be performed on existing facilities to verify phasing prior to making final electrical connections to new facilities.

END OF SECTION

34.5kV AND 12.5kV LINES
O'MALLEY JCT TO NEW SEWARD HWY JCT
W.O. E1613642 – 12.5kV
W.O. E1620054 – 34.5kV
O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

DRAWING INDEX

DRAWING NUMBER	SHEET NUMBER	TITLE
MJS2-RW-0002	1 OF 2	ROW
MJS2-RW-0002	2 OF 2	ROW
MJS2-EE-0001	1 OF 2	PRIMARY CIRCUIT DIAGRAM – EXISTING AND NEW – 12.5KV
MJS2-EE-0001	2 OF 2	PRIMARY CIRCUIT DIAGRAM – EXISTING AND NEW – 34.5KV
MJS2-EE-0002	1 OF 2	ELECTRICAL RETIREMENT VAULT-N3 TO VAULT-N4
MJS2-EE-0002	2 OF 2	ELECTRICAL RETIREMENT VAULT-N4 TO VAULT-N5
MJS2-EE-0003	1 OF 2	ELECTRICAL NEW VAULT-N3 TO VAULT-N4
MJS2-EE-0003	2 OF 2	ELECTRICAL NEW VAULT-N4 TO VAULT-N5
MJS2-PP-1001	1 OF 2	TRENCH CONFIGURATION RETIREMENT VAULT-N3 TO VAULT-N4
MJS2-PP-1001	2 OF 2	TRENCH CONFIGURATION RETIREMENT VAULT-N4 TO VAULT-N5
MJS2-PP-1002	1 OF 2	TRENCH CONFIGURATION NEW VAULT-N3 TO VAULT-N4
MJS2-PP-1002	2 OF 2	TRENCH CONFIGURATION NEW VAULT-N4 TO VAULT-N5
MJS2-SS-0002	1 OF 4	ELECTRICAL EXISTING – VAULT DETAILS
MJS2-SS-0002	2 OF 4	ELECTRICAL NEW – VAULT DETAILS
MJS2-SS-0002	3 OF 4	ELECTRICAL EXISTING – VAULT DETAILS
MJS2-SS-0002	4 OF 4	ELECTRICAL NEW – VAULT DETAILS
MJS2-SS-0003	1 OF 1	ELECTRICAL NEW – TRENCH DETAILS



VICINITY MAP

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER; TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/22/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/22/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16		
2	ISSUED FOR CONSTRUCTION	GSG/05-22-17	JSA/05-22-17		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE

CHUGACH
POWERING ALASKA'S FUTURE
Chugach Electric Association, Inc.
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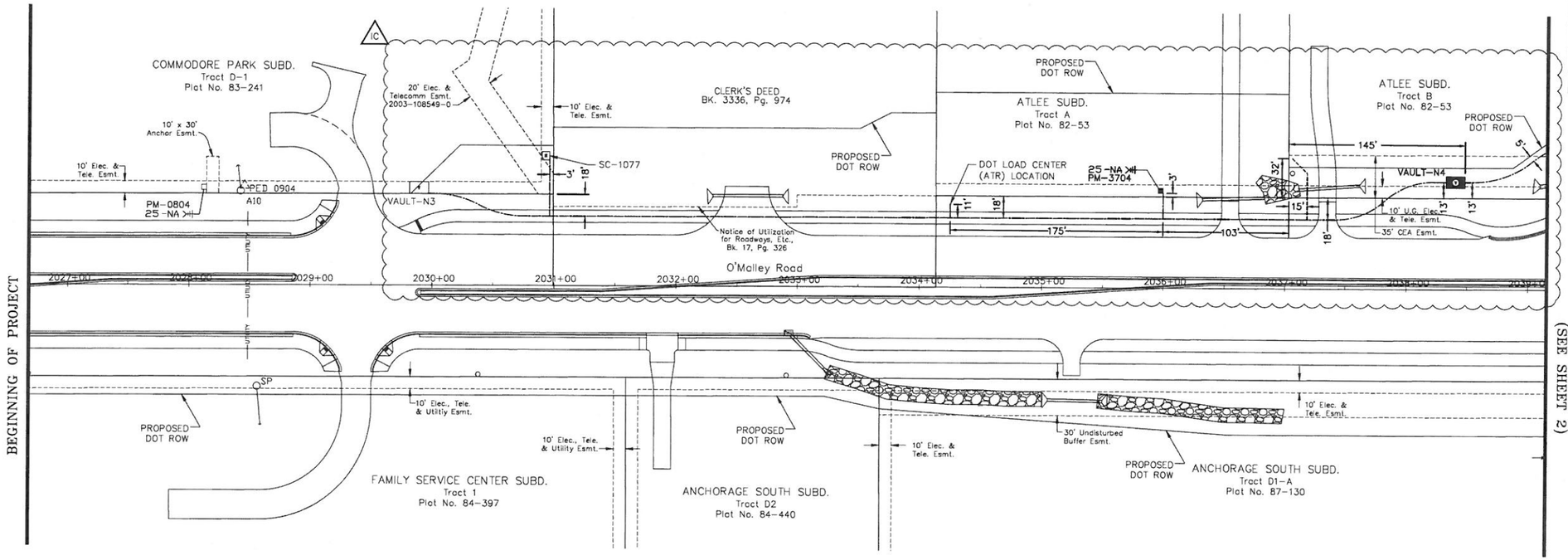
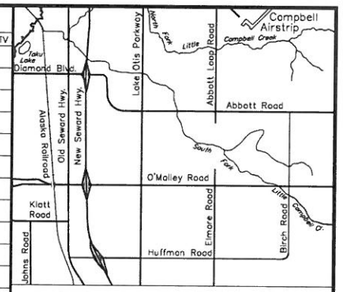
Anchorage, Alaska 99519-6300

34.5KV SUBTRANSMISSION LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
COVER SHEET AND DRAWING INDEX

DRAWING NO. – PREVIOUS/REFERENCE: MJS2-PR-0001
DRAWING NO.: MJS2-PR-0001/E1613642/E1620054
SHEET 1 OF 1
PAGE ___ / ___



POLE CONTACT RECORD		
LOCATION	ATU	CATV
INITIAL/DATE		



CONDUCTOR DATA

Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet
Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)

ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

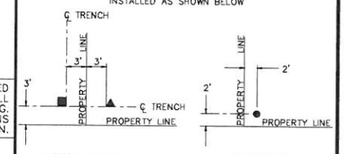
NEW		EXISTING
	PADMOUNT TRANSFORMER	
	PEDESTAL	
	POWER POLE	
	STREET LIGHT	
	WARNING POST	
	1ø U.G. PRI. CONDUCTOR	
	3ø U.G. PRI. CONDUCTOR	
	U.G. SECONDARY CONDUCT.	
	U.G. STREET LIGHT CONDUCT.	
	U.G. SUBTRANSMISSION LINE	
	1ø O.H. CONDUCTOR	
	3ø O.H. CONDUCTOR	
	O.H. TRANSMISSION LINE	
J	JUNCTION BOX	J
	SPLICE POINT	
	SPARE CONDUIT	
	CONDUIT W/ CONDUCTOR	
S	SWITCH CABINET	S

R.O.W. LEGEND

PROPERTY LINE

CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW



Typical Staking
N.T.S.

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 06/15/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 06/15/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 06/15/2017.
CONFIDENTIAL

50 0 50 100 FT.
GRAPHIC SCALE

CHANGES TO SEALED DRAWINGS NOT AUTHORIZED IN WRITING BY THE STAMPING ENGINEER SHALL VOID THE SEAL ON THE ENTIRE DRAWING. THE SEAL IS VALID ONLY FOR MODIFICATIONS MADE UNDER THIS ONE DRAWING REVISION.

DRYDEN & LARUE, INC (AECC612)
3305 ARCTIC BLVD, STE 201
ANCHORAGE, AK 99503, (907) 349-6653
PROJECT ID: 17-0247
PROJECT LOCATION: ANCHORAGE, AK

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
1	AS-BUILT OMALLEY LINE PROJECT	MS/2010		
2	AS-BUILT OMALLEY LINE PROJECT	TBD		
3	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16	
4	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
5	ISSUED FOR CONSTRUCTION	GSG/06-15-17	JSA/06-15-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

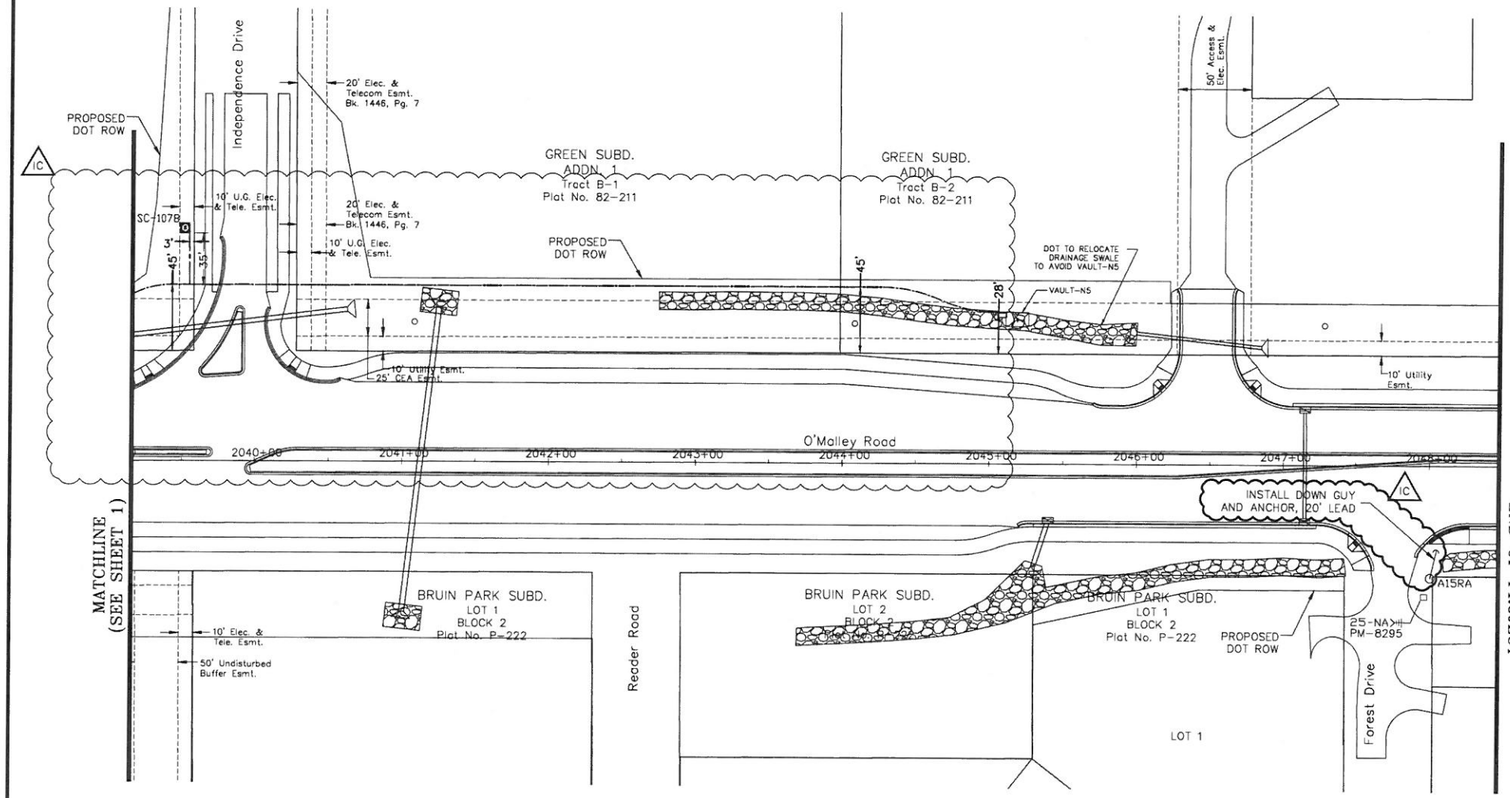
34.5KV SUBTRANSMISSION LINE O'MALLEY JCT - NEW SEWARD HWY JCT LINE 2 (BC) ROW

GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

MJS2-RW-0002-0002.DWG

W.O. NO.:
C.W.P. REF. NO.: MJS2-RW-0002/E1613642/E1620054

SHEET 1 OF 2



POLE CONTACT RECORD

LOCATION	ATU	CATV

INITIAL/DATE________

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.________
Manuf. Date________
Volt Rating________
Insul. Type________
Insul. Size________
Cond. Size/Type________
Quantity in Feet________

Manuf.________
Manuf. Date________
Volt Rating________
Insul. Type________
Insul. Size________
Cond. Size/Type________
Quantity in Feet________

Manuf.________
Manuf. Date________
Volt Rating________
Insul. Type________
Insul. Size________
Cond. Size/Type________
Quantity in Feet________

Manuf.________
Manuf. Date________
Volt Rating________
Insul. Type________
Insul. Size________
Cond. Size/Type________
Quantity in Feet________

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●✳	STREET LIGHT	○✳
▪	WARNING POST	▫
—‖—	1ø U.G. PRI. CONDUCTOR	—‖—
—‖‖—	3ø U.G. PRI. CONDUCTOR	—‖‖—
- - - - -	U.G. SECONDARY CONDUCT.	- - - - -
------------	U.G. STREET LIGHT CONDUCT.	------------
—\\\\\\—	U.G. SUBTRANSMISSION LINE	—\\\\\\—
—— - - ——	1ø O.H. CONDUCTOR	—— - - ——
—— - - - ——	3ø O.H. CONDUCTOR	—— - - - ——
— — + — +	O.H. TRANSMISSION LINE	— — + — +
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
═‖‖═	CONDUIT W/ CONDUCTOR	═‖‖═
S	SWITCH CABINET	S

R.O.W. LEGEND

——————	PROPERTY LINE
—— - —— - ——	CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.

GRAPHIC SCALE

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DRYDEN & LARUE, INC (AECC612)
3305 ARCTIC BLVD, STE 201
ANCHORAGE, AK 99503, (907) 349-6653

PROJECT ID: 17-0247
PROJECT LOCATION: ANCHORAGE, AK

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 06/15/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 06/15/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 06/15/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 1)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L)
W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
1	AS-BUILT OMALLEY LINE PROJECT	MS/2010		
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4	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
5	ISSUED FOR CONSTRUCTION	GSG/06-15-17	JSA/06-15-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

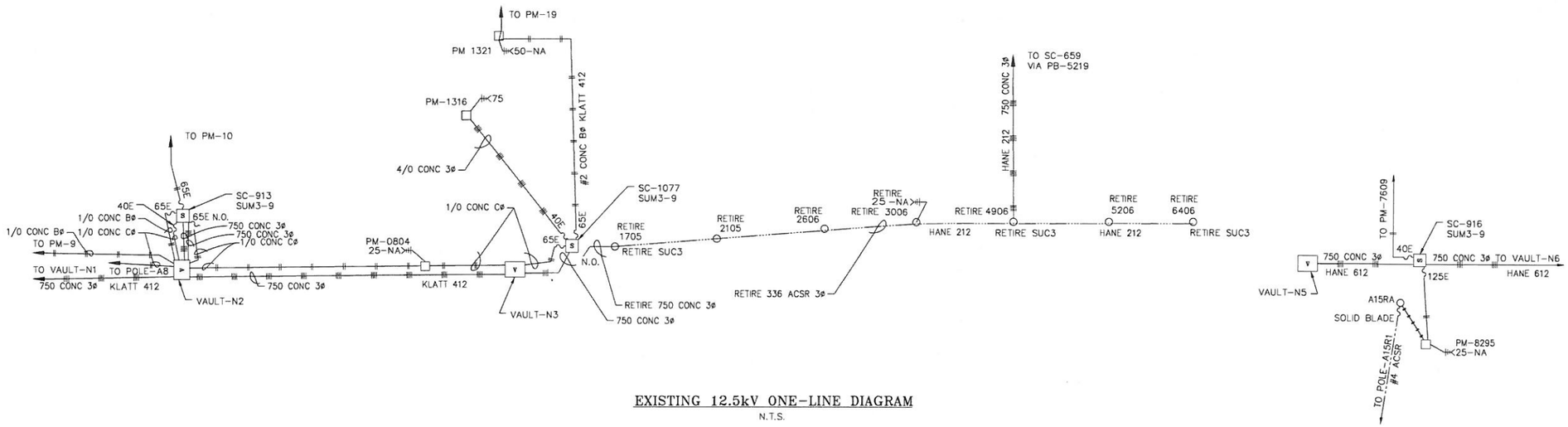
34.5KV SUBTRANSMISSION LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
ROW

GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

MJS2-RW-0002-0002.DWG

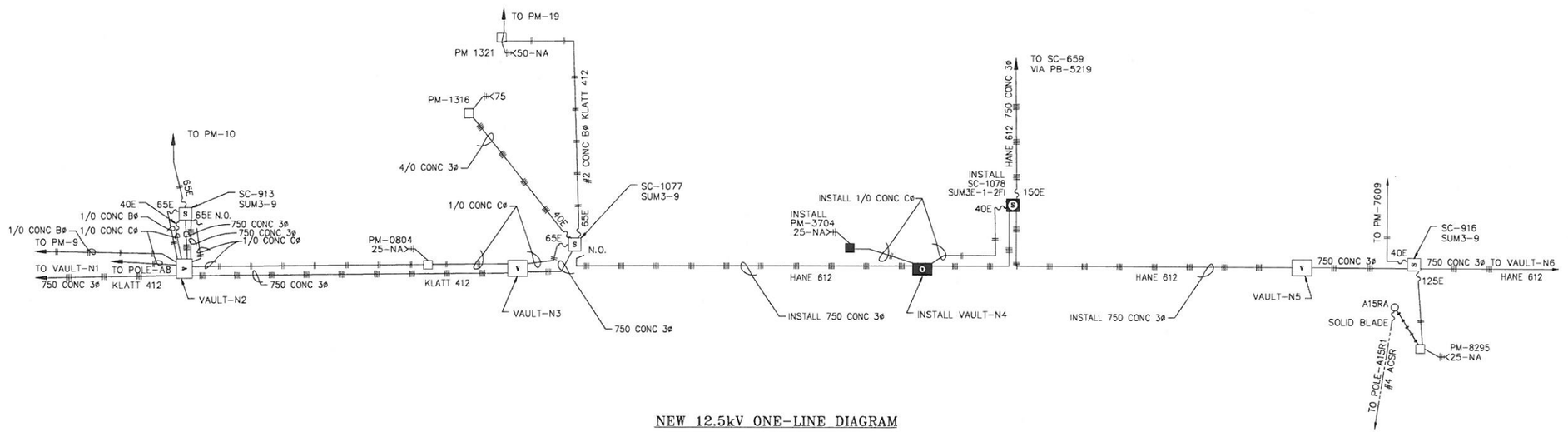
W.O. NO.:
C.W.P. REF. NO.: MJS2-RW-0002/E1613642/E1620054

SHEET 2 OF 2



EXISTING 12.5kV ONE-LINE DIAGRAM

N.T.S.



NEW 12.5kV ONE-LINE DIAGRAM

N.T.S.

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/24/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/24/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/24/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16	
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
2	ISSUED FOR CONSTRUCTION	GSG/05-24-17	JSA/05-24-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

34.5KV SUBTRANSMISSION LINE
O'MALLEY JCT - NEW SEWARD HWY JCT LINE 2 (BC)
PRIMARY CIRCUIT DIAGRAM

FEEDERs: KLATT 412, HANE 612

MJS2-EE-0001-0001.DWG

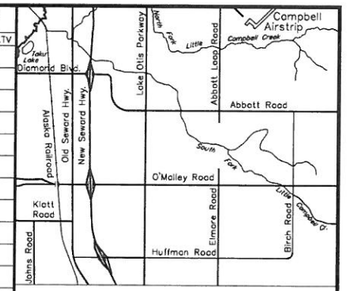
W.O. NO.: / C.W.P. REF. NO.: MJS2-EE-0001/E1613642/E1620054

SHEET 1 OF 2

POLE CONTACT RECORD

LOCATION	ATU	CATV

INITIAL/DATE



Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet
Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)
ANCHORAGE AREA 278-3121
STATEWIDE 800-478-3121
AT&T ALASCOM INC. 264-8465
ALASKA RAILROAD UTILITIES 265-2457
ALYESKA CABLE TV (GIRDWOOD) 783-2982
KULIS AIR BASE 249-1499
MILITARY PETROLEUM FUEL LINES 552-2334
OR 552-5342
STATE STORM DRAINS & STREET LIGHTS 333-2411

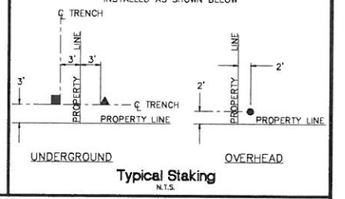
CONSTRUCTION LEGEND

NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●-✳	STREET LIGHT	○-✳
■	WARNING POST	□
═	1ø U.G. PRI. CONDUCTOR	═
≡	3ø U.G. PRI. CONDUCTOR	≡
- - -	U.G. SECONDARY CONDUCT.	- - -
- - -	U.G. STREET LIGHT CONDUCT.	- - -
≈	U.G. SUBTRANSMISSION LINE	≈
———	1ø O.H. CONDUCTOR	———
———	3ø O.H. CONDUCTOR	———
— + — + —	O.H. TRANSMISSION LINE	— + — + —
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
≡	CONDUIT W/ CONDUCTOR	≡
S	SWITCH CABINET	S

R.O.W. LEGEND

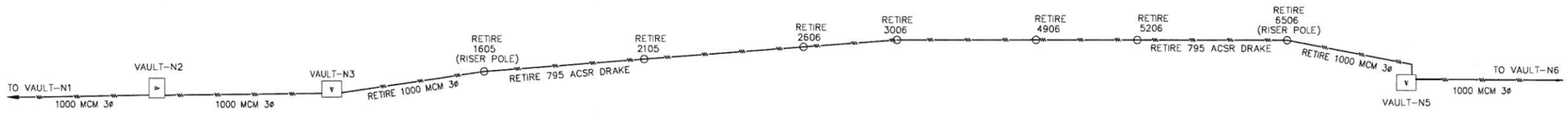
PROPERTY LINE
CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW



UNDERGROUND OVERHEAD

Typical Staking
N.T.S.



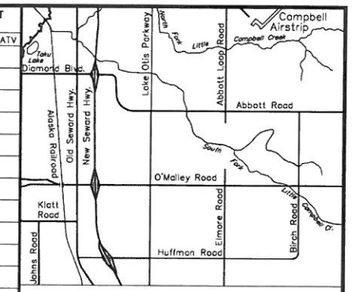
EXISTING 34.5kV ONE–LINE DIAGRAM
N.T.S.

NEW 34.5kV ONE–LINE DIAGRAM
N.T.S.

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 07/21/2016.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 07/21/2016.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 07/21/2016.
CONFIDENTIAL

POLE CONTACT RECORD

LOCATION	ATU	CATV
INITIAL/DATE		



Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet
Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)
ANCHORAGE AREA..... 278–3121
STATEWIDE..... 800–478–3121
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ALASKA RAILROAD UTILITIES..... 265–2457
ALYESKA CABLE TV (GIRDWOOD)..... 783–2982
KULIS AIR BASE..... 249–1499
MILITARY PETROLEUM FUEL LINES..... 552–2334
OR 552–5342
STATE STORM DRAINS & STREET LIGHTS..... 333–2411

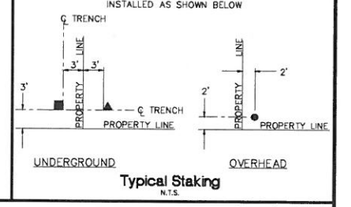
CONSTRUCTION LEGEND

NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●–✳	STREET LIGHT	○–✳
■	WARNING POST	□
═══	1ø U.G. PRI. CONDUCTOR	═══
═══	3ø U.G. PRI. CONDUCTOR	═══
- - - - -	U.G. SECONDARY CONDUCT.	- - - - -
- - - - -	U.G. STREET LIGHT CONDUCT.	- - - - -
═\\\═	U.G. SUBTRANSMISSION LINE	═\\\═
———	1ø O.H. CONDUCTOR	———
———	3ø O.H. CONDUCTOR	———
– + – + –	O.H. TRANSMISSION LINE	– + – + –
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═══	SPARE CONDUIT	═══
═══	CONDUIT W/ CONDUCTOR	═══
S	SWITCH CABINET	S

R.O.W. LEGEND

PROPERTY LINE
CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW



Typical Staking
N.T.S.

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	GSG/05–26–16	JSA/05–26–16	
1	ISSUED FOR CONSTRUCTION	GSG/07–21–16	JSA/07–21–16	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

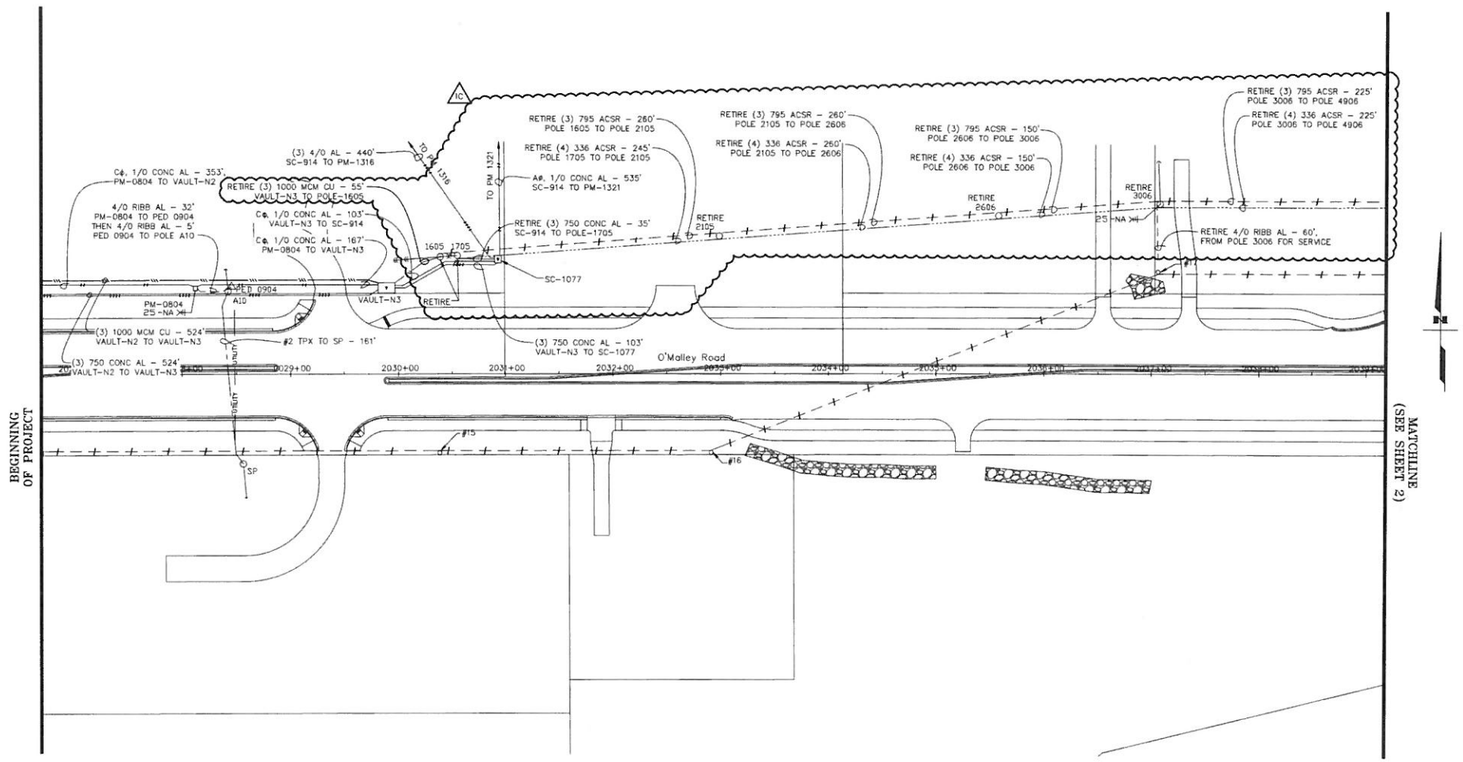
Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519–6300

DRAWING NAME:
34.5KV SUBTRANSMISSION LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
PRIMARY CIRCUIT DIAGRAM

MJS2–EE–0001–0002.DWG

W.O. NO.:
C.W.P. REF. NO.: MJS2–EE–0001/E1613642/E1620054

SHEET 2 OF 2



RETIREMENT NOTE
ALL EQUIPMENT TO BE RETIRED SHALL BE COMPLETELY REMOVED AND DISPOSED OF BY CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, ALL POLES, ANCHORS, ANCHOR RODS, H-PILES, CONDUITS AND CABLES.

50 0 50 100 FT.
GRAPHIC SCALE

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/22/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/22/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

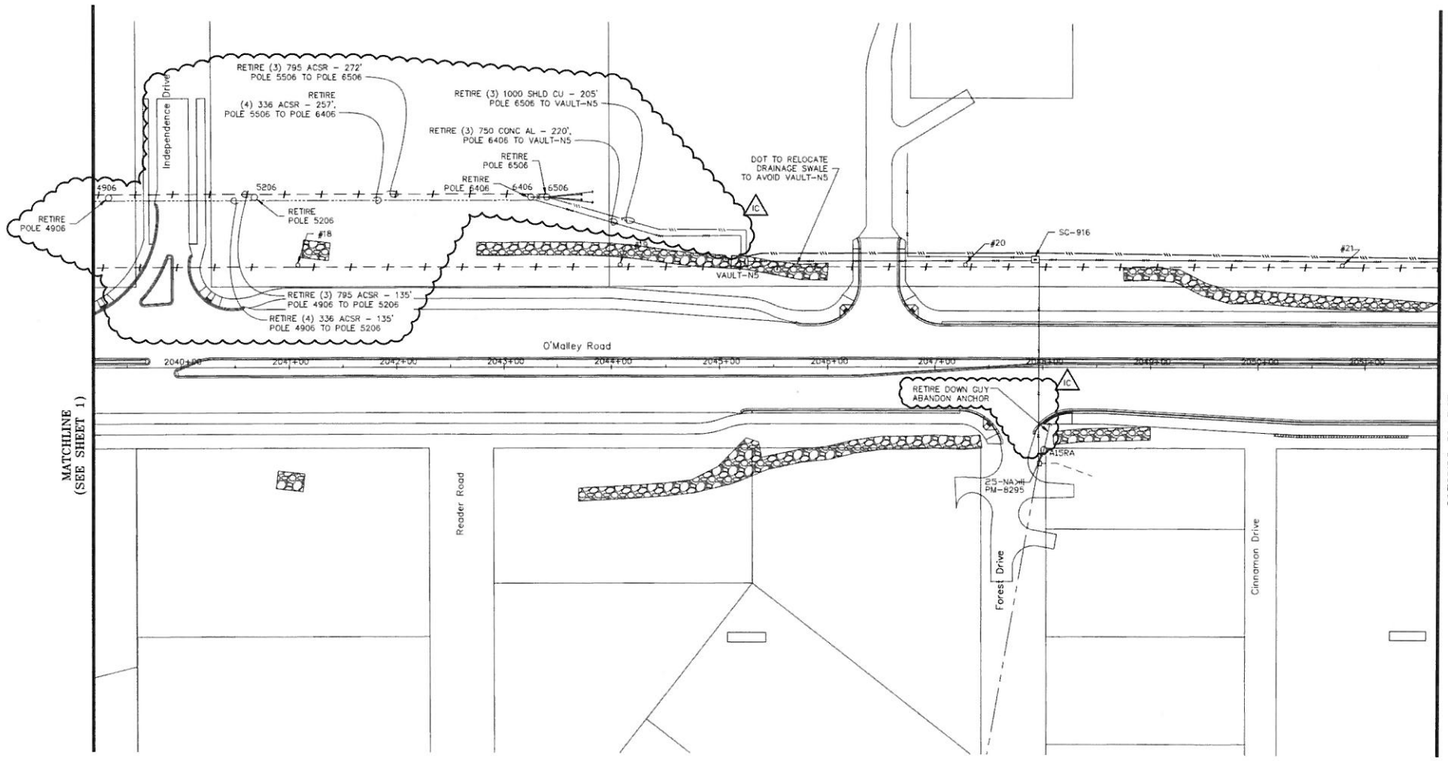
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16		
2	ISSUED FOR CONSTRUCTION	GSG/05-22-17	JSA/05-22-17		

NO.	RECORD REVISION	TECH / DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS-BUILT O'MALLEY LINE PROJECT	MS	10.0590	E0612708	SW	06/04/07

CHUGACH
POWERING ALASKA'S FUTURE
Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

34.5KV SUBTRANSMISSION BURIED LINE
O'MALLEY JCT – SEWARD HWY JCT LINE 2 (BC)
ELECTRICAL RETIREMENT
VAULT-N3 TO VAULT-N4

DRAWING NO. – PREVIOUS/REFERENCE: MJS2-EE-0002-0001.DWG
DRAWING NO.: MJS2-EE-0002/E1613642/E1620054
SHEET 1 OF 2
PAGE ____ / ____



RETIREMENT NOTE
ALL EQUIPMENT TO BE RETIRED SHALL BE COMPLETELY REMOVED AND DISPOSED OF BY CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, ALL POLES, ANCHORS, ANCHOR RODS, H–PILES, CONDUITS AND CABLES.

50 0 50 100 FT.
GRAPHIC SCALE

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/22/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/22/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

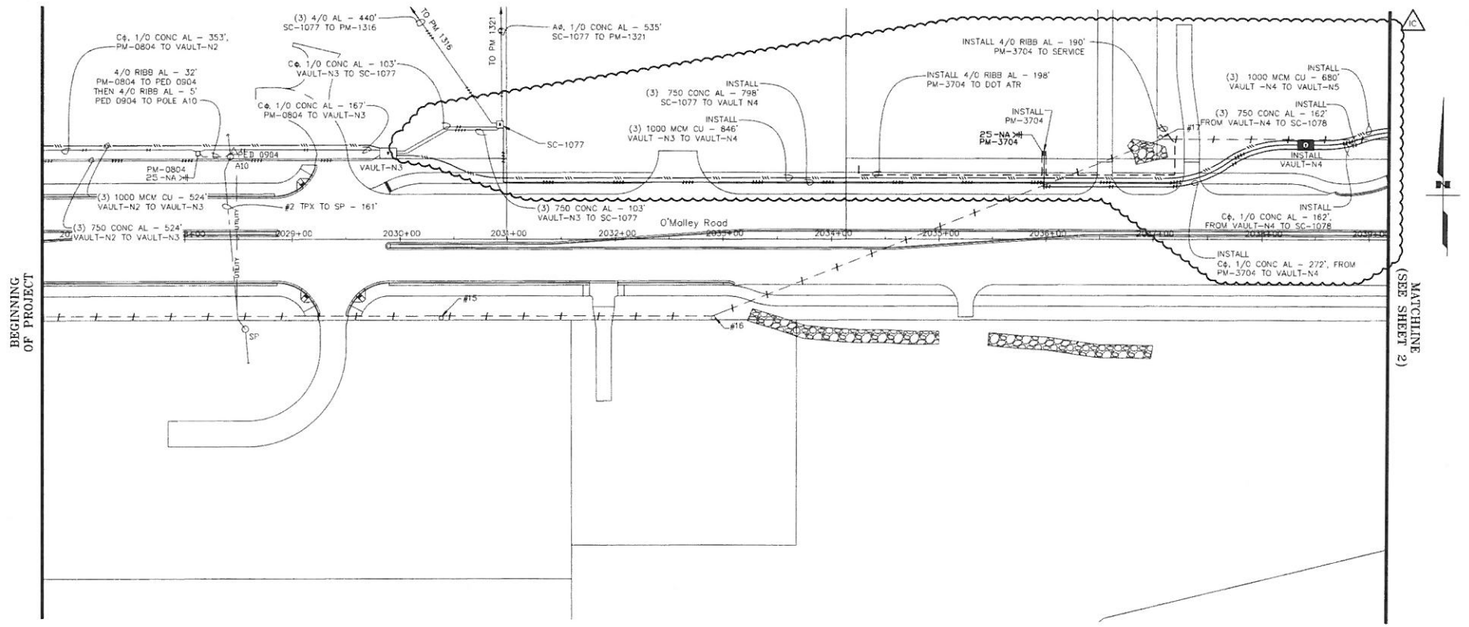
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05–26–16	JSA/05–26–16		
1	ISSUED FOR CONSTRUCTION	GSG/07–21–16	JSA/07–21–16		
2	ISSUED FOR CONSTRUCTION	GSG/05–22–17	JSA/05–22–17		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS–BUILT OMALLEY LINE PROJECT	MS	10.0590	ED612708	SW	06/04/07

CHUGACH
POWERING ALASKA'S FUTURE
Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519–6300

34.5KV SUBTRANSMISSION BURIED LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
ELECTRICAL RETIREMENT
VAULT–N4 TO VAULT–N5

MJS2–EE–0002–0002.DWG
DRAWING NO. – PREVIOUS/REFERENCE
DRAWING NO.: MJS2–EE–0002/E1613642/E1620054
SHEET 2 OF 2
PAGE ____ / ____



50 0 50 100 FT.
GRAPHIC SCALE

APPROVED FOR CONSTRUCTION OF W.O. E1313328/E1320408 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1313328/E1320408 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/22/2017
CERTIFIED FOR CONSTRUCTION OF W.O. E1313328/E1320408 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/22/2017
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1313328/E1320408

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05–26–16	JSA/05–26–16		
1	ISSUED FOR CONSTRUCTION	GSG/07–21–16	JSA/07–21–16		
2	ISSUED FOR CONSTRUCTION	GSG/05–22–17	JSA/05–22–17		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS–BUILT OMALLEY LINE PROJECT	MS	10.0590	E0612708	SW	06/04/07
2	AS–BUILT OMALLEY LINE PROJECT					TBD

CHUGACH
POWERING ALASKA'S FUTURE

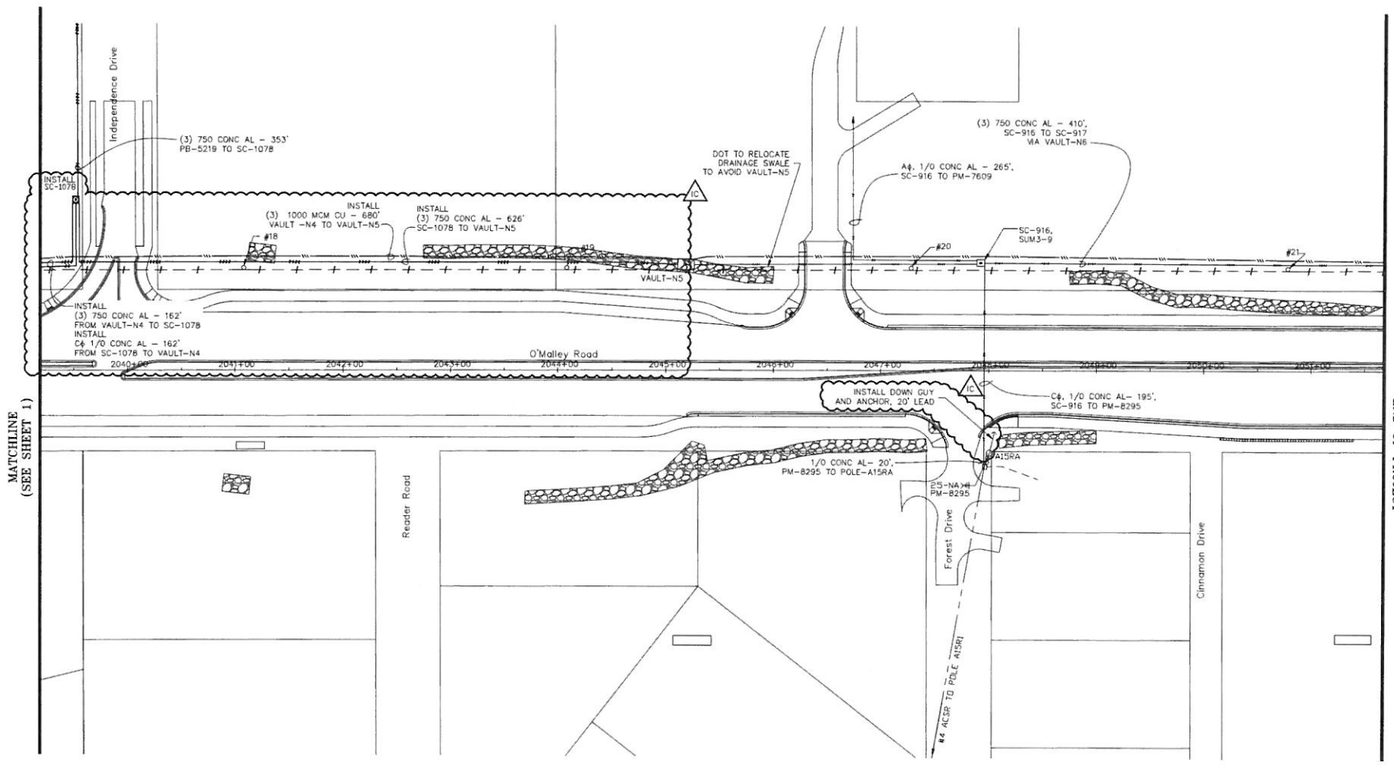
Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519–6300

34.5KV SUBTRANSMISSION BURIED LINE
O'MALLEY JCT – SEWARD HWY JCT LINE 2 (BC)
ELECTRICAL NEW
VAULT–N3 TO VAULT–N4

DRAWING NO. – PREVIOUS/REFERENCE: MJS2–EE–0003–0001.DWG

DRAWING NO.: MJS2–EE–0003/E1313328/E1320408

SHEET 1 OF 2
PAGE ____ / ____



50 0 50 100 FT
GRAPHIC SCALE

APPROVED FOR CONSTRUCTION OF W.O. E1313328/E1320408 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
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PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05–26–16	JSA/05–26–16		
1	ISSUED FOR CONSTRUCTION	GSG/07–21–16	JSA/07–21–16		
2	ISSUED FOR CONSTRUCTION	GSG/05–22–17	JSA/05–22–17		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS–BUILT OMALLEY LINE PROJECT	MS	10.0590	E0612708	SW	06/04/07
2	AS–BUILT OMALLEY LINE PROJECT					TBD

CHUGACH
POWERING ALASKA'S FUTURE

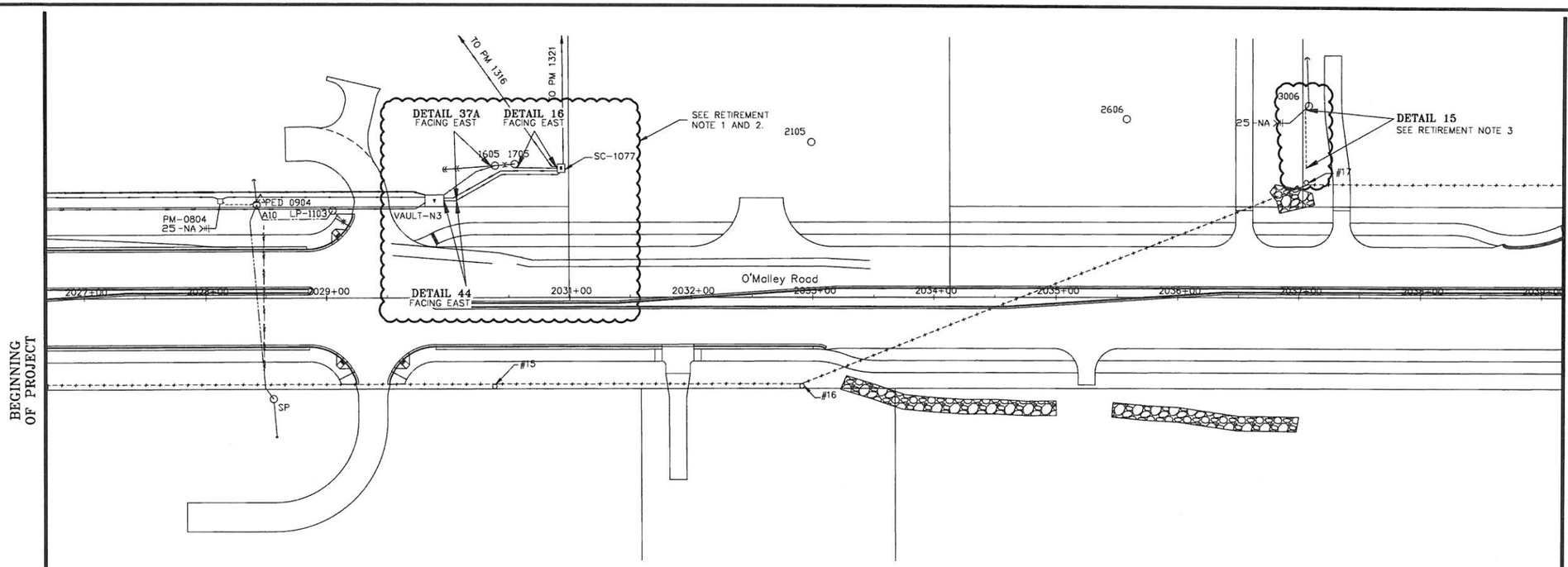
Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519–6300

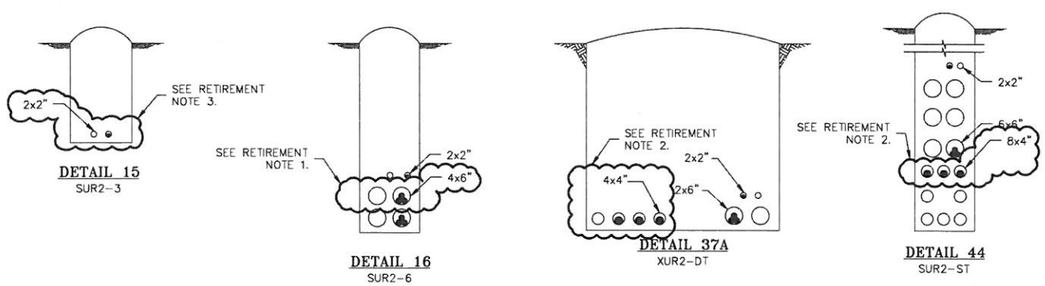
34.5KV SUBTRANSMISSION BURIED LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
ELECTRICAL NEW
VAULT–N4 TO VAULT–N5

DRAWING NO. – PREVIOUS/REFERENCE: MJS2–EE–0003–0002.DWG

DRAWING NO.: MJS2–EE–0003/E1613642/E1620054

SHEET 2 OF 2
PAGE ___ / ___





RETIREMENT NOTES:

1. REMOVE CABLES FROM SC-1077 TO POLE 1705. REMOVE ASSOCIATED CONDUITS.
2. REMOVE CABLES FROM VAULT-N3 TO POLE 1605. REMOVE ASSOCIATED CONDUITS. SEAL VAULT PENETRATIONS ASSOCIATED WITH REMOVED CONDUITS.
3. REMOVE CABLE FROM POLE-3006 TO SERVICE. REMOVE ASSOCIATED CONDUITS.

DETAIL 15
SUR2-3

DETAIL 16
SUR2-6

DETAIL 37A
XUR2-DT

DETAIL 44
SUR2-ST

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
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CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
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1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
2	ISSUED FOR CONSTRUCTION	GSG/05-22-17	JSA/05-22-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

34.5kV SUBTRANSMISSION LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
TRENCH CONFIGURATION RETIREMENT
VAULT-N3 TO VAULT-N4

GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

MJS2-PP-1001-0001.DWG

W.O. NO.:
C.W.P. REF. NO.: MJS2-PP-1001/E1613642/E1620054

SHEET 1 OF 2

POLE CONTACT RECORD

LOCATION	ATU	CATV

INITIAL/DATE______

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.______ Manuf.______
Manuf. Date______ Manuf. Date______
Volt Rating______ Volt Rating______
Insul. Type______ Insul. Type______
Insul. Size______ Insul. Size______
Cond. Size/Type______ Cond. Size/Type______
Quantity in Feet______ Quantity in Feet______

Manuf.______ Manuf.______
Manuf. Date______ Manuf. Date______
Volt Rating______ Volt Rating______
Insul. Type______ Insul. Type______
Insul. Size______ Insul. Size______
Cond. Size/Type______ Cond. Size/Type______
Quantity in Feet______ Quantity in Feet______

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

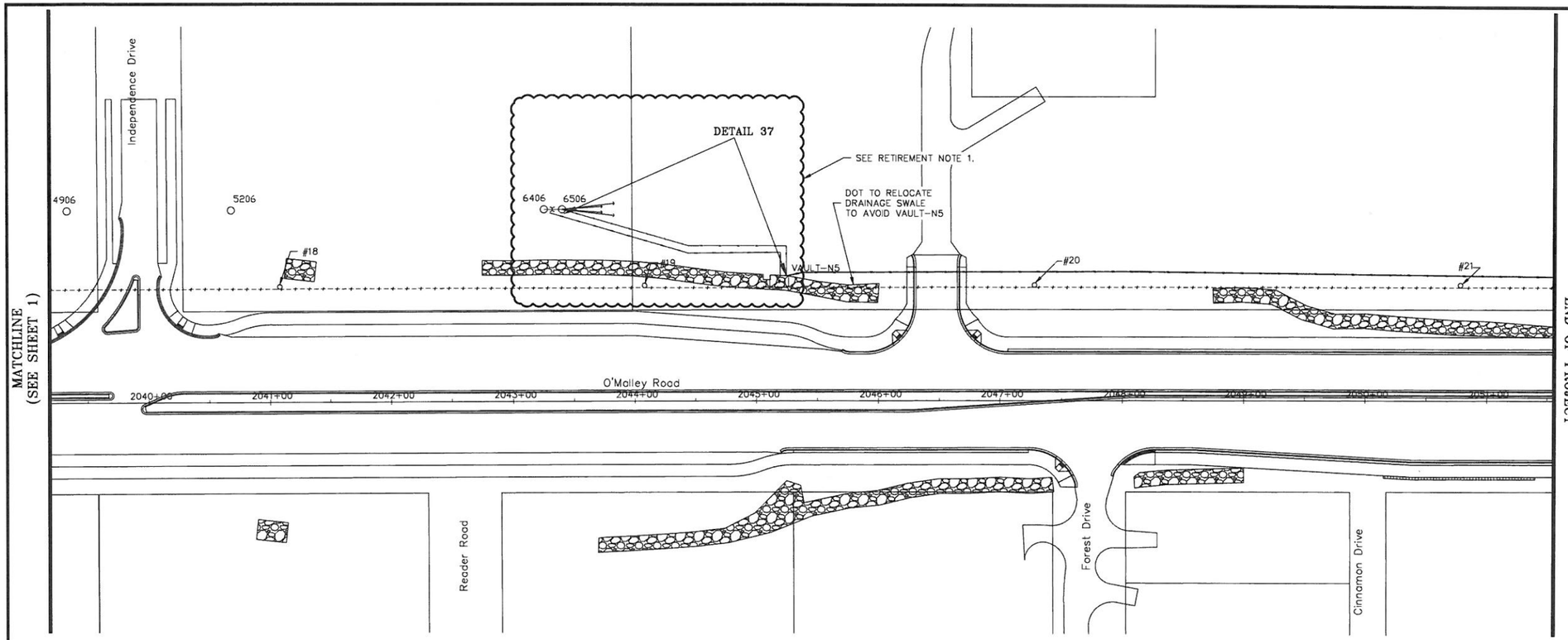
NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●✱	STREET LIGHT	○✱
■	WARNING POST	□
—╫—	1ø U.G. PRI. CONDUCTOR	—╫—
—╫╫—	3ø U.G. PRI. CONDUCTOR	—╫╫—
- - - - -	U.G. SECONDARY CONDUCT.	- - - - -
------------	U.G. STREET LIGHT CONDUCT.	------------
—\\\—	U.G. SUBTRANSMISSION LINE	—\\\—
—-—-—	1ø O.H. CONDUCTOR	—-—-—
—---—	3ø O.H. CONDUCTOR	—---—
— —+—+	O.H. TRANSMISSION LINE	— —+—+
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
═╫╫═	CONDUIT W/ CONDUCTOR	═╫╫═
S	SWITCH CABINET	S

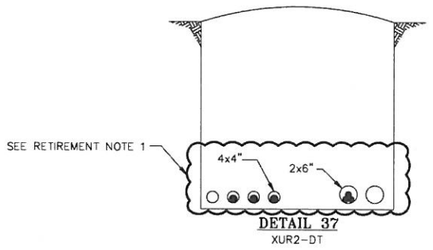
R.O.W. LEGEND

————	PROPERTY LINE
—-—-—	CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.





RETIREMENT NOTES:

1. REMOVE CABLES BETWEEN RETIRED POLES 6406/6506 AND VAULT-N5. REMOVE ASSOCIATED CONDUITS. SEAL VAULT PENETRATIONS ASSOCIATED WITH REMOVED CONDUITS.

DETAIL 37
XUR2-DT

POLE CONTACT RECORD		
LOCATION	ATU	CATV

INITIAL/DATE____

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.____ Manuf.____
Manuf. Date____ Manuf. Date____
Volt Rating____ Volt Rating____
Insul. Type____ Insul. Type____
Insul. Size____ Insul. Size____
Cond. Size/Type____ Cond. Size/Type____
Quantity in Feet____ Quantity in Feet____

Manuf.____ Manuf.____
Manuf. Date____ Manuf. Date____
Volt Rating____ Volt Rating____
Insul. Type____ Insul. Type____
Insul. Size____ Insul. Size____
Cond. Size/Type____ Cond. Size/Type____
Quantity in Feet____ Quantity in Feet____

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●-✳	STREET LIGHT	○-✳
■	WARNING POST	□
——‖——	1ø U.G. PRI. CONDUCTOR	——‖——
——‖‖——	3ø U.G. PRI. CONDUCTOR	——‖‖——
– – – – –	U.G. SECONDARY CONDUCT.	– – – – –
·········	U.G. STREET LIGHT CONDUCT.	·········
——\\\——	U.G. SUBTRANSMISSION LINE	——\\\——
——— –	1ø O.H. CONDUCTOR	——— –
——— – –	3ø O.H. CONDUCTOR	——— – –
– –+– –+	O.H. TRANSMISSION LINE	– –+– –+
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═══	SPARE CONDUIT	═══
═‖‖═	CONDUIT W/ CONDUCTOR	═‖‖═
S	SWITCH CABINET	S

R.O.W. LEGEND

————	PROPERTY LINE
—·—·—	CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.

50 0 50 100 FT.
GRAPHIC SCALE

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/22/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/22/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16	
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
2	ISSUED FOR CONSTRUCTION	GSG/05-22-17	JSA/05-22-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

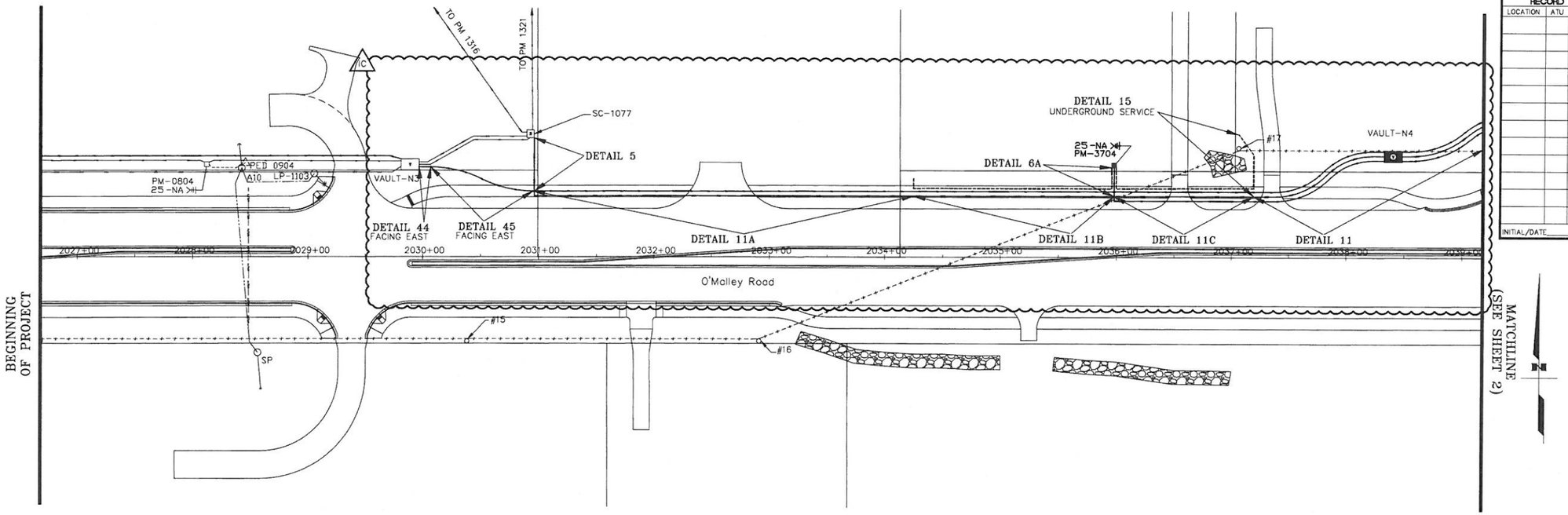
Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

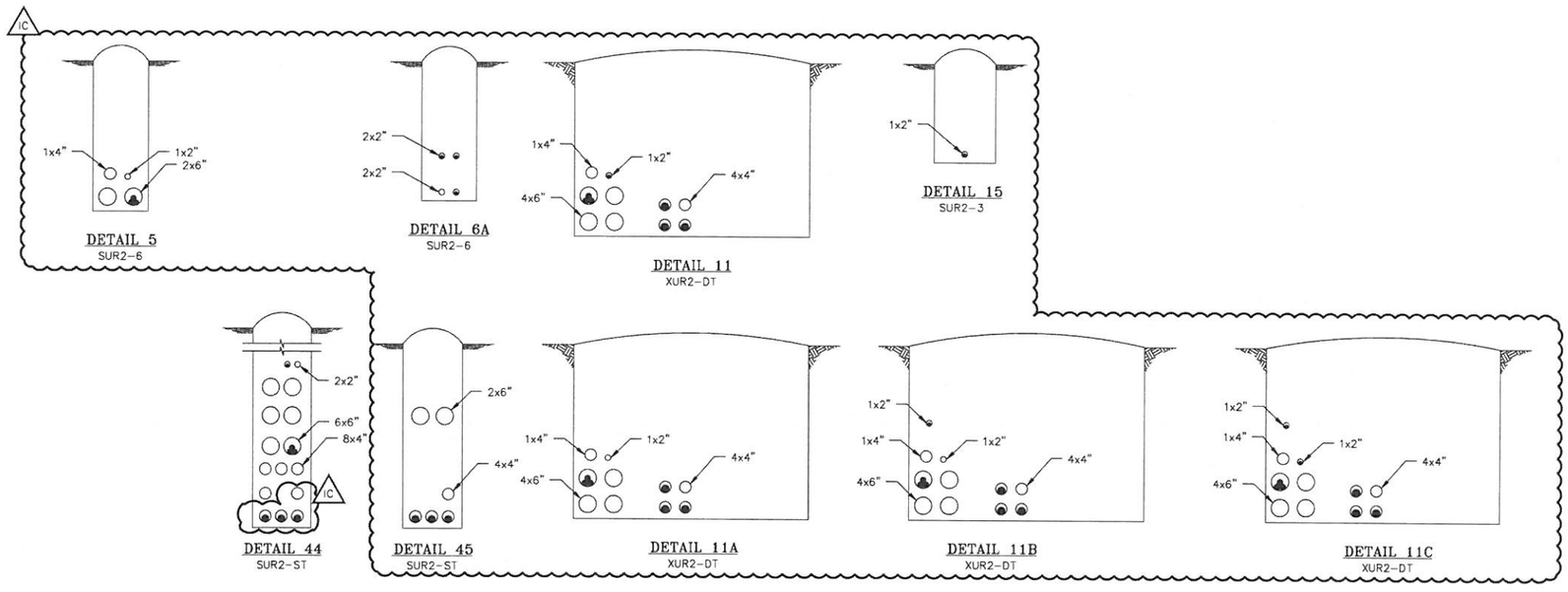
DRAWING NAME:
34.5kV SUBTRANSMISSION LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
TRENCH CONFIGURATION RETIREMENT
VAULT-N4 TO VAULT-N5
GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

MJS2-PP-1001-0002.DWG

W.O. NO.:
C.W.P. REF. NO.: MJS2-PP-1001/E1613642/E1620054

SHEET 2 OF 2





POLE CONTACT RECORD		
LOCATION	ATU	CATV
INITIAL/DATE		

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.______ Manuf.______
Manuf. Date______ Manuf. Date______
Volt Rating______ Volt Rating______
Insul. Type______ Insul. Type______
Insul. Size______ Insul. Size______
Cond. Size/Type______ Cond. Size/Type______
Quantity in Feet______ Quantity in Feet______

Manuf.______ Manuf.______
Manuf. Date______ Manuf. Date______
Volt Rating______ Volt Rating______
Insul. Type______ Insul. Type______
Insul. Size______ Insul. Size______
Cond. Size/Type______ Cond. Size/Type______
Quantity in Feet______ Quantity in Feet______

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●-✳	STREET LIGHT	○-✳
■	WARNING POST	□
─┼┼─	1ø U.G. PRI. CONDUCTOR	─┼┼─
─┼┼┼─	3ø U.G. PRI. CONDUCTOR	─┼┼┼─
- - - -	U.G. SECONDARY CONDUCT.	- - - -
- - - -	U.G. STREET LIGHT CONDUCT.	- - - -
─\\\─	U.G. SUBTRANSMISSION LINE	─\\\─
──	1ø O.H. CONDUCTOR	──
──	3ø O.H. CONDUCTOR	──
─ ┼ ─ ┼	O.H. TRANSMISSION LINE	─ ┼ ─ ┼
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
═┼┼┼═	CONDUIT W/ CONDUCTOR	═┼┼┼═
S	SWITCH CABINET	S

R.O.W. LEGEND

──── PROPERTY LINE
─ ─ ─ CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.

CHANGES TO SEALED DRAWINGS NOT AUTHORIZED IN WRITING BY THE STAMPING ENGINEER SHALL VOID THE SEAL ON THE ENTIRE DRAWING. THE SEAL IS VALID ONLY FOR MODIFICATIONS MADE UNDER THIS ONE DRAWING REVISION.

DRYDEN & LARUE, INC (AECC612)
3305 ARCTIC BLVD, STE 201
ANCHORAGE, AK 99503, (907) 349-6653

PROJECT ID: 17-0247
PROJECT LOCATION: ANCHORAGE, AK

GRAPHIC SCALE

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 06/15/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 06/15/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 06/15/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. #: E1613642/E1620054

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1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
2	ISSUED FOR CONSTRUCTION	GSG/06-15-17	JSA/06-15-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

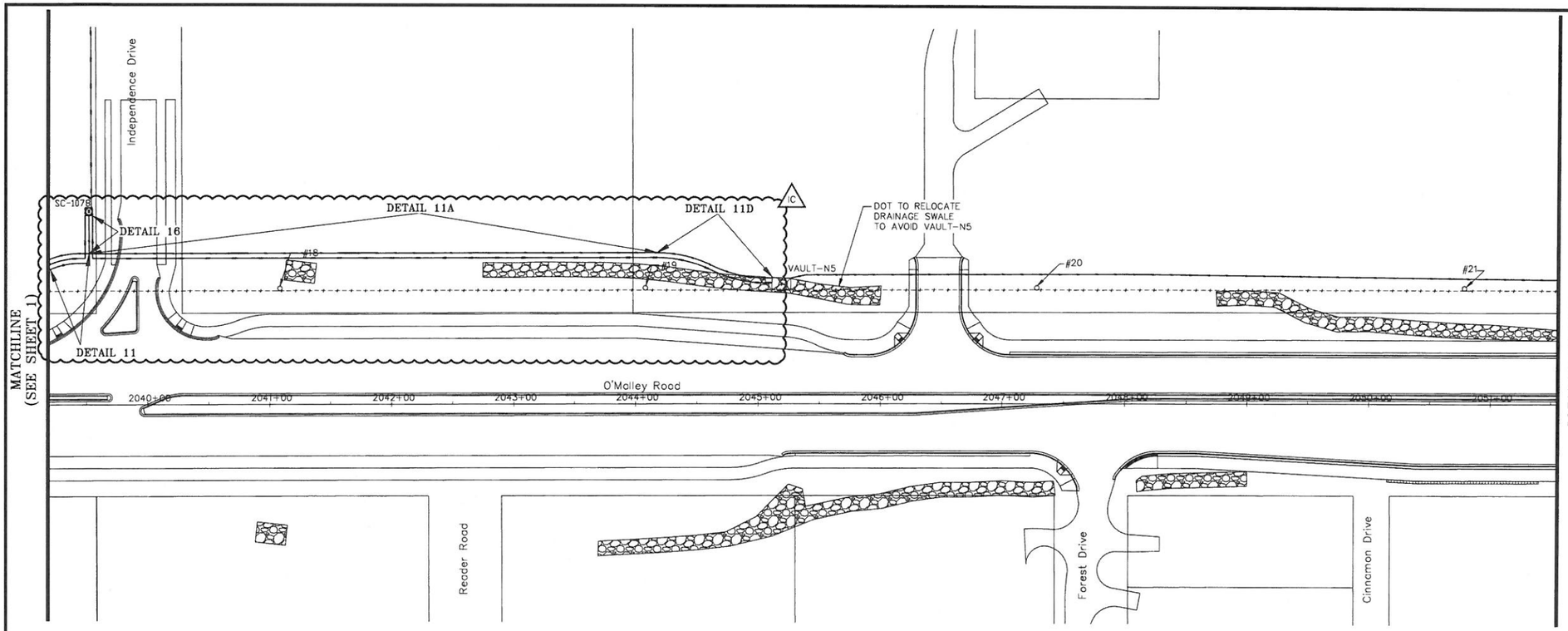
34.5kV SUBTRANSMISSION LINE
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
TRENCH CONFIGURATION NEW
VAULT-N3 TO VAULT-N4

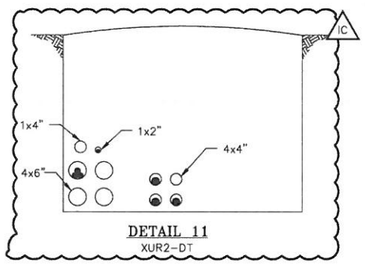
GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

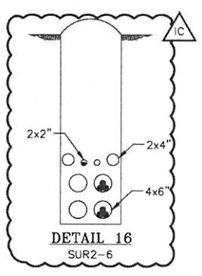
MJS2-PP-1002-0001.DWG

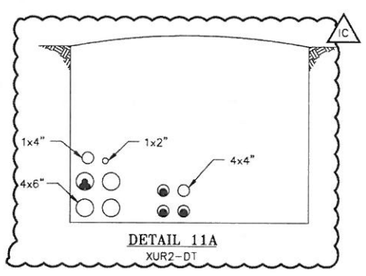
W.O. NO.:
C.W.P. REF. NO.: MJS2-PP-1002/E1613642/E1620054

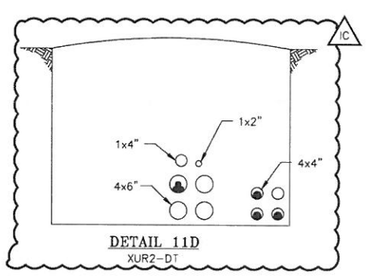
SHEET 1 OF 2











POLE CONTACT RECORD

LOCATION	ATU	CATV

INITIAL/DATE

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf. ____ Manuf. ____
Manuf. Date ____ Manuf. Date ____
Volt Rating ____ Volt Rating ____
Insul. Type ____ Insul. Type ____
Insul. Size ____ Insul. Size ____
Cond. Size/Type ____ Cond. Size/Type ____
Quantity in Feet ____ Quantity in Feet ____

Manuf. ____ Manuf. ____
Manuf. Date ____ Manuf. Date ____
Volt Rating ____ Volt Rating ____
Insul. Type ____ Insul. Type ____
Insul. Size ____ Insul. Size ____
Cond. Size/Type ____ Cond. Size/Type ____
Quantity in Feet ____ Quantity in Feet ____

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

NEW		EXISTING
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
●-✳	STREET LIGHT	○-✳
■	WARNING POST	□
─╫─	1ø U.G. PRI. CONDUCTOR	─╫─
─╫╫─	3ø U.G. PRI. CONDUCTOR	─╫╫─
-------	U.G. SECONDARY CONDUCT.	-------
-------	U.G. STREET LIGHT CONDUCT.	-------
─\\\─	U.G. SUBTRANSMISSION LINE	─\\\─
── ──	1ø O.H. CONDUCTOR	── ──
── ──	3ø O.H. CONDUCTOR	── ──
─ ─ + ─ +	O.H. TRANSMISSION LINE	─ ─ + ─ +
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═══	SPARE CONDUIT	═══
═╫╫═	CONDUIT W/ CONDUCTOR	═╫╫═
S	SWITCH CABINET	S

R.O.W. LEGEND

──── PROPERTY LINE
── ─ ── CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW

UNDERGROUND
OVERHEAD

Typical Staking
N.T.S.

DETAIL 11
XUR2-DT

DETAIL 16
SUR2-6

DETAIL 11A
XUR2-DT

DETAIL 11D
XUR2-DT

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 06/16/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 06/16/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 06/16/2017.
CONFIDENTIAL

GRAPHIC SCALE

CHANGES TO SEALED DRAWINGS NOT AUTHORIZED IN WRITING BY THE STAMPING ENGINEER SHALL VOID THE SEAL ON THE ENTIRE DRAWING. THE SEAL IS VALID ONLY FOR MODIFICATIONS MADE UNDER THIS ONE DRAWING REVISION.

DRYDEN & LARUE, INC (AECC612)
3305 ARCTIC BLVD, STE 201
ANCHORAGE, AK 99503, (907) 349-6653

PROJECT ID: 17-0247
PROJECT LOCATION: ANCHORAGE, AK

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
DESIGNER/PROJECT ENGINEER: CHRIS VIERHUFF/STERLING GRESS (D&L)
W.O. #: E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16	
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16	
2	ISSUED FOR CONSTRUCTION	GSG/06-16-17	JSA/06-16-17	

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

34.5kV SUBTRANSMISSION LINE
O'MALLEY JCT - NEW SEWARD HWY JCT LINE 2 (BC)
TRENCH CONFIGURATION NEW
VAULT-N4 TO VAULT-N5

GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

MJS2-PP-1002-0002.DWG

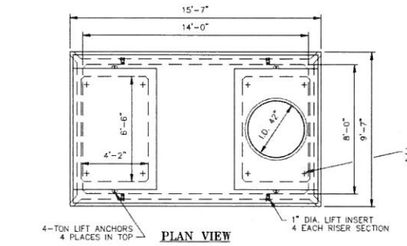
W.O. NO.:
C.W.P. REF. NO.: MJS2-PP-1002/E1613642/E1620054

SHEET 2 OF 2

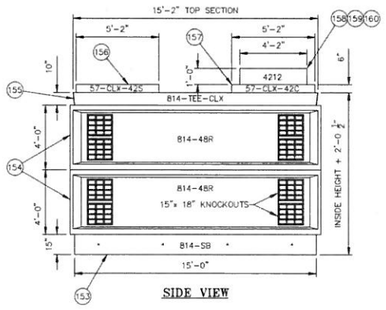
MATERIAL LIST FOR VAULTS N1 THROUGH N12

DWG. REF.	QUANTITY N1	N2	N3	N5	N6	N7	N8	N9	N10	N11	N12	DESCRIPTION	MANUFACTURER CATALOG No.
153	1	1	1	1	1	1	1	1	1	1	1	VAULT BASE, WEIGHT 17,300 LBS	UV #814-SB
154	2	2	2	2	2	2	2	2	2	2	2	VAULT RISER, WEIGHT 12,500 LBS	UV #814-48R
155	1	1	1	1	1	1	1	1	1	1	1	VAULT TOP, WEIGHT 9,400 LBS	UV #814-TEE-CLX
156	1	1	1	1	1	1	1	1	1	1	1	VAULT COVER, WEIGHT 3,150 LBS	UV #57-CLX-42S
157	1	1	1	1	1	1	1	1	1	1	1	VAULT COVER, WEIGHT 2,250 LBS	UV #57-CLX-42C
158	1	1	1	1	1	1	1	1	1	1	1	VAULT 12" RISER, ROUND, 42" DIA., WEIGHT 650 LBS	UV #8212
159	1	1	1	1	1	1	1	1	1	1	1	VAULT FRAME, WEIGHT 680 LBS	UV #4220-HD
160	1	1	1	1	1	1	1	1	1	1	1	VAULT COVER, SOLID, WEIGHT 600 LBS	UV #4220-S
161	0	5	3	3	6	3	3	3	6	3	3	12" STANCHION, HEAVY DUTY NON METALLIC	UNDERGROUND DEVICES CR12-B
162	10	15	13	13	10	13	13	13	10	13	13	36" STANCHION, HEAVY DUTY NON METALLIC	UNDERGROUND DEVICES CR36-B
163	30	51	42	39	39	39	39	39	39	39	39	SADDLE BRACKET, 3"	UNDERGROUND DEVICES 3HDS
164	8	10	13	13	3	11	13	13	3	13	13	RACK ARM, 8"	UNDERGROUND DEVICES RA08

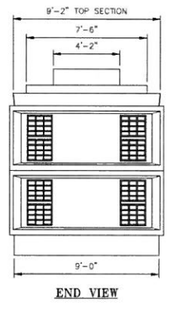
NOTE:
1. INSTALL RACKING IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.



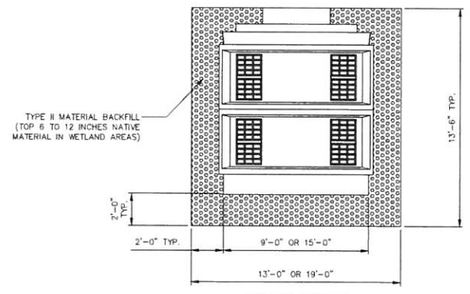
PLAN VIEW



SIDE VIEW



END VIEW

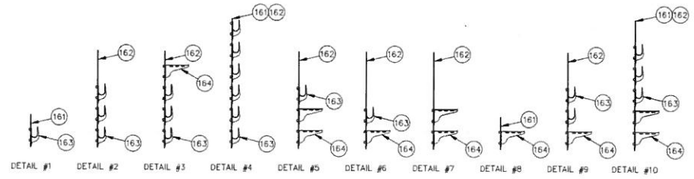


BURIAL DETAIL
TYPICAL

12.5KV & 34.5KV VAULT DETAIL (UTILITY VAULT #814-8-LA)

TYPICAL
N.T.S.

VAULT-N1	NORTH WALL TOP	NORTH WALL BOTTOM	EAST WALL TOP	EAST WALL BOTTOM	SOUTH WALL TOP	SOUTH WALL BOTTOM	WEST WALL TOP	WEST WALL BOTTOM
		3-36"STANC. 9-3HDS 3-RA08		2-36"STANC. 6-3HDS 2-RA08		3-36"STANC. 9-3HDS 3-RA08		2-36"STANC. 6-3HDS
VAULT-N2		DETAIL #3 2-36"STANC. 6-3HDS	3-36"STANC. 6-30HS 3-RA08	DETAIL #3 3-36"STANC. 9-3HDS	2-36"STANC. 2-12" STANC. 6-30HS 4-RA08	DETAIL #3 2-36"STANC. 2-12" STANC. 12-3HDS	3-12"STANC. 3-3HDS	DETAIL #2 3-36"STANC. 9-3HDS 3-RA08
VAULT-N3		DETAIL #2 3-36"STANC. 9-3HDS 3-RA08	DETAIL #9	DETAIL #2 2-36"STANC. 6-3HDS 2-RA08	DETAIL #10 3-36"STANC. 6-RA08 3-3HDS	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS	DETAIL #1	DETAIL #3 2-36"STANC. 6-3HDS 2-RA08
		DETAIL #3		DETAIL #3	DETAIL #6	DETAIL #4		DETAIL #3
VAULT-N5	3-36"STANC. 6-RA08	3-36"STANC. 3-12" STANC. 18-3HDS		2-36"STANC. 6-3HDS 2-RA08		3-36"STANC. 9-3HDS 3-RA08		2-36"STANC. 6-3HDS 2-RA08
VAULT-N6	DETAIL #7 3-12"STANC. 3-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 6-3HDS
VAULT-N7	DETAIL #8	3-36"STANC. 9-3HDS 3-RA08		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08	3-36"STANC. 6-RA08	DETAIL #2 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08
VAULT-N8	3-36"STANC. 6-RA08	DETAIL #3 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08	DETAIL #7	DETAIL #4 3-36"STANC. 9-3HDS 3-RA08		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08
VAULT-N9	DETAIL #7 3-36"STANC. 6-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08		DETAIL #3 3-36"STANC. 9-3HDS 3-RA08		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08
VAULT-N10	DETAIL #7 3-12"STANC. 3-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 6-3HDS
VAULT-N11	DETAIL #8 3-36"STANC. 6-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08		DETAIL #2 3-36"STANC. 9-3HDS 3-RA08		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08
VAULT-N12	DETAIL #7 3-12"STANC. 3-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 6-3HDS
	DETAIL #8	DETAIL #4		DETAIL #2		DETAIL #2		DETAIL #2



NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 07/21/2016
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 07/21/2016
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 07/21/2016.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS-BUILT OMALLEY LINE PROJECT	MS				11/17/10

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Minnesota Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

12.5kV DISTRIBUTION AND 34.5kV SUBTRANSMISSION LINES O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC) ELECTRICAL EXISTING – VAULT DETAILS

GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412. MJS2-SS-0002-0001.dwg

DRAWING NO. – PREVIOUS/REFERENCE
NEW
DRAWING NO.: MJS2-SS-0002/E1613642/E1620054

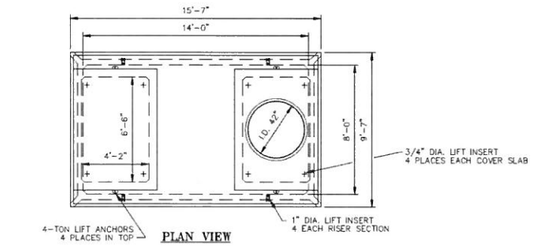
SHEET 1 OF 4
PAGE ____ / ____

MATERIAL LIST FOR VAULTS N1 THROUGH N12

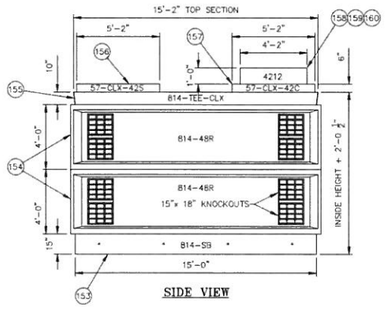
DWG. REF.	QUANTITY N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12	DESCRIPTION	MANUFACTURER CATALOG No.
153	1	1	1	1	1	1	1	1	1	1	1	1	VAULT BASE, WEIGHT 17,300 LBS	UV #814-SB
154	2	2	2	2	2	2	2	2	2	2	2	2	VAULT RISER, WEIGHT 12,500 LBS	UV #814-48R
155	1	1	1	1	1	1	1	1	1	1	1	1	VAULT TOP, WEIGHT 9,400 LBS	UV #814-TEE-CLX
156	1	1	1	1	1	1	1	1	1	1	1	1	VAULT COVER, WEIGHT 1,150 LBS	UV #57-CLX-42S
157	1	1	1	1	1	1	1	1	1	1	1	1	VAULT COVER, WEIGHT 2,250 LBS	UV #57-CLX-42C
158	1	1	1	1	1	1	1	1	1	1	1	1	VAULT 12" RISER, ROUND, 42" DIA., WEIGHT 650 LBS	UV #4212
159	1	1	1	1	1	1	1	1	1	1	1	1	VAULT FRAME, WEIGHT 680 LBS	UV #4220-HD
160	1	1	1	1	1	1	1	1	1	1	1	1	VAULT COVER, SOLID, WEIGHT 600 LBS	UV #4220-S
161	0	5	12	3	3	6	3	3	3	6	3	3	12" STANCHION, HEAVY DUTY NON METALLIC	UNDERGROUND DEVICES CR12-B
162	10	15	36	13	13	10	13	13	13	10	13	13	36" STANCHION, HEAVY DUTY NON METALLIC	UNDERGROUND DEVICES CR36-B
163	30	51	75	42	39	39	39	39	39	39	39	39	SADDLE BRACKET, 3"	UNDERGROUND DEVICES 3HDS
164	8	10	6	1	3	3	11	13	13	3	13	13	RACK ARM, 8"	UNDERGROUND DEVICES RA08

1C

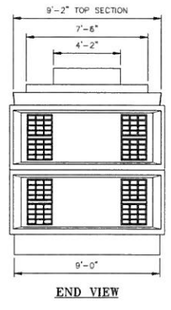
NOTE:
1. INSTALL RACKING IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.



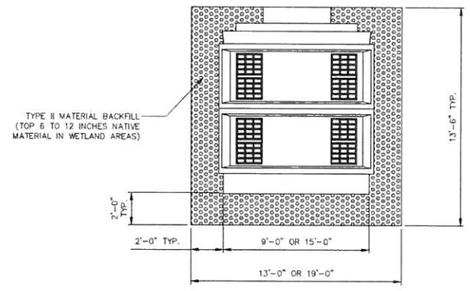
PLAN VIEW



SIDE VIEW



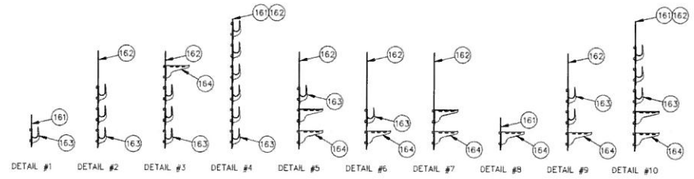
END VIEW



BURIAL DETAIL
TYPICAL

12.5KV & 34.5KV VAULT DETAIL (UTILITY VAULT #814-8-LA)
TYPICAL
N.T.S

VAULT-N1	NORTH WALL TOP	NORTH WALL BOTTOM	EAST WALL TOP	EAST WALL BOTTOM	SOUTH WALL TOP	SOUTH WALL BOTTOM	WEST WALL TOP	WEST WALL BOTTOM
		3-36"STANC. 9-3HDS 3-RA08		2-36"STANC. 6-3HDS 2-RA08		3-36"STANC. 9-3HDS 3-RA08		2-36"STANC. 6-3HDS
VAULT-N2		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 2-12" STANC. 6-3DHS 4-RA08	3-12"STANC. 3-3HDS	DETAIL #2 3-36"STANC. 9-3HDS 3-RA08
VAULT-N3		DETAIL #2 3-36"STANC. 9-3HDS		DETAIL #2 2-36"STANC. 6-3HDS		DETAIL #4 3-36"STANC. 9-3HDS 3-RA08	DETAIL #1	DETAIL #3
VAULT-N4	DETAIL #5 3-36"STANC. 3-3HDS 3-RA08	DETAIL #2 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #2 2-36"STANC. 6-3HDS		DETAIL #2 3-36"STANC. 9-3HDS		DETAIL #2 2-36"STANC. 6-3HDS
VAULT-N5	DETAIL #6 3-12"STANC. 6-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08		DETAIL #2 3-36"STANC. 9-3HDS 3-RA08		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08
VAULT-N6	DETAIL #7 3-12"STANC. 3-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 6-3HDS
VAULT-N7	DETAIL #8	DETAIL #2 3-36"STANC. 9-3HDS 3-RA08		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08	DETAIL #7 3-36"STANC. 6-RA08	DETAIL #8 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08
VAULT-N8	DETAIL #7 3-36"STANC. 6-RA08	DETAIL #3 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08	DETAIL #7	DETAIL #4 3-36"STANC. 9-3HDS 3-RA08		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08
VAULT-N9	DETAIL #7 3-36"STANC. 6-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08		DETAIL #3 3-36"STANC. 9-3HDS 3-RA08		DETAIL #3 2-36"STANC. 6-3HDS 2-RA08
VAULT-N10	DETAIL #7 3-12"STANC. 3-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 6-3HDS
VAULT-N11	DETAIL #8 3-36"STANC. 6-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08		DETAIL #2 3-36"STANC. 9-3HDS 3-RA08		DETAIL #2 2-36"STANC. 6-3HDS 2-RA08
VAULT-N12	DETAIL #7 3-12"STANC. 3-RA08	DETAIL #4 3-36"STANC. 3-12" STANC. 18-3HDS		DETAIL #3 2-36"STANC. 6-3HDS		DETAIL #3 3-36"STANC. 9-3HDS		DETAIL #3 2-36"STANC. 6-3HDS
	DETAIL #8	DETAIL #4		DETAIL #2		DETAIL #2		DETAIL #2



NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 07/21/2016.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 07/21/2016.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 07/21/2016.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS-BUILT OMALLEY LINE PROJECT	MS				11/17/10

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Minnesota Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

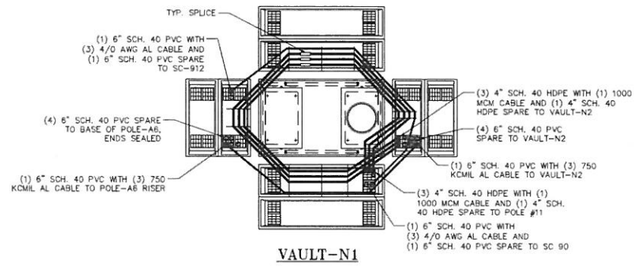
DRAWING NAME:

12.5kV DISTRIBUTION AND
34.5kV SUBTRANSMISSION LINES
O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC)
ELECTRICAL NEW – VAULT DETAILS

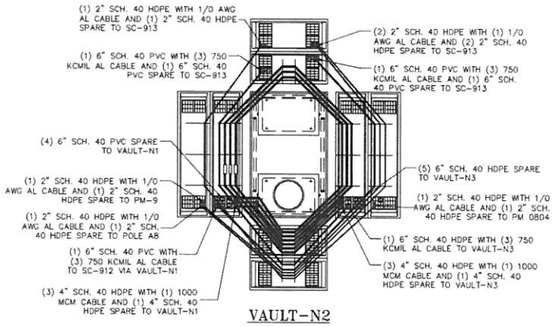
GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412. MJS2-SS-0002-0002.dwg

DRAWING NO. – PREVIOUS/REFERENCE
NEW
DRAWING NO.: MJS2-SS-0002/E1613642/E1620054

SHEET 2 OF 4
PAGE ____ / ____



VAULT-N1



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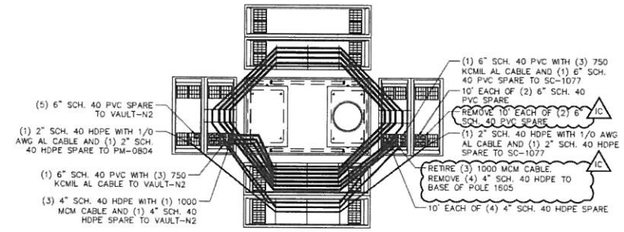
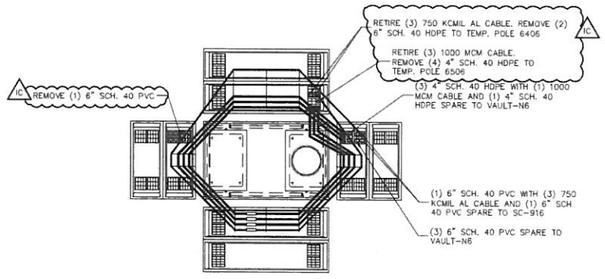
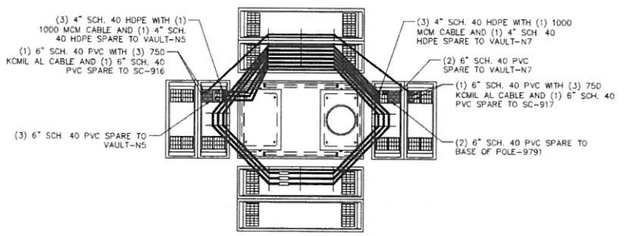


VAULT-N3



VAULT-N5



VAULT-N6

NOTES:
1. SPLICE LOCATION ON DRAWING MAY NOT BE ACCURATE.

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/22/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/22/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/22/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	CSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	CSG/07-21-16	JSA/07-21-16		
2	ISSUED FOR CONSTRUCTION	CSG/05-22-17	JSA/05-22-17		

NO.	RECORD REVISION	TECH./DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS-BUILT OMALLEY LINE PROJECT	MS				11/17/10

CHUGACH
POWERING ALASKA'S FUTURE
Chugach Electric Association, Inc.
5601 Minnesota Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

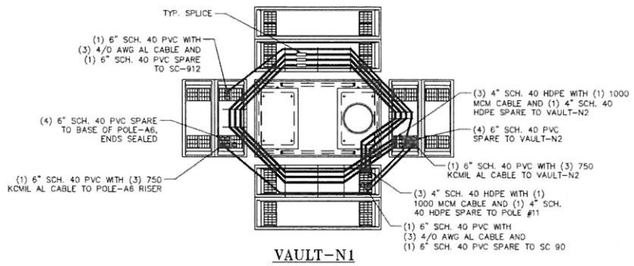
12.5kV DISTRIBUTION AND 34.5kV SUBTRANSMISSION LINES O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC) ELECTRICAL EXISTING – VAULT DETAILS

GRIDS: 2532-2536, 2632-2636. MAPS: 1203-15C, 16C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

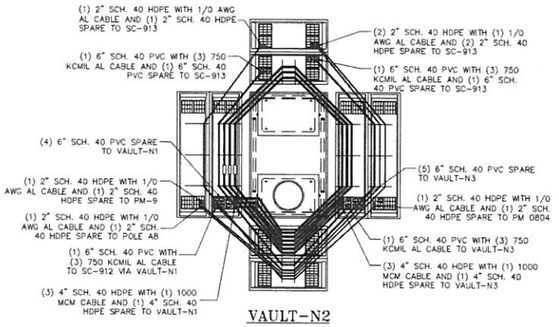
MJS2-SS-0002-0003.dwg

DRAWING NO. - PREVIOUS/REFERENCE
NEW
DRAWING NO.: MJS2-SS-0002/E1613642/E1620054

SHEET 3 OF 4
PAGE ___ / ___



VAULT-N1



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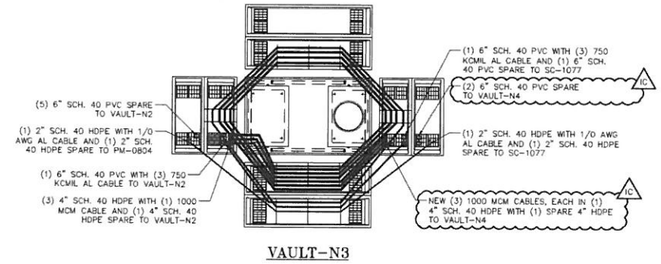
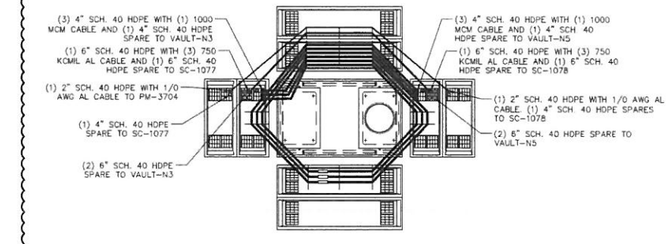
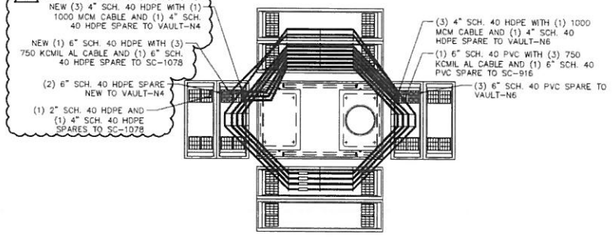


VAULT-N3



NEW VAULT-N4



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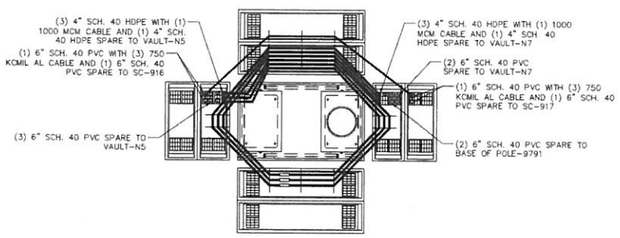


VAULT-N6

NOTES:
1. SPLICE LOCATION ON DRAWING MAY NOT BE ACCURATE.

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 05/24/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 05/24/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 05/24/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)
ENG./DESIGN.: CHRIS VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16		
2	ISSUED FOR CONSTRUCTION	GSG/05-24-17	JSA/05-24-17		

NO.	RECORD REVISION	TECH./DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE
1	AS-BUILT OMALLEY LINE PROJECT	MS				11/17/10

CHUGACH
POWERING ALASKA'S FUTURE
Chugach Electric Association, Inc.
5601 Minnesota Drive – P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:

12.5kV DISTRIBUTION AND 34.5kV SUBTRANSMISSION LINES O'MALLEY JCT – NEW SEWARD HWY JCT LINE 2 (BC) ELECTRICAL NEW – VAULT DETAILS

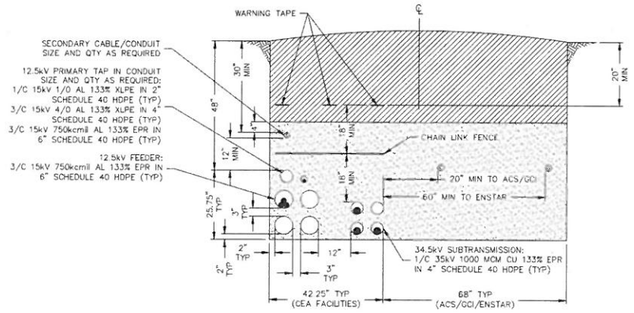
GRIDS: 2532-2536, 2632-2636, MAPS: 1203-15C, 18C, 16D, 17C, 17D, 20A, 20B, 21A, 21B, 22B.
FEEDERS: KLATT 412, O'MALLEY 412.

MJS2-SS-0002-0004.dwg

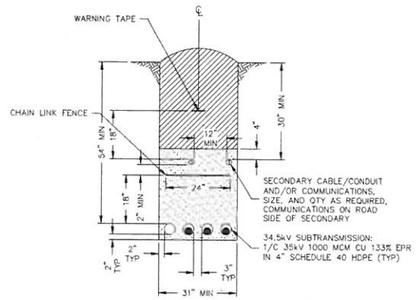
DRAWING NO. – PREVIOUS/REFERENCE

DRAWING NO.: MJS2-SS-0002/E1613642/E1620054

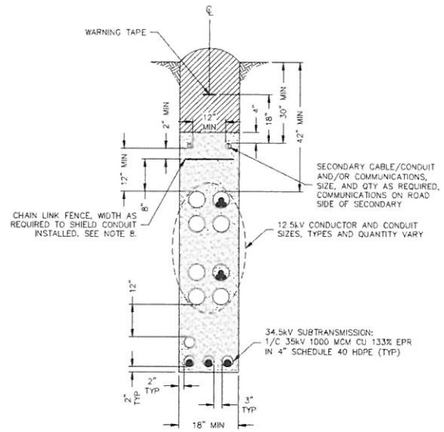
SHEET 4 OF 4
PAGE ___ / ___



XUR2-DT
NTS
SEE NOTES 1, 2, 10, 11 & 12



SUR2-DT
NTS
(34.5kV ONLY)



SUR2-ST
NTS
SEE NOTES 6, 7, AND 8

LEGEND

- UNDISTURBED EARTH
- COMPACTED BACKFILL IN 12"-18" LIFTS
- BEDDING SAND OR CLEAN SOIL

NOTES:

1. MAINTAIN 12" MINIMUM VERTICAL CLEARANCE BETWEEN 12.5KV AND 34.5KV WHEN 12.5KV CROSSES OVER 34.5KV.
2. CABLE AND CONDUIT TYPES AND SIZES ARE TYPICAL FOR ALL TRENCH TYPES.
3. TOP 6 TO 12 INCHES OF BACKFILL WILL BE NATIVE MATERIAL IN WETLAND AREAS
4. SUPER DEEP TRENCH MAY BE REQUIRED FOR TRANSITIONS FROM TYPICAL TRENCH CONFIGURATIONS TO VAULT PENETRATIONS.
5. MINIMUM CONDUIT CLEARANCE BETWEEN 34.5kV AND 12.5kV CONDUIT (12") MAY BE VIOLATED AT TRANSITIONS TO VAULT PENETRATIONS. CLEARANCES SHALL BE MAXIMIZED UNDER REDUCED CLEARANCE CONDITIONS.
6. WHEN 34.5kV CONDUIT IS INCLUDED IN A TRENCH CONFIGURATION, CHAIN LINK FENCE SHALL BE INSTALLED IN TRENCH AND BE LOCATED A MINIMUM OF 18" ABOVE 34.5kV OR 8" ABOVE 12.5kV, WHICHEVER PROVIDES GREATER CLEARANCE FROM THE 34.5kV.
7. DEPTHS SPECIFIED ARE TO FINISHED GRADE.
8. OVER-EXCAVATE TRENCHES AS NECESSARY TO ALLOW FOR (A) SAND BEDDING OR (B) LOOSE AND SANDY SOILS OR (C) WHERE MORE THAN ONE CABLE WILL BE INSTALLED IN TRENCH AND LAYING OF FIRST CABLE MAY CAUSE TRENCH DAMAGE AND REDUCTION IN DEPTH.
9. BACKFILLING IS PART OF ALL TRENCHING UNITS INCLUDING JOINT-USE TRENCHES. ALL BACKFILL WITHIN 24" OF CABLE OR CONDUIT SHALL BE FREE OF LARGE ROCKS AND FROZEN MATERIAL WHICH MAY CAUSE DAMAGE TO THE INSTALLED CABLE AND CONDUIT. COMPACT BACKFILL IN 12"-18" LIFTS.
10. CEA INSTALLATION ON NORTH SIDE OF TRENCH THROUGHOUT.
11. MAINTAIN 20" CLEARANCE BETWEEN NEAREST CEA PRIMARY AND ACS / CCI FACILITIES
12. MAINTAIN 60" CLEARANCE BETWEEN NEAREST CEA PRIMARY AND ENSTAR FACILITIES.

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

CHANGES TO SEALED DRAWINGS NOT AUTHORIZED IN WRITING BY THE STAMPING ENGINEER SHALL VOID THE SEAL ON THE ENTIRE DRAWING. THE SEAL IS VALID ONLY FOR MODIFICATIONS MADE UNDER THIS ONE DRAWING REVISION.

DRIVEN & LARUE, INC. (AECC612)
3305 ARCTIC BLVD, STE 201
ANCHORAGE, AK 99503, (907) 349-6853
PROJECT ID: 14-0738
PROJECT LOCATION: ANCHORAGE, AK

APPROVED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JON SINCLAIR, SR. MANAGER, TRANSMISSION & SUBSTATION ENGINEERING, CEA, ON 06/15/2017.
REVIEWED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY CHRISTIAN VIERHUFF, PROJECT ENGINEER, CEA, ON 06/15/2017.
CERTIFIED FOR CONSTRUCTION OF W.O. E1613642/E1620054 BY JACK ANDERSON, NO. EE 6894, D&L, ON 06/15/2017.
CONFIDENTIAL

PROJECT: O'MALLEY ROAD FACILITIES RELOCATION (PHASE 1)
ENG./DESIGN.: CHRISTIAN VIERHUFF/STERLING GRESS (D&L) W.O. # E1613642/E1620054

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MGR./SUPV./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
0	ISSUED FOR CONSTRUCTION	GSG/05-26-16	JSA/05-26-16		
1	ISSUED FOR CONSTRUCTION	GSG/07-21-16	JSA/07-21-16		
2	ISSUED FOR CONSTRUCTION	GSG/06-15-17	JSA/06-15-17		

NO.	RECORD REVISION	TECH./ DWN. BY	W.P.#	W.O. APPROVED	RECORD APPROVED	DATE

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Minnesota Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:
34.5kV SUBTRANSMISSION LINE
O'MALLEY JCT - NEW SEWARD HWY JCT LINE 2 (BC)
ELECTRICAL NEW
TRENCH AND FOUNDATION DETAILS

mjs2-ss-0003.dwg

DRAWING NO. - PREVIOUS/REFERENCE

DRAWING NO.: MJS2-SS-0003/E1613642/E1620054

SHEET 1 OF 1
PAGE ____ / ____

Appendix B

Staking Sheets / Equipment Diagrams

STAKING SHEET

[ ] INDICATES EXISTING, * INDICATES RETIRE

	STR. OR POLE #	STATION (Shown on P&P Dwg)	STRUCTURE OR POLE HT/CLASS	CONDUCTOR NO.	CONDUCTOR TYPE	BACK SPAN (ft)	LINE ANGLE	ASSEMBLY NO.	ASSEMBLY TYPE	FOUNDATION NO.	FOUNDATION TYPE	GUY NO.	GUY TYPE	GUY LEAD (ft)	ANCHOR NO.	ANCHOR TYPE	MISC. NO.	MISC. TYPE	REMARKS
ADD	[VAULT-N3]			[3]	1000 CU	524		[524]	SUM5044H								3	XUM6-28G	FIRE TAPE ALL NEW CABLES IN VAULTS
								[1]	XUM814										
RETIRE	*POLE 1605		*55/H1	*3	1000 CU	55		*55	SUM5044H	1	SM31A	*1	TG-11B-FG	55	*4	SF7C	*1	TUC1X	ALL EQUIPMENT TO BE REITRED SHALL BE COMPLETELY REMOVED AND DISPOSED OF.
								*1	TP-7MT			*1	TG-11B-FG	45			1	SM2-11	
												*1	TG-11B-FG	35			*2	TG-25D	
												*1	TG-11B-FG	30			1	SM52-3	
RETIRE	[POLE 1705]		[45/1]									*2	TG-11A-SG	15			*2	TG-25C	POLE RETIRED UNDER DISTRIBUTION WORK ORDER. SEE DISTRIBUTION STAKING SHEETS FOR LISTING OF OTHER ASSEMBLIES ON POLE 1705
RETIRE	POLE 2105		*55/H1	*3	795 ACSR	260		*1	TP-4A	1	SM31A						1	SM52-3	
RETIRE	POLE 2606		*50/H1	*3	795 ACSR	260		*1	TP-4A	1	SM31A						1	SM52-3	
RETIRE	POLE 3006		*85/H3	*3	795 ACSR	150		*1	TP-4A	1	SM31A	*1	TG-11A-2FG	40	*1	SF7C	*1	TG-25C	
																	1	SM2-11	
																	1	SM52-3	
RETIRE	POLE 4906		*75/H3	*3	795 ACSR	225		*1	TP-3A	1*	DHP1						1	SM52-3	
RETIRE	POLE 5206		*70/H3	*3	795 ACSR	135		*1	TP-3A	1*	DHP1						1	SM52-3	
RETIRE	[POLE 6406]		[45/1]							1*	DHP1	*2	TG-11A-SG	15			*2	TG-25C	POLE RETIRED UNDER DISTRIBUTION WORK ORDER. SEE DISTRIBUTION STAKING SHEETS FOR LISTING OF OTHER ASSEMBLIES ON POLE 6406
RETIRE	POLE 6506		*55/H1	*3	795 ACSR	272		*1	TP-7MT	1*	DHP1	*1	TG-11B-FG	43	*4	SF7C	*1	TUC1X	ALL EQUIPMENT TO BE REITRED SHALL BE COMPLETELY REMOVED AND DISPOSED OF.
												*1	TG-11B-FG	43			1	SM2-11	
												*1	TG-11B-FG	33			1	SM52-3	
												*1	TG-11B-FG	33			*2	TG-25D	
ADD	VAULT-N4			3	1000 CU	850		850	SUM5044H								3	XUM6-28G	TRENCH UNITS ARE CARRIED IN DISTRIBUTION STAKING SHEETS, FIRETAPE ALL NEW CABLES IN VAULTS

DATE	NO.	REVISIONS	BY
5/27/2016	0	ISSUED FOR CONSTRUCTION	D&L
5/22/2017	1	ISSUED FOR CONSTRUCTION	D&L

CHUGACH ELECTRIC ASSOCIATION, INC.
PO BOX 196300
ANCHORAGE, AK 99519-6300

DESIGNER	GSG
CHECKER	JSA
DIST. ENG.	GSG
MGR. ENG.	JSA

34.5kV SUBTRANSMISSION LINE
GRAVEL JCT TO O'MALLEY JCT
O'MALLEY ROAD FACILITIES RELOCATION
(PHASE 2)

GRID: 2532-2536 AND 2632-2636

SHEET 1 OF 2 **W.O. NO. E1620054**

STAKING SHEET

[ ] INDICATES EXISTING, * INDICATES RETIRE

	STR. OR POLE #	STATION (Shown on P&P Dwg)	STRUCTURE OR POLE HT/CLASS	CONDUCTOR NO.	CONDUCTOR TYPE	BACK SPAN (ft)	LINE ANGLE	ASSEMBLY NO.	ASSEMBLY TYPE	FOUNDATION NO.	FOUNDATION TYPE	GUY NO.	GUY TYPE	GUY LEAD (ft)	ANCHOR NO.	ANCHOR TYPE	MISC. NO.	MISC. TYPE	REMARKS
RETIRE	VAULT-N5			*3	1000 CU	205		*205	SUM5044H										ALL EQUIPMENT TO BE REITRED SHALL BE COMPLETELY REMOVED AND DISPOSED OF.
ADD	VAULT-N5			3	1000 CU	816		816	SUM5044H								3	XUM6-28G	TRENCH UNITS ARE CARRIED IN DISTRIBUTION STAKING SHEETS, FIRETAPE ALL NEW CABLES IN VAULTS

DATE	NO.	REVISIONS	BY
5/27/2016	0	ISSUED FOR CONSTRUCTION	D&L
5/22/2017	1	ISSUED FOR CONSTRUCTION	D&L

CHUGACH ELECTRIC ASSOCIATION, INC.
PO BOX 196300
ANCHORAGE, AK 99519-6300

DESIGNER	GSG
CHECKER	JSA
DIST. ENG.	GSG
MGR. ENG.	JSA

34.5kV SUBTRANSMISSION LINE
GRAVEL JCT TO O'MALLEY JCT
O'MALLEY ROAD FACILITIES RELOCATION
(PHASE 2)

GRID: 2532-2536 AND 2632-2636

SHEET 2 OF 2 **W.O. NO. E1620054**

RELOCATION FOR CONFLICTING FACILITIES
STAKING SHEET
for
Project: E1613642
O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

Design No.: 01

Capital Account: / / /

Reimbursable Account: / / /

Retirement Account: / / /

Work Plan No.:

Project Type: 15 KV UNDERGROUND

Reviewed by Designer/Project Engineer: _____ Date: 5/24/2017
Sterling Gress

Reviewed by Supervisor/Manager: _____ Date: 5/24/2017
Jack Anderson

Remarks:

Electric Power Systems, Inc.
3305 Arctic Boulevard, Suite 201
Anchorage, Alaska 99503-4575

Designer	GSG	Date 5/24/2017
Checker	JSA	Date 5/24/2017
Manager	JSA	Date 5/24/2017

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

Structure: VAULT N3 **Grid: 2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
1/0 CONC Conductor	Existing	1	167.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
1/0 CONC Conductor	Existing	1	0.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
750 CONC	Existing	3	524.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
750 CONC	Existing	3	0.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
SUM5022H	Existing		167.00	(2) 2" HDPE CONDUITS	/ /	
SUM5026H	Existing		524.00	(2) 6" HDPE CONDUITS	/ /	
SUM5026H	Existing		524.00	(2) 6" HDPE CONDUITS	/ /	
SUM5026H	Existing		524.00	(2) 6" HDPE CONDUITS	/ /	
SUM5026H	Existing		10.00	(2) 6" HDPE CONDUITS	/ /	
SUM5026H	Existing		10.00	(2) 6" HDPE CONDUITS	/ /	
XUM814	Existing		1.00	PRECAST SECTIONAL VAULT	/ /	
SUM5022H	Existing		0.00	(2) 2" HDPE CONDUITS	/ /	
SUM5026H	Existing		0.00	(2) 6" HDPE CONDUITS	/ /	

Remarks: 10' OF 4 EACH 6" CONDUITS ARE EXISTING STUB OUTS TOWARD NEW VAULT-N4.

Structure: SC-1077 **Grid: 2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
1/0 CONC Conductor	Existing	1	0.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
4/0 CONC	Existing	3	0.00	4/0 CONCENTRIC PRIMARY 3 PH	/ /	
1/0 CONC Conductor	Existing	1	103.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
750 CONC	Existing	3	103.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
SR1-16	Existing		103.00	CLEARING, 16' FOR UG LINES	/ /	
SUM1F	Existing		1.00	PAD ASSEMBLY, SWITCH CABINET, PMH	/ /	
SUM3-9	Existing		1.00	600 A SC 2 FUSES 2 SWITCHES	/ /	
SUM5022H	Existing		103.00	(2) 2" HDPE CONDUITS	/ /	
SUM5026H	Existing		103.00	(2) 6" HDPE CONDUITS	/ /	
SUM5026H	Existing		0.00	(2) 6" HDPE CONDUITS	/ /	
SUM6-25C 1 PH	Existing		2.00	1/0 PRIMARY TERMINATION	/ /	
SUM6-25D 3 PH	Existing		1.00	4/0 PRIMARY TERMINATION	/ /	
SUM6-25F 3 PH	Existing		1.00	750 MCM PRIMARY TERMINATION	/ /	
SUM6-36A	Existing		5.00	FUSE, S&C END FITTING SML-20	/ /	
1707	Existing		3.00	FUSE, S&C 14.4 SMU-20 040E	/ /	
1708	Existing		2.00	FUSE, S&C 14.4 SMU-20 065E	/ /	
SUME445S4	Existing		4.00	4" RSC 45 48"	/ /	
SUME645P5	Existing		4.00	6" PVC 45 60"	/ /	
* *750 CONC*	*Retire*	3	0.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
* *SUM6-25F 3 PH*	*Retire*		1.00	750 MCM PRIMARY TERMINATION	/ /	
SUM6-25F 3 PH	**Install**		1.00	750 MCM PRIMARY TERMINATION	/ /	
750 CONC	**Install**	3	0.00	750 CONCENTRIC PRIMARY	/ /	
SUME245S3	**Install**		1.00	2" RSC 45 36"	/ /	
SUME445S4	**Install**		1.00	4" RSC 45 48"	/ /	
SUME645S5	**Install**		2.00	6" RSC 45 60"	/ /	

Remarks: (1) 2" RSC 45 36" ORIENTED SOUTH FOR RUN TO PM-3704. (1) 4" RSC 45 48" AND (2) 6" RSC 45 60" ORIENTED SOUTH FOR NEW RUN TO VAULT-N4

Structure: VAULT N4 **Grid: 2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
XUM814	Existing		1.00	PRECAST SECTIONAL VAULT	/ /	
750 CONC	**Install**	3	798.00	750 CONCENTRIC PRIMARY	/ /	
750 CONC	**Install**	3	0.00	750 CONCENTRIC PRIMARY	/ /	
1/0 CONC Conductor	**Install**	1	0.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
1/0 CONC Conductor	**Install**	1	0.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
SUM6-28F 3 PH	**Install**		1.00	750 MCM PRIMARY SPLICE	/ /	
SUM6-28C 1 PH	**Install**		1.00	1/0 PRIMARY SPLICE-15KV	/ /	
SUM5014H	**Install**		798.00	(1) 4" HDPE CONDUIT	/ /	
SUM5026H	**Install**		798.00	(2) 6" HDPE CONDUITS	/ /	
SUM5026H	**Install**		846.00	(2) 6" HDPE CONDUITS	/ /	
SUME490S4	**Install**		1.00	4" RSC 90 48"	/ /	
SUME690S5	**Install**		2.00	6" RSC 90 60"	/ /	
SUR2-6	**Install**		48.00	PRIMARY TRENCH	/ /	
XUR2-DT	**Install**		846.00	DEEP PRIMARY TRENCH (12.5/34.5 kV)	/ /	

Remarks: VAULT UNITS COVERED UNDER 35 KV WORK ORDER. SEE DRAWINGS FOR RACKING DETAILS. 750 CONC FROM SC-1077 SHALL BE PULLED FROM SC-1077 TO VAULT-N4. 48' SUR2-6 IS SOUTH FROM SC-1077 TO XUR2-DT TRENCH. 846' OF 6" HDPE IS BACK TO VAULT-N3. FIRE-TAPE ALL NEW CABLES INSTALLED IN VAULT.

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

3305 Arctic Boulevard, Suite 201
Anchorage, Alaska 99503-4575

Checker	__JSA__	Date 05/24/2017
Manager/Supervisor	__JSA__	Date 05/24/2017

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

Structure: **PM 3704** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
1/0 CONC Conductor	**Install**	1	272.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
4/0 RIBB	**Install**		198.00	4/0 3-WIRE SECONDARY	/ /	
4/0 RIBB	**Install**		190.00	4/0 3-WIRE SECONDARY	/ /	
SUR2-6	**Install**		21.00	PRIMARY TRENCH	/ /	
SUR2-3	**Install**		53.00	TRENCH, SECONDARY	/ /	
SUR2-3	**Install**		11.00	TRENCH, SECONDARY	/ /	
SUG6-25	**Install**		1.00	XFMR, PM, 25 KVA, 1 PH, RADIAL	/ /	
SUM1	**Install**		1.00	PAD ASSEMBLY, CONCRETE	/ /	
SUM6-1C	**Install**		1.00	1/0 LB ELBOW TERMINATION-15KV	/ /	
SUM5012H	**Install**		272.00	(1) 2" HDPE CONDUIT	/ /	
SUM5012H	**Install**		198.00	(1) 2" HDPE CONDUIT	/ /	
SUM5012H	**Install**		190.00	(1) 2" HDPE CONDUIT	/ /	
SUM5012H	**Install**		571.00	(1) 2" HDPE CONDUIT	/ /	
SUME290S3	**Install**		3.00	2" RSC 90 36"	/ /	

Remarks: **Work has been revised - see Appendix J and Pre-Bid for discussion**

Structure: **VAULT-N4** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
REPEAT					/ /	

Remarks:

Structure: **SC-1078** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
SUM1I	**Install**		1.00	CONCRETE PAD VISTA	/ /	
SUM3E-1-2FI	**Install**		1.00	600 A PM VISTA (SPECIAL ORDER MATERIAL)	/ /	
SUM6-36A	**Install**		4.00	FUSE, S&C END FITTING SML-20	/ /	
1707	**Install**		4.00	FUSE, S&C 14.4 SMU-20 040E	/ /	
SUME445S4	**Install**		2.00	4" RSC 45 48"	/ /	
SUME645S5	**Install**		6.00	6" RSC 45 60"	/ /	
SUM6-25F 3 PH	**Install**		3.00	750 MCM PRIMARY TERMINATION	/ /	
SUM6-25C 1 PH	**Install**		1.00	1/0 PRIMARY TERMINATION	/ /	
750 CONC	**Install**	3	0.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
750 CONC	**Install**	3	0.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
750 CONC	**Install**	3	162.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
SUM5022H	**Install**		162.00	(2) 2" HDPE CONDUITS	/ /	
SUM5026H	**Install**		162.00	(2) 6" HDPE CONDUITS	/ /	
SUME490S4	**Install**		1.00	4" RSC 90 48"	/ /	
SUME690S5	**Install**		2.00	6" RSC 90 60"	/ /	
1/0 CONC Conductor	**Install**	1	162.00	1/0 CONCENTRIC PRIMARY 1 PH	/ /	
SUR2-NT	**Install**		62.00	NORMAL PRIMARY TRENCH	/ /	
SHUR2-6	**Install**		10.00	PRIMARY TRENCH HAND -DIG	/ /	

Remarks: (2) 6" RSC 45 60" ORIENTED NORTH FOR INTERCONNECT TO EXISTING SC-659 VIA PB-5219.
(4) 6" RSC 45 60" ORIENTED SOUTH FOR INTERCONNECT TO NEW VAULT-N4 AND VAULT-N5.
(2) 4" RSC 45 48" ORIENTED SOUTH FOR INTERCONNECT TO NEW VAULT-N4 AND VAULT-N5.
SHUR2-6 IS FOR INTERCEPTING EXISTING 15kV CABLES RUNNING NORTH/SOUTH ON WEST SIDE OF INDEPENDENCE DRIVE TO PB-5219.
BENCHING FOR SC-1078 INSTALLATION IS REQUIRED.

Structure: **VAULT N5** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
750 CONC	Existing	3	0.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
XUM814	Existing		1.00	PRECAST SECTIONAL VAULT	/ /	
* *SUM5026H*	*Retire*		220.00	(2) 6" HDPE CONDUITS	/ /	
SUM6-28F 3 PH	**Install**		1.00	750 MCM PRIMARY SPLICE	/ /	
SUME490S4	**Install**		1.00	4" RSC 90 48"	/ /	
SUME690S5	**Install**		2.00	6" RSC 90 60"	/ /	
XUR2-DT	**Install**		680.00	DEEP PRIMARY TRENCH (12.5/34.5 kV)	/ /	
SUM5026H	**Install**		680.00	(2) 6" HDPE CONDUITS	/ /	
SUM5012H	**Install**		626.00	(1) 2" HDPE CONDUIT	/ /	
SUM5014H	**Install**		626.00	(1) 4" HDPE CONDUIT	/ /	
SUM5026H	**Install**		626.00	(2) 6" HDPE CONDUITS	/ /	
750 CONC	**Install**	3	626.00	750 CONCENTRIC PRIMARY 3 PH	/ /	

Remarks: 626' 750 CONC, 626' (1) 2", (1) 4" AND (2) 6" CONDUIT BACK TO SC-1078. 680' TRENCH AND (2) 6" CONDUIT BACK TO NEW VAULT-N4. RETIRED 220' OF SUM5026H IS FROM RETIRED POLE-6406. FIRE-TAPE ALL NEW CABLES INSTALLED IN VAULT.

Structure: **SC-1077** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
REPEAT					/ /	

Remarks:

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

3305 Arctic Boulevard, Suite 201
Anchorage, Alaska 99503-4575

Checker	__JSA__	Date 05/24/2017
Manager/Supervisor	__JSA__	Date 05/24/2017

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

Structure: **POLE 1705** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	0.00	OH PRIMARY CONDUCTOR	/ /	
* *750 CONC*	*Retire*	3	35.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
* *45/1*	*Retire*		1.00	POLE, 45 FOOT CLASS 1	/ /	
* *SC7A-2*	*Retire*		1.00	XARM SNGL 4-WIRE DEADEND	/ /	
* *SM5-RTB*	*Retire*		3.00	RAPTOR, TUBING, HEAT SHRINK JMPR CVR	/ /	
* *SUC3*	*Retire*		1.00	RISER, 3-PH (PRIMARY), FEEDER CIRCUIT	/ /	
* *SM2-11*	*Retire*		1.00	POLE GROUNDING ASSY	/ /	
* *SM52-3*	*Retire*		1.00	POLE NUMBERING GUIDE	/ /	
* *SUM5016S*	*Retire*		10.00	(1) 6" STEEL CONDUIT	/ /	
* *SUME690S5*	*Retire*		2.00	6" RSC 90 60"	/ /	
SUM5026H	Existing		35.00	(2) 6" HDPE CONDUITS	/ /	

Remarks: ABANDON 6" CONDUIT RUN FROM SC-1077. RETIRE RISER DOWN TO HORIZONTAL UNDERGROUND CONDUIT. CAP/SEAL END OF ABANDONED CONDUIT.

Structure: **POLE 2105** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	245.00	OH PRIMARY CONDUCTOR	/ /	
* *336 ACSR Conductor*	*Retire*	4	0.00	OH PRIMARY CONDUCTOR	/ /	
55/H1	Existing		1.00	POLE, 55 FOOT CLASS H1	/ /	
* *SC9-2A*	*Retire*		1.00	UNDERBUILD XARM LGCNDR	/ /	
* *SM5-RC*	*Retire*		1.00	RAPTOR, 15 KV SS PIN INSULATOR COVER	/ /	

Remarks: POLE RETIREMENT COVERED UNDER 34.5 kV WORK ORDER.

Electric Power Systems, Inc. Designer/Project Engineer __GSG__ Date 05/24/2017
3305 Arctic Boulevard, Suite 201 Checker __JSA__ Date 05/24/2017
Anchorage, Alaska 99503-4575 Manager/Supervisor __JSA__ Date 05/24/2017

Structure: **POLE 2606** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	260.00	OH PRIMARY CONDUCTOR	/ /	
* *336 ACSR Conductor*	*Retire*	4	0.00	OH PRIMARY CONDUCTOR	/ /	
50/H1	Existing		1.00	POLE, 50 FOOT CLASS H1	/ /	
* *SC9-2A*	*Retire*		1.00	UNDERBUILD XARM LGCNDR	/ /	
* *SM5-RC*	*Retire*		1.00	RAPTOR, 15 KV SS PIN INSULATOR COVER	/ /	

Remarks: POLE RETIREMENT COVERED UNDER 34.5 kV WORK ORDER.

Structure: **POLE 3006** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	150.00	OH PRIMARY CONDUCTOR	/ /	
* *336 ACSR Conductor*	*Retire*	4	0.00	OH PRIMARY CONDUCTOR	/ /	
85/H3	Existing		1.00	POLE, 85 FOOT CLASS H3	/ /	
* *SC9-2A*	*Retire*		1.00	UNDERBUILD XARM LGCNDR	/ /	
* *SE1-3*	*Retire*		1.00	DOWN GUY, SINGLE, 10M	/ /	
* *SG39-25*	*Retire*		1.00	XFMR, OH, 25 KVA, 1-PH TANGENT	/ /	
* *SM5-RC2*	*Retire*		1.00	RAPTOR, 15KV DS PIN INSULATOR COVER	/ /	

Remarks: POLE RETIREMENT COVERED UNDER 34.5 kV WORK ORDER. Service from xfmr is OH to Pole#17

Structure: **SERVICE** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *4/0 RIBB*	*Retire*	1	60.00	4/0 3-WIRE SECONDARY	/ /	
SUM5022H	Existing		60.00	(2) 2" HDPE CONDUITS	/ /	

Remarks:

Structure: **POLE 3006** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
REPEAT					/ /	

Remarks:

Electric Power Systems, Inc. Designer/Project Engineer __GSG__ Date 05/24/2017
3305 Arctic Boulevard, Suite 201 Checker __JSA__ Date 05/24/2017
Anchorage, Alaska 99503-4575 Manager/Supervisor __JSA__ Date 05/24/2017

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

Structure: **POLE 4906** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	225.00	OH PRIMARY CONDUCTOR	/ /	
* *336 ACSR Conductor*	*Retire*	4	0.00	OH PRIMARY CONDUCTOR	/ /	
75/H3	Existing		1.00	POLE, 75 FOOT CLASS H3	/ /	
* *SC9-3A*	*Retire*		1.00	SINGLE XARM LGCNDR	/ /	
* *SUC3*	*Retire*		1.00	RISER, 3-PH (PRIMARY), FEEDER CIRCUIT	/ /	
* *SM2-11*	*Retire*		1.00	POLE GROUNDING ASSY	/ /	
* *SUM5016S*	*Retire*		10.00	(1) 6" STEEL CONDUIT	/ /	
* *SUME690S5*	*Retire*		2.00	6" RSC 90 60"	/ /	
* *SM5-RC*	*Retire*		1.00	RAPTOR, 15 KV SS PIN INSULATOR COVER	/ /	
* *SM5-RTB*	*Retire*		3.00	RAPTOR, TUBING, HEAT SHRINK JMPR CVR	/ /	

Remarks: POLE RETIREMENT COVERED UNDER 34.5 kV WORK ORDER. ABANDON 6" CONDUIT RUN TO SC-1078. RETIRE RISER DOWN TO HORIZONTAL UNDERGROUND CONDUIT. CAP/SEAL END OF ABANDONED

Structure: **POLE 5206** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	135.00	OH PRIMARY CONDUCTOR	/ /	
* *336 ACSR Conductor*	*Retire*	4	0.00	OH PRIMARY CONDUCTOR	/ /	
70/H3	Existing		1.00	POLE, 70 FOOT CLASS H3	/ /	
* *SC9-3A*	*Retire*		1.00	SINGLE XARM LGCNDR	/ /	
* *SM5-RC*	*Retire*		1.00	RAPTOR, 15 KV SS PIN INSULATOR COVER	/ /	

Remarks: POLE RETIREMENT COVERED UNDER 34.5 kV WORK ORDER.

Structure: **POLE 6406** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
* *336 ACSR Conductor*	*Retire*	4	257.00	OH PRIMARY CONDUCTOR	/ /	
* *750 CONC*	*Retire*	3	0.00	750 CONCENTRIC PRIMARY 3 PH	/ /	
* *45/1*	*Retire*		1.00	POLE, 45 FOOT CLASS 1	/ /	
* *SC7A-2*	*Retire*		1.00	XARM SNGL 4-WIRE DEADEND	/ /	
* *SM5-RTB*	*Retire*		3.00	RAPTOR, TUBING, HEAT SHRINK JMPR CVR	/ /	
* *SM2-11*	*Retire*		1.00	POLE GROUNDING ASSY	/ /	
* *SM52-3*	*Retire*		1.00	POLE NUMBERING GUIDE	/ /	
* *SUC3*	*Retire*		1.00	RISER, 3-PH (PRIMARY), FEEDER CIRCUIT	/ /	
* *SUM5016S*	*Retire*		10.00	(1) 6" STEEL CONDUIT	/ /	
* *SUME690S5*	*Retire*		2.00	6" RSC 90 60"	/ /	

Remarks: RETIRE RISER DOWN TO HORIZONTAL UNDERGROUND CONDUIT. CAP/SEAL END OF ABANDONED CONDUI

Structure: **POLE A15RA** **Grid:** **2532-2536, 2632-2636**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty.
1/0 ACSR	Existing	2	0.00	1/0 ACSR PRIMARY	/ /	
45/1	Existing		1.00	POLE, 45 FOOT CLASS 1	/ /	
A5	Existing		1.00	VERTICAL SINGLE DEADEND	/ /	
SM2-11	Existing		1.00	POLE GROUNDING ASSY	/ /	
SF4C	Existing		1.00	ANCHOR, 4' CONCRETE	/ /	
SUA1	Existing		1.00	PRI RISER ON 1 PH OH LINE	/ /	
SUM5012S	Existing		10.00	(1) 2" STEEL CONDUIT	/ /	
SUME290S	Existing		2.00	CONDUIT ELBOW, 2" 90°, RSC	/ /	
* *SE1-5*	*Retire*		1.00	DOWN GUY, SINGLE, 16M	/ /	
SE1-5	**Install**		1.00	DOWN GUY, SINGLE, 16M	/ /	
SF4C	**Install**		1.00	ANCHOR, 4' CONCRETE	/ /	

Remarks: ABANDON ANCHOR IN PLACE. CUT OFF RETIRED GUY WIRE 12" BELOW GRADE. INSTALL NEW ANCHOR AND GUY WIRE WITH 20' LEAD.

Project: E1613642 Design: 01 RELOCATION FOR CONFLICTING FACILITIES

O'MALLEY ROAD FACILITIES RELOCATION (PHASE 2)

3305 Arctic Boulevard, Suite 201
Anchorage, Alaska 99503-4575

Checker	__JSA__	Date 05/24/2017
Manager/Supervisor	__JSA__	Date 05/24/2017

Manufacturer: VISTA

Model: 422

1078

Serial Number:

Manufactured Date:

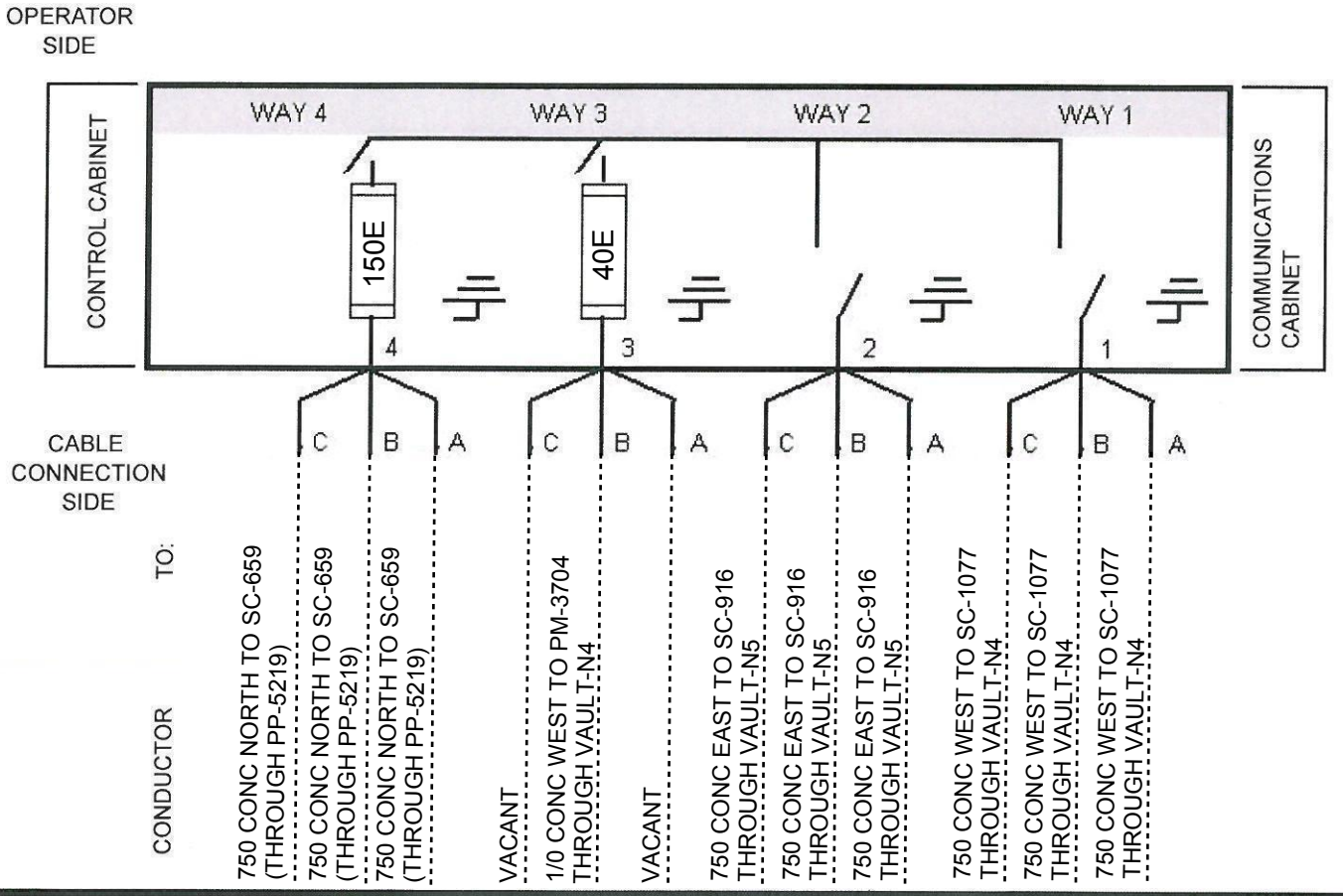
Notes:

DIRECTION (Reference to North)

Revised Date:

Revised WO/JO:

Status:	CLOSED	Status:	CLOSED	Switch #: 14618 Status:	CLOSED	Switch #: 14617 Status:	CLOSED



CHUGACH
POWERING ALASKA'S FUTURE

LOCATION

NORTH SIDE OF O'MALLEY ROAD 130' WEST OF INDEPENDENCE DRIVE

Grid Map Location No.: 2533 - 0639

Inspected by:

Install Date:

Install Work Order ID: E1613642

Feeder: HANE 612

APPENDIX C

PERMISSION TO ENTER PROPERTY

Date: _____
Project: _____
Contractor: _____
W.O. No.: _____

I, _____, Owner of Lot _____, Block _____, in _____ Subdivision, located in Anchorage, Alaska do hereby allow and permit Chugach Electric Association, Inc., and or its Contractor, to enter upon my property for the purpose of _____
_____
_____
_____
_____
_____
_____

I understand the above named Contractor does not have the right under the construction contract to enter upon my property. I am allowing the Contractor to enter my property under private Agreement and hold Chugach Electric Association, Inc., harmless from any act of the Contractor while working on the above identified property.

Signature: _____ Date: _____
Address: _____
_____
_____
_____

Appendix D

CAD/GIS Spatial Data Standards

CAD / GIS
Spatial Data Standards

Last Revision Date: May 21, 2014

Vision: *Establish collection standards that affirm GIS as the visualization tool to integrate corporate information assets and facilitate data visualization and analysis.*

Chugach Electric Association, Inc.
5601 Electron Drive
P.O. Box 196300
Anchorage, AK 99519-6300

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Table of Contents

1. Introduction

The following document describes the spatial data standards of Chugach Electric Associations, Inc. (Chugach). The intent is to describe the:

- Coordinate System and Map Projection standard for delivered electronic data,
- Format of GPS and electronic survey data delivered in AutoCAD,
- Format of delivered electronic GIS data, project files, maps, and metadata.

This document is a reference guide for Chugach and Contractor employees working on behalf of Chugach; it specifies the standards for CAD/GIS spatial data deliverables. Any deviation from these specifications set forth in this document MUST BE APPROVED PRIOR TO DATA COLLECTION. This requirement ensures that the data collected will be viable when it enters Chugach's GIS records. When you request a deviation it enables us to evaluate and update this standards document as necessary. This document is intended to be a "living document" which will be updated as technology changes or as the standards adopted by Chugach change. In either case, we welcome your comments and specific feedback upon the Spatial Data Standards that follow.

2. Coordinate System, Datum & Map Projection

The standard coordinate system, datum and map projection currently used in Chugach's GIS is Alaska State Plane Zone 4 NAD 83 (2002) also known as the (CORS96) realization.

NOTE: The term 'realization' is the National Geodetic Service's official name for revisions to the NAD83 system; however, 'epoch' is more commonly used in its place throughout the industry with the occasional use of 'revision' and 'datum tag'. Chugach has elected to use the term 'epoch' when referring to NGS realizations.

a. *Map Projection*

The map projection that best serves Chugach facilities is Transverse Mercator. The specified coordinate system, datum and map projection is used by all of Chugach's GIS-based Transmission and Distribution Design and Mapping products.

Maps may be delivered to Chugach in other projections, with advance approval by the CAD/GIS manager.

b. *Datum, Coordinate System & Projection Information*

Name: NAD 1983 Alaska State Plane Zone 4 FIPS (Federal Information Processing Standards) 5004 (US Survey Feet)
Projection: Transverse_Mercator

i. Map Projection Parameters

Projection: Transverse_Mercator
False_Easting: 1640416.666667
False_Northing: 0.000000
Central_Meridian: -150.000000
Scale_Factor: 0.999900
Latitude_Of_Origin: 54.000000
Linear Unit: Foot_US (0.304800609601219)

ii. Geographic Coordinate System

Name: GCS_North_American_1983
Angular Unit: Degree (0.0174532925199433295)
Prime Meridian: Greenwich (0.000000000000000000)

iii. Datum

Name: D_North_American_1983
Spheroid: GRS_1980
Semimajor Axis: 6378137.000000000000000000
Semiminor Axis: 6356752.314140356100000000
Inverse Flattening: 298.257222101000020000

c. *NAD 27 to NAD 83 Conversion*

The State Plane grid coordinates is a mathematical conversion that translates latitude and longitude into a Cartesian (or map) Northing (Y) and Easting (X) coordinate system, and this transformation must maintain the same datum tag (NAD83, NAD27, etc...) as the origin latitude and longitude coordinates. Following the conversion into State Plane (NAD27) a Lat-Long (NAD27) can be converted into State Plane (NAD83), using the NADCON conversion for Alaska.

Chugach's original ArcINFO coverages were stored in Alaska State Plane Zone 4 NAD27. These coverages were converted in June 2003 to Alaska State Plane Zone 4 FIPS 5004 (US Survey Feet), NAD83 (CORS96) (2002) using ESRI's ArcToolbox, and the **NAD_1927_to_NAD_1983_Alaska** algorithm, to avoid the 400ft errors that the standard NAD_1927_to_NAD_1983_NADCON creates. Chugach stores our Spatial Database in an Oracle GeoDatabase. The Municipality of Anchorage's GIS data is also stored in the Alaska State Plane Zone 4 (it is Chugach's understanding that the Datum is NAD83 (CORS96) (2002).

NOTE: Some State and Federal data may still be stored in the NAD27 Datum. If you utilize NAD27 data it will be necessary to convert your deliverable information into Chugach's standard datum. The NADCON datum conversion algorithm specific for Alaska will be used.

NADCON is a very common algorithm, which is included in projection software such as ESRI ArcCatalog, Intergraph Projection Manager, Tralaine and others. NADCON works very well for transforming data which spans a large geographic area such as Chugach's distribution and transmission network.

GIS Data Deliverable Standards

The following standard is a guide for delivering GIS data to Chugach. These standards are designed to allow Chugach to easily import GIS data into their Oracle/SDE database.

d. ***Data Format***

GIS Data delivered to Chugach will be submitted in the currently installed version of ArcGIS in a personal or file geodatabase format. The use of feature datasets is encouraged within the personal or file geodatabase. Requests to deliver data in formats other than personal or file geodatabase must be approved by the GIS manager.

e. ***Map Production***

All GIS map products shall be completed using the currently installed version of ArcMap. Maps must be delivered to Chugach in MXD format. All data used to create maps must be contained within a personal or file geodatabase and delivered to Chugach. MXD's must be able to locate all data and attached files when transferred to Chugach. Maps must contain the following information:

- Chugach Logo
- All GIS map products shall display the copyright (©) symbol as follows: Copyright Chugach Electric Association, Inc. ©
- Chugach Disclaimer –
  "Chugach does not warrant the accuracy or completeness of the information contained on this map. The map may not be suitable for user's particular purpose. When accuracy is necessary for any purpose, it is the responsibility of the user to request locates of **Chugach** facilities. This map was produced for Chugach by [insert Engineering/Survey Firm Name]."

f. ***Metadata***

Complete ESRI metadata in the personal or file geodatabase will be required for each feature dataset or feature class. All fields listed as required in the metadata are to be filled out and detail the data acquisition and transformation processes utilized with the data being submitted to Chugach. In addition to populating, the Description Tab as shown in the sample of FGDC metadata below with the **REQUIRED** sections in bold, (which is important to Chugach long-term; it is vital that the Attributes Tab be populated, as it will allow us to know the meaning of the data represented in a given feature class.

NOTE: If you are editing metadata in ArcCatalog this can be found on the Attribute Tab inside the Entity Attribute Tab. It is imperative that column definitions be input and should include all value defaults and named domains. This information is the most important information for long term maintenance of the collected data being handed over to Chugach.

Identification_Information:
  Citation:
    Citation_Information:
      Originator: **REQUIRED: The name of an organization or individual that developed the data set.**
      Publication_Date: **REQUIRED: The date when the data set is published or otherwise made available for release.**
      Title:
      Geospatial_Data_Presentation_Form: vector digital data
      Online_Linkage:
  Description:
    Abstract: **REQUIRED: A brief narrative summary of the data set.**

Purpose: **REQUIRED: A summary of the intentions with which the data set was developed.**
Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: **REQUIRED: The year (and optionally month, or month and day) for which the data set corresponds to the ground.**
Currentness_Reference: **REQUIRED: The basis on which the time period of content information is determined.**
Status:
Progress: **REQUIRED: The state of the data set.**
Maintenance_and_Update_Frequency: **REQUIRED: The frequency with which changes and additions are made to the data set after the initial data set is completed.**
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: **REQUIRED: Western-most coordinate of the limit of coverage expressed in longitude.**
East_Bounding_Coordinate: **REQUIRED: Eastern-most coordinate of the limit of coverage expressed in longitude.**
North_Bounding_Coordinate: **REQUIRED: Northern-most coordinate of the limit of coverage expressed in latitude.**
South_Bounding_Coordinate: **REQUIRED: Southern-most coordinate of the limit of coverage expressed in latitude.**
Keywords:
Theme:
Theme_Keyword_Thesaurus: **REQUIRED: Reference to a formally registered thesaurus or a similar authoritative source of theme keywords.**
Theme_Keyword: **REQUIRED: Common-use word or phrase used to describe the subject of the data set.**
Access_Constraints: **REQUIRED: Restrictions and legal prerequisites for accessing the data set.**
Use_Constraints: **REQUIRED: Restrictions and legal prerequisites for using the data set after access is granted.**
Native_Data_Set_Environment: Microsoft Windows 2000 Version 5.0 (Build 2195) Service Pack 3; ESRI ArcCatalog 8.2.0.700
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Distribution_Information:
Resource_Description: Downloadable Data
Metadata_Reference_Information:
Metadata_Date: 20030425
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: REQUIRED: The organization responsible for the metadata information.
Contact_Person: **REQUIRED: The person responsible for the metadata information.**
Contact_Address:
Address_Type: **REQUIRED: The mailing and/or physical address for the organization or individual.**
City: **REQUIRED: The city of the address.**
State_or_Province: **REQUIRED: The state or province of the address.**
Postal_Code: **REQUIRED: The ZIP or other postal code of the address.**
Contact_Voice_Telephone: **REQUIRED: The telephone number by which individuals can speak to the organization or individual.**
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

3. Survey (AutoCAD) Deliverable Standards

The following standards are a guide to use when submitting survey data stored in an AutoCAD drawing file.

a. *Format*

The AutoCAD format is a (.dwg) file that is no more than two (2) previous platforms release behind the most current version of AutoCAD.

NOTE: A platform release is defined as a change to the .dwg file format and not necessarily the incremental release of updated AutoCAD software.

b. *Block and Data Dictionary*

With the submittal of AutoCAD mapping to Chugach, a data dictionary describing the layer naming convention and a copy of blocks used will be required. The data dictionary should list all layers in the drawing and describe what is present on the layer, list all blocks in the file, and include a title or description of the block. If the block is per a certain industry standard (i.e., ANSI, etc.), indicate the standard used. Any inserted blocks or XREF files should be listed in data dictionary.

c. *Projection Information*

c.1 *Horizontal Projection Information*

The map projection will be required to be documented for the data set. If a plant (or local) grid is used, tie coordinates to NAD 1983 (2003) (CORS96) epoch Alaska State Plane Zone 4 FIPS 5004 (US Survey Feet) will be required.

c.2 *Vertical Projection Information*

All vertical data shall be based on the most current geoid, unless otherwise specified.

d. *Plant Grid*

Chugach also uses a “plant grid” for construction projects. Plant Grid may also be referred to as a construction grid or a local coordinate system. When using the plant grid it will be necessary to establish at a minimum 3 control points at opposite sides of the Plant Grid which have both plant grid coordinates and Alaska State Plane Zone 4 NAD83 (2003) (CORS96) epoch coordinates established. This will allow Chugach to scale and rotate the data used in the plant grid so that it can be incorporated with Chugach’s existing GIS data.

d.1 *Linear Projects*

Linear Projects, such as transmission lines, shall incorporate the requirements noted above in 3.d and shall require an additional control point for every line-mile included in the scope of the project.

e. *Survey Datum*

The datum used for survey purposes will be NAD83 (2003) (CORS96) epoch; this level of precision is specified to ensure that the coordinates referenced will be re-creatable when the NGS CORS Multi-Year Solution is implemented, by Chugach.

4. Conventional and GPS (RTK) Survey Standards

The following standards are a guide to use when using GPS survey techniques on Chugach projects. All surveying must meet the minimum requirements set out in the ASPLS; Standards of Practice for Professional Land Surveyors.

a. *Electronic Data Collection*

Chugach recognizes that some of the field data may be electronically collected and printed out on supplemental sheets rather than being written by hand in the field book. If used, these supplemental sheets must be initialed by the Party Chief or GPS Operator, referenced in the field book, kept with the field book, and are considered part of the field book.

b. *Minimum Standards and Limitation of Use for GPS Technology*

We require the use of Bureau of Land Management standards as set forth in their publication: Standards for the Positional Accuracy of Cadastral Surveys When Using Global Navigation Satellites Systems (GNSS), February 23, 2009. See Attachment 1.

c. *GPS Deliverables*

The following are required:

- Station Observation Logs (and Field Notes for conventional surveying)
- Digital Raw GPS Data (for Trimble that would be a .dat file)
- Copies of all processing reports produced by GPS processing software (like Trimble Geomatics Office and OPUS)
- Survey Report containing the following:
    - Equipment used
    - Methodology used
    - Control used
    - Datum used
    - Issues with the survey

d. *Emerging GPS Technologies*

Chugach recognizes the dynamic nature of GPS surveying in the areas of real time positioning, quick ambiguity determination and "on the fly" initializing. Chugach's specifications are not intended to hinder the integration of advancements which may be beneficial, efficient, and accurate to our program, but rather, to guarantee the degree of confidence, reliability, and repeatability for verification that Chugach considers necessary in the performance of Cadastral Surveys.

Chugach encourages the presentation and discussion of these emerging technologies when considered a viable option in the performance of specific projects or portions of projects. In these instances the Chugach GPS standards must guide the formulation of procedures that maintain the degree of confidence, reliability, and repeatability in the final product that Chugach attains in the current standards. These procedures must closely reflect the approach that follows the professional standards and accepted procedures of the established surveying community.

Standards

For the

Positional Accuracy

of

Cadastral Surveys

When Using

Global Navigation Satellite Systems (GNSS)

February 23, 2009

Cadastral Survey
Bureau of Land Management
Department of the Interior

Attachment 1-1

Preface

These *Standards for the Positional Accuracy of Cadastral Surveys When Using Global Navigation Satellite Systems* (Standards) were developed as an update to the positional standards originally defined in *IM 2001-186, Standards and Guidelines for Cadastral Surveys Using Global Positioning System Methods*, and are a product of a joint venture between the United States Forest Service and the Bureau of Land Management. The positional standards outlined in this updated document are intended to apply to all boundary surveys conducted under the authority of official Special Instructions or other survey-related instructions issued by the Bureau of Land Management (Cadastral Survey) when Global Navigation Satellite Systems (GNSS) technology is used. In addition to the positional standards, this document also describes how survey accuracies will be defined and computed. These positional accuracy standards are consistent with the current edition of the *Manual of Surveying Instructions*.

In 2001, when IM 2001-186 was originally issued, the use of Real-Time Kinematic (RTK) global positioning system (GPS) technology while conducting cadastral or other boundary surveys was still in its infancy. IM 2001-186 was intended to provide instructions on the use of these technologies as well as provide guidance on the accuracy levels necessary to achieve acceptable results comparable to conventional terrestrial surveys. In the past few years, use of GPS/GNSS technological knowledge and methodology have become universal throughout the surveying profession making portions of IM 2001-186 no longer applicable or required.

The positional accuracy standards identified in IM 2001-186 were defined in terms of the 95 percent confidence error "circle" as called for in the Federal Geographic Data Committee's (FGDC) document FGDC-STD-007.1-1998**,** *Geospatial Positioning Accuracy Standards Part 1: Reporting Methodology***.** However, this methodology has not been widely adopted or accepted and, as such, has proven difficult to implement. In this document the positional accuracy standards are defined in terms of the 95 percent confidence error "ellipse," which can easily be computed using any contemporary GNSS software suite.

Cadastral Surveys are an important part of the National Spatial Data Infrastructure (NSDI), and the accuracy reporting requirements of this document are in accordance with accuracy reporting requirements of the FGDC *Geospatial Positioning Accuracy Standards, July 1997*. These standards do not require that cadastral surveys be performed to the higher accuracy and methodology required of geodetic control surveys. They are intended to provide sufficient observational, positional, and occupational redundancies to detect blunders and quantitatively demonstrate the stated accuracy of a survey has been achieved to ensure a certain level of acceptability and positional confidence.

The positional standards set forth in this document have undergone both internal and external review and scrutiny. All issues, comments, and concerns have been considered in the preparation of this document.

Standards for Positional Accuracy Using GNSS Technology

The following standards are for Global Navigation Satellite System (GNSS) technology and will be used to define the minimally acceptable levels of positional accuracy required of any Department of the Interior, Bureau of Land Management, official cadastral or administrative boundary survey.

Local Accuracy Standards[1]

Semi-major axis 95 percent error ellipse	Application
Less than 0.025 (m)	Cadastral Project Control
Less than 0.050 (m)	Cadastral Corner Measurements

Network Accuracy Standards[2]

Semi-major axis 95 percent error ellipse	Application
Less than 0.050 (m)	Cadastral Project Control
Less than 0.100 (m)	Cadastral Corner Measurements

[1] See Appendix 1, items 3 and 4.
[2] See Appendix 1, items 5 and 6.

Appendix 1

Supporting Information

1. The standard is based on the magnitude of the semi-major axis of the 95 percent confidence level error ellipse.

2. A least squares adjustment or other multiple baseline data analysis should be used to verify that the required level of positional accuracy has been achieved.

3. The local accuracy of a control point established as part of a static GNSS project control network can be determined by performing a minimally constrained least squares analysis of the network and ensuring the magnitude of the semi-major axis of the 95 percent confidence level error ellipse is less than or equal to the values in Table 1.

4. The local accuracy of a cadastral corner measurement can be determined by performing a minimally constrained least squares analysis of the network and ensuring the magnitude of the semi-major axis of the 95 percent confidence level error ellipse is less than or equal to the values in Table 1.

5. The network accuracy of a control point established as part of a static GNSS project control network can be determined by performing a fully constrained least squares analysis of the network and ensuring the magnitude of the semi-major axis of the 95 percent confidence level error ellipse is less than or equal to the values in Table 2.

6. The network accuracy of a cadastral corner measurement point established by real time kinematic, fast static, or kinematic methods which meet the manufacturer's specifications may be determined by performing a fully constrained least squares analysis of the network and ensuring the magnitude of the semi-major axis of the 95 percent confidence level error ellipse is less than or equal to the values in Table 2.

7. The National Geodetic Survey (NGS) program "OPUS – Static" (http://www.ngs.noaa.gov/OPUS/) returns the maximum peak-to peak separation for each component of the computed position. The maximum peak-to-peak separation of the computed position will be used to estimate the semi-major axis of the 95 percent confidence error ellipse for network accuracy determination for these standards.

8. The NGS program "OPUS – RS" (http://www.ngs.noaa.gov/OPUS/) returns the standard deviation for each component of the computed position. Two times the largest position component standard deviation will be used to estimate the semi-major axis of the 95 percent confidence error ellipse for network accuracy determination for these standards.

———————

Appendix 2

Glossary

Cadastral Corner Measurements - The measurements used to define the location of Public Land Survey System (PLSS) corners and boundaries. Cadastral Corner Measurements are based on the Cadastral Project Control coordinates or direct ties to the National Spatial Reference System (NSRS).

Cadastral Project Control - A network or series of the GPS/GNSS of control points that are tied to the NSRS, which is created to control all subsequent GPS cadastral corner measurements. The Cadastral Project Control is adjusted independently of other cadastral measurements

Fully Constrained Least Squares Adjustment - For the purpose of this document, a least squares adjustment performed by holding the horizontal coordinates of all control points and a minimum of one vertical control coordinate fixed and allowing all other points to be adjusted.

Local Accuracy - A value that represents the uncertainty at the 95 percent confidence level in the coordinates of a measured point relative to the coordinates of other directly connected and adjacent points in the survey.

Minimally Constrained Least Squares Adjustment - For the purpose of this document, a least squares adjustment performed by holding the coordinates of one control point fixed and allowing all other points to be adjusted.

Network Accuracy - A value that represents the uncertainty in the coordinates of a measured point at the 95 percent confidence level relative to the NSRS as determined in the survey.

OPUS-RS - An internet-located positioning program developed and supported by the NGS. This program allows the user to submit 15 minutes to 2 hours of GPS data to NGS. NGS will then compute and return, via email, the calculated coordinates of the position.

OPUS-Static - An internet-located positioning program developed and supported by the NGS. This program allows the user to submit a minimum of 2 hours of GPS data to NGS. NGS will then compute and return, via email, the calculated coordinates of the position.

Appendix 3

CERTIFICATE OF APPROVAL AND ACCEPTANCE

These Standards for the Positional Accuracy of Cadastral Surveys When Using Global Navigation Satellite Systems have been properly vetted and, THEREFORE, are considered approved for use within the Bureau of Land Management when establishing or reestablishing boundaries, control networks, or other segregation lines necessary to meet realty needs.

_____

Donald A. Buhler
Surveyor General
Department of the Interior
Bureau of Land Management

Appendix E:

CAD Drawing Standards

CAD Drawing Standard

Revision Date:

[1/1/15]

I) BEGINNING A NEW DRAWING

A. Chugach Electric Prototype Drawing

An AutoCAD prototype drawing can be provided by CAD/GIS Services and is to be used when beginning a new drawing for all departments and all consulting firms.

The provided Prototype drawing will contain all of the standard Chugach Electric (Chugach) layers, line types, colors, blocks, settings, etc. When work is delivered to Chugach, the CAD drawing file, X-References, images, excel files, blocks and .ctb plot style files shall be included in the drawing package delivered to Chugach (if applicable, X-References shall be bound). The mask portion of any text masking shall be on its own layer, color yellow. **No yellow shall be used in the drawing with the exception of masking.**

II) DRAWING SETUP

The following are the standard defaults, unless otherwise defined within the prototype drawing:

A. Layers

BLOCK	GREEN, CONTINUOUS, ALL BLOCKS
DIM	BLUE, DIM. LINES & LEADERS
REV CLOUD	BLUE, CONTINUOUS, CLOUD
REV NUMBER	RED, CONTINUOUS, TRIANGLE
TBLOCK	BLUE, TITLE BLOCK
TBLOCK TEXT	BLACK/WHITE
TEXT	BLACK/WHITE, NOTES, ALL OTHER TEXT & TEXT WITH LEADER LINES
MASKING	YELLOW ALL MASKING SEPARATED FROM TEXT
VIEWPORT	COLOR 211, CONTINUOUS
AC	BLUE, CONTINUOUS, ALL AC CIRCUITS
CT	CYAN, CONTINUOUS, ALL CT CIRCUITS
DC	RED, CONTINUOUS, ALL DC CIRCUITS
PRIMARY	BLACK, 0.015" CONTINUOUS, ALL PRIMARY CIRCUITS & BUS WORK
PT	MAGENTA, CONTINUOUS, ALL PT CIRCUITS

B. Line Types

Name	*Description*	*Color*	*Line type*
CONT	CONTINUOUS	RED	CONTINUOUS
CONT-THK	.015 WIDE CONTINUOUS	WHITE	PLINE
HIDDEN	A,0.1,-0.15	CYAN	HIDDEN
DASH	,0.5,-0.15	CYAN	DASHED
CENTER	A,0.6,-0.1,0.1,-0.1	CYAN	CENTER
PHANTOM	A,0.5,-0.1,0.15,-0.1,0.15,-0.1	MAGENTA	PHANTOM
BLOCK	CONTINUOUS	GREEN	CONTINUOUS
AC	CONTINUOUS	BLUE	CONTINUOUS
CT	CONTINUOUS	CYAN	CONTINUOUS
DC	CONTINUOUS	RED	CONTINUOUS
PRIMARY	.015 WIDE CONTINUOUS	WHITE	CONTINUOUS
PT	.015 WIDE CONTINUOUS	MAGENTA	CONTINUOUS
TEXT	CONTINUOUS	WHITE	CONTINUOUS
DIM	CONTINUOUS	BLUE	CONTINUOUS
TBLOCK	CONTINUOUS	BLUE	CONTINUOUS
REV	.015 WIDE CONTINUOUS	BLUE	CONTINUOUS

B. Dimension Variables (DIM VARS) - Preset in prototype drawing

DIMASO	ON
DIMASZ	0.140
DIMCLRD	BLUE
DIMCLRE	BLUE
DIMCLRT	WHITE
DIMEXE	0.062
DIMEXO	0.062
DIMSCALE	1 = 1
DIMTEXT	0.1
DIMTXSTY	= SIMPLEX

C. Unit of Measurement

Units of Measure	Type = Decimal, Precision = 0.0000
Decimal Degrees	Type = Decimal Degrees, Precision = 0
Direction for East	East 3 o'clock = 0
Drawing Units	Inches

D. Text

All text	Upper case unless noted otherwise.
Primary headings	Roman T, 0.187; White
Subheadings	Simplex, 0.125; White
The word "NOTES:"	Simplex,.125; White
Remainder of text or notes	Simplex, 0.10; White
Masking portion of all text on its own layer	Color Yellow

E. Blocks

1. Create all blocks on layer 0, at a scale of 1 to 1. All blocks shall be inserted on the layer named “BLOCK”.
2. A set of blocks will be provided by Chugach.

***All contractor created blocks shall be furnished to Chugach.*

F. Spatial Standards

Drawings that are showing field facilities shall comply with the “*CAD /GIS Spatial Data Standards*” as appropriate. The minimum acceptable standard for a CAD drawing is incorporated below in AutoCAD. This coordinate standard can be assigned using the “AK83-4F” code:

Datum and Coordinate System

Name: NAD 1983 Alaska State Plane Zone 4 FIPS (Federal Information Processing Standards) 5004 (US Survey Feet)

Select “AK83-4F” from the Coordinate System Ribbon using the Assign button.

Please refer to the Survey Section of the “CAD /GIS Spatial Data Standards” for best practice when utilizing locations that can be surveyed.

III) ENDING A DRAWING

A. Ending Parameters

All drawings provided to Chugach shall be ended with the following parameters saved:

1. Purge all un-needed items.
2. Verify all x-refs and images are bound or included in package.
3. Before ending the drawing 'ZOOM EXTENTS'.
4. Text Style set to SIMPLEX.
5. Set plotter configuration to “NONE”.
6. Send Plot Style (.ctb file) with package.

IV) USE OF EXISTING AUTOCAD RECORD DRAWINGS WITHIN PROJECTS

Chugach currently uses AutoCAD Map 3D 2012. Chugach will not be responsibility to provide existing AutoCAD drawings in a release newer than AutoCAD Map 3D 2012. Chugach will accept drawings in formats of the most recent release and back to and including Autodesk 2006 applications.

V) USE OF EXISTING RASTERIZED RECORD DRAWINGS WITHIN PROJECTS

Existing rasterized record drawings are in CALS Group IV format with a .gp4 file extension. Edits to these drawings are to be made with AutoCAD using AutoCAD Map Raster Design 2012. All standards within this document, which can be used with raster files, shall be applied.

When the edit results in two files, keep both files (one file has the edits in vector format and the second file is the remaining raster portion of the original drawing as a hybrid file). Chugach will decide whether to redraw the remaining raster portion after a project is “as-built”.

VI) CHANGES TO THE DRAWINGS

See Attachment A for an example of where information from sections VI A-D is to be provided.

A. Design/Construction/As Built Revisions

1. The bottom left corner of the drawing has a "Revision" area. This revision area is used during DESIGN, CONSTRUCTION, and AS BUILT process only. When changes are made to the drawing during the DESIGN phase, capitalized alpha revisions are entered into the revision area, (see Table 1).

Table 1

NO.	DESIGN/CONSTRUCTION/AS BUILT REVISION	DWN. BY/DATE	REVIEWED MGR/SUPV/DATE	APPROVED DIRECTOR/DATE
A	PRELIMINARY DESIGN - TO ADD 75 MVA XFMR	D&L/3-3-12	RF/3-3-12	JDS/3-3-12
B	FINAL DESIGN	D&L/4-2-12	SW/4-9-12	JDS/4-10-12
C	IN-HOUSE REVIEW	SW/5-1-12	SW/5-4-12	JDS/5-5-12

2. Editing of a markup drawing being passed back and forth between the edit originator and a Chugach CAD/GIS Operator does not constitute a new revision in the revision block. The date above the drawing title block (far right corner) shall be updated each time an edited drawing is plotted and passed from the Chugach CAD/GIS Operator back to the edit originator.

3. When the DESIGN has been approved for bidding/construction, all alpha revisions are removed. Revision 0 ISSUED FOR CONSTRUCTION is placed in the revision area. Any addendums shall be numbered 0-1, 0-2, etc., with the addendum number and a brief description in the comments area. Any change orders shall be continued in consecutive order 0-3, 0-4, etc., with the change order number and a brief description in the comments area. "As builting" by various entities shall also follow numerically in sequence, 0-5, 0-6, etc. with a description of the entity and/or extent of the As Built (see Table 2).

Table 2

NO.	DESIGN/CONSTRUCTION/AS BUILT REVISION	DWN. BY/DATE	REVIEWED MGR/SUPV/DATE	APPROVED DIRECTOR/DATE
0	ISSUED FOR CONSTRUCTION	PA/5-12-11	SW/5-15-11	JDS/5-16-11
0-1	ADDENDUM #1	RF/6-1-12	SW/6-3-12	JDS/6-5-12
0-2	CHANGE PER ICOR #444	GC/7-15-12	RF/7/16/12	JDS/7-16-12
0-3	CHANGE PER ICOR #446	GC/8-1-12	RF/8-4-12	JDS/8/10/12
0-4	AS BUILT BY CONSTRUCTION CONTRACTOR	D&L/9-15-12	SW/9-20-12	JDS/9-20-12
0-5	AS BUILT BY ARELAY SHOP≅	TH/10-15-12	RF/10-30-12	JDS/11/1/12
0-6	AS BUILT BY AOPS≅	GH/12-1-12	AL/12-15-12	JDS/12/15/12

4. If there is a handwritten signature or initials in the various columns of the revision block on the marked up original, the drafter shall add them to the electronic file, i.e. the name or initials and the date.
5. If a signed and dated certification stamp is placed on the drawing, a note that describes the certification shall be added to the notes area within the body of the drawing. Examples: A.) Design certified for construction by (first name, middle initial, last name), (license number), (firm worked for), (date on stamp). B.) Design certified for mfg./fabrication by first name, middle initial, last name), (license number), (firm worked for), (date on stamp). C.) "As-built" certified by first name, middle initial, last name), (license number), (firm worked for), (date on stamp).
6. When the CONSTRUCTION and AS-BUILT phases are complete, **all** revisions are deleted from the bottom left revision area and a summary revision shall be place in the "Record Revision" area (see table 3, rev. 3).

B. Record Revisions

1. All record drawing revisions shall be entered under 'Record Revision' in the title block. All new revisions will be entered in numerical sequence starting at the top and working down through all revision lines, (see Table 3).
2. The Project Engineer will submit signed "AS-BUILT" drawings for Record Revision. Typically, the Project Description will be used as the revision description, unless otherwise noted by the Project Engineer. The drafter shall type in the date and name or initials as provided by the Project Engineer in the appropriate areas and add a new revision accordingly, to include a work order number and when available the Work Plan Number.

Table 3

NO.	RECORD REVISION	TECH / DWN. BY	WP#	WO# APPROVED	RECORD APPROVED	DATE
1	AS-BUILT - CONTRACTOR	D&L		E1120378	JDS	04/14/10
2	DRAWN TO CAD - CONTRACTOR	D&L			JDS	09/4/10
3	ADD NEW TRANSFORMER	HP/EK/2-11	1001.345EN	E0920050	SW	03/14/11
4	ADD 2-1 TIME DELAY	MT/LP/8-11		E0920050	SW	09/1/11
5	AB-BUILT PER SHAWN WENDLING	GC		E1120376	SW	1/13/13

3. Once the revision block is filled, the oldest revision will be dropped and all revisions moved up to make room for the new revision (Table 4).

Table 4

NO.	RECORD REVISION	TECH/ DWN BY	WP#	W.O. APPROVED	RECORD APPROVED	DATE
2	DRAWN TO CAD - CONTRACTOR	D&L			DG	09/8/01
3	INSTALLED NEW TRANSFORMER	HP/EK/2-18-04	1001.345EN	E0412365	SW	03/4/04
4	INSTALLED 2-1 TIME DELAY	MT/LP/6-18-04		E0412365	SW	09/16/04
5	AS-BUILT PER SHAWN WENDLING	GC			JDS	11/1/04
6	SWEC - GROUND GRID RELOCATED	D&L/7-16-10		E0913412	RF	08/10/10
7	AS –BUILT PER RYAN FREY	GC		E1016222	RF	12/14/10

4. The Standard As-built Drawing Colors:

RED	CHANGE
GREEN	DELETE
BLUE	ADD

C. Clouds (around revised areas on the drawings)

1. New drawings: When the “AS-BUILT” process is complete and the record revision (revision number 1) block is completed, all clouds shall be removed from new Chugach drawings.
2. Existing record drawings: When an existing record drawing is changed as part of the DESIGN/CONSTRUCTION/AS-BUILT process during a project, the drawing shall have the revised areas clouded. The previous record revision cloud shall be removed from the drawing at the beginning of the DESIGN phase; however the triangle and record revision number shall stay on the drawing. During the DESIGN stage all revisions to the record drawing shall be kept on the drawing with a triangle and corresponding capitalized alpha revision. When a drawing moves to “Issued for Construction” (revision 0), all capitalized alpha characters within triangles shall be change to a 0 (zero).
3. When the revision block area of the drawing becomes full, the earliest (top) revision shall be deleted. The triangle on the drawing which corresponds to that revision shall be removed, (see table 4).

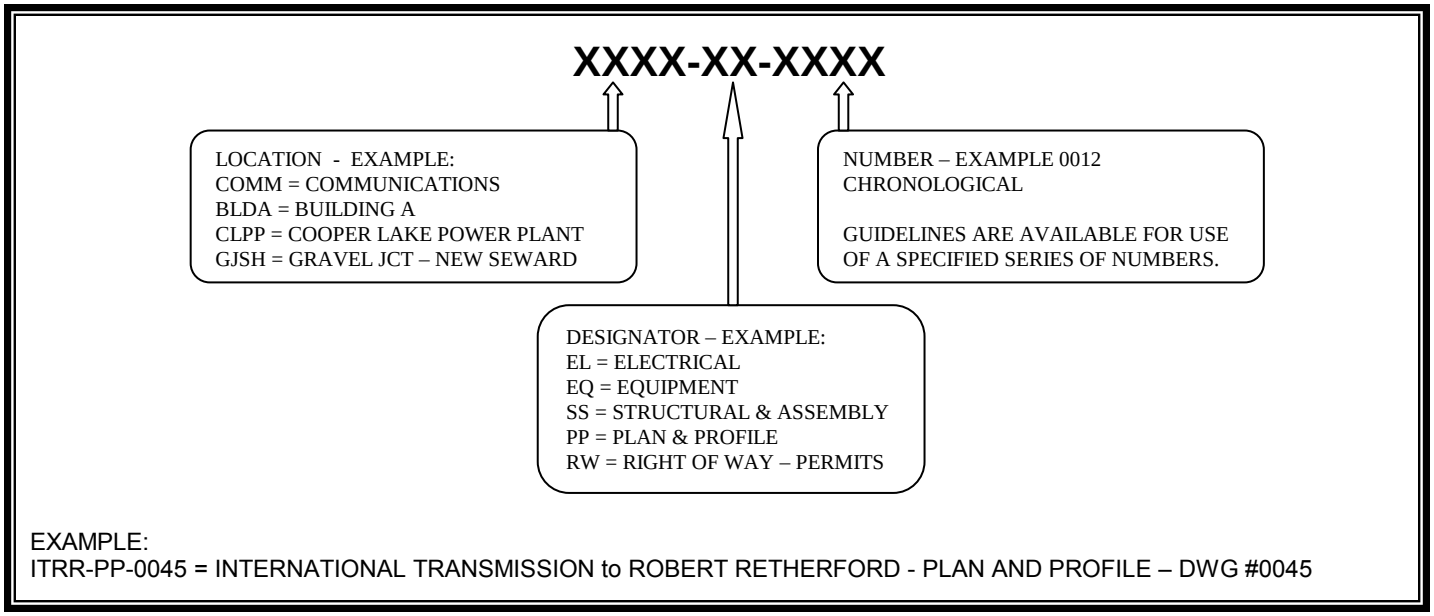
VII) SUBMITTING THE FINAL DRAWINGS/PROJECT TO CHUGACH ELECTRIC

1. Each CAD project shall be submitted in version from AutoCAD 2012 through the current release of AutoCAD.
2. Documentation shall be provided listing new layers and blocks created during the project with a brief description of each.
3. An electronic copy shall be provided to Chugach containing the CAD file, all x-references, all images, world files, excel files, blocks and .ctb Plot Styles used and/or created during the project.

4. Projects that use a single electronic CAD file with multiple layout tabs as sheets in the set of drawings shall be limited to those that require match-lines, i.e. transmission line plan and profile sheets. X-referenced drawing shall be used on projects that have separate sheets for various layers within the project; examples would be substations with sheets for the ground grid, foundations, equipment, outlines, conduit, buildings, etc. All X-References shall be bound to the drawing and an electronic file containing the X-Reference shall be provided to Chugach.
5. Reference the current version of the U.S. National CAD Standard for Architecture, Engineering, & Construction for any standards not specifically addressed within this document.

VIII) DRAWING NUMBERING

1. Drawing Numbers shall be issued for **SUBSTATIONS**, **TRANSMISSION LINES, SUBMARINE CABLES, POWER PLANTS AND HEADQUARTER BUILDINGS** by Chugach CAD/GIS Services Staff via the responsible Chugach Project Engineer using the following format:



2. Chugach's CAD/GIS Services is the SOLE SOURCE provider of drawing numbers. There are NO EXCEPTIONS to this numbering process. All numbers shall be distributed by Chugach's CAD/GIS Services staff.

IX) DRAWING NUMBER – PREVIOUS/REFERENCE

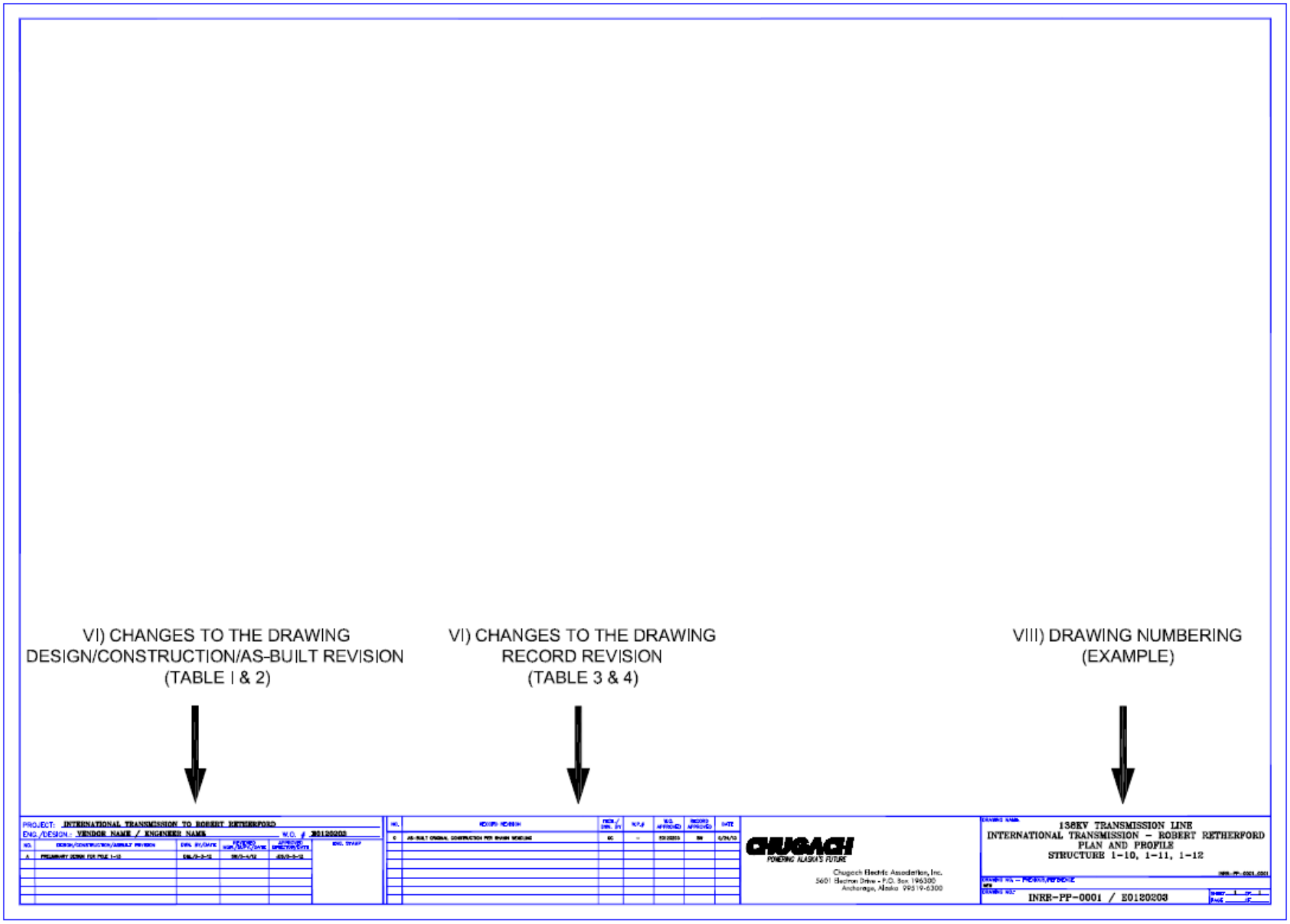
The Drawing Number area of the drawing's title block is to be completed for each drawing (see Attachment A). The following choices are available:

1. **New** – Include the word "NEW" and date when the drawing is new.
2. **Previous-Reference - Drawing Number** if the drawing is being re-numbered. Often a manufacture's number, an A/E firm's project numbers, or an old Chugach record drawing number are placed here when the drawing is renumbered per Chugach's standard numbering scheme.

X) Large Project Schema for Meridian Import via Excel Spreadsheet

1. When an AS-BUILT project will result in the need to mass import a large number of CAD drawings, the editing contractor shall request from the Project Engineer an Excel spreadsheet provided by CAD/GIS Services for importing the drawings into Meridian in mass.

Attachment A



Appendix F

ADOT Installation Authorization

Christian Vierhuff

From: Freese, David A (DOT) <david.freese@alaska.gov>
Sent: Tuesday, June 20, 2017 9:51 AM
To: Christian Vierhuff; Jon Sinclair; Jarrett Boling
Cc: Phillips, John C (DOT)
Subject: O'Malley Road Permitting for permanent lines

*****EXTERNAL EMAIL******

Christian – from our phone conversation today, we permit the permanent lines after the agreement has been completed and as builts have been submitted to the Department. Please include this in your bid documents however you see fit.

Thanks

David

Appendix G:

D.C. Hi-Pot Test / Cable Pulling Data

D.C. High Potential Test

Customer: _____ Date:_____
Location: _____
Feeder or Cable No._____ Size: _____ Rating _____ Length: _____
Date Installed: _____ Number of Splices: _____
Termination - Test End: _____ Opposite End: _____
Weather: _____ Temperature: _____ Humidity: _____
System Voltage: _____ kV _____ Delta _____ Wye Grounded _____ Ungrounded:____
Tested By: _____ Test Set:_____
Test kV: _____ Factory: _____ Acceptance: _____ Proof:_____

	A Phase (µA)	B Phase (µA)	C Phase (µA)	History & Remarks
_____Seconds up to_____kV				
_____Seconds up to_____kV				
_____Seconds up to_____kV				
_____Seconds up to_____kV				
_____Seconds up to_____kV				
_____Seconds up to_____kV				
_____Seconds up to_____kV				
_____Seconds up to_____kV				
Hold Test for ____ minutes. Leakage Current				
½ min. – 1 min.	/			
1 ½ min – 2 min.	/			
3 min.				
4 min.				
5 min.				
6 min.				
7 min.				
8 min.				
9 min.				
10 min.				
11 min.				
12 min.				
13 min.				
14 min.				
15 min.				
Decsv Voltage 2 min.				
Decsv Voltage 1 min.				

CABLE PULLING DATA

Date:____________________ Project:______________________________

Contractor:____________________________ Foreman:____________________________

Chugach Representative: ____

Cable Circuit:________________________ Phase:______________________________

Cable Size:__________________________ Cable Manufacturer:__________________

Pull Direction

From:_______________________________ To:________________________________

Cable Lubricant:______________________ Maximum Recorded Tension:_________#

Cable Circuit:________________________ Phase:______________________________

Cable Size:__________________________ Cable Manufacturer:__________________

Pull Direction

From:_______________________________ To:________________________________

Cable Lubricant:______________________ Maximum Recorded Tension:_________#

Cable Circuit:________________________ Phase:______________________________

Cable Size:__________________________ Cable Manufacturer:__________________

Pull Direction

From:_______________________________ To:________________________________

Cable Lubricant:______________________ Maximum Recorded Tension:_________#

________________________________ ________________________________

Chugach Representative Contractor

APPENDIX H – SWPPP 3rd Party Certification

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

SWPPP SUBCONTRACTOR CERTIFICATION

Project Name:	O'Malley Road Reconstruction: Ph. 1 Seward Highway to Livingston St.
Project Number:	Z538040000
Project Location:	Anchorage, AK
Operator(s):	DOT&PF and QAP

As a subcontractor, you are required to comply with the Construction General Permit (CGP) and the conditions of the Stormwater Pollution Prevention Plan (SWPPP), for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the site or other location easily accessible during normal business hours CGP 5.10.3.1.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____ Telephone Number: _____

_____

Type of Construction Service Provided:

Printed Name: _____

Title: _____

Signature: _____

Date: _____

Appendix I

HSE Checklist

SUGGESTED CONTRACTOR HSE PLAN WORK SHEET AND CHECKLIST

WORK HAZARD ASSESSMENT AND MITIGATION PLAN

1. _____ Have you reviewed the project Work scope and analyzed it for potential hazards such as confined space entry, excavations, falls, electrical safety, and other OSHA recognized hazards?

2. _____ Have you included a written assessment of the hazards from question 1 that includes a list of them and discusses how you will handle each of them**? (Your response for handling them can be to list your existing appropriate procedure.)**

3. _____ Have you reviewed Chugach Electric Association Procedure 10.5, Confined Space Entry?

MSDS INFORMATION

1. _____ Will you be using or creating chemicals that must have Material Safety Data Sheets on them?

2. _____ If you answered "yes" to question 1, have you provided a separate list of those chemicals with your bid?

3. _____ Have you reviewed the requirements of Chugach Electric Association Safety Procedure 7.3, Hazard Communications?

ENERGY ISOLATION PROCEDURE/PLAN

1. _____ Have you reviewed the project Work scope to determine from the scope the need for energy isolation (lockout/tagout)?

2. _____ If you answered "yes" to question 1, do you have a written energy isolation procedure?

3. _____ Have you attached a copy of the procedure?

PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. _____ Have you reviewed the project Work scope to determine the type of PPE you are required to provide for your crew, and included a list of it with your HSE?

2. _____ If the project Work is located at Chugach's Beluga generating plant, have you reviewed Chugach Electric Association Procedure 11.7, Visitor Checklist?

EMERGENCY RESPONSE PLAN

1. _____ Have you reviewed the project Work scope to determine from the scope the types of emergencies that may be reasonably anticipated due to the work tasks or work location**? (This can include such topics as First Aid, emergency evacuation, fire hazard, etc.)**

2. _____ Based on your review, have you included a list or discussion of your response plan for those emergencies? **(Make sure you consider existing conditions such as weather, remote location, and existing resources in developing your plans.)**

HAZARDOUS MATERIAL/HAZARDOUS WASTE MITIGATION and RESPONSE PLAN

1. _____ Have you reviewed the project Work scope to determine the type of hazardous material you may be handling, and the type of hazardous waste your operation may generate?

2. _____ Have you included a discussion of your plan for safely handling and disposing of these materials and wastes?

3. _____ Have you included a discussion of your response plan in case of a release?

Appendix J:

W.O. E1613652 – DOT Load Centers

In Design

BIDSHEET

for

PROJECT : E1613652
O'MALLEY RD PH II - 1Ø LOAD CENTERS

Work Request: E1613652
Design No.: 3.O'MALLEY RD PH-1- 1Ø LOAD CENTER
Capital Account: 10720/000/03/7665
Reimbursible Account: / / /
Retirement Account: 10880/326/03/7665
Work Plan No:
Project Type: Other

Reviewed by Designer/Project Engineer: SM Date: 6/30/16
Sue Mattson

Reviewed by Supervisor/Manager: _____ Date: _____
Supervisor

Remarks:

ASSEMBLY UNITS BID SHEET

In Design

Project: E1613652 Contractor: _____

O'MALLEY RD PH II - 1Ø LOAD CENTERS

	Assembly Unit	Proposed Quantity	Actual Quantity	Labor	Material	Labor & Material	Extended Labor & Material
	1/0 CONC	0.590					
	2 RIBB Service	0.115					
	CLEAN CNDT	0.270					
	MANHOURS	27.000					
	RAISE PAD	1.000					
	SHUR2-3	0.035					
	SHUR2-5	0.050					
	STAG-2	3.000					
	SUG6-25	2.000					
	SUM1	2.000					
	SUM5012H	0.435					
	SUM5024H	0.270					
	SUM6-10	1.000					
	SUM6-1C 1 PH	3.000					
	SUME290S3	3.000					
	SUME445S4	2.000					
	SUME490F3	2.000					
	SUR2-3	0.080					
	SUR2-5	0.250					
*	STAG-2	3.000					
*	SUM6-10	1.000					
*	SUM6-1C 1 PH	1.000					
*	4/0 RIBB	0.090					

Total Extended Labor & Material This Page _____

Total Extended Labor & Material Previous Page _____

Total Extended Labor & Material _____

In Design

STAKING SHEET

for

PROJECT: E1613652

O'MALLEY RD PH II - 1Ø LOAD CENTERS

Work Request:	**E1613652**
Design:	**3.O'MALLEY RD PH-1- 1Ø LOAD CENTER**
Capital Account:	**10720/000/03/7665**
Reimbursible Account:	/ / /
Retirement Account:	**10880/326/03/7665**
Work Plan No:	
Project Type:	**Other**

Reviewed by Designer/Project Engineer: SM Sue Mattson Date: 6/30/16

Reviewed by Supervisor/Manager: _____ Supervisor Date: _____

Remarks:

Chugach Electric Association
5601 Minnesota Drive
Anchorage, Alaska

Designer SM Date 6/30/16

Checker _____ Date ___/___/___

Manager _____ Date ___/___/___

Project: E1613652 **Design: 3.O'MALLEY RD PH-1- 1Ø LOAD CENTER** **In Design**

O'MALLEY RD PH II - 1Ø LOAD CENTERS **Grid:**

Structure: **01. JB 1**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
MANHOURS	**Install**	0	8	MANHOURS (MANHOUR OF LABOR)		
RAISE PAD	**Install**	0	1	RAISE PAD (RAISE EXISTING PAD)		
SUM6-1C 1 PH	**Install**	0	1	SUM6-1C (1/0 LB ELBOW TERMINATION-15KV)		
SUME490F3	**Install**	1	2	SUME490F3 (4" FG 90 36")		
SUM6-10	*Remove*	0	1	SUM6-10 (200A BUSHING CAP)		

Remarks: RAISE AND LEVEL EXISTING J BOX PAD

GENERAL: TYPICAL THRU INSTALLATION OF LC A, B & C .

CEA CONTRACTOR WILL WORK UNDER THE DOT SWWP AND TRAFFIC CONTROL . DOT WILL BE RESPONSIBLE FOR LANDSCAPING.

MANHOURS TO BE USED AT THE INSPECTORS DISCRETION

EXTEND THE 2-4" HDPE INTO JB 1

Structure: **02. PM 6397**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
1/0 CONC	**Install**	1	270	1/0 CONC Wire (1/0 CONCENTRIC PRIMARY)		
SHUR2-5	**Install**	0	30	SHUR2-5 (PRIMARY TRENCH HAND -DIG)		
SUG6-25	**Install**	0	1	SUG6-25 (XFMR, PM, 25 KVA, 1 PH, RADIAL)		
SUM1	**Install**	0	1	SUM1 (CONCRETE PAD 1 PH XFMR)		
SUM5012H	**Install**	0	270	SUM5012H - Conduit ((1) 2" HDPE CONDUIT)		
SUM5024H	**Install**	0	270	SUM5024H - Conduit ((2) 4" HDPE CONDUIT)		
SUM6-1C 1 PH	**Install**	0	1	SUM6-1C (1/0 LB ELBOW TERMINATION-15KV)		
SUME445S4	**Install**	0	2	SUME445S4 (4" RSC 45 48")		
SUR2-5	**Install**	0	240	SUR2-5 (PRIMARY TRENCH)		

Remarks: STOP THE 2-4" EMPTY AT THE NORTH SIDE OF PM 6397

SUME445S4 HORIZONTAL BEND EAST SIDE

Structure: **03. LC-TS"A"120/240**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
2 RIBB Service	**Install**	1	50	2 RIBB Wire Service (#2 3-WIRE SERVICE)		
SHUR2-3	**Install**	0	15	SHUR2-3 (SECONDARY TRENCH - HAND DIG)		
SUM5012H	**Install**	0	50	SUM5012H - Conduit ((1) 2" HDPE CONDUIT)		
SUR2-3	**Install**	0	35	SUR2-3 (SECONDARY TRENCH)		

Remarks:

Structure: **04. LC-TS"B" 240/480**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
2 RIBB Service	**Install**	1	50	2 RIBB Wire Service (#2 3-WIRE SERVICE)		
SHUR2-3	**Install**	0	20	SHUR2-3 (SECONDARY TRENCH - HAND DIG)		
SUM5012H	**Install**	0	50	SUM5012H - Conduit ((1) 2" HDPE CONDUIT)		
SUR2-3	**Install**	0	30	SUR2-3 (SECONDARY TRENCH)		

Remarks:

Structure: **05. PM 0205**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
MANHOURS	**Install**	0	2	MANHOURS (MANHOUR OF LABOR)		

Remarks: MANHOURS AT THE INSPECTORS DISCRETION

Structure: **06. EXIST L.C.**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
4/0 RIBB Secondary	Abandon	1	90	4/0 3-WIRE SECONDARY		

Remarks:

Structure: **07. PM 4104**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
SUM6-10	**Install**	0	1	SUM6-10 (200A BUSHING CAP)		
SUM6-1C 1 PH	*Remove*	0	1	SUM6-1C (1/0 LB ELBOW TERMINATION-15KV)		

Chugach Electric Association
5601 Minnesota Drive
Anchorage, Alaska

Designer/Project Engineer _____ Date ___/___/___
Checker _____ Date ___/___/___
Manager/Supervisor _____ Date ___/___/___

Project: E1613652 **Design: 3.O'MALLEY RD PH-1- 1Ø LOAD CENTER** **In Design**

O'MALLEY RD PH II - 1Ø LOAD CENTERS **Grid:**

Remarks:

Structure: **08. PM 3003**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
1/0 CONC	**Install**	1	320	1/0 CONC Wire (1/0 CONCENTRIC PRIMARY)		
CLEAN CNDT	**Install**	0	270	CLEAN CNDT (MANDREL & SWAB)		
MANHOURS	**Install**	0	8	MANHOURS (MANHOUR OF LABOR)		
SHUR2-5	**Install**	0	20	SHUR2-5 (PRIMARY TRENCH HAND -DIG)		
SUG6-25	**Install**	0	1	SUG6-25 (XFMR, PM, 25 KVA, 1 PH, RADIAL)		
SUM1	**Install**	0	1	SUM1 (CONCRETE PAD 1 PH XFMR)		
SUM5012H	**Install**	0	50	SUM5012H - Conduit ((1) 2" HDPE CONDUIT)		
SUM6-1C 1 PH	**Install**	0	1	SUM6-1C (1/0 LB ELBOW TERMINATION-15KV)		
SUME290S3	**Install**	0	3	SUME290S3 (2" RSC 90 36")		
SUR2-5	**Install**	0	10	SUR2-5 (PRIMARY TRENCH)		

Remarks: MANHOURS: INTERCEPT EXISTING HDPE TWO LOCATIONS. PERFORM HDPE SPLICES. INSPECTORS DISCRETION

THREE (3) 90 DEG. 2" GRC CONDUIT ELBOWS FOR USE AT THE SPLICE POINTS AS NEEDED

Structure: **09. LC-LU"C" 240/480**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
2 RIBB Service	**Install**	1	15	2 RIBB Wire Service (#2 3-WIRE SERVICE)		
SUM5012H	**Install**	0	15	SUM5012H - Conduit ((1) 2" HDPE CONDUIT)		
SUR2-3	**Install**	0	15	SUR2-3 (SECONDARY TRENCH)		

Remarks:

Structure: **10. VAULT N4**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
MANHOURS	**Install**	0	8	MANHOURS (MANHOUR OF LABOR)		
STAG-2	**Install**	0	2	STAG-2 (PRIMARY CABLE TAG)		
STAG-2	*Remove*	0	2	STAG-2 (PRIMARY CABLE TAG)		

Remarks: MANHOURS: ACCESS VAULT, DEWATER VAULT IF NECESSARY,

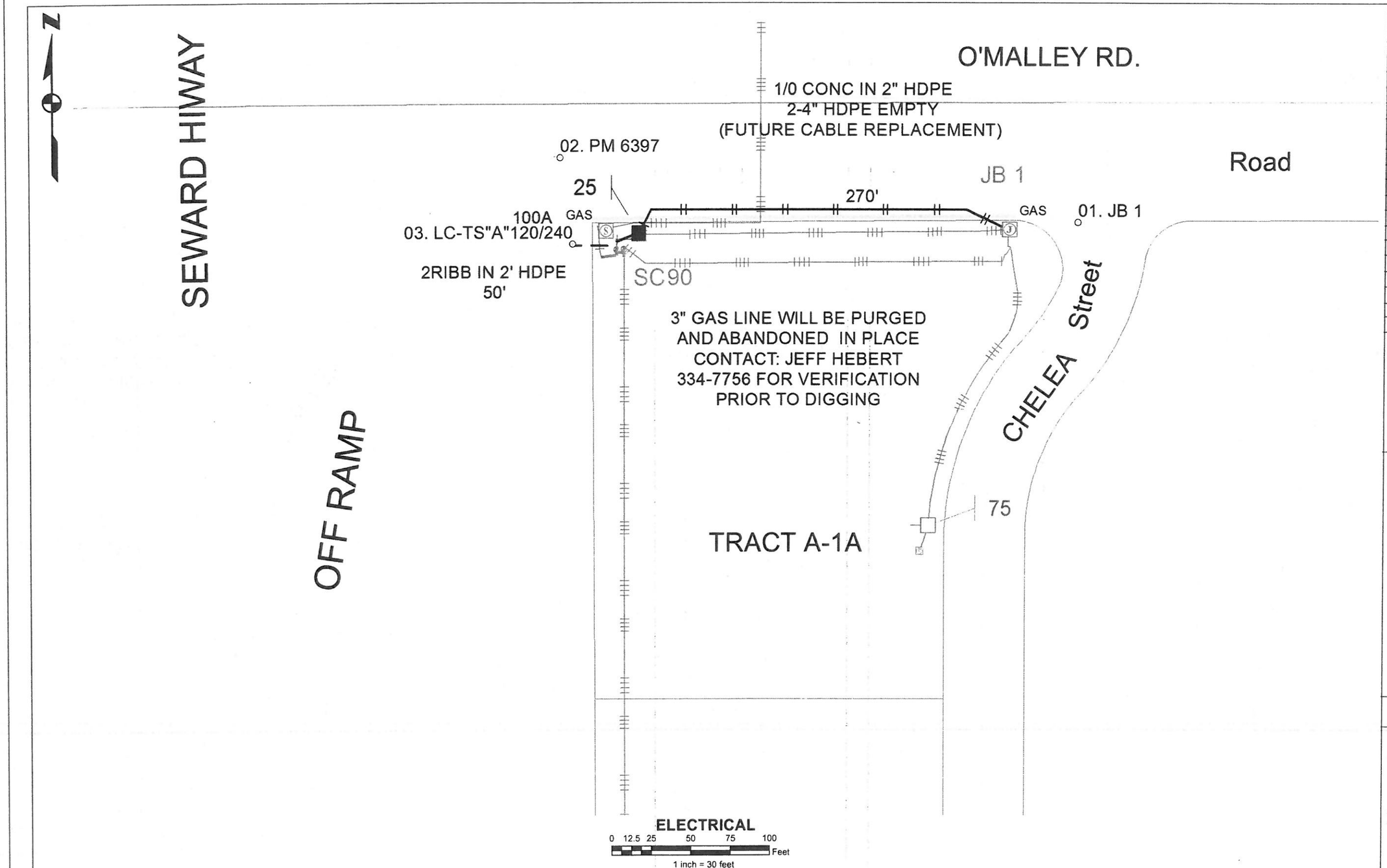
RETAG EMPTY CONDUIT THAT PREVIOUSLY RAN TO PM 4104 AS "ABANDONED"

RETAG EMPTY CONDUIT THAT PREVIOUSLY RAN TO SC 914 AS "ABANDONED"

Structure: **11. SC 914**

Assembly Unit	Activity	#Cond	Qty	Unit Description	Complete	Qty
MANHOURS	**Install**	0	1	MANHOURS (MANHOUR OF LABOR)		
STAG-2	**Install**	0	1	STAG-2 (PRIMARY CABLE TAG)		
STAG-2	*Remove*	0	1	STAG-2 (PRIMARY CABLE TAG)		

Remarks: RETIRE 2" EMPTY CONDUIT TAG " TO PM 4104"
RETAG SAME "TO PM 3003"



3" GAS LINE WILL BE PURGED AND ABANDONED IN PLACE
CONTACT: JEFF HEBERT
334-7756 FOR VERIFICATION
PRIOR TO DIGGING

POLE CONTACT RECORD

LOCATION	TEL	CATV

Manuf.
Manuf. Date
Volt Rating
Insul. Type
Insul. Size
Cond. Size/Type
Quantity in Feet

Manuf.
Manuf. Date
Volt Rating
Insul. Type
Insul. Size
Cond. Size/Type
Quantity in Feet

Manuf.
Manuf. Date
Volt Rating
Insul. Type
Insul. Size
Cond. Size/Type
Quantity in Feet

Manuf.
Manuf. Date
Volt Rating
Insul. Type
Insul. Size
Cond. Size/Type
Quantity in Feet

INITIAL/DATE________

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

New		Existing
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
✳	STREET LIGHT	✳
▪	WARNING POST	▫
—+—	1Ø UG PRI CONDUCTOR	—+—
——	3Ø UG PRI CONDUCTOR	——
- - - -	UG SECONDARY CONDUCTOR	- - - -
········	UG STREET LIGHT CONDUCTOR	········
- · - ·	1Ø OH CONDUCTOR	- · - ·
—·—·—	3Ø OH CONDUCTOR	—·—·—
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
≡	CONDUIT W/ CONDUCTOR	≡
S	SWITCH CABINET	S

R.O.W LEGEND

— — — — R.O.W LINE
— - — - — CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.

PROJECT: SOA L.C. CENTERS 1ØUG LINE EXT. & TRANSFORMER INSTALL

ENGINEER / SMATTS

W.O. # 2696 E1613652

NO.	DESIGN / CONSTRUCTION / ASBUILT REVISION	DWN. BY / DATE	REVIEWED MGR./SUPV./ DATE	APPROVED DIRECTOR / DATE
0	ISSUED FOR CONSTRUCTION	6/29/16	5/17	5/25/17

ENGINEERING STAMP

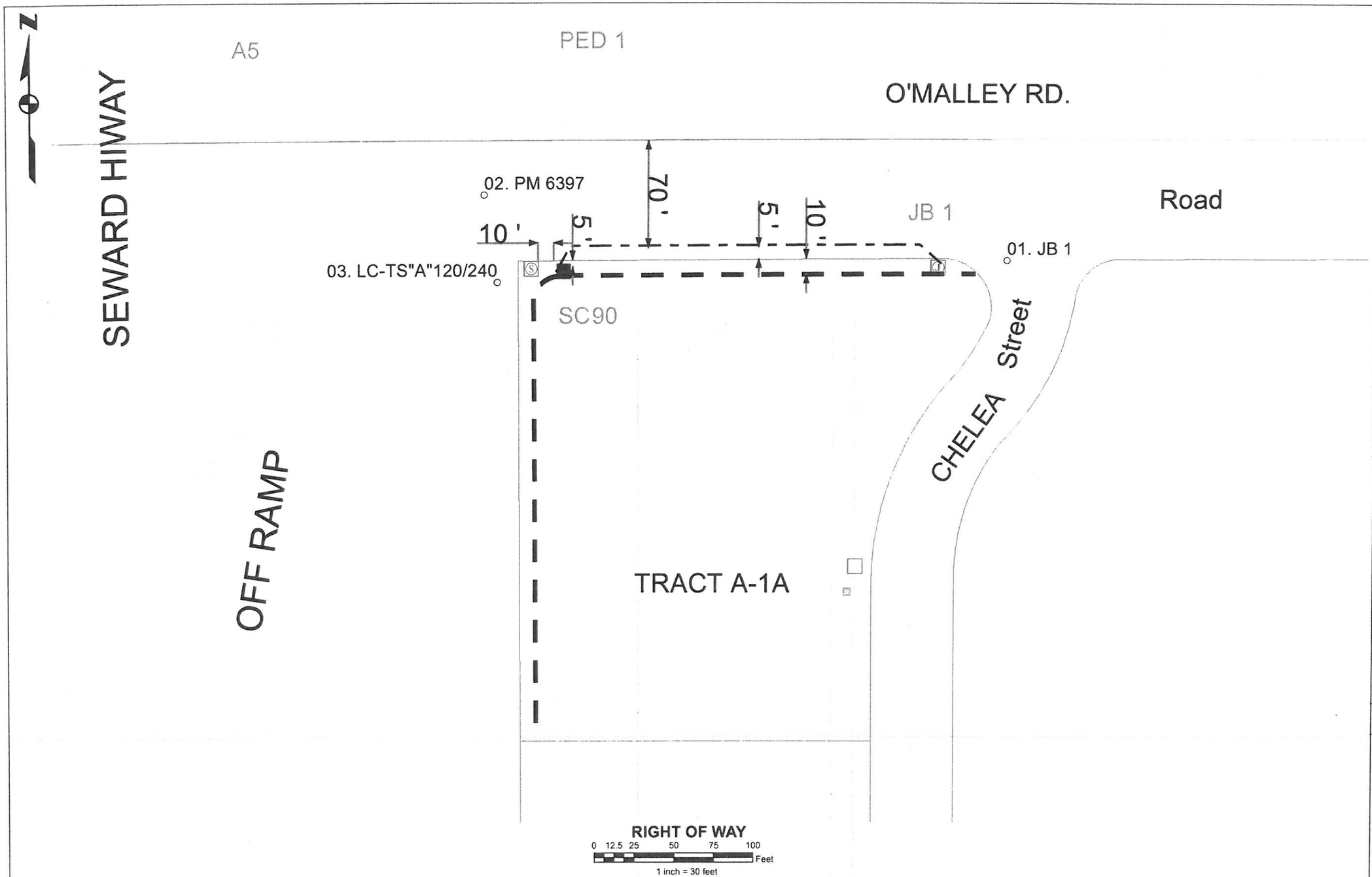
CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:
E1613652
SOA LOAD CENTER "A", "B" & "C"
1Ø UG LINE EXT & TRANSFORMER INSTALL
GRIDS: 2634, 2533, 2534
MAPS: 1203-17D, 16C, 20B
FEEDERS: KLSS 412, HN 612

W.O. NUMBER: 2696 E1613652

SHT. 5 OF 11



POLE CONTACT RECORD		
LOCATION	TEL	CATV

Manuf. ____
Manuf. Date ____
Volt Rating ____
Insul. Type ____
Insul. Size ____
Cond. Size/Type ____
Quantity in Feet ____

INITIAL/DATE____

CALL BEFORE YOU DIG!

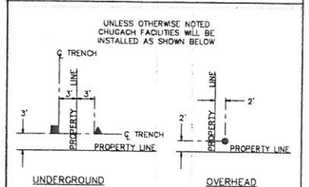
LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334
	552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

New		Existing
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
✳	STREET LIGHT	✳
▪	WARNING POST	▫
	1 Ø UG PRI CONDUCTOR	
	3 Ø UG PRI CONDUCTOR	
	UG SECONDARY CONDUCTOR	
	UG STREET LIGHT CONDUCTOR	
	1 Ø OH CONDUCTOR	
	3 Ø OH CONDUCTOR	
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
	SPARE CONDUIT	
	CONDUIT W/ CONDUCTOR	
S	SWITCH CABINET	S

R.O.W LEGEND
R.O.W LINE
CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW



Typical Staking
N.T.S.

PROJECT: SOA L.C. CENTERS 1ØUG LINE EXT. & TRANSFORMER INSTALL
ENGINEER / SMATTS

W.O. # 2696 E1613652

NO.	DESIGN / CONSTRUCTION / ASBUILT REVISION	DWN. BY / DATE	REVIEWED MGR./SUPV./ DATE	APPROVED DIRECTOR / DATE
0	ISSUED FOR CONSTRUCTION	6/29/16	5/17/17	SHD 5/25/17

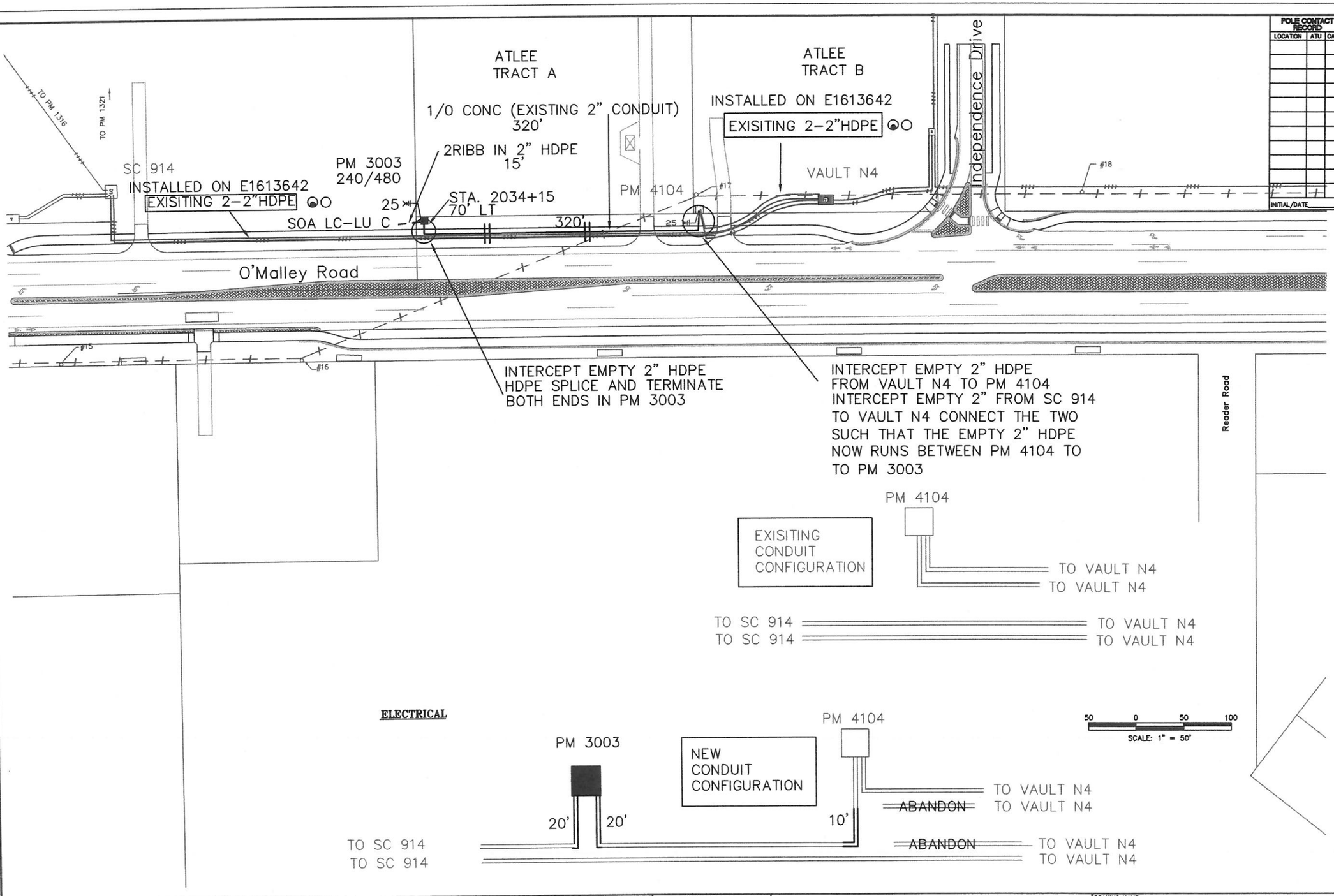
ENGINEERING STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME: E1613652
SOA LOAD CENTER "A", "B" & "C"
1Ø UG LINE EXT & TRANSFORMER INSTALL
GRIDS: 2434, 2633, 2634
MAPS: 1203-17D, 16C, 20B
FEEDERS: KLSS 412, HN 612

W.O. NUMBER: 2696 E1613652



POLE CONTACT RECORD

LOCATION	ATU	CATV

INITIAL/DATE

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity In Feet	Quantity In Feet
Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity In Feet	Quantity In Feet

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)
ANCHORAGE AREA..... 278-3121
STATEWIDE..... 800-478-3121
AT&T ALASCOM INC. 264-8465
ALASKA RAILROAD UTILITIES..... 265-2457
ALYESKA CABLE TV (GIRDWOOD)..... 783-2982
KULIS AIR BASE..... 249-1499
MILITARY PETROLEUM FUEL LINES..... 552-2334
OR 552-5342
STATE STORM DRAINS & STREET LIGHTS..... 333-2411

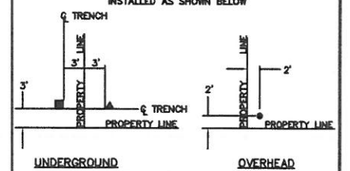
CONSTRUCTION LEGEND

NEW		EXISTING
	PADMOUNT TRANSFORMER	
	PEDESTAL	
	POWER POLE	
	STREET LIGHT	
	WARNING POST	
	1ø U.G. PRI. CONDUCTOR	
	3ø U.G. PRI. CONDUCTOR	
	U.G. SECONDARY CONDUCT.	
	U.G. STREET LIGHT CONDUCT.	
	1ø O.H. CONDUCTOR	
	3ø O.H. CONDUCTOR	
J	JUNCTION BOX	J
	SPLICE POINT	
	SPARE CONDUIT	
	CONDUIT W/ CONDUCTOR	
S	SWITCH CABINET	S

R.O.W. LEGEND

R.O.W. LINE
CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW



UNDERGROUND OVERHEAD

Typical Staking
N.T.S.

ELECTRICAL

PROJECT: O'MALLEY PHASE 1 L.C. (LC "C") SOA
DESIGNER/PROJECT ENGINEER: SMATTSON
W.O. #: E1613652

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	6/29/16	5/17	5/25/17

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

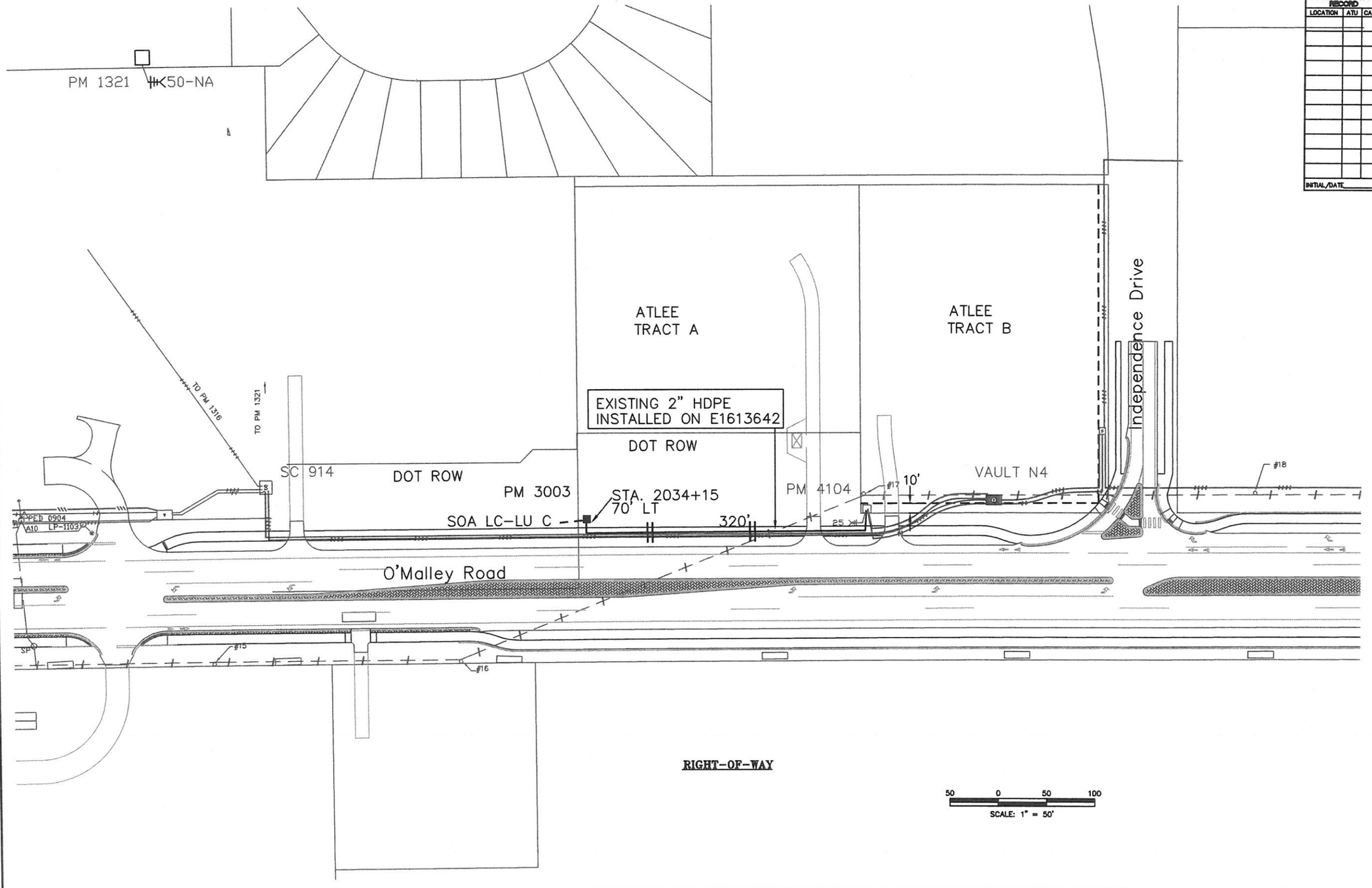
DRAWING NAME:

O'MALLEY L.C.- LU "C" SOA
GRID: 2632, 2533, 2534
MAP: 1203-20B, 1203-17D, 1203-16C
FEEDER: HN 612

J:design\e16\13652\load center 3 drawing.dwg

W.O. NO.:
C.W.P. REF. NO.: E1613652

SHEET 7 OF 11



POLE CONTACT RECORD		
LOCATION	ATU	CATV
INITIAL/DATE		

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet
Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

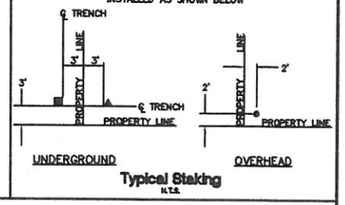
CONSTRUCTION LEGEND

NEW		EXISTING
	PADMOUNT TRANSFORMER	
	PEDESTAL	
	POWER POLE	
	STREET LIGHT	
	WARNING POST	
	1ø U.G. PRI. CONDUCTOR	
	3ø U.G. PRI. CONDUCTOR	
	U.G. SECONDARY CONDUCT.	
	U.G. STREET LIGHT CONDUCT.	
	1ø O.H. CONDUCTOR	
	3ø O.H. CONDUCTOR	
J	JUNCTION BOX	J
	SPLICE POINT	
	SPARE CONDUIT	
	CONDUIT W/ CONDUCTOR	
S	SWITCH CABINET	S

R.O.W. LEGEND

R.O.W. LINE
CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW



Typical Staking
N.T.S.

PROJECT: O'MALLEY PHASE 1 L.C. (LC "C") SOA
DESIGNER/PROJECT ENGINEER: SMATTSON
W.O. #: E1613652

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	6/29/16	6/8/17	SES 5/25/17

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

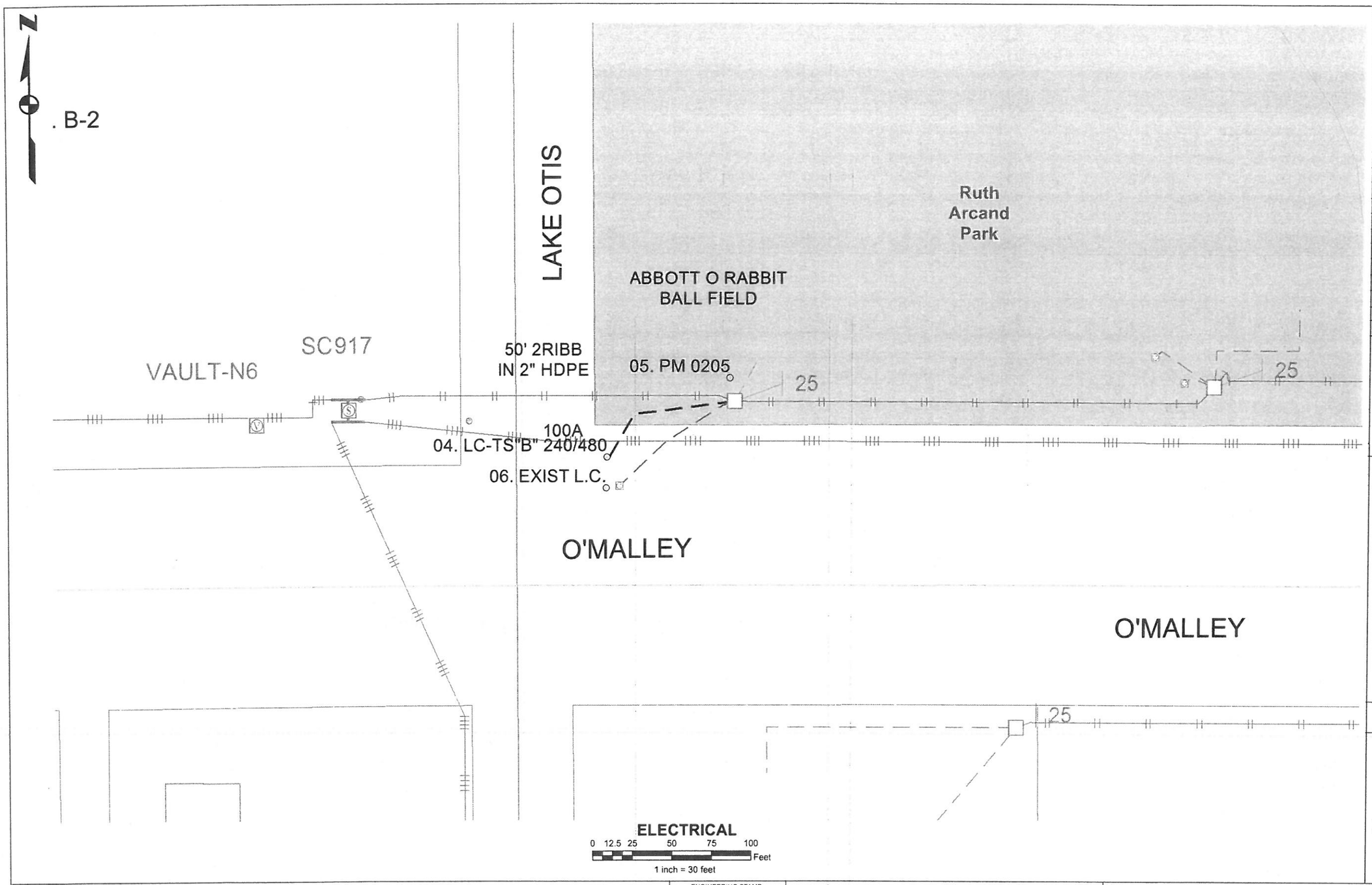
DRAWING NAME:

O'MALLEY L.C.- LU "C" SOA
GRID: 2632, 2533, 2534
MAP: 1203-20B, 1203-17D, 1203-16C
FEEDER: HN 612

I:design\e16\13652\load center 3 drawing.dwg

W.O. NO.: E1613652
C.W.P. REF. NO.:

SHEET 8 OF 11



POLE CONTACT RECORD

LOCATION	TEL	CATV

INITIAL/DATE________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

New		Existing
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
⁎	STREET LIGHT	⁎
■	WARNING POST	□
─┼─	1 Ø UG PRI CONDUCTOR	─┼─
──	3 Ø UG PRI CONDUCTOR	──
- - - -	UG SECONDARY CONDUCTOR	- - - -
········	UG STREET LIGHT CONDUCTOR	········
-·-·-	1 Ø OH CONDUCTOR	-·-·-
-··-··-	3 Ø OH CONDUCTOR	-··-··-
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
≡	CONDUIT W/CONDUCTOR	≡
S	SWITCH CABINET	S

R.O.W LEGEND

- - - - - R.O.W LINE
— - — - — CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.

PROJECT: SOA L.C. CENTERS 1ØUG LINE EXT. & TRANSFORMER INSTALL
ENGINEER / SMATTS Rr
W.O. # 2696 E1613652

NO.	DESIGN / CONSTRUCTION / ASBUILT REVISION	DWN. BY / DATE	REVIEWED MGR./SUPV./ DATE	APPROVED DIRECTOR / DATE
0	ISSUED FOR CONSTRUCTION	6/29/16	5/17	5/25/17

ENGINEERING STAMP

CHUGACH
POWERING ALASKA'S FUTURE

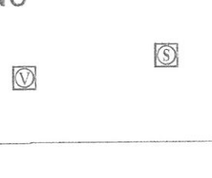
Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

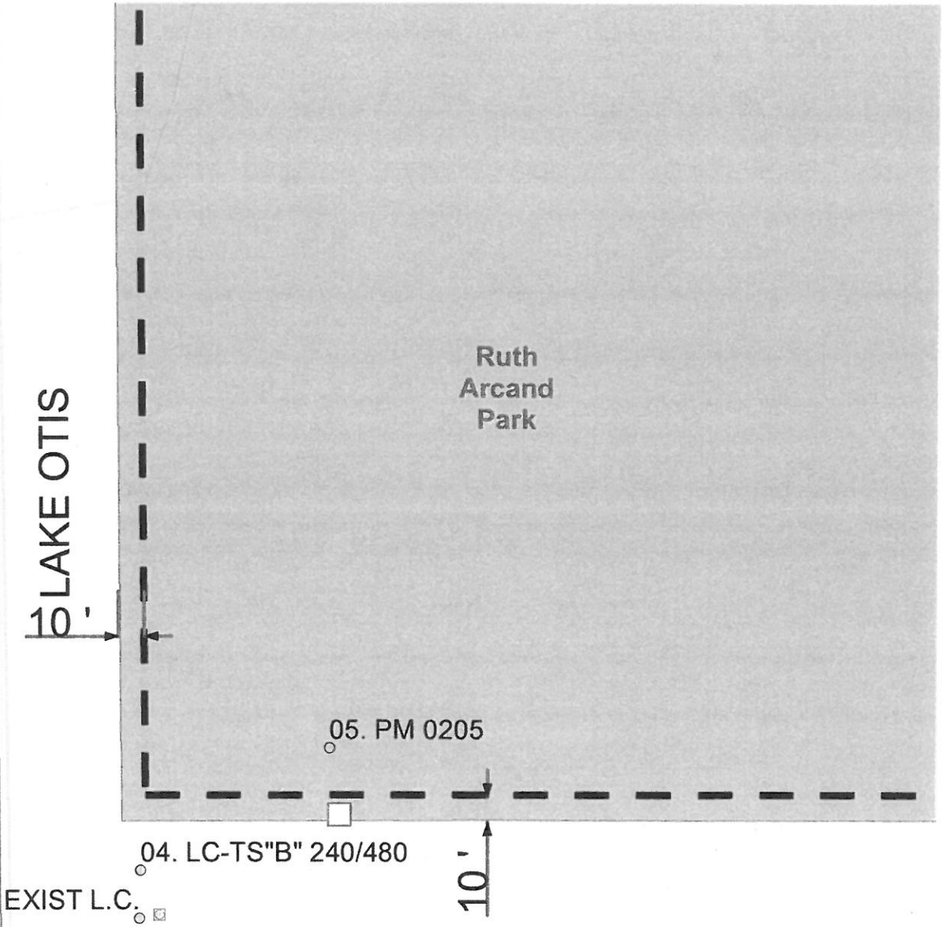
DRAWING NAME:

E1613652
SOA LOAD CENTER "A", "B" & "C"
1Ø UG LINE EXT & TRANSFORMER INSTALL
GRIDS: 2634, 2533, 2534
MAPS: 1203-17D, 16C, 20B
FEEDERS: KLSS 412, HN 612

W.O. NUMBER: 2696 E1613652

SHT. 9 of 11





POLE CONTACT RECORD

LOCATION	TEL	CATV

INITIAL/DATE________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

Manuf. ________
Manuf. Date ________
Volt Rating ________
Insul. Type ________
Insul. Size ________
Cond. Size/Type ________
Quantity in Feet ________

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

CONSTRUCTION LEGEND

New		Existing
■	PADMOUNT TRANSFORMER	□
▲	PEDESTAL	△
●	POWER POLE	○
	STREET LIGHT	
■	WARNING POST	□
	1 Ø UG PRI CONDUCTOR	
	3 Ø UG PRI CONDUCTOR	
----	UG SECONDARY CONDUCTOR	----
....	UG STREET LIGHT CONDUCTOR	....
	1 Ø OH CONDUCTOR	
	3 Ø OH CONDUCTOR	
J	JUNCTION BOX	J
◆	SPLICE POINT	◇
═	SPARE CONDUIT	═
≡	CONDUIT W/ CONDUCTOR	≡
S	SWITCH CABINET	S

R.O.W LEGEND

— — — —	R.O.W LINE
— - — - —	CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED CHUGACH FACILITIES WILL BE INSTALLED AS SHOWN BELOW

Typical Staking
N.T.S.

PROJECT: SOA L.C. CENTERS 1ØUG LINE EXT. & TRANSFORMER INSTALL
ENGINEER / SMATTS
W.O. # 2696 E1613652

NO.	DESIGN / CONSTRUCTION / ASBUILT REVISION	DWN. BY / DATE	REVIEWED MGR./SUPV./ DATE	APPROVED DIRECTOR / DATE
0	ISSUED FOR CONSTRUCTION	6/29/16	[illegible]	5/25/17

ENGINEERING STAMP

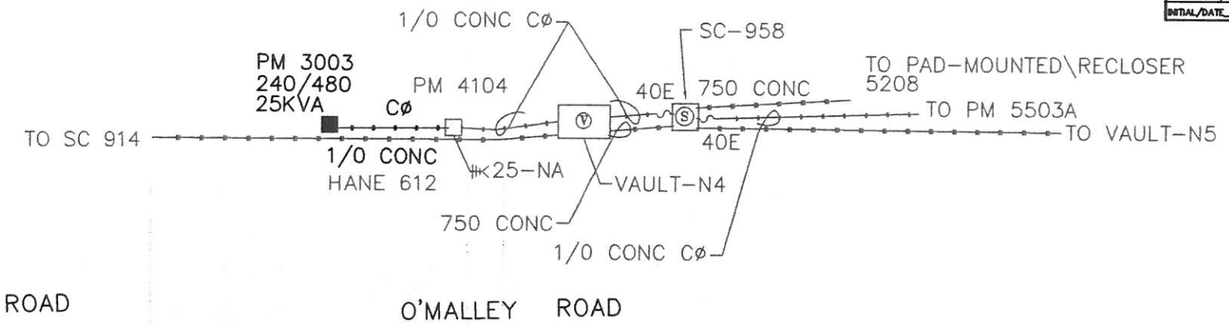
CHUGACH
POWERING ALASKA'S FUTURE

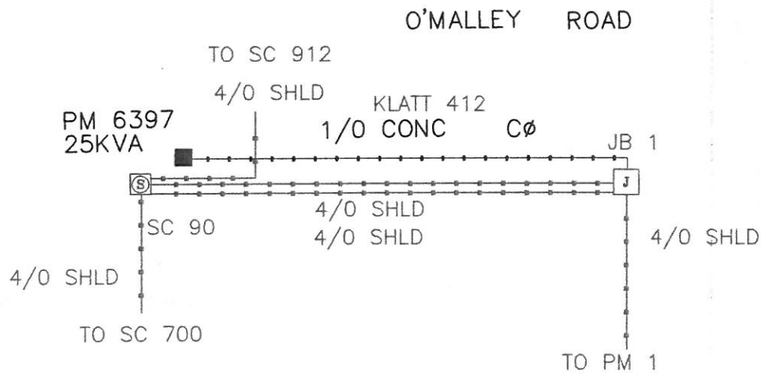
Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:
E1613652
SOA LOAD CENTER "A", "B" & "C"
1Ø UG LINE EXT & TRANSFORMER INSTALL
GRIDS: 2434, 2633, 2634
MAPS: 1203-17D, 16C, 20B
FEEDERS: KLSS 412, HN 612

W.O. NUMBER: 2696 E1613652

SHT. 10 of 11





EXISTING & NEW PRIMARY CIRCUIT DIAGRAM

POLE CONTACT RECORD		
LOCATION	ATU	CATV
INITIAL/DATE		

Vicinity Map
N.T.S.

CONDUCTOR DATA

Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet
Manuf.	Manuf.
Manuf. Date	Manuf. Date
Volt Rating	Volt Rating
Insul. Type	Insul. Type
Insul. Size	Insul. Size
Cond. Size/Type	Cond. Size/Type
Quantity in Feet	Quantity in Feet

CALL BEFORE YOU DIG!

LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA	278-3121
STATEWIDE	800-478-3121
AT&T ALASCOM INC.	264-8465
ALASKA RAILROAD UTILITIES	265-2457
ALYESKA CABLE TV (GIRDWOOD)	783-2982
KULIS AIR BASE	249-1499
MILITARY PETROLEUM FUEL LINES	552-2334 OR 552-5342
STATE STORM DRAINS & STREET LIGHTS	333-2411

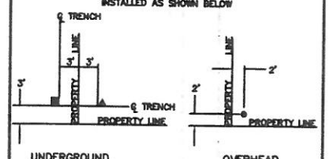
CONSTRUCTION LEGEND

NEW		EXISTING
	PADMOUNT TRANSFORMER	
▲	PEDESTAL	△
●	POWER POLE	○
	STREET LIGHT	
■	WARNING POST	□
	1ø U.G. PRI. CONDUCTOR	
	3ø U.G. PRI. CONDUCTOR	
	U.G. SECONDARY CONDUCT.	
	U.G. STREET LIGHT CONDUCT.	
	1ø O.H. CONDUCTOR	
	3ø O.H. CONDUCTOR	
J	JUNCTION BOX	J
	SPLICE POINT	
	SPARE CONDUIT	
	CONDUIT W/ CONDUCTOR	
S	SWITCH CABINET	S

R.O.W. LEGEND

R.O.W. LINE
CENTERLINE OF TRENCH

UNLESS OTHERWISE NOTED
CHUGACH FACILITIES WILL BE
INSTALLED AS SHOWN BELOW



Typical Staking
N.T.S.

PROJECT: SOA LC 1ø UG LINE EXT. & TRANS. INSTALL
DESIGNER/PROJECT ENGINEER: SMATTSON W.O. #: E1613652

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	ME 6/29/16	[illegible] 6/30/17	[illegible] 5/25/17

ENG. STAMP

CHUGACH
POWERING ALASKA'S FUTURE

Chugach Electric Association, Inc.
5601 Minnesota Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:
SOA LOAD CENTERS "A", "B" & "C"
1ø UG LINE EXT & TRANSFORMER INSTALL
GRIDS: 2534, 2633, 2634
MAPS: 1203-17D, 16C, 20B
FEEDERS: KLSS 412, HN 612

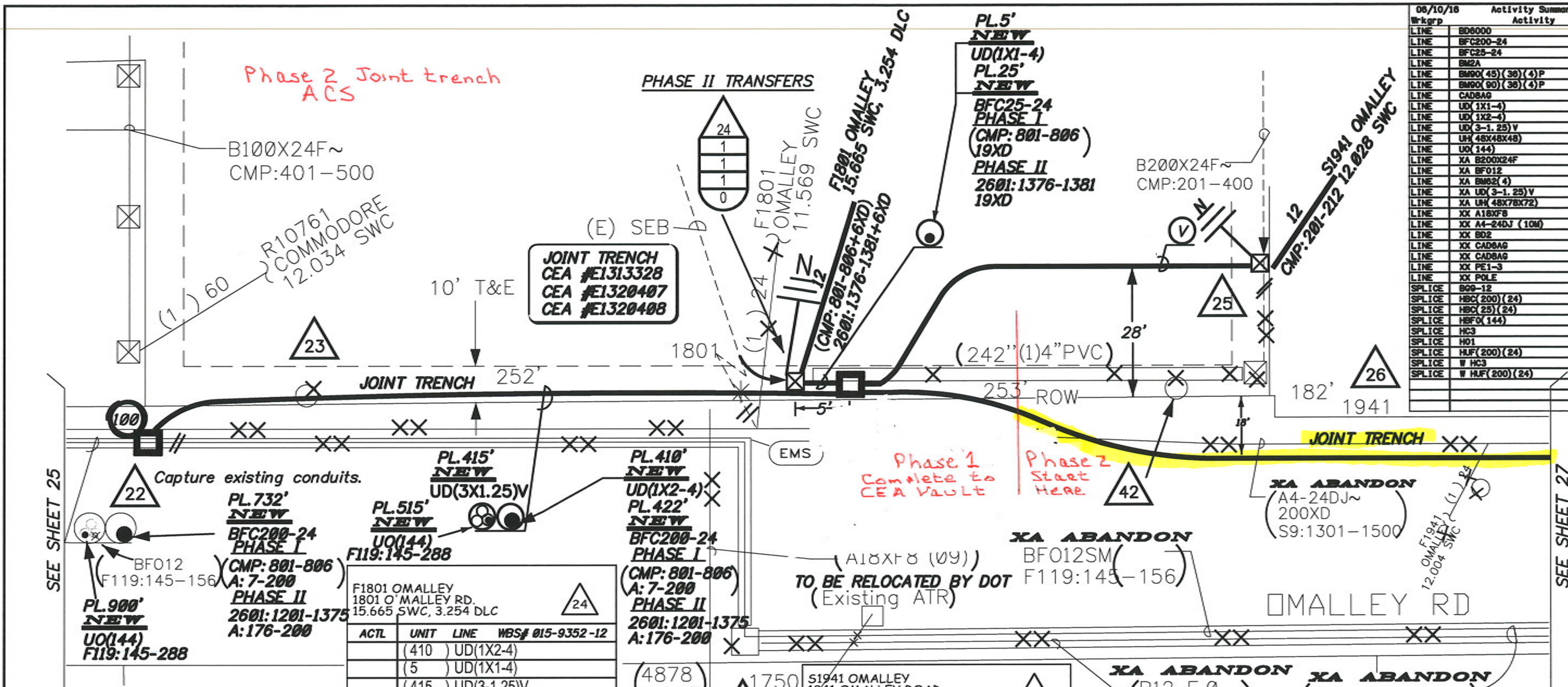
J:\Design\E16\13652\13652pcd.dwg

W.O. NO.: E1613652
C.W.P. REF. NO.:

SHEET 11 OF 11

Appendix K:

Enstar, GCI & ACS Bid Documents



06/10/16 Activity Summary Dwg=15935226			
Wrkgrp	Activity	QTY	ACTL
LINE	BD6000	1	
LINE	BFC200-24	1154	
LINE	BFC25-24	25	
LINE	BM2A	2	
LINE	BM90(45)(36)(4)P	12	
LINE	BM90(90)(36)(4)P	2	
LINE	CAD8AG	1	
LINE	UD(1X1-4)	151	
LINE	UD(1X2-4)	410	
LINE	UD(3-1.25)V	415	
LINE	UH(48X48X48)	2	
LINE	UO(144)	1415	
LINE	XA B200X24F	35	
LINE	XA BF012	1438	
LINE	XA BM62(4)	599	
LINE	XA UD(3-1.25)V	357	
LINE	XA UH(48X78X72)	1	
LINE	XX A18XF8	175	
LINE	XX A4-24DJ (10M)	1288	
LINE	XX BD2	1	
LINE	XX CAD6AG	1	
LINE	XX CAD8AG	1	
LINE	XX PE1-3	1	
LINE	XX POLE	3	
SPLICE	BG9-12	1	
SPLICE	HBC(200)(24)	1	
SPLICE	HBC(25)(24)	1	
SPLICE	HBFO(144)	1	
SPLICE	HC3	400	
SPLICE	HO1	144	
SPLICE	HUF(200)(24)	1	
SPLICE	W HC3	25	
SPLICE	W HUF(200)(24)	1	

VAULT & FIBER SPLICE
10761 COMMODORE
10.507 F119, 16.062 SWC, 3.651 DLC — 22

ACTL	UNIT	LINE WBS# 015-9352-12
	(1)	UH(48X48X48)
	(4)	BM90(45)(36)(4)P
	(900)	UO(144)

ACTL	UNIT	SPLICE WBS# 015-9352-25
	(144)	HO1
	(1)	HBFO(144)

POLE
10761 COMMODORE — 23

ACTL	UNIT	LINE WBS# 015-9352-49
	(601)	XX A4-24DJ (10M)
	(1)	XX POLE

F1801 OMALLEY
1801 O'MALLEY RD.
15.665 SWC, 3.254 DLC — 24

ACTL	UNIT	LINE WBS# 015-9352-12
	(410)	UD(1X2-4)
	(5)	UD(1X1-4)
	(415)	UD(3-1.25)V
	(1)	UH(48X48X48)
	(1)	BM90(90)(36)(4)P
	(6)	BM90(45)(36)(4)P
	(1)	CAD8AG
	(1)	BM2A
	(25)	BFC25-24
	(1154)	BFC200-24
	(515)	UO(144)

ACTL	UNIT	SPLICE WBS# 015-9352-25
	(200)	HC3
	(1)	HBC(25)(24)
	(1)	HUF(200)(24)
	(1)	BG9-12
	(25)	W HC3
	(1)	W HUF(200)(24)

ACTL	UNIT	LINE WBS# 015-9352-51
	(1)	XX CAD6AG

S1941 OMALLEY
1941 OMALLEY ROAD
12.028 KF SWC — 25

ACTL	UNIT	LINE WBS# 015-9352-12
	(1)	BD6000
	(1)	BM2A
	(1)	BM90(90)(36)(4)P
	(2)	BM90(45)(36)(4)P
	(146)	UD(1X1-4)

ACTL	UNIT	SPLICE WBS# 015-9352-25
	(200)	HC3
	(1)	HBC(200)(24)

ACTL	UNIT	LINE WBS# 015-9352-51
	(35)	XA B200X24F
	(242)	XA BM62(4)
	(1)	XX CAD8AG

POLE
1941 OMALLEY RD — 26

ACTL	UNIT	LINE WBS# 015-9352-49
	(182)	XX A4-24DJ (10M)
	(1)	XX POLE

POLE — 42

ACTL	UNIT	LINE WBS# 015-9352-49
	(505)	XX A4-24DJ (10M)
	(1)	XX POLE

VAULT, PED & POLE — 27

ACTL	UNIT	LINE WBS# 015-9352-51
	(1)	XA UH(48X78X72)
	(357)	XA BM62(4)
	(1438)	XA BF012
	(1)	XX BD2
	(357)	XA UD(3-1.25)V

ACTL	UNIT	LINE WBS# 015-9352-49
	(175)	XX A18XF8
	(1)	XX PE1-3

CALL
CALL LOCATE: 1-800-478-3121
2 WORKING DAYS PRIOR TO CONSTRUCTION FOR UNDERGROUND SERVICES LOCATING

alaska COMMUNICATIONS.

TOWNSHIP 12N	RANGE 3W	SECTION 17	DA#	EFRAP#	HELD ORDER: YES NO; PERMITS: YES NO; CUTS REQ: YES NO; PRESSURE: YES NO
ASSOCIATED WORK ORDERS: 012-9302, 013-9387	SOURCE MAPS: 2533	REVISION NUMBER-DATE-INITIALS: REV. / REV. / REV.	EXCHANGE SWC - 1201	S#	TITLE: SWC SOA 53804 RELO O'MALLEY PH I
			CAD# 15935226		WO# (2015) 015-9352
			ENGR/EXT: Lance Dilley / 982-1417		BOROUGH/CNTY MOA
			DWN: LTD	DATE: 5/9/2016	SCALE: NTS; APR'D:; ISSUED:; SH. 26 OF 42 SHTS.

F2001 OMALLEY 2001 O'MALLEY RD 12.160 SWC		28
	UNIT LINE	WBS# 015-9352-49
	(156) XX A4-24DJ (10M)	
	(1) XX POLE	

OMA-17 2021 OMALLEY RD 12.402 SWC		29
	UNIT LINE	WBS# 015-9352-49
	(242) XX A4-24DJ (10M)	
	(1) XX POLE	

SPLICE & POLE		30
	UNIT LINE	WBS# 015-9352-49
	(178) XX A4-24DJ (10M)	
	(1) XX POLE	
	(1) XX PE1-3	

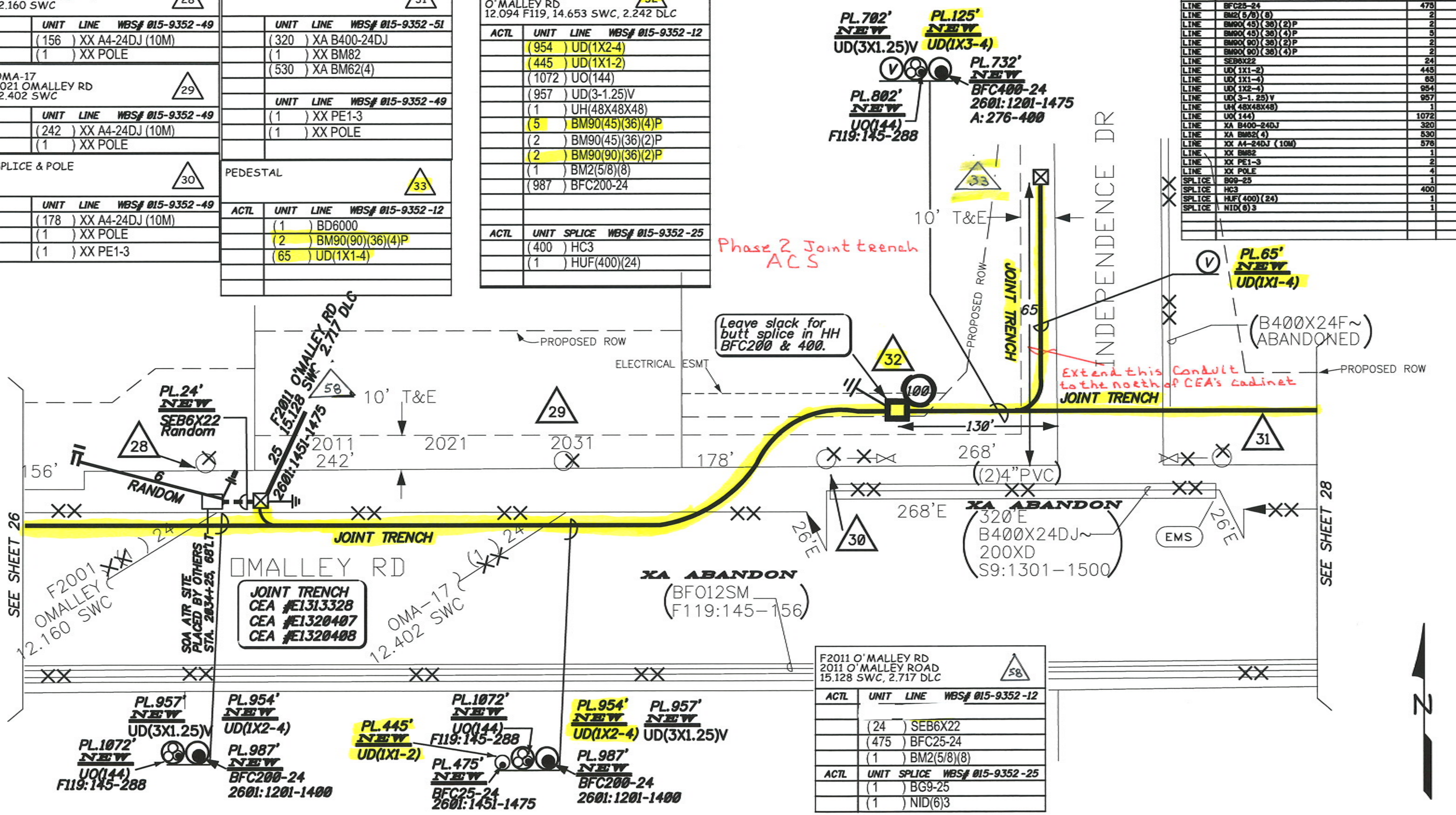
SPLICE & POLE		31
	UNIT LINE	WBS# 015-9352-51
	(320) XA B400-24DJ	
	(1) XX BM82	
	(530) XA BM62(4)	
	UNIT LINE	WBS# 015-9352-49
	(1) XX PE1-3	
	(1) XX POLE	

PEDESTAL		33
ACTL	UNIT LINE	WBS# 015-9352-12
	(1) BD6000	
	(2) BM90(90)(36)(4)P	
	(65) UD(1X1-4)	

VAULT O'MALLEY RD 12.094 F119, 14.653 SWC, 2.242 DLC		32
ACTL	UNIT LINE	WBS# 015-9352-12
	(954) UD(1X2-4)	
	(445) UD(1X1-2)	
	(1072) UO(144)	
	(957) UD(3-1.25)V	
	(1) UH(48X48X48)	
	(5) BM90(45)(36)(4)P	
	(2) BM90(45)(36)(2)P	
	(2) BM90(90)(36)(2)P	
	(1) BM2(5/8)(8)	
	(987) BFC200-24	
ACTL	UNIT SPLICE	WBS# 015-9352-25
	(400) HC3	
	(1) HUF(400)(24)	

06/10/16 Activity Summary Dwg=15935227

Wrkgrp	Activity	QTY	ACTL
LINE	BD6000	2	
LINE	BFC200-24	987	
LINE	BFC25-24	475	
LINE	BM2(5/8)(8)	2	
LINE	BM90(45)(36)(2)P	2	
LINE	BM90(45)(36)(4)P	5	
LINE	BM90(90)(36)(2)P	2	
LINE	BM90(90)(36)(4)P	2	
LINE	SEB6X22	24	
LINE	UD(1X1-2)	445	
LINE	UD(1X1-4)	65	
LINE	UD(1X2-4)	954	
LINE	UD(3-1.25)V	957	
LINE	UH(48X48X48)	1	
LINE	UO(144)	1072	
LINE	XA B400-24DJ	320	
LINE	XA BM82(4)	530	
LINE	XX A4-24DJ (10M)	576	
LINE	XX BM82	1	
LINE	XX PE1-3	2	
LINE	XX POLE	4	
SPLICE	BG9-25	1	
SPLICE	HC3	400	
SPLICE	HUF(400)(24)	1	
SPLICE	NID(6)3	1	



F2011 O'MALLEY RD 2011 O'MALLEY ROAD 15.128 SWC, 2.717 DLC		58
ACTL	UNIT LINE	WBS# 015-9352-12
	(24) SEB6X22	
	(475) BFC25-24	
	(1) BM2(5/8)(8)	
ACTL	UNIT SPLICE	WBS# 015-9352-25
	(1) BG9-25	
	(1) NID(6)3	

CALL
CALL LOCATE: 1-800-478-3121
2 WORKING DAYS PRIOR TO CONSTRUCTION FOR UNDERGROUND SERVICES LOCATING

alaska COMMUNICATIONS

TOWNSHIP 12N	RANGE 3W	SECTION 17	DA#	EFRAP#
ASSOCIATED WORK ORDERS: 012-9302, 013-9387	SOURCE MAPS 2533	REVISION NUMBER-DATE-INITIALS / REV. / REV. / REV.	EXCHANGE SWC - 1201; S#; CAD# 15935227; ENGR/EXT: Lance Dilley / 982-1417; OWN: LTD; DATE: 5/9/2016

HELD ORDER: YES NO | PERMITS: YES NO | CUTS REQ: YES NO | PRESSURE: YES NO

TITLE: SWC SOA 53804 RELO O'MALLEY PH I

WO# (2015) 015-9352

BOROUGH/CNTY: MOA

SCALE: NTS APR'D: ISSUED:

SH. 27 OF 42 SHTS.

POLE (34)

ACTL	UNIT	LINE	WBS# 015-9352-49
	(290	) XX A4-24DJ (10M)	
	(1	) XX POLE	

OMA-14 (35)
13.467 SWC

ACTL	UNIT	LINE	WBS# 015-9352-49
	(277	) XX A4-24DJ (10M)	
	(1	) XX POLE	
	(150	) XX SEA	

OMA-15A (36)
13.634 SWC

ACTL	UNIT	LINE	WBS# 015-9352-49
	(167	) XX A4-24DJ (10M)	
	(1	) XX POLE	
	(2	) XX PE1-3	
	(10	) XX A1-24 (10M)	
	(155	) XX A1-26 (10M)	

VAULT (37)
O'MALLEY RD
12.896 F119, 13.921 SWC, 1.510 DLC

ACTL	UNIT	LINE	WBS# 015-9352-12
	(575	) UD(1X2-4)	
	(125	) UD(1X3-4)	
	(802	) UO(144)	
	(702	) UD(3-1.25)V	
	(2	) CORE DRILL	
	(732	) BFC400-24	

ACTL	UNIT	SPLICE	WBS# 015-9352-25
	(400	) HC3	
	(1	) HUF(400)(24)	

2421 O'MALLEY (38)
2421 O'MALLEY RD
14.175 SWC, 1.764 DLC

ACTL	UNIT	LINE	WBS# 015-9352-12
	(281	) BFC100-24	

ACTL	UNIT	SPLICE	WBS# 015-9352-25
	(1	) BG9-12	
	(1	) HBC(100)(24)	

10801 FOREST DR (41)
10801 FOREST DR
14.405 SWC, 1.994 DLC

ACTL	UNIT	LINE	WBS# 015-9352-12
	(165	) BFC100-24	
	(65	) BFC100-24T	
	(1	) BM86-4(P)	
	(40	) W BM62(4)	

ACTL	UNIT	LINE	WBS# 015-9352-07
	(1	) PM11	
	(1	) PE1-3	
	(1	) PF2-7	

ACTL	UNIT	SPLICE	WBS# 015-9352-25
	(1	) HBC(100)(24)	

ACTL	UNIT	SPLICE	WBS# 015-9352-21
	(1	) HAC(100)(24)	
	(100	) W HC3	
	(2	) W SEA	

ACTL	UNIT	LINE	WBS# 015-9352-49
	(595	) XX SEA	

VAULT (39)

ACTL	UNIT	LINE	WBS# 015-9352-51
	(1	) XA UH(48X78X72)	
	(1736	) XA BM62(4)	
	(1776	) XA BFO12	
	(1740	) XA UD(3-1.25)V	

VAULT (40)

ACTL	UNIT	LINE	WBS# 015-9352-51
	(1	) XA UH(48X78X72)	
	(618	) XA BM62(4)	
	(664	) XA BFO12	
	(624	) XA UD(3-1.25)V	

06/10/16 Activity Summary Dwg=15935228			
Wrkgrp	Activity	QTY	ACTL
LINE	BFC100-24	446	
LINE	BFC100-24T	65	
LINE	BFC400-24	732	
LINE	BM86-4(P)	1	
LINE	CORE DRILL	2	
LINE	PE1-3	1	
LINE	PF2-7	1	
LINE	PM11	1	
LINE	UD(1X2-4)	575	
LINE	UD(1X3-4)	125	
LINE	UD(3-1.25)V	702	
LINE	UO(144)	802	
LINE	W BM62(4)	40	
LINE	XA BF012	2440	
LINE	XA BM62(4)	2354	
LINE	XA UD(3-1.25)V	2384	
LINE	XA UH(48X78X72)	2	
LINE	XX A1-24 (10M)	10	
LINE	XX A1-26 (10M)	155	
LINE	XX A4-24DJ (10M)	734	
LINE	XX PE1-3	2	
LINE	XX POLE	3	
LINE	XX SEA	745	
SPLICE	BG9-12	1	
SPLICE	HAC(100)(24)	1	
SPLICE	HBC(100)(24)	2	
SPLICE	HC3	400	
SPLICE	HUF(400)(24)	1	
SPLICE	W HC3	100	
SPLICE	W SEA	2	

GREEN SUBD

ACS TRENCH 35'

PROPOSED ROW

4878 VAULT

2321

240'(12"PVC

PL.254' NEW BFC100-24 2601:1501-1600

2421

2421 O'MALLEY 14.175 SWC, 1.764 DLC

12

6XD+1595-1600

PL.656' NEW UD(3X1.25)V

PL.756' NEW UO(144) F119:145-288

PL.667' NEW BFC400-24 2601:1201-1600

PROPOSED ROW

650'(2)4"PVC

JOINT TRENCH

290'E

277'E

CEA N5

167'E

238'(1)4"PVC

233'E

XX REMOVE (A1-24~ S9:1401-1500)

SEE SHEET 27

SEE SHEET 29

OMALLEY RD

XX REMOVE (A4-24~ 200XD S9:1301-1500)

JOINT TRENCH CEA #E1313328 CEA #E1320407 CEA #E1320408

OMA-14 13.467 SWC (1) 24

OMA-15A 13.634 SWC (1) 24

ADJUST CONDUIT GRADE TO ELIMINATE CONFLICT WITH STORM DRAIN INSTALLATION.

141'(1)4"PVC

10'E

155'E

PL.165' NEW BFC100-24 2601:1501-1600

XX REMOVE (A1-26~ S9:1401-1500)

20' LEAD

Phase 2 Joint teench ACS

XA ABANDON (BFO12SM F119:145-156)

XA ABANDON (B12 F.Ø. 12XD)

READER RD

4878 VAULT

PL.702' NEW UD(3X1.25)V

PL.575' NEW UD(1X2-4)

PL.802' NEW UO(144) F119:145-288

PL.732' NEW BFC400-24 2601:1201-1475 A:276-400

10801 FOREST DR 14.405 SWC, 1.994 DLC (1) 24

41 100 15 15 0

A1-26~ (S9:1401-1500) 2601:1501-1600

FOREST DR

10821

10801

23'

PL.65' NEW BFC100-24(T) 2601:1501-1600

Transfer 349-2096 & 349-6831 to new terminal 10801 Forest Dr. Remove drop wire to BRA15R1.

CINNAMON DR

4878 VAULT

SEE SHEET 34

CALL
CALL LOCATE: 1-800-478-3121
2 WORKING DAYS PRIOR TO CONSTRUCTION
FOR UNDERGROUND SERVICES LOCATING

alaska COMMUNICATIONS.

TOWNSHIP 12N	RANGE 3W	SECTION 17	DA#	EFRAP#	HELD ORDER: YES NO ☐ ☒	PERMITS: YES NO ☒ ☐	CUTS REQ: YES NO ☒ ☐	PRESSURE: YES NO ☒ ☐
ASSOCIATED WORK ORDERS	SOURCE MAPS	REVISION NUMBER–DATE–INITIALS	EXCHANGE SWC – 1201	S#	TITLE: SWC SOA 53804 RELO O'MALLEY PH I			WO# (2015) 015-9352
012-9302	2533	REV.	CAD# 15935228					
013-9387		REV.	ENGR/EXT: Lance Dilley / 982-1417		BOROUGH/CNTY MOA			
		REV.	DWN: LTD	DATE: 5/9/2016	SCALE: NTS	APR'D:	ISSUED:	SH. 28 OF 42 SHTS.

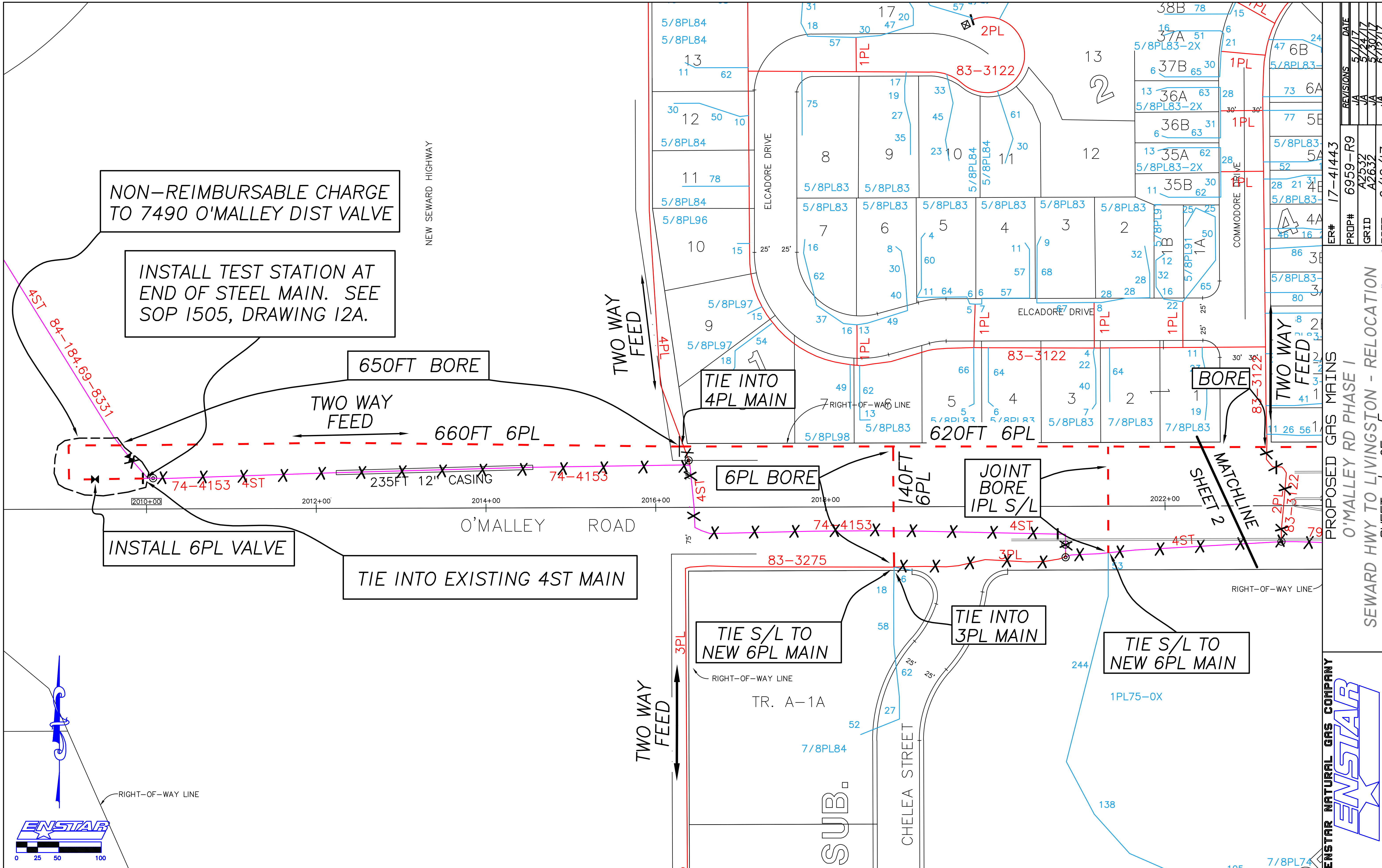
JOINT TRENCH BID

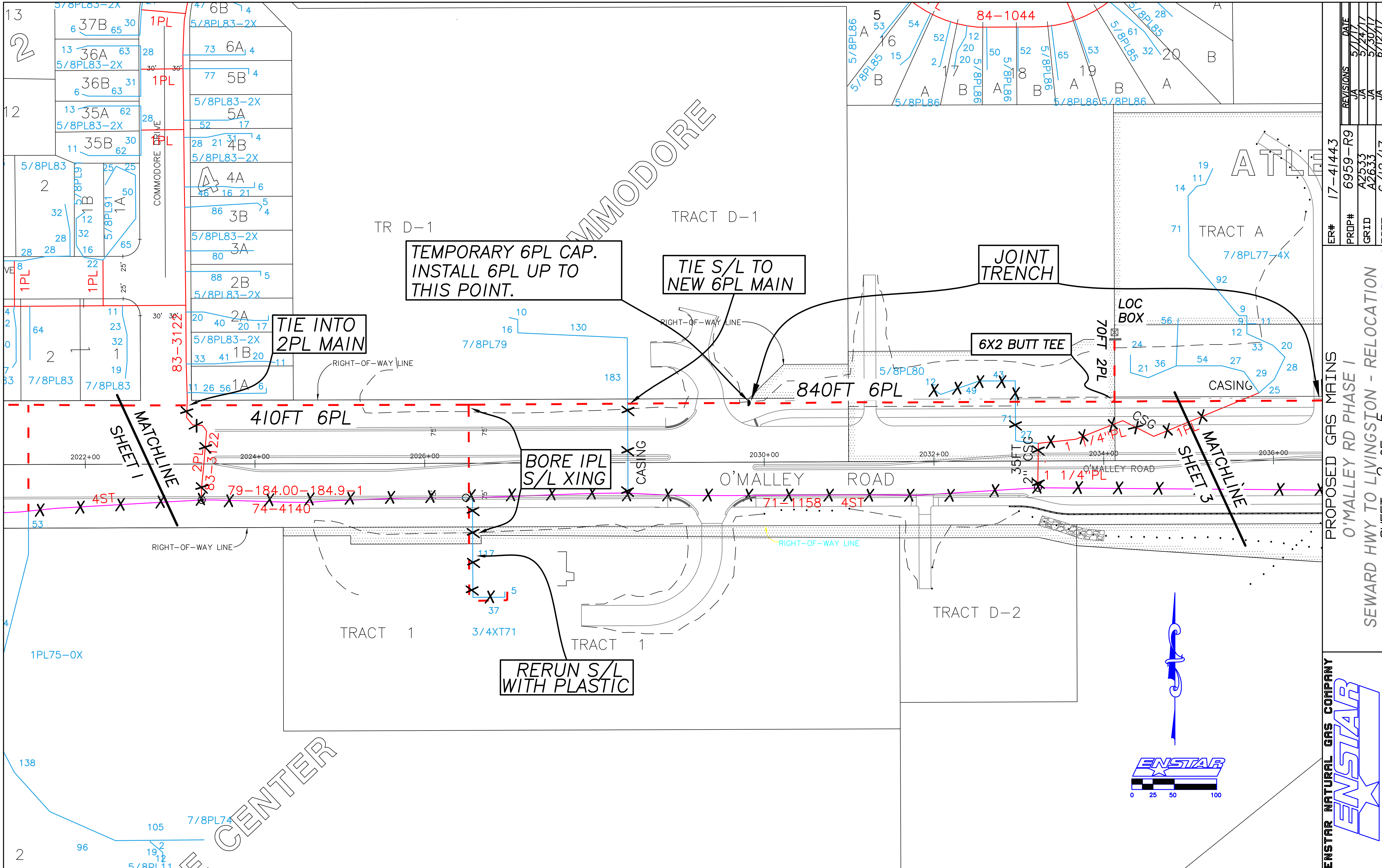
Contractor: SWC SOA 53804 Relo O'Malley Phase 2

6/12/2017

CEA work order:						
UNIT #	UNIT DESCRIPTION	UNIT PRICE	U/M	QTY		TOTAL
1	place 25 PR cable	$ -	per lin. ft.	0		$ -
1	place 50 PR cable	$ -	per lin. ft.	0		$ -
2	place 100 PR cable	$ -	per lin. ft.	0		$ -
2	place 200 PR cable	$ -	per lin. ft.	0		$ -
3	place 400 PR cable	$ -	per lin. ft.	0		$ -
3	place 600 PR cable	$ -	per lin. ft.	0		$ -
4	place 900 PR cable	$ -	per lin. ft.	0		$ -
4	place 1200 PR cable	$ -	per lin. ft.	0		$ -
5	Place Conduit -4" PVC 1x1-4" PVC (1ea)	$ -	per lin. ft.	65		$ -
5A	Place Conduit -4" PVC 1x2-4" PVC (2ea)	$ -	per lin. ft.	1529		$ -
5B	Place Conduit -4" PVC 1x3-4" PVC (3ea)	$ -	per lin. ft.	125		$ -
5C	Place Conduit -4" PVC 1x4-4" PVC (4ea)	$ -	per lin. ft.	0		$ -
5D	Place Conduit -2" PVC 1x1-2" PVC (1ea)	$ -	per lin. ft.	445		$ -
5E	Place Conduit -2" PVC 1x2-2" PVC (2ea)	$ -	per lin. ft.	0		$ -
6	Innerduct / HDPE / 2" / 1.25" / 1"	$ -	per lin. ft.	0		$ -
7	UH(30X48X48) Hand Hole	$ -	each	0		$ -
7A	BD6000 Peds	$ -	each	0		$ -
8	Pedestal w/ stake 400 PR and up	$ -	each	0		$ -
8A	Pedestal w/ post 400 PR and up	$ -	each	0		$ -
9	MGN Ground	$ -	each	6		$ -
10	GROUND ROD	$ -	each	4		$ -
11	SPLICE PIT	$ -	each	0		$ -
12	BACK FILL SPLICE PIT	$ -	each	0		$ -
13	ACS TRENCH ONLY	$ -	per lin. ft.	0		$ -
14	HOUR MISC. LABOR	$ -	per man hour	0		$ -
15	MATL PICK UP / RETURN	$ -	per work order	0		$ -
16	RISERS 2"/4" PVC	$ -	each	0		$ -
17	ANCHOR / DOWN GUY	$ -	each	0		$ -
18	POLE ATTACHMENT	$ -	each	0		$ -
1A	SERVICES DROP UP TO 12 PAIR 50 foot minimum	$ -	per lin. ft.	0		$ -
A	Buried pipe sweeps, RIGID(4) PVC (2)			0		$ -
B		$ -				$ -
C		$ -				$ -
D		$ -				$ -
E		$ -				$ -
F		$ -				$ -
				JOB TOTAL		$ -

Comments: On all PVC conduit that is placed it is required that it be sweep out to remove debris, mandreled for size and a mule tape install to verify footage and to aid inner duct installation per RUS specs.


NON-REIMBURSABLE CHARGE TO 7490 O'MALLEY DIST VALVE
INSTALL TEST STATION AT END OF STEEL MAIN. SEE SOP 1505, DRAWING 12A.
650FT BORE
TWO WAY FEED
660FT 6PL
235FT 12" CASING
74-4153
4ST
4ST 84-184.69-8331
INSTALL 6PL VALVE
TIE INTO EXISTING 4ST MAIN
O'MALLEY ROAD
NEW SEWARD HIGHWAY
TIE INTO 4PL MAIN
6PL BORE
140FT 6PL
620FT 6PL
JOINT BORE 1PL S/L
BORE
MATCHLINE SHEET 2
83-3122
83-3275
3PL
TIE S/L TO NEW 6PL MAIN
TIE INTO 3PL MAIN
TIE S/L TO NEW 6PL MAIN
ELCADORE DRIVE
COMMODORE DRIVE
CHELEA STREET
TR. A-1A
SUB.
RIGHT-OF-WAY LINE
PROPOSED GAS MAINS
O'MALLEY RD PHASE I
SEWARD HWY TO LIVINGSTON - RELOCATION
SHEET 1 OF 5
SCALE 1"=100'
ER# 17-41443
PROP# 6959-R9
GRID A2532 A2632
DATE 6/12/17
DRAWN JK
CHKD JH
REVISIONS
ENSTAR NATURAL GAS COMPANY
ANCHORAGE, ALASKA


TEMPORARY 6PL CAP. INSTALL 6PL UP TO THIS POINT.
TIE S/L TO NEW 6PL MAIN
JOINT TRENCH
TIE INTO 2PL MAIN
6X2 BUTT TEE
LOC BOX
70FT 2PL
840FT 6PL
410FT 6PL
BORE 1PL S/L XING
RERUN S/L WITH PLASTIC
CASING
MATCHLINE SHEET 1
MATCHLINE SHEET 3
O'MALLEY ROAD
COMMODORE DRIVE
TRACT D-1
TR D-1
TRACT D-2
TRACT 1
TRACT A
RIGHT-OF-WAY LINE
79-184.00-184.9-1
74-4140
71-1158
83-3122
84-1044
4ST
1PL
2PL
1 1/4"PL
35FT 2" CSG
7/8PL79
7/8PL77-4X
7/8PL83
5/8PL83-2X
5/8PL80
3/4XT71
1PL75-0X
7/8PL74
5/8PL11
2022+00
2024+00
2026+00
2030+00
2032+00
2034+00
2036+00
0 25 50 100
ENSTAR
PROPOSED GAS MAINS
O'MALLEY RD PHASE I
SEWARD HWY TO LIVINGSTON - RELOCATION
SHEET 2 OF 5
SCALE 1"=100'
ER# 17-41443
PROP# 6959-R9
GRID A2533 A2633
DATE 6/12/17
REVISIONS DATE
JA 5/1/17
JA 5/24/17
JA 5/30/17
JA 6/12/17
DRAWN JK CHK'D JH
ENSTAR NATURAL GAS COMPANY
ANCHORAGE, ALASKA

ATLEE SUB.

TRACT A

TRACT B

TRACT B-1

JOINT TRENCH

INSTALL 6PL UP TO THIS POINT. TEMPORARY 6PL CAP.

SUB.

TRACT B-2

LOC BOX

6X2 BUTT TEE

INDEPENDENCE DRIVE

100FT 2PL

750FT 6PL

560FT 6PL

CASING

RIGHT-OF-WAY LINE

2PL

150FT

71-1158 4ST

TIE S/L TO 6PL MAIN

MATCHLINE SHEET 2

O'MALLEY ROAD

15FT TCE

150FT 6PL

BORE 6PL

130FT 6PL

MATCHLINE SHEET 4

IPL

TIE S/L TO NEW 2PL MAIN

TIE S/L'S INTO NEW 2PL MAIN

TWO WAY FEED

1-1/4ST

READER ROAD

FOREST DRIVE

CINNAMON DRIVE

7/8PL77-4X

5/8PL02

5/8PL81

5/8PL79

5/8PL77

5/8PL86

5/8PL80

1/2XT71

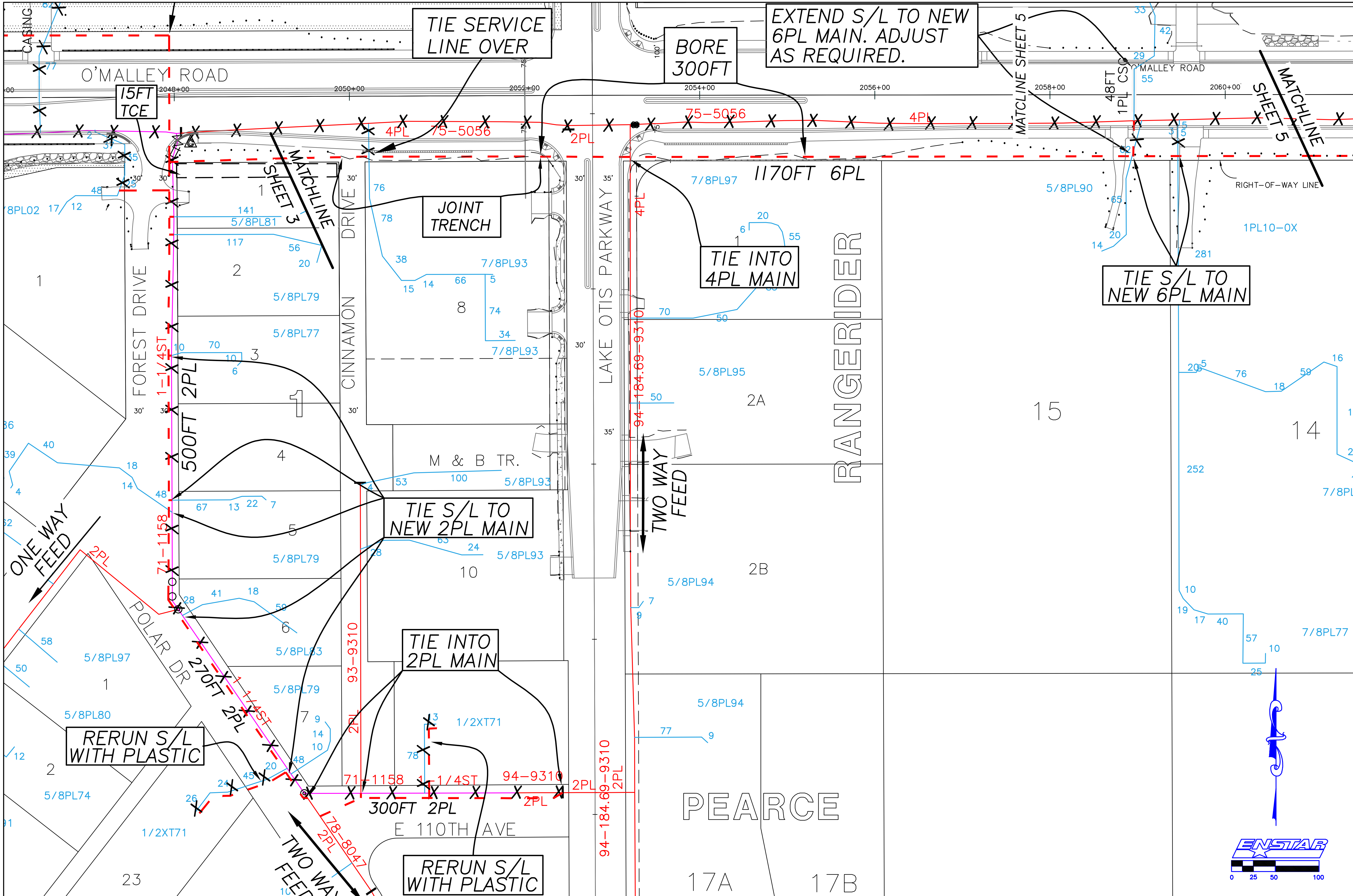
3/4XT71

0 25 50 100

ER#	17-41443		
PROP#	6959-R9	REVISIONS	DATE
GRID	A2533 A2633	JA	5/1/17
		JA	5/24/17
		JA	5/30/17
		JA	6/12/17
DATE	6/12/17	DRAWN	JK CHKD JH

PROPOSED GAS MAINS
O'MALLEY RD PHASE I
SEWARD HWY TO LIVINGSTON - RELOCATION
SCALE 1"=100'
SHEET 3 OF 5

ENSTAR NATURAL GAS COMPANY
ANCHORAGE, ALASKA

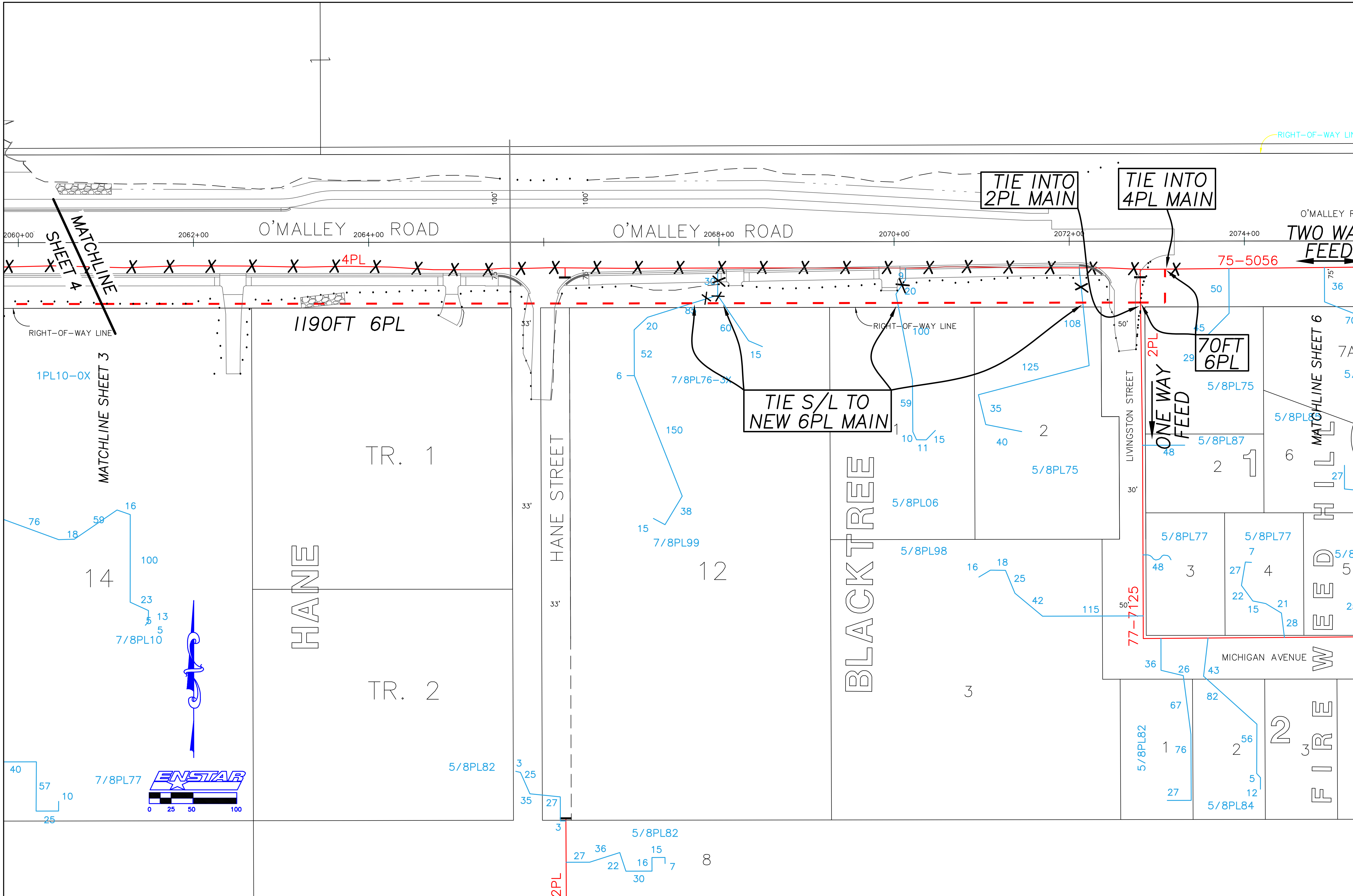

TIE SERVICE LINE OVER
BORE 300FT
EXTEND S/L TO NEW 6PL MAIN. ADJUST AS REQUIRED.
MATCHLINE SHEET 5
O'MALLEY ROAD
15FT TCE
75-5056
4PL
2PL
1170FT 6PL
MATCHLINE SHEET 3
JOINT TRENCH
TIE INTO 4PL MAIN
TIE S/L TO NEW 6PL MAIN
RIGHT-OF-WAY LINE
FOREST DRIVE
CINNAMON DRIVE
LAKE OTIS PARKWAY
RANGERIDER
500FT 2PL
1-1/4ST
71-1158
94-184.69-9310
93-9310
TIE S/L TO NEW 2PL MAIN
M & B TR.
TWO WAY FEED
ONE WAY FEED
POLAR DR
270FT 2PL
TIE INTO 2PL MAIN
RERUN S/L WITH PLASTIC
300FT 2PL
E 110TH AVE
178-8047
PEARCE
17A
17B
15
14
2A
2B
1/2XT71
1PL10-0X
48FT 1PL CSG
CASING
RERUN S/L WITH PLASTIC

PROPOSED GAS MAINS
O'MALLEY RD PHASE I
SEWARD HWY TO LIVINGSTON - RELOCATION
SHEET 4 OF 5 SCALE 1"=100'

ER#	17-41443
PROP#	6959-R9
GRID	A2633
DATE	6/12/17

REVISIONS	DATE
JA	5/1/17
JA	5/24/17
JA	5/30/17
JA	6/12/17
DRAWN JK	CHKD JH

ENSTAR NATURAL GAS COMPANY
ANCHORAGE, ALASKA



O'MALLEY ROAD
O'MALLEY ROAD
O'MALLEY ROAD
MATCHLINE SHEET 4
MATCHLINE SHEET 3
MATCHLINE SHEET 6
RIGHT-OF-WAY LINE
4PL
1190FT 6PL
TIE INTO 2PL MAIN
TIE INTO 4PL MAIN
TWO WAY FEED
75-5056
TIE S/L TO NEW 6PL MAIN
70FT 6PL
ONE WAY FEED
2PL
77-7125
TR. 1
TR. 2
HANE
HANE STREET
BLACKTREE
LIVINGSTON STREET
MICHIGAN AVENUE
WEED HILL
FIRE
7/8PL76-3X
7/8PL99
5/8PL06
5/8PL98
5/8PL75
5/8PL87
5/8PL77
5/8PL82
5/8PL84
7/8PL10
7/8PL77
1PL10-0X

ER# 17-41443
PROP# 6959-R9
GRID A2533-34 A2633-34
DATE 6/12/17

REVISIONS	DATE
JA	5/1/17
JA	5/24/17
JA	5/30/17
JA	6/12/17
DRAWN JK	CHKD JH

PROPOSED GAS MAINS
O'MALLEY RD PHASE I
SEWARD HWY TO LIVINGSTON - RELOCATION
SHEET 5 OF 5
SCALE 1"=100'

ENSTAR NATURAL GAS COMPANY
ANCHORAGE, ALASKA

OH 96ct fiber

UG .500 & .750 coax

UG .500 coax and Pedestal

UG 96ct fiber

Pedestal

Vaults

UG 96ct fiber

ROW

ROW

ROW

ROW

ROW

MATCH LINE STA. 2029+00

MATCH LINE STA. 2034+00

N89°46'31.30"E
2637.934

2031+00

O'MALLEY ROAD

2032+00

2033+00

S-115

P-115

S-116

BEGIN PEDESTRIAN FENCE
STA 2032+89, 53.5' RT

DESIGNED BY	LRA
CHECKED BY	DLB
DRAFTED BY	MEF

XREFS
N/A
N/A

SCALE
N/A

LAYOUT
F7

DATE TIME
3/21/2016 3:57 PM

DRAWING LOCATION
W:\Projects\O'Malley Reconst-53804\Civil3D14\Planset\53804 Production Dwgs\F1-27 P&P(ALT-1).dwg

SHEET NO.	TOTAL SHEETS
F7	E44
STATE	YEAR
ALASKA	2016

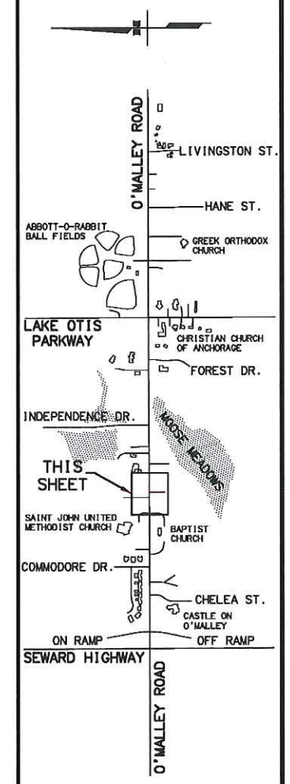
PROJECT DESIGNATION
0512(008)/Z538040000

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION



PRELIMINARY
3.21.2016

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
AMATS:
O'MALLEY ROAD RECONST, PH1
SEWARD HWY TO LIVINGSTON ST
O'MALLEY ROAD
PLAN AND PROFILE
STA 2029+00 TO 2034+00

DESIGNED BY: JAB
CHECKED BY: CLP
DRAFTED BY:

XREFS: N/A N/A

SCALE: N/A

LAYOUT: F9

DATE TIME: 3/21/2016 3:57 PM

DRAWING LOCATION: W:\Projects\O'Malley Reconst-53804\Civ3D14\Planset\53804 Production Dwgs\F1-27 P&P(ALT-1).dwg

CHILI PEPPER FIELD

OH 96ct fiber

ROW

TEMPORARY CONSTRUCTION CUT LINE

CEA UGE 10X15' VAULT

Pedestal

UG .500 & .750 coax

Vault

UG 96ct fiber

MATCH LINE STA. 2034+00

2035+00

2036+00

2037+00

2038+00

MATCH LINE STA. 2039+00

O'MALLEY ROAD

N89°46'31.30"E
2637.934

UG 96ct fiber

TEMPORARY CONSTRUCTION CUT LINE

SHEET NO.	TOTAL SHEETS
F9	E44
STATE	YEAR
ALASKA	2016

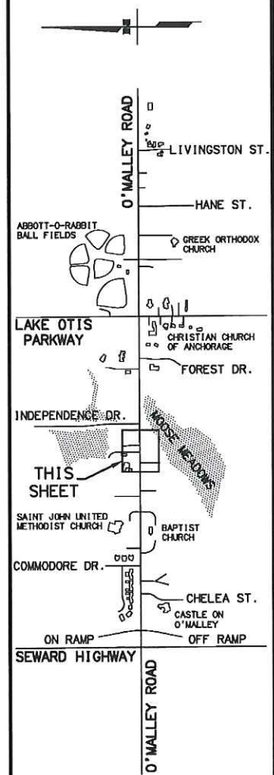
PROJECT DESIGNATION
0512(008)/Z538040000

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION



PRELIMINARY
3.21.2016

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
AMATS:
O'MALLEY ROAD RECONST, PH1
SEWARD HWY TO LIVINGSTON ST
O'MALLEY ROAD
PLAN AND PROFILE
STA 2034+00 TO 2039+00

OH 96ct fiber

INDEPENDENCE DR.

102+00

ROW

END PROJECT

UG .750 coax

BEGIN PEDESTRIAN FENCE STA 2040+47, 66.2' LT

TEMPORARY CONSTRUCTION CUT LINE

N00°13'28.7"W 300.00'

UG 96ct fiber

ROW

vault

pedestals

vault

pedestal

ROW

101+00

UG .500 & .750 coax

MATCH LINE STA. 2039+00

2040+00

2041+00

2042+00

N89°46'31.30"E 2637.934

2043+00

MATCH LINE STA. 2044+00

O'MALLEY ROAD

100+00

INTERSECTION
"OM" STA. 2039+93.00 =
"IN" STA. 100+00.00
SEE SHEET F16 FOR INDEPENDENCE DR.

UG 96ct fiber

ROW

TEMPORARY CONSTRUCTION CUT LINE

MOOSE MEADOWS

DESIGNED BY: MB
CHECKED BY: CJP
DRAFTED BY:

XREFS: N/A N/A

SCALE: N/A

LAYOUT: F11

DATE TIME: 3/21/2016 3:57 PM

DRAWING LOCATION: W:\Projects\O'Malley Reconst-53804\Civ3D14\Planset\53804 Production Dwgs\F1-27 P&P(ALT-1).dwg

SHEET NO.	TOTAL SHEETS
F11	E44
STATE	YEAR
ALASKA	2016

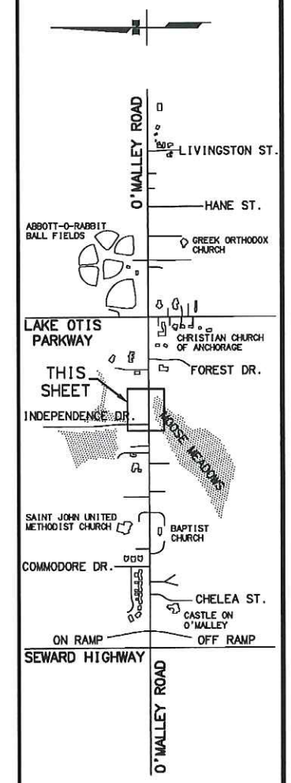
PROJECT DESIGNATION
0512(008)/Z538040000

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION



PRELIMINARY
3.21.2016

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
AMATS:
O'MALLEY ROAD RECONST, PH1
SEWARD HWY TO LIVINGSTON ST
O'MALLEY ROAD
PLAN AND PROFILE
STA 2039+00 TO 2044+00

pedestal
UG .625 coax
UG 96ct fiber
TEMPORARY CONSTRUCTION CUT LINE
ROW
STA. 2044+03 BEGIN TAPER 54.0' LT
UG .625 coax
UG .875 coax
pedestal
ROW
UG .750 and .500 coax
STA. 2045+89 END TAPER 40.0' LT
UG 96ct fiber
Vault
S-203
UG 96 ct fiber
MATCH LINE STA. 2044+00
2045+00
N89°46'31.30"E 2637.934
2046+00
2047+00
2048+00
MATCH LINE STA. 2049+00
O'MALLEY ROAD
P-202
S-202
S-204
P-201
P-203
P-200
S-201
S-200
ROW
ROW
FOREST DRIVE
ROW
ROW
STA. 2048+58 BEGIN TAPER 40.0' RT

DESIGNED BY	LRA
CHECKED BY	CJB
DRAFTED BY	MEF

XREFS
N/A
N/A

SCALE
N/A

LAYOUT
F13

DATE TIME
3/21/2016 3:57 PM

DRAWING LOCATION
W:\Projects\O'Malley Reconst-53804\Civil3D14\Planset\53804 Production Dwgs\F1-27 P&P(ALT-1).dwg

SHEET NO.	TOTAL SHEETS
F13	E44
STATE	YEAR
ALASKA	2016

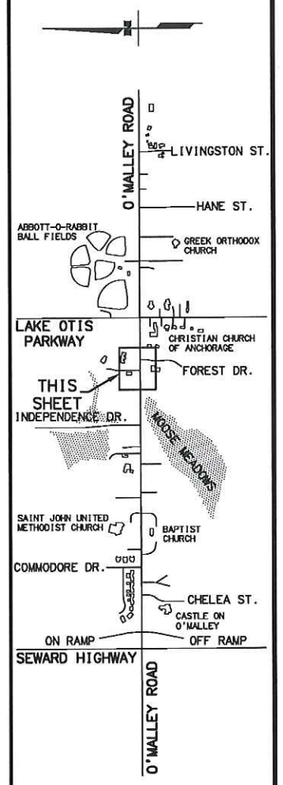
PROJECT DESIGNATION
0512(008)/Z538040000

ADDENDUM NO.

ATTACHMENT NO.

REVISIONS

NO.	DATE	DESCRIPTION



PRELIMINARY
3.21.2016

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
AMATS:
O'MALLEY ROAD RECONST, PH1
SEWARD HWY TO LIVINGSTON ST
O'MALLEY ROAD
PLAN AND PROFILE
STA 2044+00 TO 2049+00