

COMMUNITY DEVELOPMENT DEPARTMENT PLANNING STAFF ANALYSIS

TYPE 4 TOWER DESIGN

DATE: July 20, 2015

CASE NO: 2015-0076

APPLICANT: Verizon Wireless

REPRESENTATIVE: Justin Abbott, Select Site Acquisition, LLC

REQUEST: Design approval for a Type 4 “Monopine” camouflaged tower

APPLICABLE ZONING CODE “Old Code”

LOCATION: Alyeska North Addition #1, Block 1, Lots 1, 3C, 3B, 4 & USS 3569 PTN & Township 10 North, Range 2 East Section 16 PTN

COMMUNITY COUNCIL: Girdwood Board of Supervisors and Girdwood Land Use Committee

TAX NUMBER: 076-015-35/Grid SE 4817

ZONING: gRST-2 (New Base Resort) District

RECOMMENDATION: Approval

ATTACHMENTS:

1. Application

PROPOSAL:

The applicant proposes to replace an existing 75-foot wood pole, type I (monopole) tower with an 80-foot “monopine” camouflaged tower in approximately the same location on the subject property. The Monopine is designed to accommodate AT&T, Verizon Wireless and a future wireless carrier. The owners of the property, Alyeska Ski Resort, LLC requested a camouflaged tower for this location.

CODE REQUIREMENTS:

Anchorage Municipal Code (AMC) 21.09.050-1 (Table of Allowed Uses) indicates that a Type 1 and Type 4 tower are a permitted principal use in the district subject to AMC 21.45.265 and AMC 21.50.280. However, AMC 21.45.265.A.17.B. states,

“Qualification of type 4 tower structure and antenna. Each type 4 tower structures and antenna design shall be qualified as meeting the design standard by the planning and zoning commission. A proponent of a type 4 tower structures and antenna design shall provide the commission with evidence in the form of construction drawings, photographs, renderings, or other data sufficient for the commission to find the design standard is satisfied. At completion of the construction of the first tower structure and antenna under a newly qualified design, it shall be reviewed by the commission to confirm the installation complies with the design standards. If the installation fails to comply subsequent tower structure and antenna design and installation shall be amended or redesigned as directed by the commission.”

AMC 21.35.020.B. defines a type 4 tower as,

“Type 4 means a support structure, such as an existing building, steeple, spire or utility pole that is not a type 1, 2 or 3 and is used for supporting a disguised, camouflaged, or hidden antenna array so that it’s principal or secondary function as an antenna and antenna support structure is imperceptible to an uneducated eye. The antennas are mounted on the support structure so that they are located and designed to minimize visual and aesthetic impacts to surrounding land uses and structures and shall, to the greatest extent practical, blend into the existing environment. This definition shall include any antenna or antenna array complying with the objective of definition whether it is mounted on tower structure or not.”

This is the first time a type 4 tower has been submitted in the Municipality of Anchorage and the first time that the Planning and Zoning Commission has reviewed a design for type 4 towers.

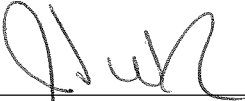
DEPARTMENT RECOMMENDATION:

The Department recognizes the need for improvements to the wireless communications network in the area. The conversion of the existing wood pole tower to a camouflaged tower is suitable for this location. The design of the tower as a “monopine” matching the existing vegetation is an acceptable design. The Department recommends APPROVAL of the design of the tower as

a monopine used for cellular or wireless communications in the gRST-2 (new base resort) district subject to the following conditions of approval:


1. A Notice of Zoning Action shall be filed with the State of Alaska District Recorder's Office. Proof of such shall be submitted to the Planning Department.
2. This approval is subject to the petitioner's application, narrative and submittals.
3. Tower construction shall be completed one year following issuance of a land use permit.
4. An administrative permit shall be obtained for any antenna(s) in accordance with AMC 21.45.265A.11.

Reviewed by:



Jerry T. Weaver, Jr.
Director

Prepared by:



Jillanne Inglis
Lead, Land Use Review

(Case No. 2015-0076, Parcel ID No. 051-015-35)



Select Site Acquisition, LLC

June 30, 2015

Jillanne M. Inglis
Lead Plan Reviewer
Land Use Review Section
Planning Division
Community Development Department
907-343-8353
inglisjm@muni.org

RE: Verizon Wireless - Land Use A141171 / Building Permit X15-1646

Dear Mrs. Inglis,

Please accept this letter as the Project Description and justification for the proposed Type 4 – Camouflaged Tower, which will replace the existing wood pole tower, located at 104 Arlberg Avenue, Girdwood, AK 99587. Tax Parcel: 076-015-35

The subject property is owned and controlled by Alyeska Ski Resort, LLC. The original tower replacement was planned as a painted monopole (Building Permit C14-1897). During the negotiations with the Alyeska Resort, the owners decided that a camouflaged tower would be a more suitable design at this location.

Project Description: Replacement of the existing wood pole tower with a “Monopine” camouflaged tower at approximately the same location on the subject property. The proposed Monopine is a 75-foot steel structure with fiberglass branches that extend up to 80-feet AGL. The Monopine is designed to accommodate AT&T, Verizon Wireless and a future wireless carrier. Please see the construction drawings & structural drawings for details on the design.

Larson Camouflage was chosen as the designing manufacturer for the proposed Monopine Tower, due to their expertise in camouflaged towers. The tower will have custom painted faux bark to match the natural trees found in the Girdwood area. Additionally, the antennas will be custom fitted with fiberglass socks that will conceal the antennas and blend with the fiberglass branches/foilage.

Please see the supporting documentation to be presented to the Planning & Zoning Commission so that they can make a determination on the design standard. These are Photo-simulation of the Monopine, Information from Larson Camouflage & Construction Drawings.

Sincerely,
Justin Abbott representing Verizon Wireless

Real Estate – Planning & Permitting – Project Management
870 Oravetz Road SE, Auburn, WA 98092
(206) 790-4655



CURRENT

VIEW #1 LOOKING SOUTHEAST



PROPOSED

LARSON

CAMOUFLAGE

HOME

ABOUT

PRODUCTS

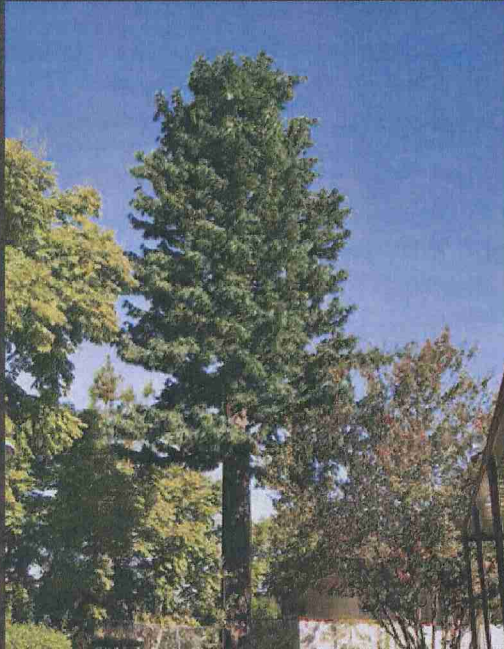
PROCESS

QUALITY

MEDIA

CONTACT

Mono-Pine • Mono-Palm • Saguaro • Slimline/Cypress • DAS • Mono-Elm • Architectural • WaterTowers, Steeples, etc. • Refurbishment



Mono-Pines

Larson created the first Mono-Pine camouflaged cellular tower in 1992 launching the concealed tower industry. Ever since, Larson has been leading the industry with new and improved designs and products. With unique features like Larson antenna branches and matching antenna "socks", the antennas installed on the trees pictured left and bottom right below (each has 9 antennas and other equipment installed) are virtually invisible.

While it is important for the antennas to be "invisible" to people, it is just as important for the branches be "invisible" to the RF signal. That's why Larson uses only RF friendly materials to fabricate its branches resulting in extremely low insertion and return loss properties that are needed for today's wireless networks to function at peak performance.

Mono-Pine Branch Density Options



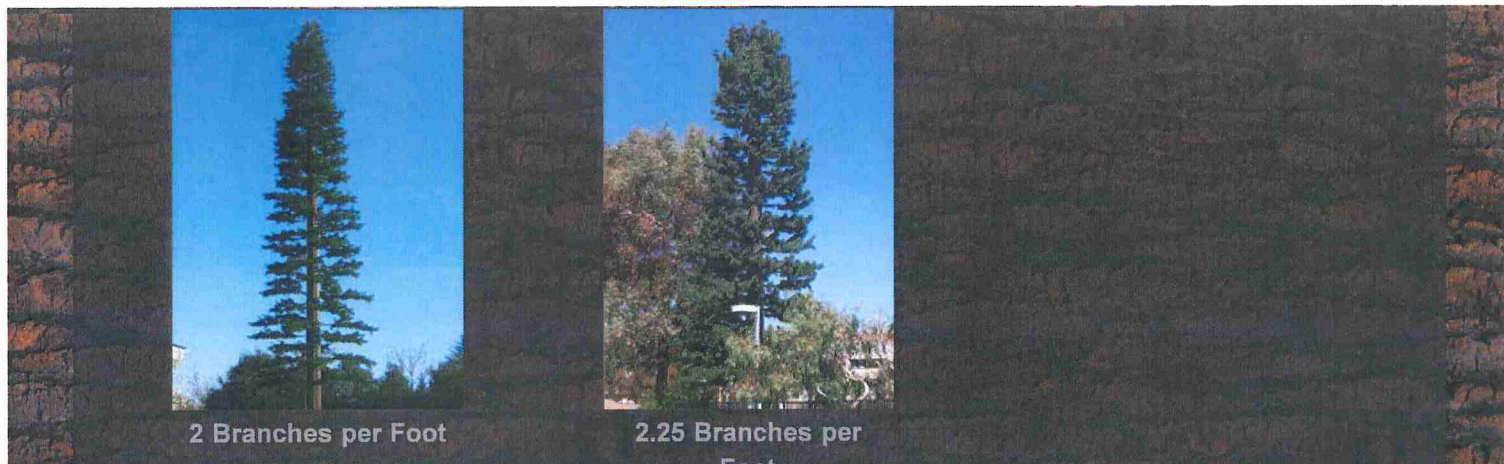
3 Branches per Foot
with Antenna Socks



3 Branches per Foot
with Antenna Socks



3 Branches per Foot
with Antenna
Branches



LARSON CAMOUFLAGE, LLC

CONTACT

email info@larsoncamo.com

phone 520-294-3900

fax 520-741-3488

1501 s. euclid ave.

tucson, az 85713

Larson Camouflage, LLC

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PLANS PREPARED BY:

**West Tower
Communications, Inc.**

**Select Site
Acquisition, LLC**

P.O. Box 1292, Maple Valley, WA 98038
Office 206-790-4655

**DHD
Architecture PLLC.**

13424 246TH Ave SE
Issaquah, WA 98027



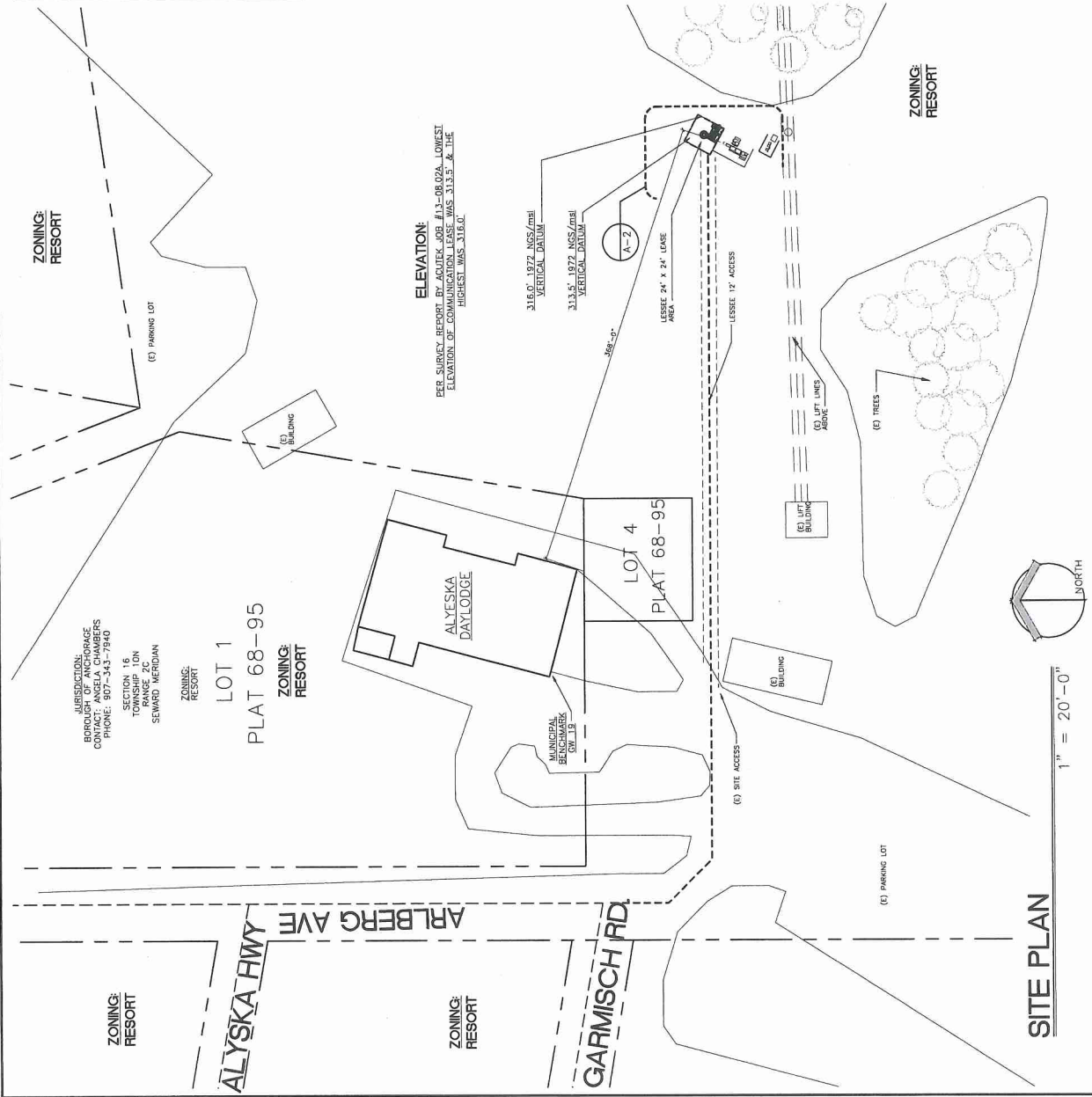
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7	07-10-14	CD ANTINNA REVS
8	08-28-14	CD PRELIM
9	09-15-14	CD FINAL
10	11-06-14	BP COMMENTS
11	02-25-15	TOWER REVS
12	03-17-15	NOTE REVS
13	05-13-15	REVS
14	06-03-15	EQUIP PLAN REVS

PROJECT:
AK ALYESKA
- ALT 1
104 ARLBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:
A-1

GENERAL NOTES:

- [illegible]



SITE PLAN



NO.	DATE	ISSUE BLOCK
01	07-10-14	2D ANTENNA REVS
02	08-28-14	CD PRELIM
03	09-15-14	CD FINAL
04	11-06-14	BP COMMENTS
05	02-25-15	TOWER REVS
06	03-17-15	NOTE REVS
07	05-13-15	REVS
08	06-03-15	EQUIP PLAN REVS

PROJECT:

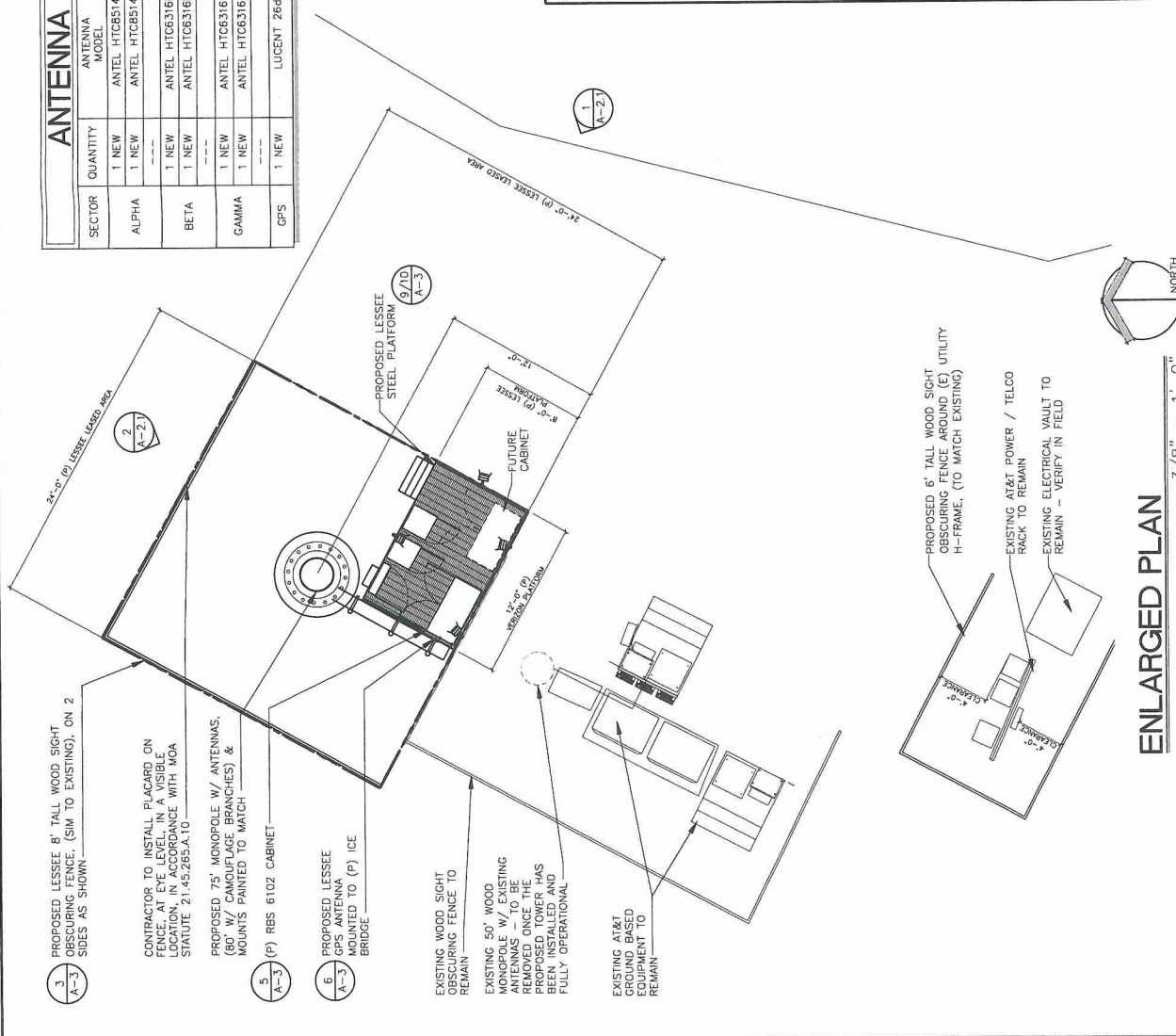
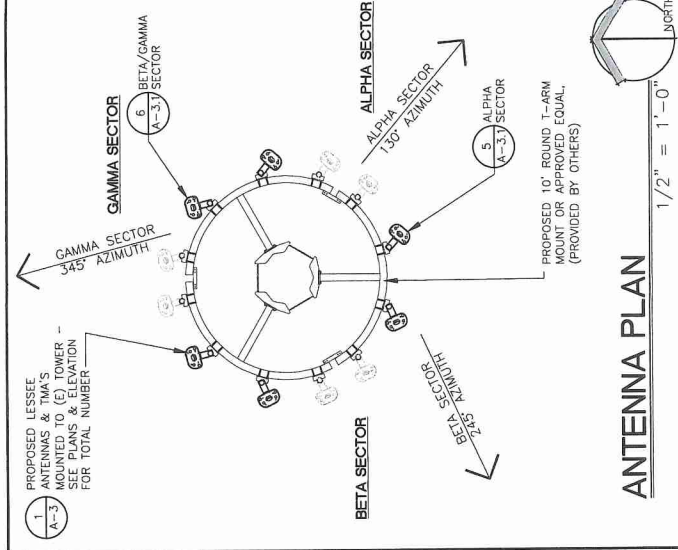
AK ALYESKA - ALT 1

104 ARLBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:

A-2

ANTENNA / COAX SCHEDULE									
SECTOR	QUANTITY	ANTENNA MODEL	RAD CNT	ANT. SIZE	AZIMUTH	NUMBER OF COAX RUNS	COAX SIZE	COAX LENGTH	TMA
ALPHA	1 NEW	ANTEL HTC8514R00	67"	4'-10"	130°	2 NEW	7/8"	95'-0"±	YES
	1 NEW	ANTEL HTC8514R00	67"	4'-10"	130°	2 NEW	7/8"	95'-0"±	YES
	---	---	---	---	---	---	---	---	---
BETA	1 NEW	ANTEL HTC6316R000	67"	7'-0"	245°	2 NEW	7/8"	95'-0"±	YES
	1 NEW	ANTEL HTC6316R000	67"	7'-0"	245°	2 NEW	7/8"	95'-0"±	YES
	---	---	---	---	---	---	---	---	---
GAMMA	1 NEW	ANTEL HTC6316R000	67"	7'-0"	345°	2 NEW	7/8"	95'-0"±	YES
	1 NEW	ANTEL HTC6316R000	67"	7'-0"	345°	2 NEW	7/8"	95'-0"±	YES
	---	---	---	---	---	---	---	---	---
GPS	1 NEW	LUCENT 26dB	12'-0"	---	---	---	---	---	---







PLANS PREPARED BY:
WeeTower Communications, Inc.
Select Site Acquisition, LLC
P.O. Box 1992, Maple Valley, WA 98043
Office 206-790-4866
DHD
Architecture PLLC
13424 246TH Ave SE
Issaquah, WA 98027



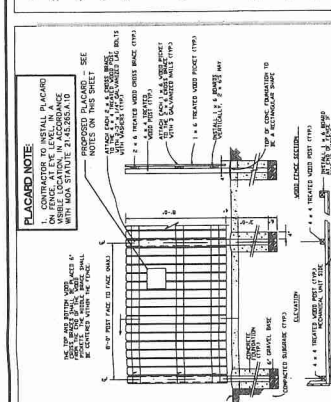
NO.	DATE	ISSUE BLOCK
06-03-15	06-03-15	EQUIP PLAN REVS
09-13-15	09-13-15	REVS
03-17-15	03-17-15	NOTE REVS
02-25-15	02-25-15	TOWER REVS
11-09-14	11-09-14	CD COMMENTS
09-19-14	09-19-14	CD FINAL
09-28-14	09-28-14	CD PRELIM
07-10-14	07-10-14	CD ANTENNA REVS
06-03-15	06-03-15	ISSUE BLOCK

PROJECT:
AK ALYESKA - ALT 1
104 ARLBURG AVE
GIRDWOOD, AK 99587

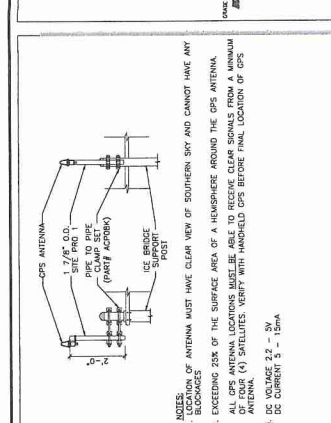
SHEET NUMBER:
A-3

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND STIPULATED IN THE SPECIFICATION PROJECT SUMMARY.
2. RUBBISH, STUMPS, CEMBS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN AN APPROPRIATE MANNER.
3. THE SITE SHALL BE GRADDED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT, TOWER AREAS, AND ADJACENT BUILDINGS.
4. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND, FROZEN ROCK, OR FROZEN PERMANENTLY FROZEN SOIL.
5. THE SURFACE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH AND UNIFORM GRADE PRIOR TO THE CRUSHED STONE APPLICATION.
- SUBGRADE AND BASE PREPARATION:
1. FOR SUB-ON-GRADE CONSTRUCTION IT WILL BE NECESSARY TO OVERDOCK THE EXISTING SURFACE TO A MINIMUM OF 12" BELOW THE FINISHED GRADE. THE EXISTING SURFACE SHALL BE GRADDED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT, TOWER AREAS, AND ADJACENT BUILDINGS. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH AND UNIFORM GRADE PRIOR TO THE CRUSHED STONE APPLICATION.
2. HORIZONTAL, APPROXIMATELY 6" TO 8" DEEP, LOTS AND MECHANICALLY COMPACTING EACH LIFT TO AT LEAST THE SPECIFIED MINIMUM DRY DENSITY.
3. REMOVED FROM FLATWORK AREAS.
4. THE GROUND SURFACE SURROUNDING EXTERIOR STRUCTURES SHALL BE SLOPED TO DRAIN AWAY IN ALL DIRECTIONS.

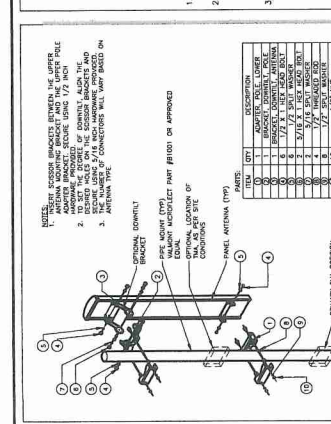
GENERAL NOTES
NOT TO SCALE



WOOD SIGHT OBSCURING FENCE
NOT TO SCALE



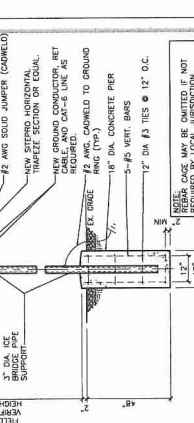
GPS ANTENNA DETAIL
NOT TO SCALE



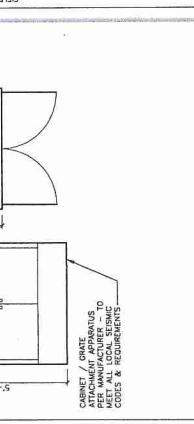
ANTENNA MOUNTING DETAIL
NOT TO SCALE

NOT USED
NOT TO SCALE

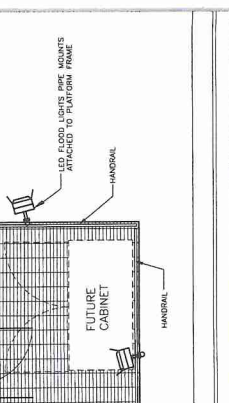
NOT USED
NOT TO SCALE



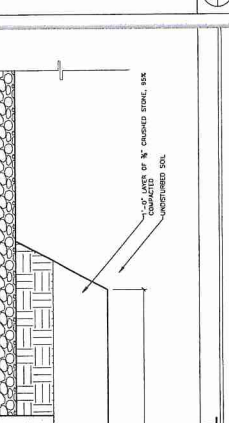
ICE BRIDGE
NOT TO SCALE



ERICSSON RBS 6102 BASE STATION
NOT TO SCALE



EQUIPMENT LAYOUT
NOT TO SCALE



PLATFORM AT GRADE BEAM ANCHOR DETAIL
NOT TO SCALE



PLANS PREPARED FOR:

PLANS PREPARED BY:

WestTower
Communications, Inc.

Select Site
Acquisition, LLC
P.O. Box 1932, Apple Valley, WA 99008
Phone 206-760-6665

DHD
Architecture PLLC
13424 248TH Ave SE
Issaquah, WA 98027



NO	DATE	ISSUE BLOCK
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08	28-14	CD PRELIM
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02	25-15	TOWER REVS
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09	13-15	REVS
08	03-15	EQUIP PLAN REVS

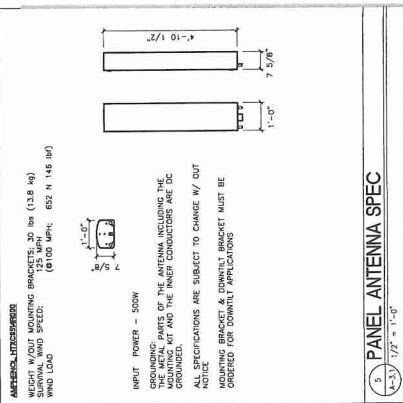
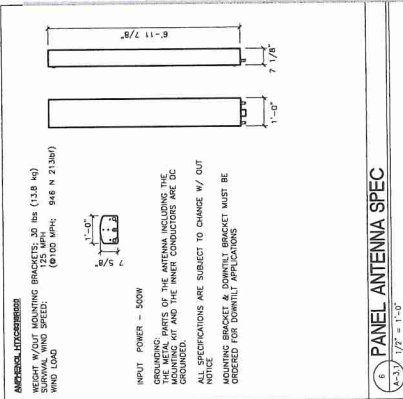
PROJECT:
**AK ALYESKA
- ALT 1**
104 ARLBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:
A-3.1

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND STIPULATED IN THE SPECIFICATION PROJECT SUMMARY.
 2. RUBBISH, STUMP REMAINS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT THE NEAREST APPROPRIATE LOCATION.
 3. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE PCS EQUIPMENT, TOWER AREA, AND ADJACENT BUILDINGS.
 4. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON THE SITE UNLESS IT IS FROZEN TO A MINIMUM OF 6 INCHES AND THE FILL IS COMPACTED TO A MINIMUM OF 95% OF THE SUBGRADE.
 5. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH AND UNIFORM GRADE PRIOR TO THE CRUSHED STONE APPLICATION.
- SUBGRADE AND BASE PREPARATION:**
1. FOR SLAB-ON-GRADE CONSTRUCTION IT WILL BE NECESSARY TO OVEREXCAVATE THE EXISTING GRADE TO A MINIMUM OF 6 INCHES BELOW THE FINISHED GRADE. THE SOIL SHALL BE REMOVED TO A MINIMUM OF 6 INCHES BELOW THE FINISHED GRADE. THE SOIL SHALL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY UNIT WEIGHT WITH A MOISTURE CONTENT WITHIN 2% OF THE MAXIMUM DRY UNIT WEIGHT. THE MOISTURE PROCTOR TEST (ASTM D-1557) COMPACTION REQUIREMENTS APPLY TO THE EXCAVATED SOIL.
 2. COMPACTION SHALL BE ACCOMPLISHED BY PLACING THE FILL IN SUCCESSIVE HORIZONTAL LAYERS, APPROXIMATELY 6 TO 8" THICK, AND MECHANICALLY COMPACTING EACH LAYER TO THE REQUIRED DENSITY. THE EXCAVATED SOIL SHALL BE REMOVED FROM THE WORK AREA.
 3. ANY ORGANIC MATERIAL, DELETERIOUS MATERIAL, OR DISTURBED SOIL SHALL BE REMOVED FROM THE WORK AREA.
 4. THE GROUND SURFACE SURROUNDING EXTERIOR STRUCTURES SHALL BE SLOPED TO DRAIN AWAY IN ALL DIRECTIONS.

GENERAL NOTES

NOT TO SCALE



GENERAL STRUCTURAL NOTES

SECTION 1 GENERAL CONDITIONS AND DESIGN LOADS

BUILDING CODE:

ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE 2009 INTERNATIONAL BUILDING CODE (IBC). DESIGN STANDARDS, SPECIFICATIONS AND PRODUCT MANUFACTURER'S CATALOGS, WHERE REFERENCED SHALL BE THE LATEST EDITION.

GRAVITY LOAD:

EQUIPMENT SHELTER DEAD LOAD: 60.000LB
ROOF FRAMING LIVE LOAD: 60 PSF (SNOW, FOR FDN. DESIGN)

WIND LOAD:

BASIC WIND SPEED: 90 MPH, (3) SECOND GUST
WIND IMPORTANCE FACTOR: 1.15
BUILDING CATEGORY: IV
INTERNAL PRESSURE COEFFICIENT: 0.18 (ENCLOSED)

SEISMIC LOAD:

SEISMIC IMPORTANCE FACTOR, i_e : 1.5
SEISMIC USE GROUP: IV
SPECTRAL RESPONSE ACCELERATIONS S_s AND S_1 : 1.01, 0.30
SITE CLASS: D
DESIGN BASE SHEAR (LRFD): 0.24
RESPONSE MODIFICATION FACTOR: 3
ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE PROCEDURE

SHOW DRAWING SUBMITTALS:

SHOP DRAWINGS SHALL BE SUBMITTED TO THE VERIZON PROJECT MANAGER IF REQUESTED FOR THE FOLLOWING ITEMS;

1. REINFORCING STEEL
2. STRUCTURAL STEEL

CONTRACTOR SHALL REVIEW SHOP DRAWINGS PRIOR TO REVIEW BY OTHERS.

QUALITY ASSURANCE PLAN:

SPECIAL INSPECTION IN ACCORDANCE WITH IBC SECTIONS 110 AND 1704 SHALL BE PERFORMED BY A QUALIFIED TESTING AGENCY DESIGNATED BY THE PROJECT MANAGER AND RETAINED BY THE PROJECT MANAGER. THE RESULTS OF ALL SPECIAL INSPECTIONS SHALL BE SUBMITTED TO THE PROJECT MANAGER. SPECIAL INSPECTION SHALL BE PROVIDED FOR THE FOLLOWING ELEMENTS:

1. STRUCTURAL STEEL FABRICATION AND ERECTION PER IBC SECTION 1704 AND TABLE 1704.3
2. CONCRETE CONSTRUCTION PER IBC SECTION 1704 AND TABLE 1704.4

GENERAL CONDITIONS:

REFER TO ARCHITECTURAL, CIVIL AND ELECTRICAL DRAWINGS FOR DIMENSIONS AND LOCATIONS OF OPENINGS.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING. IF CONDITIONS DIFFER FROM THE DRAWINGS, CONTRACTOR SHALL NOTIFY THE PROJECT MANAGER PRIOR TO PROCEEDING. CONTRACTOR SHALL BE RESPONSIBLE FOR STABILITY AND TEMPORARY SHORING REQUIRED TO SECURE THE STRUCTURE PRIOR TO THE INSTALLATION OF PERMANENT SUPPORTS AND STIFFENING ELEMENTS.

SECTION 2 SITE WORK

DESIGN CRITERIA:

NO SOILS REPORT AVAILABLE AT TIME OF FOUNDATION DESIGN. THE FOLLOWING CRITERIA HAS BEEN USED FOR THE DESIGN OF THE SHELTER FOUNDATION;

ALLOWABLE FOUNDATION PRESSURE: 1500 PSF

ALLOWABLE LATERAL BEARING PRESSURE: 150 PCF

ALLOWABLE LATERAL SLIDING COEFFICIENT: 0.25

SOIL CONDITIONS SHALL BE VERIFIED BY COMPETENT REPRESENTATIVE RETAINED BY OWNER. IF FINDINGS DIFFER FROM CONDITIONS ASSUMED NOTIFY PROJECT MANAGER FOR POSSIBLE RE DESIGN.

EXCAVATION:

EXCAVATE TO DEPTH SHOWN AND TO FIRM UNDISTURBED MATERIAL. EXCAVATIONS SHALL BE BACKFILLED WITH NON-FROST SUSCEPTIBLE GRAVEL. CARE SHALL BE EXERCISED TO AVOID BURIED LINES AND OTHER CONCEALED ITEMS DURING EXCAVATION.

FILL, BACKFILL AND COMPACTION:

COMPACTED STRUCTURAL FILL BELOW FOOTINGS AND SLABS SHALL BE GRANULAR, PLACED IN 8 INCH LIFTS AND COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557
BACKFILL AGAINST RETAINING WALLS OR BASEMENT WALLS SHALL BE FREE DRAINING GRANULAR MATERIAL.

SECTION 3 CONCRETE

MATERIALS:

CEMENT SHALL BE ASTM C150, TYPE I OR TYPE II.

COARSE AND FINE AGGREGATE SHALL BE ASTM C33.

WATER SHALL BE CLEAN AND POTABLE.

28 DAY COMPRESSIVE STRENGTH SHALL BE 3000 PSI FOR ALL CAST IN PLACE CONCRETE. MINIMUM CEMENT CONTENT SHALL BE 6 SACK MIX. ALL CONCRETE SHALL BE AIR ENTRAINED.

CONCRETE WORK SHALL BE PERFORMED WHEN TEMPERATURES ARE ABOVE FREEZING OR COLD WEATHER MEASURES SHALL BE USED TO PROTECT CONCRETE DURING CONSTRUCTION.

REINFORCING STEEL:

REINFORCING STEEL SHALL BE DETAILED, FABRICATED AND PLACED PER ACI-318. SUPPORT REINFORCEMENT WITH APPROVED CHAIRS, SPACERS OR TIES. STEEL NEVER TO BE PLACED DIRECTLY ON GROUND.

DEFORMED BAR REINFORCEMENT: ASTM A-615 GRADE 60

PROVIDE CORNER BARS AT ALL WALL AND FOOTING CORNERS AND INTERSECTIONS WITH DIAMETER TO MATCH REINFORCEMENT AND 2'-6" HORIZONTAL LAP LENGTH.

CONCRETE COVER ON REINFORCING (UNLESS SHOWN OTHERWISE):

CAST AGAINST EARTH 3"
EXPOSED TO EARTH AND SLAB ON GRADE 2"
WALLS, TO WEATHER FACE 1 1/2"
WALLS, TO INSIDE FACE 1"
COLUMNS AND BEAMS TO STIRRUPS 1 1/2"

SECTION 4 METALS

MATERIALS:

WIDE FLANGE SHAPES SHALL BE ASTM A709 ($F_y = 50$ KSI)

STEEL PLATES AND SHAPES SHALL BE ASTM A6 ($F_y = 36$ KSI)

HSS SECTIONS SHALL BE ASTM A618, GRADE 2 ($F_y = 46$ KSI)

ANCHOR BOLTS SHALL BE ASTM A-307 U.N.O. ON PLANS AND DETAILS.

ALL BOLTS AT BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS SHALL BE ASTM A490-N U.N.O. ALL BOLTS SHALL BE INSTALLED WITH HARDENED WASHERS CONFORMING TO ASTM F-436 AND NUTS CONFORMING TO ASTM A-563.

ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIP GALVANIZED. ALL STEEL NOT EXPOSED TO WEATHER SHALL BE SHOP PRIMED.

WELDING:

ALL WELDING SHALL BE PER AWS D1.1 CURRENT EDITION AND SHALL BE PERFORMED BY WAGO CERTIFIED WELDERS.
USE 70 KSI LOW HYDROGEN ELECTRODES.

CONTINUOUS SPECIAL INSPECTION SHALL BE PROVIDED FOR FULL PENETRATION FIELD JOINTS. RESULTS OF ALL TESTS SHALL BE SUBMITTED TO THE PROJECT MANAGER FOR REVIEW.

NO WELDING OF REINFORCING STEEL SHALL BE ALLOWED UNLESS APPROVED BY THE PROJECT MANAGER.

QUALITY ASSURANCE PLAN

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARDS	IBC REFERENCE
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS AND PLACEMENT.	-	X	ACI 318: 3.5, 7.1-7.7	1913.4
2. INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1704.3, ITEM 5B.	-	X	AWS D1.4: 3.5.2	-
3. INSPECTION OF BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED OR WHERE STRENGTH DESIGN IS USED.	X	-	ACI 318: 8.1.3, 21.2.8	1911.5, 1912.1
4. INSPECTION OF ANCHORS INSTALLED IN HARDENED CONCRETE.	-	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1912.1
5. VERIFYING USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: CH. 4 5.2-5.4	1904.2.2, 1913.2, 1913.3
6. AT THE TIME FRESH CONCRETE IS SAMPLED FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C 172: 5.1, 5.2, 5.3, 5.6, 5.8	1913.10
7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	-	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8
8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	ACI 318: 5.11-5.13	1913.9
9. INSPECTION OF PRESTRESSED CONCRETE A. APPLICATION OF PRESTRESSING FORCES. B. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SYSTEM.	X X	- -	ACI 318: 18.20 ACI 318: 18.18.4	-
10. ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	ACI 318: CH. 16	-
11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN AND POSTTENSIONED CONCRETE PARTS, WALLS, SLABS, AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	X	ACI 318: 6.2	-
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND CONDITION. THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 6.1.1	-



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Issaquah, WA 98027



ISSUED DATE:	06-03-15
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PROJECT:
AK ALYESKA
- ALT 1
104 ALBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:
A-4

NO.	DATE	ISSUE BLOCK
01	07-10-14	2D ANTENNA REVS
02	08-28-14	CD PRELIM
03	09-15-14	CD FINAL
04	11-06-14	BP COMMENTS
05	02-23-15	TOWER REVS
06	03-17-15	NOTE REVS
07	05-13-15	REVS
08	08-03-15	EQUIP PLAN REVS

PROJECT:

AK ALYESKA - ALT 1

104 ARLBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:

E-1

ELECTRICAL LEGEND

--- UNDERGROUND	--- GROUND CONDUCTOR
--- RACINT	
--- FUSED DISCONNECT	--- PANELBOARD
--- TRANSFORMER	--- FUSED DISCONNECT
--- FEEDER KEY	--- LOCAL DISCONNECT
--- GROUND	--- GROUND ROD
--- PANELBOARD	--- EXOTHERMIC WELD
--- METER	--- COMPRESSOR TYPE CONNECTION
--- ELECTRICAL EQUIPMENT ENCLOSURE	--- TEST WELL
--- ELECTRICAL SERVICE	--- AUTOMATIC TRANSFER SWITCH
--- TELEPHONE SERVICE	--- WEATHERHEAD
--- GENERATOR	--- GENERATOR RECEPTACLE

ABBREVIATIONS

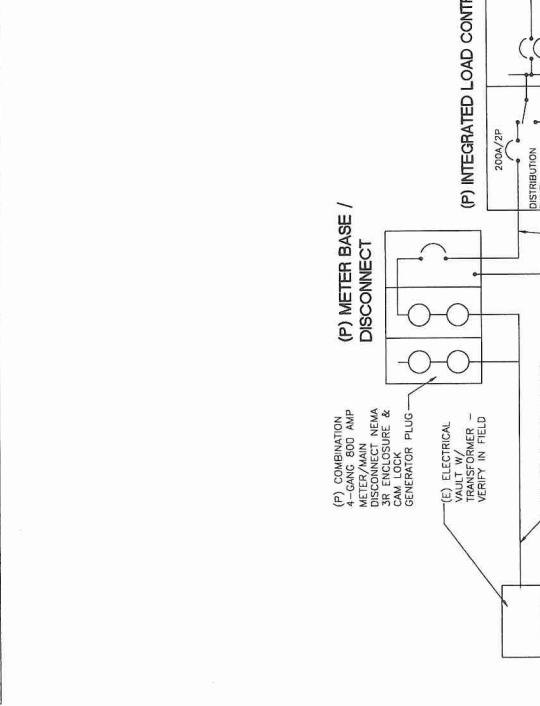
AWG	AMERICAN WIRE GAUGE
BCW	BARE COPPER WIRE
DWG	DRAWING
EUT	ELECTRICAL METALLIC TUBING
GRN	GROUND
INT	INTERIOR
IMC	INTERMEDIATE METALLIC
PCS	PERSONAL COMMUNICATION
MGB	MASTER GROUND BAR
RGS	RIGID GALVANIZED STEEL
RWY	RACEWAY
TP	TYPICAL

ELECTRICAL NOTES

1. INSTALLATION OF SECONDARY POWER AND CONNECTION TO METER SHALL BE COMPLETED IN COMPLIANCE WITH NATIONAL ELECTRIC CODE, NFPA 70, AND THE STATE OF WASHINGTON LAWS, RULES AND REGULATIONS. FOR NATIONAL ELECTRICAL CODE, REFER TO THE 2014 NEC. FOR WASHINGTON STATE, REFER TO THE 2014 WAC. FOR LOCAL UTILITY STANDARDS, REFER TO THE 2014 LUS. FOR LOCAL PUD, REFER TO THE 2014 LPU. FOR LOCAL C.E.A. REFER TO THE 2014 C.E.A. S651-401, I.C.E.A. P81-570, & LOCAL PUD.
2. PROVIDE A UTILITY BASE PER LOCAL UTILITY STANDARDS. MOUNT ON SIDE OF OWNER FURNISHED BACK BOARD.
3. UNDERGROUND CONDUIT SHALL BE RIGID POLYVINYL CHLORIDE (PVC) OR RIGID POLYETHYLENE GLYCOL (PE-GC) UNLESS OTHERWISE SPECIFIED. WESTERN PLASTICS OR CARLEN MANUFACTURER COUPLINGS SHALL BE SLIP-ON, SOLVENT SEALED T-PIPE, SOLVENT, WESTERN TYPE COMPATIBLE WITH PVC DUCT. ALL BENDS SHALL BE "WIDE SWEEP" TYPE WITH A 24" MINIMUM RADIUS. ALL CONDUIT SHALL BE 1/2" RIGID PVC, (OR PVC ENCLOSED IN 8" x 8" RED CONCRETE DUCTBANK).
4. CONDUIT USED INDOORS SHALL BE EMT, AND RIGID GALVANIZED STEEL OUTDOORS. CONDUIT SHALL BE RIGID STEEL AND COMPRESSOR TYPE FOR E.M.T. SET SCREW FITTINGS ARE NOT PERMITTED. FOR ALL STUB-UPS, USE RIGID GALVANIZED STEEL CONDUIT.
5. WIRE AND CABLE SHALL BE OF THE TYPE AND SIZE AS REQUIRED BY NEC. THERE WILL BE NO SPACES ALLOWED.
6. CONTRACTOR SHALL PROVIDE TEST OF THE GROUNDING SYSTEM BY CERTIFIED MANAGER FOR REVIEW. GROUNDING SYSTEM RESISTANCE TO GROUND SHALL NOT EXCEED 5 OHMS. ALL ABOVE GRADE INTERIOR GROUNDING CONNECTORS SHALL BE DOUBLE END BOLTED TO GROUND. ALL EXTERIOR GROUNDING CONNECTORS SHALL BE DOUBLE END BOLTED TO GROUND. ALL EXTERIOR GROUNDING CONNECTORS SHALL BE TAKEN TO REVIEW CONNECTION POINTS AND DISCUSS ALL EXPOSED GROUNDING CONNECTIONS TO BE COATED WITH ANTI-CORROSION AGENT SUCH AS "NO-OXY", "NOAGLX" OR "PENETROX". VERIFY PRODUCT WITH PROJECT MANAGER. ALL BOLTS, WASHERS AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
7. ALL EXTERIOR GROUND BARS SHALL BE COATED WITH AN ANTI-CORROSION AGENT SUCH AS UPS-3 OR AS PER NOTE 6 ABOVE.
8. ALL JUNCTION AND OUTLET BOXES TO BE LABELED WITH WORDS AND NUMBERS, DESIGNATING ALL CIRCUIT NUMBERS CONTAINED IN EACH BOX.
9. CONTRACTOR TO ENSURE LC PROVIDED WITH (2) INTERNAL TYS.
10. CONTRACTOR SHALL COORDINATE WITH SITE SURVEY TO LOCATE EXISTING UNDERGROUND UTILITIES. WHEREVER POTENTIAL INTERFERENCE EXISTS WITH THE PROPOSED UNDERGROUND DAMAGE CONTACT ALL UTILITIES TO LOCATE UNDERGROUND PIPING IN PUBLIC ROW.
11. VERIFY THAT A.I.C. OF THE UTILITY DOES NOT EXCEED THE A.I.C. RATING OF THE PROVIDED EQUIPMENT SHELTER PACKAGE. IF OVER 10KALC, PROVIDE FUSIBLE SERVICE ENTRANCE SWITCH AND CONFIRM LOWERING OF AIC TO ACCEPTABLE LEVELS.
12. UTILITY POINTS OF SERVICE AND WORK / MATERIALS SHOWN ARE BASED UPON PRELIMINARY INFORMATION PROVIDED BY THE UTILITY COMPANIES AND ARE FOR BID PURPOSES ONLY.
13. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR FINAL AND EXACT WORK / MATERIALS REQUIREMENTS AND SPECIFICATIONS ONLY. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, PULL ROPES, CABLES, PULL BOXES, CONCRETE ENCASUREMENT OF CONDUIT (IF REQUIRED), TRANSFORMER PAD, AND ALL OTHER MATERIALS AND EQUIPMENT REQUIRED FOR THE COMPANY FEES AND INCLUDE ALL REQUIREMENTS IN SCOPE OF WORK.

LOADS, SEE PANEL SCHEDULE

PANEL 'A'									
NO.	TRIP	LOAD DESCRIPTION	LOAD (VA)	LOAD TYPE	LOAD (VA)	LOAD TYPE	TRIP (A)	LOAD (VA)	LOAD TYPE
1	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
2	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
3	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
4	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
5	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
6	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
7	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
8	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
9	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
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27	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
28	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2
29	2	80 BPS NUMBER 1	1,330	A	600	A	15	1	2



(P) COMBINATION 4-GANG 800 AMP METER/MAIN DISCONNECT NEMA 3R ENCLOSURE & CAM LOCK PLUG

(E) ELECTRICAL VAULT W/ TRANSFORMER - VERIFY IN FIELD

(P) 120 / 240V 1 PHASE UNDERGROUND SERVICE (V.I.F.)

(P) GROUND ELECTRODE SYSTEM SHALL CONSIST OF: #2 BARE CU. CONNECTED 10' x 10' LONG DRIVEN GROUND ROD(S)

(3) #2/0, Z

(1) #6C,

SCHEMATIC ONE-LINE DIAGRAM



PLANS PREPARED FOR:
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NO.	DATE	ISSUE BLOCK
01	06-03-15	ISSUE DATE
02	06-03-15	06-03-15
03	03-13-15	REVS
04	02-17-15	NOTE REVS
05	02-25-15	TOWER REVS
06	11-06-14	BR COMMENTS
07	09-15-14	CD FINAL
08	08-28-14	CD PRELIM
09	07-10-14	2D ANTENNA REVS
10		

PROJECT:
AK ALYESKA - ALT 1
104 ARLBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:
E-2

ELECTRICAL NOTES

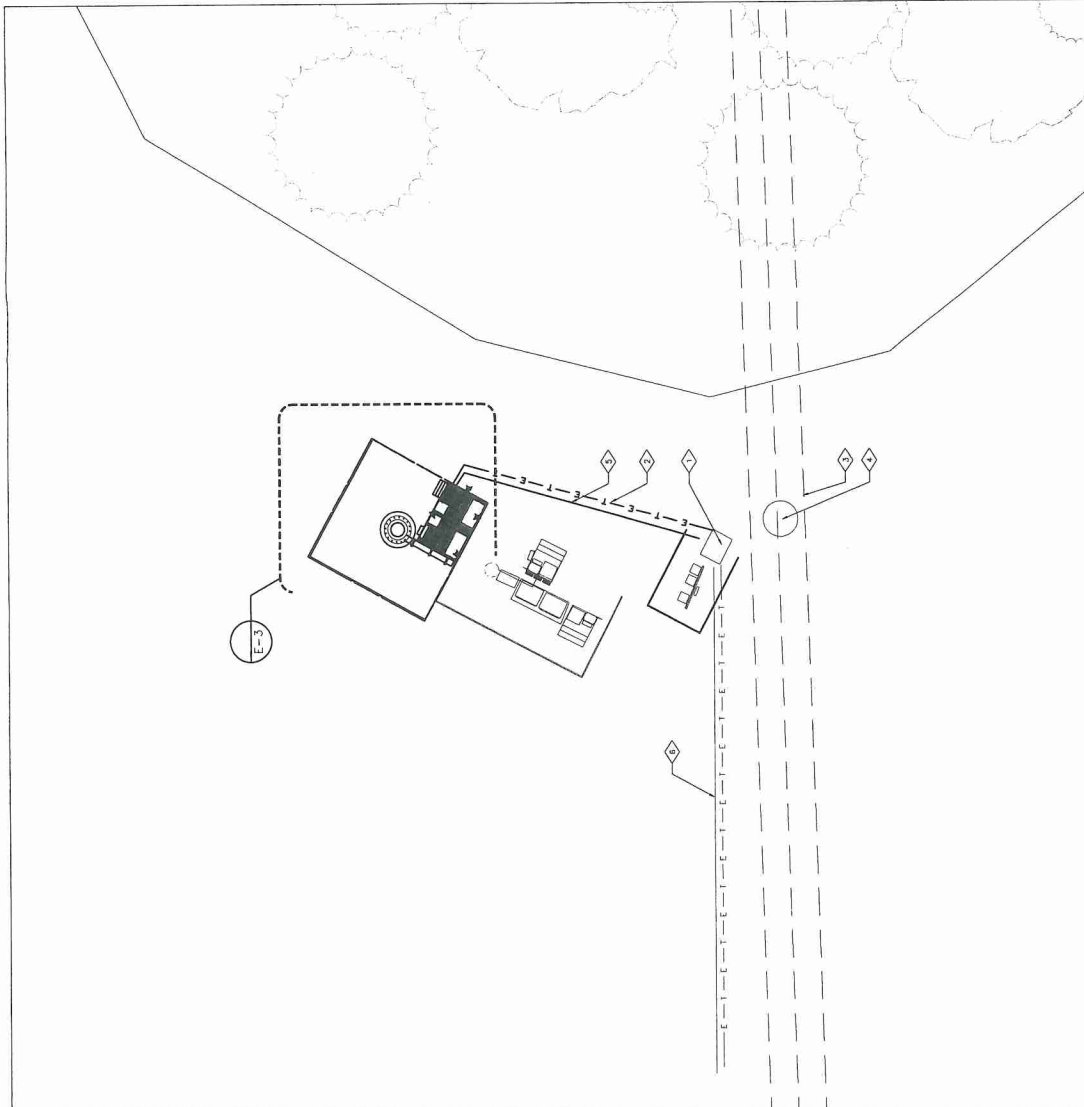
- 1 EXISTING ELECTRICAL VAULT - VERIFY IN FIELD
- 2 NEW VERIZON WIRELESS ELECTRICAL ROUTE FROM EXISTING ELECTRICAL VAULT TO LC CABINET - VERIFY CONNECTIONS IN FIELD
- 3 OVERHEAD SKI LIFT LINES
- 4 SKI LIFT POLE
- 5 UNDERGROUND FIBER ROUTE, CONDUIT SIZE PER PROVIDER; VERIFY WITH CLIENT REPRESENTATIVE AT TIME OF CONSTRUCTION
- 6 FIBER TO ORIGINATE FROM UTILITY PEDESTAL, THEN ROUTE U/G TO NEW VERIZON WIRELESS UTILITY RACK

GENERAL NOTES

THIS IS NOT A SITE SURVEY.
ALL PROPERTY BOUNDARIES, ORIENTATION OF TRUE NORTH AND ALL UTILITIES SHOWN ARE APPROXIMATE. A TAX PARCEL MAP AND ARE APPROXIMATE - SEE SURVEY FOR ACTUAL INFORMATION IF PROVIDED.

DIG NOTE: CALL BEFORE YOU DIG! BURIED UTILITIES EXIST IN THE AREA AND UTILITY INFORMATION SHOWN MAY NOT BE COMPLETE. A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION, 1-800-478-3121.

POWER / TELCO NOTE:
POWER TO ORIGINATE FROM THE EXISTING UTILITY POLE, (VERIFY NUMBER IN FIELD), THEN ROUTE O/H TO NEW VERIZON WIRELESS UTILITY POLE, THEN ROUTE U/G TO THE PROPOSED VERIZON WIRELESS UTILITY RACK. VERIFY POLE NUMBER FIBER TO ORIGINATE FROM UTILITY POLE, (VERIFY POLE NUMBER IN FIELD), THEN ROUTE U/G TO THE PROPOSED VERIZON WIRELESS UTILITY RACK. VERIFY POLE NUMBER FIBER TO ORIGINATE FROM UTILITY RACK, THEN ROUTE U/G TO THE PROPOSED VERIZON WIRELESS UTILITY RACK.



1 SCHEMATIC ELECTRICAL SITE PLAN
(1" = 10'-0")



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NO.	DATE	ISSUE BLOCK
01	06-03-15	ISSUE BLOCK
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PROJECT:
AK ALYESKA - ALT 1
104 ARLBERG AVE
GIRDWOOD, AK 99587

SHEET NUMBER:
E-3

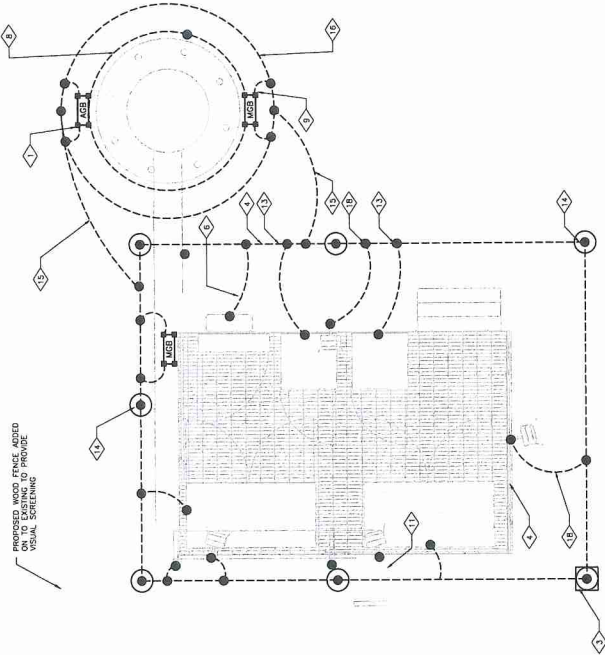
KEYED NOTES

1. NEW AFB AT ANTENNAS
2. MASTER GROUND BUS BAR TO GROUND RING CONNECTION
3. GROUND TEST WELL (MINIMUM OF 2 PLACES)
4. NEW EQUIPMENT PLATFORM #2 AND BROW GROUND RING
5. CONNECT STEEL PLATFORM TO NEW GROUND RING WITH #2 BROW (4 LOCATIONS)
6. CONNECT NEW SERVICE UTILITY RACK AS PER N.E.C. CODE
7. CONNECT NEW ANTENNA WITH #2 BROW TO AFB (TYPICAL AT EACH ANTENNA)
8. CONNECT NEW AFB TO EXISTING AFB WITH (2) #2 BROW
9. PROPOSED AFB AT BASE OF TOWER
10. CONNECT NEW GENERATOR (IF USED) TO NEW GROUND RING W/ #2 BROW
11. CONNECT ICE BRIDGE TO GROUND RING W/ #2 BROW
12. CONNECT NEW GPS RECEIVER TO GROUND RING W/ #2 BROW
13. CONNECT NEW EQUIPMENT CABINET TO GROUND RING W/ #2 BROW (TYP)
14. GROUND ROD SPACING AT 10' O.C. MINIMUM - 15' O.C. MAXIMUM
15. CONNECT NEW TOWER / MONOPOLE GROUND RING TO NEW EQUIPMENT PLATFORM GROUND RING W/ (2) #2 BROW (2 LOCATIONS)
16. EXISTING TOWER / MONOPOLE GROUND RING - VERIFY IN FIELD
17. NEW MASTER GROUND BUS BAR
18. CONNECT NEW EXTERIOR LIGHTING TO GROUND RING W/ #2 BROW
19. CONNECT GATE SWING TO GATE POST WITH #2 BROW (TYP)

NOTES

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS AND ALL APPLICABLE LOCAL CODES.
2. ALL GROUNDING SHALL CONFORM TO THE CURRENT VERIZON WIRELESS STANDARDS.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND CONDUIT INSTALLATION TO AVOID ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. PREPARED SHELTER WILL BE PROVIDED WITH INTERNAL WIRING AND EQUIPMENT CONNECTIONS TO ANTENNAS. ANTENNA WIRING AND ARRANGEMENT REFER TO DRAWINGS PROVIDED BY SHELTER MANUFACTURER.
6. FOR INTERIOR EQUIPMENT LAYOUT AND LOCATION, SEE SHELTER MANUFACTURER'S DRAWINGS AND SPECIFICATION, IN CASE OF CONFLICT THE DRAWINGS GOVERN.
7. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADDLED).
8. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR & EXTERIOR) SHALL BE FORMED USING TWO (2) HIGH PRESS CRIMPS.
9. ALL EXOTHERMIC CONNECTIONS TO THE GROUND RODS SHALL START AT THE TOP & HAVE A MINIMUM OF 18" OF EXPOSED ROD TO ALLOW FOR PROPER CRIMPING.
10. GROUNDING CONDUCTORS TO BE CLEAN AND FREE OF PAINT AT THEIR MAKING SURFACES AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
11. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG TH PLATED COPPER UNLESS OTHERWISE NOTED.
12. GROUND RODS SHALL BE GALVANIZED STEEL OR COPPER CLAD STEEL 5/8" 10-FT. LONG, AND SHALL BE DRIVEN VERTICALLY WITH THEIR TOPS 18" BELOW FINAL GRADE OR 6" BELOW FROST LINE FOR MAXIMUM DEPTH.
13. GROUNDING CONDUCTORS SHALL BE 1/2" OR 3/4" IN DIAMETER AND SHALL BE SOLDERED OR WELDED TO THE GROUND RODS. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND ROD ARE NOT PERMITTED.
14. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE MINIMUM 45° BENDS CAN BE ADEQUATELY SUPPORTED.
15. GROUND RING SHALL BE LOCATED A MINIMUM OF 24" BELOW GRADE OR 6" MINIMUM BELOW THE FROST LINE.
16. GROUNDING CONDUCTORS AND GROUND ROD MINIMUM OF 1'-0" FROM EQUIPMENT ENCLOSURES AND CONDUITS SHALL BE USED TO PREVENT SHORTS TO CONDUITS, CONCRETE, PAINT, SPREAD FOOTING, OR FENCE.
17. EXOTHERMIC WELD GROUND CONNECTION TO FENCE POST. TREAT WITH A COLD GALVANIZED SPRAY.
18. OBSERVE N.E.C. AND LOCAL UTILITY REQUIREMENTS FOR ELECTRICAL SERVICE GROUNDING.
19. GROUNDING ATTACHMENT TO TOWER SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS OR AT GROUNDING POINTS PROVIDED (2 MINIMUM).
20. MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS.
21. MINIMUM BENDING RADIUS FOR GROUNDING CONDUCTORS IS 18" WHEN BENDING IS REQUIRED. MINIMUM BENDING RADIUS FOR GROUND RODS IS 18" WHEN BENDING IS REQUIRED.
22. NO SPICES PERMITTED IN GROUND CONDUCTORS.
23. ALL MECHANICAL CONNECTIONS ARE TOLERABLE TO THE MANUFACTURER'S SPECIFIED VALUES.
24. GROUND BARS SHALL NOT BE FIELD MODIFIED.
25. ALL HORIZONTAL FENCE SECTIONS TO BE GROUNDING WITH 8" SINGLE BARREL GROUND STRIPS.

NOTE: GROUNDING PLAN IS FOR REFERENCE ONLY. THE CONTRACTOR SHALL VERIFY ALL GROUNDING THAT MEETS ALL STATE & LOCAL DESIGN REQUIREMENTS. EXISTING SOIL RESISTIVITY SHALL BE DETERMINED BY SOIL RESISTIVITY TEST AT A LATER DATE.



1. SCHEMATIC ELECTRICAL GROUNDING PLAN
1/8" = 1'-0"

