

Agenda

Planning Commission - Regular Meeting City and Borough of Juneau Ben Haight, Chair

July 11, 2017
Assembly Chambers
7:00 PM

I. ROLL CALL

II. APPROVAL OF MINUTES

- A. June 13, 2017 Draft Minutes - Regular Planning Commission Meeting
- B. June 13, 2017 Draft Minutes - Committee of the Whole Meeting
- C. June 27, 2017 Draft Minutes - Regular Planning Commission

III. WRITTEN AGENCY AND PUBLIC COMMENTS POST DEADLINE

- A. Additional Materials for 7/11/17 Meeting

IV. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

V. PLANNING COMMISSION LIAISON REPORT

VI. RECONSIDERATION OF THE FOLLOWING ITEMS

- A. AME2017 0002: A rezone request for 1.23 acres from D18 (Multi-Family Residential District, 18 units per acre) to MU (Mixed-Use).

VII. CONSENT AGENDA

VIII. CONSIDERATION OF ORDINANCES AND RESOLUTIONS

IX. UNFINISHED BUSINESS

X. REGULAR AGENDA

- A. WCF2017 0007: A Wireless Communications Facility application to replace an existing 90 ft. tower with a 120 ft. tower.
- B. AME2017 0004: A rezone request for the property at 9990 Mendenhall Loop Road from D-5 (single-family residential, 5 dwelling units per acre) to D-10 (multi-family residential, 10 dwelling units per acre).

XI. BOARD OF ADJUSTMENT

XII. OTHER BUSINESS

XIII. DIRECTOR'S REPORT

- A. Update on Parks & Rec Master Plan
- B. AK Supreme Court Opinion and Judgment

XIV. REPORT OF REGULAR AND SPECIAL COMMITTEES

XV. PLANNING COMMISSION COMMENTS AND QUESTIONS

XVI. ADJOURNMENT

Agenda
Planning Commission
Regular Meeting
CITY AND BOROUGH OF JUNEAU
Ben Haight, Chairman
June 13, 2017

I. ROLL CALL

Ben Haight, Chairman, called the Regular Meeting of the City and Borough of Juneau (CBJ) Planning Commission (PC), held in the Assembly Chambers of the Municipal Building, to order at 7:08 p.m.

Commissioners present: Ben Haight, Chairman; Paul Voelckers, Vice Chairman; Michael LeVine, Nathaniel Dye, Dan Miller, Percy Frisby, Dan Hickok, Kirsten Shelton-Walker, Carl Greene

Commissioners absent:

Staff present: Rob Steedle, CDD Director; Beth McKibben, Planning Manager; Brenwynne Grigg, Administrative Officer; Laura Boyce, Senior Planner, Jill Maclean, Senior Planner, Robert Palmer, Assistant Municipal Attorney; Greg Chaney, Lands and Resources Manager; Rachel Friedlander, Lands and Resources Specialist; Gary Gillette, Port Engineer/Architect II

Assembly members: Debbie White

II. APPROVAL OF MINUTES

- a. May 9, 2017, Draft Minutes - Regular Planning Commission Meeting

MOTION: *by Mr. LeVine, to approve the May 9, 2017, Regular Planning Commission meeting minutes with any minor changes by staff or Commission member.*

The motion passed with no objection.

III. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

Juneau resident Kari Robinson said she is a property owner on North Douglas of a triplex and a

cabin. She said they are in the process of selling their property and that the property has a designation of "legal but nonconforming". Their buyer is unable to obtain bank financing for the property because if more than 75 percent of the structure was destroyed they would not be able to rebuild it with the existing use, said Ms. Robinson. She said she wanted to make the Commission aware of this issue which other homeowners in the City are experiencing and that she hoped the Commission could take steps to rectify this situation.

Commission Comments and Questions

Mr. Voelckers asked if Ms. Robinson knew if this was a relatively new process undertaken by the banks.

Ms. Robinson said it sounds like it is a relatively new phenomenon. She said this did not appear to be an issue with appraisals in the past, but that now they cannot even obtain an appraisal for their property until this issue is resolved.

Chairman Haight said this has not yet been discussed by the Title 49 Committee but that it is something that needed to take place in the near future.

Mr. LeVine noted that this same issue has been raised before the Commission several times within the past few weeks. The actual intent of that provision was to allow individuals to obtain financing, he said. If it has changed then they need to adjust the provision accordingly, he said.

Mr. Hickok asked if the property owner could rezone the property to rectify the situation.

Ms. McKibben said that applications for rezones are only accepted in January and July, and that the requested rezoning has to be the extension of an existing zoning district, or more than two acres. In addition, it would need to be consistent with the maps of the Comprehensive Plan, she noted. The nonconforming section of the code has not changed in many years, said Ms. McKibben. Within the past few years the staff has been hearing consistently from residents that they are not able to obtain financing because the property is identified as nonconforming, said Ms. McKibben.

Mr. Voelckers said that he felt other Commission members were in agreement that there is underlying language which should be rectified to reflect legally nonconforming residences.

Mr. Miller said he wondered if the problem could be taken care of with some form of deed restriction that could be filed with the plat on the land indicating that the use that was conforming at one time could go with the land so that the land itself remained in conformance.

Resident Joanne Birt stated that on her street, Meadow Lane, homes have sold many times, and when a coworker attempted to buy a home on this street this same issue arose. It is the verbiage stating that the structure could not be rebuilt if 75 percent of the structure burned,

she said.

Juneau resident and former Planning Commission Chairman Mike Satre said during his time on the Planning Commission he tried to emphasize two things: the ability for the public to use their own private property in the best way possible, and protection of the public process. He said he hoped the Commission could view the variance issue fairly simply. While the code is being rewritten he said he hoped the misconception was not given to the public that variances are not being issued. Variances are an important part of the public process, said Mr. Satre.

Regarding eagles, said Mr. Satre, the buffer could remain for public land and removed for private land with a pamphlet available instructing the public about eagles and their nesting habits.

IV. PLANNING COMMISSION LIAISON REPORT

Assembly liaison to the Planning Commission Debbie White reported that the finance committee will meet June 14, (2017). They are going to discuss the process related to the budget, as this year some of the items appeared to be out of order, said Ms. White. They will discuss the allocation of one percent issues, and they will discuss Alaska municipal infrastructure requests through the federal government.

The Assembly voted to revisit the mining ordinance issue, and the Mayor has created a short term task force on homelessness, said Ms. White.

Mortgage loan originators are spending a full business day a week just keeping up on the changes that are happening in the industry, said Ms. White. Appraisal standards changed several years ago and one of those items was the repercussions if the structure burned down and if it could be rebuilt, said Ms. White. When the current appraisers in Juneau see a nonconforming use, their eyes they see that as a “no”, said Ms. White. A systemic response is required to solve that problem, she noted.

Commission Comments and Questions

Mr. Voelckers asked if the Assembly has begun conversations regarding the overlay districts outlined by the Commission for downtown Juneau and the town of Douglas.

Ms. White said that item was introduced to the Assembly during its last regular meeting which means that it will come back to the Assembly for public testimony at its next regular meeting.

V. RECONSIDERATION OF THE FOLLOWING ITEMS – NONE

VI. CONSENT AGENDA

CSP2017 0009 was pulled from the Consent Agenda at the request of Mr. Voelckers and placed under the Regular Agenda.

- a. **USE2017 0009:** Conditional Use Permit for additional living space above a nonconforming garage.

Applicant: Matt Davidson

Location: 521 Ninth Street

Staff Recommendation

It is recommended that the Planning Commission adopt the Director's analysis and findings and APPROVE the requested Conditional Use Permit. The permit would allow the development of a second story addition above an existing nonconforming attached garage, 1.87 feet from a side lot line, in a D5 zoning district.

The approval is subject to the following conditions:

1. To ensure that further encroachment into the setbacks does not occur, the dimensions of the existing eaves be measured in the field and not exceeding their current distance from the side lot line added as a condition of approval of a building permit.
2. Prior to the issuance of a Temporary Certificate of Occupancy for the associated building permit, an as-built survey of the completed addition is provided to the Community Development Department.

- b. **CSP2017 0007:** A consistency review for renewal of lease of CBJ lands for existing monitoring equipment associated with the Juneau Airport Wind System (JAWS)

Applicant: City and Borough of Juneau

Location: Fish Creek Rd, Dock St, Alaway Ave

Staff Recommendation

Staff recommends that the Planning Commission forward the subject proposal to the Assembly with a recommendation of approval.

MOTION: *by Mr. LeVine, to approve USE2017 0009 and CSP2017 0007 and accept staff's findings, analysis and recommendations.*

The motion passed with no objection.

VII. CONSIDERATION OF ORDINANCES AND RESOLUTIONS - NONE

VIII. UNFINISHED BUSINESS - NONE

IX. REGULAR AGENDA

CSP2017 0009: CBJ acquisition of a portion of the Auke Bay Marine Station from the federal government.

Applicant: City & Borough of Juneau

Location: 11305 Glacier Highway

Staff Recommendation

Staff recommends that the Planning Commission find CSP2017 0009 to be consistent with adopted local plans and polices, as required by CBJ 49.10.170(c), CBJ 49.15.580 and AS 35.30.010 and forward to the Assembly a recommendation for approval to allow for the acquisition of a fraction of USS 1500 from the federal government.

Chairman Haight said he has participated in this particular project in the past but that he is no longer involved. He stated that he does not feel he has a conflict.

The Commission voiced no objection.

Mr. Voelckers said there was a note that the Auke Bay Plan had designated a sea walk to this area that went around to the Anderson building.

Mr. Gillette said their conceptual plan does include a sea walk. The only caveat is that they do not own all of the tidelands, he said. There are some private tidelands for which they are going to have to negotiate, he said.

Mr. Voelckers proposed that they amend the recommendation to add the following language:

MOTION: *by Mr. Voelckers, that the Commission adopt CSP2017 0009, with staff's findings, analysis and recommendations, with the addition of one condition: that, "Subsequent planning and development by Docks and Harbors on CBJ land shall incorporate the space for a sea walk as identified in the Auke Bay Plan."*

The motion passed with no objection.

CSP2017 0010: CBJ land disposal to add 14,000 - 22,000 square feet to Entrance Point Subdivision Tract C in the Rural Reserve zoning district along North Douglas Highway.

Applicant: City & Borough of Juneau

Location: Entrance Point Subdivision, North Douglas Highway

Staff Recommendation

Staff recommends that the Planning Commission find CSP2017 0008 to be consistent with adopted local plans and policies, as required by CBJ 49.10.170(c), CBJ 49.15.580 and AS 35.30.010 and forward to the Assembly a recommendation for approval to allow for the sale of a portion of USS 3559 to the owners of Entrance Point Subdivision Tract C. This recommendation is based on the following condition:

1. The area of land disposed by CBJ to the owners of Entrance Point Subdivision Tract C shall be the minimum necessary to meet the dimensional requirements of the Rural Reserve zoning district found in Title 49, the Land Use Code.

The Lands Division is the applicant for this item, said Ms. McKibben. This is a City/State project review for a land disposal to add approximately 14,000 - 22,000 square feet to Tract C in the Rural Reserve zoning district along North Douglas Highway. The lot is triangular, noted Ms. McKibben, and the person who wants to purchase the property would like it to be rectangular in shape which would make it easier to develop.

The property does have City water and is on private septic, noted Ms. McKibben. The access is via North Douglas Highway, she added. The current, triangular lot is 14,260 square feet, said Ms. McKibben. The minimum lot size in the Rural Reserve zoning district is 36,000 square feet, she said. It is a nonconforming lot. Since the lot was created before it was zoned, said Ms. McKibben, it is considered a legally nonconforming lot. The lot as it currently exists could be developed with a single family home, said Ms. McKibben. Adding 22,000 square feet would bring the lot up to the minimum lot size for the Rural Reserve zone, she noted.

Ms. McKibben said that goal one of the 2016 Lands Plan is to continue to place CBJ land into private ownership based upon the following objectives:

- 🏠 Make land available for community expansion
- 🏠 Expand the property tax base
- 🏠 minimize the CBJ's costs for disposing of land
- 🏠 Provide opportunities for a variety of housing by disposing of land in multiple locations, by a variety of methods and at several price ranges
- 🏠 Maximize the CBJ's return on its property
- 🏠 Provide opportunities for as many people as possible to acquire CBJ land

The proposed disposal has not been appraised, and the individual who wishes to purchase the property does not want to have an appraisal performed unless he's being sold the land requested, said Ms. McKibben.

The staff supports the proposed land disposal, but it recommends that the minimum amount of

land sold be enough to meet the minimum lot size for the Rural Reserve zone, said Ms. McKibben, to total 36,000 square feet.

Commission Comments and Questions

Mr. LeVine asked if it matters to the staff how the additional 22,000 square feet are constructed.

Ms. McKibben said from the CDD standards, as long as the lot meets the requirements of area, depth and width, they are satisfied.

Applicant

Ms. Friedlander told the Commission that the top rectangle over the drawing indicates the size of rectangle necessary, as the previous request did not meet lot depth, required at 150 feet. To meet that lot depth, the lot would be a total of 36,320 square feet, said Ms. Friedlander. She added that the individual who wishes to purchase the property has stated that he is not sure that he can afford to purchase enough property to make it a conforming lot for the Rural Reserve zone, said Ms. Friedlander.

Commission Comments and Questions

Mr. LeVine said he is not confident that expanding a nonconforming lot from a smaller nonconforming lot to a larger nonconforming lot is a good idea.

Mr. Voelckers commented that it seems like the lot is not fully conforming now and it does not really make sense to continue to retain the lot in its nonconforming state.

Mr. Dye asked what the approximate cost would be for the additional 8,100 square feet of property.

Ms. Friedlander said that she does not have an approximate square footage price. She added the purchaser of the property did not want to have an appraisal done until he knew that he was going to be able to purchase the property.

Public Comment

North Douglas resident SueAnn Randall read a letter she had sent to the Planning Commission regarding the lot purchase request. In her letter she requested that the Planning Commission have the foresight to maintain the Rural Reserve minimum square foot requirement of 36,000 square feet in order to encourage and enable the property owner's ability to maintain the wilderness aesthetics of this area of Juneau. A neighboring property owner, in her letter she said that no public notice had been provided for this item on the agenda, and therefore the opportunity for public comment had been reduced.

Applicant

Ms. Friedlander said the person who wishes to purchase the property has stated that the chances of him purchasing more property than he has requested are very slim. She said it appears he does not wish to purchase more than the 14,000 square foot amount of property he originally indicated.

Commission Comments and Questions

Mr. Voelckers asked if there is any idea of what the cost difference would be between the 28,000 square foot purchasing price and the 36,000 square foot purchase price.

No cost estimate was forthcoming.

MOTION: *by Mr. LeVine, that the Planning Commission find CSP2017 0010 to be consistent with adopted local plans and policies as required by CBJ 49.10.170 (c), CBJ 49.50.580 and AS 35.30.010 and recommend the approval of the sale of the minimum portion of USS 3559 Lot 2 of Entrance Point Subdivision Tract C to meet the dimensional requirements of the Rural Reserve zoning district found in Title 49 and of the Land Use Code.*

Speaking in favor of his motion, Mr. LeVine said it was his intent to have the Planning Commission recommend to the Assembly the disposal of the minimum amount of land necessary to meet the Rural Reserve dimensional requirements. He said as he and Mr. Voelckers stated previously, he did not feel that they should perpetuate the nonconforming lot size. He said he did not think the Planning Commission should be in the business of creating new nonconforming lots or of expanding nonconforming lots.

Speaking in favor of the motion, Mr. Miller said if the Lands Division wants to help out the purchaser, perhaps they could give him better terms.

Ms. Shelton-Walker also spoke in favor of the motion.

Mr. Voelckers also spoke in favor of the motion, and said by requesting the adequate lot size for Rural Reserve legal answers would not be necessary.

The motion passed with no objection.

IX. BOARD OF ADJUSTMENT - NONE

X. OTHER BUSINESS - NONE

XI. DIRECTOR'S REPORT

Wireless Ordinance

Mr. Steedle said he met with the gentleman representing a small telecommunications company who had appeared at the last regular Planning Commission meeting with questions about how the CBJ wireless communication facility code could be applied to smaller companies. He did not understand what the current requirements consisted of, said Mr. Steedle. Upon being informed of the current requirements, the individual left the office satisfied, said Mr. Steedle.

Rules of Order Revisions

Mr. Steedle said the staff will be bringing revisions to the rules of order before the Commission in the near future.

Construction in Juneau Past and Present

Ms. Grigg provided the Commission with a presentation on permit activity within Juneau over the years as well as the current state of affairs in Juneau.

Building Season Comparisons and New Dwellings by Type

Nation-wide public and private sector construction spending trends indicate that the public sector is relatively stable from 2012 to 2017, said Ms. Grigg. The variability occurs in the private sector, she noted. This trend is the opposite in Juneau, she noted, with the private sector relatively stable with the greatest variability in the public sector spending.

State Spending on Projects since 2008

The state has reduced its contributions to basically what is required to match federal funding, said Ms. Grigg. Most federal funding is for aviation and transportation, she said.

CDD's Revenue by Building Season

There was a drop in revenue in 2010 and 2011, she noted, speculating that this is due to the recession in Juneau and the Lower 48 in 2008. The revenue at the permit center is not directly related to activity, said Ms. Grigg. It is more closely related to the project values, she said. Therefore they could be very busy within the Department and yet not show a lot of revenue because the projects could be of lower value, she said. Remodel projects bring in lower revenue as well, she said.

The permit center is very slow in January, taking in few projects, increasing in pace by March with April being the indicator month, she said. Depending on the projects in April, they can somewhat predict how the rest of the building season will proceed, said Ms. Grigg. By August the season has pretty much wound down, said Ms. Grigg.

This year in March the permits were far below the usual traffic, said Ms. Grigg. They were showing about half the activity expected in April as well, she noted. The trend did rise

somewhat in May, said Ms. Grigg.

Commission Comments and Questions

Mr. Miller said he wanted to point out that it was a very late winter this year.

To date they are about 13 percent below average, said Ms. Grigg.

New Dwelling Units

Ms. Grigg showed a graph of the new dwelling units constructed in Juneau over the past 20 years. Alaska experienced a recession between 1986 and 1987, said Ms. Grigg. This resulted in somewhat of a demand in single family dwellings, with absolutely no demand for multi-family dwellings, she noted. Juneau experienced a sharp increase in mobile home development, she said.

In 1995 there was an increase in single-family dwelling development. It then leveled off and has trended down slightly, she said. Meanwhile multi-family housing has been gradually rising over the years, she said. Juneau is currently in a down year for multi-family development. Most of those permits were issued last year, said Ms. Grigg. Single-family homes and single-family homes with accessory apartments are trending downward, she said.

Mr. Dye asked if these are occupancy permits or if these are building permits.

These are construction permits, said Ms. Grigg.

What This Means

The Housing Needs Assessment compiled in 2010 determines that there were 12,974 housing units. If this figure is accurate, noted Ms. Grigg, with 997 dwelling units added to the community since 2010, with a loss of 136 units, then housing stock has been increased by 6.6 percent, she noted.

This data can also be used to measure the impact of regulations on development, said Ms. Grigg. Actions by the Planning Commission can directly affect permitting, she said. Multi-family development in Juneau has not been this high since 1996, said Ms. Grigg. The Housing Needs Assessment determined the need for more housing in Juneau, she said. That assessment was updated in 2012, and in 2013 the Comprehensive Plan recommended a Housing Action Plan, she said. The Economic Development Plan was formulated and the Housing Action Plan was released, said Ms. Grigg.

It is possible that these plans have been responsible for the increase in multi-family dwellings, speculated Ms. Grigg.

Mr. Miller noted that in 1995 there was a 15 unit housing project built by Tlingit and Haida, and in 1996 the very large Riverbend housing project was constructed behind the Mendenhall Post Office.

Mr. Voelckers added that Cedar Park was constructed the year before the Riverbend project.

Single-Family Detached Home Values over the Years

This data covers the years from 2006 to 2016, said Ms. Grigg. This data is compiled from the 2003 International Building Code Construction Valuation Table which is what they are still using today to calculate fees in the permit center, said Ms. Grigg. The value displayed on the table is how the permits are valued in the permit center, said Ms. Grigg. This does not include the purchase price of the home which would include land and other variables, she added.

This data indicated the cost of construction per square foot is \$116 a square foot, she said. Those are 2003 costs, she stated.

The biggest demand over this 10 year period is between the \$200,000 to \$300,000 price point, said Ms. Grigg. The market value for those homes would be between \$350,000 - \$400,000, said Ms. Grigg. That was closely followed by the \$300,000 - \$400,000 price point and the \$100,000 - \$200,000 categories, she said. The average price was \$255,950 for a home said Ms. Grigg. The median price was \$349,000 she added. The reason for that is because there is a huge variation in home prices in Juneau, noted Ms. Grigg. The average size of the average priced home was about 1,891 square feet, said Ms. Grigg. Decks and garages are not included in the square footage, she added. The median size of the median priced home is 2,000 square feet, she said.

The average size of the custom single-family home has been relatively flat over the past few years, said Ms. Grigg. People seem most comfortable in homes of about 1,700 to 2,100 square feet, she said. The data indicates that the demographics of the building community have not changed much over the years, said Ms. Grigg. The lowest price point trended down, noted Ms. Grigg. The \$200,000-\$500,000 price range is trending up, she said. She attributed this to the recovery from the 2008 economic downturn.

New Accessory Apartments Since 2010

In 2014 there was an accessory apartment code revision which lessens the requirements for a Conditional Use Permit, said Ms. Grigg. Consequently, shortly after the code revision, the construction of accessory apartments has increased, she noted. Five permits for accessory apartments have been issued this year, said Ms. Grigg. There were also grants awarded for accessory apartments in 2015, noted Ms. Grigg.

Accessory apartments are in big demand in the 400,000 and \$500,000 price range, said Ms. Grigg. About half of the homes in that price range have been permitted for accessory apartments between 2013 and 2016, she noted. About 31 percent of the homes built in the

\$300,000 - \$400,000 price point have accessory apartments, she added.

Mr. Voelckers asked if the CDD is finding any negative consequences resulting from accessory apartment construction such as neighbors complaining about parking.

Mr. Steedle said they have not experienced any negative consequences.

Chairman Haight said he really appreciated receiving this information, and that he found it very helpful. He asked if there is any data on vacancies.

Ms. Grigg said she does not have that data but that she believes the housing manager is working on it.

Lemon Creek Master Plan Update

The next Lemon Creek Steering Committee meeting is June 28, (2017) said Ms. Maclean. The draft plan will be presented to the committee at that meeting, she said. It should be put out for public comment July 10 through July 24, said Ms. Maclean. They will then review the comments and make recommendations to the Steering Committee and bring back the final plan to the Steering Committee on July 31, she said. It should be before the Planning Commission on August 22, she said.

XII. REPORT OF REGULAR AND SPECIAL COMMITTEES - NONE

XIII. PLANNING COMMISSION COMMENTS AND QUESTIONS

Mr. Miller said as they whittle down the list of variances that he thought of the CSP applications which often have variances attached to them. He said they could be crossed off the list to narrow the scope.

Mr. LeVine said he would like to see the Planning Commission come up with some sort of process to address the concerns expressed before the Commission recently about homes which cannot obtain a an appraisal because they are on nonconforming lots. This is definitely creating a problem within the community, he said.

Mr. Steedle said they would present the Commission with a report and some options.

XIV. ADJOURNMENT

The meeting was adjourned at 8:28 p.m.

Agenda
Planning Commission
Committee of the Whole
 CITY AND BOROUGH OF JUNEAU
Ben Haight, Chairman
 June 13, 2017

I. ROLL CALL

Ben Haight, Chairman, called the Committee of the Whole (COW) meeting of the City and Borough of Juneau (CBJ) Planning Commission (PC), held in the Assembly Chambers of the Municipal Building, to order at 5:11 p.m.

Commissioners present: Ben Haight, Chairman; Paul Voelckers, Vice Chairman; Michael LeVine, Nathaniel Dye, Dan Miller, Percy Frisby, Dan Hickok, Kirsten Shelton-Walker, Carl Greene

Commissioners absent:

Staff present: Rob Steedle, CDD Director; Beth McKibben, Planning Manager; Laura Boyce, Senior Planner; Teri Camery, Senior Planner; Jill Maclean, Senior Planner; Robert Palmer, Assistant Municipal Attorney

Assembly members:

II. REGULAR AGENDA

- a. **AME2016 0002:** Variances - Commissioner training and discussion about proposed amendments.

Providing background on this item, Mr. Steedle said that they have been working on variances for quite a while. Most of the work involves clarifying the language and ascertaining that the criteria are very clear. Since there has been a change in the Title 49 Committee, the staff wants to make sure that the entire Commission is aware and involved in the process, said Mr. Steedle. They want to ensure that they have code that is well understood, he said. The behavior of past commissioners has deviated somewhat from the intent of the variance, said Mr. Steedle. The other two items on the agenda for this meeting reflect the other two areas in which they are building flexibility into the code, he said. They have to be careful to develop enough flexibility within the code so that Juneau residents can build on their property, said Mr. Steedle. The Alaska Planning Commission handbook of which all Commission members should have

been provided, said Ms. Boyce, depicts a variance as a “safety valve”. It is an exception from the strict terms of the zoning or platting code allowing a relaxation of the strict requirements of the code for extraordinary cases, said Ms. Boyce. The City and Borough of Juneau is a home rule municipality, said Ms. Boyce, enabling the community to make its own rules, she said. Most of the other communities in Alaska follow the state statutes, she added.

The CBJ code states that variances are required to vary dimensions or design standards of the Title, said Ms. Boyce, where hardship and practical difficulties result in an extraordinary situation or a physical feature affecting only a specific parcel of property, read Ms. Boyce. The Board of Adjustment may grant a variance in harmony with the general purpose and intent of the Title, she said. Dimensional standards such as setbacks, lot width and lot depth can be varied, as well as design standards, she said. Design standards are not really defined within the code, said Ms. Boyce. The code is clear about what cannot be varied, she said. The use of land or structures, anything that affects housing density, lot coverage or those establishing construction standards cannot be varied, said Ms. Boyce.

And if too many variances are approved, said Ms. Boyce, then potentially the Land Use Code may be weak. They have looked at the past 30 years of data regarding variances, said Ms. Boyce. They have categorized the variances by type such as setback variances, she noted. For example there have been a total of 42 cases regarding eagle tree buffers, said Ms. Boyce. All of those variance requests have been approved, she noted. Those variances all had conditions attached to them, and the staff decided that it would be wise to change the code to accommodate those conditions, she said.

Eighty-nine percent of the variance requests which have come before the Commission in the past 30 years have been approved, she said. There have been about 1,200 cases that have been created for the past 30 years, but a number of those did not complete the process before the Commission, she said. Over half of the cases have been set back variances, said Ms. Boyce. The area of setbacks needs to be explored so that more flexibility will be allowed within the code, she said. Downtown Douglas and downtown Juneau are both areas that are highly susceptible to setback variance requests, said Ms. Boyce. The current zoning for those areas does not fit the development pattern, she said. They will be utilizing the overlay districts for those areas for the next few years until the code can be finalized for those areas, she said.

They are proposing exterior insulation additions so the exterior of the building would be given an allowance of four inches to homes which could be within the setback, said Ms. Boyce. She also mentioned needed ADA improvements for homes.

Parking variances are the next most sought after variances, said Ms. Boyce. There have been code changes over the years to help with this situation, she noted. More proposed code changes for parking are coming up, she said. Last year new parking standards for senior housing were added to code, as well as a new parking waiver approved allowing for reduction

of spaces in certain cases, while leaving the door open for variances as well, said Ms. Boyce. There is a fee-in-lieu district for certain downtown areas, said Ms. Boyce, for which a fee can be paid in lieu of providing the actual parking space. There are also two parking districts for the downtown area; one providing a 30 percent reduction in spaces and the other a 60 percent reduction, said Ms. Boyce.

Water body buffers were the third most prevalent variance sought, said Ms. Boyce. All 42 variances sought for eagle nests have been approved over the years, said Ms. Boyce. The panhandle section of the code has been amended so that the width of one of the lots could be reduced so that it could accommodate panhandle development, she said. They are currently working on panhandle changes which could affect that area of the code, she added.

Access related types of variances as an amendment to the code in 2015 allows for a privately maintained access road option which is available outside of the urban service area boundary, said Ms. Boyce. This year the shared access road, where up to four lots can share a road, has been added to the code, she said. The access standards have been moved to the subdivision portion of the code, said Ms. Boyce. The panhandle section of the code in which two lots can share a driveway will be coming before the Commission for review, said Ms. Boyce. They are also looking into the possibility of making the shared access road option available within the urban service area as well, she noted.

Design standards are not clearly defined in code, said Ms. Boyce. One of the proposed changes the staff is reviewing is the expansion of the Conditional Use Permit approval process for major developments to incorporate design standards as part of that review, she said.

Commission Comments and Questions

Mr. Voelckers asked if proposed code changes would be applied to only the five categories or if all Conditional Use Permit requests would be allowed.

Ms. Boyce replied that she thought any major development going through a Conditional Use Permit review process could incorporate the design standard review as well.

They used to get lots of variance requests for vegetative cover, particularly in the Mixed-Use zone districts, said Ms. Boyce. For this district the fact that they could have 100 percent lot coverage but at the same time require a five percent vegetative cover resulted in a conflict, she said. In 2012 they removed the requirement for vegetative cover within a Mixed-Use district, she said. In the future the staff would like to amend the vegetative cover section of the code, because it is not clear what the purpose of vegetative cover is, she said. They would like to clarify what the purpose of vegetative cover is and review the requirements for the different zone districts, said Ms. Boyce.

There have also been flood zone related variances as well as sign related variances, said Ms. Boyce. Title 49 states that these types of variances can be requested before the Board of Adjustment, she said. They will be working on sign code changes in the future, she said.

There are currently six criteria which must be met in order to be granted a variance, with number five containing four sub criteria, one of which must be met, said Ms. Boyce. Over the past year the Title 49 committee has come up with five criteria that they feel provide more clarity, she said.

The Title 49 committee has not yet addressed the Olmo decision, said Ms. Boyce. One of the questions they have is if the five criteria developed by the Title 49 committee are relevant in light of the Olmo decision, she said. One of the questions the staff would like the Commission to answer is if the current five criteria developed by the Title 49 committee are still relevant in light of the Olmo decision, said Ms. Boyce.

In summary, said Ms. Boyce, the changes to the code they are recommending provide for the development of flexibility:

- ✓ Parking waiver
- ✓ Additional setback exceptions
- ✓ Zone changes
- ✓ Revise the Conditional Use Permit to allow for design modification consideration
- ✓ Code changes to provide greater flexibility for those variances requested most often
- ✓ Streamside water body buffers
- ✓ Shared access
- ✓ Eagle nests

Commission Comments and Questions

Mr. Voelckers commented that the new variance review created by the Olmo decision is already currently in place. It is stopping the approval of variances that would otherwise probably be approved by the traditional variance criteria, he said. Mr. Voelckers said he would like to get the new language in place as soon as possible, currently with the relaxations and improvements discussed by Ms. Boyce. The overlay districts will help with the downtown Juneau and Douglas areas, he added.

Mr. Miller said he agreed that it would be beneficial to leave the current variances in place until the other code changes are set in place. Once code changes are in place it makes sense to tighten up the variances, said Mr. Miller. The Olmo decision tightens up the process to the extent that flexibility is severely limited, he said. Mr. Miller said he has had a hard time understanding how the Olmo decision was made. He said he is appreciative that the Olmo decision was actually included in the staff report.

He read through this decision several times, said Mr. Miller, trying to identify the specific content that clearly stated what portion of the interpretation has been brought before the Commission as law. He could not come up with clear direction from the decision, said Mr. Miller. The very next section in the Title under variances is Article Three "Interpretations", said Mr. Miller. He said it is not actually the Law department that interprets the code. It is the Board of Adjustment, said Mr. Miller, which is authorized to interpret the text of this title. He said he felt that the threshold determination for variances established by the Olmo decision should be interpreted by the Board of Adjustment.

Mr. Miller said he agreed with Mr. Voelckers that the variance criteria should remain as they are, with the six criteria. Before the variance criteria are changed, the other code changes should be implemented, he said.

Concurring with the comments already made by Mr. Voelckers and Mr. Miller, Mr. LeVine said that he saw the value in simplifying the variance process. The decisions made on variances have been inconsistent in the past, said Mr. LeVine. He said he felt they do run the risk of changing the criteria and then in three years finding themselves back in the same situation, where the new criteria are difficult to interpret and implement, unless great care is taken starting with a "clean slate".

Mr. Voelckers said in reviewing the proposed new five criteria for a variance that the first condition; (*Special conditions and circumstances exist that are peculiar to the land or structures or use involved and are not applicable to other lands and structures in the same district*) reminds him of the language introduced through the Olmo decision which stipulates that hardship and practical difficulties result from an extraordinary situation or unique physical feature affecting only a specific parcel of property.... Mr. Voelckers said he would like to get rid of the language in 49.20.250(b) and go with something less restrictive. Almost no variance request will be able to meet that standard, he said. A variance is to allow the Commission to utilize subjective common sense, said Mr. Voelckers, not to place standards that are next to impossible for most applicants to meet. He said he liked the softer language in the new draft, making it less of an impossible standard to meet for a variance.

Mr. Miller said he felt the proposed second criterion was too difficult to meet; "That compliance with the existing standards would unreasonably limit the owner from using the property for a permissible principal use." According to this criterion, an applicant could always build something, therefore not allowing them to build what it was they wanted to build, he said.

Mr. LeVine said this criterion also caught his attention. They discussed that criterion and its connection to takings, said Mr. LeVine. Mr. LeVine also asked why the third criterion was relevant: "The deviation from the requirement of this title is no more than is necessary to permit a reasonable use of the property". It doesn't matter that the variance is as little as

possible, said Mr. LeVine. He said what matters is that a variance is granted which makes the most sense.

Mr. Palmer said the variance provision in code is necessary to avoid takings. The safety relief valve of a variance is to avoid the constitutional takings. This is so the City does not have to pay somebody for unreasonably regulating their property, explained Mr. Palmer. He said he felt this ties into number three.

Mr. Voelckers asked Mr. Palmer for the definition of a “taking”.

The basic “takings” concept is that the government cannot take your land without providing fair compensation, said Mr. Palmer. The Supreme Courts have narrowed this a little bit to say that reasonable regulations are fine, but that unreasonable regulations are “takings”, he explained. In the context of Title 49, the basic concept is that the government cannot unreasonably regulate your land. The core to variances is that land cannot be unreasonably regulated, he said.

Mr. LeVine agreed with the explanation of Mr. Palmer, but asked why proposed criterion number two was necessary at all.

Mr. Palmer said he felt that number two and number three functionally related to each other. These nuances come into play when the municipality is adding some variation to the code proposed by the state. He said he could not articulate the distinction between the proposed criteria number two and number three. In response to a question from Mr. Voelckers, Mr. Palmer clarified that he could not identify the distinction between number two and number three, or the fundamental need for either of the two criteria.

Ms. Boyce said that number three outlines what already exists within the code. She said the staff felt it was important to have a variance request for what was actually needed and not in excess of what was needed by the applicant.

Ms. Shelton-Walker noted that everyone’s definition of what is “reasonable” could differ. She asked what standard was used to define that term.

Mr. Palmer said that is where past decisions are helpful. For example, he said, when the Assembly makes a decision such as the Olmo decision, it can be followed and the decision can be affirmed. To deviate from that decision a really good distinction must be provided, he explained.

Mr. LeVine asked if there is a reason why the Planning Commission could not suggest to the Assembly that a code provision be formulated that has the effect of temporarily removing the

Olmo decision while the code is being updated and modified. He asked if there could be changes made in the code to obviate the Olmo decision.

Mr. Palmer said there may be a way, but that he was not quite sure at this time how that could be accomplished. If they create new standards and start from a new slate, then the Olmo decision would be irrelevant, said Mr. Palmer. Or, he said, another case could be put forward challenging that decision. Then the Assembly would have to decide, he said.

Mr. LeVine asked if the determination of the Olmo decision is interpreted largely to mean that variances are appropriate only when a taking would otherwise be the result.

Mr. Palmer answered that he did not think it was quite that narrow in scope.

Mr. Miller said the Assembly has ruled that the threshold that exists is as a result of the CBJ vs. Thibodeau in 1979.

Mr. Palmer responded that is one of the cases they relied upon.

Mr. Miller said they were told in 1979 that is how they should be complying with variances. He said the Commission has not been complying with that decision since 1979. The code was tightened up in 1995 with disregard to that 1979 decision, said Mr. Miller. Mr. Miller said he did not think that they needed to meet Olmo threshold determination.

Mr. Voelckers asked if the proposed criteria could supplant the Olmo threshold currently applied.

Mr. Palmer confirmed that through the legislative process in writing new code the Commission could retain or reject the Olmo decision.

Mr. LeVine said it is better to fix the code than to make the granting of variances standard operating procedure.

Mr. Dye asked if Juneau has a variance problem or if it is just assuming that it has a problem. He asked how this community compares with other communities within Alaska regarding the number of variances issued.

A lot of the feedback they garnered from other planners at the State Planners Conference last year, said Ms. Boyce, was that variances were often used in other communities and that they were used as a tool for flexibility.

Ms. McKibben said she has worked in three other communities within Alaska and that Juneau issues a higher number of variances than any of the other communities in which she worked.

Mr. Voelckers said a variance was granted for the construction of the Marine Exchange building currently being constructed by the bridge. He said that construction would not have been approved under the current standards, and yet it is a very beneficial project for the community. They have to be careful to keep everything in context, he said.

The Walter Soboleff building was a great project for Juneau, said Mr. Miller, and it would never have met the threshold criteria by today's standards. There is no way the Assembly would have wanted the Planning Commission to deny the variance for that project, said Mr. Miller. That is another great example for a reason to say "yes" to a variance, he added.

Mr. LeVine said the problem he has with the way variances have been executed in the past is that they were inconsistent. If there are standards, he said, then those standards need to be abided by. Witnessing the variances approved he has seen on his past three years on the Planning Commission has made him wonder whether any variance denials would stand up were they to be challenged. That creates an inconsistency in the way that standards are applied, he said. They need to find a way to streamline the process and make it work in a consistent way, said Mr. LeVine.

Mr. Dye asked why the municipality cannot simply use the state standards for variances.

Mr. Steedle clarified that the state standards do not apply to Juneau, since it is a home rule community.

Chairman Haight said he cannot grasp the meaning of the new criteria for variances as well as the old criteria, since they were backed up by explanatory language. He said he would like to see explanatory language for the new criteria so that he could place it in context. He said he also liked Mr. Dye's idea of building off of the state's variance language.

Mr. Steedle suggested the Commission take a look at the third state criterion in light of its recent Tyler Rental decision. He said that variance could never have been granted had they been using the state criteria, because that reason for a variance was entirely monetary. He said he did not think the state criteria were a panacea for what the Planning Commission was trying to accomplish.

It would be useful for the Planning Commission to be given another vehicle to facilitate the granting of variances for projects of community worth such as the Soboleff building or the Marine Exchange, said Mr. Voelckers.

Mr. LeVine said it would be interesting to go through the past variances and identify which variances would have been accommodated by the recently developed overlay districts, and which variances would not have been addressed by the overlay district. Then they would have a better idea of where to place their focus.

Mr. Miller said he felt that was a great way to begin the process. He also recommended that any applications which come before the Commission as a Conditional Use Permit which needed variances could also be identified. He said he felt that the Conditional Use Permit process was a great way to deal with all of the issues at one time. Whether it is called a variance or a Conditional Use Permit, the important aspect was that there be a public hearing, said Mr. Miller.

Ms. McKibben clarified Mr. Miller's statement to mean that the Conditional Use Permit process be an opportunity to provide flexibility. She said what Ms. Boyce has stated is that the Conditional Use Permit process gives projects the opportunity to have that flexibility.

Mr. Miller said the applications already requiring a Conditional Use Permit and a variance be accomplished at once during the Conditional Use Permit review.

Mr. Steedle asked if the direction from the Commission was to do the analysis that Mr. LeVine requested, as well as develop alternative language modeled after the Alaska statute.

Ms. Shelton-Walker asked if creating language off of the Alaska statute would deal with the Olmo decision as well.

Mr. Voelckers said he was not sure that the Alaska statute language could be used to supplant the proposed criteria for the code. He said he felt they should keep working with the existing proposed criteria, with serious consideration as to whether criteria two and three are helpful.

Mr. LeVine said he agreed that the Alaska statute language was not what was needed as a basis for the new criteria. He asked if they were trying to develop standards that were flexible creating the opportunity for the granting of a lot of variances or with trying to create strict standards and only allow a few variances. He said he felt the best situation would be a flexible code and limited variances.

Chairman Haight said he felt they needed to address the variance criteria and also to address the code that affects the variances.

Mr. Miller said he liked the idea of identifying those variances which could be dealt with through the overlay district and then see what was left to help them identify what was needed in the process. It may be clear after that, said Mr. Miller, or it may remain just as obscure as it is now.

Mr. Frisby said he liked the approach mentioned by Mr. Miller. He asked when they could expect to be deciding on variances by the new code.

Mr. Steedle said two of those code changes are next on the agenda. He said they would return to the Commission with new proposed code language and further analysis.

Mr. Voelckers asked if the work the staff will be doing on the proposed code changes would come back before the Committee of the Whole or if it would first go to the Title 49 committee.

Mr. LeVine said this seems like an important topic and that it would be good to bring it back before the Committee of the Whole.

Chairman Haight clarified that the staff will bring the new information back before the Committee of the Whole at a future scheduled meeting.

b. AME2016 0019: Proposed amendments to buffers around eagle nests.

Ms. Camery said they are before the Commission for specific direction on how to deal with eagle nests. The current ordinance prohibits development within 330 feet of an eagle nest on public land, and within 50 feet of an eagle nest on private land. That buffer increases to 330 feet during the nesting season if the nest has actively nesting eagles, said Ms. Camery.

The eagle ordinance is tied to the code definition of development which includes a lot of irrelevant activities which has caused a lot of unnecessary restrictions and variances in the past, said Ms. Camery. The United States Fish and Wildlife Service (USFWS) has an optional federal permit, entitled an eagle take permit, which allows applicants to disturb an eagle and avoid violating the federal bald Eagle protection act, often with mitigation conditions attached to minimize harm, explained Ms. Camery.

Virtually all past variances requested for eagle nests have been approved, said Ms. Camery. They have had great difficulty with implementation of the eagle ordinance, said Ms. Camery, with identification of the eagle nests and especially with the identification of active eagle nests. They can no longer rely on active staff with the Fish and Wildlife Service for those identification purposes, she said. Their staff has been cut and they can no longer offer those services, she added.

CDD needs a scientific, defensible, rational basis for regulations, said Ms. Camery. CDD has looked at regulating non-urban eagles versus urban eagles, since urban eagles are not as sensitive to development as non-urban eagles, she said. CDD could not come up with any definable regulation monitors for eagles, such as noise, heavy equipment, or activity, said Ms. Camery. Also, CDD cannot even identify where current eagle nests exist and whether they are active or not, said Ms. Camery.

There is also the potential option of deleting the ordinance, she said. The eagle take permit of the Fish and Wildlife Service has often been cited as a reason for a variance, said Ms. Camery.

The local population of eagles is increasing, said Ms. Camery. They are not endangered, she added. Either deletion or revision of the ordinance could potentially be justified by the Comprehensive Plan, said Ms. Camery.

CDD would like direction from the Planning Commission on whether or not they should continue evaluating revision options or whether the direction would be to delete the ordinance, said Ms. Camery.

Mr. Frisby asked how it was determined whether a nest was active or inactive.

That is exactly the problem, said Ms. Camery. They have relied on the Fish and Wildlife Service for this information in the past, and that agency can no longer provide that information, she said.

Ms. McKibben said another issue raised by the Fish and Wildlife Service is that eagles do not necessarily use the same nest year after year. An active nest one year does not mean that it will be an active nest the following year, she explained.

Commission Comments and Questions

Mr. Voelckers asked if the question has come up as to whether The Fish and Wildlife Service has perceived that the CBJ should have any role in protecting eagles. He said perhaps this is simply a redundancy from which the municipality can remove itself.

The Fish and Wildlife Service is supportive of the City's ordinance, said Ms. Camery. The federal eagle permit is not required, said Ms. Camery. It is a liability shield for major developments, she said. The City's ordinance is a requirement and it does offer protection which the federal regulation does not, she explained.

Mr. LeVine said he sees the problem that the municipality has standards but there is no way to ascertain if those standards are being met. He said he is of the opinion that the lack of information makes it impossible to know if the standards are being met and there is no way to enforce those standards. It is difficult to have an eagle ordinance when it cannot be ascertained if it is needed and if needed, could not be reviewed and could not be enforced, he added.

Mr. Dye asked if Ms. McKibben knew the nesting range of eagles.

Ms. Camery said she thought it was a range of at least a half mile to a mile.

Mr. Dye said the urban service area boundary would not be beneficial, then.

Mr. Miller asked if the U.S. Fish and Wildlife Service with their take permit has supplemental information for the public such as brochures. He said it would be helpful if there is already a

pamphlet listing general standards which could be identified which could then be dispersed to the public.

Ms. McKibben said they have spent hours with Fish and Wildlife, and if there was some easily identifiable criteria which they could use they would have already presented that to the Commission.

Mr. Voelckers said if there is no perception of a vulnerability, and the City has no resources and no evidence or criteria, it is a fight in which the City should not engage in. Mr. Voelckers said he would be comfortable with the City getting out of the eagle regulation business.

Mr. LeVine said if they were going to regulate eagle nests it would be the best solution to put the onus on the property developer to identify the nest. If they found a nest, they would then need to come speak with a City representative, he said.

Mr. Dye asked how they would enforce the above scenario.

There is a prohibition on the taking of eagles under the Migratory Bird Treaty Act, said Mr. LeVine.

Chairman Haight asked if this is something that could be added to a building permit.

Mr. Voelckers said if there were not clear objective criteria and some way to implement those rules then they could easily develop into a scenario where conscientious people would identify eagle nests and those who were not so scrupulous would not.

Mr. Miller said perhaps they could have no code for those eagles already acclimated to the urban service area and some form of a checklist regarding eagles for those constructing outside of the urban service area.

Mr. Steedle said the urban service area boundary has been discussed by the staff, but that it is actually a poor proxy for where eagles are habituated. He said that Stabler's Quarry is outside of the urban service area boundaries and that the eagles are just fine in that location. He said with the resources that they have perhaps as far as they can take it is educating the public about the necessity of being aware and respectful of eagle nests. The City does not have the ability to enforce an eagle ordinance, he added.

Mr. Frisby said he felt that giving up on the eagle nest issue altogether was not a positive way to address the issue.

Mr. Hickok asked if they were to remove the ordinance if it would need to go before the Assembly. They will not even know where the eagle nests are if they do not have the capacity to inspect the property for those nests, said Mr. Hickok.

Mr. Miller said in the Community Development Department reception area there are a number of handouts. He said perhaps they could have the handout available for those seeking a building permit to educate on the subject.

Mr. Steedle asked the Commission if they would like the staff to bring forward the ordinance with the deletion of the eagle nest portion for their review, or if there is some further research the Commission would like the staff to conduct on this matter.

Mr. LeVine said he felt this may be the best recommendation. He said they cannot direct staff to go work harder on something that they have already worked very hard to resolve.

Mr. Steedle said they will be back at the next Committee of the Whole with streamside buffers and variances.

c. AME2017 0001: Update on proposed amendments to buffers for anadromous waterbodies.

III. **OTHER BUSINESS** - None

IV. **REPORT OF REGULAR AND SPECIAL COMMITTEES** - None

V. **ADJOURNMENT**

The meeting was adjourned at 6:59 p.m.

Agenda
Planning Commission
 Regular Meeting
 CITY AND BOROUGH OF JUNEAU
Ben Haight, Chairman
 June 27, 2017

I. ROLL CALL

Ben Haight, Chairman, called the Regular Meeting of the City and Borough of Juneau (CBJ) Planning Commission (PC), held in the Assembly Chambers of the Municipal Building, to order at 7:05 p.m.

Commissioners present: Ben Haight, Chairman; Paul Voelckers, Vice Chairman; Nathaniel Dye, Percy Frisby, Dan Hickok, Dan Miller, Carl Greene

Commissioners absent: Michael LeVine, Kirsten Shelton-Walker

Staff present: Rob Steedle, CDD Director; Beth McKibben, Planning Manager; Laura Boyce, Senior Planner; Teri Camery, Senior Planner; Gary Gillette, Port Engineer for Docks and Harbors; Robert Palmer, Assistant Municipal Attorney

Assembly members: Debbie White

II. APPROVAL OF MINUTES

May 23, 2017, Draft Minutes - Regular Planning Commission Meeting

MOTION: *by Mr. Miller, that the May 23, 2017, regular Planning Commission meeting minutes be approved with any minor corrections by staff or Commission member.*

The motion passed with no objection.

III. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

Greg Chaney, Lands Manager for the CBJ, who lives in the Starr Hill area, spoke as a private citizen on the overlay district, of which his neighborhood is a part. The overlay district was approved by the Assembly last night. Mr. Chaney said he is in favor of the overlay district. Showing pictures of his neighborhood displaying his house to the Commission, Mr. Chaney noted that the majority of his house does not conform to the rear setback. Showing a map of the area, Mr. Chaney commented that within the entire neighborhood, there is not one home in this district which conforms with the D-5 zoning conventional standards.

D-5 zoning for the neighborhood was enacted around 1986, said Mr. Chaney. The problem is that of the existing homes in the neighborhood, many of them over 100 years old, do not comply with this zoning, said Mr. Chaney. As a result, he said, if anyone wants to do any reconstruction, issues arise, he said. Typically this would require a variance, he said. To help resolve this problem, the overlay district can be a potentially great solution, he said. If setbacks are averaged per the overlay district, said Mr. Chaney, it comes out to about nine feet for the rear yard setback, he noted. They would like to build a deck and they cannot build the deck they would like to build because of this, he said.

The only people that could take advantage of the average would be those who are far away from the average, said Mr. Chaney. That means that half of the people in the neighborhood are not going to be able to take advantage of the average setback, he said. Therefore, he said, the only property owners within this area that would be helped by this are three homes within the entire neighborhood of twenty homes.

Mr. Chaney said he had interpreted the overlay district verbiage to mean that the footprint of the existing residential building could be used as the basis for reconstruction through a Conditional Use Permit. Mr. Chaney said he understands this option has always been available under the reconstruction section of the code. He said when he brought this up to the Assembly at its meeting last night, some Assembly members were confused.

IV. PLANNING COMMISSION LIAISON REPORT

Assembly Liaison to the Planning Commission Debbie White reported that the overlay district was approved by the Assembly despite some confusion on the part of some Assembly. Jill Maclean did a phenomenal job explaining this item to the Assembly, said Ms. White.

V. RECONSIDERATION OF THE FOLLOWING ITEMS - None

VI. CONSENT AGENDA

Consent agenda items USE2017 0008 and CSP2017 0006 were pulled from the Consent Agenda at the request of Dennis Watson and placed on the Regular Agenda.

CSP2017 0002: A City State Project for the acquisition of tidelands from the State of Alaska by the City and Borough of Juneau Docks and Harbors Department for the Statter Harbor Launch Ramp project.

Applicant: City and Borough of Juneau

Location: 11801 Glacier Highway

Staff Recommendation

Staff recommends that the Planning Commission recommend to the Assembly that CSP2017 0002, City Project Review for acquisition of submerged lands, is consistent with the 2013 Comprehensive Plan, Auke Bay Area Plan, Title 49 and other associated plans mentioned herein and forward to the Assembly a recommendation for approval.

MOTION: *by Mr. Dye, to approve CSP2017 0002 with staff's findings, analysis and recommendations.*

The motion was approved with no objection.

VI. CONSIDERATION OF ORDINANCES AND RESOLUTIONS - None

VII. UNFINISHED BUSINESS - None

VIII. REGULAR AGENDA

Chairman Haight and Commissioner Hickok withdrew from all Statter Harbor items on the agenda due to conflicts.

USE2017 0008: A Conditional Use Permit for Statter Harbor Development

Applicant: City and Borough of Juneau

Location: 11520 Auke Bay Harbor Road

Staff Recommendation

Staff recommends that the Planning Commission adopt the Director's analysis and findings and grant the requested Conditional Use for construction of new mooring and loading floats, uplands development, kayak launch ramp, restrooms and covered shelter with potential second floor commercial space, and removal and replacement of a section of the moorage facility, subject to the following conditions:

Prior to issuance of a building permit, the applicant shall submit a lighting plan illustrating the location and type of exterior lighting proposed for the development. Exterior lighting shall be designed and located to minimize offsite glare. All exterior lighting fixtures shall be of a "full cutoff" design.

There are a total of five phases to the Statter Harbor project, said Ms. Camery. Phase Two was completed in 2016, she noted. That phase consisted of the large parking area and the boat launch ramp, she said.

This item involves Phases III, IV, and the future phase, said Ms. Camery. This involves a series of improvements including new loading floats for the charter fleet that serves cruise ship passengers on whale watching and fishing tours; an upland staging area for charter bus loading

and unloading; and an upland building with an open shelter, restrooms, and a potential second floor commercial space. Phase IV includes the charter fleet facility with approximately 866 lineal feet of side tie moorage as well as a new field dispensary. A separate kayak ramp would also be constructed to reduce conflicts with boaters, said Ms. Camery. Also the development provides a new Bay Walk, a continuation of the sea walk that was developed in the previous phase, along the perimeter of the parking area. The future phase moorage replacement would remove and replace the oldest section of Statter Harbor moorage floats, known as the horseshoe area. This section of the harbor is near the end of its useful life.

The major goal of all of these developments within the Statter Harbor Master Plan has been to separate user groups, and to improve vehicle, vessel and pedestrian circulation, said Ms. Camery.

The application is complete and the use is appropriate according to the Table of Permissible Uses, said Ms. Camery. It complies with the public notice requirements, and there is no evidence that the development endangers public health or safety, she said. There is no evidence that the development decreases the value of or is out of harmony with property in the neighboring area, she said. The project is in conformity with the Auke Bay Area Plan, the Juneau Comprehensive Plan, and the Juneau Economic Development Plan, said Ms. Camery. It is also in compliance with the Juneau Coastal Management Plan, she noted. The project meets all of the necessary conditions for approval of this project, said Ms. Camery.

The staff recommends that prior to issuance of a building permit, the applicant shall submit a lighting plan illustrating the location and type of exterior lighting proposed for the development. Exterior lighting shall be designed and located to minimize offsite glare. All exterior lighting fixtures shall be a "full cutoff design", read Ms. Camery.

Commission Comments and Questions

Mr. Voelckers summarized that these phases are essentially comported with material that has already been presented to the Commission at previous meetings. He said this is the execution of the project but that there are not any significant changes to what the Commission has been exposed to previously.

Ms. Camery agreed, stating that this was an excellent summary by Mr. Voelckers. This plan has gone through an extensive public process as well as extensive federal resource agency review, said Ms. Camery.

Mr. Miller noted that in the staff report it is stated that there is a 14,400 square foot restroom and shelter with potential second floor commercial space. He said he thought perhaps this was a typo, as this is a very large size.

Ms. Camery noted that elsewhere it is stated that the building is 12,500 square feet.

To clarify this question, Mr. Gillette said that the restroom is about 1,100 square feet, and that the building is about 1,400 square feet per floor. The flood zone issue only applies to the first floor restroom, said Mr. Gillette. This is because FEMA (Federal Emergency Management Agency) considers this a habitable space, he added. The City building code does not consider the restroom a habitable space, he added, but they must conform to federal standards.

Applicant (CBJ)

Representing the CBJ, Mr. Gillette said that there was an existing boat yard at Statter Harbor and that the 2008 plan retained the boat yard. The Docks and Harbors Board determined the best way to meet their goals for the entire Statter Harbor area was to move the boat yard up, he said. That reduced the required amount of fill lessening impact on the area dramatically, he said.

Public Comment

Former Commission member and Juneau resident Dennis Watson told the Commission that he has some concerns with the Statter Harbor items on the agenda before the Commission. With the new float formation, said Mr. Watson, new larger sizes of boats will be coming into the Harbor further than they ever have before. He said he felt this design will bring safety issues between kayakers and larger boats going in and out of adjacent areas. Because of this, Mr. Watson said he did not feel that the congestion issue has been adequately addressed. He said he felt the kayak ramp should have been located elsewhere.

Noting that he has attended almost all of the Harbor Board meetings on this issue since 2005, Mr. Watson said there has never been a discussion on whale watching vessels. There are other types of charter boats in addition to the commercial fishing fleet, said Mr. Watson. The commercial fishing fleet is not allowed to fuel at these docks, he said. This resulted in the City creating a special use dock, he said, with the use of public funds. Mr. Watson said in his opinion Docks and Harbors should never be allowed to use public funds to create an exclusive facility for a special part of the fishing and tourism fleet.

It is not in the best interests of the community to have a self-service fuel dock in that area, said Mr. Watson. He said in his opinion this is in effect giving them “the keys to the castle”. He said this is not noted anywhere in the application. It also does not show in the application where the fuel tanks will be located, said Mr. Watson. It appears from the application that they would be using existing fuel tanks, said Mr. Watson. But if the existing fuel provider does not win the bid, then those fuel tanks would not be used, he said.

Commission Comments and Questions

Mr. Voelckers confirmed with Mr. Watson that Mr. Watson has raised these issues with the Harbor Board.

Mr. Voelckers said this may be pressing the boundary of issues which the Planning Commission should be evaluating relative to what the Harbor Board handles.

Juneau resident Jim Ayres said he was in agreement with many of the items raised by Mr. Watson. He said he felt the Commission was moving very fast on this development. Like Mr. Watson, Mr. Ayres said he did not feel it is right for the municipality to accommodate a specific industry and a specific group without recognizing what the overall consequences to the community may be.

Mr. Ayers said he felt the Planning Commission was the “compass” for the community and that regarding Statter Harbor it has gotten a bit “off course”. Mr. Ayers said over his extensive career there are two important lessons that he has learned:

1. All plans need a feedback loop and course corrections because otherwise it can be a plan to drive one off the “cliff”
2. There are three ways we can destroy our ecosystems and our community;
 - i. “We love it to death by smothering it with a thick, wet blanket of humanity”
 - ii. We pollute it with trash, toxins and noise
 - iii. We over exploit it because we can’t stop ourselves

Changes in the climate must be adapted to, said Mr. Ayres, saying he was glad the Assembly had adopted its support of the Paris Treaty. There are far more people on the planet which would like to have a chunk of Juneau which we cannot accommodate, he said. Just because more growth can be accommodated, said Mr. Ayres, it does not necessarily mean that it is a good thing. The resilience of our community, economy, environment, climate and culture must be accommodated to support a sustainable way of living.

The CBJ Comprehensive Plan states that economic development should be balanced by nature and quality of life, said Mr. Ayres. The Comprehensive Plan encourages and fosters sustainable, value-added, nonpolluting economic development which sustains or increases neighborhood living, natural settings, and other opportunities, read Mr. Ayres. The development in Auke Bay is inconsistent with what is stated in the Comprehensive Plan, said Mr. Ayres. At some point there needs to be a pause, a review, and a feedback loop, said Mr. Ayres.

Auke Bay resident Mark Allen said he did not understand why the Docks and Harbors Department was taking a role in the development of potential retail space in Auke Bay. He said he was not in favor of the second floor being a retail space. CBJ should not be in the business of competing with private business in Auke Bay, said Mr. Allen. He said there has been a dislike of Docks and Harbors generated by the landscaping in front of the parking lot involving the planting of trees which commercial business owners in the area feel will block the view of the harbor eventually.

He read part of the Auke Bay Area Plan which stipulates that the plan should preserve unique views that make Auke Bay area a truly special place. Mr. Allen said he did not feel planting trees which will grow and block views from commercial businesses and the highway preserves Auke Bay views. He presented a petition signed by around 100 Auke Bay residents requesting that the CBJ not construct retail space within the Statter Boat Harbor parking and launch area.

Juneau resident Erin Howell also expressed her objection to the CBJ proposal to construct retail space on the second floor of the restroom structure. She said she felt that CBJ was trying to act as a "business owner". She said she felt this put the CBJ in direct competition with Juneau businesses. She said there are 12 boats at the Allen Marine docks and that there are about 45 vehicles in the parking lot on any given day. She said that is roughly four cars per boat.

Lena resident Mitch Falk said that he and his wife own property in Auke Bay adjacent to the Harbor office. He said he did not feel the City should be getting into the commercial, retail, and rental business. He said he had a problem paying taxes to an entity that would go into competition with him. Mr. Falk said he felt the plan was incomplete. He said he counted 82 parking places and six handicapped parking spaces in the Statter parking lot, and that according to the original plan there was supposed to be 100 parking spaces. Now there is talk of providing designated parking spaces for the charter boats, said Mr. Falk. He said he felt this plan was given initial approval and that subsequent actions have been taken as construction moved along. Mr. Falk said he was not in favor of a second commercial story being placed upon the restroom in the harbor area. He asked where customers for the second commercial story would park.

Mr. Voelckers asked Mr. Steedle if he could address how he felt the role of the Planning Commission overlaps with the role of the Docks and Harbors Board. He said he felt it may help the Commission clarify its role in the process.

Mr. Steedle said this is a very good question, and one that is difficult to unravel. The role of the Planning Commission is to ensure that proposals meet the requirements of the Land Use Code. The other part of the role is to ensure that City projects are consistent with the City's adopted plans, said Mr. Steedle. It is on the CSP question on which the Commission should focus its energy, said Mr. Steedle.

Mr. Miller said the USE application is a Conditional Use Permit. There are exact findings which the Commission has to make to which the staff has proposed answers. Those are the seven different criteria which must be considered and met, said Mr. Miller.

Mr. Voelckers asked the applicant if they could answer the items addressed by the public.

Applicant

Mr. Gillette said the Docks and Harbors Board has held a number of public meetings including

two special public meetings in January, 2016. They received a number of comments in July, 2016. He said they addressed those comments. They also presented the plan as it was developing four times at public Docks and Harbors meetings.

Pointing to a map of Statter Harbor, Mr. Gillette said one of the issues is that they were creating a choke point for traffic going in and out of the parking lot. He said they realize there are potential conflicts with the design and that they have moved the ramp up to create more space. They are very comfortable the area has been adequately designed to accommodate the traffic, said Mr. Gillette.

There is currently a lot of congestion at the fuel dock constructed by Petro Marine, said Mr. Gillette. Since the charter fleet is concentrated in this area, said Mr. Gillette, to relieve congestion in the area they plan to have a fuel dispensary. They have issued a request for Letters of Interest for that fuel dispensary, he said. They have heard from three primary fuel providers in Juneau, including Petro Marine, said Mr. Gillette. There is enough room to accommodate additional tanks, noted Mr. Gillette.

Mr. Gillette noted that there have been comments against spending City tax dollars on something that is for a special use group. This facility will be funded 85 percent by passenger fees, said Mr. Gillette. This is because the primary purpose will be to accommodate whale watch passengers derived from the cruise ship industry, he said. Fifteen percent of the funding will be generated from Docks and Harbors funds, he said. That is the percentage of independent travelers using the tour ships and dock, he said. Those funds are collected from moorage fees and charter fees charged to the tour boat operators for the staging of their buses, he said. The funding is not derived from sales tax or property tax, said Mr. Gillette.

In response to remarks stating that they were proceeding too fast on this project, they have been working on this project since its origin in 2002, said Mr. Gillette.

The plan for a commercial space above the restroom facility has not changed since May, said Mr. Gillette. An abutter's notice was sent out by the department, he said. That notice did not mention the fuel dock or the proposed commercial space, he said. He said he did bring this up with the Community Development Department and was told to send out a second abutter's notice mentioning those two items, which they did, said Mr. Gillette. It was not the plan that changed, it was the public notice which was changed, clarified Mr. Gillette.

In terms of sustainability, said Mr. Gillette, there is a growing interest in electrifying charter boats, he said. The dock will also have electric pedestals for electric vessels and water, said Mr. Gillette.

The plan for the commercial space above the public restroom was approved by the Assembly and at numerous public meetings, said Mr. Gillette. This is not a new plan, he said. This is a

promotion of the development of Auke Bay as a town center, said Mr. Gillette. This space would be used by private businesses, he said, not by the City in competition with private business.

Mr. Dye asked how important the retail space was to the overall design of the structure.

Mr. Gillette said Docks and Harbors is an enterprise fund. They received no funding from the general fund, he explained. Docks and Harbors is to be self-sufficient and pay for its own operation, he said, through fees, grants, and some sale tax money approved by voters. One way to be self-sufficient is to create leased properties, he said. If the community decided that is not what they want to see in Statter Harbor, said Mr. Gillette, then he did not feel that Docks and Harbors would implement it.

Mr. Greene asked Mr. Gillette to speak about the trees which some residents are concerned will block the view from Auke Bay commercial property and from the highway.

These trees have already been approved by the Planning Commission, said Mr. Gillette. The primary purpose of the trees is to create a green buffer between residential condominiums and the parking lot, he said. They do not grow nearly as tall in Juneau as they do in more southern climes, said Mr. Gillette. Also, he said, they are planted in only two feet of dirt, which will inhibit growth. They do not think the trees will block views, he said. They did remove six trees which they felt could potentially inhibit views, said Mr. Gillette.

Mr. Frisby asked if Petro Marine has a long term contract for its fuel dock.

Mr. Gillette said that Petro Marine has about 33 more years left on its 35 year lease. They invested close to \$1 million to build the float, he said.

Mr. Frisby clarified that Petro Marine serves all types of vessels.

Mr. Gillette said the intent for the new fuel facility is to provide fuel for the charter boats since that is where they will be departing from and returning to.

Mr. Frisby asked what the ultimate capacity of the Statter Harbor will be to accommodate future development within the marine tour industry.

They will manage it as they do the downtown docks, said Mr. Gillette. The buses are given a very limited time to load and unload their passengers, and they adhere to their schedules.

Mr. Frisby said in general it is a beautiful plan, but that it appears that the local boats and fishing boats are being pushed further and further away from the core areas, and that the

tourism industry is overtaking all of the community resources in this area. He asked how this growth will be regulated in the future.

Mr. Gillette said they are already looking 10 to 15 years into the future for future expansion.

Mr. Miller summarized that the new Statter Harbor facility will alleviate congestion for all participants in the older harbor. He verified with Mr. Gillette that the charter boats would actually moor in the new facility overnight. Mr. Miller verified that the retail space proposed to be constructed above the restroom would be an opportunity for a private Juneau business, not CBJ. Mr. Miller said he did not recall that the Commission knew that trees were being planted at Statter harbor to block the view.

MOTION: *by Mr. Miller, to approve USE2017 0008 and accept the staff's findings, analysis and recommendations.*

Speaking in favor of his motion, Mr. Miller said this is a Conditional Use Permit to which very specific criteria must be applied. This request meets all of the necessary criteria, said Mr. Miller.

Roll Call Vote:

Yeas: Dye, Greene, Miller, Frisby, Voelckers,

Nays:

The motion passed by unanimous vote.

CSP2017 0006: A City Project Review for Statter Harbor improvements
Applicant: City and Borough of Juneau
Location: 11520 Auke Bay Harbor Road

Staff Recommendation

Staff recommends that the Planning Commission find that the proposed City project for construction of new mooring and loading floats, uplands development, kayak launch ramp, restrooms and covered shelter with potential second floor commercial space, and removal and replacement of a section of the moorage facility, is consistent with adopted plans of the CBJ, and to endorse the city project as required by CBJ Code 49.15.540 and AS 35.30.010, with the following conditions:

1. Prior to issuance of a building permit, the applicant shall submit a lighting plan illustrating the location and type of exterior lighting proposed for the development.

Exterior lighting shall be designed and located to minimize offsite glare. All exterior lighting fixtures shall be of a “full cutoff” design.

MOTION: *by Mr. Miller, to approve CSP2017 0006 and accept staff’s findings, analysis and recommendations.*

Mr. Dye asked to make a friendly amendment to the main motion that it be clarified that the CSP would not cover actual construction of the second floor commercial space using public funds.

Mr. Miller accepted the friendly amendment.

The motion passed with no objection.

AME2017 0002: A rezone request for 1.23 acres from D18 (Multi-Family Residential District, 18 units per acre) to MU (Mixed-Use).
Applicant: Corporation of the Catholic Bishop of Juneau
Location: 416 Fifth Street

Mr. Voelckers and Chairman Haight recused themselves from this item due to conflicts.

Staff Recommendation

Staff recommends that the Planning Commission concur with the Director’s analysis and findings and recommend approval to the Assembly for a rezone of the 0.8988 acres for the entirety of Block 25 from D-18 to MU (Mixed Use).

Ms. Boyce said that this is a request to rezone just under an acre from D-18 to Mixed Use. The public notification, signs and mailings incorrectly specified 1.23 acres, but the actual site is just under an acre.

This property is located between Gold and Harris Streets, and Fifth and Sixth Streets, downtown. It is zoned D-18 which is a multi-family zone district allowing up to 18 dwellings units per acre. It is adjacent to the Mixed Use zone district. This is a request by the property owner to rezone the entire block to Mixed Use, she said.

Ms. Boyce explained that the Catholic Corporation of the Bishop of Juneau owns the entire block. The Comprehensive Plan land use designation is TTC, Traditional Town Center. *[Ms. Boyce misspoke here; the land use designation for this property is actually MDR, Medium Density Residential, which is reflected in the staff report and presentation slides – Editor.]* It is served by city water and sewer. There is access with driveways along Fifth, Gold and Harris

Streets. The majority of the land uses are religious facilities, and they lease out some business offices.

Ms. Boyce presented a map (via a PowerPoint presentation) showing the area in question if the rezone request is approved to Mixed-Use. She indicated that the boundary along Fifth Street between D-18 and Mixed-Use cuts in and out and is not a clear line.

She said this map shows the Comprehensive Plan land use designations as well as the zoning districts. Rezones need to be in substantial compliance with the Comprehensive Plan land use designations. The subject D-18 parcels are in an area designated Medium Density Residential. Portions marked RS are neighborhood parks. The majority of Mixed Use zone districts are in traditional town center, but Mixed Use zone districts can be found in other land use designations as well, said Ms. Boyce.

Ms. Boyce said that the Comprehensive Plan describes Medium Density Residential as characterized by urban residential lands for multi-family dwelling units at densities ranging from 5 to 20 units per acre. Commercial development should be of a scale consistent with residential neighborhoods. Traditional Town Center is a new designation defined in the 2013 update to the Comprehensive Plan; prior to that it had been Mixed Use. These lands are characterized by high density residential and non-residential land uses in downtown areas and around shopping centers. Residential and non-residential uses can be combined within a single structure including off-street parking.

Ms. Boyce said for a rezoning request the properties at issue should be 2 acres or more or an expansion of an existing zone district. This request is to expand the adjacent Mixed Use zone district. A rezoning shall only be approved upon a finding that the proposed zone district and the uses allowed therein are in substantial conformance with the land use maps of the Comprehensive Plan.

Ms. Boyce gave some background information about the property. The original structure on the property was the church and rectory building. The records are not clear but development may have occurred as early as 1890 through 1912 during Juneau's initial development period. Other buildings were constructed in 1933 and 1954, said Ms. Boyce. Those buildings predate zoning, she said. Zoning came to Juneau in 1956 which is when the city started applying setbacks, use restrictions, etc. Therefore, much of the development on this block is nonconforming, she said. Development that occurred prior to 1987 – the previous zoning, once it was applied to the property, called for a 15-foot front yard setback which is less restrictive than what there is now which is 20 feet. Development also received variances to 7 feet along Sixth Street and 4 feet along Gold Street. The point is that most of the development on the block in question is nonconforming to current standards. In 1987 when the CBJ-wide rezoning occurred, D-18 was applied to this property which requires a 20 foot front yard setback. None of the development on the site conforms to that.

Ms. Boyce explained that the land use code describes the D-18 residential district as intending to accommodate primarily multi-family development at a density of 18 dwelling units per acre. It is a high density, multi-family zoning district, said Ms. Boyce. The Mixed-Use district is defined in code as a district to accommodate a mix of appropriate commercial and residential land uses. It reflects the existing downtown development pattern and is intended to maintain the stability of the downtown area. Multi-family uses are allowed and encouraged.

Ms. Boyce said staff did analysis and looked at all of the zone districts that fall within the Medium Density Residential land use designation. There is a wide range of zone districts that are found in that designation. There are properties from D-3 to D-18; Light Commercial, allowing for densities of up to 30 dwelling units; General Commercial, allowing residential units at 50 dwelling units per acre; Mixed Use, which has no limit on density; and Waterfront Commercial, which allows for 30 units per acre as well *[editor notes that later Ms. Boyce stated the correct density for waterfront commercial is 18 units per acres]*. So there is a wide variety of zone districts and there is already mixed-use within the Medium Density Residential land use designation.

Doing this analysis, staff determined that the request for a rezone to Mixed Use is not out of compliance with the land use maps, said Ms. Boyce. In the applicant's project narrative, they mentioned that an amendment to the Comprehensive Plan maps would be needed to TTC so that the Mixed-Use would be in conformance with that. However, based on the analysis, staff does not believe a Comprehensive Plan amendment is needed because there already exists a Mixed Use zone downtown with a MDR designation.

Mixed Use zoning allows for a combination of residential and commercial uses to be potentially on the same piece of property, said Ms. Boyce. The same types of uses in D-18 zoning can be found in Mixed Use zones, said Ms. Boyce. The uses not allowed in D18 require a conditional use permit in the MU. There is still a public process for applicants to consider other uses within Mixed Use zones, said Ms. Boyce. At the neighborhood meeting held in March, said Ms. Boyce, a few neighbors mentioned concerns about marijuana uses potentially being allowed on the property if it was zoned Mixed Use, since it is allowed in Mixed Use zones and not in D-18 zones. Because there is a requirement for marijuana businesses to be 500 feet from certain other uses, said Ms. Boyce, marijuana uses could not be used on that property regardless of the zoning.

A 20 foot setback requirement is required in D-18 zoning with no front setback required for Mixed Use zones, said Ms. Boyce. Up to 50 percent of the lot can be covered in D-18 zones with 100 percent of the lot allowed to be covered in Mixed Use zones, she said. The maximum height in the D-18 zones is 35 feet, with no height restrictions in the Mixed Use zones. Ms. Boyce also said she believes one of the buildings on site exceeds the current height limit. There is no limit for density in a Mixed Use zone with the limit of 18 dwellings allowed per acre

in a D-18 zone, said Ms. Boyce. The D-18 zone has a 30% vegetative cover requirement. This site previously received a variance to the vegetative cover requirement. Any future development will have to meet the current parking requirements. The property is not in any of the parking districts that allow reductions. This limits development potential on the property.

The Commission can deny the rezone request, it can recommend approval of the request to the Assembly or it can also recommend an alternate request, said Ms. Boyce. The comprehensive plan policies and guidance say that when considering a rezone we should aim to promote the highest best use of the land. The staff has found that the rezone request is in substantial conformance to the land use maps of the Comprehensive Plan, and the findings are that it meets the submittal requirements and the other requirements of the land use code and is an expansion of an existing district. The analysis we did shows there is a broad range of zone districts in the MDR designation and we recommend you concur and recommend approval to the assembly said Ms. Boyce.

Applicant

Corey Wall, of MRV Architects, said the main point they would like to make is that nothing on the site currently complies with the code, specifically the setbacks. Any modifications they may wish to make to the church property would require substantial and numerous variances, said Mr. Wall. According to Mr. Wall, the CDD staff is moving away from the variance route, and instead moving towards the use of zoning to match existing development on the site. Behind their rezone request is their desire to have the zoning of the property actually match what exists on the site, he said. Any modification to the front of the cathedral, for example, would require a variance, said Mr. Wall. If the property was rezoned to Multi-Use then all of the existing buildings would be in compliance, said Mr. Wall.

Project manager Brian Goettler told the Commission the cathedral building is in need of repair. They would like to do a modest renovation of the cathedral, add an elevator, and add access from the sidewalk for handicapped accessibility, explained Mr. Goettler. To complete this project they would require several variances, which he said he understood are going away. Subsequently, they are requesting a rezone for the property so they can make the upgrades that are necessary, he said.

Public Comment

Juneau resident Karen Allen told the Commission she lives directly across the street from the uphill side of this project. Ms. Allen said the Diocese is a great neighbor, and that she thought rezoning the block would probably be a good idea. Ms. Allen said her only concern is that she felt there was a discrepancy with the Comprehensive Plan. Ms. Allen said she would like to see the proper process followed; revise the Comprehensive Plan so that it is in accordance with Multi-Use zoning. She said she would like to see a good precedent set for this so that in the future it could be applied to other applicants.

Juneau resident Kim Metcalfe said she was born in Saint Anne's Hospital and went for eight years to Saint Anne's School. Ms. Metcalfe expressed concern that changing the zoning of the property to Mixed-Use would mean there was no limit to the number of units or height of structure within that zone. She stated she realizes there are currently no plans for change in density or height of the property, and that she was concerned about possible future uses of the property. Residents in the area are concerned about "Mixed-Use creep", said Ms. Metcalfe.

Area resident Paul Korchin said that he lives up the hill from the proposed rezone. He said the CBJ Comprehensive Plan designates this property as "MDR" (Medium Density Residential), and not TTC (Traditional Town Center). He said these designations align with the zoning of the properties. To rezone the property as Mixed-Use would functionally if not formally make the property a TTC designation, said Mr. Korchin. This is not in line with the Comprehensive Plan, he said. He stated that he did not think that the proposed Mixed-Use zoning was in substantial conformance with the Comprehensive Plan.

Juneau resident Yvette Sortiere told the Commission that the Diocese is a good neighbor, but that rezoning is not the answer. The church is already nonconforming, said Ms. Sortiere, and it has been allowed to continue to grow and remodel. While she felt the church should be allowed to implement its remodel, she said she did not feel that rezoning was the correct route to achieve these ends. She said that while the staff appears to think that the proposed rezone would substantially conform to the land use maps, they were not told why this would be in conformance. The proposed rezone would cut a slice of D-18 zoning out of the area, she said. She said she is concerned that this rezoning would have the effect of moving with the property in perpetuity. Ms. Sortiere said she would like the Commission to grant variances to the church so that it can complete the remodel that it would like to accomplish.

Applicant

Mr. Wall said it appears that potential future development is a concern of the neighbors. He said that is a difficult concern to address. It is certainly not the intent of this project, he said. He wanted to emphasize that in his opinion the legal Department of the City and Borough of Juneau is really starting to inhibit the granting of variances. He said it was their understanding that it is not simply possible anymore to obtain variances to accomplish renovation projects because there have been legal consequences from the granting of past variances. By not changing the Comprehensive Plan and by retaining the designation as Medium Density Residential, then any commercial development should be consistent with the residential neighborhood, said Mr. Wall, thus dealing with many of the concerns expressed by the residents. Any future projects would require going through the public process, said Mr. Wall.

Commission Comments and Questions

Mr. Hickok asked how many variances the project would require.

Mr. Wall said the project would probably require a variance for a front yard setback, a variance for a side yard setback, and a variance for vegetative cover.

Mr. Hickok asked the staff if variances could be combined in one project or if it was an individual process for each variance request.

Mr. Steedle said that each variance would have to be considered separately.

Mr. Frisby said he did not feel comfortable with the limited number of Commission members present at this meeting making this decision. He asked if this item could be postponed to the next meeting when hopefully more Commission members would be present.

Mr. Dye asked what the vote requirements were with limited number of Commission members present.

Mr. Steedle said that an issue would need four votes to pass.

Ms. Boyce said there is a possibility that ADA improvements could be made even though they may not align with the City code, since federal law supersedes municipal regulations. Rezoning requests need to be in conformance with the Land Use Maps; the Comprehensive Plan overall is not specifically mentioned, said Ms. Boyce. We have the residential density component we look at but isn't as clear for commercial component. For this case we looked at density and mixed use has no limit and D18 has a limit of 18 units per acre which can be increased with bonuses. We looked at the micro-level, the density on this site could potentially go up. Overall for all MDR density at the macro-level MDR density won't go beyond 14 units per acre. The mixed use district allows for both commercial and residential uses on the same lot, as does D18. Comprehensive plan policies in the plan also support this request.

Mr. Miller said that he argued about "substantial" conformance. The Commission never took enough time to look at where those borders needed to be and that he felt that "fuzzy lines" on the Land Use Maps are important; that they should not be too strict. He added that he is very concerned that the first few things that the applicant had to say were that the variance process has been discontinued or is now impossible, when in fact it is not supposed to be. While a rezone would fix the predicament of the applicants, said Mr. Miller, it would leave ambiguity with the neighbors. He stated the overlay district might help with this. Ms. Boyce pointed out the overlay district only applies to residential development.

MOTION: *by Mr. Miller, to approve AME2017 0002 with staff's findings, analysis and recommendations.*

Speaking against his motion, Mr. Miller said that right now he feels the process is broken. Variances are tools that the development community uses for these exact situations, said Mr. Miller. To say that variances are locked down or that variances cannot be used anymore is

absolutely false, said Mr. Miller, because it is something that can be done. Mr. Miller said that he did not think in this situation that a rezone made any sense.

Roll Call Vote:

Yeas: Hickok, Greene, Dye

Nays: Miller, Frisby

The motion failed. Needs 5 votes for approval.

MOTION: *by Mr. Hickok, that AME2017 0002 be reconsidered at the next regular Commission meeting when a larger quorum is expected.*

Roll Call Vote:

Yeas: Frisby, Miller, Greene, Hickok, Dye

Nays:

The motion passed by unanimous vote.

Vice Chair Voelckers convened the body as the Board of Adjustment.

BOARD OF ADJUSTMENT

FZE2017 0001: A Flood Zone Exception for Statter Harbor Development
Applicant: City & Borough of Juneau
Location: 11520 Auke Bay Harbor Road

Staff Recommendation

Staff recommends that the Board of Adjustment adopt the Director's analysis and findings and grant the requested Flood Zone Exception, FZE2017 0001. The Flood Zone Exception would allow construction of a public restroom in a Velocity Flood Zone, subject to the following conditions:

1. Prior to the issuance of a building permit, the applicant shall submit a letter from a licensed professional engineer indicating that the fill will be designed to withstand the 100-year storm force which is described in the City & Borough's currently adopted Flood Insurance Study.

2. Prior to issuance of a building permit, the applicant shall provide additional backflow prevention within the plumbing disposal system to prevent floodwaters from infiltrating the CBJ wastewater system, to be approved by the CBJ Engineering Department.

Ms. Camery said there are so many criteria involved with the flood zone exception that they wanted to inform the Commission. This flood zone exception would allow the construction of a restroom at an elevation of 25 feet which is two feet below the base flood zone elevation, said Ms. Camery. It is only the restroom which is subject to the flood zone exception, said Ms. Camery. This does not include the shelter or the second-floor retail space, she noted. While the restroom is not considered a habitable structure under the CBJ building code, it is considered a habitable structure by the Federal Emergency Management Agency (FEMA), said Ms. Camery.

Ms. Camery provided an overview via a PowerPoint presentation of key criteria that were reviewed in the staff report and led to the staff recommendation.

Commission Comments and Questions

Mr. Miller noted that the restroom structure is located way inside of the bay behind several breakwaters and docks. He asked if this building could not have the requirements waived due to its location behind all of the wave-breaking structures.

Ms. Camery said this was discussed in the staff report and that it is certainly a major argument of the applicant, but that it is within the 100 year flood plain and must go by the federal regulations for that reason.

There are 11 criteria to be considered, all of which the staff has deemed as met, said Ms. Camery. She said the staff concludes that section 49.70.410 (b), (c), (d), (e), (f), (g) and (h) Exception criteria have all been met.

Applicant

Mr. Gillette said he would like to mention that one would think the breakwater and the other infrastructure preceding the location of the restroom would serve as protection for the structure should there be a flood. The City can request that FEMA evaluate the location again, said Mr. Gillette. He said to his knowledge that request has never been made to FEMA by the CDD. Also they were told it would be a long process, said Mr. Gillette.

Mr. Voelckers noted that it does not appear the City is having to spend a lot of money to address these FEMA requirements.

Mr. Hickok asked if the fact the structure is in the hundred year floodplain creates more insurance costs.

Mr. Gillette said it is his understanding that FEMA will not insure the structure. The structure will be covered by City insurance, he added. In answer to a question by Mr. Hickok, Mr. Gillette said the second story of the structure is not within the floodplain.

Mr. Miller said if there was a private developer who wanted to build on the second-floor that the banks would probably require flood insurance, since it would technically be in a flood zone. He said obtaining an exception for the structure may be a good idea because it would reduce the flood insurance for the second-floor retail space.

MOTION: *by Mr. Miller, to approve FZE2017 0001 with staff's findings, analysis and recommendations.*

The motion passed with no objection.

The Board of Adjustment was adjourned and reconvened as the Planning Commission.

IX. OTHER BUSINESS

X. DIRECTOR'S REPORT

Review of Title 49's Nonconforming Development Policies

Ms. McKibben has written a brief memo on the nonconformance issues, said Mr. Steedle. They consider this to be a significant problem facing the community, said Mr. Steedle. Since the practice of the lending community has changed, noted Mr. Steedle, they feel that they need to react appropriately, he said. Ms. McKibben will be undertaking this project, said Mr. Steedle. They feel that this issue needs to be addressed now, he said.

Mr. Voelckers said he was surprised that this was viewed as a difficult undertaking by the CDD.

It would be relatively easy to clean up the existing language, said Mr. Steedle. The difficult aspect is that there is a nonconforming code for a reason, he said. It appears, however, that they are going to need to build some sort of escape hatch, said Mr. Steedle.

Ms. McKibben said she thinks a lot of their challenges will be solved by clarifying the language, breaking it up and addressing nonconforming structures, uses and lots separately. With each one of those items are policy questions which need to be addressed, she said.

The problem experienced by homeowners in the finance world is that they cannot rebuild their homes to a density which is supported by current zoning, said Ms. McKibben.

Mr. Miller said in his building profession he has closed a lot of loans, and it is unbelievable how quickly those regulations are transitioning. He said he felt it was very important to understand just what the banks need before this process was initiated.

Ms. McKibben asked the Commission how they would like to work with this: through the Title 49 Committee, through a Committee of the Whole, or would they like to appoint a special committee.

Mr. Dye asked Ms. McKibben in her opinion what would be the most expedient route to take to deal with the nonconforming issue.

Chairman Haight said he felt the Title 49 committee would be the best vehicle, and that he would advise that the Title 49 Committee bring this before the Committee of the Whole as soon as possible.

XI. REPORT OF REGULAR AND SPECIAL COMMITTEES

Mr. Voelckers reported that the Lemon Creek Plan is almost complete. They will be meeting on June 28, (2017) . That draft plan should be before the Commission in late July or early August, said Mr. Voelckers.

XII. PLANNING COMMISSION COMMENTS AND QUESTIONS

XIII. ADJOURNMENT

The meeting was adjourned at 10:38 p.m.

Additional Materials

Regular Planning Commission Meeting

Assembly Chambers
7:00pm
Meeting Date: July 11, 2017

1. AME2017 0002:

- a. Public Comment from S. Pfister & H. Chester, sent 7/11/17

2. WCF2017 0007:

- a. Memo from Jill Maclean re: Additional Condition recommendation

3. AME2017 0004:

- a. Map of Vista Blue, supplied by Duran Construction
- b. House Plan Elevations, supplied by Duran Construction

From: STEVEN PFISTER <steviejohn@gci.net>
Sent: Tuesday, July 11, 2017 11:19 AM
To: PC_Comments
Subject: AME2017 0002 Catholic Bishop of Juneau

Steven Pfister
Hans Chester
326 Sixth Street.

Our home is approximately 100 feet from Saint Anne's and we are concerned with the proposed rezone to MU. With no height restrictions, no setback requirements, and the possibility of having bars, manufacturing, marijuana retail stores, rooming houses and more parking issues we feel this could adversely affect the future of our neighborhood. The Church has been a good neighbor but we do worry about MU creep and feel that granting variances is the best way to move forward with their remodel.

Thank you, Steven and Hans



(907) 586-0715
CDD_Admin@juneau.org
www.juneau.org/CDD
155 S. Seward Street • Juneau, AK 99801

July 10, 2017

TO: Planning Commission

FROM: Jill Maclean, AICP, Senior Planner
Community Development Department

CASE NO.: WCF2017 0007

PROJECT PROPOSAL: A Wireless Communication Facility application to replace a 90 foot wooden tower with a 120 foot steel monopole tower.

A handwritten signature in black ink, appearing to read 'Jill Maclean', is written over the printed name and title.

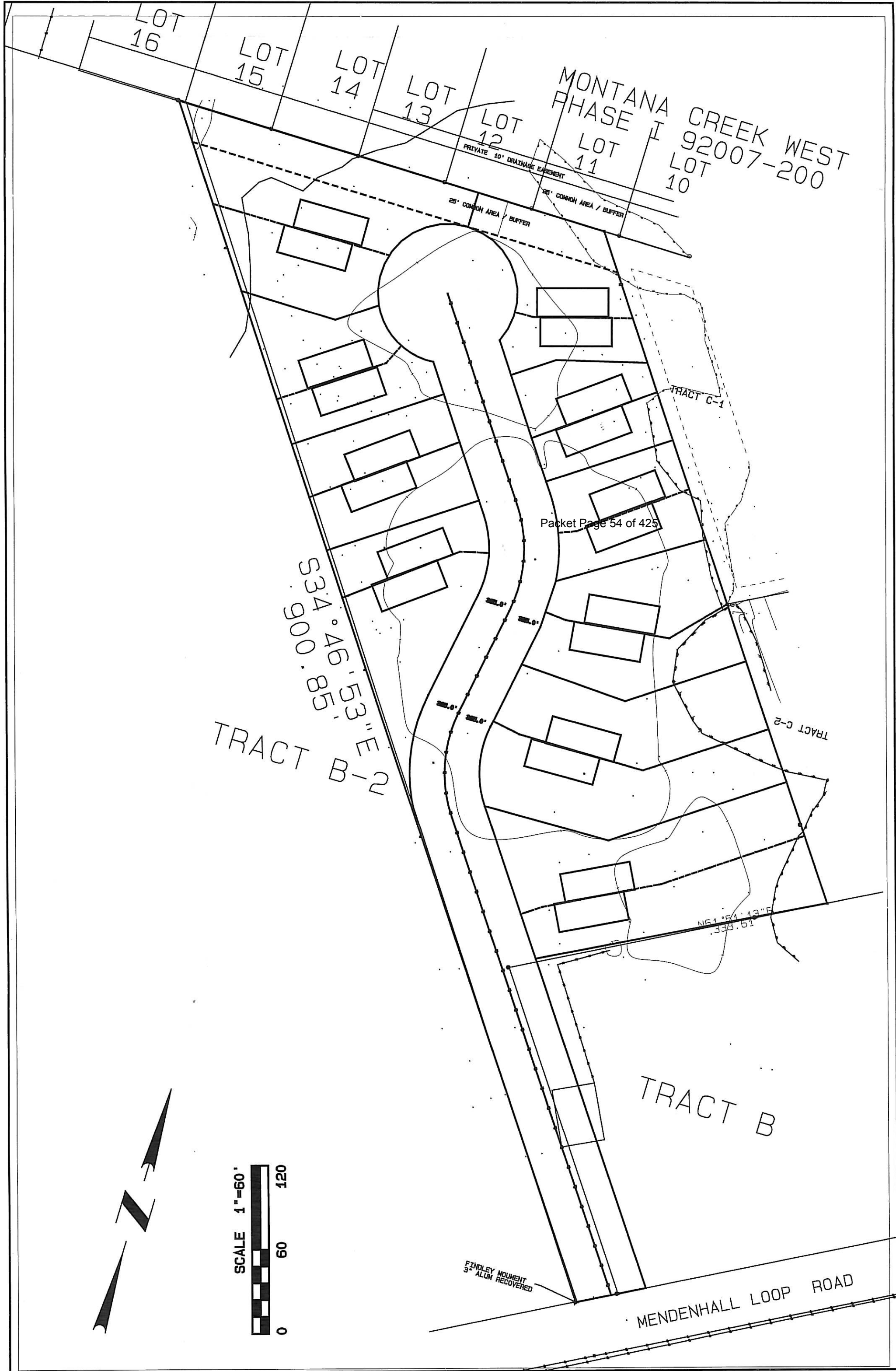
RE: Additional Condition

It is recommended that the following language be included in the Recommendation:

RECOMMENDATION

It is recommended that the Planning Commission adopt the Director's analysis and findings and grant the requested Special Use Permit. The permit would allow the development of a wireless communication facility to replace a 90 foot wooden WCF with a 120 foot steel monopole WCF, **and up to four (4) non-concealed antenna arrays,** with the following conditions, and any changes to these conditions may require a new SUP:

1. Steel monopole must be matte gray in color;
2. Site security and signage must be installed and maintained as according to plan;
3. Lighting is not to be added to the WCF.



LOT 16

LOT 15

LOT 14

LOT 13

LOT 12

MONTANA CREEK WEST
PHASE I

LOT 11

LOT 10

92007-200

PRIVATE 10' DRAINAGE EASEMENT

25' COMMON AREA / BUFFER

25' COMMON AREA / BUFFER

TRACT C-1

Packet Page 54 of 425

S34°46'53"E
900.85'

TRACT B-1

TRACT C-2

N64°51'43"E
338.61'

TRACT B

FINDLEY MOUNT
3' ALUM RECOVERED

MENDENHALL LOOP ROAD

VISTA BLUE

Vista Blue House Plan Elevations

Duran Construction Company



Blueberry Zero Lot 1



Blueberry Zero Lot 2



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155 S. Seward Street • Juneau, AK 99801

July 6, 2017

RE: Zone Change Request, Block 25, Juneau Town Site Supplemental Information

From: MRV Architects

To: CBJ Planning Commission

Case Number: AME2017 0002

Corey Wall of MRV Architects submitted the following memo responding to the discussion that occurred during the first hearing of AME2017 0002, on June 27, 2017.

MRV ARCHITECTS

1420 GLACIER AVENUE, JUNEAU, AK 99801 (907) 586-1371

Re: **Zone Change Request, Block 25, Juneau Town Site Supplemental Information**
 Attn: Laura Boyce, Senior Planner CBJ Community Development
 cc: Rob Steedle, Beth McKibben
 By: Corey Wall, for the Roman Catholic Diocese of Juneau
 Date: July 6, 2017

The request for re-zoning Block 25 was heard at the June 27 Planning Commission meeting. The request was initially denied with a re-hearing scheduled for the next meeting on July 11. The request was to change the zoning of the block from D-18 to MU.

Upon review, we feel the discussion during the meeting framed the argument for rezoning incorrectly. Although the initial application clearly laid the rationale for the re-zoning of the block, the discussion during the meeting focused on the much-smaller issue of whether current renovation plans for the Cathedral would be best served by variances or re-zoning.

As noted in the initial application, we believe the parcel was categorized incorrectly during the zoning and comprehensive planning processes and should be re-zoned to reflect reality. It seems clear that the site is, and always has been, treated as a Mixed Use (MU) and Traditional Town Center (TTC). It isn't clear why the parcel was zoned as D-18 and considered MDR in the Comprehensive Plan, but these designations do not reflect the actual development of the site.

None of the development on the site complies with the D-18 designation. Conversely, all development fits with an MU designation. Specifically:

- Not one of the buildings on the site conforms to D-18 setback requirements. The front yard setbacks of the buildings range from 11'-10" (Cathedral), to 10'-8" (Parish Hall), to only 2'-9" (St. Ann's Building), far less than the 20' required in D-18.
- The existing buildings on the site are much taller than allowed in D-18. The 1950 portion of the St. Ann's building is 5 stories tall. The majority of the 1930's St. Ann's building is 4-stories tall. Although we don't have exact survey data, given that the building occupies the top end of the sloping site, they exceed the 35' height limitation by almost 25'.
- The overall site is developed far beyond the 30% vegetative cover required in D-18.
- The type of buildings on the site are disallowed in D-18. The original St. Ann's hospital is not allowed in a D-18 district. The current use of the 27,600sf building as an office is not allowed in D-18 (over 10-fold larger than allowable). If the Parish hall is considered a social club, it is not allowed in a D-18 district. Even the cathedral itself is more appropriate in an MU (potential department approval rather than CUP) than in D-18.

As the attached pictures indicate, the block has been an MU development in scale and type for over 100 years. An argument could be made that, given the age and scale of the development of St. Ann's, this block is a far more likely candidate for MU designation than any of the surrounding parcels to the south of 5th Street which are currently zoned MU and TTC.

The current zoning and Comprehensive Plan designation in effect down-zones the site and creates an awkward conflict. Essentially the zoning regulations stipulate that any future development will be constrained to far less density, site utilization or even allowed uses than during the contiguous 127-year ownership of the property. We do not believe the Commission intended this result when they passed the Comprehensive Plan and current Zoning. Certainly the Diocese did not realize the implications for future development when the current zoning rules and planning were applied to the site or they would have requested the MU and TTC designations far earlier. The current zoning appears to simply be an oversight that should be rectified.

The original application delineates how the re-zoning request follows all the CBJ procedures and requirements so we will not outline them again here. Please do not hesitate to contact me if we can provide any more information.

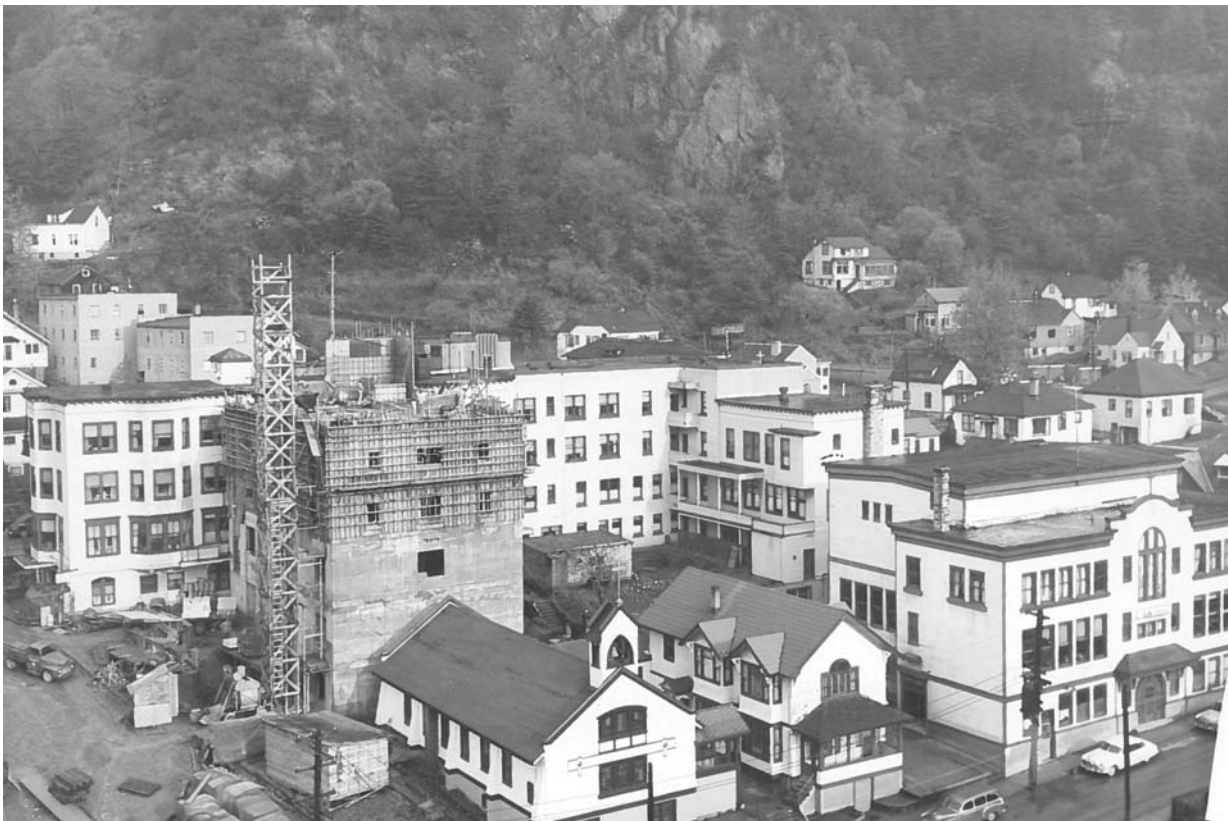
Sincerely,



Corey Wall, AIA
MRV Architects, PC



1914 - St. Ann's Hospital from Sixth and Gold Streets



1950 - Block from Fifth and Gold Streets



2017 - Catholic Community Services Building from Sixth and Harris Streets



2017 - Block from Harris Street



(907) 586-0715
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www.juneau.org/CDD
155 S. Seward Street • Juneau, AK 99801

DATE: June 22, 2017

TO: Planning Commission

FROM: Laura A. Boyce, AICP, Senior Planner
Community Development Department

A handwritten signature in black ink, appearing to read 'L. Boyce', is positioned to the right of the 'FROM:' field.

FILE NO.: AME2017 0002

PROPOSAL: Request to rezone approximately 0.899 acres from D-18 (Multifamily, 18 dwelling units per acre) to Mixed Use (MU)

GENERAL INFORMATION

Applicant: Corporation of the Catholic Bishop of Juneau

Property Owner: Corporation of the Catholic Bishop of Juneau

Property Address: 400 Fifth Street; 415 Fifth Street; 416 Sixth Street; 419 Sixth Street

Legal Description: Lots 1 - 8, Block 25, Juneau Townsite

Parcel Code Nos.: 1C040A250010, 1C040A250020, 1C040A250030, 1C040A250031

Site Size: 39,144 Square Feet (0.8988 acres)

Current Zoning: D-18 (Multifamily, 18 du/acre)

**Comprehensive Plan Future
Land Use Designation:** Medium Density Residential

Utilities: CBJ Water and Sewer

Access: Fifth Street, Harris Street, and Gold Street

Existing Land Use: Religious Worship Facility and Associated Uses

Surrounding Land Use: North - Residential, Single- and Multifamily (D-18)
South - Mixed Uses (MU)

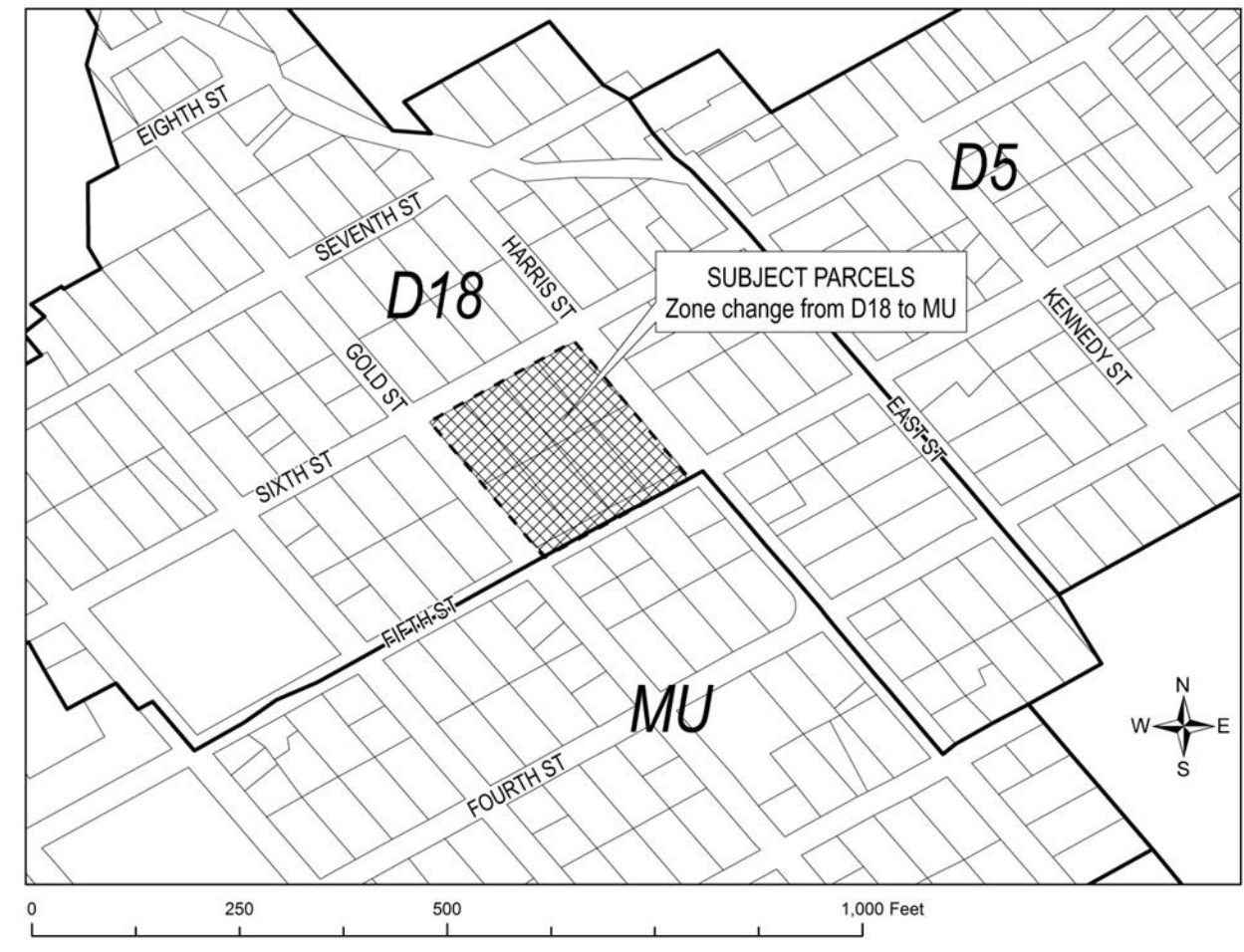
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East - Residential, Single- and Multifamily (D-18)
 West - Multifamily, Religious uses (D-18)

ATTACHMENTS

- Attachment A Rezone Application, including Project Narrative
- Attachment B Neighborhood Meeting Materials
- Attachment C Land Use Mapping Analysis – Zone District by Comprehensive Plan Land Use Designation
- Attachment D Previous Comprehensive Plan Amendment Map Excerpts

VICINITY MAP



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INTRODUCTION

The City and Borough of Juneau Code states in CBJ 49.10.170(d) that the Commission shall make recommendations to the Assembly on all proposed amendments to this title, zonings and re-zonings, indicating compliance with the provisions of this title and the Comprehensive Plan.

PROPOSAL

The Corporation of the Catholic Bishop of Juneau submitted an application requesting that their property (the entirety of Block 25, Juneau Townsite, bounded by Fifth, Gold, Harris, and Sixth Streets) be rezoned from D-18 to Mixed Use. The parcels within the entire block are owned by the Corporation and are used for religious worship facilities and related uses, including a place of worship (Cathedral of the Nativity), parish hall (St. Ann's Parish Hall), the Rectory, offices, and associated uses. The Corporation leases out space for business and professional offices as well.

In the Project Narrative, the applicant states that the property is built out but improvements are needed to upgrade or improve the existing structures. The buildings on the property pre-date current zoning requirements, especially setbacks. Existing development is built closer to the property boundaries than current zoning allows. Since the buildings encroach into the current D-18 setbacks, variances would be needed in order to modify the buildings. The existing development, both in building massing and scale as well as uses, is more consistent with the adjacent Mixed Use (MU) zone district than with the existing D-18 zone district.

The applicant's Project Narrative includes that a modification of the Comprehensive Plan would also be proposed, changing the Medium Density Residential (MDR) designation to Traditional Town Center (TTC). Staff's analysis shows that a Comprehensive Plan amendment is not needed in order to approve this rezone request.

BACKGROUND

Development on Block 25 of the Juneau Townsite occurred as early as 1890. Exact dates are not known, but historical records state that the existing church and rectory were built between 1890 and 1918, during Juneau's initial development period. Other buildings on the block were constructed in 1933, 1954, and 1976. One of the buildings was removed in 1991 due to fire damage, and a new building – the St. Ann's Center on the corner of Fifth and Harris Streets - was constructed in 1993-1994. A number of the buildings pre-date zoning requirements and do not meet current zone district development standards. Uses on the property are related to religious worship facilities including a rectory, a parish hall, and a place of worship as well as associated office use such as Catholic Community Services. The property owner also leases out space for business and medical offices.

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A variance (VR-76-08) was approved in 1976 to reduce the front yard setbacks to 7 feet along Sixth Street and 4 feet along Gold Street from the then-required 15 foot setback for the building. (Different zoning applied then; now the requirement is 20 feet.) Another variance was approved (VR-91-24) that resulted in a reduction from the required 30% vegetative cover to 15%. Conditional Use Permits were approved in 1971, 1975, and 1976 for a nursing home, a day care facility, and business offices.

Much of the development occurred prior to the existence of zoning requirements in the CBJ and is nonconforming. In the borough-wide rezoning in 1987, the current D-18 zone district was applied to this property which requires a minimum of a 20 foot front yard setback. This rezone request, if granted, would bring existing development into conformance with the Land Use Code.

ZONE CHANGE INITIATION

The Land Use Code outlines the procedure and requirements regarding rezone requests at CBJ 49.75 *Article I, Rezoning*s. The City and Borough of Juneau Code states in CBJ 49.10.170(d) that the Commission shall make recommendations to the Assembly on all proposed amendments to this title, zonings and re-zonings, indicating compliance with the provisions of this title and the Comprehensive Plan.

CBJ 49.75.110. Initiation. A rezoning may be initiated by the director, the commission or the assembly at any time during the year. A developer or property owner may initiate a request for rezoning in January or July only. Adequate public notice shall be provided by the director to inform the public that a rezoning has been initiated.

1. Was the proposed zone change initiated by the property owner during the appropriate time frame OR was the zone change initiated by the commission, assembly or director?

YES. The application for the subject zone change was initiated by the property owner in January, 2017.

2. Has the director provided adequate public notice through newspaper advertising, property owner mailings, and by requiring a public notice sign be posted on-site?

YES. A Notice of a Neighborhood Meeting regarding the rezone request was mailed to all property owners within 500 feet of the subject parcel on March 1, 2017. A Notice of Public Hearing was mailed to the same owners advising them of a June 13 hearing date, and a second notice was sent on June 1, 2017 when the hearing was rescheduled. Public notice of this project was provided in the June 16, 2017 and June 26, 2017 issues of the Juneau Empire in the "Your Municipality" section.

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Moreover, a public notice sign was posted on the site on Monday, June 12, visible from the right-of-way, which was at least two weeks prior to the scheduled Planning Commission hearing.

RESTRICTIONS AND PROCEDURE

The CBJ Land Use Code provides restrictions for zone district change requests.

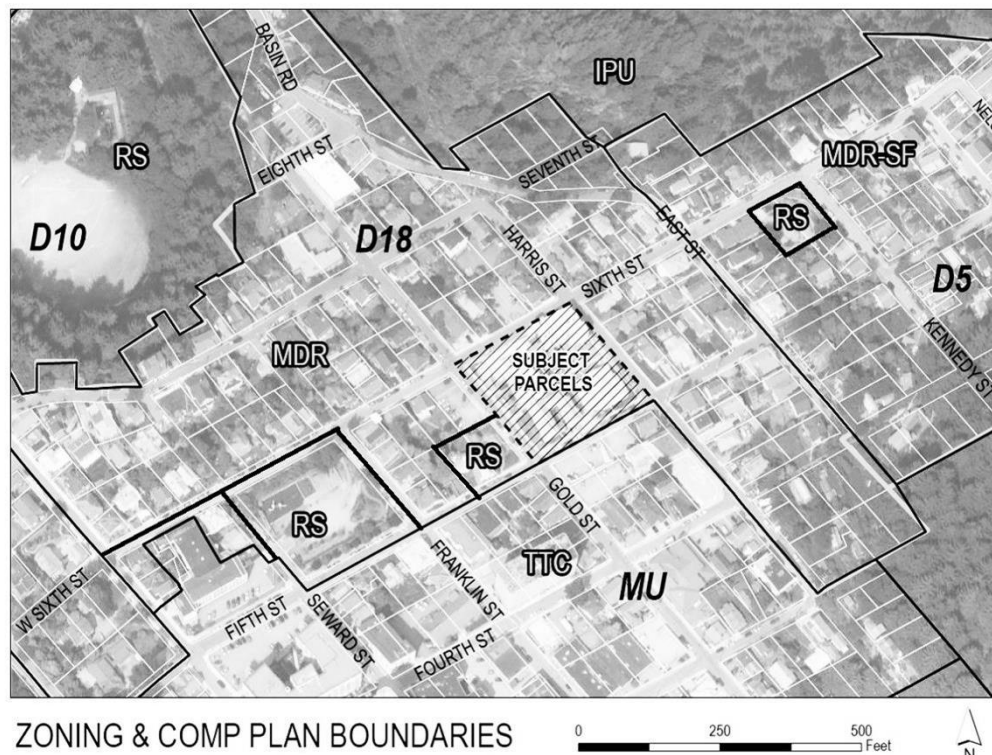
CBJ 49.75.120. Restrictions on Rezoning. Rezoning requests covering less than two acres shall not be considered unless the rezoning constitutes an expansion of an existing zone. Rezone requests which are substantially the same as a rezoning request rejected within the previous twelve months shall not be considered. A rezoning shall only be approved upon a finding that the proposed zone district and the used allowed therein are in substantial conformance with the land use maps of the comprehensive plan.

This proposal conforms to these restrictions:

1. It is an expansion of an existing abutting district.
2. There has not been a similar request made for the property within the past year.

COMPLIANCE WITH THE 2013 JUNEAU COMPREHENSIVE PLAN

The Comprehensive Plan land use designations and zoning districts are shown on the map below:



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The subject property is zoned D-18 and the 2013 Comprehensive Plan land use designation is Medium Density Residential (MDR). The Mixed Use (MU) zone district – the requested zone district – is located just south of the property, within the Traditional Town Center (TTC) Comprehensive Plan land use designation. The TTC land use designation was introduced with the 2013 update to the Comprehensive Plan. That designation was Mixed Use (MU) prior to the 2013 update.

In Chapter 11, Comprehensive Plan Land Use Maps, the following guidance is offered in regard to rezoning:

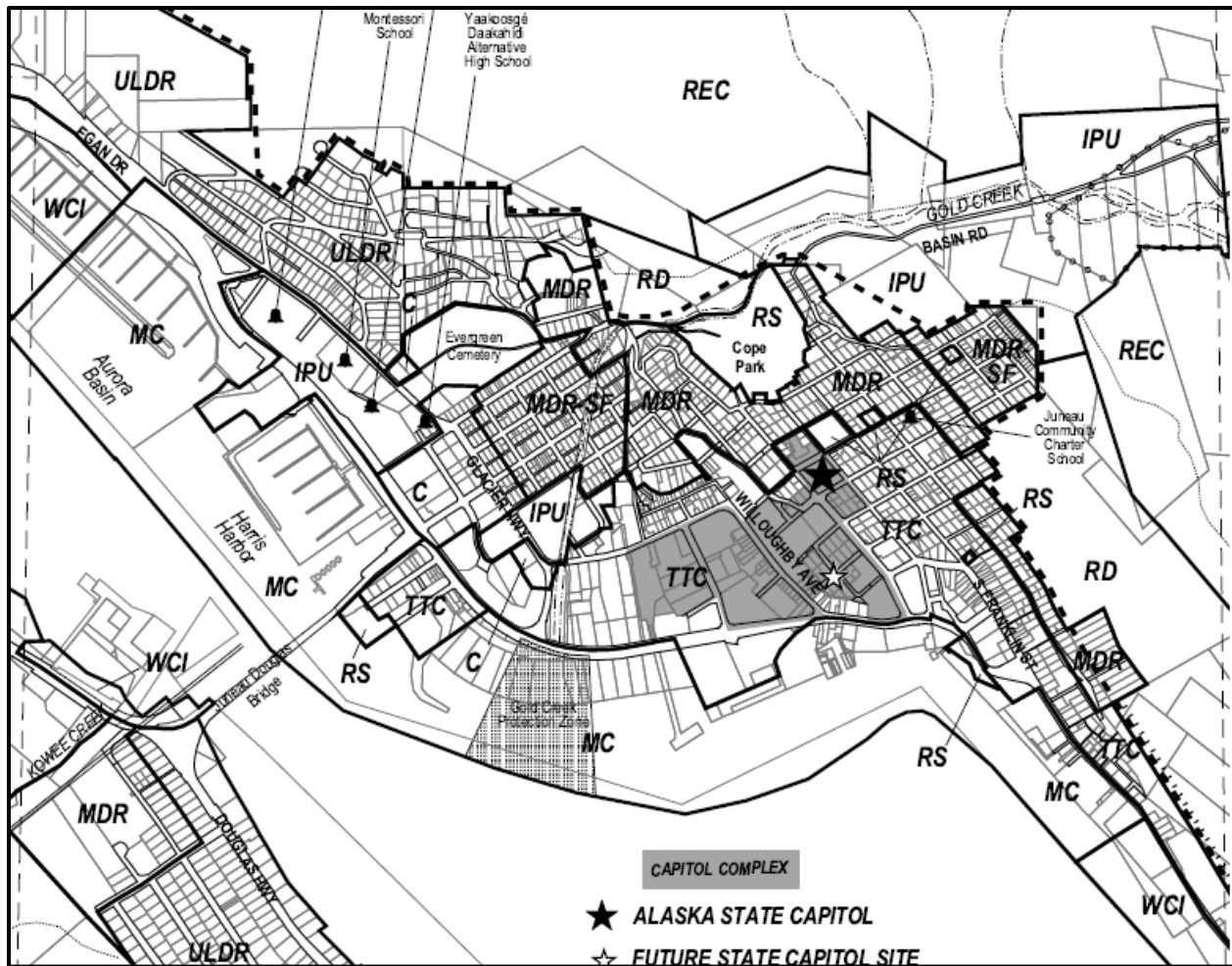
In considering a rezoning request, the Planning Commission and the Assembly should aim to promote the highest and best use of the land under consideration and all new zoning or re-zoning designations are required to be substantially consistent with the Comprehensive Plan and associated land use maps. In some cases, the highest and best use may be increased density or more intensive use of the land; in other cases, the highest and best use may be preservation, flood control, or providing a buffer between development and areas subject to natural hazards. (p. 143)

Chapter 1 of the Comprehensive Plan supports the flexibility of the Plan, and emphasizes that it should be used when considering community growth, along with other current information. Specifically, the Plan states:

Discussions related to community growth, redevelopment, capital and social improvements, or budget, must occur in consultation with the Plan. ... [The Plan] should ... bring into focus sufficient information and data so that the best possible considered and objective judgments can be made, using the most current data available when the data in the Plan is out of date. [The Plan] ... provides a logical, consistent, and purposeful approach to managing community growth and development. (p. 1)

When considering this request it is important to understand what the Comprehensive Plan intends when describing land use designations. The Plan states that the designations are intended to describe the overall character of development for each land use category. The Plan definitions are not intended to be firm or restrictive definitions. In contrast, zoning uses that are allowed outright, or allowed through a Conditional Use permit, are firm and restrictive. The designations and their allowed uses reflect cultural values and economic and societal needs, and over time, the Comprehensive Plan descriptions of land use categories will change to reflect changing values and circumstances. (p. 144) The Comprehensive Plan map for this area is shown below.

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CBJ 49.75.120 partially incorporates those Comprehensive Plan policies and guidance and directs that *A rezoning shall only be approved upon a finding that the proposed zoning district and the uses allowed therein are in substantial conformance with the land use maps of the Comprehensive Plan.* Therefore, the question is whether this rezone request substantially conforms with the land use maps of the Comprehensive Plan.

“Substantial conformance with the land use maps of the Comprehensive Plan” means the proposed zoning district (Mixed Use) needs to substantially conform with the Comprehensive Plan land use designation (Medium Density Residential). The term “substantial conformance” means that the proposed zoning district may deviate slightly from the Comprehensive Plan land use designation; it does not have to precisely match the maps but must materially be the same.

The proposed zone change to Mixed Use does substantially conform to the Medium Density Residential designation, as described in the next section.

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Comprehensive Plan Land Use Designations

The property is located in Subarea 6 of the 2013 Comprehensive Plan (Map M). The plan designates this property as MDR, Medium Density Residential. Medium Density Residential is described as:

These lands are characterized by urban residential lands for multifamily dwelling units at densities ranging from 5 to 20 units per acre. Any commercial development should be of a scale consistent with a residential neighborhood, as regulated in the Table of Permissible Uses (CBI 49.25.300).

The area immediately south of the property is identified as Traditional Town Center (TTC) and is described as follows:

These lands are characterized by high density residential and non-residential land uses in downtown areas and around shopping centers, the University, major employment centers and public transit corridors, as well as other areas suitable for a mixture of retail, office, general commercial, and high density residential uses at densities at 18 or more residential units per acre. Residential and non-residential uses could be combined within a single structure, including off-street parking. Ground floor retail space facing roads with parking behind the retail and housing above would be an appropriate and efficient use of land.

Subarea 6 of the Comprehensive Plan is described as “Urban” which is the existing character outlined in Chapter 3, Community Form, as:

Urban areas are represented by downtown Juneau and Douglas, West Juneau, medium-density areas of Lemon Creek and Switzer Village, the mixed use area around and between the Mendenhall Mall and Nugget Mall, and the village area around Auke Bay Harbor and the University. In these urban areas, residential, commercial, mixed use and/or public facilities share land and utilities in a compact area. Urban areas are characterized by low- to mid-rise residential and commercial structures, often with the uses mixed within the same structure or with commercial uses lining the edges of residential neighborhoods. Typical mass and scale of these urban neighborhoods are 2 to 3-story structures separated by parking lots, roads, sidewalks and landscaping or small yards. Medium to high residential densities of 10 to nearly 400 residential uses per acre can be found in the downtown Juneau area; densities of 14 units per acre can be found in the West Juneau Area; densities of seven units per acre can be found in the Lemon Creek and Switzer Creek areas and in the Auke Bay area.

Subarea 6, which includes the subject property and nearby properties, is described as ... *a mixed use community with land use designations in the core downtown area ranging from the rural Resource Development (RD), to Recreation Resource (REC) on the steep northern edges of*

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the core area and tiering down the slopes to the Channel with the more urban Medium Density Residential (MDR), Medium Density Residential/Single Family (MDR/SF), Urban Low Density Residential (ULDR), Traditional Town Center (TTC), Commercial (C), Institutional and Public Use (IPU) and Waterfront Commercial (WC) districts.

... The downtown area includes special overlay districts, including parking districts, an historic district, a Waterfront District that is the subject of the Long Range Waterfront Master Plan, along with the Landslide and Avalanche Hazard Zone designations. (p. 184)

The following zone districts are located in the various MDR land use designations found throughout the CBJ: D-1(T)D-3, D-3, D-5, D-5(T)D-18, D-10, D-10(T)D-18, LC, GC, MU, and WC. Approximately 36 acres of MDR lands are zoned for commercial uses (LC, GC, MU, and WC). Because approximately 3 acres of MU zoning is already found within the MDR designation, it would not be an anomaly to rezone this block, consisting of less than one acre, to MU. (See Attachment C)

When reviewing all MDR designated properties collectively, if all zone districts were built out to the maximum residential density called for (arbitrarily assuming a practical limit of 100 du/acre for MU, although it has no upper limit), the resulting densities would be 13.6 dwelling units per acre. MDR allows for densities between 6 and 20 units per acre. This request, if granted, would have minimal impact to the resulting overall density; it would still be fewer than 14 dwelling units per acre if all properties were development to their maximum residential potential. However on a micro level – specifically analyzing just the subject parcels – the residential density could potentially increase if the zone district request is approved. Although there are no residential units currently anticipated for the property, in the event that the current owner sells to someone else, development in the future may increase on the site. MDR allows for multi-family development up to 18 units per acre. The MU zoning district does not have a limit on the number of residential units per acre, but there is a limit on the feasibility of how many units can be accommodated on a site. Parking requirements, specifically, would limit further development potential on this block. This property is not located within a parking district overlay area so parking reductions afforded by these districts are not applicable. It is unlikely that the site could be redeveloped for residential uses at a density much higher than the surrounding neighborhood, even if the zoning remained D-18 due to the constraints of the site and its ability to provide required parking. However, the parking waiver was recently approved (2017) and could be used to provide some parking flexibility.

Regarding non-residential uses, which will be covered in more detail below, the requested zone district of MU and the existing D-18 district include many of the same uses allowed outright or with approval of a Conditional Use Permit. This is discussed in more detail below. The requested zone district may be found to be substantially in conformance with the Comprehensive Plan regarding the non-residential uses portion of the request.

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The following zone districts are currently found in the downtown MDR Comprehensive Plan land use designation: D-5, D-10, D-18, LC (Light Commercial), and MU (Mixed Use). All of the existing MU zone districts found within the MDR designation are located downtown. The requested rezone would be comparable to what already exists. Additionally, it would be an expansion of an existing zoning district.

Previous Comprehensive Plans have amended the line between the MDR and the TTC (then MU) designated areas, specifically along Sixth Street. (See Attachment D) As is evident now, the line dips below and returns to Sixth Street, as shown on the map earlier in this report. The 1976 Downtown Plan identified this property as Medium Density Residential which described densities up to 70 units per acre (p. 27). The existing land uses on this block were identified as "Public" which included religious uses.

The 2013 Comprehensive Plan (the Plan) provides guidance to residents and local officials as to the location, intensity, and timing of future public and private development as well as conservation measures. This property is located within the urban service area boundary (USAB). The Plan discusses compact infill development within the USAB. A development would build *...to the maximum density allowed by the zoning district within which the property lies, provided that road and intersections serving the new development have adequate capacity and levels of service to accommodate the proposed intensity of development. Building lands should be developed as medium- to high-density affordable housing or mixed residential and commercial developments wherever is possible and practicable. This is particularly true for lands located within walking distance (approximately one-quarter mile) of public transit service.* (p. 15.)

As stated in CBJ 49.75.130(a), the Commission may approve, approve with modifications, or deny a rezone request. The Commission may recommend approval to the Assembly for different zone districts than what is requested by the applicant or recommended by staff.

COMPLIANCE WITH CBJ LAND USE CODE

According to the Land Use Code, the existing D-18 zone district is described as follows:

The D-18, residential district, is intended to accommodate primarily multifamily development at a density of 18 dwelling units per acre. This is a high density multifamily zoning district intended to accommodate midrise-type development.

The requested zone district, Mixed Use (MU), is described as follows:

The mixed use and mixed use 2 districts are established to accommodate a mix of appropriate commercial and residential uses....The MU, mixed use district, reflects the

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existing downtown development pattern and is intended to maintain the stability of the downtown area. Multifamily residential uses are allowed and encouraged.

D-18 and MU allow for the potential for many of the same uses. The uses that are not allowed in the D-18 zone district but may be allowed in MU require a Conditional Use Permit. A sample of permissible uses in the D-18 and Mixed Use zone districts is shown in the table, below:

Use	D-18 Zone District	Mixed Use Zone District
RESIDENTIAL USES		
Single-family residential, duplexes	Department Approval	Department Approval
Multifamily	Department Approval CUP approval	Department Approval CUP approval
Bed and Breakfasts, Rooming Houses	Department Approval CUP approval	Department Approval
Hotels, motels	Not allowed	Department Approval CUP approval
SALES AND RENTAL GOODS, MERCHANDISE OR EQUIPMENT		
Storage and display of goods and outdoor merchandising of goods	Not allowed	Department approval CUP approval
Marijuana retail store	Not allowed	CUP approval, but not allowable given current adjacent uses
PROFESSIONAL OFFICE, CLERICAL, RESEARCH, REAL ESTATE, OTHER OFFICE SERVICES		
Offices not greater than 2,500 sf	CUP approval	Department approval
Offices greater than 2,500 sf	Not allowed	Department approval CUP approval
Research, lab uses	Not allowed	Department approval CUP approval
Marijuana testing facility	Not allowed	CUP approval, but not allowable given current adjacent uses
MANUFACTURING, PROCESSING, CREATING, REPAIRING, RENOVATING PAINTING, CLEANING, ASSEMBLING OF GOODS		
Light manufacturing	CUP approval	Department approval CUP approval
Medium manufacturing	Not allowed	CUP approval

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Marijuana product manufacturing facility	Not allowed	CUP approval, but not allowable given current adjacent uses
EDUCATIONAL, CULTURAL, RELIGIOUS, PHILANTHROPIC, SOCIAL, FRATERNAL USES		
Trade school, vocational schools, commercial schools	Not allowed	CUP approval
Churches, synagogues, temples	CUP approval	Department approval CUP approval
Social, fraternal clubs, union halls	Not allowed	Department approval CUP approval
INSTITUTIONAL DAY OR RESIDENTIAL CARE, HEALTH CARE FACILITIES, CORRECTIONAL FACILITIES		
Hospital	Not allowed	CUP approval
Health care clinics, assisted living, day care centers, child care centers, correctional facilities	CUP approval	Department approval CUP approval
RESTAURANTS, BARS, NIGHTCLUBS		
Small restaurants, less than 1,000 sf with no drive-through	CUP approval	Department approval
Restaurants, bars, seasonal open air food service with no drive-through	Not allowed	Department approval CUP approval
OTHER		
Motor vehicle, mobile home sale or rental	Not allowed	CUP approval
Vet clinic, Day animal services	Not allowed	CUP approval
Commercial agriculture, excluding farm animals	CUP approval	Not allowed
Spring water bottling	CUP approval	Not allowed
Full service dry cleaner	Not allowed	CUP approval
Funeral home	Not allowed	CUP approval

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Another way to evaluate the differences between the current zone district requirements and the requested zone district is to review the dimensional standards of both districts, as shown below:

	D-18	Mixed Use (MU)
<i>Setbacks</i>		
<i>Front</i>	20 feet	0 feet
<i>Rear</i>	10 feet	0 feet
<i>Side</i>	5 feet	0 feet
<i>Street Side</i>	13 feet	0 feet
<i>Lot Coverage – Maximum</i>	50%	None
<i>Building Height maximum</i>		
<i>Primary Uses</i>	35 feet	No Limit
<i>Accessory Uses</i>	25 feet	No Limit
<i>Vegetative Coverage</i>	30%	None
<i>Density</i>	18 du/acre	No Limit

Existing development on the properties conforms more closely to the requested MU district in building bulk, massing, height, and uses than with the D-18 zone district. In the applicant's project narrative, it is stated that no further development is planned. However in the case that the property ownership changes or if plans change, development may become more intense.

A number of setback exceptions exist in the Land Use Code, such as CBJ 49.25.430(3), which addresses lots that have multiple frontages; however, none of the existing setback exceptions would allow for additions to the front facades of the buildings. A variance request is one of the potential remedies to make improvements to the portions of the buildings that encroach into the setbacks. ADA requirements, a part of federal law, may be allowed within the setbacks in certain instances. Required improvements such as these may supersede our Code in certain instances.

Although the subject properties are within the current draft Alternative Development Overlay District (ADOD) boundaries, that ordinance, if adopted, only provides the Commission to review and consider alternative setback and lot coverage scenarios for residential development.

Planning Commission
File No.: AME2017 0002
June 22, 2017
Page 14 of 15

The adjacent Mixed Use zone properties south of Fifth Street are located within the parking special overlay districts of PD-1 and Fee-In-Lieu. The existing Mixed Use zone properties between Fifth and Sixth Streets are not located within those parking districts. While the majority of downtown MU-zoned properties are within the downtown parking districts, not all of them are. Rezoning the subject properties to MU would not create any inconsistencies with the existing parking district overlays nor necessitate amendments to those boundaries to accommodate the property.

PUBLIC COMMENT

At the March 7, 2017, neighborhood meeting, approximately twelve people attended, including staff and the applicants. Staff provided an overview of the rezone process and the applicant discussed the proposal. There were questions and concerns regarding compatibility with the adjacent residential neighborhoods. Specifically, marijuana establishments were mentioned as a concern. While not mentioned at the meeting, the Mixed Use (MU) zone district does allow for marijuana establishments with approval of a Conditional Use Permit however the likelihood of this happening is low. State law prohibits marijuana establishments within 500 feet of schools and places of worship. Both are located either on or within 500 feet of the site. Therefore, current laws would not allow for the permitting of marijuana establishments on the subject properties.

Other concerns mentioned were the continuation of Mixed Use “creep” into the D-18 district, such as with the Terry Miller building, and the change in dimensional standards, such as height, setbacks, and vegetative cover, that would occur if the zone change were approved.

The Neighborhood Meeting Materials, including the meeting sign in sheet, are located in Attachment B.

To date, staff has not received correspondence regarding the proposed rezone request.

FINDINGS

After review of the application materials, the CBJ Land Use Code and the CBJ Comprehensive Plan, the Director makes the following findings:

1. The request meets the submittal requirements and the rezoning initiation, zone change restrictions, and procedural requirements of the CBJ Land Use Code as the application was submitted timely and is an expansion of an existing zone district.
2. Based upon the analysis above, this proposal substantially conforms to the Land Use Maps of the Comprehensive Plan.

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3. A broad range of zone districts currently exist within the Comprehensive Plan's MDR land use designation. The requested zone district of MU is consistent with land use designations of the Comprehensive Plan.

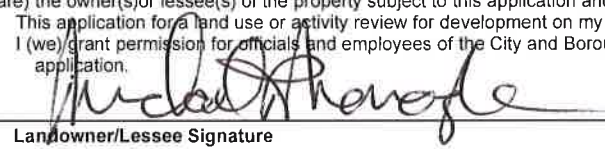
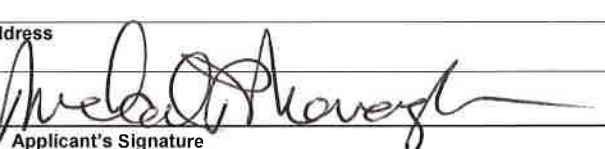
STAFF RECOMMENDATION

Staff recommends that the Planning Commission concur with the Director's analysis and findings and recommend approval to the Assembly for a rezone of the 0.8988 acres for the entirety of Block 25 from D-18 to MU (Mixed Use).

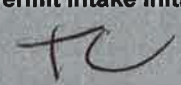
DEVELOPMENT PERMIT APPLICATION

Packet Page 76 of 425

Project Number AME20170002	CITY and BOROUGH of JUNEAU	Date Received: 1/27/16
Project Name (City Staff to Assign Name)		

PROJECT / APPLICANT INFORMATION	Project Description Zone Change Request		
	PROPERTY LOCATION		
	Street Address 416 5th Street	City/Zip Juneau 99801	
	Legal Description(s) of Parcel(s) (Subdivision, Survey, Block, Tract, Lot) Juneau Town Site; block 25 lots 1 & 2; block 25 lots 3 & 4; block 25 lots 5,6,7 & 8		
	Assessor's Parcel Number(s) 1C040A250010, 1C040A250020, 1C040A250030		
	LANDOWNER/ LESSEE		
	Property Owner's Name CORPORATION OF THE CATHOLIC BISHOP OF JUNEAU	Contact Person: Michael Monagle	Work Phone: 586-2227 x27
	Mailing Address 415 6th St Ste 300 Juneau AK 99801	Home Phone:	Fax Number: 463-3237
	E-mail Address businessmanager@dioceseofjuneau.org	Other Contact Phone Number(s): (907) 209-2080	
	LANDOWNER/ LESSEE CONSENT ****Required for Planning Permits, not needed on Building/ Engineering Permits****		
I am (we are) the owner(s) or lessee(s) of the property subject to this application and I (we) consent as follows: A. This application for a land use or activity review for development on my (our) property is made with my complete understanding and permission. B. I (we) grant permission for officials and employees of the City and Borough of Juneau to inspect my property as needed for purposes of this application.			
X	 Landowner/Lessee Signature	1/25/2017 Date	
X	 Landowner/Lessee Signature	 Date	
NOTICE: The City and Borough of Juneau staff may need access to the subject property during regular business hours and will attempt to contact the landowner in addition to the formal consent given above. Further, members of the Planning Commission may visit the property before the scheduled public hearing date.			
APPLICANT If the same as OWNER, write "SAME" and sign and date at X below			
Applicant's Name SAME	Contact Person:	Work Phone:	
Mailing Address	Home Phone:	Fax Number:	
E-mail Address	Other Contact Phone Number(s):		
X	 Applicant's Signature	1/25/2017 Date of Application	

-----OFFICE USE ONLY BELOW THIS LINE-----

STAFF APPROVALS	☒	Permit Type	***SIGN	Date Received	Application Number(s)
		Building/Grading Permit			
		City/State Project Review and City Land Action			
		Inquiry Case (Fee In Lieu, Letter of ZC, Use Not Listed)			
		Mining Case (Small, Large, Rural, Extraction, Exploration)			
		Sign Approval (If more than one, fill in all applicable permit #'s)			
		Subdivision (Minor, Major, PUD, St. Vacation, St. Name Change)			
		Use Approval (Allowable, Conditional, Cottage Housing, Mobile Home Parks, Accessory Apartment)			
		Variance Case (De Minimis and all other Variance case types)			
	X	Wetlands Permits			
	Zone Change Application		1/27/17	AME20170002	
	Other (Describe)				
Comments:					Permit Intake Initials 

ZONE CHANGE APPLICATION

Project Number	Project Name (15 characters)	Case Number AME 20170003	Date Received 1/27/17																																								
LEGAL DESCRIPTION(S) AND LIMITS OF PROPERTY TO BE REZONED: <u>ALL OF BLOCK 25, JUNEAU TOWN SITE. BLOCK CONSISTS OF PARCEL 1C040A250010, LOTS 1 AND 2; 1C040A250020, LOTS 3 AND 4; 1C040A250030, LOTS 5, 6, 7, and 8. SEE ATTACHED SITE PLAN.</u>																																											
IS THIS AN EXPANSION OF AN EXISTING ZONE?		☒ Yes ☐ No																																									
Total Land Area of Proposed Change <u>1.23</u> acres		Comp Plan Designation <u>MDR</u>																																									
Current Zone(s) <u>D-18</u>		Comp Plan Map <u>MAP M</u>																																									
New Zone Requested <u>MU</u>																																											
TYPE OF ZONE CHANGE REQUESTED: ☒ Regular ☐ Transition																																											
HAS THIS OR A SIMILAR ZONE CHANGE BEEN REQUESTED IN THE PREVIOUS 12 MONTHS? ☐ Yes ☒ No																																											
UTILITIES AVAILABLE: WATER: ☒ Public ☐ On Site SEWER: ☒ Public ☐ On Site																																											
PURPOSE OF THE REQUESTED ZONE CHANGE: <u>SEE ATTACHED MEMO.</u>																																											
IS THERE A PROPOSED USE OF THE LAND? (BUILT-OUT) ☒ Yes ☐ No																																											
PROPOSED BUFFERS TO ADJACENT ZONES? (N.A.) ☐ Yes ☒ No																																											
DESCRIBE (INCLUDING TYPE AND DENSITY OF PROPOSED DEVELOPMENT): <u>SEE ATTACHED MEMO.</u>																																											
DESCRIBE ANY POTENTIAL IMPACTS TO PUBLIC INFRASTRUCTURE:																																											
STREETS: <u>NEGLECTIBLE OR NONE</u>																																											
WATER: <u>(DITTO)</u>																																											
SEWER: <u>(DITTO)</u>																																											
For more information regarding the permitting process and the submittals required for a complete application, please see the reverse side. If you need any assistance filling out this form, please contact the Permit Center at 586-0770.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5">ZONE CHANGE FEES</th> </tr> <tr> <th></th> <th>Fees</th> <th>Check No.</th> <th>Receipt</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>Application Fees</td> <td>\$ <u>600</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Admin. of Guarantee</td> <td>\$ _____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Adjustment</td> <td>\$ _____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pub. Not. Sign Fee</td> <td>\$ <u>50</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pub. Not. Sign Deposit</td> <td>\$ <u>100</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Fee</td> <td>\$ <u>750</u></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			ZONE CHANGE FEES						Fees	Check No.	Receipt	Date	Application Fees	\$ <u>600</u>				Admin. of Guarantee	\$ _____				Adjustment	\$ _____				Pub. Not. Sign Fee	\$ <u>50</u>				Pub. Not. Sign Deposit	\$ <u>100</u>				Total Fee	\$ <u>750</u>			
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NOTE: MUST BE ACCOMPANIED BY DEVELOPMENT PERMIT APPLICATION FORM

MRV ARCHITECTS

1420 GLACIER AVENUE, JUNEAU, AK 99801 (907) 586-1371

Re: Zone Change Request, Block 25, Juneau Town Site
 Attn: Mr. Rob Steedle, Director
 CBJ Community Development
 By: Paul Voelckers, for the Roman Catholic Diocese of Juneau
 Date: January 13, 2017

Dear Mr. Steedle,

As we have discussed, the Roman Catholic Diocese of Juneau has been studying potential upgrades to the Cathedral of the Nativity, located within Block 25 of the Juneau Town Site. Such upgrades, which are intended to include new and improved ADA access and other functional necessities, will potentially create permitting and variance concerns due to the underlying zoning of this block as D-18, a medium-density residential zone. All buildings within this block, including the Cathedral, have perimeter walls located within the required setbacks for D-18.

Rather than anticipate a series of variances which would likely be required for even simple modifications, the way forward is perhaps best addressed by a re-zone of the property. Other property immediately contiguous to Block 25 along the downhill or southeasterly boundary is zoned Mixed-Use (MU), as is most of the adjoining urban center of Juneau.

Briefly, Title 49 describes D-18 zoning as *"intended to accommodate primarily multifamily development at a density of 18 dwelling units per acre"*. 49.25.220 describes Mixed-use districts, with MU zoning intended to *"reflect the existing downtown development pattern and maintain the stability of the downtown area. Multifamily residential uses are allowed and encouraged."*

A convincing case can be made that Block 25 is much closer in development type, scale, and use to MU than to D-18 residential zoning. Block 25 has been fully developed for many decades, with institutional church and mixed-use buildings. The largest structure, fronting 6th Street, is the former Saint Ann's Hospital, which now houses Diocese offices and a variety of other commercial tenants. Other principal structures include the Cathedral of the Nativity, St. Ann's Parish Hall, and the Rectory supporting the Cathedral. In general, Block 25 is fully built-out, with only limited changes to the general scope and feel of the buildings likely for a significant period of time.

An attached site plan (prepared in 2001 for other purposes), is still accurate in its depiction of buildings, parking, and walks. A proposed re-alignment of the MU and D-18 districts is illustrated, with an affected size of 1.23 acres. A concurrent modification of the Comprehensive Plan would also be proposed, with MDR residential uses modified to TTC, Traditional Town Center.

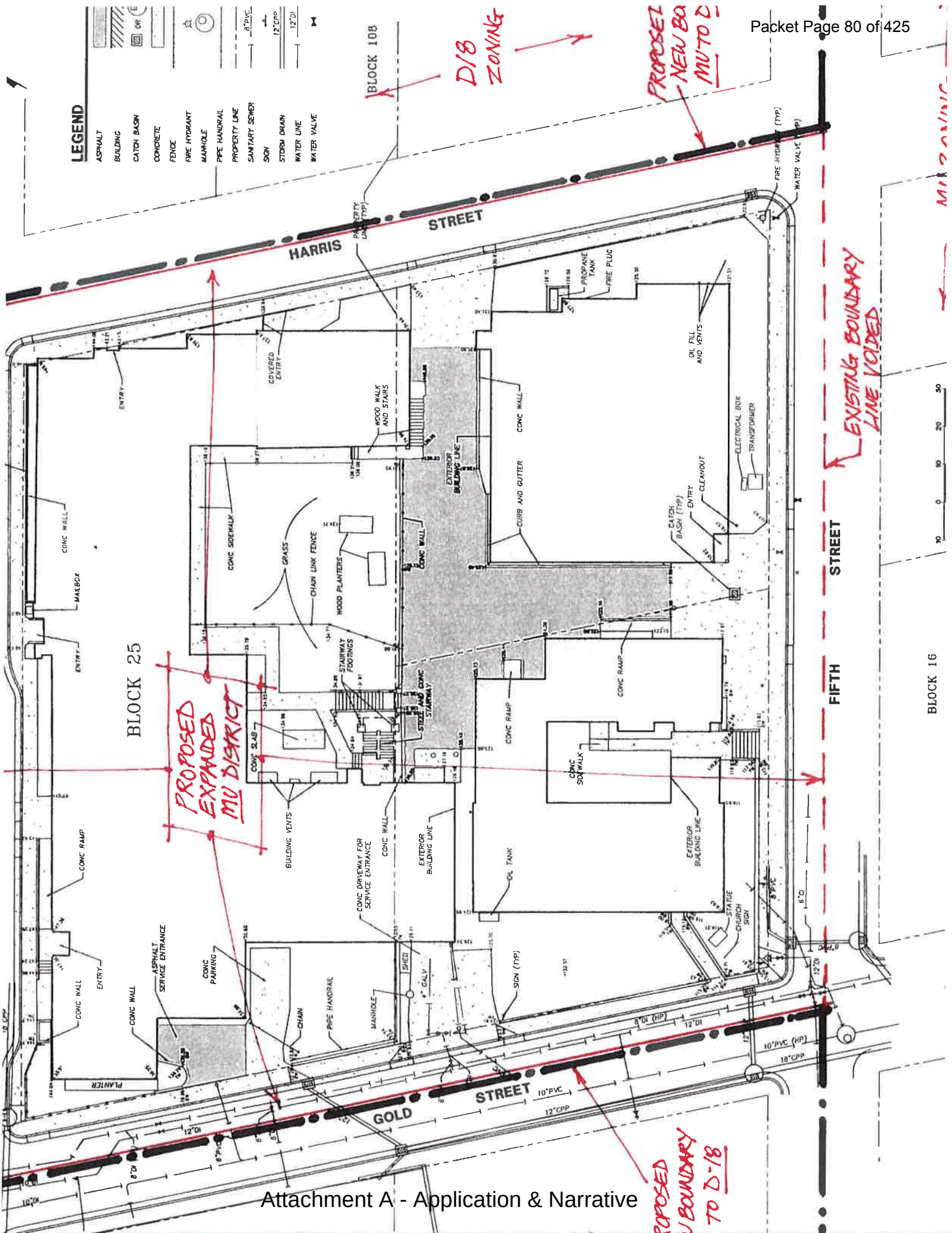
Please let me know if any more information on potential upgrades to the Cathedral would be useful to this discussion. We anticipate virtually no impact on CBJ utilities, street structures, or other responsibilities as part of this re-zone, if successful. Thank you for your consideration.

Sincerely,

Paul Voelckers
MRV Architects

LEGEND

- ASPHALT
- BUILDING
- CATCH BASIN
- CONCRETE
- FENCE
- PIPE HYDRANT
- MANHOLE
- PIPE HANDRAIL
- PROPERTY LINE
- SANITARY SEWER
- SOIL
- STORM DRAIN
- WATER LINE
- WATER VALVE



Statutory Warranty Deed

Deed Book 29 Page 130
Juneau Recording Dist.

THE GRANTOR THE SISTERS OF ST. ANN OF JUNEAU, ALASKA,
835 Humboldt Street
residing at Victoria, British Columbia, Canada
for and in consideration of TEN DOLLARS (\$10.00) and other valuable consideration,
in hand paid, conveys and warrants to CORPORATION OF THE CATHOLIC BISHOP
OF JUNEAU, a religious corporation sole,

the following described real estate:
REAL PROPERTY: Lot 3 of Block 26; Lots 5, 6, 7 and 8 of Block 25; those
certain portions of Lots 1 and 2 of Block 25 more particularly described as
follows: Beginning at Cor.No. 1, the most westerly corner of Lot 1, Block
25, Townsite of Juneau, thence from Cor.No. 1 by metes and bounds, S. 41°
17' E., 17.00 feet to Cor.No. 2; N. 60° 35' E., 68.5 feet to Cor.No. 3; N.
29° 25' W., 16.64 feet to Cor.No. 4; S. 60° 35' W., 72.00 feet to Cor.No. 1,
the point of beginning; together with the building and structures thereon.
It is understood that the structures on the above described property minutely
encroach upon adjoining land of the Corporation of the Catholic Bishop of
Juneau. Additionally, minute portions of the structure located on Lot 5 of
said Block 25 encroach upon Harris Street, a public street, for which the
grantor makes no covenants or warranties of ownership.

PERSONAL PROPERTY: All personal property existing in the structure constructed
upon said Lots 5, 6, 7 and 8 and portions of Lots 2 and 3 of said Block 25,
consisting of furniture, fixtures, equipment used in the operation of St. Ann's
Hospital which remain in the structure for a period of ninety (90) days from
the date the above described premises are delivered to grantee by the grantor,
except personal property described as:

- (a) X-ray equipment on the ground floor of the structure owned by the U.S. Public Health Service;
- (b) All personal property regardless of its nature contained in the structures which is owned respectively by Dr. Robert Smalley, Dr. T. A. Stengl, Dr. Gary Hedges and Dr. John A. Banholzer;
- (c) All personal property regardless of its nature contained in the structures which is owned by the U. S. Public Health Service and the State of Alaska Division of Mental Health;
- (d) All equipment and the contents thereof consisting primarily of vending machines and other equipment owned by Charles H. Lupro.

situated in the State of Alaska.

DATED this 1st day of September 1971
THE SISTERS OF ST. ANN OF JUNEAU, ALASKA
BY: [Signature] (seal)

ACKNOWLEDGEMENT

STATE OF ALASKA
CITY OF

THIS CERTIFIES that on this 10 day of
before me, the undersigned, a Notary Public in and for the State of Alaska, personally appeared
to me known and known to me to be the person(s) named as grantor(s) in the foregoing deed and
(individually) acknowledged to me that executed the same freely and
voluntarily for the uses and purposes therein mentioned.

WITNESS my hand and official seal the day and year in this certificate first above written

Notary Public for Alaska.
My commission expires

MINER PUBLISHING COMPANY

JUNE 11-332-2

AGENDA

Neighborhood Meeting For Proposed Rezone of 1.23 acres FROM: D-18 TO: Mixed Use (MU)

March 7th, 2017
Downtown Library
6:00pm

- Welcome – Introductions
- Why we are here? – Application and Rezone Process
- Proposed Project –
 - o Applicant
- What happens next? –
 - o Review and Staff Report – Please send comments to:
Laura A. Boyce, Senior Planner or laura.boyce@juneau.org
155 S. Seward St.
Community Development Department
Juneau, AK 99801
Ph: (907)586-0753
 - o Planning Commission public hearing (notice will be mailed to you) **(TBD)**
 - o Assembly meetings – two meetings
 - Ordinance Introduction
 - Ordinance Public Hearing
 - If approved – ordinance goes into effect 30 days after public hearing
- Questions, Comments, and Concerns -

Meeting – Request for Rezone, from D-18 to Mixed Use (MU)

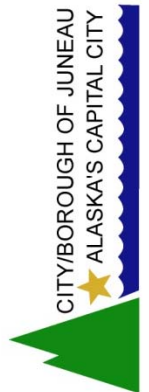
Property Location – 415 5th Street

Downtown Library March 7th, 2017 6:00 p.m.

NAME	ADDRESS	PHONE NUMBER		
Hans Chester	326 Sixth St.	209-7011	nookil.aan@gmail.com	
Pfister	" "	419-7889	steviejohn@gci.net	
Mike Monagle	415 6th St Ste 300	586-2227	mpmonagle@gmail.com	
Eve Soutiere	634 6th St	388-0755	yvette.soutiere@claska.gov	
Paul Korchin	" "			
Keith Levy	534 5th St.	586-1427	keithblevy@gmail.com	
BRIAN GOETTLER	(CATHEDRAL)	209-6894		
CARL UHNDIL	2921 Blademy Hills	523-5091		
PAUL KORCHIN	634 6th St		pdkorchine@gmail.com	

Proposed Rezone of Property Corp. of the Catholic Bishop of Juneau

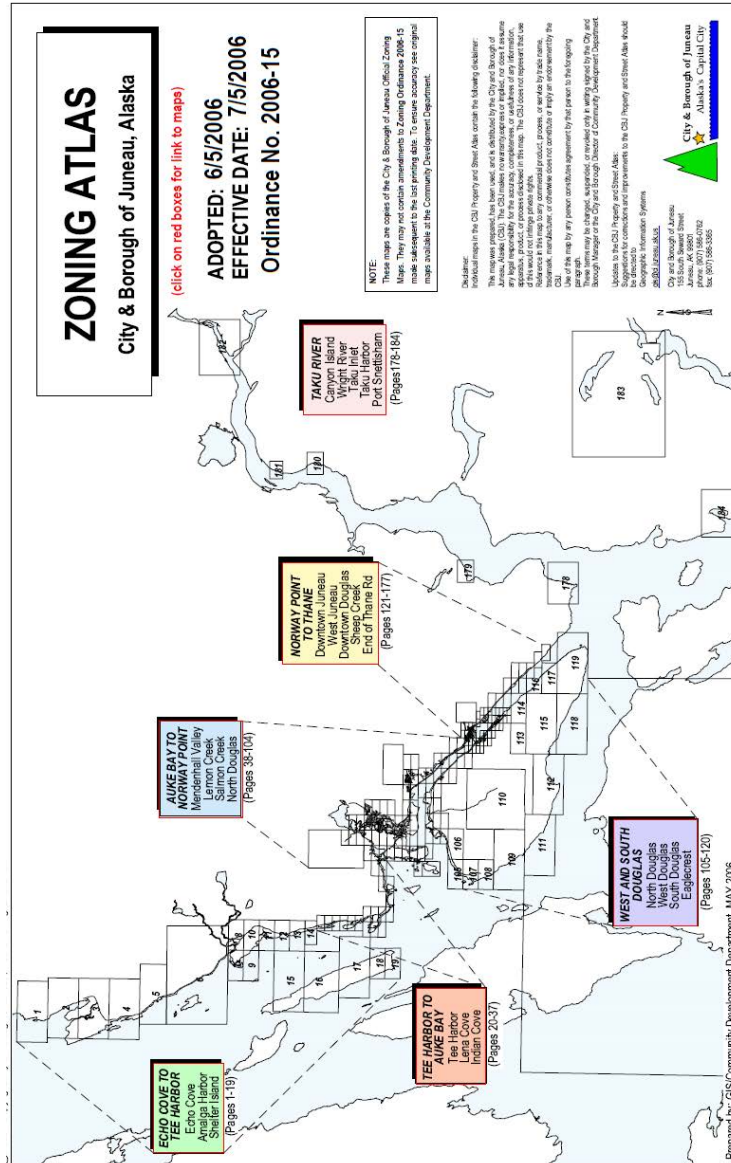
**Neighborhood Meeting
March 7, 2017**



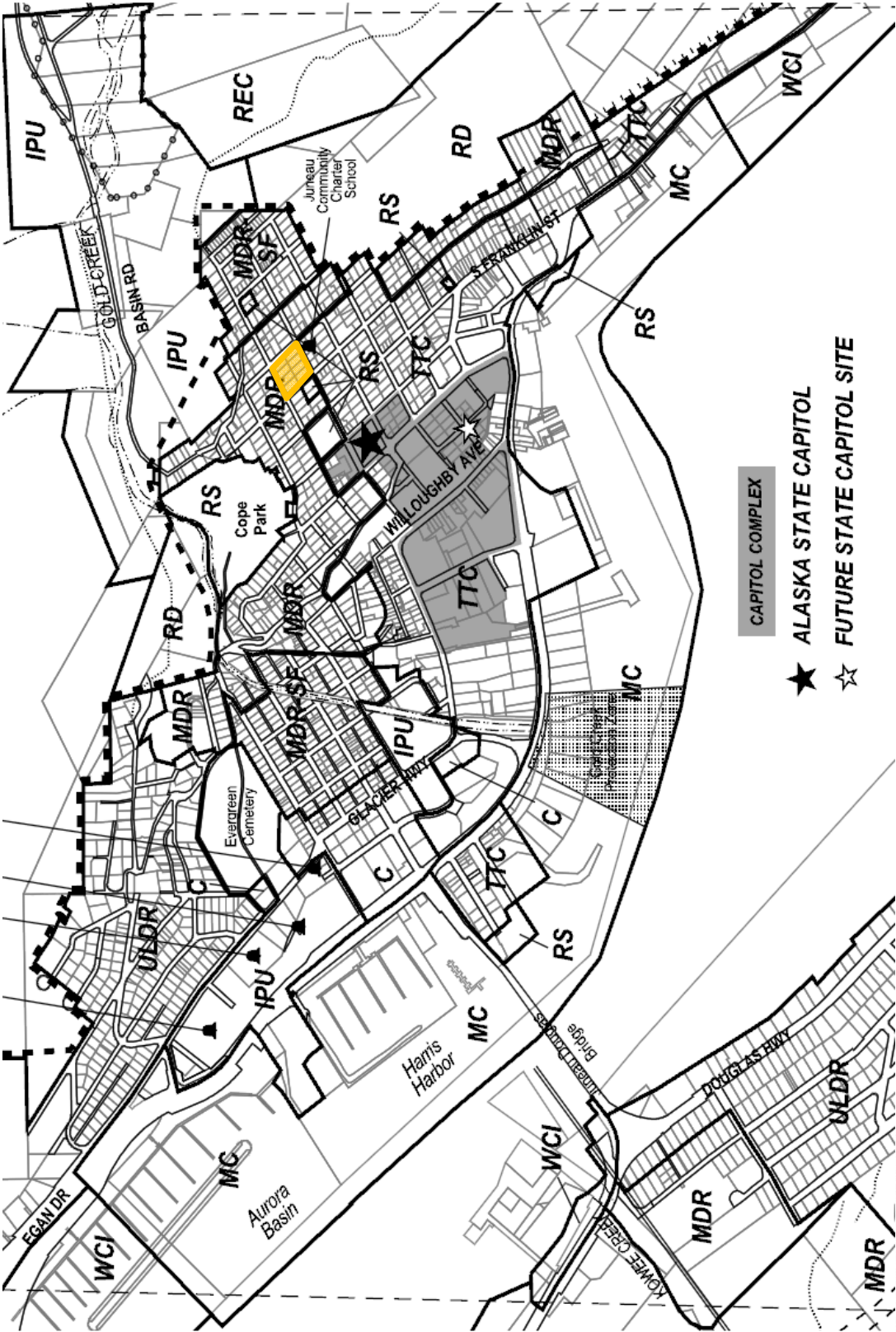
Proposed Rezone

What is proposed?

A revision to the official Zoning Atlas of the CBJ

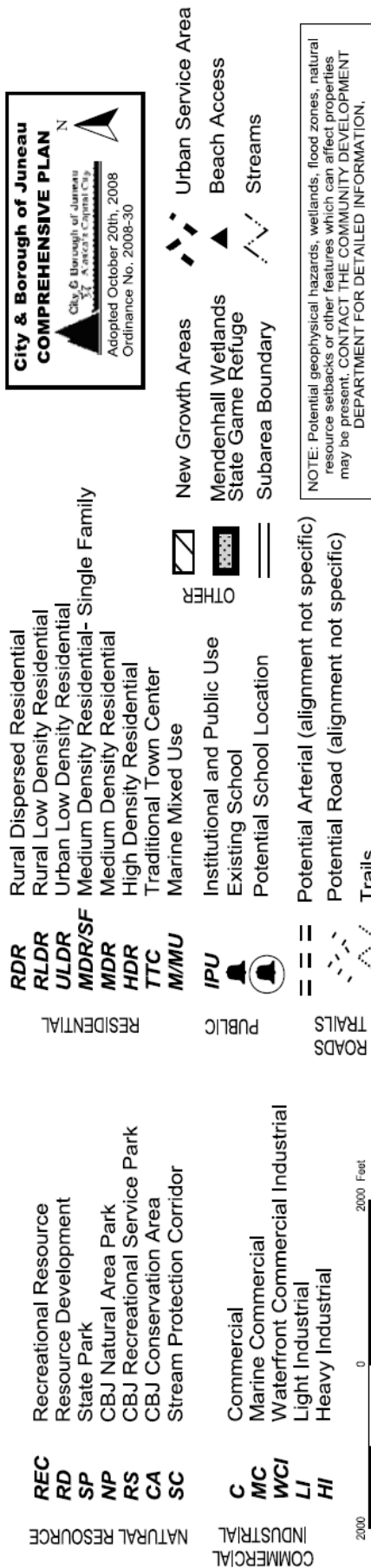


Comprehensive Plan Land Use Designation



CITY/BOROUGH OF JUNEAU
★ ALASKA'S CAPITAL CITY

Comprehensive Plan Land Use Designation

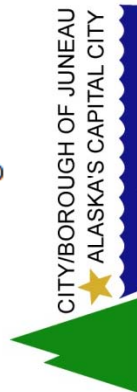


Medium Density Residential (MDR).

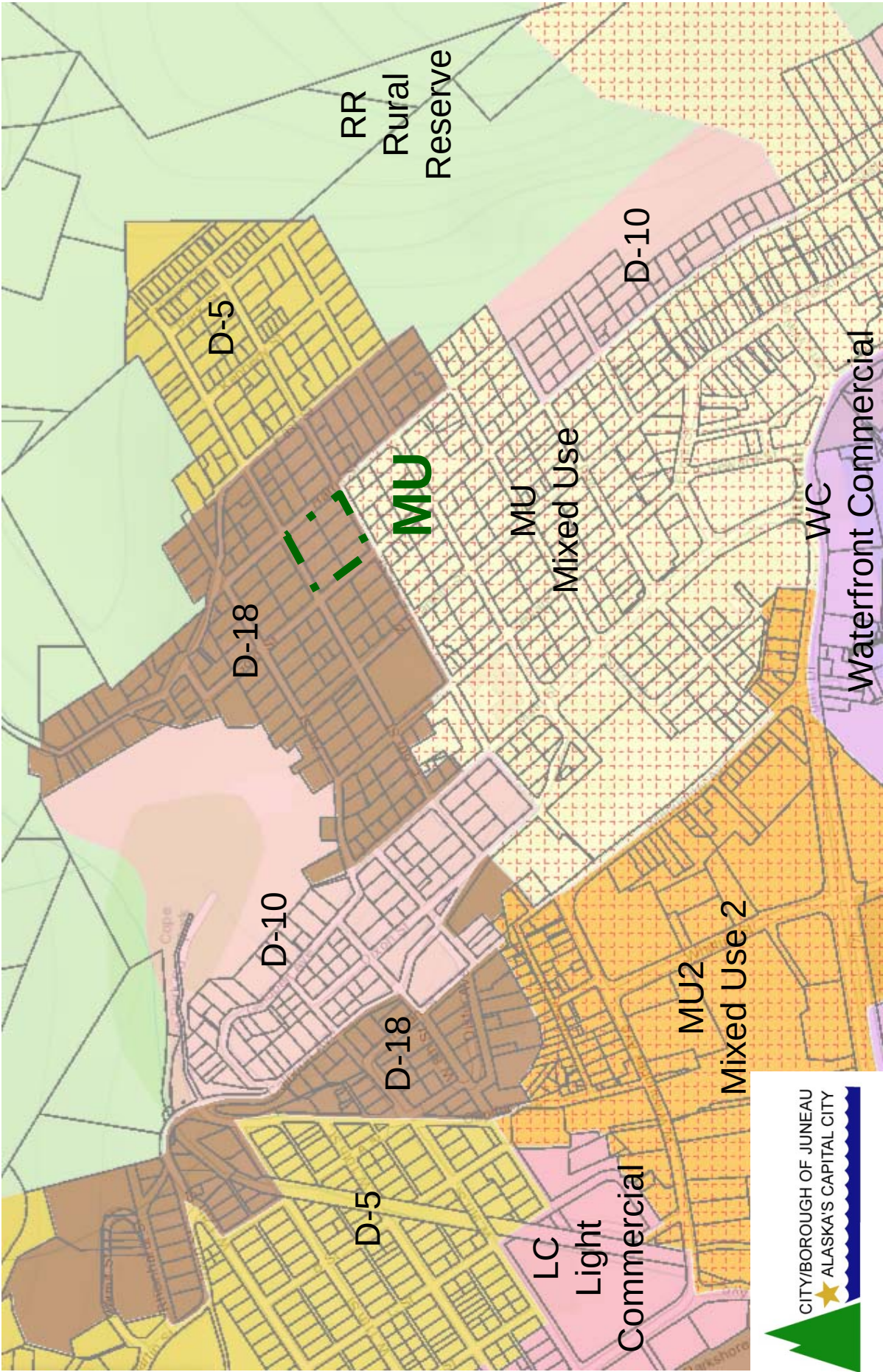
These lands are characterized by urban residential lands for multifamily dwelling units at densities ranging from 5 to 20 units per acre. Any commercial development should be of a scale consistent with a residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).

Traditional Town Center (TTC).

These lands are characterized by high density residential and non-residential land uses in downtown areas and around shopping centers, the University, major employment centers and public transit corridors, as well as other areas suitable for a mixture of retail, office, general commercial, and high density residential uses at densities at 18 or more residential units per acre. Residential and non-residential uses could be combined within a single structure, including off-street parking. Ground floor retail space facing roads with parking behind the retail and housing above would be an appropriate and efficient use of the land.

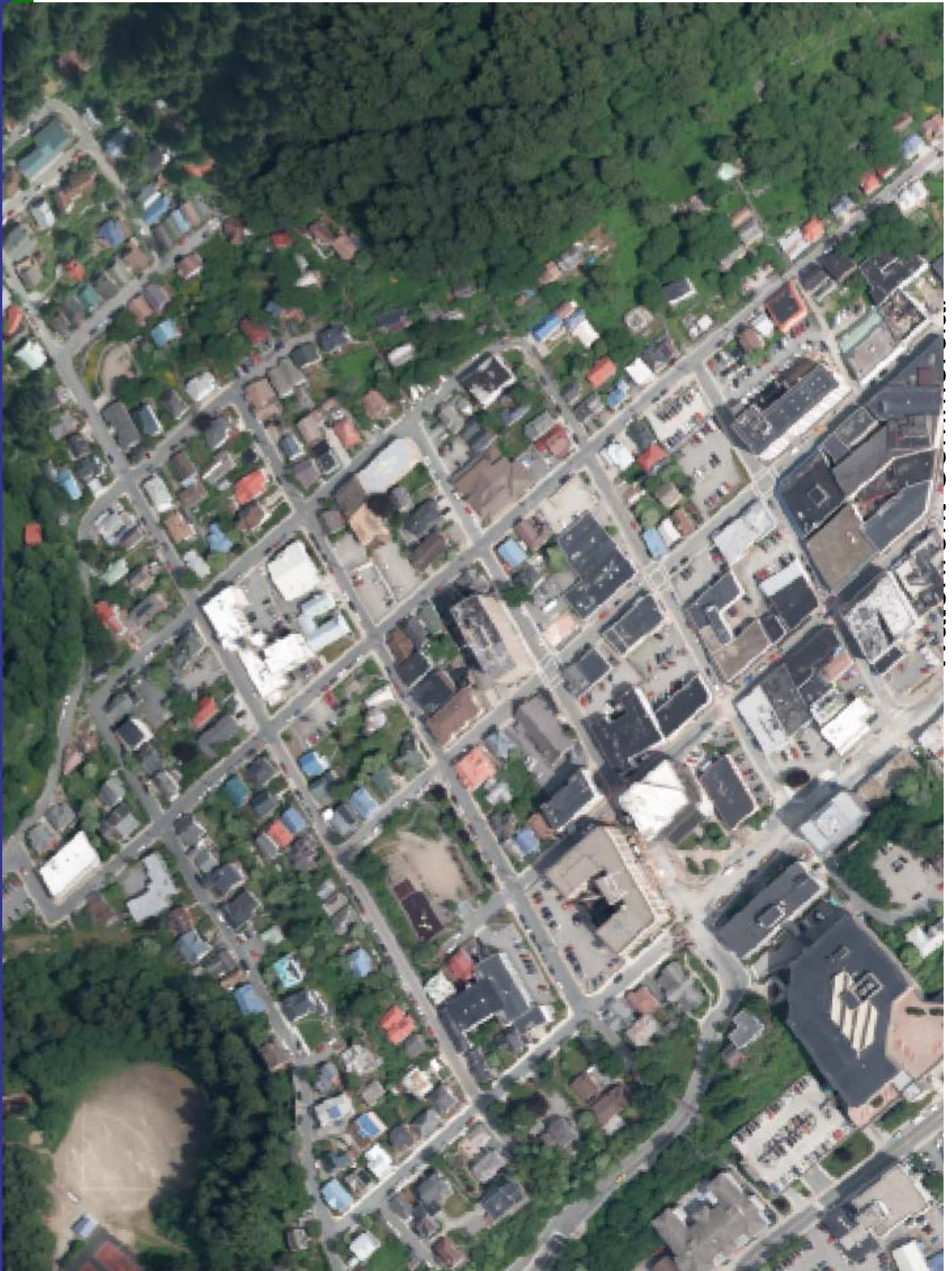


Proposed Rezone



Attachment B - Neighborhood Meeting

2013 Aerial Photograph



Rezone Request

FROM:

49.25.210 Residential districts.

The following districts are established to provide a healthy, safe and pleasant environment for residential living protected from incompatible and disruptive activities:

- (a) The D-18, residential district, is intended to accommodate primarily multifamily development at a density of 18 dwelling units per acre. This is a high density multifamily zoning district intended to accommodate midrise-type development.

TO:

49.25.220 Mixed use districts.

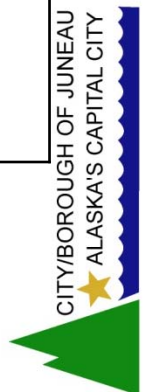
The mixed use and mixed use 2 districts are established to accommodate a mix of appropriate commercial and residential uses.

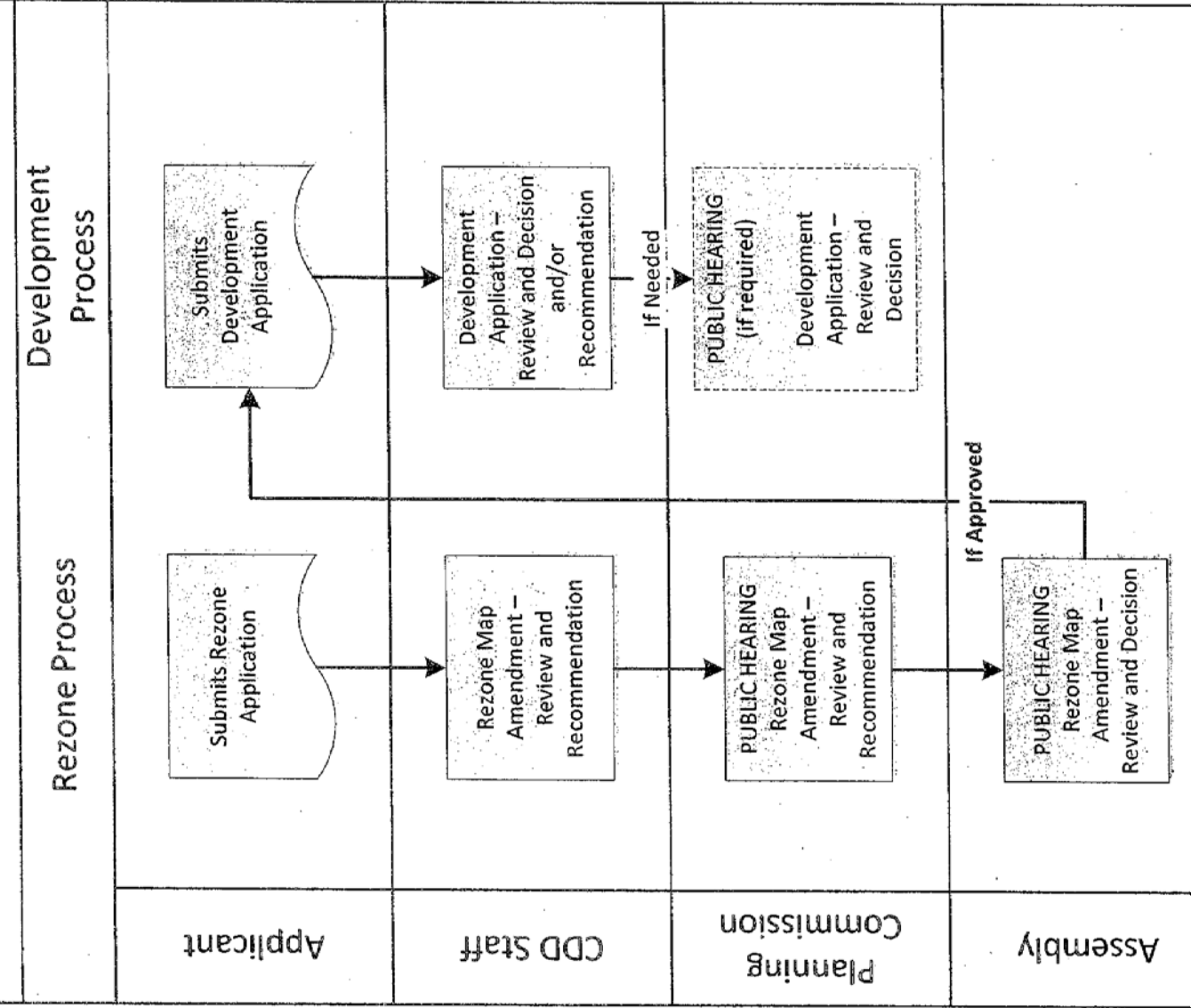
- (a) The MU, mixed use district, reflects the existing downtown development pattern and is intended to maintain the stability of the downtown area. Multifamily residential uses are allowed and encouraged.



Rezone Request

Table of Dimensional Standards		MU
Existing site 1.23 acres		Mixed Use (1.23 acres)
D-18 (18 du/acre) (1.23 acres)		
Maximum Number of Units	23	No Limit
Maximum Height Limit	35 feet	None
Maximum Lot Coverage	50%	None
Vegetative Cover	30%	None
Minimum Lot Size	5,000 sq. ft.	4,000 sq. ft.
Minimum Lot Width	50 ft.	50 ft.
Minimum Lot Depth	80 ft.	80 ft.





Any questions?

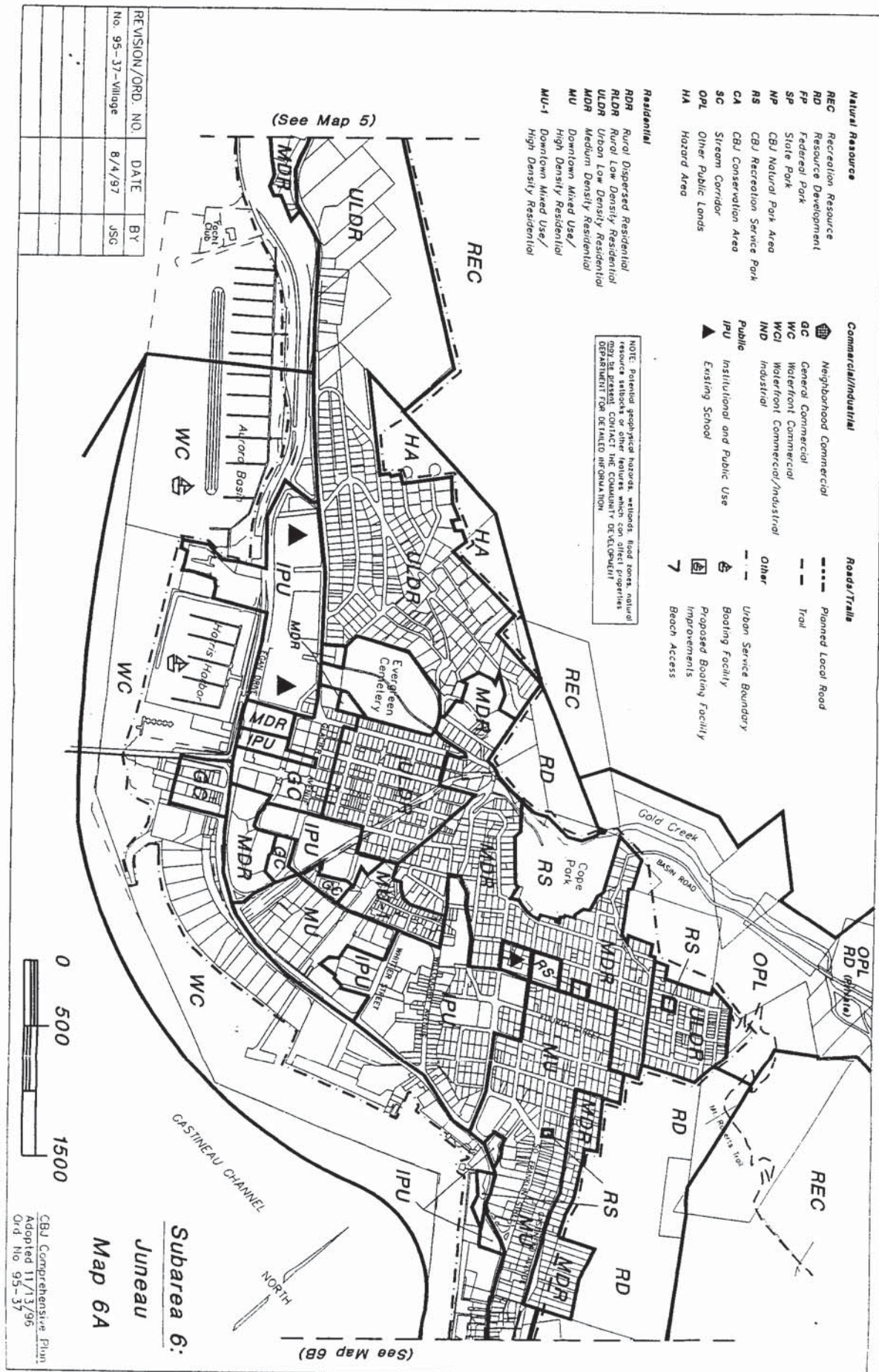


Existing Zone Districts within the MDR Comprehensive Plan Land Use Designation – 2017 Analysis

Zone District	Total Acreage	Zone District Description
D-1(T)D-3	2.39 acres	The D-1, residential district, is intended to accommodate primarily single-family and duplex residential development in areas outside the urban service boundary at a density of one dwelling unit per acre. Certain D-1 zoned lands, however, may exist within the urban service boundary in transition areas if public sewer or water are absent but planned for. The D-1 classification will be changed to a higher density upon provision of services.
D-3	108.36 acres	The D-3, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of three dwelling units per acre. D-3 zoned lands are primarily located outside the urban service boundary where public utilities are not provided. The density reflects the existing pattern of development of properties in the district. There is a limited amount of D-3 zoned lands located within the urban service boundary. These are lands for which a lower density is deemed appropriate or, in the case of transition zones, where the zoning will be changed to a higher density when sewer and water are provided.
D-5	156.47 acres	The D-5, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of five dwelling units per acre. D-5 zoned lands are located in the urban service boundary and are served or can be served by public water and sewer.
D-5(T)D-18	1.15 acres	The D-5, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of five dwelling units per acre. D-5 zoned lands are located in the urban service boundary and are served or can be served by public water and sewer.
D-10	158.92 acres	The D-10 and D-15, residential districts, are intended to accommodate primarily multifamily residential development at ten and 15 units per acre respectively. These are relatively low-density multifamily districts.
D-10(T)D-15	11.36 acres	The D-10 and D-15, residential districts, are intended to accommodate primarily multifamily residential development at ten and 15 units per acre respectively. These are relatively low-density multifamily districts.
D-15	652.72 acres	The D-10 and D-15, residential districts, are intended to accommodate primarily multifamily residential development at ten and 15 units per acre respectively. These are relatively low-density multifamily districts.
D-18	357.41 acres	The D-18, residential district, is intended to accommodate primarily multifamily development at a density of 18 dwelling units per acre. This is a high density multifamily zoning district intended to accommodate midrise-type development.
LC	17.26 acres	The LC, light commercial district, is intended to accommodate commercial development that is less intensive than that permitted in the general commercial district. Light commercial districts are primarily located adjacent to existing residential areas. Although many of the uses allowed in this district are also allowed in the GC, general commercial district, they are listed as conditional uses in this district and therefore require commission review to determine compatibility with surrounding land uses. A lower level of intensity of development is also achieved by stringent height and setback restrictions. Residential development is allowed in mixed- and single-use developments in the light commercial district.
GC	5.95 acres	The GC, general commercial district, is intended to accommodate most commercial uses. Commercial activities are permitted outright in the zone except for those few uses that are listed as conditional uses to ensure compatibility. Residential development is allowed in mixed- and single-use developments in the general commercial district.

Existing Zone Districts within the MDR Comprehensive Plan Land Use Designation – 2017 Analysis

MU	3.04 acres	The mixed use and mixed use 2 districts are established to accommodate a mix of appropriate commercial and residential uses. The MU, mixed use district, reflects the existing downtown development pattern and is intended to maintain the stability of the downtown area. Multifamily residential uses are allowed and encouraged.
WC	5.36 acres	The following districts are established to accommodate those uses that are dependent or directly related to the water, a waterfront location, or both. These districts regulate development of the waterfront to take advantage of the unique attributes and limitations of its lands: The WC, waterfront commercial district, is intended to provide both land and water space for uses which are directly related to or dependent upon a marine environment. Such activities include private boating, commercial freight and passenger traffic, commercial fishing, floatplane operations, and retail services directly linked to a maritime clientele. Other uses may be permitted if water-dependent or water-oriented. Residential development is allowed in mixed- and single-use developments in the waterfront commercial district.



Urban/Low Density Residential. Urban/suburban residential land for detached single-family units, duplex and zero-lot-line units at densities of one to six units per acre; may include mobile homes where specifically permitted.

Medium Density Residential. Urban/suburban residential land for multifamily dwelling units at densities ranging from 7 to 20 units per acre; may include subdivisions of mobile home parks where specifically permitted.

Mixed Use (Including High Density Residential). Land in the downtown and other areas intended for a mixture of retail, office, general commercial, and high density residential uses at a density of 60 residential units per acre downtown, and a density of 40 units per acre elsewhere. These uses could be combined within a single building.

Transition Area. Predominately undeveloped or low density residential areas within the urban service boundary that do not have public sewer and water services. A transition area is shown as a lower density classification that would undergo a transition (T) to a higher density classification. The transition classification intended to limit development to the lower density until sewer and water are available.

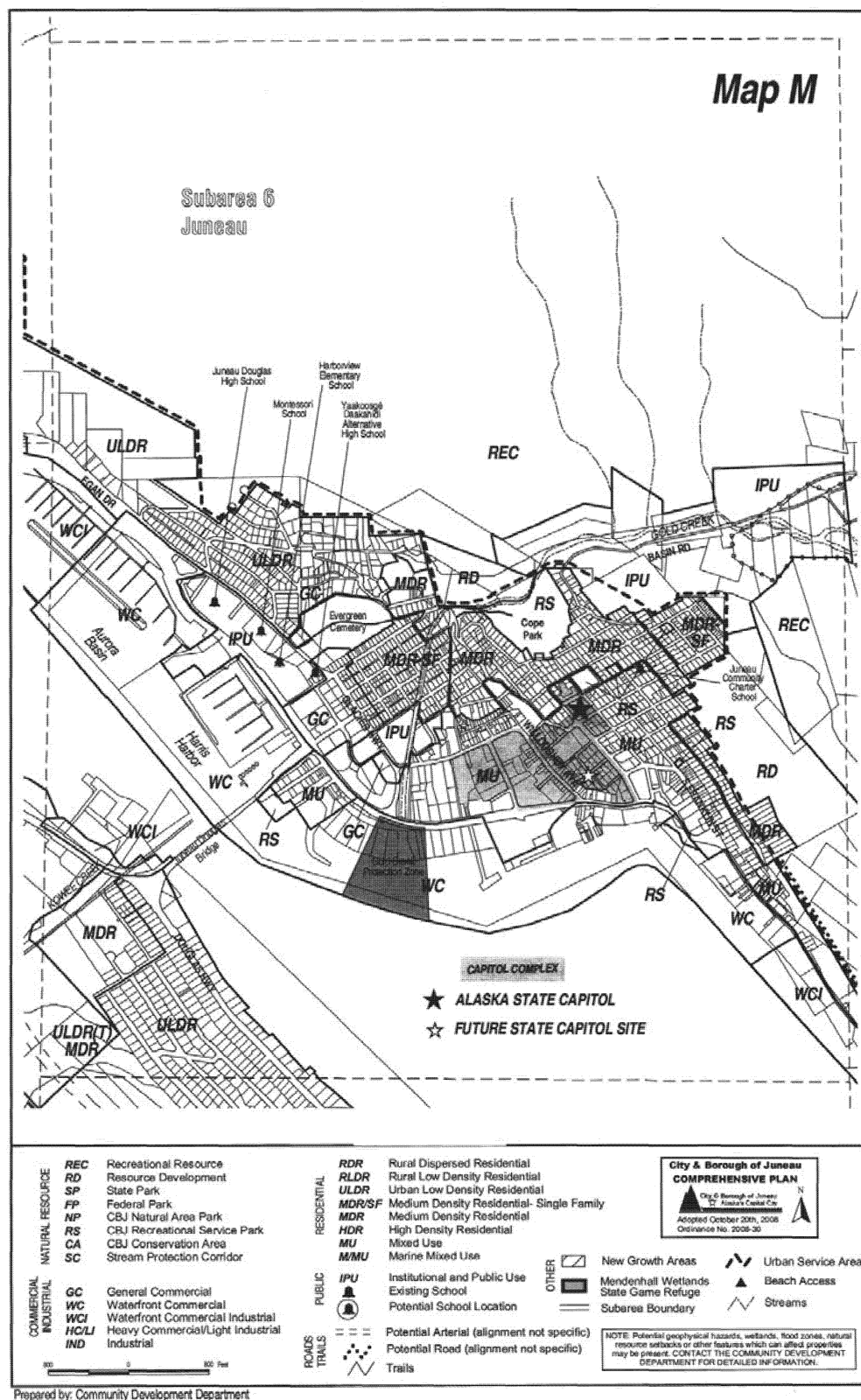
Neighborhood Commercial. Neighborhood commercial areas generally sell goods necessary to meet daily needs, and occupy less than two acres. Such uses include small grocery stores, dry cleaners and beauty/barber shops. Areas shown on the map are conceptual unless existing use is neighborhood commercial.

General Commercial. Land for retail uses, including neighborhood retail and community commercial, such as shopping centers, mixed retail/residential/office uses, especially in downtown Juneau and Douglas, and office use, including leased government office space.

Industrial. Land to be developed for general industrial uses such as manufacturing, warehousing, repair and maintenance, wholesaling, and as presently allowed by conditional use permit under the Land Use Code, an array of sales and service uses.

Waterfront Commercial. Land to be used primarily for water-dependent and water-related commercial uses and, in special cases, for water-related mixed uses including hotel and residential use.

Waterfront Commercial/Industrial. Land to be used primarily for water-dependent and water-related commercial and industrial uses such as marine transportation terminals, small boat marinas, marine freight handling areas, fish buying and processing plants and marine parks.



six units per acre. Any commercial development should be of a scale consistent with a single-family residential neighborhood.

Medium Density Residential (MDR). These lands are characterized by urban residential lands for multifamily dwelling units at densities ranging from 5 to 20 units per acre. Any commercial development should be of a scale consistent with a residential neighborhood.

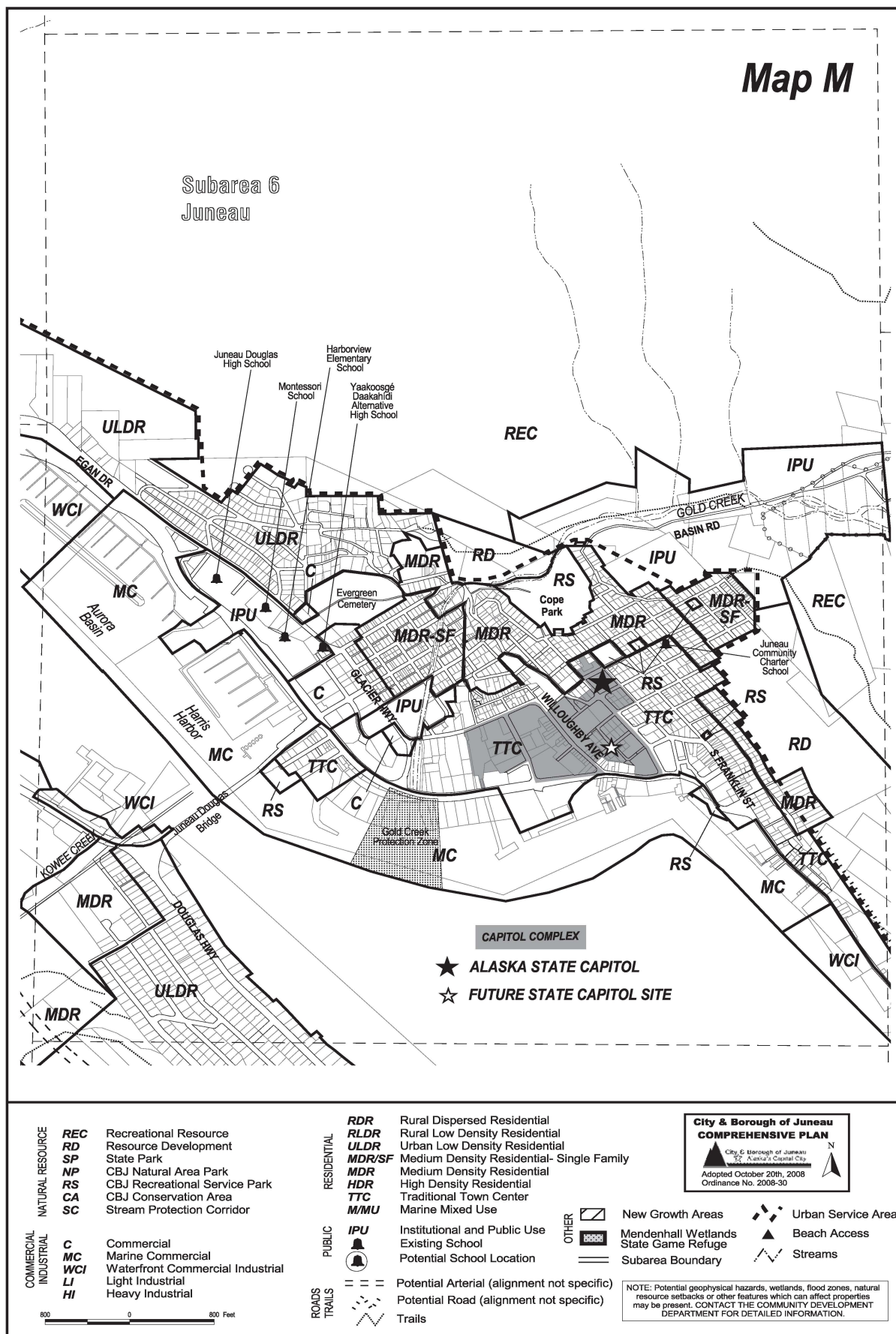
Medium Density Residential—Single Family Detached (MDR/SF). These lands are characterized by single-family detached homes at densities ranging from 10 to 20 units per acre. Only single-family detached homes, single-family detached homes with an accessory apartment, cottage houses and bungalow houses are permitted within this zone. Any commercial development should be of a scale consistent with a single-family residential neighborhood.

High Density Residential (HDR). These lands are characterized by urban residential lands suitable for new, in-fill or redevelopment housing at high densities ranging from 18 to 60 units per acre. Commercial space may be an element of developments on properties under this designation.

Mixed Use (MU). These lands are characterized by high density residential and non-residential land uses in Downtown areas and around shopping centers, the University, major employment centers and public transit corridors, as well as other areas suitable for a mixture of retail, office, general commercial, and high density residential uses at densities ranging from 18 to 60 residential units per acre. Residential and non-residential uses could be combined within a single structure, including off-street parking. Ground floor retail space facing roads with parking behind the retail and housing above would be an appropriate and efficient use of the land.

Marine Mixed Use (M/MU). These lands are characterized by high density residential and non-residential land uses in areas in and around harbors and other water-dependent recreational or commercial/industrial areas. Suitable locations include Auke Bay, Downtown Juneau, Downtown Douglas, and the waterfront areas of the West Douglas and Echo Cove New Growth Areas when Master Development Plans are developed. Typically, neighborhood-serving and marine-related retail, marine industrial, personal service, food and beverage services, recreational services, transit and transportation services should be allowed and encouraged, as well as medium- and high-density residential uses at densities ranging from 10 to 60 residential units per acre. Ground floor retail space facing roads with parking behind the retail and housing above would be an appropriate and efficient use of the land. Float homes, live-a-boards, and house boats, if necessary services (such as sewer) are provided to berthing locations, are appropriate for these areas.

Transit Oriented Development (TOD). These lands are located with one-quarter mile of a bus transfer point, express bus stop, or along a major bus route with short headways and long service hours. This area is characterized by high density residential and non-residential land uses in Downtown areas, in or near shopping centers, near the University and major employment centers. Residential and non-residential uses could be combined within a single structure, including off-street parking. Ground floor retail space facing roads with parking behind the retail and housing above would be an appropriate and efficient use of the land.



Attachment D - Comp Plan Map Excerpts

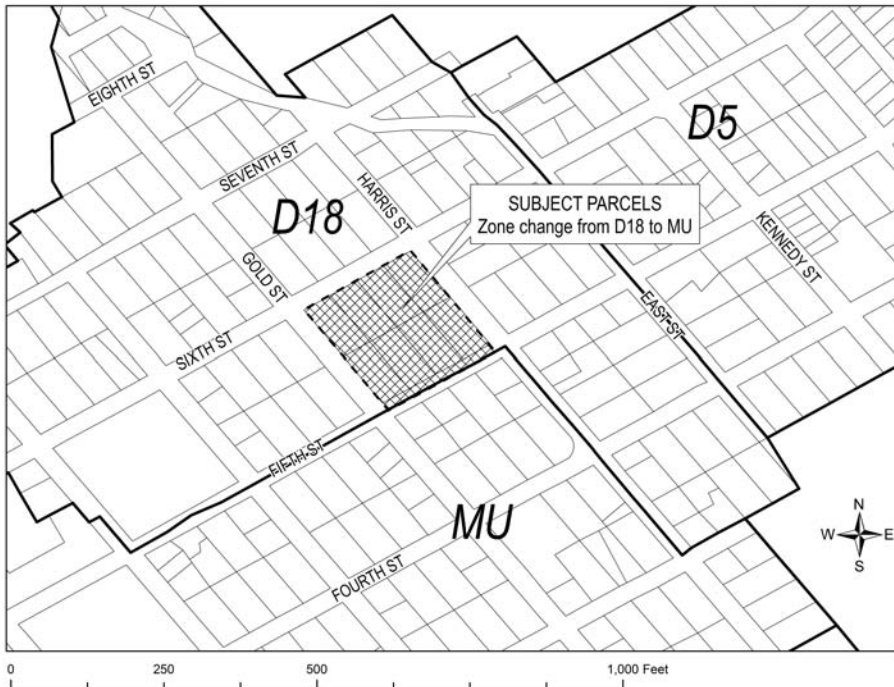
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[REDACTED]

[REDACTED]

NOTICE OF NEIGHBORHOOD MEETING



City & Borough of Juneau
Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:



Notice of Neighborhood Meeting Regarding Rezone Request **Downtown Public Library, Large Meeting Room** **Tuesday, March 7, 6:00 pm**

Dear Resident,

The CBJ Community Development Department (CDD) received a Zone Change Application (AME2017 0002) from the Catholic Diocese of Juneau to rezone 1.23 acres comprising Juneau Town Site, Block 25. This area is contained between 5th and 6th Streets and Harris and Gold Streets at the base of Starr Hill. The request is to rezone the block from D-18 (Multi-family Residential District, 18 dwelling units per acre) to MU (Mixed-Use District).

CDD is hosting a neighborhood meeting to explain the details of the request and the CBJ rezone process. This meeting will be held on Tuesday, March 7 beginning at 6:00 pm at the Downtown Public Library.

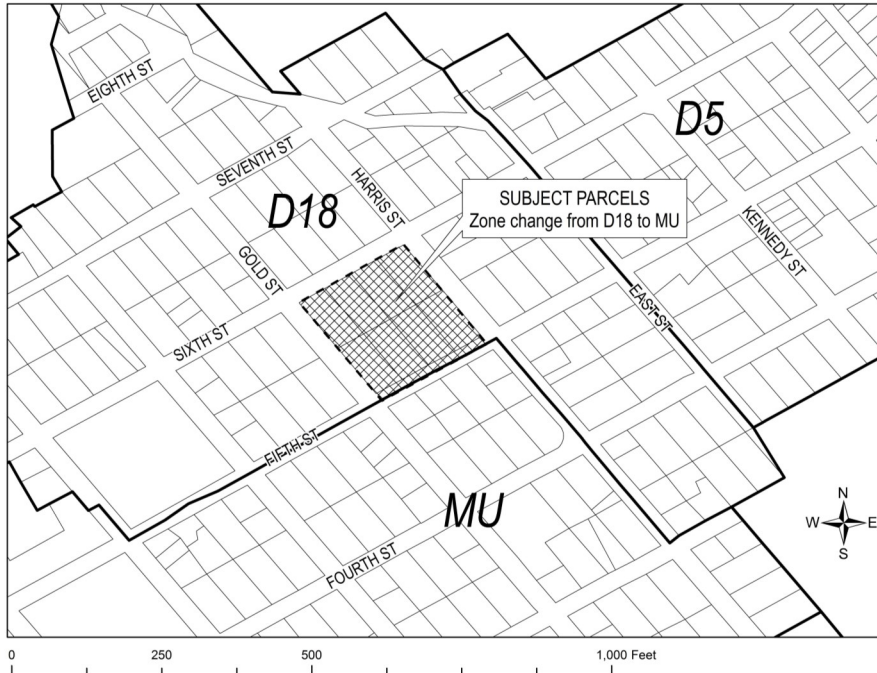
The purpose of the meeting is to provide information, respond to questions, and to get a sense of concerns that the neighborhood might have so that issues may be addressed in advance of the formal public hearing with the CBJ Planning Commission.

If you have questions or would like more information, please contact Laura Boyce, Community Development Planner, at (907) 586-0753 or by email at laura.boyce@juneau.org.



Date notice was printed: March 1, 2017

NOTICE OF PUBLIC HEARING



City & Borough of Juneau

Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:



PROPOSAL: A rezone request for 1.23 acres from D18 (Multi-Family Residential District, 18 units per acre) to MU (Mixed-Use).

File No:	AME2017 0002	Applicant:	Corporation of the Catholic Bishop of Juneau
To:	Adjacent Property Owners	Property PCN:	1-C04-0-A25-002-0
Hearing Date:	June 13, 2017	Owner:	Corporation of the Catholic Bishop of Juneau
Hearing Time:	7:00 PM	Lot Size:	9786 square feet
Place:	Assembly Chambers	Zoned:	D18
	Municipal Building	Site Address:	416 Fifth Street
	155 South Seward Street, Juneau, AK 99801	Accessed Via:	Fifth Street

PROPERTY OWNERS PLEASE NOTE:

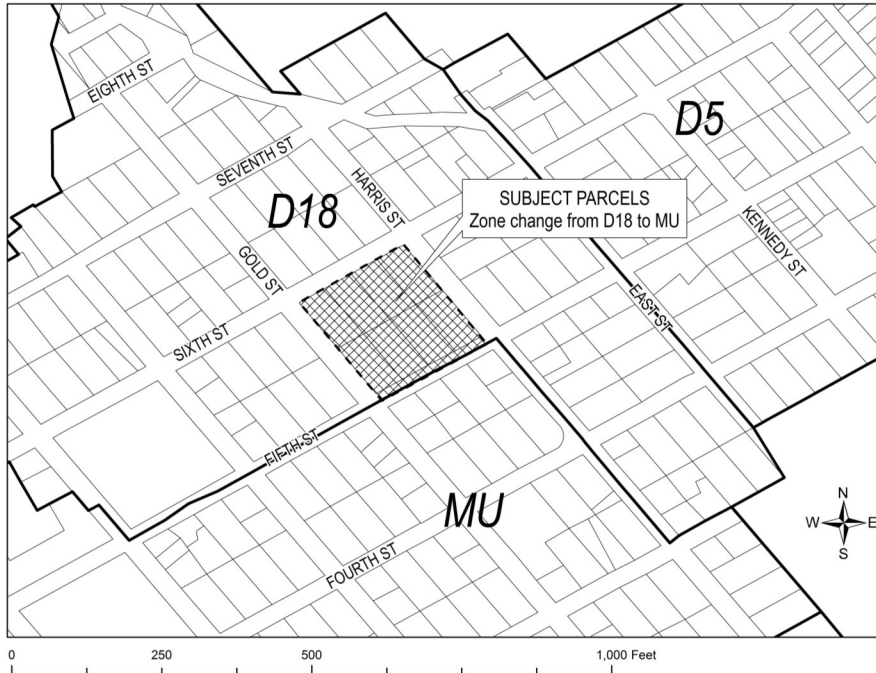
You are invited to attend this Public Hearing and present oral testimony. The Planning Commission will also consider written testimony. You are encouraged to submit written material to the Community Development Department 14 days prior to the Public Hearing. Materials received by this deadline are included in the information packet given to the Planning Commission a week before the Public Hearing. Written material received after the deadline will be provided to the Planning Commission at the Public Hearing.



If you have questions, please contact Laura Boyce at laura.boyce@juneau.org or (907) 586-0753.

Planning Commission Agendas, Staff Reports and Meeting Results can be viewed at <http://www.juneau.org/assembly/novus.php>

NOTICE OF PUBLIC HEARING



City & Borough of Juneau

Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:

Please Note: This hearing has been rescheduled from June 13th. The case will now be heard by the Planning Commission on June 27th. See the reverse for more details.

PROPOSAL: A rezone request for 39,144 square feet from D-18 (Multi-Family Residential District, 18 units per acre) to MU (Mixed-Use).

File No:	AME2017 0002	Applicant:	Corporation of the Catholic Bishop of Juneau
To:	Adjacent Property Owners	Property PCN:	1C040A250010; 1C040A250020 1C040A250030; 1C040A250031
New Hearing Date:	June 27, 2017	Owner:	Corporation of the Catholic Bishop of Juneau
Hearing Time:	7:00 PM	Lot Size:	39,144 square feet
Place:	Assembly Chambers Municipal Building 155 South Seward Street, Juneau, AK 99801	Zoned:	D-18
		Site Address:	400, 415 and 416 Fifth Street
		Accessed Via:	Gold Street, Fifth Street and Harris Street

PROPERTY OWNERS PLEASE NOTE:

You are invited to attend this Public Hearing and present oral testimony. The Planning Commission will also consider written testimony. You are encouraged to submit written material to the Community Development Department 14 days prior to the Public Hearing. Materials received by this deadline are included in the information packet given to the Planning Commission a week before the Public Hearing. Written material received after the deadline will be provided to the Planning Commission at the Public Hearing.



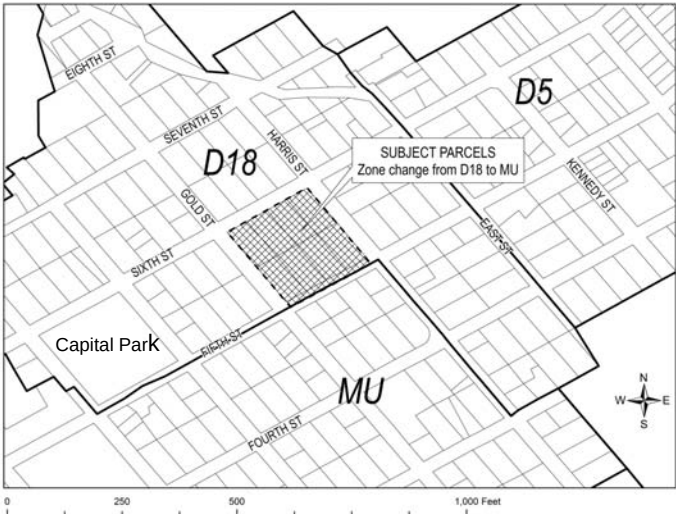
If you have questions, please contact Laura Boyce at laura.boyce@juneau.org or (907) 586-0753.

Planning Commission Agendas, Staff Reports and Meeting Results can be viewed at <http://www.juneau.org/assembly/novus.php>

AME2017 0002
A request to rezone 0.89 acres from D-18 to MU

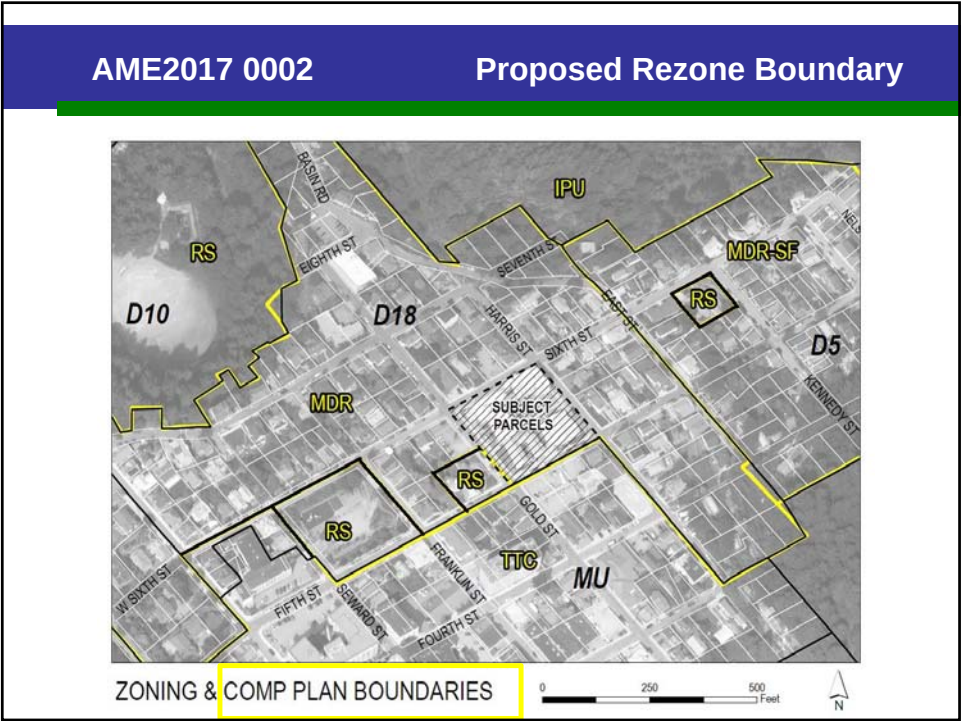
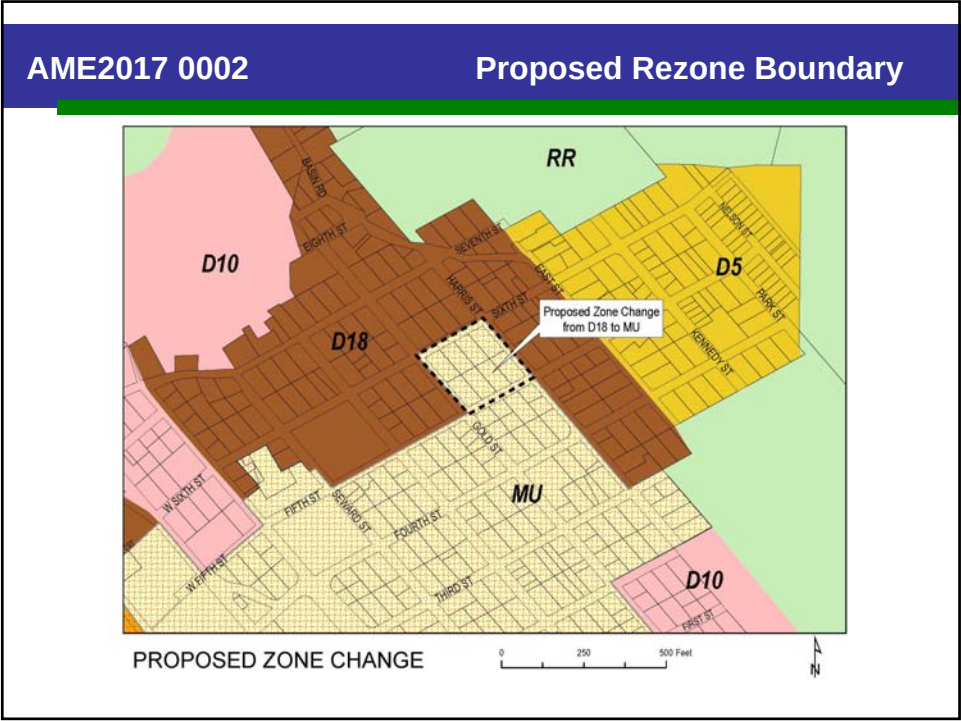


AME2017 0002 **Vicinity Map**



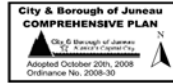


Overview	
Site Size:	0.8999 Acres
Property Owner/Applicant:	Catholic Corporation of the Bishop
Existing Zoning:	D-18 (Multifamily, 18 du/acre)
Comprehensive Plan Land Use Designation:	MU (Mixed Use)
Utilities:	City water and sewer
Access:	Fifth, Gold, and Harris Streets
Existing Land Use:	Religious facilities and business offices



Comprehensive Plan Land Use Designation

NATURAL RESOURCE	REC	Recreational Resource	RDR	Rural Dispersed Residential	OTHER		New Growth Areas		Urban Service Area
	RD	Resource Development	RLDR	Rural Low Density Residential			Mendenhall Wetlands		Beach Access
COMMERCIAL INDUSTRIAL	SP	State Park	ULDR	Urban Low Density Residential			State Game Refuge		Streams
	NP	CBJ Natural Area Park	MDR/SF	Medium Density Residential- Single Family					
	RS	CBJ Recreational Service Park	MDR	Medium Density Residential					
	CA	CBJ Conservation Area	HDR	High Density Residential					
	SC	Stream Protection Corridor	TTC	Traditional Town Center					
PUBLIC			MMU	Marine Mixed Use					
	C	Commercial							
	MC	Marine Commercial	IPU	Institutional and Public Use					
	WCI	Waterfront Commercial Industrial		Existing School					
	LI	Light Industrial		Potential School Location					
	HI	Heavy Industrial							
				Potential Road (alignment not specific)					
				Trails					



NOTE: Potential geophysical hazards, wetlands, flood zones, natural resource setbacks or other features which can affect properties may be present. CONTACT THE COMMUNITY DEVELOPMENT DEPARTMENT FOR DETAILED INFORMATION.

Medium Density Residential (MDR).

These lands are characterized by urban residential lands for multifamily dwelling units at densities ranging from 5 to 20 units per acre. Any commercial development should be of a scale consistent with a residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).

Traditional Town Center (TTC).

These lands are characterized by high density residential and non-residential land uses in downtown areas and around shopping centers, the University, major employment centers and public transit corridors, as well as other areas suitable for a mixture of retail, office, general commercial, and high density residential uses at densities at 18 or more residential units per acre. Residential and non-residential uses could be combined within a single structure, including off-street parking. Ground floor retail space facing roads with parking behind the retail and housing above would be an appropriate and efficient use of the land.

Rezone Requirements

CBJ 49.75.120. RESTRICTIONS ON REZONINGS

Rezoning must be more than two acres OR an expansion of an existing zone.

The rezone request is an expansion of the adjacent MU zone district

Requests which are substantially the same as a rezoning request rejected within the previous twelve months shall not be considered.

A similar request has not been made within the previous twelve months

Rezone Requirements

49.75.120 Restrictions on Rezoning

A rezoning shall only be approved upon a finding that the proposed zoning district and the uses allowed therein are in substantial conformance with the land use maps of the comprehensive plan.

Background

- Development on the site pre-dates zoning requirements -
 - Church and rectory – 1890-1918
 - 1933
 - 1954
- Newer development received variances for front yard setbacks (7 ft. along Sixth St., 4 ft. along Gold St.)
- Most of the development is non-conforming to current standards
- 1987 – CBJ-wide rezoning – D-18 applied (20 foot front setback); prior setback had been 15 feet

Rezone Request

FROM:

49.25.210 Residential districts.

The following districts are established to provide a healthy, safe and pleasant environment for residential living protected from incompatible and disruptive activities:

- (a) The D-18, residential district, is intended to accommodate primarily multifamily development at a density of 18 dwelling units per acre. This is a high density multifamily zoning district intended to accommodate midrise-type development.

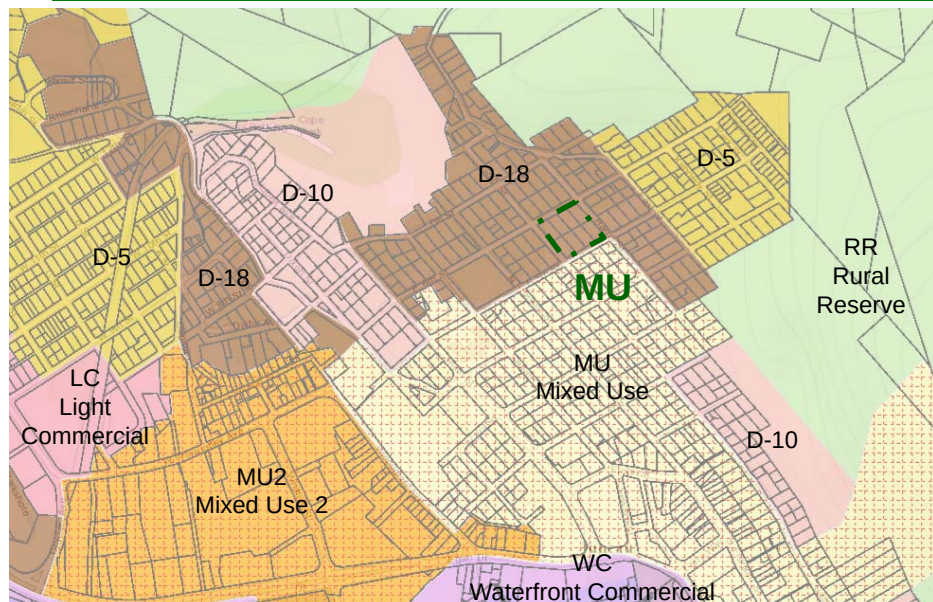
TO:

49.25.220 Mixed use districts.

The mixed use and mixed use 2 districts are established to accommodate a mix of appropriate commercial and residential uses.

- (a) The MU, mixed use district, reflects the existing downtown development pattern and is intended to maintain the stability of the downtown area. Multifamily residential uses are allowed and encouraged.

Proposed Rezone



Zone District	Acres	Percentage of Total MDR Designation
D-1(T)D-3	2.39	0.2%
D-3	108.36	7.3%
D-5	156.47	10.6%
D-5(T)D-18	1.15	0.1%
D-10	158.92	10.7%
D-10(T)D-15	11.36	0.8%
D-15	652.72	44.1%
D-18	357.41	24.1%
LC	17.26	1.2%
GC	5.95	0.4%
MU	3.04	0.2%
WC	5.36	0.4%

Land Use Code Conformance

- Because of other MU, LC, GC, and WC lands within the MDR designation, this request is consistent to existing lands.
- Staff concludes that the proposed rezone to Mixed Use is consistent with the Land Use Code.

Uses in the D-18 and MU Districts

	D-18	MU
Single-family residential, duplexes		
Multifamily		
Bed & Breakfasts, Rooming Houses		
Hotels, Motels		
Storage and Display of goods/merchandising		
Marijuana Retail store		
Offices not greater than 2,500 sf		
Offices greater than 2,500 sf		
Research, lab uses		
Marijuana testing facility		
Light manufacturing		
Medium Manufacturing		
Marijuana product manufacturing		
Trade school, commercial school		
Churches, synagogues, temples		
Social, fraternal halls, union halls		
Hospital		
Health care clinic, day care center		

Zone District Comparison

	D-18	MU
Setbacks		
Front		
Rear	10'	0'
Side	5'	0'
Street side		
Lot coverage		
Permissible uses		
Building Height	35'	None
Vegetative coverage	30%	None
Density	18 du/acre	No Limit

Differences between D-18 and MU

- Primary difference between D-18 and MU is height: 35 feet in D-18, no limit in Mixed Use.
- Residential Density: 18 units per acre in D-18, no limit in Mixed Use. However, site constrains limit development opportunities on site.

Public Comments

- No comments received

Zone Change Options and Alternatives

ZONE CHANGE OPTIONS AND ALTERNATIVES

The applicant has requested to have 0.89 acres rezoned to Mixed Use (MU).

The options are to recommend approval to the Assembly for the request as submitted, deny the request as submitted, or recommend an alternative to the Assembly.

Comprehensive Plan Policies and Guidance

In considering re-zoning requests, the Planning Commission and the Assembly should aim to promote the highest and best use of the land under consideration and all new zoning or re-zoning designations are required to be substantially consistent with the Comprehensive Plan and associated land use maps. In some cases, the highest and best use may be increased density or more intensive use of the land; in other cases, the highest and best use may be preservation in an undisturbed state for purposes of habitat preservation, flood control, or providing a buffer between development and areas subject to natural hazards. (Page 147)

Findings

CBJ 49.75.120. RESTRICTIONS ON REZONINGS.

Rezoning requests covering less than two acres shall not be considered unless the rezoning constitutes an expansion of an existing zone. Rezone requests which are substantially the same as a rezoning request rejected within the previous twelve months shall not be considered. A rezoning shall only be approved upon a finding that the proposed zoning district and the uses allowed therein are in substantial conformance with the land use maps of the comprehensive plan.

Findings

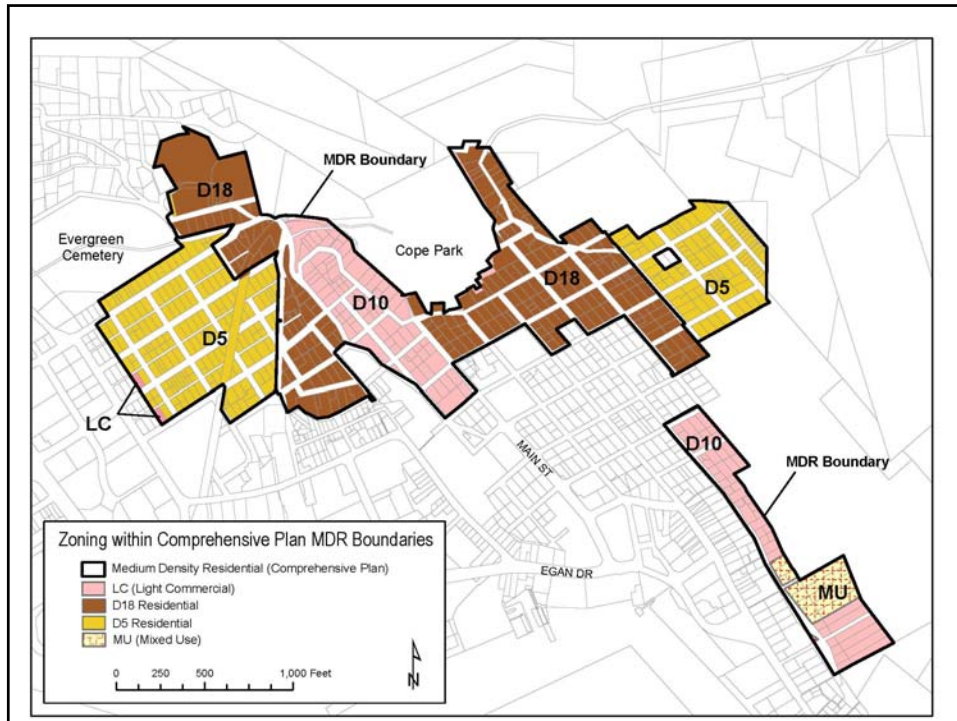
RESTRICTIONS ON REZONINGS

This proposal conforms to these restrictions as follows:

- 1.The request meets the submittal requirements and the rezoning initiation, zone change restrictions, and procedural requirements of the CBJ Land Use Code as the application was submitted timely and is an expansion of the an existing zone district.
- 2.This proposal substantially conforms to the Land Use Maps of the Comprehensive Plan.
- 3.A broad range of zone districts currently exist within the Comprehensive Plan's MDR land use designation. The requested zone district of MU is consistent with land use designations of the Comprehensive Plan.

Staff Recommendation

Staff recommends that the Planning Commission concur with the Director's analysis and findings and recommend approval to the Assembly for a rezone of the 0.8988 acres for the entirety of Block 25 from D-18 to MU (Mixed Use).

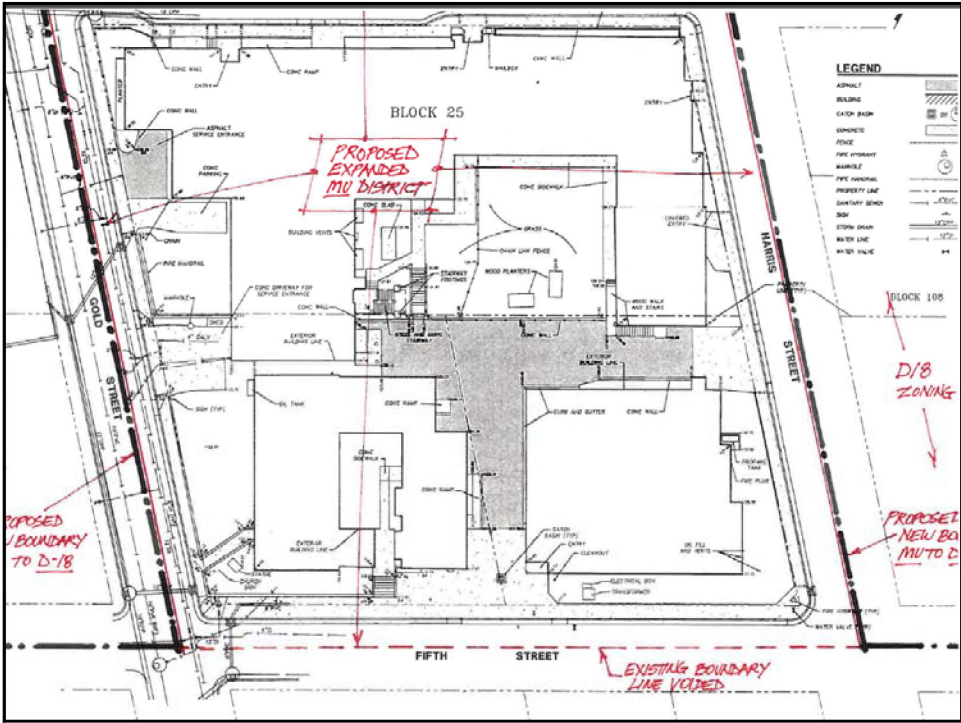


AME2017 0002

Rezone Requirements

CBJ 49.75.130 – PROCEDURE. A rezoning shall follow the procedure for a major development permit except for the following:

- (1) The commission decision for approval shall constitute only a recommendation to the assembly.
- (2) As soon as possible after the commission's recommendation, the assembly shall provide public notice and hold a public hearing on the proposed rezoning. A rezoning shall be adopted by ordinance, and any conditions thereon shall be contained in the ordinance. Upon adoption of any such ordinance, the director shall cause the official zoning map to be changed in accordance therewith.
- (3) The commission decision for denial shall constitute a final agency decision on the matter which will not be presented to the assembly unless it is appealed to the assembly in accordance with CBJ 49.20.120.





(907) 586-0715
PC_Comments@juneau.org
www.juneau.org/plancomm
155 S. Seward Street • Juneau, AK 99801

**PLANNING COMMISSION
NOTICE OF RECOMMENDATION**

Date: July 19, 2017
File No.: AME2017 0002

City and Borough of Juneau
City and Borough Assembly
155 South Seward Street
Juneau, AK 99801

Proposal: Planning Commission Recommendation to the City and Borough Assembly regarding a request to rezone approximately 0.899 acres from D-18 to Mixed Use (MU).

Property Address: 400 Fifth Street; 416 Fifth Street; 415 Sixth Street, 419 Sixth Street

Legal Description: Lots 1 - 8, Block 25, Juneau Town Site

Parcel Code Number: 1-C04-0-A25-001-0; 1-C04-0-A25-002-0; 1-C04-0-A25-003-0, 1-C04-0-A25-003-1

Hearing Date: July 11, 2017

The Planning Commission, at its regular public meeting, adopted the analysis and findings listed in the attached memorandum dated June 22, 2017, and recommended that the City and Borough Assembly adopt staff's recommendation for approval to rezone approximately 0.899 acres from D-18 (Multifamily, 18 dwelling units per acre) to MU (Mixed Use). The Planning Commission found that this proposed expansion of the adjacent Mixed Use (MU) zone district substantially conforms to the maps of the Comprehensive Plan.

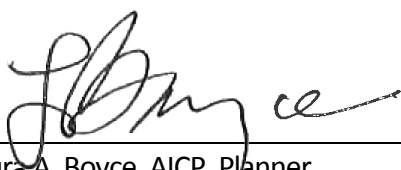
Attachments: June 22, 2017 memorandum from Laura A. Boyce, AICP, Senior Planner, Community Development, to the CBJ Planning Commission regarding AME2017 0002.

This Notice of Recommendation constitutes a recommendation of the CBJ Planning Commission to the City and Borough Assembly. Decisions to recommend an action are not appealable, even if the

City and Borough Assembly
File No.: AME2017 0002
July 19, 2017
Page 2 of 2

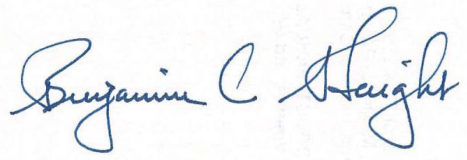
recommendation is procedurally required as a prerequisite to some other decision, according to the provisions of CBJ 01.50.020 (b).

Project Planner: _____


Laura A. Boyce, AICP, Planner
Community Development Department



Filed With City Clerk



Benjamin Haight, Chair
Planning Commission

July 21, 2017

Date

cc: Plan Review

NOTE: The Americans with Disabilities Act (ADA) is a federal civil rights law that may affect this recommended text amendment. ADA regulations have access requirements above and beyond CBJ - adopted regulations. Contact an ADA - trained architect or other ADA trained personnel with questions about the ADA: Department of Justice (202) 272-5434, or fax (202) 272-5447, NW Disability Business Technical Center (800) 949-4232, or fax (360) 438-3208.



(907) 586-0715
 CDD_Admin@juneau.org
 www.juneau.org/CDD
 155 S. Seward Street • Juneau, AK 99801

DATE: July 6, 2017

TO: Planning Commission

FROM: Jill Maclean, AICP, Senior Planner
 Community Development Department

FILE NO.: WCF2017 0007

PROPOSAL: A Wireless Communication Facility application to replace a 90 foot wooden tower with a 120 foot steel monopole tower.

GENERAL INFORMATION

Applicant: American Tower Company

Property Owner: Harvey A. Hildre

Property Address: 5641 Glacier Highway / 5594 Tonsgard Court

Legal Description: Hildre III, Lot 3A1

Parcel Code Number: 5-B12-0-106-007-3

Site Size: 100,841 sq. ft. (2.32 acres)

Comprehensive Plan Future Land Use Designation: Heavy Industrial

Zoning: Industrial (I)

Utilities: CBJ Water/Sewer

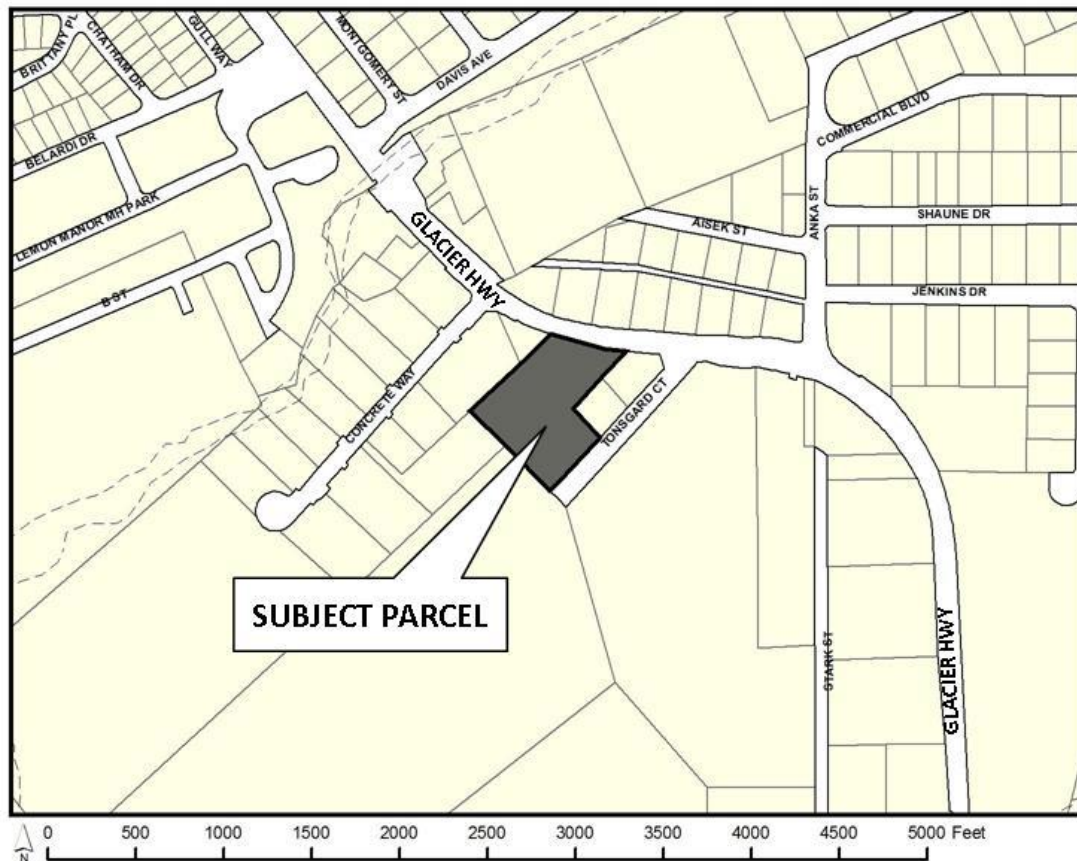
Access: Glacier Highway / Tonsgard Court

Existing Land Use: Existing wireless tower, warehouse, single-family residence, storage and containers

Surrounding Land Use:
 North – Breeze-In Grocery
 South – AEL&P
 East – Gas N Go, Glacier Highway
 West – Capitol Disposal Landfill

Planning Commission
 File No.: WCF 2017 0007
 July 6, 2017
 Page 2 of 9

VICINITY MAP



ATTACHMENTS

- Attachment A – Public Notification
- Attachment B – Application and General Narrative
- Attachment C – Wireless Telecommunications Master Plan Site 27 Excerpt
- Attachment D – Eligibility Request Facility (49.65.930 - Table 1)
- Attachment E – 49.80.120 Definitions Excerpt
- Attachment F – Drawings Package
- Attachment G – Simulated Renderings of Existing, Proposed and Full Buildout of WCF
- Attachment H – Evidence of Balloon Test
- Attachment I – FAA Letter
- Attachment J – RF Emissions Compliance Report

PROJECT DESCRIPTION

The applicant requests a Special Use Permit (SUP) for the development of a Wireless Communication Facility (WCF) to replace a 90 foot wooden wireless tower with a 120 foot steel monopole wireless tower. The existing WCF is identified in the Wireless Telecommunications Master Plan (WMP) as Site 27 (see Attachment C). The existing WCF is to be removed in its entirety, and the new WCF will be located on the same site 30 feet from the existing tower location.

Planning Commission
 File No.: WCF 2017 0007
 July 6, 2017
 Page 3 of 9

A special use permit is required for WCF that do not fall under the categories of 49.65.930 Table 1 (see Attachment D).

This application requires a SUP per the following requirements:

1. The proposed antennas are not flush-mounted, per the requirements of 49.65.930.
2. The proposed antennas are not flush-mounted and thus are not concealed per the definition found in 49.80.120 (see Attachment E):
 - a. A Concealed WCF is defined as a *“WCF equipment compound that is not readily identifiable as such (emphasis added), and is designed to be aesthetically compatible with existing and proposed building(s), vegetation, natural features, and uses on the site.”*
 - i. The proposed WCF may be appropriate to the site, but due to the non-flush mounted antennas it is readily identifiable as a WCF.
3. The proposed project exceeds the “eligible facility request” standards as shown in 49.65.950 Table 1 (see Attachment C):
 - a. No substantial change as provided in 49.65.950 (b)—there is substantial change in the height of the existing and proposed towers (30 foot increase); and
 - b. New non-concealed tower in an Industrial zone measuring over 60 feet in height—the proposed tower is non-concealed and measures 120 feet in height.

AGENCY REVIEW

CDD conducted an Agency Review Period from May 28, 2017 to June 12, 2017. Comments received are listed below:

- CBJ Building Division – No issues at this time.
- Capital City Fire/Rescue – No issues at this time.
- CBJ General Engineering – No issues at this time.
- Juneau Police Department – No issues at this time.
- CBJ Assessor’s Department – No issues at this time.
- Juneau International Airport – No comments received.
- FAA – As stated in their letter dated March 6, 2017 (refer to Attachment I), the FAA finds that the aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s) listed in their letter are met.
- AKDOT&PF – No issues at this time.

ANALYSIS

The purpose of Specified Use Provisions Article IX. Wireless Communication Facilities (CBJ 49.65.900), is to establish reasonable regulations for the placement, construction and modification of wireless communication facilities (WCF) consistent with the Telecommunications Act of 1996 and applicable law and:

- (a) Promote the health, safety, and general welfare of the public and the City and Borough;

Planning Commission
 File No.: WCF 2017 0007
 July 6, 2017
 Page 4 of 9

- (b) Minimize the impacts of WCFs by establishing standards for siting, design and screening and by requiring consistency with the City and Borough's wireless telecommunications master plan;
- (c) Encourage the collocation of antennas on existing structures thereby minimizing new visual impacts and reducing the need for new towers;
- (d) Maintain the natural surroundings and character of the City and Borough;
- (e) Preserve neighborhood harmony and scenic viewsheds and corridors as indicated in the Comprehensive Plan of the City and Borough of Juneau;
- (f) Accommodate the growing need and demand for wireless communications services;
- (g) Respond to the policies embodied in the Telecommunications Act of 1996 in such a manner as not to unreasonably discriminate between providers of functionally equivalent personal wireless services or to prohibit or have the effect of prohibiting personal wireless services; and
- (h) Respond to the policies embodied in Section 6409(a) of the Spectrum Act (P.L. 112-96).

As the Director has found that the project is not an Eligible Facility Request per CBJ 49.65.950 Table 1 (Attachment D), the project must demonstrate compliance with the requirements and conditions of a Special Use Permit, including:

Project Site / Zoning District - The project site is a 100,841 square foot parcel located in an Industrial (I) zoning district and WCF are permissible in an Industrial zone. The site currently accommodates a 90 foot high WCF, single-family residence, warehouse, storage, containers and parking. The proposed WCF site within the existing parcel is 30 feet by 30 feet (900 sq. ft.).

Project Design -

- **Security:** The proposed security is consistent with the requirements of CBJ 49.65.930(b). The site will be secured with a chain link fence, a locked access gate, and all structures and cabinets inside the enclosure will be locked.
- **Signage:** The proposed safety signage is consistent with the requirements of CBJ 49.65.930(c). Refer to Attachment B, page 10 for details.
- **Lighting:** The proposed WCF will not be lighted. Should lighting be added in the future, an additional SUP may be required.
- **Setbacks:** The setbacks meet the requirements of CBJ 49.65.930(f). The WCF is designed with theoretical breakpoint technology. The setbacks are 25 feet from Tonsgard Court, 78 feet to the closest side yard, and 292 feet from the other side yard. The WCF is approximately 235 feet from the existing residence on the site, which is also the closest residence. Refer to Attachment B, page 12 for details.
- **Structural assessment:** The development meets the requirements of CBJ 49.65.930(j). The WCF is designed with theoretical breakpoint technology, with the breakpoint at approximately 102 feet. Refer to Attachment B, page 12 for details.
- **Visual Impact Assessment:**

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- Zone of Visibility Map: The application includes a zone of visibility map that meets the requirements of CBJ 49.65.970(c)(2)(B)(i). Refer to Attachment B page 21 for details.
- Siting for Least Adverse Impact: The development meets the requirements of CBJ 49.65.930(i) and minimizes adverse effects on the surrounding landscape as it is located in an Industrial zoning district with other WCF in the vicinity and is not easily viewed from residences or from natural areas, except for the residence located on the site.
- Simulated Renderings of Existing, Proposed and Full Buildout of WCF: The photo simulation provided in the application meets the requirements of CBJ 49.65.970(b)(2)(B)(iii). Refer to Attachment G for renderings.
- Screening of Base: The development meets the requirements of CBJ 49.65.930(e) and is screened with chain link fencing lined with fabric. Refer to Attachment F pages 8-10 for details.
- Balloon Test: Per CBJ 49.65.970(c)(2)(D), a balloon test was conducted for 72 hours from June 30, 2017 through July 3, 2017 (refer to Attachment H). The purpose of a balloon test is to illustrate to the public the proposed height and location of the proposed WCF. Per the requirements of CBJ 49.65.970(e), abutters within 1,500 feet were noticed of the public hearing. The abutter notification and the three public notification signs posted at the site included the dates of the balloon test.
- FCC Compliance Report: A FCC Compliance Report was submitted with the application and is consistent with the requirements of CBJ 49.65.960(d). Refer to Attachment B page 15 for details.
- RF Emissions Compliance Report (propagation study / certification by a professional engineer): An RF Emissions Compliance Report was submitted with the application and is consistent with the requirements of CBJ 49.65.960(s). Refer to Attachment J for details.

Traffic – The proposed use is not anticipated to add traffic to the existing site, excluding the limited traffic during construction and periodic maintenance.

Parking and Circulation – The site has parking and is accessed from both Glacier Highway and Tonsgard Court.

Noise – The site is surrounded on all sides by industrial-zoned land. The project is not expected to generate noise beyond that of uses allowed outright in the Industrial zoning district.

Public Health or Safety - No evidence indicates that there are any public health or safety impacts from the proposed project. The Federal Communication Commission (FCC) establishes a maximum emission level to preserve human health and safety. If construction of new and improved towers reach above the tree line, the Federal Aviation Administration (FAA) and the Juneau International Airport (JIA) are notified to ensure aviation safety and compliance with aviation regulations (refer to Attachment I FAA Letter).

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Habitat – No habitat protected by Title 49 is affected by this proposal.

Vegetative Cover – The site is located on a property in an Industrial zoning district. This district requires 5% vegetative cover. The site appears to meet the 5% vegetative cover requirement.

CONFORMITY WITH ADOPTED PLANS

2013 Comprehensive Plan:

POLICY 12.11. TO PLAN FOR AND TO ESTABLISH LAND USE CONTROLS ON WIRELESS COMMUNICATIONS FACILITIES IN A MANNER THAT IS APPROPRIATE FOR THE COMMUNITY AND WITHIN THE PARAMETERS ESTABLISHED BY FEDERAL LAW.

The subject property has a Comprehensive Land Use designation of Heavy Commercial (HI). The HI land use designation is defined as follows:

Land to be developed for heavy industrial uses such as large scale food production and/or processing; large-scale or industrial-related repair activities; metal fabrication; wholesale trade; manufacturing processes; warehousing; outdoor storage; trucking; animal kennels; crematoria; repair and maintenance uses; resource extraction and processing such as gravel pits, rock crushing facilities, cement batch plants, asphalt plants, fuel tanks, stump dumps, salvage yards, landfill sites; aircraft facilities; and other similar large-scale or noisy and/or noxious industrial activities...

WCF are deemed appropriate to the zoning and considered “other similar large-scale industrial activity”.

The project complies with the *2013 Comprehensive Plan*.

Wireless Telecommunications Master Plan (WMP):

Adopted October 29, 2014, the WMP serves as a planning tool for the City and Borough of Juneau (CBJ) that guides the future development of wireless telecommunication facilities.

POLICY 1. TO ENSURE THE PROTECTION OF THE HEALTH AND SAFETY OF THE PUBLIC WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

POLICY 2. TO PROTECT AVIATION SAFETY BY COORDINATING WITH FEDERAL AVIATION ADMINISTRATION (FAA) WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

POLICY 3. TO PROTECT THE NATURAL ENVIRONMENT WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

POLICY 5. PROMOTE LAND USE EFFICIENCY WITH THE COLLOCATION OF WIRELESS COMMUNICATION FACILITIES TO EXISTING STRUCTURES.

POLICY 6. TO PRESERVE THE SCENIC VIEWSHEDS AND CORRIDORS LISTED IN THE 2013 COMPREHENSIVE PLAN WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

The project generally complies with the Wireless Telecommunications Master Plan.

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FINDINGS

CBJ 49.65.970(d) and (e), Director's Review, states that the director shall review the application for completeness.

1. The director shall review the application for completeness.
2. Incomplete applications shall be rejected and the applicant notified in writing within 30 days of receipt of the initial submission. If rejected, the director's decision shall identify the deficiencies in the application, which, if cured, would make the application complete.
3. Once an application is deemed complete, the director shall schedule it for a hearing before the planning commission, and shall give notice to the applicant and the public in accordance with subsection (e).

CBJ 49.65.970(f), Planning Commission Determination, states that the Planning Commission is authorized to review, analyze, evaluate and make decisions with respect to reviewing special use permits for WCFs.

1. The Planning Commission may impose any conditions on a special use permit:
 - a. Required to ensure compliance with the design criteria specified in section 49.65.930; and
 - b. That are consistent with the purposes of this article, which may include conditions related to the aesthetic effect of the WCF and compatibility with the surrounding area. Factors relevant to aesthetic effects are: the protection of the view in sensitive or particularly scenic areas, scenic corridors/viewsheds identified in the Comprehensive Plan of the City and Borough of Juneau and in the historic district; the concentration of WCFs in the proposed area; and whether the height, design, placement or other characteristics of the proposed facility could be modified to have a less intrusive visual impact.
2. The Planning Commission may deny an application for any of the following reasons:
 - a. Conflict with safety and safety-related codes and requirements;
 - b. Conflict with the purpose of a specific zoning, overlay, or land use designation;
 - c. Presence of another approved WCF or WCF application within the geographic search area that is available to the applicant;
 - d. The proposed site is on, or eligible to be on, the National Register of Historic Places;
 - e. The proposed site is in an area commonly valued by the community as a whole for its natural or scenic properties.
 - f. For a proposed freestanding tower, the applicant fails to demonstrate that no existing structure or tower can accommodate the applicant's proposed use without increasing the height of the existing tower or structure or otherwise creating a greater visual impact; or that use of such existing facilities is technically infeasible or commercially impracticable; and
 - g. Conflicts with the provisions of this article.
3. The Planning Commission shall deny any application for WCF in the following locations:
 - a. State or local wildlife refuges;
 - b. In any area designated as a public park, unless screened so as to minimize visual and noise impacts, and as long as public use will not be disrupted; and

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- c. In any area designated as a scenic corridor/viewshed identified in the Comprehensive Plan of the City and Borough of Juneau.
 - d. In any area that fully or partially obstructs the view of the Mendenhall Glacier from the waterfront roadway from the North Douglas boat launch facility to False Outer Point.
4. The Planning Commission shall condition a permit on a requirement to construct the WCF within a reasonable period of time, which may not exceed 18 months.

Per CBJ 49.65.970(d) and (f), Review of Director's and Commission's Determinations, the Director makes the following findings on the proposed development:

1. *Is the application for the requested special use permit complete?*

Yes. Staff finds that the application contains the information necessary to conduct a full review of the proposed wireless communications facility. The application submittal by the applicant, including the appropriate fees, substantially conforms to the requirements of CBJ Chapter 49.65.900.

2. *Is the proposed project consistent with safety and safety-related codes and requirements?*

Yes. According to the RF Emissions Compliance Report, which is certified by a professional engineer, the WCF is consistent with safety and safety-related codes and requirements.

3. *Is the proposed use appropriate according to the Table of Permissible Uses and other specific zoning, overlay, or land use designation?*

Yes. The requested permit is appropriate according to the Table of Permissible Uses. The permit is listed at CBJ 49.25.300, Section 18.500 and CBJ 49.65.950 for the Industrial zoning district. The development is not located in an overlay district.

4. *Is the presence of another approved WCF or WCF application within the geographic search area that is available to the applicant?*

N/A. As this is a replacement of an existing WCF, this is not applicable. The proposed WCF requires a SUP because the antennas are not flush-mounted and the WCF is non-concealed resulting in a WCF that is "readily identifiable" as a WCF.

5. *Was Public Notice of the Planning Commission consideration in compliance with CBJ 49.65.970(e)?*

Yes. Public notice of this project was provided in the June 30, 2017 and July 10, 2017 issues of the Juneau Empire's "Your Municipality" section, and a Notice of Public Hearing was mailed to all property owners within 1500 feet of the subject parcel. Moreover, three Public Notice Signs were posted on the subject parcel and at the two entrances to the site, visible from the public right-of-way.

6. *Is the presence of another approved WCF or WCF application within the geographic search area that is available to the applicant?*

Yes. The applicant is replacing the existing WCF with an upgraded WCF in the same location.

7. *Is the proposed site on, or eligible to be on, the National Register of Historic Places?*

No. The development site does not meet the National Register of Historic Places Criteria for Evaluation.

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8. Is the proposed site in an area commonly valued by the community as a whole for its natural or scenic properties?

No. The development site is located in a developed industrial area.

9. For a proposed freestanding tower, did the applicant demonstrate that no existing structure or tower can accommodate the applicant's proposed use without increasing the height of the existing tower or structure or otherwise creating a greater visual impact; or that use of such existing facilities is technically infeasible or commercially impracticable?

Yes. The applicant has demonstrated that the existing structure cannot accommodate the proposed use, and the WMP Site 27 analysis confirms that future collocations would likely require structural reinforcements.

10. Will the proposed development be in general conformity with the land use plan, thoroughfare plan, or other officially adopted plans?

Yes. The development is in general conformity with Title 49, the 2013 Comprehensive Plan and the Wireless Telecommunications Master Plan.

11. Is the proposed development located on State or local wildlife refuges?

No. The proposed development is located on private property in an Industrial zoning district.

12. Is the proposed development in any area designated as a public park, unless screened so as to minimize visual and noise impacts, and as long as public use will not be disrupted?

No. The proposed development is located on private property in an Industrial zoning district.

13. Is the development in any area designated as a scenic corridor/viewshed identified in the Comprehensive Plan of the City and Borough of Juneau?

No. The proposed development is not located any area designated as a scenic corridor/viewshed.

14. Is the development in any area that fully or partially obstructs the view of the Mendenhall Glacier from the waterfront roadway from the North Douglas boat launch facility to False Outer Point?

No. The proposed development would not visually impact views of the Mendenhall Glacier.

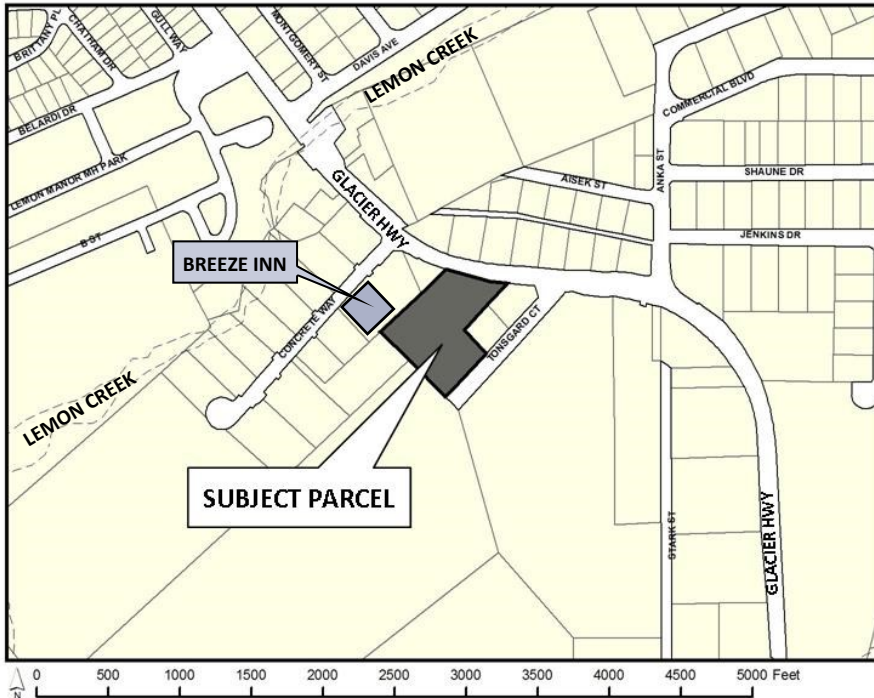
The Planning Commission may deny a Special Use Permit according to the process pursuant to 49.65.970(f)(2). The Planning Commission shall deny a Special Use Permit for a project listed in areas of the borough, as indicated in 49.65.970(f)(3). The Commission cannot deny the permit outside of those listed items.

RECOMMENDATION

It is recommended that the Planning Commission adopt the Director's analysis and findings and grant the requested Special Use Permit. The permit would allow the development of a wireless communication facility to replace a 90 foot wooden WCF with a 120 foot steel monopole WCF with the following conditions, and any changes to these conditions may require a new SUP:

1. Steel monopole must be matte gray in color;
2. Site security and signage must be installed and maintained as according to plan;
3. Lighting is not to be added to the WCF.

NOTICE OF PUBLIC HEARING



City & Borough of Juneau

Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:



PROPOSAL: A Wireless Communications Facility application to replace an existing 90 ft. tower with a 120 ft. tower.

NOTE: A balloon test will occur from June 30 to July 3, 2017. A balloon will be flown from the top of the existing tower at a height of 120 ft. in order to illustrate the height of the proposed tower.

File No:	WCF2017 0007	Applicant:	American Tower Co.
To:	Adjacent Property Owners	Property PCN:	5B1201060073
Hearing Date:	July 11, 2017	Owner:	Harvey A. Hildre
Hearing Time:	7:00 PM	Lot Size:	100,841 sq. ft. (2.32 acres)
Place:	Assembly Chambers	Zoned:	Industrial (I)
	Municipal Building	Site Address:	5641 Glacier Hwy / 5594 Tongsgard Court
	155 South Seward Street, Juneau, Alaska 99801	Accessed Via:	Glaciery Hwy / Tongsgard Court

PROPERTY OWNERS PLEASE NOTE:

You are invited to attend this Public Hearing and present oral testimony. The Planning Commission will also consider written testimony. You are encouraged to submit written material to the Community Development Department 14 days prior to the Public Hearing. Materials received by this deadline are included in the information packet given to the Planning Commission a week before the Public Hearing. Written material received after the deadline will be provided to the Planning Commission at the Public Hearing.



If you have questions, please contact Jill Maclean at jill.maclean@juneau.org or (907) 586-0756.

Planning Commission Agendas, Staff Reports and Meeting Results can be viewed at <http://www.juneau.org/assembly/novus.ph>

Date notice was printed: June 9, 2017

Document to Support American Tower Company's application to replace and existing cell and data wireless facility at 5594 Tongard Court, Juneau, Alaska

This document is formatted to follow the outline called for in the Juneau Permit Center's *Wireless Communication Facility Check List*.

Prepared by Walsh Planning & Development Services in Juneau on behalf of American Tower

Check List Item 1) Completed WCF Application follows this page and that is followed by Check List Item 2) Building Permit Application.

Check List Item 3) Fees, will be paid at submittal.

This Application consists of this document and the material in the Support Package which is provided electronically.

Packet Page 133 of 425

Attachment B - Application & Narrative



City and Borough of Juneau
155 S. Seward Street
Juneau, Alaska 99801
tel. 907-586-5240
fax 907-586-5385
<http://www.juneau.org>

Community Development Department

Juneau Permit Center

Building Permit Application Request:

Please fill out the form below and submit for building, right-of-way or utility permit application. Submission of this form does not guarantee that your application will be accepted. Staff will attempt to call or email you if there are questions or concerns with your application.

All applications that require plans/drawings must be submitted in person, and go through an intake approval interview (i.e., any structure).

Fees may be paid by credit card with the card number given to our staff when they call you or the card number may be emailed to us. Remember to include the Type of Card, Name on the Card, Card Number and Expiration Date. The information may also be placed in the Description field below but note that this page is **not secure**.

Please note that **fields marked with an asterisk * are required**. If these fields are not filled out or a choice is not selected, you will be unable to submit the form. Missing information will be highlighted in red when you click on "Submit".

Online application for: Roof replacement, residential electrical/plumbing, demolition, and similar minor permits.

Online Permit Application

*Permit Type:

Building Permit

*Project Address or Legal Description:

5594 Tongsgard Court

*Describe Proposed Project in Detail:

Replace existing 90' wood cell tower with 120' steel monopole.

Value of work (materials + labor), if quote is materials only, please state in description.

\$150,000

*Applicant Name

Murray Walsh on behalf of American Tower Company

*Applicant Address

2974 Foster Ave

Applicant Phone:

907-723-8444 *Ph

Ph2

Fax

***E-mail Address:**

murray@acsalaska.net

***Owner Name**

(Enter "Same" if same as Applicant)

Loretta and Harvey Hildre

***Owner Address**

(Enter "Same" if same as Applicant)

P.O. Box 020729, Juneau, AK 99802

Owner Phone & Fax Numbers

907-780-4221 Ph

Fax

Contractor Name (or Owner/Builder)

Contractor not selected as of May 22, 2017

Contractor Phone & Fax Numbers

Ph

Fax

By clicking on the SUBMIT button you are certifying that you have read and examined this application and know the same to be true and correct. You further certify that all provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. You understand that the granting of a permit does not presume to give authority to violate or cancel the provisions of any other federal, state or local law regulating construction or the performance of construction.

Submit

Clear

If you have questions, please contact us at 586-0770 and speak to a Permit Technician or send an email message to: [PERMITS@ci.juneau.ak.us]

Check List Item 4) Narrative to Show Compliance with CBJ 49.65.930 on ATC Application Proposed Replacement Tower on Tonsgard Court with Special Attention to Support Use of Non-Concealed Antennae

Introduction:

The City and Borough of Juneau (CBJ) adopted a stringent section in the land use code to regulate Wireless Communication Facilities (WCF) in 2014. American Tower Corporation (ATC) has acquired an existing cell phone tower located on Tonsgard Court and wishes to replace the current 90-foot wood pole with a 120-foot steel monopole tower. Walsh Planning & Development Services (WPDS) has been retained to shepherd the application through the CBJ process. This will be the first WCF application processed under the new code. A key provision in the new code calls for antennae mounted on a tower to be “concealed” if possible. The exact language is:

49.65.930 General Requirements

(a) Concealed and non-concealed antenna.

(1) Antennas shall be mounted on the WCFs so as to present the smallest possible silhouette, profile, or cross-section, unless applicant provides sufficient evidence that doing so would prohibit the applicant from properly deploying the network. New antenna mounts shall be flush-mounted onto existing WCFs, unless it is demonstrated through RF propagation analysis that flush-mounted antennas will not meet the network objectives of the desired coverage area. (Emphasis added.)

This paper is a submission to seek CBJ approval to place at least one non-concealed antenna array at the top of the new tower that is proposed as part of this application. In summary, the new tower and new antenna array are necessary for the proper functioning of cell phone and data transmissions of the most modern kind.

Source Material:

Three technical papers have been supplied as appendices in the Support Package for this Narrative:

Base station antenna selection for LTE networks, published in May of 2015 by staff scientists at Sprint and Commscope. This paper is called “*Selection*” in the following text.

Basic Antenna Principles for Mobile Communications, originally published in Germany by Peter Scholz, an employee of KATHREIN-Werke KG. This paper is called “*Principles*” in the following text.

Electrical Isolation of Co-Located Horizontally and Vertically Stacked Antennas, from the Andrew antenna section of Commscope. Undated, called “*Isolation*” in the following text.

Discussion:

The new tower will have attachment points to accommodate at least four antenna arrays as required by the code. The topmost of these will be leased to AT&T. That company, a long-standing provider of cell and data service in Juneau, intends to make this WCF a centerpiece in its system for Juneau and wants to maximize its capability and capacity. The tower site is in an excellent location to serve nearly all of the road system on Douglas Island as well as most of downtown, Lemon Creek and the lower Mendenhall Valley. AT&T is moving to use Long Term Evolution (LTE) equipment along with the rest of the wireless industry. The reasons for choosing LTE are explained in *Selection* in its Executive Summary:

Rapid mobile data growth is requiring the industry to use more sophisticated, higher-capacity access technologies like LTE, which supports many advanced antenna techniques. LTE requires precise containment of RF signals used to transmit mobile data, which can only be accomplished with high-performance antennas. This paper gives an overview of antennas and their application in practical configurations for various types of LTE antenna techniques.

AT&T is proposing a “Four Column” array because, as shown in Table 4 in *Selection*, it provides the broadest possible range of service. These antennas are not capable of 360 degree service in the way that a whip antenna on an automobile does. Each is capable of 120 degree service so that is why three arrays are shown thus resulting in 360 degree service.

Choosing this type of non-omnidirectional antenna is further explained in *Principles*, Page 7, which includes the following:

The $\lambda/2$ antennas discussed up until now have all radiated the same power from the tip of the mast in all azimuth directions (Fig.8). The vertical half power beamwidth was 78 Degrees. One can see that a large proportion of the energy is radiated both upwards and downwards, as a result a lot of power is lost in the desired horizontal plane.

By connecting single, and vertically stacked dipoles at a middle distance of one wavelength the half power beamwidth can be reduced (Fig.10). As a result the radiated power in the horizontal plane is increased. This increase is called gain, which is nothing other than binding the radiated power in a defined direction. A doubling of the number of dipoles results in a gain increase of 3 dB (double the power).

In more common terms, the idea is to direct power out and down to the wireless users and not overhead and out into space.

Using a *system* of antennas is also explained a bit more in *Principles* on Page 9:

Special applications which cannot be realised by using a single antenna are very often achieved via antenna combinations. The combination is made up of several single antennas and a distribution system (power splitter and connecting cable). Very often a combination is designed in order to achieve a higher gain. Many different antennas are also used to achieve a wide range of horizontal radiation characteristics by varying the number of antennas, the azimuth direction, the spacing, the phase and the power ratio.

Again, as stated above, AT&T must respond to several different brands of cell phone, computers and other wireless communication devices that use a wide variety of frequencies, power levels, bandwidths and electronic interface protocols to both send and receive communications. The antenna choice is vastly simplified for a single radio station that only transmits on a single frequency.

The next question that would arise in this context is the need for separation between antennas from one to another and between an antenna and the pole or mast that elevates it. This is the subject of *Principles*. On Page B-15 there is a drawing showing a three-sided antenna array that has three antennas per side. AT&T is proposing the same array but with four antennas per side. Each antenna has a transmit feature, usually at the top, and a receiving feature, usually at the bottom. The drawing on B-15 shows that each side or face of the array is four meters wide, or a little over 13 feet. This is to assure there is enough distance between antennas to avoid interference.

Each of the antenna providers that AT&T wants to use have separation recommendations in the installation manuals that summarize to 12 inches. That is, there needs to be at least 12 inches between one antenna and another and the same or more between the antenna and the monopole.

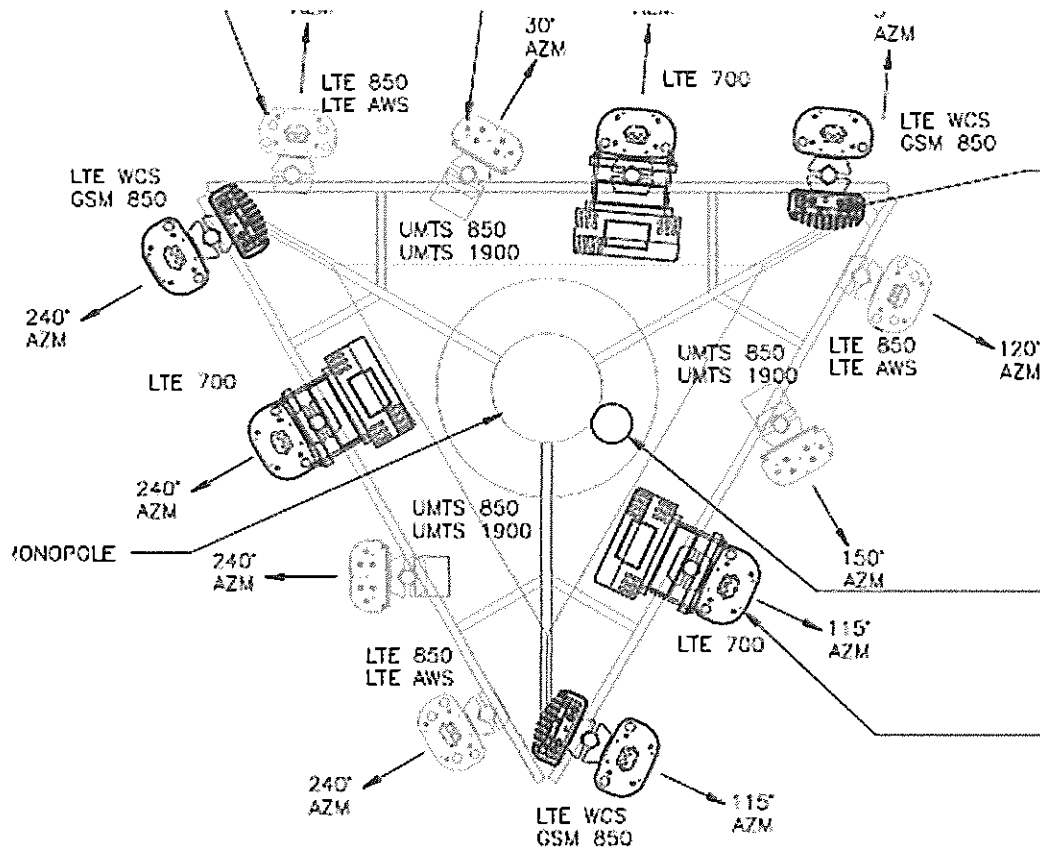
There is another aspect associated with AT&T's proposed array. There is a platform between the pole and the antenna mounting racks. This enables a technician to stand and install the antennas and to service them. This is much safer and more efficient than if the technician has to hang from webbing or straps to perform tasks.

The relevant conclusion in the Note called *Isolation* is shown here:

For in-band carriers (i.e. co-located A and B band 800 MHz carriers), a minimum of 50 dB isolation between the stacked antennas is frequently required.

So, spacing to achieve at least 50 dB is a key goal in antenna array design and the tables in *Isolation* bear this out. For this specific application, a final resource, an e-mail from Todd Richardson, the Anchorage-based construction manager for MASTEC to WPDS is instructive:

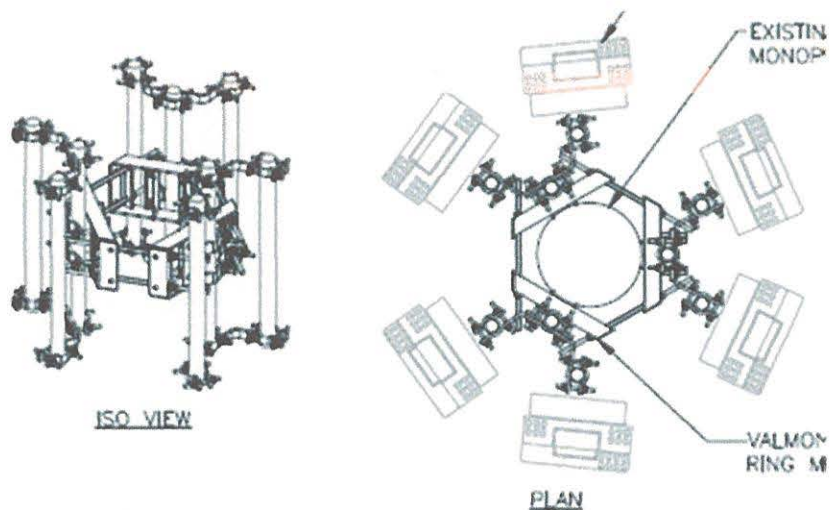
What I'm learning is that with the new cross-polarized antennas, horizontal spacing is becoming less and less critical. However, carriers are now installing the radio heads behind the antennas. Mounting the antennas on a non-protruding pipe mount not only limits space for the radio heads. It makes it very difficult to perform maintenance and replacement of the radio heads. Reasonable working space for these configurations should be a minimum 12" between antennas.



This picture [below] illustrates antennas that have the radio head behind the antenna. This illustration shows the radio head flush to the back of the antenna. But in some cases, the radio head is rotated 90 degrees and installed to one side of the antenna and a second radio head will be installed on the other side of the antenna, causing the antenna to protrude out even further. A non-protruding mount doesn't allow for room both antennas and the radio unit. This illustration [was] cut from construction drawings from one of AT&T Mobility's current sites. There is no way to fit all of these antennas with radio heads on a non-protruding pipe mount. The picture below shows how two radio heads have been installed behind the antenna.



The next configuration shows how we have accommodated a smaller build out with non-protruding mounts.



This configuration requires us to mount the radio heads below the antennas. To hang all the antennas in the first illustration would require an additional vertical lease space, which is expensive and highly inefficient. It also requires very little future growth needs for new technologies or split sector configurations requiring additional antennas.

Todd Richardson

Construction Manager – Alaska Market

2240 East Dowling Rd, Anchorage, AK 99507
Office: (907) 336-1300 Mobile: (907) 351-3886

The result of all these stipulations and requirements are the large antenna arrays as shown here and in the application drawings.

49.65.930 General Requirements

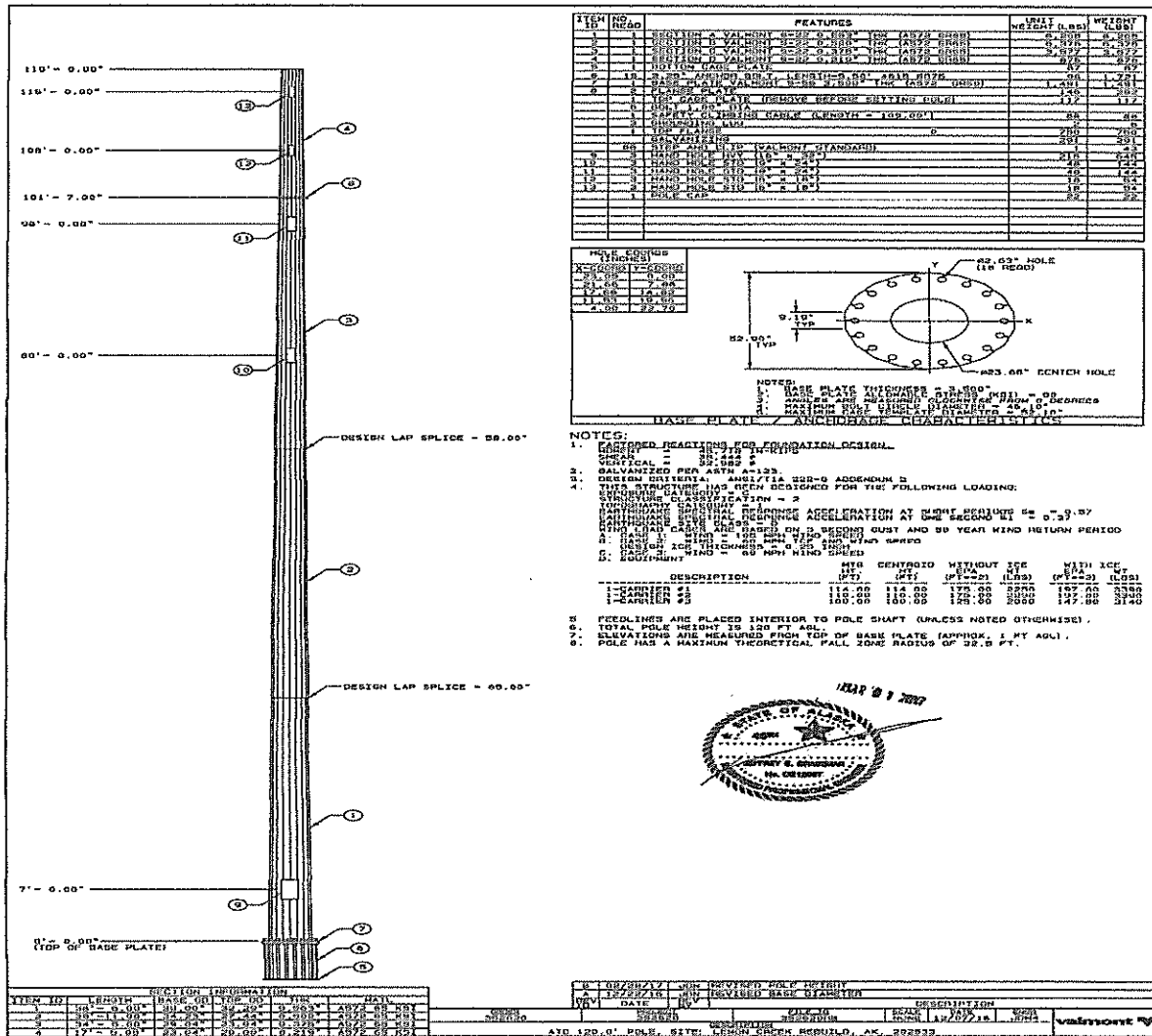
(2) Attached, concealed feed lines and antennas shall be designed to architecturally match the facade, roof, wall, or structure on which they are affixed so that they blend with the existing design, color, and texture of the structure.

The existing WCF is a wood pole with wiring mounted externally as shown here:



The proposed facility will be a hollow steel monopole with wiring mounted internally to present a modern and clean view at street level. The site will also be fenced with chain link fencing that has slats to present a plain industrial façade.

A drawing of the pole itself is on the next page.



49.65.930 – General Requirements, cont'd

(b) Security of WCFs. All WCFs shall be located, fenced or otherwise secured in a manner that prevents unauthorized access.

(1) All antennas, towers and other supporting structures shall be constructed or shielded to reasonably prevent unauthorized access.

(2) Transmitters and telecommunications control points must be installed in a manner to be readily accessible only to persons authorized to operate or service them.

As noted above, the site will be secured with a chain link fence. There will be a locked access gate in the fence and all structures and cabinets inside will also be locked. There are drawing in the Support Package to show these features.

49.65.930 – General Requirements, cont'd

(c) *Signage.* WCFs shall contain a sign no larger than four square feet with text in a sufficient font size to provide adequate notification to persons in the immediate area of the presence of an antenna that has transmission capabilities. The sign shall contain the name(s) of the owner(s) and operator(s) of the facility, an emergency phone number(s), and FCC registration number, if applicable. The sign shall be on the equipment shelter or cabinet and be visible from the access point of the site. The sign shall not be lighted unless authorized by the City and Borough or unless applicable provisions of law require such lighting. No other signage, including advertising, shall be permitted on any WCF, unless required by law.

An excerpt from the Support Package showing the signage specifications is on the next page.

CAUTION  Beyond this point: Radio frequency fields at this site may exceed FCC rules for human exposure. For your safety, obey all posted signs and site guidelines for working in radio frequency environments. NO TRESPASSING ATC SITE NUMBER: 202533 ATC SITE NAME: REBUILD LEMON CREEK AK	WARNING  Beyond this point: Radio frequency fields at this site may exceed FCC rules for human exposure. For your safety, obey all posted signs and site guidelines for working in radio frequency environments. ATC SITE NUMBER: 202533 ATC SITE NAME: REBUILD LEMON CREEK AK	FCC TOWER REGISTRATION # Posting of signs required by law  1242712	NOTICE GUIDELINES FOR WORKING IN RADIOFREQUENCY ENVIRONMENTS • All personnel should have electromagnetic safety (EMS) awareness training. • All personnel entering this site must be authorized. • Obey all posted signs. • Assume all antennas are active. • Before working on antennas, notify owners and observe appropriate instructions. • Maintain minimum 3 feet clearance from all antennas. • Do not stand in front of antennas. • Use personal RF protective attire working near antennas. • Never service equipment without suitable safety protocol. • Do not operate base station antennas in equipment racks. ATC SITE NUMBER: 202533 ATC SITE NAME: REBUILD LEMON CREEK AK	AMERICAN TOWER ATC TOWER SIGNAGE 300 REGENCY PARKWAY SUITE 100 DART, NC 27016 PHONE: 800.461.7171 CDA: 6987 ATC SITE NUMBER: 202533 ATC SITE NAME: REBUILD LEMON CREEK AK SITE ADDRESS: 1800 TONGUE CREEK JUNEAU, AK 99801 Feb 21 2017 10:04 AM ISSUED BY: JN APPROVED BY: JN DATE DRAWN: 02/21/17 ATC JOB NO: 102665 SIGNAGE INSET NUMBER: C-501 REVISION: 0
---	--	--	--	--

49.65.930 – General Requirements, cont'd

(d) *Lighting*. Notice is required to be provided to the FAA, on a form prescribed by the FAA, if the facility falls under notification requirements mentioned in 14 CFR Part 77. The applicant is responsible for determining whether notification is required. Any WCF that is required to have lighting by the FAA will be lighted with the minimum intensity and number of flashes per minute (i.e., the longest duration between flashes) allowable by the FAA. The lights shall be oriented, shielded or otherwise designed so as not to project directly on to surrounding property, consistent with FAA requirements.

The tower will not be required to have lighting. A letter from the FAA so stating is in the Support Package.

49.65.930 – General Requirements, cont'd

(e) Design criteria.

(1) All freestanding WCFs between 60 and 120 feet in height shall be engineered and constructed to accommodate no fewer than four antenna arrays. All WCFs between 121 feet and 150 feet shall be engineered and constructed to accommodate no fewer than five antenna arrays. All WCFs between 151 feet and taller shall be engineered and constructed to accommodate no fewer than six antenna arrays.

The proposed tower will accommodate four antenna arrays.

(2) All utilities for a WCF site shall be installed underground and in compliance with all ordinances, rules and regulations of the City and Borough, including, but not limited to, the National Electrical Code where appropriate. The director may waive or vary the requirements of underground installation of utilities whenever, in the opinion of the director, such waiver shall not be detrimental to the health, safety, or general welfare of the community or the environment, or the visual and scenic characteristics of the area.

All utilities are presently underground and will remain so.

(3) All appurtenant or associated facilities of a WCF shall maximize use of building materials, colors and textures designed to blend with the structure to which it may be affixed, or to harmonize with the natural surroundings or built environment, which shall include

the utilization of concealed or concealment technology for facilities appurtenant to concealed WCFs. If located in or abutting a residential, commercial or mixed-use district, the appurtenant or associated facility shall be placed inside an enclosed structure, fenced, or screened with sight-obscuring foliage, which will be as tall as the appurtenant or associated facility.

As shown in the Support Package drawings, the ground-level appearance of the facility will be that of a yard surrounded by sight-obscuring fencing.

(4) Use of guy wires is prohibited for all WCF.

No guy wires are proposed.

49.65.930 – General Requirements, cont'd

(f) *Setbacks*. Freestanding towers and appurtenant structures shall be subject to the setbacks described below:

(1) If the tower is not constructed using breakpoint design technology, the minimum setback distance from the nearest property line shall be equal to the height of the proposed tower.

The proposed tower IS offered with the breakpoint design technology.

(2) If the tower has been constructed using breakpoint design technology, the minimum setback distance shall be equal to 110 percent of the distance from the top of the structure to the breakpoint level of the structure or the minimum yard setback requirements, whichever is greater. ... Certification by a professional engineer registered in the State of Alaska of the breakpoint design and the design's fall radius must be provided with the application.

A March 1, 2017 letter from Valmont Structures explains the design of the tower and the general nature of tower responses to external stresses. This letter is in the Support Package. An excerpt from it is below:

In addition, we have designed this monopole with a theoretical break point at approximately 102.58-ft elevation, by purposely over designing the pole sections below this point. In the unlikely event the pole were to fail at this point, the significant loading reduction caused by the removal of the tower wind area and weight above would greatly reduce any chance that the remaining tower would have any structural damage, thereby providing a theoretical failure zone of approximately 17.42-ft for the 120-ft AGL monopole.

The site plan, which follows Page 17, shows a 24 foot setback for the tower.

(3) Any appurtenant structure shall be located so as to comply with the applicable minimum setback requirements for the property on which it is situated.

No appurtenant structures are proposed. The existing equipment cabinets meet the setback required in the Industrial Zone.

49.65.930 – General Requirements, cont'd

(g) WCF shall not significantly affect natural areas or land designated as natural area park or scenic corridor/viewshed as identified in the Comprehensive Plan of the City and Borough of Juneau.

The tower site is located in a large industrial area amid a wide array of industrial structures, storage areas and the landfill.

49.65.930 – General Requirements, cont'd

(h) *Master Plan*. WCFs shall be consistent with the City and Borough's wireless telecommunications master plan.

It is clear to the applicant that this proposal is consistent with the policy provisions of the Master Plan that are relevant to it. The applicant is willing to assist the CDD staff with an in-depth review of the Master Plan policies if requested.

49.65.930 – General Requirements, cont'd

(i) *Visibility*.

(A) WCF shall be configured and located in a manner that shall minimize adverse effects including visual impacts on the landscape and adjacent properties and shall be maintained in accordance with the requirements of this article.

The proposed tower will have a much better appearance than the current facility and will not be easily visible from residential areas and not visible at all from recreational areas.

(B) WCFs shall be designed to either resemble the surrounding landscape and other natural features where located in proximity to natural surroundings, or be compatible with the urban, built environment, through matching or complementing existing structures and specific design considerations such as architectural designs, height, scale, color, and texture.

The proposed tower has an industrial tower appearance that is quite compatible with its surroundings.

49.65.930 – General Requirements, cont'd

(j) *Structural assessment.* The owner of a freestanding WCF tower shall have a structural assessment of the tower conducted by a professional engineer, licensed in the State of Alaska, if the tower is within the distance from the top of the structure to the breakpoint level of the structure from a dwelling, parking lot, playground, or right-of way, or if the tower was not constructed using breakpoint design technology. The owner shall submit the structural assessment report required by this subsection, signed by the engineer who conducted the assessment, to the director by July 1 every fifth year from the date of issuance of the building permit.

Valmont has supplied a 21 page structural assessment that is in the Support Package. A summary of the specifications is below.

3/1/17
ENGINEERING DATA
for
ATC
LEMON CREEK REBUILD, AK, 202533
VALMONT QUOTATION 352620

- 1) STRUCTURE DESIGN CONFORMS TO EIA/TIA-222-G INCLUDING:
105.0 MPH WIND (3 SECOND GUST, 50 YR. RETURN PERIOD)
60.0 MPH ICE WIND (50 YR. RETURN PERIOD)
DESIGN ICE THICKNESS = 0.25 INCHES
EXPOSURE CATEGORY C
STRUCTURE CLASSIFICATION II
TOPOGRAPHIC CATEGORY 1
60.0 MPH BASIC WIND SPEED WITH NO ICE FOR TWIST AND SWAY
SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS AND 1 SEC.: $S_s = 0.57$ & $S_1 = 0.37$
- 2) FEEDLINES ARE ASSUMED TO BE PLACED INTERIOR TO THE POLE.
- 3) ALL MICROWAVE ASSUMED TO BE 6 GHz UNLESS OTHERWISE NOTED.
- 4) TOTAL POLE HEIGHT IS 120 FT AGL.
- 5) ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE (APPROX. 1 FT AGL).
- 6) POLE HAS A MAXIMUM THEORETICAL FALL ZONE RADIUS OF 22.5 FT.
- 7) LOADING AS FOLLOWS:
119.0' POLE
1 - CARRIER #1 @ 114.0
1 - CARRIER #2 @ 110.0
1 - CARRIER #3 @ 100.0

The attachment location for the fourth carrier is at the top of the tower.

Check List Item 5) FCC Compliance Report

The following is an excerpt from the 60-page Compliance Report contained in the Support Package.

Engineering Statement in Re:
Electromagnetic Energy Analysis
American Tower Corporation
Juneau, AK

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Velocitel, Inc. in Raleigh, North Carolina; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by American Tower Corporation (See attached Site Summary and Carrier documents), and that American Tower Corporation's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "Rebuild Lemon Creek AK" ("the site"); and

That American Tower Corporation operates at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by American Tower Corporation and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radiofrequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of American Tower Corporation's operating frequency as shown on the attached antenna worksheet; and

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any noncompliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the existing operation is no more than 3.411% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the existing operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that American Tower Corporation's existing operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

Signed by Klaus Bender on April 17, 2017.

Check List Item 6) Site Address and CBJ Parcel Identification Number

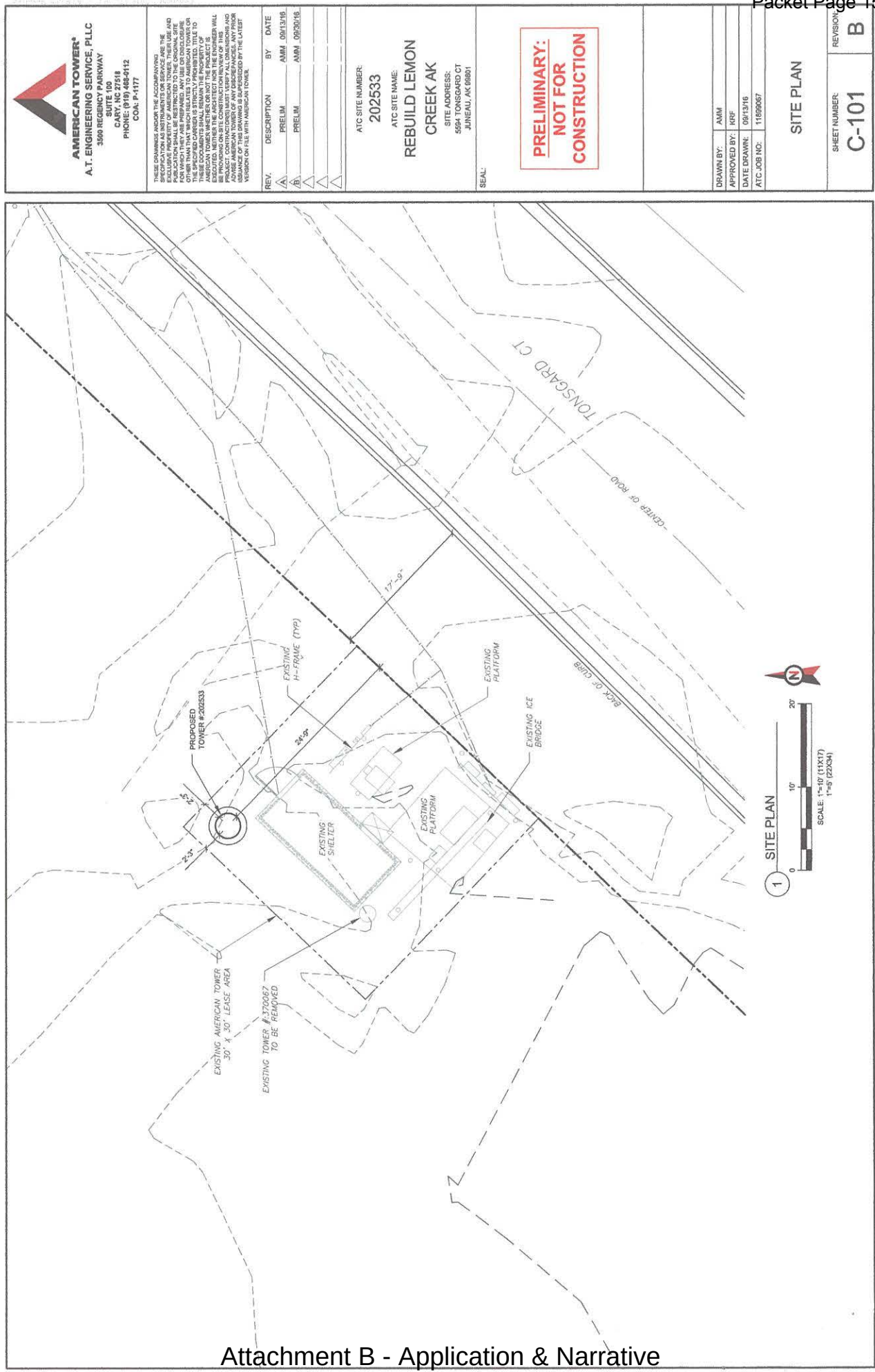
5594 Tongard Court, Juneau, Alaska. PIN: 5B1201060073

Check List Item 7) Site Size and Dimensions

Site is a square, 30 feet by 30 feet containing 900 square feet.

Check List Item 8) Site Plan

See following page.



 AMERICAN TOWER® A.T. ENGINEERING SERVICE, PLLC 3500 REGENCY PARKWAY CARY, NC 27518 PHONE: (919) 468-0112 COA: P-1177	
THESE DOCUMENTS, INCLUDING THE LOGO AND ANY OTHER MARKINGS, ARE THE PROPERTY OF AMERICAN TOWER. THEIR USE AND REPRODUCTION FOR ANY PURPOSE, INCLUDING FOR WHICH THEY ARE PREPARED, ANY USE OR DISCLOSURE, IN ANY MANNER, WITHOUT THE WRITTEN PERMISSION OF AMERICAN TOWER IS STRICTLY PROHIBITED. TITLE TO THESE DOCUMENTS SHALL REMAIN THE PROPERTY OF AMERICAN TOWER. NO PART OF THESE DOCUMENTS SHALL BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF AMERICAN TOWER.	
REV.	DESCRIPTION BY DATE
A	PRELIM AMM 09/13/16
B	PRELIM AMM 09/30/16
C	
D	
E	
ATC SITE NUMBER: 202533	
ATC SITE NAME: REBUILD LEMON CREEK AK	
SITE ADDRESS: 5594 TONGARD CT JUNEAU, AK 99801	
SEAL:	
PRELIMINARY: NOT FOR CONSTRUCTION	
DRAWN BY:	AMM
APPROVED BY:	KRF
DATE DRAWN:	09/13/16
ATC JOB NO:	11590067
SITE PLAN	
SHEET NUMBER:	REVISION:
C-101	B

Check List Item 9) Proposed WCF type and design

As described earlier, this WCF will be a steel monopole, matte grey finish, 120 feet tall, unlit, capable of hosting four carriers.

Check List Item 10) Certification of Compliance with Applicable Laws.

The various items in the Support Package contain certifications from their authors. These include the FAA letter, RF propagation letter, the structural study and the general drawings.

Check List Item 11) Documents from an Alaska Licensed Professional Engineer

Letter indicating compliance with applicable laws

Letter indicating compliance with industry practices

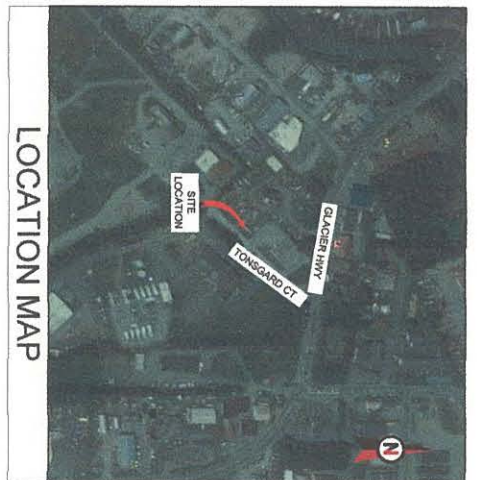
The following page is taken from the Drawings Package and contains the required compliances.



AMERICAN TOWER®

SITE NAME: REBUILD LEMON CREEK
SITE NUMBER: 202533
SITE ADDRESS: 5594 TONGGARD CT
JUNEAU, AK 99801

DROP AND SWAP



LOCATION MAP

COMPLIANCE CODE		PROJECT SUMMARY		PROJECT DESCRIPTION		SHEET INDEX					
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT. THE PROJECT SHALL BE CONSIDERED TO BE CONSIDERED TO PERMIT WORK NOT CONFORMING TO THESE CODES. 1. INTERNATIONAL BUILDING CODE (IBC) 2. NATIONAL ELECTRIC CODE (NEC) 3. LOCAL BUILDING CODE 4. CITY/COUNTY ORDINANCES		SITE ADDRESS: 5594 TONGGARD CT JUNEAU, AK 99801 COUNTY: JUNEAU BOROUGH GEOGRAPHIC COORDINATES: LATITUDE: 54.35472 LONGITUDE: -154.49722 GROUND ELEVATION: 29' AMSL ZONING INFORMATION: JURISDICTION: CITY OF JUNEAU, AK PARCEL NUMBER: 58120100042 ZONING: INDUSTRIAL		PROJECT TEAM TOWER OWNER: GIF TOWERS II, LLC 6000 WOODBURN AVE WOODBURN, MA 01801 PROPERTY OWNER: SANTA ANA UNITED SCHOOL DISTRICT SANTA ANA, CA 92701 ENGINEER: ATC TOWER SERVICES 3500 REGENCY PARKWAY SUITE 100 CARY, NC 27518 AGENT: SCOTT PHILLIPS ATTORNEY, AMERICAN TOWER 1000 WOODBURN AVE WOODBURN, MA 01801		PROJECT LOCATION DIRECTIONS FROM JUNEAU, AK: HEAD SOUTHWEST ON W 9TH ST TOWARD D ST. TURN RIGHT ONTO GLACIER AVE. TURN LEFT AT THE 1 ST CROSS STONTO W 10TH ST. TURN RIGHT AT THE 2ND CROSS ST INTO ELM DR. THE 2ND EXIT AND STAY ON GLACIER. TURN LEFT ONTO SHINE ACCESS ROAD.					
						PROJECT NOTES 1. THE FACILITY IS UNMANNED. 2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE. 3. EXISTING FACILITY MEETS OR EXCEEDS ALL FAA AND FCC REGULATORY REQUIREMENTS. 4. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE. 5. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED. 6. HANDICAP ACCESS IS NOT REQUIRED.					
UTILITY COMPANIES POWER COMPANY: ALASKA ELECTRIC LIGHT & POWER PHONE: (907) 780-2222 TELEPHONE COMPANY: GCI PHONE: (944) 666-4861											

REV.	DESCRIPTION	BY	DATE
1/0	FOR PERMITTING	JN	02/18/17

ATC SITE NUMBER:
202533
ATC SITE NAME:
REBUILD
LEMON CREEK AK

SITE ADDRESS:
5594 TONGGARD CT
JUNEAU, AK 99801

SEAL:

Feb 21 2017 10:03 AM

DRAWN BY: JN
APPROVED BY: JRF
DATE DRAWN: 02/16/17
ATC JOB NO: 1203062

TITLE SHEET

SHEET NUMBER: G-001
REVISION: 0

Check List Item 12) FAA Compliance Letter

This letter follows on the next three pages.



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2017-AAL-25-OE
Prior Study No.
2004-AAL-2-OE

Issued Date: 03/06/2017

Regulatory Compliance
American Towers, LLC
10 Presidential Way
Woburn, MA 02138

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Antenna Tower Rebuild Lemon Creek AK (202533)
Location: Juneau, AK
Latitude: 58-21-17.40N NAD 83
Longitude: 134-29-50.38W
Heights: 29 feet site elevation (SE)
125 feet above ground level (AGL)
154 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- ☐ At least 10 days prior to start of construction (7460-2, Part 1)
☒ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 1.

This determination expires on 09/06/2018 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination does not constitute authority to transmit on the frequency(ies) identified in this study. The proponent is required to obtain a formal frequency transmit license from the Federal Communications Commission (FCC) or National Telecommunications and Information Administration (NTIA), prior to on-air operations of these frequency(ies).

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (310) 725-6591. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2017-AAL-25-OE.

Signature Control No: 320525552-324353402
Tamera Burch
Technician

(DNE)

Attachment(s)
Frequency Data

cc: FCC

Frequency Data for ASN 2017-AAL-25-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W

Check List Item 13) Location of any dwellings within height of the tower

There are none.

Check List Item 14) Disclosure of any agreements which limit and/or preclude sharing with other WCFs.

There are none.

Check List Item 15) Affidavit with regard to 49.64.920

This application is for a new 120 foot steel tower to replace an existing 90 foot wooden pole WCF. The extra height will allow a greater service area and reduce the need for other WCFs. The new facility is located out of sight of any recreational area and will clearly be more appealing in appearance than the current WCF. There is an extensive discussion earlier in this document over the need for non-concealed antennas that applies to this Check List Item as well. When the WCF Master Plan policies are looked at together, including the ones that encourage a strong utility, this is clearly a net gain for the community.

Affiant: Murray R. Walsh

Check List Item 16) Foundation and Attachments Compliance

The required letter shows on the next two pages.



March 1, 2017

**Ref: Design and Failure Modes for a 120-ft AGL Tapered Monopole
Quality of Steel and Fabrication of a Monopole Structure
Valmont Project No. 352620
Site: Lemon Creek Rebuild, AK, 202553
Pole Designed with a maximum Theoretical Fall Radius of 22.5'.**

In order to assure you of the high quality of all Valmont products, we would like to offer the following comments:

- Communications monopole structures designed by Valmont are sized in accordance with the latest governing revision of the ANSI/TIA 222 standard unless otherwise requested by our customer. This standard has been approved by ANSI/ASCE-7, which has dealt with the design of antenna support structures for over 40 years. The TIA standard, based on provisions of this nationally known specification, has a long history of reliability. At its core philosophy is its first and foremost priority to safeguard and maintain the health and welfare of the public.
- The TIA standard designates a minimum wind loading for each county in the United States. Valmont uses the wind loading listed in the TIA standard unless a greater value is specified by our customer. Structures are also designed for radial ice at a code specified reduced design wind loading. Code designated coefficients are used to ensure that the structure will survive the designed wind speed. The structure can usually survive even a greater wind load than the basic design wind speed because of these conservative coefficients.
- Design and loading assumptions that are used for the analyses of these structures are very conservative in nature when compared to other codes, which makes structural failure highly improbable.
- Failure of a steel monopole occurs when a point is reached where the induced stresses exceed the yield strength of the material. At this point, the deflections induced in the material are no longer temporary. Hence, a permanent deflection in the monopole would exist.
- The term failure above refers to local buckling at a designated point on the pole. Local buckling does not cause a free falling pole; rather it relieves the stresses from the pole at this location. Monopoles are flexible, forgiving structures, which are not generally susceptible to damage by impact loads such as wind gust or earthquake shocks.
- When local buckling occurs, a relatively small portion of the shaft distorts and "kinks" the steel. When the pole begins to bend the exposure area is reduced and therefore, the force due to wind is decreased as well. Even though buckling exists, the cross section of the pole is capable of carrying the entire vertical load. Therefore, wind induced loads could not conceivably bring this type of structure to the ground due to the excellent ductile properties, design criteria, and failure mode.
- Valmont's communication poles have proven to be very reliable products. Valmont has provided structures that have performed well during earthquakes in California, hurricanes in the South (including Hugo, Andrew, Opal and Katrina), and a number of tornadoes. In over 25 years of engineering and fabricating thousands of monopoles, to our knowledge Valmont has never experienced an in service failure of a communication pole due to weather induced overloading, even though, as in the cases of Hurricanes Hugo, Andrew and Katrina, the wind speeds exceeded the design wind speed. We use the latest standards, wind speed information, and sophisticated analytical tools to ensure that we maintain our unblemished record for quality.

Valmont Microflex, LTCS, Valmont Industries, Inc.
3575 25th Street Salem, OR 97302-1123 USA
Toll Free: 800-547-2151 Fax: 503-316-2040 www.valmont.com



Valmont Quality of Steel and Manufacturing:

- Monopoles are fabricated from ASTM A572 Grade 65 material with a controlled silicon content of 0.06% maximum to ensure a uniform galvanized coating. The base material is fabricated from Grade 50 material. All plate material meets a V-Notch toughness requirement of 15 ft-lbs. @ -20 degrees Fahrenheit. By meeting the strict toughness requirement, monopoles are best suited to resist the cyclic/fatigue type loading (i.e. wind induced loading) these structures exhibit.
- Valmont's anchor bolts are fabricated from A615 Grade 75 material. The bolts are 2 1/4 in diameter, made from #18J bar stock. Anchor bolts come complete with five (5) A194 Grade 2H hex nuts.
- For the past 40 years, our company has always guaranteed the quality of the steel used in building our structures. Material Certifications are available on all material at the time of fabrication. Fabrication of the monopole is performed in accordance with the provisions of the AISC Manual of Steel Construction and ASCE Design of steel Transmission Pole Structures. All welding and inspection is in accordance with the American Welding Society's Specification D1.1-latest revision. Testing and inspection reports are available upon request at the time of fabrication.

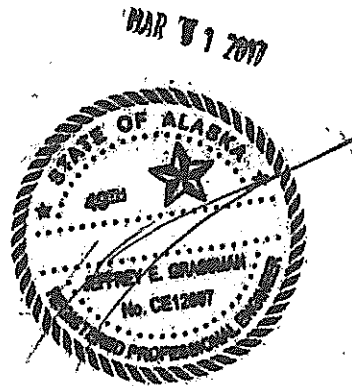
In addition, we have designed this monopole with a theoretical break point at approximately 102.58-ft elevation, by purposely over designing the pole sections below this point. In the unlikely event the pole were to fail at this point, the significant loading reduction caused by the removal of the tower wind area and weight above would greatly reduce any chance that the remaining tower would have any structural damage, thereby providing a theoretical failure zone of approximately 17.42-ft for the 120-ft AGL monopole.

I hope these comments address any issues that you might encounter relative to the anticipated performance of monopole structures and quality of steel fabrication. If you have additional questions or comments, I may be reached at 503-589-6639.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathon Neumann", written over a horizontal line.

Jonathon Neumann
Associate Engineer, EIT
Valmont Microflex



Valmont Microflex, LTCS, Valmont Industries, Inc.
3575 25th Street Salem, OR 97302-1123 USA
Toll Free: 800-547-2151 Fax: 503-316-2040 www.valmont.com

Check List Item 17) Visual Impact Study

There is an existing 90-foot-tall cell tower at the site of the proposed new tower. To show the visual impact, a neighborhood survey and photographic survey was done. This first picture is aimed at the site from the Grants Plaza parking lot. The existing pole is not visible at all, nor would the new tower be visible.



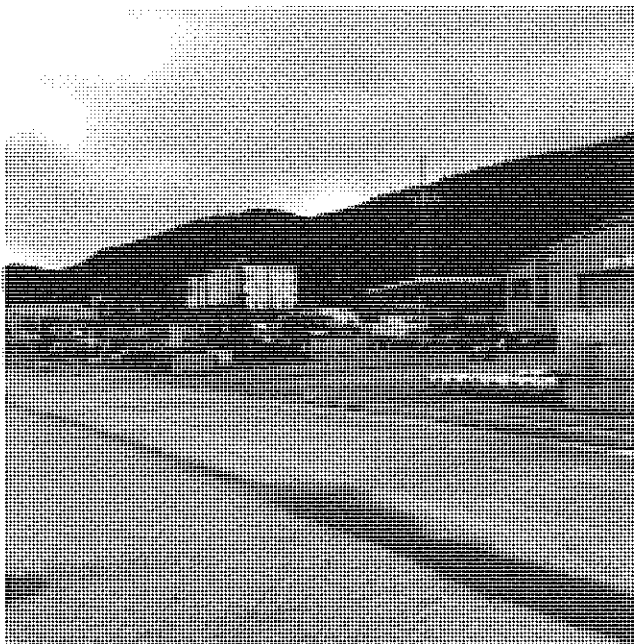
The next picture is taken from the Lemon Creek Breeze In parking lot. The existing tower is clearly visible as are some neighboring vertical industrial elements.



The next picture was taken from the AEL&P parking lot. The existing tower is visible and it can be easily imagined to be taller by 30 feet but not any more impactful.



This picture was taken from the foot of Concrete Way. The existing tower is visible in the background but the far more dominant feature is the other multi-leg tower in the foreground.



The next picture was taken from the entrance to the card lock fueling station on the right as one enters Tongsgard Court on the way to the landfill.



This is a picture of the existing ground level elements that support the tower. All of this will be obscured by slatted chain link fence as part of the proposed upgrade.



Finally, this is the existing tower as seen from Glacier Highway if a driver glances to the left while passing through the intersection with Tongard Court.

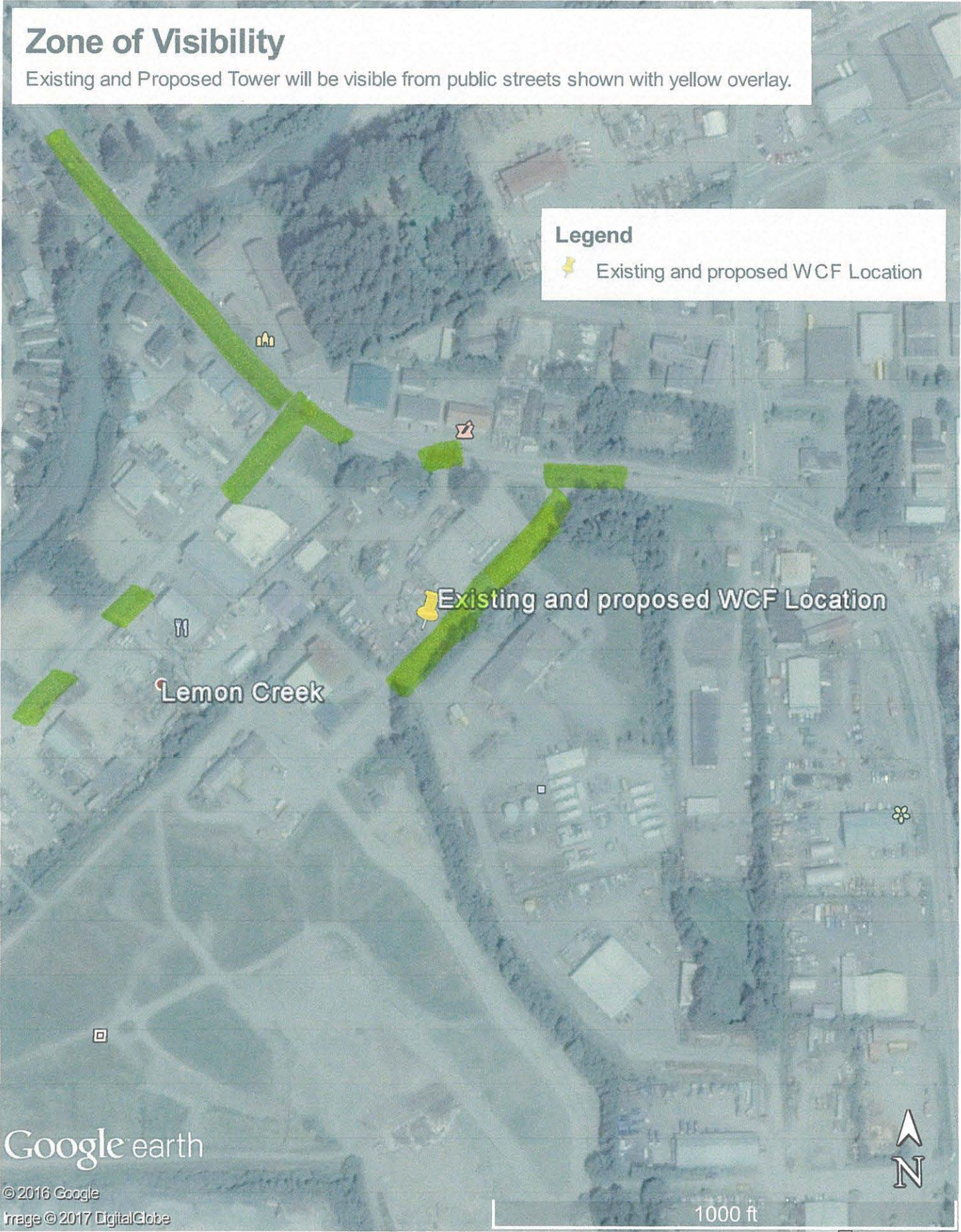


The existing and proposed WCF are not visible from any residential area or any recreational area. As stated earlier, the new WCF will have internal wiring and will appear as a smooth-sided steel spire at ground level.

There is no illustration provided that shows how the WCF will appear from parks, public lands and historic areas because the facility will not be visible from any of those places. The picture above shows how the facility will be visible from Glacier Highway for a short segment of that roadway's intersection with Tongard Court.

As discussed, the tower base will be screened by a slatted chain link fence.

The Check List calls for a Zone of Visibility Map. A road survey was done to show the visibility of the tower from various local public streets. The map on the following page shows the road segments from which the tower will be visible highlighted in yellow highlight.



Check List Item 18) Information for Lighted Towers

As said earlier, the proposed tower will not be lighted.

Check List Item 19) Narrative on Tower Height

To meet the requirements of the WCF code – capability to host four or more carriers – and to meet the RF needs associated with wireless telephone and data communication, the proposed height is necessary. As situated, the current tower hosts only one carrier at 90 feet. An additional 30 feet is needed to provide ten foot segments for three more carriers. There is a necessary vertical separation between carriers to avoid interference. This is discussed at length in the paper nicknamed *Isolation* in the Support Package.

Check List Item 20) Visual Impact Assessment

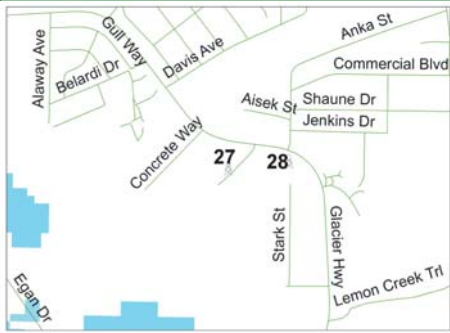
The applicant believes that sufficient material has been provided under Item 17 to assure that the visual impact will be a net positive benefit over the current situation and that the proposed facility is entirely appropriate to the Industrial zoning district.

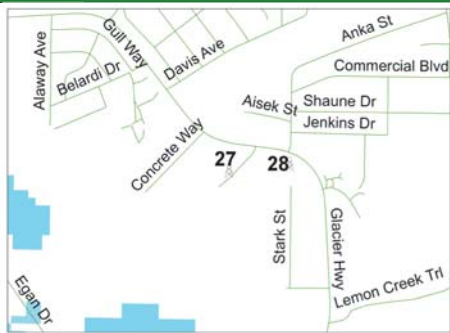
Check List Item 21) Balloon Test

The applicant hopes to be excused from this requirement because this proposal is to replace an existing tower with a better one. The code, at 49.65.970(c)(2)(D) says “In order to better inform the public in the case of a new freestanding WCF, ...” so it seems reasonable to waive this requirement for this application. However, if the CDD staff requires this test, then the best time to carry it out would be after the public notice for the hearing has gone out. That way, the public can be informed to expect the balloon test.

Check List Item 22) Propagation Study

This is addressed in the RF Emissions Compliance Report contained in the Support Package.

Site 27		Site Map	Site Photo
Owner:	Global Tower, LLC		
Identification:	FCC: 1242712		
Address:	5594 Tonsgard Court		
Latitude:	58-21-17.8 N		
Longitude:	-134-29-49.4 W		
Access:	Vehicle		
Site Details			
Type:	Wood Pole		
Height:	FCC antenna structure registration identifies tower height at 105'; the CBJ indicates 80'.		
Collocations:	Existing: Yes, 3	Future: 0-2	
Observations:	Tower property identified.		
Comments:	Future collocations will likely require structural reinforcements of the tower.		

Site 28		Site Map	Site Photo
Owner:	Unknown		
Identification:	Unknown		
Address:	5541 Glacier Highway		
Latitude:	58-21-18.58 N		
Longitude:	-134-29-37 W		
Access:	Vehicle		
Site Details			
Type:	Lattice Tower		
Height:	100' per the CBJ.		
Collocations:	Existing: Yes, 2	Future: 3	
Observations:	No tower ownership information provided on site.		
Comments:	Site is easily accessible off Glacier Highway.		

49.65.950 - Administrative permits.

- (a) A WCF described in Table 1 shall be approved or denied by the director, unless lighting would be required by the FAA or FCC. An eligible facility request in Table 1 must be approved by the director. A special use permit shall be required of all lighted WCF or any WCF requiring air navigation lighting.

TABLE 1

WCF Type	Zoning Districts	Maximum Height	Minimum Distance
Eligible Facility Request	All	No substantial change as provided in 49.65.950(b)	N/A
Collocation other than an Eligible Facility Request	All	Not more than 10% of existing structure or 20 feet (unless the increased height requires an existing unlit WCF to become lit)	N/A
Concealed attached	All	≤ 20 feet ¹	N/A
Non-concealed attached	D-1—D-18	≤ 5 feet ¹	N/A
Non-concealed attached	Nonresidential and mixed use	≤ 20 feet ¹	N/A
New concealed tower	WI, WC, GC, LC	≤ 20 feet above maximum height of zoning district	N/A
New concealed tower	RR	≤ 100 feet	> 500 feet to recognized neighborhood association established in accordance with CBJ chapter 11.35
New concealed tower	I	≤ 120 feet	> 500 feet to D-1—D-18 districts
New concealed tower	D-1—D-18	Compliant with maximum height of zoning district	N/A
New non-concealed tower	RR, except	≤ 120 feet	> 1,000 feet to recognized neighborhood association established in accordance with CBJ chapter 11.35
New non-concealed tower	I	≤ 60 feet	>500 feet to D-1—D-18 districts

Wireless communication facility (WCF) means any manned or unmanned location for the transmission and/or reception of radio frequency signals or other wireless communications and usually consisting of an antenna or group of antennas, transmission cables, and equipment cabinets, and may include an antenna support structure.

The following developments shall be considered a WCF: developments containing new, mitigated, or existing antenna support structures, public antenna support structures, replacement antenna support structures, collocation on existing antenna support structures, attached wireless communications facilities, concealed wireless communication facilities, and non-concealed wireless communication facilities. Excluded from the definition are: noncommercial amateur radio, amateur ham radio and citizen band antennas, satellite earth stations and antenna support structures, and antennas and/or antenna arrays for AM/FM/TV/HDTV broadcasting transmission facilities.

Specific types of WCFs include:

Attached WCF means an antenna or antenna array that is secured to an existing building or structure with any accompanying pole or device which attaches it to the building or structure, together with transmission cables, and an equipment cabinet which may be located either on the roof or inside/outside of the building or structure.

An attached wireless communications facility is considered to be an accessory use to the existing principal use on a site. An attached WCF includes distributed antenna system (DAS) and small cell technologies.

Concealed WCF, sometimes referred to as a concealed or camouflaged facility, means a WCF, ancillary structure, or WCF equipment compound that is not readily identifiable as such, and is designed to be aesthetically compatible with existing and proposed building(s), vegetation, natural features, and uses on a site. There are two types of concealed WCFs: 1) attached and 2) freestanding. Examples of concealed attached WCF include, but are not limited to, those designed to integrate or blend with the building or structure upon which the facility is attached by the use of paint faux windows, dormers or other architectural features. Freestanding concealed WCFs usually have a secondary, obvious function which may be, but is not limited to, the following: church steeple, windmill, bell tower, clock tower, cupola, light standard, flagpole with or without a flag, or faux tree.

Freestanding WCF means any manned or unmanned location for the transmission and/or reception of radio frequency signals, or other wireless communications and usually consisting of an antenna or group of antennas, feed lines, and equipment cabinets, and may include an antenna support structure. A freestanding WCF includes, but is not limited to, the following: guyed, lattice, or monopole support structures.

Non-concealed WCF means a wireless communication facility that is readily identifiable as such and can be either freestanding or attached.



LOCATION MAP

SITE NAME: REBUILD LEMON CREEK
SITE NUMBER: 202533
SITE ADDRESS: 5594 TONGARD CT
JUNEAU, AK 99801

DROP AND SWAP

[illegible]

REV.	DESCRIPTION	BY	DATE
0	FOR PERMITTING	JN	02/16/17
△			
△			
△			
△			

ATC SITE NUMBER:
202533

ATC SITE NAME:
REBUILD

LEMON CREEK AK

SITE ADDRESS:
5594 TONGARD CT
JUNEAU, AK 99801

SEAL:

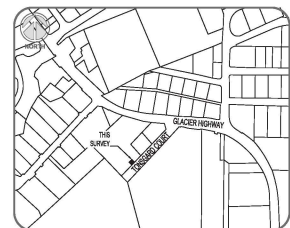


Feb 21 2017 10:03 AM

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

TITLE SHEET

SHEET NUMBER: G-001	REVISION: 9907
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VICINITY MAP
NOT TO SCALE
City & Borough of Juneau Base Map

SURVEY LEGEND

- PRIMARY MONUMENT RECOVERED
- SECONDARY MONUMENT RECOVERED #5 REBAR WITH DOWL 7712-S PLASTIC CAP
- SECONDARY MONUMENT RECOVERED DISTURBED AND WITHOUT CAP
- SET MAG NAIL IN CONCRETE
- SANITARY SEWER MANHOLE
- STORM AREA DRAIN
- WATER VALVE
- LEASE BOUNDARY
- PARCEL BOUNDARY

Attachment F - Drawings

BASIS OF BEARINGS

The basis for all bearings shown herein is the (referenced line of subject property or right of way), known as being (S43°30'33"E), per (State Subdivision III Plat No. 2011-4) of the Juneau Recording District.

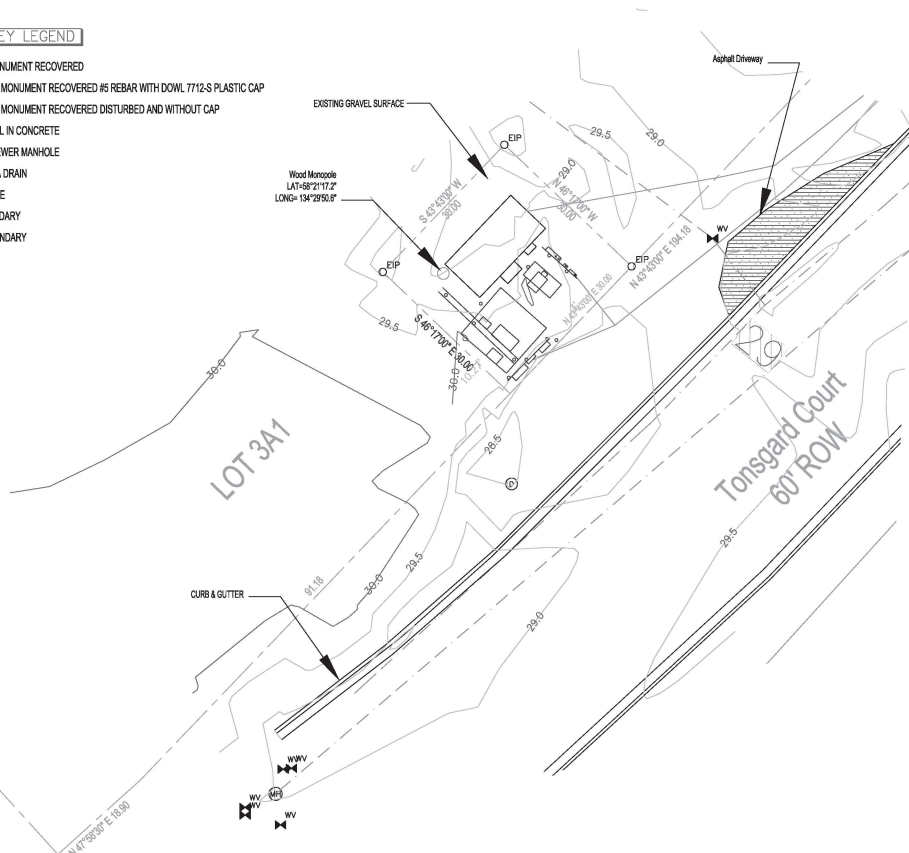
ZONING DATA

ZONE - INDUSTRIAL
SETBACK - 10'
FRONT - 10'
SIDE - 10'
REAR - 10'
HEIGHT - 0'

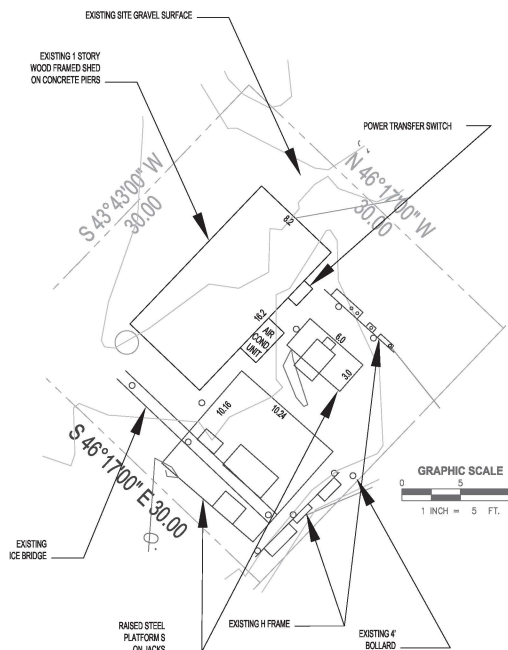
ALL SITE RESTRICTIONS WERE OBTAINED PER THE CITY & BOROUGH OF JUNEAU COMMUNITY DEVELOPMENT DEPARTMENT
CONTACT: (907) 586-0770

MISCELLANEOUS NOTES

- The lease area is contiguous to Tongard Court, a public right-of-way. Therefore, no access easement is needed.
- The locations of all utilities shown on the survey are from visible surface evidence only.
- At the time of this survey there was no observable surface evidence of earth moving work, building construction or building additions within recent months.
- At the time of this survey, there was no observable evidence of the subject property being used as a solid waste dump, ramp or sanitary landfill.
- At the time of this survey, there was no observable evidence of any recent changes in street right-of-way lines either completed or proposed, and available from the controlling jurisdiction.
- At the time of this survey, there was no observable evidence of any recent street or sidewalk construction or repairs.
- This survey was prepared for American Tower Corporation.
- State of election is NAVD 83 GNSS derived orthometric heights using Geoid 12B.
- Contour Interval 0.5'
- Lot 3A1 is used as a storage yard and shipping containers located on the northwest lease boundary.
- Site is serviced by fiber optic lines that were not located by CD on 29 August 2016.
- Lease site is not fenced.



COMPOUND DETAIL



SURVEYOR CERTIFICATE

I HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF ALASKA, AND THAT THIS PLAN REPRESENTS THE SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THE MONUMENTS SHOWN HEREON ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT.

DATE:



Drawn By: J. Ivaniszek Checked By: J. Ivaniszek

DATE: 9/2/2016

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

SURVEYOR:

CHILKAT
SURVEYING & MAPPING, LLC
10654 PORTER LAKE
JUNEAU, ALASKA 99801
907-957-1908

SURVEYOR DRAWING NUMBER

1629

SHEET TITLE

SITE TOPD MAP

PREPARED FOR:

AMERICAN TOWER CORP.
10 Presidential Way
Woburn, MA 01801

PROJECT NUMBER

370067

SITE ADDRESS

5594 TONGARD COURT
JUNEAU, ALASKA, 99801

WORK COORDINATED BY:



SITE NAME

LEMON CREEK

SHEET NUMBER

1 of 1

GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES INCLUDING ANSI/AIAA-222, AND COMPLY WITH ALL ATC MASTER SPECIFICATIONS FOR WIRELESS TOWER SITES.
 2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
 3. CONTRACTOR SHALL COORDINATE ALL REQUIRED INSPECTIONS.
 4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
 5. DETAIL CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
 6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
 7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
 8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
 9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
 10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS SHALL BE REJECTED AND REPORTED TO THE ENGINEER FOR REMOVAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE CONTRACTOR PRIOR TO PROCEEDING.
 11. EACH CONTRACTOR SHALL COOPERATE WITH THE ATC CM, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
 12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE ATC.
 13. ALL CABLE CONDUIT, EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
 14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR WILL NOTIFY THE ATC CONSTRUCTION MANAGER IMMEDIATELY.
 15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
 16. ALL ROOF WORK SHALL BE DONE BY A QUALIFIED AND EXPERIENCED ROOFING CONTRACTOR IN ACCORDANCE WITH THE ATC SPECIFICATIONS. CONTRACTOR WARRANTING THE ROOF TO ENSURE THAT THE WARRANTY IS MAINTAINED.
 17. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
 18. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
 19. CONTRACTOR SHALL FURNISH ATC WITH THREE AS-BUILT SETS OF DRAWINGS UPON COMPLETION OF WORK.
 20. CONTRACTOR SHALL COORDINATE WITH ATC ON TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
 21. PRIOR TO SUBMISSION OF BID, CONTRACTOR WILL COORDINATE WITH ATC CONSTRUCTION MANAGER TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY ATC. ALL REQUIRED PERMITS NOT OBTAINED BY ATC MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
 22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO ATC FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
 23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO ATC SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
 24. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
 25. THE CONTRACTOR SHALL MAINTAIN AT ALL TIMES A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.

EROSION AND SEDIMENTATION CONTROL PLAN NOTES:

1. THIS PLAN HAS BEEN DEVELOPED TO PROVIDE A STRATEGY FOR CONTROLLING SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION OF THE PROPOSED FACILITY. THE EQUIPMENT ANTICIPATED TO BE USED FOR THE CONSTRUCTION INCLUDES THE FOLLOWING: BACKHOES, EXCAVATORS, LOADERS, TRUCKS, CHAINSAWS, COMPACTORS, AND GRADERS. THE FOLLOWING MEASURES WILL BE UNDERTAKEN TO PROVIDE MAXIMUM PROTECTION TO THE SOIL, WATER, AND AIR DURING CONSTRUCTION AND AFTER CONSTRUCTION.
2. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM AMERICAN TOWER PRIOR TO IMPLEMENTATION.
3. THE FOLLOWING ACTIVITIES SHALL BE UNDERTAKEN TO MINIMIZE DISTURBANCE ACTIVITIES:
 - a. SURVEY STAKES, POSTS, OR CONSTRUCTION FENCE ETC. SHALL BE MAINTAINED AT ALL TIMES.
 - b. A COPY OF THE SEGMENT AND EROSION CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE DURING CONSTRUCTION UNTIL THE SITE IS STABILIZED. (AS APPLICABLE)
4. PRIOR TO GRUBBING OR ANY EARTHMOVING OPERATION, SITUATION FENCE WILL BE INSTALLED AROUND THE SLOPE ON THE CONTOUR AT THE DOWNHILL LIMIT OF THE WORK AS PROTECTION AGAINST EROSION.
5. STONE CHECK DAMS WILL BE INSTALLED IN THE DRAINAGE DITCHES TO PREVENT EROSION PRIOR TO THE STABILIZATION OF THE CHANNELS. EROSION CONTROL BLANKETS WILL ALSO BE INSTALLED IN ALL DITCHES TO BE REVEGETATED.
6. PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR CREEKS SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF THE FACILITY. AFTER PERMANENT GRADING HAS BEEN COMPLETED, WHEN IT IS NOT POSSIBLE OR PRACTICAL TO PERMANENTLY STABILIZE DISTURBED LAND, TEMPORARY EROSION CONTROL MEASURES WILL BE IMPLEMENTED WITHIN THIRTY CALENDAR DAYS OF EXPOSURE OF SOIL. ALL DISTURBED AREAS SHALL BE PROTECTED FROM EROSION AND SOIL LOSS UNTIL PERMANENT GRADING. CUT SLOPES IN COMPETENT BEDROCK AND ROCK PILES NEED NOT BE VEGETATED. ANY EXPOSED SLOPES GREATER THAN 2:1 AND NEWLY CONSTRUCTED DRAINAGE DITCHES WILL

CONCRETE AND REINFORCING STEEL NOTES:

1. DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF ALL APPLICABLE CODES INCLUDING ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", AND ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
2. MIX DESIGN SHALL BE APPROVED BY OWNER'S REPRESENTATIVE AND SUBMITTED TO ENGINEER PRIOR TO PLACING CONCRETE.
3. ALL CONCRETE SHALL BE PLACED WITH A MINIMUM 4" SLUMP AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI UNLESS OTHERWISE NOTED.

CONSTRUCTION SEQUENCE:

1. INSTALL NEW TOWER FOUNDATION
2. ERECT TOWER
3. INSTALL PROPOSED ICE BRIDGE
4. AFTER THE TOWER HAS BEEN ERECTED AND OPERATIONAL, REMOVE EXISTING WOOD POLE TOWER.
5. IF THE CONSTRUCTION IS TERMINATED OR SUSPENDED PRIOR TO CONSTRUCTION COMPLETION, ALL EXPOSED SOIL AREAS SHALL BE SEEDDED WITH TEMPORARY SEEDING AND MULCHED IMMEDIATELY.
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL SEDIMENT AND EROSION CONTROL FACILITIES IN EFFECTIVE WORKING ORDER DURING CONSTRUCTION AND UNTIL ALL EXPOSED SOIL AREAS HAVE BEEN STABILIZED.
7. AFTER FINAL STABILIZATION HAS BEEN ACHIEVED, TEMPORARY BMPs SHALL BE REMOVED.
8. AREAS THAT ARE NOT STABILIZED IMMEDIATELY SHALL BE STABILIZED PRIOR TO BEING RELEASED TO THE PUBLIC.
9. AREAS THAT ARE NOT STABILIZED IMMEDIATELY DURING REMOVAL OF TEMPORARY EAS BMPs SHALL BE STABILIZED IMMEDIATELY.

GENERAL FOUNDATION NOTES:

1. **APPLICABLE FOR EQUIPMENT SHELTER ONLY.**
THOROUGHLY COMPACT BOTTOM OF EXCAVATIONS PRIOR TO PLACING RIGID INSULATION STANDARDS. BACKFILL AND COMPACTION PROCEDURES SHALL BE DONE PER INDUSTRY PRACTICES.
2. **ANCHORING STEEL SHALL BE ASTM A615 - GRADE 60.** SECURE REINFORCING IN PLACE TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT.
3. **VERIFY DETAILS AND DIMENSIONS WITH SHELTER DRAWINGS.** NOTIFY AT CCM OF ANY DISCREPANCIES.
4. **INSULATION BARRIER PROVIDED IS FOR FROST PROTECTION IN LIEU OF STANDARD FOUNDATIONS WITH HEATING AT THIS CODE REQUIRED FROST DEPTH.**
5. **MANUFACTURER'S SPECIFICATIONS SHALL BE USED IN ACCORDANCE WITH SHELTER MANUFACTURER'S SPECIFICATIONS.**

GENERAL

SHEET NUMBER:
G-002

ATC SITE NUMBER:
202533

ATC SITE NAME:
REBUILD

LEMON CREEK AK

SITE ADDRESS:
5594 TONGARD CT

SEAL:



Feb 21 2017 10:04 AM

DRAWN BY:	JN
APPROVED BY:	KR
DATE DRAWN:	02/
ATC JOB NO:	120

GENERAL NOTE

SHEET NUMBER:
G-002

AMERICAN TOWER
ATC TOWER SERVICES
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27513
PHONE: 919.466.0112
COA: 6260F

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATION AS INSTRUMENTS OF SERVICE ARE THE PROPERTY OF AMERICAN TOWER. NO REPRODUCTION OR PUBLICATION SHALL BE RESTRICTED TO THE ORIGINAL SITE. ANY REPRODUCTION OR PUBLICATION OF THESE DRAWINGS OR SPECIFICATIONS IN ANY MANNER OR FOR ANY PURPOSE OTHER THAN THAT WHICH RELATES TO AMERICAN TOWER OR THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. TITLE TO THE SPECIFIED CARRIER IS NOT TRANSFERRED BY THESE DRAWINGS OR SPECIFICATIONS. AMERICAN TOWER WILL BE PROVIDING ON-SITE CONSTRUCTION REVIEW OF THIS PROJECT. CONTRACTOR(S) MUST VERIFY ALL DIMENSIONS AND LOCATIONS OF EXISTING AND PROPOSED STRUCTURES AND UTILITIES PRIOR TO CONSTRUCTION. THE LATEST VERSION OF THIS DRAWING IS SUPERSEDED BY THE LATEST VERSION OF THE AMERICAN TOWER.

REV.	DESCRIPTION	BY	DATE
1	FOR PERMITTING	JN	02/16/17

ATC SITE NUMBER:
202533

ATC SITE NAME:
REBUILD LEMON CREEK AK

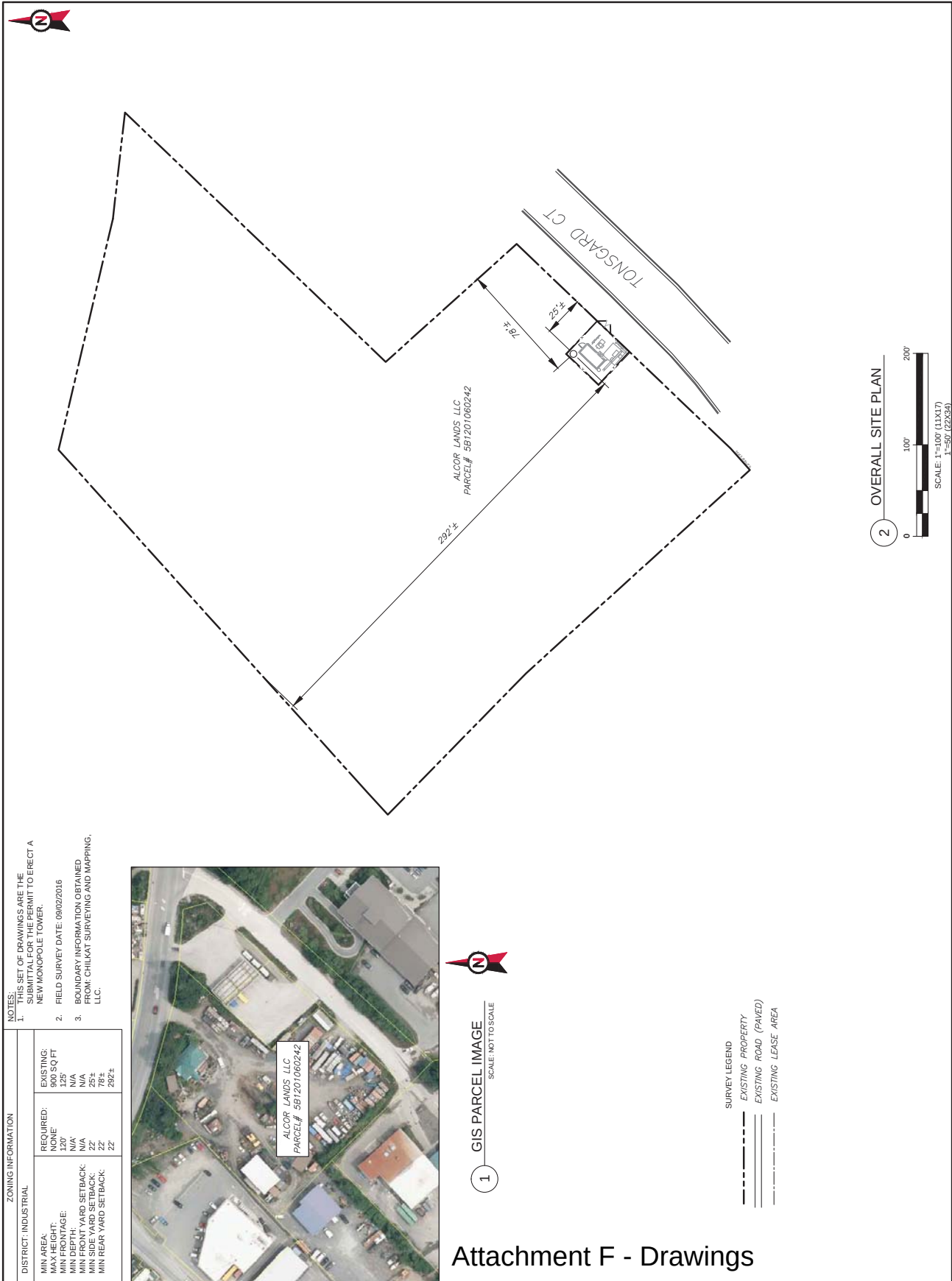
SITE ADDRESS:
5594 TONGARD CT
JUNEAU, AK 99801

Feb 21 2017 10:04 AM

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029052

OVERALL SITE PLAN

SHEET NUMBER:	C-101
REVISION:	



Attachment F - Drawings

Attachment F - Drawings



AMERICAN TOWER®
ATC TOWER SERVICES
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: 6260F

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATION AS INSTRUMENTS OF SERVICE ARE THE PROPERTY OF THE ARCHITECT. NO PART OF THIS PUBLICATION SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED, ANY USE OR DISCLOSURE OF ANY PART OF THIS PUBLICATION FOR ANY OTHER THAN THAT WHICH RELATES TO AMERICAN TOWER OR THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. TITLE TO THESE DOCUMENTS SHALL REMAIN THE PROPERTY OF AMERICAN TOWER. WHETHER OR NOT THE PROJECT IS EXECUTED, NEITHER THE ARCHITECT NOR THE ENGINEER WILL BE PROVIDING OR CONSIDERING ANY INFORMATION OR PRELIMINARY DESIGN OR CONSTRUCTION DETAILS OR ANY OTHER AMERICAN TOWER OR ANY DISCREPANCIES, ANY PRIOR VERSION OR FILE WITH AMERICAN TOWER.

REV.	DESCRIPTION	BY	DATE
0	FOR PERMITTING	JN	02/16/17
△			
△			
△			
△			

ATC SITE NUMBER:

202533

ATC SITE NAME:

REBUILD

LEMON CREEK AK

SITE ADDRESS:

5594 TONGARD CT
JUNEAU, AK 99801

SEAI:



Feb 21 2017 10:04 AM

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

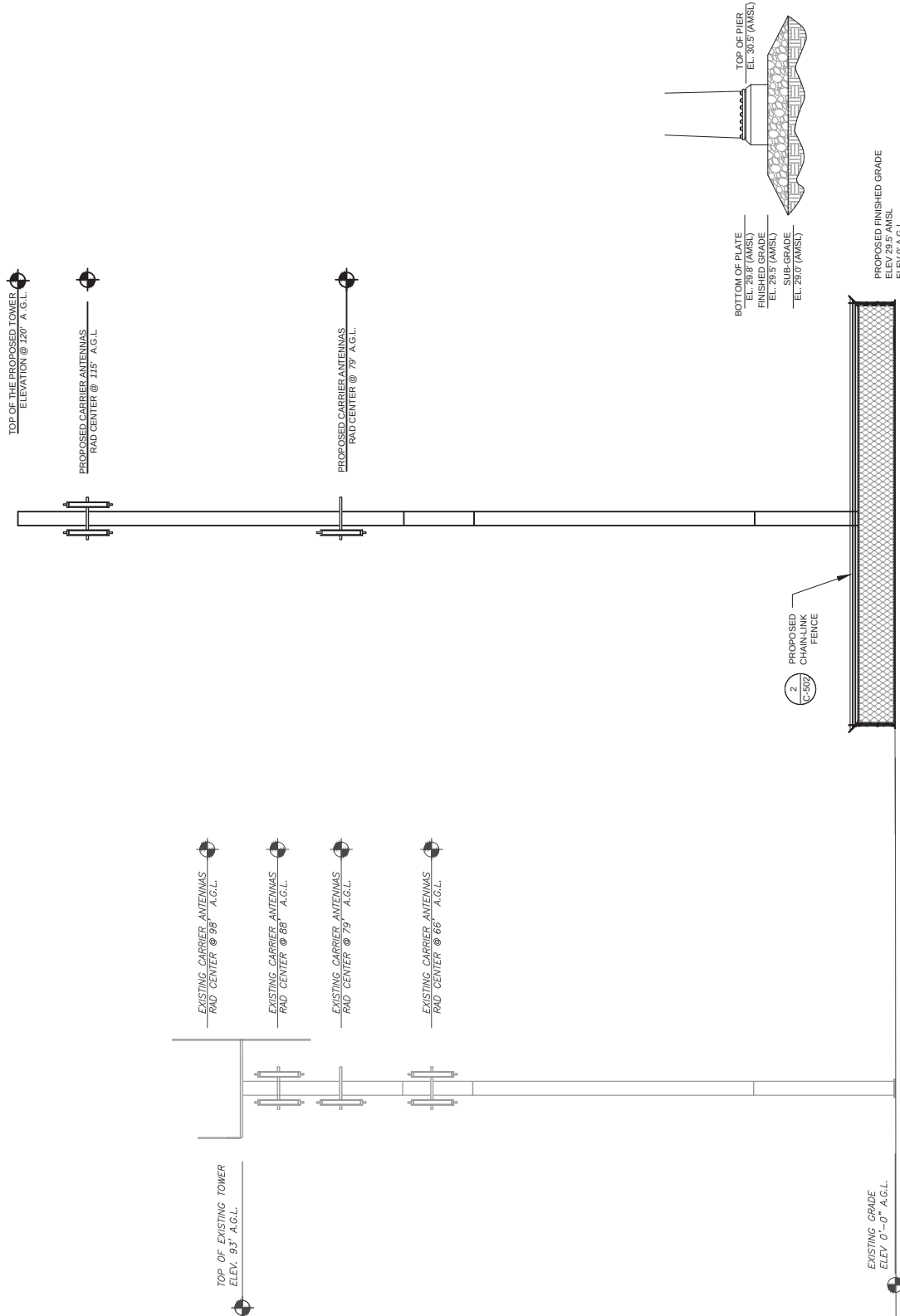
TOWER ELEVATION 9

SHEET NUMBER: REVISION: g

C-201

REVISION: 96

Packet Page 176 of 425



1 PROPOSED TOWER ELEVATION
SCALE: NOT TO SCALE

1 EXISTING TOWER ELEVATION
SCALE: NOT TO SCALE

Attachment F - Drawings

 AMERICAN TOWER® ATC TOWER SERVICES 3500 REGENCY PARKWAY SUITE 100 CARY, NC 27518 PHONE: (919) 468-0112 COA: 0260F THESE DRAWINGS AND/OR THE SPECIFICATIONS OR INSTRUMENTS OF SERVICE ARE THE EXCLUSIVE PROPERTY OF AMERICAN TOWER. THEIR REUSE OR REPRODUCTION IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF AMERICAN TOWER FOR WHICH THEY ARE PREPARED, ANY USE OR DISCLOSURE OF ANY PART OF THESE DRAWINGS OR INSTRUMENTS OF SERVICE TO ANY OTHER PARTY, INCLUDING THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. TITLE TO THESE DRAWINGS AND/OR INSTRUMENTS OF SERVICE SHALL REMAIN THE PROPERTY OF AMERICAN TOWER. NO PART OF THESE DRAWINGS OR INSTRUMENTS OF SERVICE SHALL BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF AMERICAN TOWER. THESE DRAWINGS AND/OR INSTRUMENTS OF SERVICE SHALL BE VOID IF NOT EXECUTED WITHIN THE ARCHITECT NOR THE ENGINEER WILL BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS. CONTRACTORS MUST VERIFY ALL DIMENSIONS AND ASSUMES OF THIS DRAWING IS SUPERSEDED BY THE LATEST VERSION ON FILE WITH AMERICAN TOWER.	<table border="1"> <thead> <tr> <th>REV.</th><th>DESCRIPTION</th><th>BY</th><th>DATE</th></tr> </thead> <tbody> <tr> <td>1/A</td><td>FOR PERMITTING</td><td>JN</td><td>02/16/17</td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV.	DESCRIPTION	BY	DATE	1/A	FOR PERMITTING	JN	02/16/17																					ATC SITE NUMBER: 202533 ATC SITE NAME: REBUILD LEMON CREEK AK SITE ADDRESS: 5594 TONGARCOT JUNEAU, AK 99801	SEAL:  	Feb 21 2017 10:04 AM  <table border="1"> <tr> <td>DRAWN BY:</td> <td>JN</td> </tr> <tr> <td>APPROVED BY:</td> <td>KRF</td> </tr> <tr> <td>DATE DRAWN:</td> <td>02/16/17</td> </tr> <tr> <td>ATC JOB NO.:</td> <td>12020662</td> </tr> </table> SIGNAGE Packet Page 67	DRAWN BY:	JN	APPROVED BY:	KRF	DATE DRAWN:	02/16/17	ATC JOB NO.:	12020662
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REV.	DESCRIPTION	BY	DATE
1	FOR PERMITTING	JN	02/16/17

ATC SITE NUMBER:
202533
ATC SITE NAME:
REBUILD LEMON CREEK AK
SITE ADDRESS:
5894 TONGARD CT
JUNEAU, AK 99801



Feb 21 2017 10:04 AM
cosign
DRAWN BY: JN
APPROVED BY: KRF
DATE DRAWN: 02/16/17
ATC JOB NO: 12020052

GROUNDING PLAN
SHEET NUMBER:
E-501
REGION:

1. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
2. ALL GROUND CONNECTIONS SHALL BE EXOTHERMIC WELDED. ALL WIRES SHALL BE COPPER.
3. ALL GROUNDING AND TEST GROUND TO SOURCE, GROUNDING AND OTHER OPERATIONAL TESTING WILL BE WITNESSED BY OWNER REPRESENTATIVE.
4. REFER TO ATC MASTER SPEC AND COMPLY WITH ALL REQUIREMENTS OF GROUNDING STANDARDS.
5. CLIENT SHALL PROVIDE THE REQUIRED DESIGN OF GROUNDING SYSTEM, AND RECEIVE APPROVAL OF DESIGN BY OWNER REPRESENTATIVE. PRIOR TO INSTALLATION OF GROUNDING SYSTEM. PHOTO DOCUMENT ALL CONNECTIONS AND GROUND RING.
6. NOTIFY CONSTRUCTION MANAGER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS. INSTALLATION OF GROUNDING SYSTEM SHALL BE COMPLETED AT AN ANGLE OR TOWER GROUND RING MAY BE EXTENDED AS NEEDED.

KEYED NOTES:

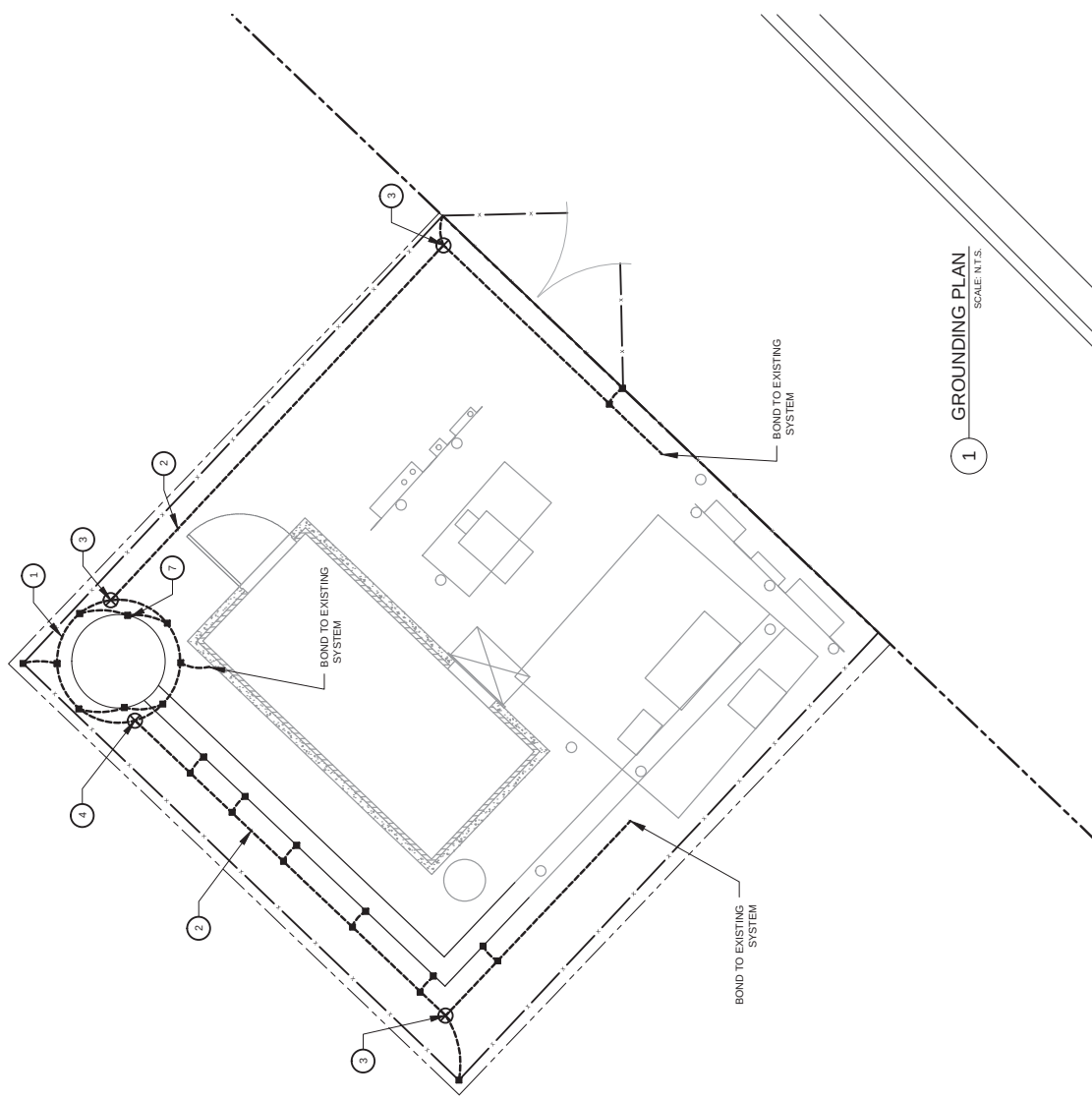
1. #2 AWG SBTC TOWER GROUND RING. (MIN 2 FT FROM FOUNDATION)
2. #2 AWG SBTC TOWER RING RADIALS. GROUNDING RADIAL (TYP.) SEE TRENCH DETAIL 3 ON SHEET E-501.
3. 5/8" X 10 FT GROUND ROD (TYP). SEE DETAILS 4 & 8 ON SHEET E-401.
4. 5/8" X 10 FT GROUND ROD WITH TEST WELL (MIN. ONE PER SITE ON TOWER GROUND RING). SEE DETAIL 5 ON SHEET E-401.
5. BOND TO ELECTRICAL SERVICE AT MAIN BONDING JUMPER WITH #2 AWG SBTC. PARALLEL CONNECTION AWAY FROM TOWER. SEE DETAIL 1 ON SHEET E-501.
6. SERVICE GROUND ROD SIZE MINIMUM PER NEC OR AS OTHERWISE INDICATED. PLACE MINIMUM OF 10' FROM ALL OTHER GROUND RODS.
7. TOWER TO GROUND RING BONDS. SEE DETAIL 6 & 7 ON SHEET E-501.
8. ADDITIONAL ROD (TYP) (IF REQUIRED, SEE INSTALL NOTES)
9. ADDITIONAL RADIAL EXTENSION IN ROAD CENTER WITH GEM 8" MAX. OR TO RIGHT OF WAY, WHICHEVER IS SHORTER. SEE DETAIL 2 ON SHEET E-401.
10. ADDITIONAL RADIAL TO LEASE AREA BOUNDARY EQUIDISTANT FROM EXISTING RADIALS AT ENDS WITH GEM (TYP). SEE DETAIL 2 ON SHEET E-401.

INSTALLATION NOTES:

1. INSTALL STANDARD BASE DESIGN AS SHOWN.
2. ALL GROUNDING SYSTEMS SHALL BE INSTALLED WITH A 3-PROBE TEST AND PRIOR TO CONNECTION OF UTILITY POWER NEUTRAL TO THE SYSTEM.
3. IF RESISTANCE (STEP 2) IS GREATER THAN 10 OHMS, INSTALL ADDITIONAL SYSTEM AS SHOWN.
4. MEASURE GROUNDING SYSTEM RESISTANCE WITH A 3-PROBE TEST AND PRIOR TO CONNECTION OF UTILITY POWER NEUTRAL TO THE SYSTEM.
5. IF RESISTANCE (STEP 4) IS GREATER THAN 10 OHMS AFTER INSTALLATION OF ADDITIONAL SYSTEM, COORDINATE WITH ATC ENGINEER OF RECORD FOR RESOLUTION.

GROUNDING PLAN LEGEND:

GROUND WIRE	⊗	COPPER GROUND ROD
GROUND BAR	⊗	TEST WELL
EXOTHERMIC WELD	⊗	
MECHANICAL WELD	⊗	



1 GROUNDING PLAN
SCALE: N.T.S.



Photosimulation of the view looking southeast from the nearest point along Concrete Way.

Rebuild Lemon Creek

5594 Tongsgard Ct
Juneau, AK 99801



Site Number 202533



Attachment G - Photo Simulation

Photosimulation of the view looking northeast from the property at the end of Tongsgard Court.

Attachment G - Photo Simulation

Existing monopole to be replaced

Proposed replacement monopole,
shown as proposed

Existing

Rebuild Lemon Creek

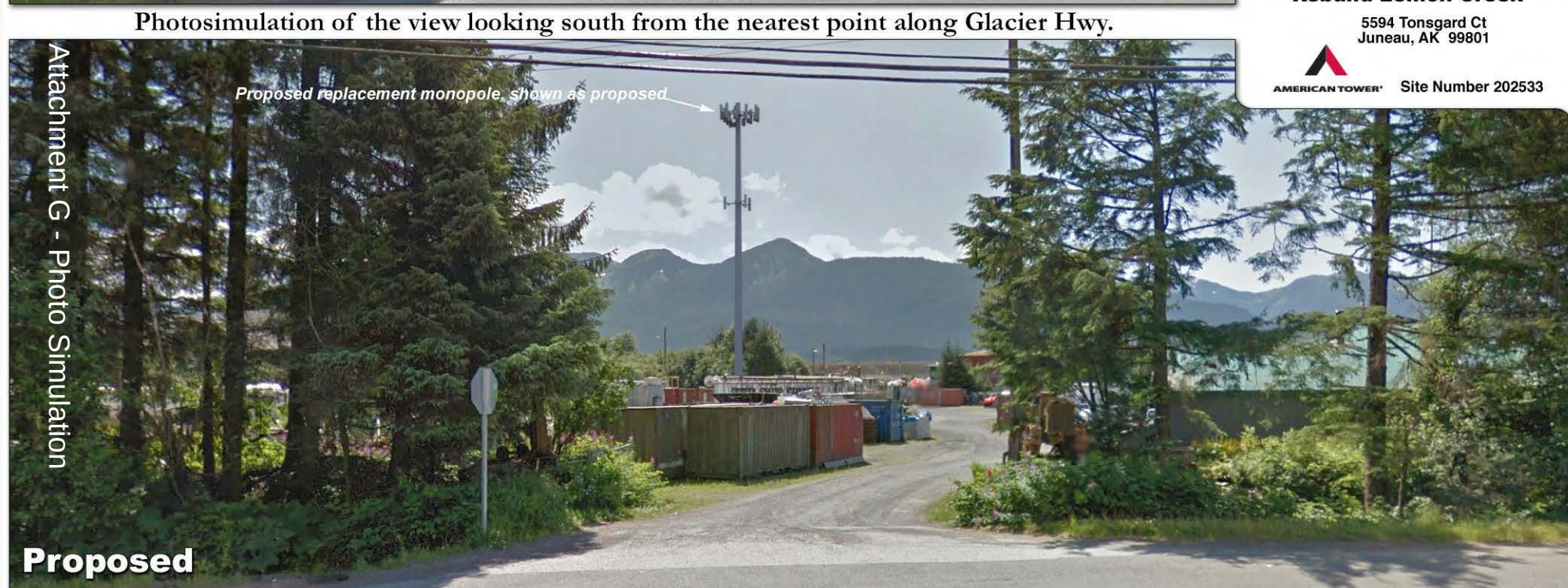
5594 Tongsgard Ct
Juneau, AK 99801



AMERICAN TOWER

Site Number 202533

Proposed



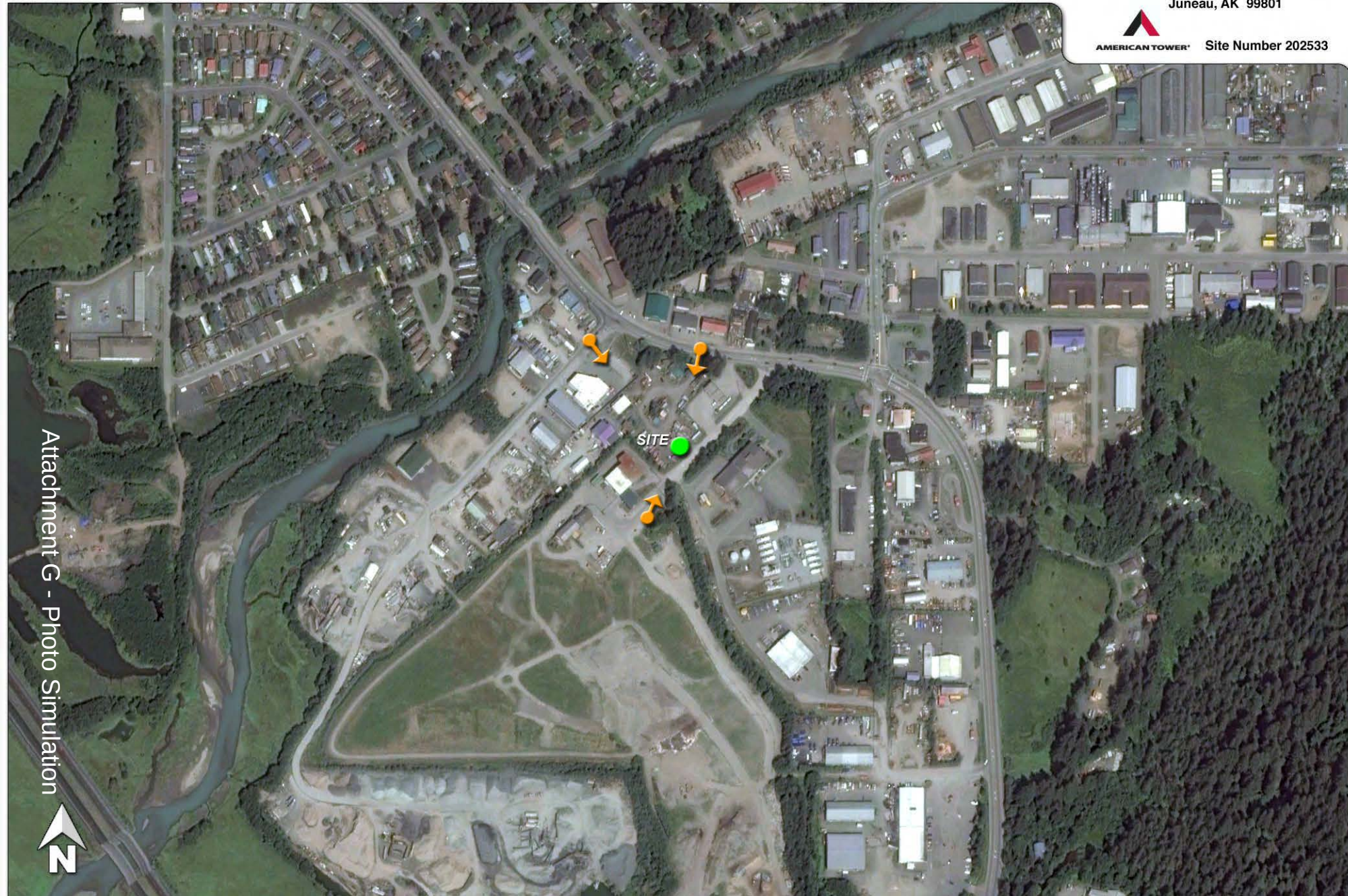
Aerial photograph showing the viewpoints for the photosimulations.

Rebuild Lemon Creek

5594 Tonsgard Ct
Juneau, AK 99801



Site Number 202533



Attachment G - Photo Simulation





Photosimulation of the view looking southeast from the nearest point along Concrete Way.

Rebuild Lemon Creek

5594 Tongsgard Ct
Juneau, AK 99801



Site Number 202533



Photosimulation of the view looking northeast from the property at the end of Tongsgard Court.

Attachment G - Photo Simulation

Existing monopole to be replaced

Proposed replacement monopole,
shown at full buildout

Existing

Rebuild Lemon Creek

5594 Tongsgard Ct
Juneau, AK 99801



Site Number 202533

Proposed



Photosimulation of the view looking south from the nearest point along Glacier Hwy.

Rebuild Lemon Creek

5594 Tongard Ct
Juneau, AK 99801



Site Number 202533



Attachment G - Photo Simulation

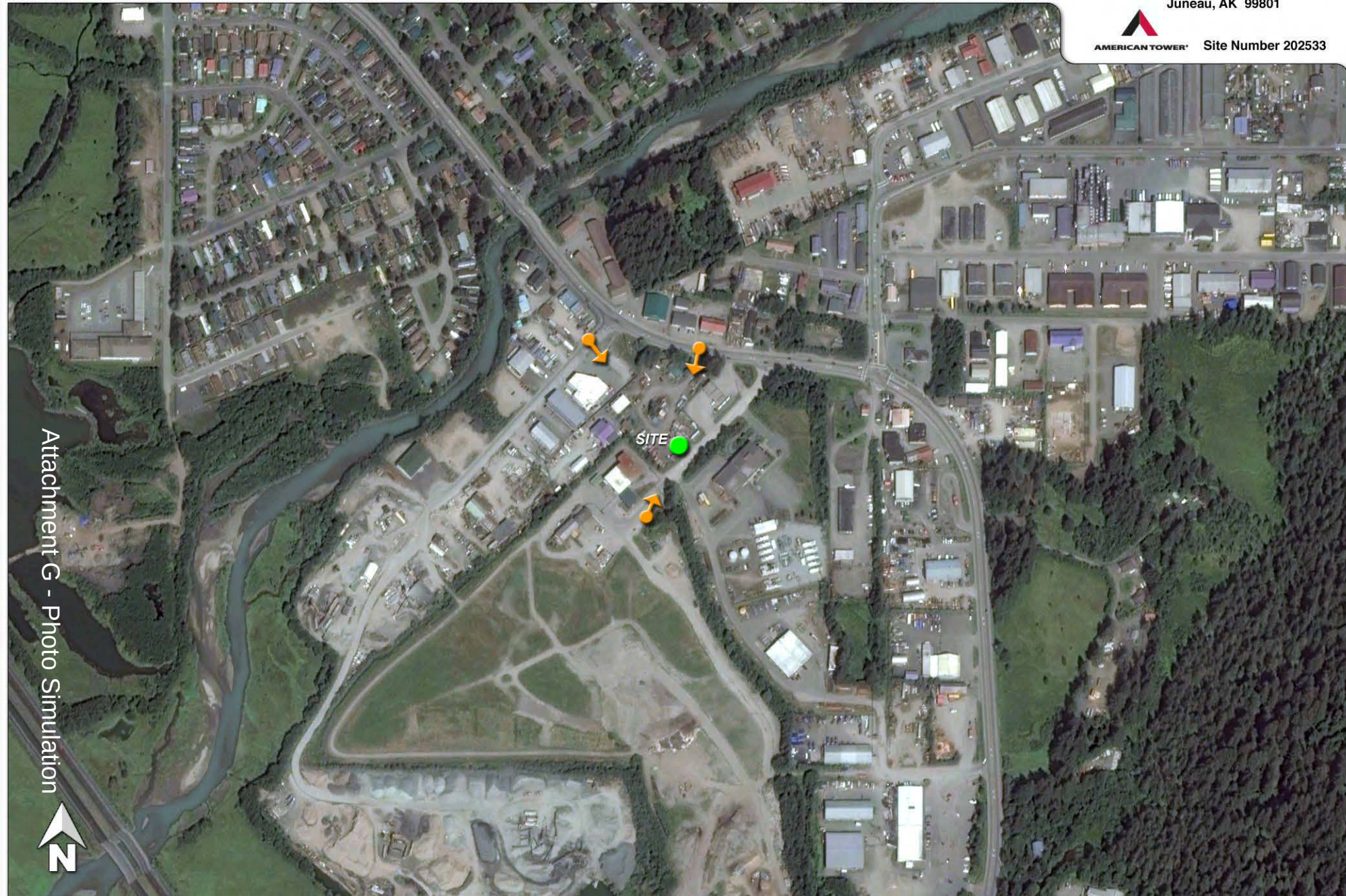
Aerial photograph showing the viewpoints for the photosimulations.

Rebuild Lemon Creek

5594 Tonsgard Ct
Juneau, AK 99801



Site Number 202533



Attachment G - Photo Simulation



AFFIDAVIT OF BALLOON DEMONSTRATION

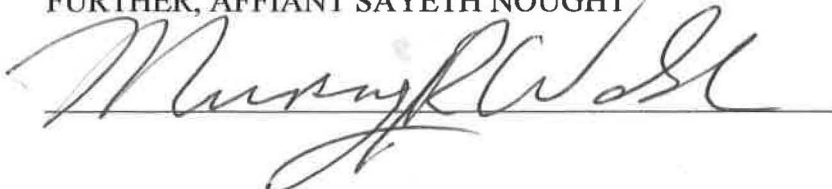
I, Murray R. Walsh, am the applicant's representative in the matter titled, WCF2017-0007. Pursuant to the CBJ Land Use Code Section 49.65.970 (c)(2)(D), I conducted a "Balloon Test" at the site of the proposed 120-foot-tall steel monopole Wireless Communication Facility commencing on June 30 at noon.

I had previously acquired a three-foot helium-inflated orange balloon from a local vendor along with an uninflated spare. On June 29, using a 16-foot extension ladder, I climbed to the top of a 40 foot-long trailer that was parked on the site about three feet from where the new tower is proposed. The top of the trailer was measured to be 13 feet above the ground. Atop the trailer, I found a ring on a slab of wood that would serve as the anchor point for the balloon. I attached a length of 600-pound test green cord to the ring and trailed a 30-foot-long piece of the cord back down the side of the trailer.

I re-entered the site on June 30 at 11:45 AM and attached the balloon with a 77 foot additional length of cord so that it would fly at 120 feet above the ground. The method of attachment was designed to discourage theft or vandalism of the demonstration balloon. After launching, I took pictures of the flying balloon and e-mailed them to Jill Maclean on the CDD staff.

I returned to the area late on the afternoon of June 30, and on the morning of July 1, the evening of July 1 and the same for July 2nd to make sure the balloon was still flying and it was. At noon on July 3rd, I recovered the balloon.

FURTHER, AFFIANT SAYETH NOUGHT

 , July 5, 2017

Attachment H - Balloon Test

Attachment H – View from Breeze-In



Attachment H - Balloon Test

Attachment H – View from AEL&P



Attachment H - Balloon Test



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No. 192 of 425
2017-AAL-25-OE
Prior Study No.
2004-AAL-2-OE

Issued Date: 03/06/2017

Regulatory Compliance
American Towers, LLC
10 Presidential Way
Woburn, MA 02138

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower Rebuild Lemon Creek AK (202533)
Location:	Juneau, AK
Latitude:	58-21-17.40N NAD 83
Longitude:	134-29-50.38W
Heights:	29 feet site elevation (SE) 125 feet above ground level (AGL) 154 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- ☐ At least 10 days prior to start of construction (7460-2, Part 1)
☒ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 1.

This determination expires on 09/06/2018 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.
- the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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This determination does not constitute authority to transmit on the frequency(ies) identified in this study. The proponent is required to obtain a formal frequency transmit license from the Federal Communications Commission (FCC) or National Telecommunications and Information Administration (NTIA), prior to on-air operations of these frequency(ies).

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (310) 725-6591. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2017-AAL-25-OE.

Signature Control No: 320525552-324353402

(DNE)

Tamera Burch
Technician

Attachment(s)
Frequency Data

cc: FCC

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W



RF EMISSIONS COMPLIANCE REPORT

American Tower Corporation

Tower Name: 202533

Tower Name: Rebuild Lemon Creek AK
5594 Tongard Ct
Juneau, AK
4/17/2017

Report Status:

The Site is Compliant



04/17/2017

Prepared By:

Sitesafe, Inc.

200 North Glebe Road, Suite 1000

Arlington, VA 22203

Voice 703-276-1100
Fax 703-276-1169

Engineering Statement in Re:
Electromagnetic Energy Analysis
American Tower Corporation
Juneau, AK

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Velocitel, Inc. in Raliegh, North Carolina; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by American Tower Corporation (See attached Site Summary and Carrier documents), and that American Tower Corporation's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "Rebuild Lemon Creek AK" ("the site"); and

That American Tower Corporation operates at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by American Tower Corporation and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of American Tower Corporation's operating frequency as shown on the attached antenna worksheet; and

AT&T Mobility
Rebuild Lemon Creek AK
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility	0.257 %
AT&T Mobility	0.29 %
AT&T Mobility	2.099 %
AT&T Mobility	0.591 %
Alaska Digital	0.173 %
Composite Site MPE:	3.411 %

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the existing operation is no more than 3.411% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the existing operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that American Tower Corporation's existing operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.


May 12, 2017

AT&T Mobility
Rebuild Lemon Creek AK
Carrier Summary

Frequency: 2135 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.57286 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.25729 %

On Axis						Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	
Kathrein-Scalia	800-10865	115	0	630	0.212918	0.021292	
Kathrein-Scalia	800-10865	115	120	630	0.212918	0.021292	
Kathrein-Scalia	800-10865	115	240	630	0.215151	0.021515	
Powerwave	P65-16-XLLHH-RRRR	87	0	630	0.456581	0.045658	
Powerwave	P65-16-XLLHH-RRRR	87	120	630	0.456581	0.045658	
Powerwave	P65-16-XLLHH-RRRR	87	240	630	0.450799	0.04508	
Powerwave	P65-16-XLLHH-RRRR	86	0	630	0.471533	0.047153	
Powerwave	P65-16-XLLHH-RRRR	86	120	630	0.471533	0.047153	
Powerwave	P65-16-XLLHH-RRRR	86	240	630	0.465562	0.046556	

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AT&T Mobility
Rebuild Lemon Creek AK
Carrier Summary

Frequency: 1975 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.9047 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.29047 %

On Axis						Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	
Kathrein-Scalia	800-10865	115	0	630	0.234243	0.023424	
Kathrein-Scalia	800-10865	115	120	630	0.234243	0.023424	
Kathrein-Scalia	800-10865	115	240	630	0.234214	0.023421	
Powerwave	P65-16-XLLHH-RRRR	87	0	630	0.681417	0.068142	
Powerwave	P65-16-XLLHH-RRRR	87	120	630	0.681417	0.068142	
Powerwave	P65-16-XLLHH-RRRR	86	0	630	0.6838	0.06838	
Powerwave	P65-16-XLLHH-RRRR	86	120	630	0.717246	0.071725	
Powerwave	P65-16-XLLHH-RRRR	86	240	630	0.71974	0.071974	
Powerwave	P65-16-XLLHH-RRRR	86	240	630	0.717246	0.071725	

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AT&T Mobility
Rebuild Lemon Creek AK
Carrier Summary

Frequency: 869 MHz
Maximum Permissible Exposure (MPE): 579.33 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 12.15785 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 2.09859 %

On Axis						Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	
Kathrein-Scala	800-10865	115	0	630	1.330071	0.229586	
Kathrein-Scala	800-10865	115	120	630	1.330071	0.229586	
Kathrein-Scala	800-10865	115	240	630	1.301235	0.224609	
ANDREW	D8589	98	0	300	0.317291	0.054768	
ANDREW	D8589	98	0	300	0.317291	0.054768	
RFS	BMRG-D-B1	95	0	300	1.063662	0.183601	
ANDREW	BMRG-D-B1	95	0	300	1.063662	0.183601	
ANDREW	D8589	94	0	300	0.340297	0.058739	
ANDREW	D8589	94	0	300	0.340297	0.058739	
RFS	BMRG-D-B1	93	0	300	1.107212	0.191118	
RFS	BMRG-D-B1	93	0	300	1.107212	0.191118	
Powerwave	P65-16-XLLHH-RRRR	87	0	630	0.681417	0.117621	
Powerwave	P65-16-XLLHH-RRRR	87	120	630	0.681417	0.117621	
Powerwave	P65-16-XLLHH-RRRR	87	240	630	0.6838	0.118032	
ANDREW	D8589	86	0	600	0.831653	0.143553	
Powerwave	P65-16-XLLHH-RRRR	86	0	630	0.717246	0.123806	
Powerwave	P65-16-XLLHH-RRRR	86	120	630	0.71974	0.124236	
Powerwave	P65-16-XLLHH-RRRR	86	240	630	0.717246	0.123806	

AT&T Mobility
Rebuild Lemon Creek AK
Carrier Summary

Frequency: 737 MHz
Maximum Permissible Exposure (MPE): 491.33 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.90387 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.59102 %

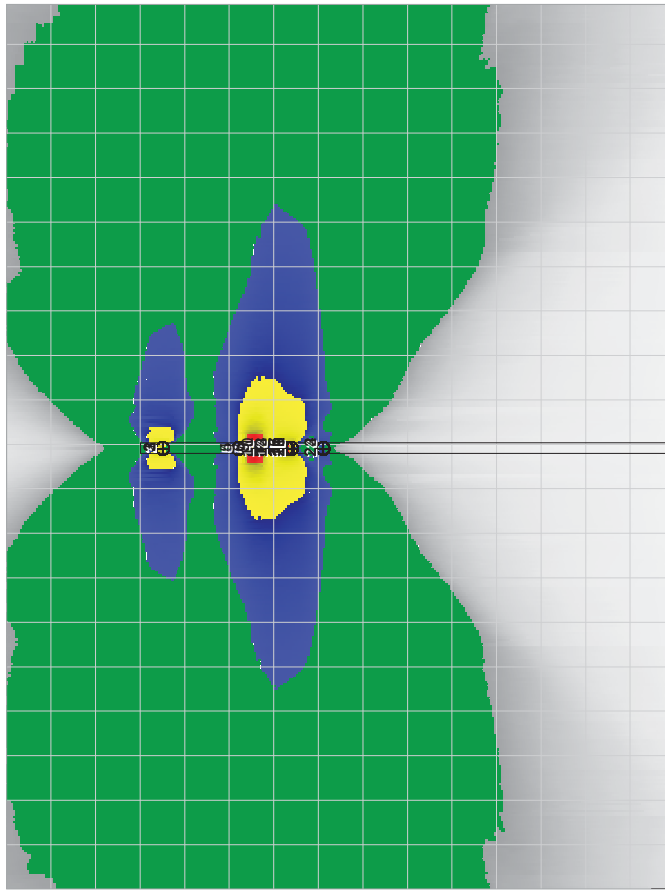
On Axis						Area	
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	
Kathrein-Scala	800-10865	115	0	630	0.385498	0.07846	
Kathrein-Scala	800-10865	115	120	630	0.385498	0.07846	
Kathrein-Scala	800-10865	115	240	630	0.385498	0.07846	
Powerwave	P65-16-XLLHH-RRRR	87	0	630	0.681417	0.136687	
Powerwave	P65-16-XLLHH-RRRR	87	120	630	0.681417	0.136687	
Powerwave	P65-16-XLLHH-RRRR	87	240	630	0.6838	0.139172	
Powerwave	P65-16-XLLHH-RRRR	86	0	630	0.717246	0.14598	
Powerwave	P65-16-XLLHH-RRRR	86	120	630	0.71974	0.146487	
Powerwave	P65-16-XLLHH-RRRR	86	240	630	0.717246	0.14598	

Alaska Digital
Rebuild Lemon Creek AK
Carrier Summary

Frequency: 1945 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 1.73467 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.17347 %

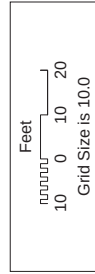
Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
RFS	APXV18-206516S-C	90	0	630	0.349316	0.034932	0.731922	0.073192
RFS	APXV18-206516S-C	90	120	630	0.349316	0.034932	0.731922	0.073192
RFS	APXV18-206516S-C	90	240	630	0.349316	0.034932	0.731922	0.073192
RFS	APXV18-206516S-C	79	0	600	0.401037	0.040104	0.924648	0.092465
RFS	APXV18-206516S-C	79	120	600	0.401037	0.040104	0.924648	0.092465
RFS	APXV18-206516S-C	79	240	600	0.401037	0.040104	0.924648	0.092465

RF Emissions Diagram for: Rebuild Lemon Creek AK
Elevation View



% of FCC Public Exposure Limit
Individual Points
5000 <= X
500 <= X < 5000
100 <= X < 500
5 <= X < 100
X <= 5

Site Name: Rebuild Lemon Creek AK
Site ID: 186986
www.sitesafe.com
Site Name: Rebuild Lemon Creek AK
Site ID: 186986
www.sitesafe.com



AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	115	Frequency (MHz):	1000	2135	Downtilt (Degrees):	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	-0.01	0.9986	1893.745	18937.42	0.000059	0.000006	1707101		
1.0	-0.06	0.9963	1893.55	1893.84	0.005857	0.000586	170734		0.0
2.0	-0.90	0.8128	947.06	946.49	0.023421	0.002342	42696		
3.0	-2.57	0.5534	631.54	630.67	0.052671	0.005267	18985		
4.0	-5.19	0.3027	473.82	472.67	0.092509	0.009250	10810		
5.0	-9.05	0.1245	373.23	372.79	0.144405	0.014440	6924		
6.0	-14.72	0.0337	316.20	314.47	0.173480	0.017348	5764		
7.0	-23.70	0.0043	271.21	269.19	0.202663	0.020266	4934		
8.0	-40.97	0.0001	237.49	235.18	0.212918	0.021292	4896		
9.0	-38.81	0.0001	211.28	208.68	0.152858	0.015286	6542		
10.0	-30.12	0.0010	190.34	187.45	0.081329	0.008133	12295		
12.0	-19.77	0.0105	158.97	155.50	0.013888	0.001390	71954		
14.0	-20.08	0.0098	136.62	132.56	0.018721	0.001872	53415		
16.0	-33.89	0.0004	119.91	115.27	0.024340	0.002434	41085		
18.0	-23.42	0.0045	106.96	101.72	0.030454	0.003045	32836		
20.0	-22.67	0.0054	96.64	90.81	0.019590	0.001964	50904		
22.0	-32.67	0.0005	88.23	81.81	0.023425	0.002342	42690		
24.0	-25.99	0.0025	81.26	74.24	0.027525	0.002753	36330		
26.0	-23.78	0.0042	75.40	67.77	0.020924	0.002092	47791		
28.0	-26.64	0.0022	70.40	62.16	0.023900	0.002390	41841		
30.0	-30.77	0.0008	66.10	57.25	0.048967	0.004897	20421		
32.0	-26.70	0.0021	62.37	52.89	0.011342	0.001134	8816		
34.0	-21.03	0.0079	59.11	49.00	0.152356	0.015236	6663		
36.0	-17.67	0.0171	56.23	45.49	0.167317	0.016732	5976		
38.0	-16.78	0.0210	53.69	42.30	0.182360	0.018236	5483		
40.0	-18.14	0.0153	51.42	39.39	0.197427	0.019743	5065		
42.0	-22.04	0.0063	49.40	36.71	0.212453	0.021245	4706		
44.0	-31.61	0.0007	47.58	34.23	0.208313	0.020831	4800		
46.0	-33.60	0.0004	45.95	31.92	0.127988	0.012799	7813		
48.0	-27.72	0.0017	44.48	29.76	0.037984	0.003798	26326		
50.0	-28.95	0.0013	43.15	27.73	0.037934	0.003793	26361		
52.0	-29.94	0.0010	41.94	25.82	0.076224	0.007622	13119		
54.0	-25.82	0.0026	40.85	24.01	0.098201	0.009820	10183		
56.0	-22.83	0.0052	39.87	22.29	0.102340	0.010234	9771		
58.0	-21.87	0.0065	38.97	20.65	0.106319	0.010632	9405		
60.0	-22.53	0.0056	38.17	19.08	0.110108	0.011011	9081		
62.0	-23.95	0.0040	37.43	17.57	0.113636	0.011364	8800		
64.0	-24.94	0.0032	36.77	16.12	0.112933	0.011293	8854		
66.0	-25.89	0.0026	36.18	14.72	0.088930	0.008893	11194		
68.0	-27.61	0.0017	35.65	13.35	0.068894	0.006889	14515		
70.0	-29.08	0.0012	35.17	12.03	0.059027	0.005903	16941		
72.0	-29.97	0.0010	34.75	10.74	0.044801	0.004480	22320		
74.0	-31.31	0.0007	34.38	9.48	0.030918	0.003092	32343		
76.0	-32.69	0.0005	34.06	8.24	0.024848	0.002485	40243		
78.0	-33.67	0.0004	33.79	7.03	0.019958	0.001996	50105		
80.0	-34.61	0.0003	33.56	5.83	0.014447	0.001444	69218		
82.0	-35.14	0.0003	33.38	4.65	0.011373	0.001137	87929		
84.0	-36.22	0.0002	33.23	3.47	0.009230	0.000923	108336		
86.0	-38.91	0.0001	33.13	2.31	0.007818	0.000782	127910		
88.0	-40.16	0.0001	33.07	1.15	0.006884	0.000688	145273		
90.0	-38.69	0.0001	33.05	0.00	0.004487	0.000449	222867		

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AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	115	Frequency (MHz):	1000	2135	Downtilt (Degrees):	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	-0.01	0.9986	1893.745	18937.42	0.000059	0.000006	1707101		
1.0	-0.06	0.9963	1893.54	1893.84	0.005857	0.000586	170734		0.0
2.0	-0.90	0.8128	947.06	946.49	0.023421	0.002342	42696		
3.0	-2.57	0.5534	631.54	630.67	0.052671	0.005267	18985		
4.0	-5.19	0.3027	473.82	472.67	0.092509	0.009250	10810		
5.0	-9.05	0.1245	373.23	372.79	0.144405	0.014440	6924		
6.0	-14.72	0.0337	316.20	314.47	0.173480	0.017348	5764		
7.0	-23.70	0.0043	271.21	269.19	0.202663	0.020266	4934		
8.0	-40.97	0.0001	237.49	235.18	0.212918	0.021292	4896		
9.0	-38.81	0.0001	211.28	208.68	0.152858	0.015286	6542		
10.0	-30.12	0.0010	190.34	187.45	0.081329	0.008133	12295		
12.0	-19.77	0.0105	158.97	155.50	0.013888	0.001384	72239		
14.0	-20.08	0.0098	136.62	132.56	0.018721	0.001872	53415		
16.0	-33.89	0.0004	119.91	115.27	0.024340	0.002427	41200		
18.0	-23.42	0.0045	106.96	101.72	0.030454	0.003045	32836		
20.0	-22.67	0.0054	96.64	90.81	0.019590	0.001959	51047		
22.0	-32.67	0.0005	88.23	81.81	0.023425	0.002342	42690		
24.0	-25.99	0.0025	81.26	74.24	0.027525	0.002753	36330		
26.0	-23.78	0.0042	75.40	67.77	0.020924	0.002092	47791		
28.0	-26.64	0.0022	70.40	62.16	0.023900	0.002390	41841		
30.0	-30.77	0.0008	66.10	57.25	0.048967	0.004897	20421		
32.0	-26.70	0.0021	62.37	52.89	0.011342	0.001134	8816		
34.0	-21.03	0.0079	59.11	49.00	0.152356	0.015236	6663		
36.0	-17.67	0.0171	56.23	45.49	0.167317	0.016732	5976		
38.0	-16.78	0.0210	53.69	42.30	0.182360	0.018236	5483		
40.0	-18.14	0.0153	51.42	39.39	0.197427	0.019743	5065		
42.0	-22.04	0.0063	49.40	36.71	0.212453	0.021245	4706		
44.0	-31.61	0.0007	47.58	34.23	0.208313	0.020831	4800		
46.0	-33.60	0.0004	45.95	31.92	0.127988	0.012799	7813		
48.0	-27.72	0.0017	44.48	29.76	0.037984	0.003798	26326		
50.0	-28.95	0.0013	43.15	27.73	0.037934	0.003793	26361		
52.0	-29.94	0.0010	41.94	25.82	0.076224	0.007622	13119		
54.0	-25.82	0.0026	40.85	24.01	0.098201	0.009820	10183		
56.0	-22.83	0.0052	39.87	22.29	0.102340	0.010234	9771		
58.0	-21.87	0.0065	38.97	20.65	0.106319	0.010632	9405		
60.0	-22.53	0.0056	38.17	19.08	0.110108	0.011011	9081		
62.0	-23.95	0.0040	37.43	17.57	0.113636	0.011364	8800		
64.0	-24.94	0.0032	36.77	16.12	0.112933	0.011293	8854		
66.0	-25.89	0.0026	36.18	14.72	0.088930	0.008893	11194		
68.0	-27.61	0.0017	35.65	13.35	0.068894	0.006889	14515		
70.0	-29.08	0.0012	35.17	12.03	0.059027	0.005903	16941		
72.0	-29.97	0.0010	34.75	10.74	0.044801	0.004480	22320		
74.0	-31.31	0.0007	34.38	9.48	0.030918	0.003092	32343		
76.0	-32.69	0.0005	34.06	8.24	0.024848	0.002485	40243		
78.0	-33.67	0.0004	33.79	7.03	0.019958	0.001996	50105		
80.0	-34.61	0.0003	33.56	5.83	0.014447	0.001444	69218		
82.0	-35.14	0.0003	33.38	4.65	0.011373	0.001137	87929		
84.0	-36.22	0.0002	33.23	3.47	0.009230	0.000923	108336		
86.0	-38.91	0.0001	33.13	2.31	0.007818	0.000782	127910		
88.0	-40.16	0.0001	33.07	1.15	0.006884	0.000688	145273		
90.0	-38.69	0.0001	33.05	0.00	0.004487	0.000449	222867		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XXLHH-RRRR Antenna Worksheet (0 Sector)

AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):					Frequency (MHz):				
630					1000				
Height (feet):					Downtilt (Degrees):				
630					2135				
Down tilt					0.0				
Percent of MPE					Below MPE				
0.000006					170710.1				
Power Density (µW/cm²)					Times				
0.00059					170710.1				
Dist From Structure (meters)					Slant Distance (meters)				
18937.42					18937.44				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.01					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
0.1					0.1				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				
Downtilt (Degrees):					Downtilt (Degrees):				
2135					2135				
Down tilt					Down tilt				
0.0					0.0				
Percent of MPE					Percent of MPE				
0.000006					0.000006				
Power Density (µW/cm²)					Power Density (µW/cm²)				
0.00059					0.00059				
Dist From Structure (meters)					Dist From Structure (meters)				
18937.42					18937.44				
Slant Distance (meters)					Slant Distance (meters)				
1893.84					1893.71				
Relative Gain					Relative Gain				
0.9986					1.0000				
Relative dB					Relative dB				
-0.06					0.00				
Depression Angle (degrees)					Depression Angle (degrees)				
1.0					1.0				
ERP (Watts):					ERP (Watts):				
630					630				
Height (feet):					Height (feet):				
630					630				

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	87	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)
Depression Angle (degrees)		Relative dB	Relative Gain	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Down tilt (Degrees):	Times Below MPE	
0.1	0.0	0.00	1.0000	18937.44	18937.42	0.000059	0.000006	170710	0.0
1.0	0.0	0.00	1.0000	1893.71	1893.55	0.000586	0.000586	170710	0.0
2.0	-0.70	-0.70	0.8511	946.49	946.49	0.023434	0.023434	42673	0.0
3.0	-2.10	-2.10	0.6166	630.67	630.67	0.052736	0.052736	18962	0.0
4.0	-4.50	-4.50	0.3548	472.67	472.67	0.093776	0.093776	10663	0.0
5.0	-8.00	-8.00	0.1585	377.79	377.79	0.118649	0.118649	8428	0.0
6.0	-12.90	-12.90	0.0513	315.42	315.42	0.142538	0.142538	7015	0.0
7.0	-14.80	-14.80	0.0331	270.30	269.19	0.166516	0.166516	6005	0.0
8.0	-12.10	-12.10	0.0617	236.45	235.18	0.190596	0.190596	5246	0.0
9.0	-10.50	-10.50	0.0891	210.12	208.68	0.214795	0.214795	4655	0.0
10.0	-10.40	-10.40	0.0912	189.04	187.45	0.239128	0.239128	4181	0.0
12.0	-15.80	-15.80	0.0263	157.42	155.50	0.288261	0.288261	3469	0.0
14.0	-23.50	-23.50	0.0045	134.81	132.56	0.159060	0.159060	6293	0.0
16.0	-13.90	-13.90	0.0407	117.84	115.27	0.201339	0.201339	4965	0.0
18.0	-17.50	-17.50	0.0178	94.06	90.81	0.239475	0.239475	4175	0.0
20.0	-17.50	-17.50	0.0111	85.40	81.81	0.186916	0.186916	3590	0.0
22.0	-25.70	-25.70	0.0027	78.18	74.24	0.208861	0.208861	4787	0.0
24.0	-29.70	-29.70	0.0011	72.07	67.77	0.286327	0.286327	4058	0.0
26.0	-23.60	-23.60	0.0044	66.82	62.16	0.208562	0.208562	3508	0.0
28.0	-17.00	-17.00	0.0200	62.28	57.25	0.289012	0.289012	3472	0.0
30.0	-15.20	-15.20	0.0302	58.30	52.89	0.149534	0.149534	6887	0.0
32.0	-16.50	-16.50	0.0224	54.79	49.00	0.208616	0.208616	4835	0.0
34.0	-20.80	-20.80	0.0083	51.68	45.49	0.289443	0.289443	3454	0.0
36.0	-29.90	-29.90	0.0010	48.90	42.30	0.322902	0.322902	3096	0.0
38.0	-32.70	-32.70	0.0005	44.14	36.71	0.394570	0.394570	2534	0.0
40.0	-33.80	-33.80	0.0004	42.10	34.23	0.428167	0.428167	2335	0.0
42.0	-26.10	-26.10	0.0025	38.56	29.76	0.456581	0.456581	2190	0.0
44.0	-24.80	-24.80	0.0033	37.02	27.73	0.111881	0.111881	8938	0.0
46.0	-25.20	-25.20	0.0030	35.61	25.82	0.048487	0.048487	20624	0.0
48.0	-27.30	-27.30	0.0019	33.14	22.29	0.075285	0.075285	13282	0.0
50.0	-29.30	-29.30	0.0012	32.06	20.65	0.101280	0.101280	10764	0.0
52.0	-32.30	-32.30	0.0006	31.07	19.08	0.107291	0.107291	9873	0.0
54.0	-35.30	-35.30	0.0003	30.17	17.57	0.110646	0.110646	9037	0.0
56.0	-37.00	-37.00	0.0002	29.34	16.12	0.118861	0.118861	8413	0.0
58.0	-38.50	-38.50	0.0001	28.59	14.72	0.099197	0.099197	10080	0.0
60.0	-39.50	-39.50	0.0001	27.92	13.35	0.059925	0.059925	16687	0.0
62.0	-41.00	-41.00	0.0001	27.31	12.03	0.036209	0.036209	27617	0.0
64.0	-43.30	-43.30	0.0001	26.77	10.74	0.015049	0.015049	66448	0.0
66.0	-45.70	-45.70	0.0000	26.29	9.48	0.008958	0.008958	111630	0.0
68.0	-45.10	-45.10	0.0000	25.87	8.24	0.006652	0.006652	150337	0.0
70.0	-43.80	-43.80	0.0000	25.50	7.03	0.006395	0.006395	157355	0.0
72.0	-43.30	-43.30	0.0000	25.20	5.83	0.004232	0.004232	236291	0.0
74.0	-44.50	-44.50	0.0000	24.95	4.65	0.002327	0.002327	429788	0.0
76.0	-45.00	-45.00	0.0000	24.76	3.47	0.002338	0.002338	427662	0.0
78.0	-42.90	-42.90	0.0001	24.63	2.31	0.002661	0.002661	375763	0.0
80.0	-43.50	-43.50	0.0001	24.52	0.00	0.002642	0.002642	378430	0.0

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	87	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)
Depression Angle (degrees)		Relative dB	Relative Gain	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Down tilt (Degrees):	Times Below MPE	
0.1	0.0	0.00	1.0000	18937.44	18937.42	0.000059	0.000006	170710	0.0
1.0	0.0	0.00	1.0000	1893.71	1893.55	0.000586	0.000586	170710	0.0
2.0	-0.70	-0.70	0.8511	946.49	946.49	0.023434	0.023434	42673	0.0
3.0	-2.10	-2.10	0.6166	630.67	630.67	0.052736	0.052736	18962	0.0
4.0	-4.50	-4.50	0.3548	472.67	472.67	0.093776	0.093776	10663	0.0
5.0	-8.00	-8.00	0.1585	377.79	377.79	0.118649	0.118649	8428	0.0
6.0	-12.90	-12.90	0.0513	315.42	315.42	0.142538	0.142538	7015	0.0
7.0	-14.80	-14.80	0.0331	270.30	269.19	0.166516	0.166516	6005	0.0
8.0	-12.10	-12.10	0.0617	236.45	235.18	0.190596	0.190596	5246	0.0
9.0	-10.50	-10.50	0.0891	210.12	208.68	0.214795	0.214795	4655	0.0
10.0	-10.40	-10.40	0.0912	189.04	187.45	0.239128	0.239128	4181	0.0
12.0	-15.80	-15.80	0.0263	157.42	155.50	0.288261	0.288261	3469	0.0
14.0	-23.50	-23.50	0.0045	134.81	132.56	0.159060	0.159060	6293	0.0
16.0	-13.90	-13.90	0.0407	117.84	115.27	0.201339	0.201339	4965	0.0
18.0	-17.50	-17.50	0.0178	94.06	90.81	0.239475	0.239475	4175	0.0
20.0	-17.50	-17.50	0.0111	85.40	81.81	0.186916	0.186916	3590	0.0
22.0	-25.70	-25.70	0.0027	78.18	74.24	0.208861	0.208861	4787	0.0
24.0	-29.70	-29.70	0.0011	72.07	67.77	0.286327	0.286327	4058	0.0
26.0	-23.60	-23.60	0.0044	66.82	62.16	0.208562	0.208562	3508	0.0
28.0	-17.00	-17.00	0.0200	62.28	57.25	0.289012	0.289012	3472	0.0
30.0	-15.20	-15.20	0.0302	58.30	52.89	0.149534	0.149534	6887	0.0
32.0	-16.50	-16.50	0.0224	54.79	49.00	0.208616	0.208616	4835	0.0
34.0	-20.80	-20.80	0.0083	51.68	45.49	0.289443	0.289443	3454	0.0
36.0	-29.90	-29.90	0.0010	48.90	42.30	0.322902	0.322902	3096	0.0
38.0	-32.70	-32.70	0.0005	44.14	36.71	0.394570	0.394570	2534	0.0
40.0	-33.80	-33.80	0.0004	42.10	34.23	0.428167	0.428167	2335	0.0
42.0	-26.10	-26.10	0.0025	38.56	29.76	0.456581	0.456581	2190	0.0
44.0	-24.80	-24.80	0.0033	37.02	27.73	0.111881	0.111881	8938	0.0
46.0	-25.20	-25.20	0.0030	35.61	25.82	0.048487	0.048487	20624	0.0
48.0	-27.30	-27.30	0.0019	33.14	22.29	0.075285	0.075285	13282	0.0
50.0	-29.30	-29.30	0.0012	32.06	20.65	0.101280	0.101280	10764	0.0
52.0	-32.30	-32.30	0.0006	31.07	19.08	0.107291	0.107291	9873	0.0
54.0	-35.30	-35.30	0.0003	30.17	17.57	0.110646	0.110646	9037	0.0
56.0	-37.00	-37.00	0.0002	29.34	16.12	0.118861	0.118861	8413	0.0
58.0	-38.50	-38.50	0.0001	28.59	14.72	0.099197	0.099197	10080	0.0
60.0	-39.50	-39.50	0.0001	27.92	13.35	0.059925	0.059925	16687	0.0
62.0	-41.00	-41.00	0.0001	27.31	12.03	0.036209	0.036209	27617	0.0
64.0	-43.30	-43.30	0.0001	26.77	10.74	0.015049	0.015049	66448	0.0
66.0	-45.70	-45.70	0.0000	26.29	9.48	0.008958	0.008958	111630	0.0
68.0	-45.10	-45.10	0.0000	25.87	8.24	0.006652	0.006652	150337	0.0
70.0	-43.80	-43.80	0.0000	25.50	7.03	0.006395	0.006395	157355	0.0
72.0	-43.30	-43.30	0.0000	25.20	5.83	0.004232	0.004232	236291	0.0
74.0	-44.50	-44.50	0.0000	24.95	4.65	0.002327	0.002327	429788	0.0
76.0	-45.00	-45.00	0.0000	24.76	3.47	0.002338	0.002338	427662	0.0
78.0	-42.90	-42.90	0.0001	24.63	2.31	0.002661	0.002661	375763	0.0
80.0	-43.50	-43.50	0.0001	24.52	0.00	0.002642	0.002642	378430	0.0

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	86	Frequency (MHz):	1000	Power Density (µW/cm²)	2135	Downtilt (Degrees):
Downnilt (Degrees):		0.0							
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)					Times Below MPE
0.1	0.0	1.0000	1893.74	1893.42			0.00059	0.00006	17071678
1.0	0.0	1.0000	1893.71	1893.55			0.000586	0.000586	170710
2.0	-0.70	0.8511	946.80	946.49			0.02343	0.02343	42672
3.0	-2.10	0.6166	631.14	630.67			0.052738	0.05274	18961
4.0	-4.50	0.3548	473.29	472.67			0.093782	0.09378	10663
5.0	-8.00	0.1585	378.56	377.79			0.118649	0.11865	8428
6.0	-12.90	0.0513	315.40	314.47			0.142538	0.14254	7015
7.0	-14.80	0.0311	270.27	269.19			0.166516	0.16652	6005
8.0	-12.10	0.0617	236.42	235.18			0.190596	0.19060	5246
9.0	-10.50	0.0891	210.08	208.68			0.214795	0.21479	4655
10.0	-10.40	0.0912	189.00	187.45			0.239128	0.23913	4181
12.0	-15.80	0.0263	157.37	155.50			0.288261	0.28826	3469
14.0	-23.50	0.0045	134.76	132.56			0.339134	0.33913	5871
16.0	-13.90	0.0407	117.78	115.27			0.399783	0.39978	6294
18.0	-17.50	0.0178	93.98	90.81			0.462497	0.46250	4957
20.0	-17.50	0.0178	93.98	90.81			0.462497	0.46250	4957
22.0	-25.70	0.0027	78.09	74.24			0.546602	0.54660	5138
24.0	-25.70	0.0027	78.09	74.24			0.546602	0.54660	5138
26.0	-29.70	0.0011	66.71	62.16			0.667130	0.66713	4046
28.0	-29.70	0.0011	66.71	62.16			0.667130	0.66713	4046
30.0	-17.00	0.0200	62.16	57.25			0.782617	0.78262	3228
32.0	-15.20	0.0302	58.17	52.89			0.882617	0.88262	5674
34.0	-16.50	0.0224	54.66	49.00			0.966588	0.96659	5244
36.0	-20.80	0.0083	51.53	45.49			0.109188	0.10919	3434
38.0	-29.90	0.0010	46.24	42.30			0.132498	0.13250	3077
40.0	-38.40	0.0001	38.39	34.23			0.160594	0.16060	2773
42.0	-32.70	0.0005	41.93	36.71			0.197794	0.19779	2513
44.0	-33.80	0.0004	41.93	36.71			0.197794	0.19779	2513
46.0	-26.10	0.0025	38.37	31.92			0.241533	0.24153	2120
48.0	-26.10	0.0025	38.37	31.92			0.241533	0.24153	2120
50.0	-24.80	0.0033	36.82	27.73			0.273256	0.27326	2679
52.0	-24.80	0.0033	36.82	27.73			0.273256	0.27326	2679
54.0	-25.20	0.0030	34.10	24.01			0.304403	0.30440	6694
56.0	-27.30	0.0019	32.91	22.29			0.341515	0.34152	22709
58.0	-29.30	0.0012	31.82	20.65			0.382825	0.38283	13621
60.0	-32.30	0.0006	30.83	19.08			0.428257	0.42826	9725
62.0	-35.30	0.0003	29.92	17.57			0.479077	0.47908	9167
64.0	-37.00	0.0002	29.09	16.12			0.532593	0.53259	8881
66.0	-38.90	0.0001	28.33	14.72			0.589106	0.58911	8260
68.0	-38.50	0.0001	27.65	13.35			0.648316	0.64832	9405
70.0	-39.50	0.0001	27.04	12.03			0.710290	0.71029	15316
72.0	-41.00	0.0001	26.49	10.74			0.774837	0.77484	25102
74.0	-43.30	0.0000	26.00	9.48			0.841648	0.84165	60665
76.0	-45.70	0.0000	25.58	8.24			0.910609	0.91061	104071
78.0	-45.10	0.0000	25.21	7.03			0.981881	0.98188	148866
80.0	-43.80	0.0000	24.90	5.83			0.006593	0.00659	151673
82.0	-43.30	0.0000	24.65	4.65			0.004446	0.00445	224943
84.0	-44.50	0.0000	24.46	3.47			0.002494	0.00250	419240
86.0	-45.00	0.0000	24.32	2.31			0.000273	0.00027	417135
88.0	-42.90	0.0001	24.24	1.15			0.002729	0.00273	366463
90.0	-43.50	0.0000	24.21	0.00			0.002709	0.00271	369079

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	86	Frequency (MHz):	1000	Power Density (µW/cm²)	2135	Downtilt (Degrees):
Downnilt (Degrees):		0.0							
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)					Times Below MPE
0.1	0.0	1.0000	1893.74	1893.42			0.00059	0.00006	17071677
1.0	0.0	1.0000	1893.71	1893.55			0.000588	0.000588	170710
2.0	-0.70	0.8511	946.80	946.49			0.02343	0.02343	42672
3.0	-2.10	0.6166	631.14	630.67			0.052738	0.05274	18961
4.0	-4.50	0.3548	473.29	472.67			0.093782	0.09378	10663
5.0	-8.00	0.1585	378.56	377.79			0.118649	0.11865	8428
6.0	-12.90	0.0513	315.40	314.47			0.142538	0.14254	7015
7.0	-14.80	0.0311	270.27	269.19			0.166516	0.16652	6005
8.0	-12.10	0.0617	236.42	235.18			0.190596	0.19060	5246
9.0	-10.50	0.0891	210.08	208.68			0.214795	0.21479	4655
10.0	-10.40	0.0912	189.00	187.45			0.239128	0.23913	4181
12.0	-15.80	0.0263	157.37	155.50			0.288261	0.28826	3469
14.0	-23.50	0.0045	134.76	132.56			0.339134	0.33913	5871
16.0	-13.90	0.0407	117.78	115.27			0.399783	0.39978	6294
18.0	-17.50	0.0178	93.98	90.81			0.462497	0.46250	4957
20.0	-17.50	0.0178	93.98	90.81			0.462497	0.46250	4957
22.0	-25.70	0.0027	78.09	74.24			0.546602	0.54660	5138
24.0	-25.70	0.0027	78.09	74.24			0.546602	0.54660	5138
26.0	-29.70	0.0011	66.71	62.16			0.667130	0.66713	4046
28.0	-29.70	0.0011	66.71	62.16			0.667130	0.66713	4046
30.0	-17.00	0.0200	62.16	57.25			0.782617	0.78262	3228
32.0	-15.20	0.0302	58.17	52.89			0.882617	0.88262	5674
34.0	-16.50	0.0224	54.66	49.00			0.966588	0.96659	5244
36.0	-20.80	0.0083	51.53	45.49			0.109188	0.10919	3434
38.0	-29.90	0.0010	46.24	42.30			0.132498	0.13250	3077
40.0	-38.40	0.0001	38.39	34.23			0.160594	0.16060	2773
42.0	-32.70	0.0005	41.93	36.71			0.197794	0.19779	2513
44.0	-33.80	0.0004	41.93	36.71			0.197794	0.19779	2513
46.0	-26.10	0.0025	38.37	31.92			0.241533	0.24153	2120
48.0	-26.10	0.0025	38.37	31.92			0.241533	0.24153	2120
50.0	-24.80	0.0033	36.82	27.73			0.273256	0.27326	2679
52.0	-24.80	0.0033	36.82	27.73			0.273256	0.27326	2679
54.0	-25.20	0.0030	34.10	24.01			0.304403	0.30440	6694
56.0	-27.30	0.0019	32.91	22.29			0.341515	0.34152	22709
58.0	-29.30	0.0012	31.82	20.65			0.382825	0.38283	13621
60.0	-32.30	0.0006	30.83	19.08			0.428257	0.42826	9725
62.0	-35.30	0.0003	29.92	17.57			0.479077	0.47908	9167
64.0	-37.00	0.0002	29.09	16.12			0.532593	0.53259	8881
66.0	-38.90	0.0001	28.33	14.72			0.589106	0.58911	8260
68.0	-38.50	0.0001	27.65	13.35			0.648316	0.64832	9405
70.0	-39.50	0.0001	27.04	12.03			0.710290	0.71029	15316
72.0	-41.00	0.0001	26.49	10.74			0.774837	0.77484	60665
74.0	-43.30	0.0000	26.00	9.48			0.841648	0.84165	104071
76.0	-45.70	0.0000	25.58	8.24			0.910609	0.91061	148866
78.0	-45.10	0.0000	25.21	7.03			0.006593	0.00659	151673
80.0	-43.80	0.0000	24.90	5.83			0.004446	0.00445	224943
82.0	-43.30	0.0000	24.65	4.65			0.002494	0.00250	419240
84.0	-44.50	0.0000	24.46	3.47			0.000273	0.00027	39957
86.0	-45.00	0.0000	24.32	2.31			0.002729	0.00273	366463
88.0	-42.90	0.0001	24.24	1.15			0.002723	0.00272	367303
90.0	-43.50	0.0000	24.21	0.00			0.002709	0.00271	369080

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AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Skala:800-10865 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	115	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)
Depression Angle (degrees)		Relative dB	Relative Gain	Dist From Structure (meters)	Power Density (µW/cm²)	Power Density (µW/cm²)	Percent of MPE	Down tilt (Degrees):	Times Below MPE
0.1	0.1	0.00	0.9993	1893.45	1893.42	0.000059	0.000006		1707101
1.0	1.0	-0.03	0.9931	1893.84	1893.55	0.005867	0.000586		170734
2.0	2.0	-0.73	0.8453	947.06	946.49	0.023421	0.002342		42696
3.0	3.0	-2.14	0.6109	631.54	630.67	0.052671	0.005267		18985
4.0	4.0	-4.32	0.3988	472.67	472.67	0.093570	0.009357		10687
5.0	5.0	-7.44	0.1803	379.23	377.79	0.146070	0.014607		6846
6.0	6.0	-11.86	0.0652	316.20	314.47	0.187111	0.018711		5344
7.0	7.0	-18.34	0.0147	271.21	269.19	0.218587	0.021859		4269
8.0	8.0	-27.79	0.0017	237.49	235.18	0.234243	0.023424		3544
9.0	9.0	-28.28	0.0015	211.28	208.68	0.184518	0.018452		5419
10.0	10.0	-28.35	0.0015	187.45	187.45	0.115615	0.011562		8649
12.0	12.0	-32.43	0.0006	158.97	155.50	0.115613	0.001561		64050
14.0	14.0	-21.87	0.0065	136.62	132.56	0.009979	0.000998		100209
16.0	16.0	-23.91	0.0041	119.91	115.27	0.042893	0.004289		23313
18.0	18.0	-22.36	0.0068	106.96	101.72	0.064840	0.006484		15422
20.0	20.0	-16.27	0.0236	96.64	90.81	0.079236	0.007924		12620
22.0	22.0	-15.69	0.0270	88.23	81.81	0.094735	0.009474		10555
24.0	24.0	-19.02	0.0125	81.26	74.24	0.111278	0.011128		8886
26.0	26.0	-21.16	0.0077	75.40	67.77	0.128773	0.012877		7765
28.0	28.0	-19.57	0.0110	70.40	62.16	0.104856	0.010486		9536
30.0	30.0	-20.61	0.0087	66.10	57.25	0.067342	0.006734		14849
32.0	32.0	-24.64	0.0034	62.37	52.89	0.075240	0.007524		13290
34.0	34.0	-27.65	0.0017	59.11	49.00	0.081359	0.008136		12291
36.0	36.0	-25.73	0.0027	56.23	45.49	0.107514	0.010751		9301
38.0	38.0	-22.12	0.0061	53.69	42.30	0.157186	0.015719		6361
40.0	40.0	-18.83	0.0131	51.42	39.39	0.170365	0.017037		5869
42.0	42.0	-17.48	0.0179	49.40	36.71	0.183562	0.018356		5447
44.0	44.0	-18.06	0.0156	47.58	34.23	0.196730	0.019673		5083
46.0	46.0	-20.11	0.0097	45.95	31.92	0.209779	0.020978		4766
48.0	48.0	-23.37	0.0046	44.48	29.76	0.219341	0.021934		4559
50.0	50.0	-27.87	0.0016	43.15	27.73	0.171825	0.017183		5819
52.0	52.0	-31.28	0.0007	41.94	25.82	0.101730	0.010173		9829
54.0	54.0	-31.56	0.0007	40.85	24.01	0.043475	0.004348		21923
56.0	56.0	-31.10	0.0008	39.87	22.29	0.043475	0.004348		23001
58.0	58.0	-28.48	0.0014	38.97	20.65	0.060258	0.006026		16595
60.0	60.0	-25.91	0.0026	38.17	19.08	0.066374	0.006637		15066
62.0	62.0	-24.59	0.0035	37.43	17.57	0.068567	0.006857		14584
64.0	64.0	-24.31	0.0037	36.77	16.12	0.070631	0.007063		14158
66.0	66.0	-24.77	0.0033	36.18	14.72	0.072521	0.007252		13789
68.0	68.0	-25.77	0.0026	35.65	13.35	0.074190	0.007419		13478
70.0	70.0	-27.41	0.0018	35.17	12.03	0.073239	0.007324		13653
72.0	72.0	-29.93	0.0010	34.75	10.74	0.063464	0.006346		15756
74.0	74.0	-33.38	0.0005	34.38	9.48	0.048548	0.004855		20598
76.0	76.0	-37.28	0.0002	34.06	8.24	0.031507	0.003151		31739
78.0	78.0	-41.31	0.0001	33.79	7.03	0.016472	0.001647		60708
80.0	80.0	-46.19	0.0000	33.56	5.83	0.007322	0.000732		136552
82.0	82.0	-52.25	0.0000	33.28	4.65	0.003129	0.000313		319581
84.0	84.0	-61.45	0.0000	33.23	3.47	0.001217	0.000122		821936
86.0	86.0	-55.48	0.0000	33.13	2.31	0.001334	0.000133		749752
88.0	88.0	-46.67	0.0000	33.07	1.15	0.001714	0.000171		583524
90.0	90.0	-43.17	0.0000	33.05	0.00	0.002031	0.000203		492270

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	86	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)
Depression Angle (degrees)		Relative dB	Relative Gain	Dist From Structure (meters)	Power Density (µW/cm²)	Power Density (µW/cm²)	Percent of MPE	Down tilt (Degrees):	Times Below MPE
0.1	0.1	0.00	1.0000	1893.44	1893.42	0.000059	0.000006		17071678
1.0	1.0	0.00	1.0000	1893.71	1893.55	0.000588	0.000586		170710
2.0	2.0	-0.70	0.8611	946.80	946.49	0.023434	0.002343		42672
3.0	3.0	-2.10	0.6166	631.14	630.67	0.052738	0.005274		18961
4.0	4.0	-4.50	0.3548	472.59	472.67	0.093782	0.009378		10663
5.0	5.0	-8.00	0.1585	379.56	377.79	0.118649	0.011865		8428
6.0	6.0	-12.90	0.0513	315.40	314.47	0.142538	0.014254		7015
7.0	7.0	-14.80	0.0313	270.27	269.19	0.166516	0.016652		6005
8.0	8.0	-12.10	0.0617	236.42	235.18	0.190596	0.019060		5246
9.0	9.0	-10.50	0.0891	210.08	208.68	0.214795	0.021479		4655
10.0	10.0	-10.40	0.0912	189.00	187.45	0.239128	0.023913		4181
12.0	12.0	-15.80	0.0263	157.37	155.50	0.288261	0.028826		3469
14.0	14.0	-23.50	0.0045	134.76	132.56	0.170997	0.017010		5878
16.0	16.0	-13.90	0.0407	117.78	115.27	0.159072	0.015907		6286
18.0	18.0	-13.20	0.0479	104.57	101.72	0.204947	0.020445		4964
20.0	20.0	-17.50	0.0078	93.98	90.81	0.249471	0.024947		4008
22.0	22.0	-29.50	0.0011	85.31	81.81	0.194107	0.019411		5151
24.0	24.0	-25.70	0.0011	71.96	67.77	0.209374	0.020937		4776
26.0	26.0	-29.70	0.0011	66.77	62.16	0.246266	0.024627		4096
28.0	28.0	-23.60	0.0044	66.71	57.25	0.286021	0.028602		3460
30.0	30.0	-15.20	0.0302	58.17	52.89	0.311336	0.031134		3211
32.0	32.0	-16.50	0.0224	54.66	49.00	0.191877	0.019188		5211
34.0	34.0	-20.80	0.0083	51.53	45.49	0.288970	0.028897		3460
36.0	36.0	-29.90	0.0010	48.74	42.30	0.322181	0.032218		3103
38.0	38.0	-38.40	0.0001	46.24	39.39	0.360594	0.036059		2773
40.0	40.0	-32.70	0.0005	43.97	36.71	0.393759	0.039376		2538
42.0	42.0	-33.80	0.0004	41.93	34.23	0.436985	0.043698		2288
44.0	44.0	-29.70	0.0011	40.06	31.92	0.465562	0.046556		2147
46.0	46.0	-26.10	0.0025	38.37	29.76	0.368061	0.036806		2716
48.0	48.0	-24.80	0.0033	36.82	27.73	0.151661	0.015166		6993
50.0	50.0	-24.30	0.0037	35.40	25.82	0.043413	0.004341		23034
52.0	52.0	-25.20	0.0030	34.10	24.01	0.074568	0.007457		13410
54.0	54.0	-27.30	0.0019	32.91	22.29	0.095151	0.009515		10509
56.0	56.0	-27.30	0.0012	31.82	20.65	0.100809	0.010081		9919
58.0	58.0	-29.30	0.0006	30.83	19.08	0.106740	0.010674		9988
60.0	60.0	-32.30	0.0003	29.92	17.57	0.115205	0.011521		8880
62.0	62.0	-35.30	0.0002	29.09	16.12	0.118317	0.011832		8451
64.0	64.0	-37.00	0.0001	28.33	14.72	0.108921	0.010892		9180
66.0	66.0	-38.90	0.0001	27.65	13.35	0.067146	0.006715		14892
68.0	68.0	-38.50	0.0001	27.04	12.03	0.038736	0.003874		25815
70.0	70.0	-41.00	0.0001	26.49	10.74	0.016006	0.001601		62476
72.0	72.0	-43.30	0.0000	26.00	9.48	0.009915	0.000992		10856
74.0	74.0	-45.70	0.0000	25.58	8.24	0.006594	0.000659		151660
76.0	76.0	-45.10	0.0000	25.21	7.03	0.006335	0.000634		157840
78.0	78.0	-43.80	0.0000	24.90	5.83	0.004244	0.000424		235643
80.0	80.0	-43.30	0.0000	24.65	4.65	0.002494	0.000249		401024
82.0	82.0	-44.50	0.0000	24.46	3.47	0.002500	0.000250		39957
84.0	84.0	-45.00	0.0000	24.32	2.31	0.002623	0.000262		381229
86.0	86.0	-42.90	0.0001	24.24	1.15	0.002613	0.000261		382723
88.0	88.0	-43.50	0.0000	24.21	0.00	0.002581	0.000258		387392

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AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Down tilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	0.0	0.0	0.9993	1893.45	18937.42	0.000059	0.000006	1707101	
1.0	-0.03	-0.03	0.9931	1893.84	1893.55	0.005867	0.000586	170734	
2.0	-0.73	-0.73	0.8453	947.06	946.49	0.023421	0.002342	42696	
3.0	-2.14	-2.14	0.6109	631.54	630.67	0.052671	0.005267	18985	
4.0	-4.32	-4.32	0.3988	473.82	472.67	0.093570	0.009357	10687	
5.0	-7.44	-7.44	0.1803	373.23	377.79	0.146070	0.014607	6846	
6.0	-11.86	-11.86	0.0652	316.20	314.47	0.187111	0.018711	5344	
7.0	-18.34	-18.34	0.0147	271.21	269.19	0.218587	0.021859	4269	
8.0	-27.79	-27.79	0.0017	237.49	235.18	0.234241	0.023421	4269	
9.0	-28.28	-28.28	0.0015	211.28	208.68	0.184518	0.018452	5419	
10.0	-28.35	-28.35	0.0015	190.34	187.45	0.115571	0.011557	8652	
12.0	-32.43	-32.43	0.0006	158.97	155.50	0.015613	0.001561	64049	
14.0	-21.87	-21.87	0.0065	136.62	132.56	0.009956	0.009956	100439	
16.0	-23.91	-23.91	0.0041	119.91	115.27	0.042883	0.004289	23313	
18.0	-22.36	-22.36	0.0058	106.96	101.72	0.064543	0.006454	15493	
20.0	-16.27	-16.27	0.0236	96.64	90.81	0.079236	0.007924	12620	
22.0	-15.69	-15.69	0.0270	88.23	81.81	0.094350	0.009435	10598	
24.0	-19.02	-19.02	0.0125	81.26	74.24	0.110839	0.011084	9022	
26.0	-21.16	-21.16	0.0077	75.40	67.77	0.128200	0.012820	7800	
28.0	-19.57	-19.57	0.0110	70.40	62.16	0.104376	0.010438	9580	
30.0	-20.61	-20.61	0.0087	66.10	57.25	0.067342	0.006734	14849	
32.0	-24.64	-24.64	0.0034	62.37	52.89	0.075240	0.007524	13350	
34.0	-27.65	-27.65	0.0017	59.11	49.00	0.081359	0.008136	12291	
36.0	-25.73	-25.73	0.0027	56.23	45.49	0.106899	0.010690	9354	
38.0	-22.12	-22.12	0.0061	53.69	42.30	0.156168	0.015617	6403	
40.0	-18.83	-18.83	0.0131	51.42	38.39	0.170365	0.017037	5869	
42.0	-17.48	-17.48	0.0179	49.40	36.71	0.181955	0.018195	5495	
44.0	-18.06	-18.06	0.0156	47.58	34.23	0.196730	0.019673	5083	
46.0	-20.11	-20.11	0.0097	45.95	31.92	0.207176	0.020718	4826	
48.0	-23.37	-23.37	0.0046	44.48	29.76	0.216095	0.021610	4627	
50.0	-27.87	-27.87	0.0016	43.15	27.73	0.171825	0.017183	5819	
52.0	-31.28	-31.28	0.0007	41.94	25.82	0.098715	0.009871	10028	
54.0	-31.56	-31.56	0.0008	40.85	24.01	0.045613	0.004561	21923	
56.0	-31.10	-31.10	0.0008	39.87	22.29	0.043475	0.004348	23001	
58.0	-28.48	-28.48	0.0014	38.97	20.65	0.058652	0.005865	17049	
60.0	-25.91	-25.91	0.0026	38.17	19.08	0.064515	0.006451	15500	
62.0	-24.59	-24.59	0.0035	37.43	17.57	0.068567	0.006857	14584	
64.0	-24.31	-24.31	0.0037	36.77	16.12	0.068459	0.006846	14607	
66.0	-24.77	-24.77	0.0024	36.18	14.72	0.072521	0.007252	13789	
68.0	-25.77	-25.77	0.0026	35.65	13.35	0.074190	0.007419	13478	
70.0	-27.41	-27.41	0.0018	35.17	12.03	0.070988	0.007099	14086	
72.0	-29.93	-29.93	0.0010	34.75	10.74	0.061506	0.006151	16258	
74.0	-33.38	-33.38	0.0005	34.38	9.48	0.048548	0.004855	20598	
76.0	-37.28	-37.28	0.0002	34.06	8.24	0.030570	0.003057	32712	
78.0	-41.31	-41.31	0.0001	33.79	7.03	0.015984	0.001599	62521	
80.0	-46.19	-46.19	0.0000	33.56	5.83	0.007103	0.000710	140788	
82.0	-52.25	-52.25	0.0000	33.38	4.65	0.003129	0.000313	319581	
84.0	-61.45	-61.45	0.0000	33.23	3.47	0.001217	0.000122	821936	
86.0	-55.48	-55.48	0.0000	33.13	2.31	0.001290	0.000129	775437	
88.0	-46.67	-46.67	0.0000	33.07	1.15	0.001655	0.000165	604258	
90.0	-43.17	-43.17	0.0000	33.05	0.00	0.001958	0.000196	510688	

AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Down tilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	0.0	0.0	0.9993	1893.45	18937.42	0.000059	0.000006	1707101	
1.0	-0.03	-0.03	0.9931	1893.84	1893.55	0.005867	0.000586	170734	
2.0	-0.73	-0.73	0.8453	947.06	946.49	0.023421	0.002342	42696	
3.0	-2.14	-2.14	0.6109	631.54	630.67	0.052671	0.005267	18985	
4.0	-4.32	-4.32	0.3988	473.82	472.67	0.093570	0.009357	10687	
5.0	-7.44	-7.44	0.1803	373.23	377.79	0.146070	0.014607	6846	
6.0	-11.86	-11.86	0.0652	316.20	314.47	0.187111	0.018711	5344	
7.0	-18.34	-18.34	0.0147	271.21	269.19	0.218587	0.021859	4269	
8.0	-27.79	-27.79	0.0017	237.49	235.18	0.234241	0.023424	4269	
9.0	-28.28	-28.28	0.0015	211.28	208.68	0.184471	0.018447	5420	
10.0	-28.35	-28.35	0.0015	190.34	187.45	0.115621	0.011562	6449	
12.0	-32.43	-32.43	0.0006	158.97	155.50	0.015595	0.001559	8623	
14.0	-21.87	-21.87	0.0065	136.62	132.56	0.009979	0.009988	100209	
16.0	-23.91	-23.91	0.0041	119.91	115.27	0.042735	0.004273	23400	
18.0	-22.36	-22.36	0.0058	106.96	101.72	0.064840	0.006484	15422	
20.0	-16.27	-16.27	0.0236	96.64	90.81	0.078873	0.007887	12678	
22.0	-15.69	-15.69	0.0270	88.23	81.81	0.094735	0.009474	10555	
24.0	-19.02	-19.02	0.0125	81.26	74.24	0.111278	0.011128	8986	
26.0	-21.16	-21.16	0.0077	75.40	67.77	0.128773	0.012877	7765	
28.0	-19.57	-19.57	0.0110	70.40	62.16	0.104856	0.010486	9536	
30.0	-20.61	-20.61	0.0087	66.10	57.25	0.067051	0.006705	14914	
32.0	-24.64	-24.64	0.0034	62.37	52.89	0.075240	0.007524	13290	
34.0	-27.65	-27.65	0.0017	59.11	49.00	0.081359	0.008136	12352	
36.0	-25.73	-25.73	0.0027	56.23	45.49	0.107514	0.010751	9301	
38.0	-22.12	-22.12	0.0061	53.69	42.30	0.157196	0.015719	6361	
40.0	-18.83	-18.83	0.0131	51.42	38.39	0.169089	0.016909	5914	
42.0	-17.48	-17.48	0.0179	49.40	36.71	0.183556	0.018356	5447	
44.0	-18.06	-18.06	0.0156	47.58	34.23	0.194660	0.019466	5137	
46.0	-20.11	-20.11	0.0097	45.95	31.92	0.209779	0.020978	4766	
48.0	-23.37	-23.37	0.0046	44.48	29.76	0.218341	0.021834	4559	
50.0	-27.87	-27.87	0.0016	43.15	27.73	0.168852	0.016885	5922	
52.0	-31.28	-31.28	0.0007	41.94	25.82	0.101730	0.010173	9829	
54.0	-31.56	-31.56	0.0007	40.85	24.01	0.044596	0.004460	22423	
56.0	-31.10	-31.10	0.0008	39.87	22.29	0.042408	0.004241	23580	
58.0	-28.48	-28.48	0.0014	38.97	20.65	0.060258	0.006026	16595	
60.0	-25.91	-25.91	0.0026	38.17	19.08	0.066374	0.006637	15066	
62.0	-24.59	-24.59	0.0035	37.43	17.57	0.066552	0.006655	15025	
64.0	-24.31	-24.31	0.0037	36.77	16.12	0.070631	0.007063	14158	
66.0	-24.77	-24.77	0.0024	36.18	14.72	0.070238	0.007024	14237	
68.0	-25.77	-25.77	0.0026	35.65	13.35	0.071873	0.007187	13913	
70.0	-27.41	-27.41	0.0018	35.17	12.03	0.073239	0.007324	13653	
72.0	-29.93	-29.93	0.0010	34.75	10.74	0.063464	0.006346	15756	
74.0	-33.38	-33.38	0.0005	34.38	9.48	0.047062	0.004706	21248	
76.0	-37.28	-37.28	0.0002	34.06	8.24	0.031507	0.003151	31739	
78.0	-41.31	-41.31	0.0001	33.79	7.03	0.016472	0.001647	60708	
80.0	-46.19	-46.19	0.0000	33.56	5.83	0.007322	0.000732	136592	
82.0	-52.25	-52.25	0.0000	33.38	4.65	0.003031	0.000303	329884	
84.0	-61.45	-61.45	0.0000	33.23	3.47	0.001177	0.000118	849300	
86.0	-55.48	-55.48	0.0000	33.13	2.31	0.001354	0.000133	749752	
88.0	-46.67	-46.67	0.0000	33.07	1.15	0.001711	0.000171	583524	
90.0	-43.17	-43.17	0.0000	33.05	0.00	0.002030	0.000203	492548	

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Downtilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000006	17071677		
1.0	0.0	1.0000	1893.71	1893.55	0.000586	0.000586	170710		
2.0	-0.90	0.8128	946.49	946.49	0.023434	0.023434	42673		
3.0	-2.70	0.5670	631.15	630.67	0.052736	0.052736	18962		
4.0	-5.80	0.2630	473.30	472.67	0.093776	0.093776	10663		
5.0	-11.30	0.0741	378.58	377.79	0.143234	0.143234	6981		
6.0	-21.50	0.0071	315.42	314.47	0.200857	0.200857	4978		
7.0	-41.90	0.0024	270.30	269.19	0.234644	0.234644	4261		
8.0	-10.50	0.0891	236.45	235.18	0.268577	0.268577	3723		
9.0	-9.20	0.1202	210.12	208.68	0.302676	0.302676	3303		
10.0	-9.80	0.1047	189.04	187.45	0.338965	0.338965	2967		
12.0	-17.00	0.0200	157.42	155.50	0.247820	0.247820	4035		
14.0	-23.20	0.0048	134.81	132.56	0.157483	0.157483	6349		
16.0	-16.20	0.0240	117.84	115.27	0.200683	0.200683	4852		
18.0	-20.40	0.0091	104.64	101.72	0.261373	0.261373	3825		
20.0	-25.30	0.0030	94.06	90.81	0.268633	0.268633	3722		
22.0	-19.90	0.0102	85.40	81.81	0.113860	0.113860	8782		
24.0	-26.80	0.0021	78.18	74.24	0.102382	0.102382	9767		
26.0	-20.20	0.0095	72.07	67.77	0.120355	0.120355	8908		
28.0	-13.60	0.0437	66.82	62.16	0.126080	0.126080	7931		
30.0	-12.60	0.0550	62.28	57.25	0.187476	0.187476	5335		
32.0	-15.20	0.0302	58.30	52.89	0.386853	0.386853	2584		
34.0	-23.10	0.0049	54.79	49.00	0.448945	0.448945	2227		
36.0	-32.40	0.0006	51.68	45.49	0.502805	0.502805	1988		
38.0	-24.60	0.0035	48.90	42.30	0.559530	0.559530	1787		
40.0	-29.50	0.0011	46.40	38.39	0.619110	0.619110	1615		
42.0	-30.00	0.0010	44.14	36.71	0.681417	0.681417	1467		
44.0	-20.90	0.0081	42.10	34.23	0.670319	0.670319	1491		
46.0	-18.10	0.0155	40.25	31.92	0.331223	0.331222	3019		
48.0	-18.20	0.0151	38.56	29.76	0.113831	0.113831	8784		
50.0	-20.60	0.0087	37.02	27.73	0.260914	0.260914	3832		
52.0	-25.00	0.0032	35.61	25.82	0.331583	0.331583	3015		
54.0	-32.40	0.0006	34.32	24.01	0.354892	0.354892	2817		
56.0	-44.70	0.0000	33.14	22.29	0.378368	0.378367	2642		
58.0	-35.00	0.0003	32.06	20.65	0.402370	0.402370	2485		
60.0	-31.30	0.0007	31.07	19.08	0.421847	0.421847	2370		
62.0	-29.20	0.0012	30.17	17.57	0.300079	0.300079	3332		
64.0	-28.90	0.0013	29.34	16.12	0.117399	0.117399	8517		
66.0	-30.10	0.0010	28.59	14.72	0.044104	0.044104	22673		
68.0	-32.50	0.0006	27.92	13.35	0.045863	0.045863	21803		
70.0	-34.50	0.0004	27.31	12.03	0.047444	0.047444	21077		
72.0	-34.70	0.0003	26.77	10.74	0.048822	0.048822	20482		
74.0	-34.70	0.0003	26.29	9.48	0.050101	0.050101	19959		
76.0	-34.70	0.0003	25.87	8.24	0.035618	0.035618	28075		
78.0	-35.60	0.0003	25.50	7.03	0.018297	0.018297	54653		
80.0	-37.30	0.0002	25.20	5.83	0.014934	0.014934	66961		
82.0	-37.80	0.0002	24.95	4.65	0.015038	0.015038	66499		
84.0	-38.80	0.0001	24.76	3.47	0.014166	0.014166	70589		
86.0	-41.00	0.0001	24.63	2.31	0.009151	0.009151	109277		
88.0	-43.20	0.0000	24.54	1.15	0.007486	0.007486	133579		
90.0	-48.20	0.0000	24.52	0.00	0.004785	0.004785	209892		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Downtilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000006	17071677		
1.0	0.0	1.0000	1893.71	1893.55	0.000586	0.000586	170710		
2.0	-0.90	0.8128	946.49	946.49	0.023434	0.023434	42673		
3.0	-2.70	0.5670	631.15	630.67	0.052736	0.052736	18962		
4.0	-5.80	0.2630	473.30	472.67	0.093776	0.093776	10663		
5.0	-11.30	0.0741	378.58	377.79	0.143234	0.143234	6981		
6.0	-21.50	0.0071	315.42	314.47	0.200857	0.200857	4978		
7.0	-41.90	0.0024	270.30	269.19	0.234644	0.234644	4261		
8.0	-10.50	0.0891	236.45	235.18	0.268577	0.268577	3723		
9.0	-9.20	0.1202	210.12	208.68	0.302676	0.302676	3303		
10.0	-9.80	0.1047	189.04	187.45	0.338965	0.338965	2967		
12.0	-17.00	0.0200	157.42	155.50	0.247820	0.247820	4035		
14.0	-23.20	0.0048	134.81	132.56	0.157483	0.157483	6349		
16.0	-16.20	0.0240	117.84	115.27	0.200683	0.200683	4852		
18.0	-20.40	0.0091	104.64	101.72	0.261373	0.261373	3825		
20.0	-25.30	0.0030	94.06	90.81	0.268633	0.268633	3722		
22.0	-19.90	0.0102	85.40	81.81	0.113860	0.113860	8782		
24.0	-26.80	0.0021	78.18	74.24	0.102382	0.102382	9767		
26.0	-20.20	0.0095	72.07	67.77	0.120355	0.120356	8908		
28.0	-13.60	0.0437	66.82	62.16	0.126080	0.126080	7931		
30.0	-12.60	0.0550	62.28	57.25	0.187426	0.187423	5335		
32.0	-15.20	0.0302	58.30	52.89	0.386853	0.386853	2584		
34.0	-23.10	0.0049	54.79	49.00	0.448945	0.448945	2227		
36.0	-32.40	0.0006	51.68	45.49	0.502805	0.502800	1988		
38.0	-24.60	0.0035	48.90	42.30	0.559530	0.559533	1787		
40.0	-29.50	0.0011	46.40	38.39	0.619110	0.561911	1615		
42.0	-30.00	0.0010	44.14	36.71	0.681417	0.681432	1467		
44.0	-20.90	0.0081	42.10	34.23	0.670319	0.670322	1491		
46.0	-18.10	0.0155	40.25	31.92	0.331223	0.331222	3019		
48.0	-18.20	0.0151	38.56	29.76	0.113831	0.113833	8784		
50.0	-20.60	0.0087	37.02	27.73	0.260914	0.260914	3832		
52.0	-25.00	0.0032	35.61	25.82	0.331583	0.331558	3015		
54.0	-32.40	0.0006	34.32	24.01	0.354892	0.354889	2817		
56.0	-44.70	0.0000	33.14	22.29	0.378368	0.378337	2642		
58.0	-35.00	0.0003	32.06	20.65	0.402370	0.402337	2485		
60.0	-31.30	0.0007	31.07	19.08	0.421847	0.42185	2370		
62.0	-29.20	0.0012	30.17	17.57	0.300079	0.300008	3332		
64.0	-28.90	0.0013	29.34	16.12	0.117399	0.11740	8517		
66.0	-30.10	0.0010	28.59	14.72	0.044104	0.04410	22673		
68.0	-32.50	0.0006	27.92	13.35	0.045863	0.04586	21803		
70.0	-34.50	0.0004	27.31	12.03	0.047444	0.047444	21077		
72.0	-34.70	0.0003	26.77	10.74	0.048822	0.04882	20482		
74.0	-34.70	0.0003	26.29	9.48	0.050101	0.05010	19959		
76.0	-34.70	0.0003	25.87	8.24	0.035618	0.035618	28075		
78.0	-35.60	0.0003	25.50	7.03	0.018297	0.01830	54653		
80.0	-37.30	0.0002	25.20	5.83	0.014934	0.014934	66961		
82.0	-37.80	0.0002	24.95	4.65	0.015038	0.01504	66499		
84.0	-38.80	0.0001	24.76	3.47	0.014166	0.01417	70589		
86.0	-41.00	0.0001	24.63	2.31	0.009151	0.00915	109277		
88.0	-43.20	0.0000	24.54	1.15	0.007486	0.00749	133579		
90.0	-48.20	0.0000	24.52	0.00	0.004785	0.00479	209892		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Downtilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	1893.71	1893.74	0.00059	0.00006	1707167		
1.0	0.0	1.0000	1893.71	1893.55	0.00586	0.00058	170710		
2.0	-0.90	0.8128	946.80	946.49	0.02343	0.00234	42672		
3.0	-2.70	0.5670	631.15	630.67	0.05273	0.00527	18962		
4.0	-5.80	0.2630	473.29	472.67	0.09377	0.00937	10663		
5.0	-11.30	0.0741	378.58	377.79	0.14324	0.01432	6981		
6.0	-21.50	0.0071	315.42	314.47	0.20085	0.02008	4978		
7.0	-37.80	0.0024	270.30	269.19	0.23464	0.02346	4261		
8.0	-48.20	0.0009	236.45	235.18	0.26857	0.02685	3723		
9.0	-58.80	0.0003	210.12	208.68	0.30267	0.03026	3303		
10.0	-68.80	0.0001	189.04	187.45	0.33896	0.03389	2967		
12.0	-78.00	0.0000	157.42	155.50	0.42782	0.04278	4035		
14.0	-86.00	0.0000	134.81	132.56	0.50682	0.05068	6374		
16.0	-92.00	0.0000	117.84	115.27	0.60683	0.06068	8452		
18.0	-96.00	0.0000	104.64	101.72	0.70637	0.07063	8400		
20.0	-98.00	0.0000	94.06	90.81	0.80633	0.08063	3722		
22.0	-99.00	0.0000	85.40	81.81	0.90633	0.09063	8816		
24.0	-99.00	0.0000	78.18	74.24	1.00633	0.10063	9792		
26.0	-99.00	0.0000	72.07	67.77	1.10633	0.11063	8329		
28.0	-99.00	0.0000	66.82	62.16	1.20633	0.12063	7946		
30.0	-99.00	0.0000	62.28	57.25	1.30633	0.13063	5335		
32.0	-99.00	0.0000	58.30	52.89	1.40633	0.14063	2581		
34.0	-99.00	0.0000	54.79	49.00	1.50633	0.15063	2227		
36.0	-99.00	0.0000	51.68	45.49	1.60633	0.16063	1983		
38.0	-99.00	0.0000	48.90	42.30	1.70633	0.17063	1780		
40.0	-99.00	0.0000	46.41	39.39	1.80633	0.18063	1615		
42.0	-99.00	0.0000	44.14	36.71	1.90633	0.19063	1462		
44.0	-99.00	0.0000	42.05	34.23	2.00633	0.20063	1491		
46.0	-99.00	0.0000	40.25	31.92	2.10633	0.21063	3011		
48.0	-99.00	0.0000	38.56	29.76	2.20633	0.22063	8773		
50.0	-99.00	0.0000	37.02	27.73	2.30633	0.23063	3832		
52.0	-99.00	0.0000	35.61	25.82	2.40633	0.24063	3013		
54.0	-99.00	0.0000	34.32	24.01	2.50633	0.25063	2817		
56.0	-99.00	0.0000	33.14	22.29	2.60633	0.26063	2642		
58.0	-99.00	0.0000	32.06	20.65	2.70633	0.27063	2479		
60.0	-99.00	0.0000	31.07	19.08	2.80633	0.28063	2364		
62.0	-99.00	0.0000	30.17	17.57	2.90633	0.29063	3332		
64.0	-99.00	0.0000	29.34	16.12	3.00633	0.30063	8474		
66.0	-99.00	0.0000	28.59	14.72	3.10633	0.31063	22673		
68.0	-99.00	0.0000	27.92	13.35	3.20633	0.32063	21803		
70.0	-99.00	0.0000	27.31	12.03	3.30633	0.33063	20920		
72.0	-99.00	0.0000	26.77	10.74	3.40633	0.34063	20300		
74.0	-99.00	0.0000	26.29	9.48	3.50633	0.35063	19959		
76.0	-99.00	0.0000	25.87	8.24	3.60633	0.36063	27826		
78.0	-99.00	0.0000	25.50	7.03	3.70633	0.37063	54237		
80.0	-99.00	0.0000	25.20	5.83	3.80633	0.38063	66620		
82.0	-99.00	0.0000	24.95	4.65	3.90633	0.39063	66499		
84.0	-99.00	0.0000	24.76	3.47	4.00633	0.40063	70589		
86.0	-99.00	0.0000	24.63	2.31	4.10633	0.41063	109959		
88.0	-99.00	0.0000	24.52	1.15	4.20633	0.42063	133409		
90.0	-99.00	0.0000	24.52	0.00	4.30633	0.43063	209450		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Downtilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	1893.71	1893.74	0.00059	0.00006	1707167		
1.0	0.0	1.0000	1893.71	1893.55	0.00586	0.00058	170710		
2.0	-0.90	0.8128	946.80	946.49	0.02343	0.00234	42672		
3.0	-2.70	0.5670	631.15	630.67	0.05273	0.00527	18962		
4.0	-5.80	0.2630	473.29	472.67	0.09377	0.00937	10663		
5.0	-11.30	0.0741	378.58	377.79	0.14324	0.01432	6981		
6.0	-21.50	0.0071	315.42	314.47	0.20085	0.02008	4978		
7.0	-37.80	0.0024	270.30	269.19	0.23464	0.02346	4261		
8.0	-48.20	0.0009	236.45	235.18	0.26857	0.02685	3723		
9.0	-58.80	0.0003	210.12	208.68	0.30267	0.03026	3303		
10.0	-68.80	0.0001	189.04	187.45	0.33896	0.03389	2967		
12.0	-78.00	0.0000	157.42	155.50	0.42782	0.04278	4035		
14.0	-86.00	0.0000	134.81	132.56	0.50682	0.05068	6374		
16.0	-92.00	0.0000	117.84	115.27	0.60683	0.06068	8452		
18.0	-96.00	0.0000	104.64	101.72	0.70637	0.07063	8400		
20.0	-98.00	0.0000	94.06	90.81	0.80633	0.08063	3722		
22.0	-99.00	0.0000	85.40	81.81	0.90633	0.09063	8816		
24.0	-99.00	0.0000	78.18	74.24	1.00633	0.10063	9792		
26.0	-99.00	0.0000	72.07	67.77	1.10633	0.11063	8329		
28.0	-99.00	0.0000	66.82	62.16	1.20633	0.12063	7946		
30.0	-99.00	0.0000	62.28	57.25	1.30633	0.13063	5335		
32.0	-99.00	0.0000	58.30	52.89	1.40633	0.14063	2581		
34.0	-99.00	0.0000	54.79	49.00	1.50633	0.15063	2227		
36.0	-99.00	0.0000	51.68	45.49	1.60633	0.16063	1983		
38.0	-99.00	0.0000	48.90	42.30	1.70633	0.17063	1780		
40.0	-99.00	0.0000	46.41	39.39	1.80633	0.18063	1615		
42.0	-99.00	0.0000	44.14	36.71	1.90633	0.19063	1462		
44.0	-99.00	0.0000	42.05	34.23	2.00633	0.20063	1491		
46.0	-99.00	0.0000	40.25	31.92	2.10633	0.21063	3011		
48.0	-99.00	0.0000	38.56	29.76	2.20633	0.22063	8773		
50.0	-99.00	0.0000	37.02	27.73	2.30633	0.23063	3832		
52.0	-99.00	0.0000	35.61	25.82	2.40633	0.24063	3013		
54.0	-99.00	0.0000	34.32	24.01	2.50633	0.25063	2817		
56.0	-99.00	0.0000	33.14	22.29	2.60633	0.26063	2642		
58.0	-99.00	0.0000	32.06	20.65	2.70633	0.27063	2479		
60.0	-99.00	0.0000	31.07	19.08	2.80633	0.28063	2364		
62.0	-99.00	0.0000	30.17	17.57	2.90633	0.29063	3332		
64.0	-99.00	0.0000	29.34	16.12	3.00633	0.30063	8474		
66.0	-99.00	0.0000	28.59	14.72	3.10633	0.31063	22673		
68.0	-99.00	0.0000	27.92	13.35	3.20633	0.32063	21803		
70.0	-99.00	0.0000	27.31	12.03	3.30633	0.33063	20920		
72.0	-99.00	0.0000	26.77	10.74	3.40633	0.34063	20300		
74.0	-99.00	0.0000	26.29	9.48	3.50633	0.35063	19959		
76.0	-99.00	0.0000	25.87	8.24	3.60633	0.36063	27826		
78.0	-99.00	0.0000	25.50	7.03	3.70633	0.37063	54237		
80.0	-99.00	0.0000	25.20	5.83	3.80633	0.38063	66620		
82.0	-99.00	0.0000	24.95	4.65	3.90633	0.39063	66499		
84.0	-99.00	0.0000	24.76	3.47	4.00633	0.40063	70589		
86.0	-99.00	0.0000	24.63	2.31	4.10633	0.41063	109959		
88.0	-99.00	0.0000	24.52	1.15	4.20633	0.42063	133409		
90.0	-99.00	0.0000	24.52	0.00	4.30633	0.43063	209450		

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Downlink (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	1893.71	1893.74	0.00059	0.00006	170710		
1.0	0.0	1.0000	1893.71	1893.55	0.00586	0.00058	170710		
2.0	-0.90	0.8128	946.80	946.49	0.02343	0.00234	42672		
3.0	-2.70	0.5370	631.14	630.67	0.05273	0.00527	18661		
4.0	-5.80	0.2630	472.67	472.67	0.09378	0.00937	10663		
5.0	-11.30	0.0741	377.79	377.79	0.14329	0.01432	6980		
6.0	-21.50	0.0071	315.40	314.47	0.20087	0.02008	4978		
7.0	-41.90	0.0024	270.27	269.19	0.23464	0.02346	4261		
8.0	-10.50	0.0891	236.42	235.18	0.26857	0.02685	3723		
9.0	-9.20	0.1202	210.08	208.68	0.30267	0.03026	3303		
10.0	-9.80	0.1047	189.00	187.45	0.33896	0.03389	2967		
12.0	-17.00	0.0200	157.37	155.50	0.26623	0.02662	3756		
14.0	-23.20	0.0048	134.76	132.56	0.15761	0.01576	6344		
16.0	-16.20	0.0240	117.78	115.27	0.20551	0.02055	4865		
18.0	-20.40	0.0091	104.57	101.72	0.26173	0.02617	3820		
20.0	-25.30	0.0030	93.98	90.81	0.28662	0.02866	3500		
22.0	-19.90	0.0102	85.31	81.81	0.13581	0.01358	7363		
24.0	-26.80	0.0021	78.09	74.24	0.10266	0.01026	9740		
26.0	-20.20	0.0095	71.96	67.77	0.12070	0.01207	8284		
28.0	-13.60	0.0437	66.71	62.16	0.13270	0.01327	7535		
30.0	-12.60	0.0590	62.16	57.25	0.16840	0.01684	5937		
32.0	-15.20	0.0302	58.17	52.89	0.36645	0.03664	2729		
34.0	-23.10	0.0049	54.66	49.00	0.45251	0.04525	2209		
36.0	-32.40	0.0006	51.53	45.49	0.50583	0.05058	1976		
38.0	-24.60	0.0035	48.74	42.30	0.56342	0.05634	1774		
40.0	-29.50	0.0011	46.24	39.39	0.62007	0.06200	1597		
42.0	-30.00	0.0010	43.97	36.71	0.68726	0.06872	1455		
44.0	-20.90	0.0081	41.93	34.23	0.71974	0.07197	1389		
46.0	-18.10	0.0155	40.06	31.92	0.41589	0.04159	2404		
48.0	-18.20	0.0151	38.37	29.76	0.09728	0.00972	10279		
50.0	-20.60	0.0087	36.82	27.73	0.24698	0.02469	4056		
52.0	-25.00	0.0032	35.40	25.82	0.33585	0.03358	2977		
54.0	-32.40	0.0006	34.10	24.01	0.36035	0.03603	2775		
56.0	-44.70	0.0000	32.91	22.29	0.48676	0.04867	2597		
58.0	-35.00	0.0003	31.82	20.65	0.43289	0.04328	2446		
60.0	-31.30	0.0007	30.83	19.08	0.43281	0.04328	2310		
62.0	-29.20	0.0012	29.92	17.57	0.34215	0.03421	2922		
64.0	-28.90	0.0013	29.09	16.12	0.14302	0.01430	6991		
66.0	-30.10	0.0010	28.33	14.72	0.04758	0.00475	21040		
68.0	-32.50	0.0006	27.65	13.35	0.04706	0.00470	21249		
70.0	-34.50	0.0004	27.04	12.03	0.04847	0.00484	20635		
72.0	-34.70	0.0003	26.49	10.74	0.04991	0.00499	20035		
74.0	-34.70	0.0003	26.00	9.48	0.05171	0.00517	19338		
76.0	-34.70	0.0003	25.58	8.24	0.038406	0.00384	26037		
78.0	-35.60	0.0003	25.21	7.03	0.019678	0.00196	50818		
80.0	-37.30	0.0002	24.90	5.83	0.015305	0.00153	65338		
82.0	-37.80	0.0002	24.65	4.65	0.015495	0.00154	64538		
84.0	-38.80	0.0001	24.46	3.47	0.014696	0.00146	68047		
86.0	-41.00	0.0001	24.32	2.31	0.009494	0.00094	105350		
88.0	-43.20	0.0000	24.24	1.15	0.007693	0.00076	129851		
90.0	-48.20	0.0000	24.21	0.00	0.004906	0.00049	203818		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1975	Downlink (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	1893.71	1893.74	0.00059	0.00006	170710		
1.0	0.0	1.0000	1893.55	1893.55	0.00586	0.00058	170710		
2.0	-0.90	0.8128	946.80	946.49	0.02343	0.00234	42672		
3.0	-2.70	0.5370	631.14	630.67	0.05273	0.00527	18661		
4.0	-5.80	0.2630	472.67	472.67	0.09378	0.00937	10663		
5.0	-11.30	0.0741	377.79	377.79	0.14329	0.01432	6980		
6.0	-21.50	0.0071	315.40	314.47	0.20087	0.02008	4978		
7.0	-41.90	0.0024	270.27	269.19	0.23464	0.02346	4261		
8.0	-10.50	0.0891	236.42	235.18	0.26857	0.02685	3723		
9.0	-9.20	0.1202	210.08	208.68	0.30267	0.03026	3303		
10.0	-9.80	0.1047	189.00	187.45	0.33896	0.03389	2967		
12.0	-17.00	0.0200	157.37	155.50	0.26623	0.02662	3756		
14.0	-23.20	0.0048	134.76	132.56	0.15761	0.01576	6344		
16.0	-16.20	0.0240	117.78	115.27	0.20551	0.02055	4865		
18.0	-20.40	0.0091	104.57	101.72	0.26173	0.02617	3820		
20.0	-25.30	0.0030	93.98	90.81	0.28662	0.02866	3500		
22.0	-19.90	0.0102	85.31	81.81	0.13581	0.01358	7363		
24.0	-26.80	0.0021	78.09	74.24	0.10266	0.01026	9740		
26.0	-20.20	0.0095	71.96	67.77	0.12070	0.01207	8284		
28.0	-13.60	0.0437	66.71	62.16	0.13270	0.01327	7535		
30.0	-12.60	0.0590	62.16	57.25	0.16840	0.01684	5937		
32.0	-15.20	0.0302	58.17	52.89	0.36645	0.03664	2729		
34.0	-23.10	0.0049	54.66	49.00	0.45251	0.04525	2209		
36.0	-32.40	0.0006	51.53	45.49	0.50583	0.05058	1976		
38.0	-24.60	0.0035	48.74	42.30	0.56342	0.05634	1774		
40.0	-29.50	0.0011	46.24	39.39	0.62007	0.06200	1597		
42.0	-30.00	0.0010	43.97	36.71	0.68726	0.06872	1455		
44.0	-20.90	0.0081	41.93	34.23	0.71974	0.07197	1389		
46.0	-18.10	0.0155	40.06	31.92	0.41589	0.04159	2404		
48.0	-18.20	0.0151	38.37	29.76	0.09728	0.00972	10279		
50.0	-20.60	0.0087	36.82	27.73	0.24698	0.02469	4056		
52.0	-25.00	0.0032	35.40	25.82	0.33585	0.03358	2977		
54.0	-32.40	0.0006	34.10	24.01	0.36035	0.03603	2775		
56.0	-44.70	0.0000	32.91	22.29	0.48676	0.04867	2597		
58.0	-35.00	0.0003	31.82	20.65	0.43289	0.04328	2446		
60.0	-31.30	0.0007	30.83	19.08	0.43281	0.04328	2310		
62.0	-29.20	0.0012	29.92	17.57	0.34215	0.03421	2922		
64.0	-28.90	0.0013	29.09	16.12	0.14302	0.01430	6991		
66.0	-30.10	0.0010	28.33	14.72	0.04758	0.00475	21040		
68.0	-32.50	0.0006	27.65	13.35	0.04706	0.00470	21249		
70.0	-34.50	0.0004	27.04	12.03	0.04847	0.00484	20635		
72.0	-34.70	0.0003	26.49	10.74	0.04991	0.00499	20035		
74.0	-34.70	0.0003	26.00	9.48	0.05171	0.00517	19338		
76.0	-34.70	0.0003	25.58	8.24	0.038406	0.00384	26037		
78.0	-35.60	0.0003	25.21	7.03	0.019678	0.00196	50818		
80.0	-37.30	0.0002	24.90	5.83	0.015305	0.00153	65338		
82.0	-37.80	0.0002	24.65	4.65	0.015495	0.00154	64538		
84.0	-38.80	0.0001	24.46	3.47	0.014696	0.00146	68047		
86.0	-41.00	0.0001	24.32	2.31	0.009494	0.00094	105350		
88.0	-43.20	0.0000	24.24	1.15	0.007693	0.00076	129851		
90.0	-48.20	0.0000	24.21	0.00	0.004906	0.00049	203818		

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AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):										579.33		
ERP (Watts):		630	Height (feet):	115	Frequency (MHz):	869	Downtilt (Degrees):		0.0			
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE					
0.1	-0.01	0.9977	1893.45	1893.42	0.00059	0.00010	9890205					
1.0	-0.10	0.9772	1893.84	1893.55	0.00587	0.00101	98911					
2.0	-0.46	0.8995	946.49	946.49	0.023421	0.00403	24735					
3.0	-1.09	0.7780	631.54	630.67	0.052671	0.00902	10999					
4.0	-2.03	0.6266	473.82	472.67	0.092499	0.01566	6263					
5.0	-3.33	0.4645	379.23	377.79	0.146070	0.02513	3986					
6.0	-5.09	0.3097	316.20	314.47	0.205603	0.03490	2817					
7.0	-7.44	0.1803	271.21	269.19	0.294016	0.044537	2245					
8.0	-10.73	0.0845	237.49	235.18	0.394162	0.050768	1969					
9.0	-15.74	0.0267	211.28	208.68	0.521616	0.052157	1917					
10.0	-24.72	0.0034	190.34	187.45	0.81819	0.048645	2055					
12.0	-15.93	0.0255	158.97	155.50	0.164907	0.028465	3513					
14.0	-11.58	0.0695	136.62	132.56	0.104387	0.018018	5549					
16.0	-11.00	0.0794	119.91	115.27	0.134302	0.023182	4313					
18.0	-12.78	0.0527	106.96	101.72	0.169653	0.029337	3408					
20.0	-17.38	0.0183	96.64	90.81	0.205663	0.03498	2867					
22.0	-30.14	0.0010	88.23	81.81	0.212111	0.037493	2657					
24.0	-25.01	0.0032	81.26	74.24	0.132485	0.02989	4372					
26.0	-19.64	0.0109	75.40	67.77	0.058905	0.01098	9903					
28.0	-19.46	0.0113	70.40	62.16	0.068990	0.011547	8660					
30.0	-23.63	0.0043	66.10	57.25	0.077487	0.01375	7476					
32.0	-30.19	0.0010	62.37	52.89	0.269517	0.04652	2149					
34.0	-18.89	0.0129	59.11	49.00	0.529455	0.091390	1094					
36.0	-13.74	0.0423	56.23	45.49	0.799015	0.137920	725					
38.0	-11.02	0.0791	53.69	42.30	0.952168	0.164356	608					
40.0	-9.65	0.1084	51.42	39.39	1.012441	0.174760	572					
42.0	-9.25	0.1189	49.40	36.71	1.114590	0.192382	519					
44.0	-9.58	0.1102	47.58	34.23	1.169820	0.201925	495					
46.0	-10.51	0.0889	45.95	31.92	1.275039	0.220877	454					
48.0	-11.94	0.0640	44.48	29.76	1.330071	0.229586	435					
50.0	-13.77	0.0420	43.15	27.73	1.193640	0.206337	485					
52.0	-15.93	0.0255	41.94	25.82	0.991335	0.171116	584					
54.0	-18.41	0.0144	40.85	24.01	0.711157	0.122754	814					
56.0	-21.14	0.0077	38.87	22.29	0.480538	0.082947	1205					
58.0	-23.98	0.0040	36.97	20.65	0.308566	0.053262	1877					
60.0	-26.59	0.0022	35.17	19.08	0.181255	0.031287	3196					
62.0	-28.64	0.0014	33.43	17.57	0.099120	0.017109	5844					
64.0	-30.30	0.0009	31.77	16.12	0.056979	0.009835	10167					
66.0	-32.03	0.0006	30.18	14.72	0.034362	0.005931	16859					
68.0	-34.01	0.0004	28.65	13.35	0.023700	0.004091	24444					
70.0	-36.10	0.0002	27.00	12.03	0.017246	0.002977	33592					
72.0	-37.96	0.0002	25.17	10.74	0.011719	0.002023	49433					
74.0	-39.49	0.0001	23.48	9.48	0.007408	0.001279	76201					
76.0	-41.20	0.0001	21.76	8.24	0.004931	0.000851	117493					
78.0	-44.04	0.0000	20.00	7.03	0.003456	0.000597	167627					
80.0	-49.42	0.0000	18.24	5.83	0.002496	0.000431	232091					
82.0	-54.36	0.0000	16.48	4.65	0.001537	0.000265	376948					
84.0	-47.66	0.0000	14.72	3.47	0.002203	0.000346	289223					
86.0	-43.48	0.0000	13.03	2.31	0.002539	0.000438	228137					
88.0	-41.19	0.0001	11.35	1.15	0.002565	0.000443	225874					
90.0	-40.19	0.0001	9.60	0.00	0.002544	0.000439	227763					

AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):							579.33		
ERP (Watts):	630	Height (feet):	115	Frequency (MHz):	869	Downtilt (Degrees):	0.0		
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	-0.01	0.9977	1893.45	1893.42	0.00059	0.00010	9890204		
1.0	-0.10	0.9772	1893.84	1893.55	0.00587	0.00101	98911		
2.0	-0.46	0.8995	946.49	946.49	0.023421	0.004043	24735		
3.0	-1.09	0.7780	631.54	630.67	0.052671	0.009042	10999		
4.0	-2.03	0.6266	473.82	472.67	0.091862	0.015857	6306		
5.0	-3.33	0.4645	379.23	377.79	0.146070	0.025123	3966		
6.0	-5.09	0.3097	316.20	314.47	0.205603	0.034940	2241		
7.0	-7.44	0.1803	271.21	269.19	0.258509	0.046322	2281		
8.0	-10.73	0.0845	237.49	235.18	0.294116	0.050768	1969		
9.0	-15.74	0.0267	211.28	208.68	0.303126	0.052323	1911		
10.0	-24.72	0.0034	190.34	187.45	0.281819	0.048645	2055		
12.0	-15.93	0.0255	158.97	155.50	0.165771	0.028614	3494		
14.0	-11.58	0.0695	136.62	132.56	0.104387	0.018018	5549		
16.0	-11.00	0.0794	119.91	115.27	0.135385	0.023369	4279		
18.0	-12.78	0.0527	108.96	101.82	0.169957	0.029337	3408		
20.0	-17.38	0.0183	96.64	90.81	0.207920	0.038989	2768		
22.0	-30.14	0.0010	88.23	81.81	0.217211	0.037483	2667		
24.0	-25.01	0.0032	81.26	74.24	0.132485	0.027868	4372		
26.0	-19.64	0.0109	75.40	67.77	0.058500	0.010988	9903		
28.0	-19.46	0.0113	70.40	62.16	0.068995	0.011547	8660		
30.0	-23.63	0.0043	66.10	57.25	0.078811	0.013604	7350		
32.0	-30.19	0.0010	62.37	52.89	0.269517	0.046522	2149		
34.0	-18.89	0.0129	59.11	49.00	0.539329	0.083695	1074		
36.0	-13.74	0.0423	56.23	45.49	0.799015	0.137920	725		
38.0	-11.02	0.0791	53.69	42.30	0.952188	0.164356	608		
40.0	-9.65	0.1084	51.42	38.39	1.033296	0.176359	560		
42.0	-9.25	0.1189	49.40	36.71	1.114590	0.192392	519		
44.0	-9.58	0.1102	47.58	34.23	1.195287	0.206321	484		
46.0	-10.51	0.0889	45.95	31.92	1.275039	0.220087	454		
48.0	-11.94	0.0640	44.48	29.76	1.330071	0.229586	435		
50.0	-13.77	0.0420	43.15	27.73	1.220248	0.210630	474		
52.0	-15.93	0.0255	41.94	25.82	0.991335	0.171116	584		
54.0	-18.41	0.0144	40.85	24.01	0.727287	0.125539	796		
56.0	-21.14	0.0077	39.87	22.29	0.491437	0.084828	1178		
58.0	-23.98	0.0040	38.97	20.65	0.308566	0.053262	1877		
60.0	-26.59	0.0022	38.17	19.08	0.181255	0.031287	3196		
62.0	-28.64	0.0014	37.43	17.57	0.101355	0.017495	5715		
64.0	-30.30	0.0009	36.77	16.12	0.056979	0.009635	10167		
66.0	-32.03	0.0006	36.18	14.72	0.035128	0.006064	16492		
68.0	-34.01	0.0004	35.65	13.35	0.024225	0.004182	23914		
70.0	-36.10	0.0002	35.17	12.03	0.017246	0.002977	33592		
72.0	-37.96	0.0002	34.75	10.74	0.011719	0.002023	49433		
74.0	-39.49	0.0001	34.38	9.48	0.007571	0.001307	76515		
76.0	-41.20	0.0001	34.06	8.24	0.004931	0.000851	117493		
78.0	-44.04	0.0000	33.79	7.03	0.003456	0.000597	176727		
80.0	-49.42	0.0000	33.58	5.83	0.002496	0.000431	232091		
82.0	-54.36	0.0000	33.36	4.65	0.001571	0.000271	366681		
84.0	-47.66	0.0000	33.23	3.47	0.002048	0.000354	282809		
86.0	-43.48	0.0000	33.13	2.31	0.002539	0.000438	228137		
88.0	-41.19	0.0001	33.05	1.15	0.002565	0.000443	225874		
90.0	-40.19	0.0001	33.07	0.00	0.002545	0.00039	226730		

AT&T Mobility
Rebuild Lemon Creek AK
ANDREW:DB589 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	98	Frequency (MHz):	869	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-1.24	0.7516	18937.44	18937.42	18937.42	0.000021	0.000004	28029501	
1.0	-0.70	0.8511	1893.76	1893.55	1893.55	0.002059	0.000355	281403	
2.0	-0.30	0.9333	946.90	946.49	946.49	0.008199	0.001415	70657	
3.0	-0.10	0.9772	631.29	630.67	630.67	0.018369	0.003171	31538	
4.0	0.00	1.0000	473.49	472.67	472.67	0.026641	0.004253	23510	
5.0	-0.20	0.9550	378.81	377.79	377.79	0.030830	0.005322	18791	
6.0	-0.90	0.8128	315.70	314.47	314.47	0.037037	0.006393	15641	
7.0	-1.80	0.6607	270.63	269.19	269.19	0.043268	0.007469	13389	
8.0	-3.20	0.4786	236.82	235.18	235.18	0.049525	0.008549	11697	
9.0	-5.00	0.3162	210.54	208.68	208.68	0.055813	0.009634	10379	
10.0	-7.10	0.1950	189.51	187.45	187.45	0.062135	0.010725	9323	
12.0	-12.80	0.0525	157.98	155.50	155.50	0.074902	0.012929	7734	
14.0	-15.80	0.0263	135.46	132.56	132.56	0.087860	0.015166	6993	
16.0	-14.80	0.0331	118.59	115.27	115.27	0.101045	0.017442	5733	
18.0	-15.10	0.0309	105.47	101.72	101.72	0.114498	0.019764	5059	
20.0	-16.50	0.0224	86.42	81.81	81.81	0.128259	0.022139	4516	
22.0	-13.70	0.0399	73.27	67.77	67.77	0.142374	0.024575	4069	
24.0	-15.10	0.0477	62.16	57.25	57.25	0.156883	0.027082	3692	
26.0	-13.80	0.0617	52.89	49.00	49.00	0.171871	0.029667	3370	
28.0	-13.70	0.0752	45.49	42.30	42.30	0.187368	0.032342	3091	
30.0	-14.30	0.0875	39.39	36.71	36.71	0.203451	0.035118	2847	
32.0	-15.60	0.0725	32.73	29.76	29.76	0.220196	0.038009	2630	
34.0	-17.40	0.0182	26.37	23.92	23.92	0.237688	0.041028	2437	
36.0	-19.40	0.0115	21.10	19.08	19.08	0.256025	0.044193	2262	
38.0	-21.10	0.0078	16.66	14.72	14.72	0.275315	0.047523	2104	
40.0	-21.10	0.0078	14.25	12.03	12.03	0.295688	0.051039	1959	
42.0	-20.50	0.0089	12.03	9.48	9.48	0.316368	0.054768	1825	
44.0	-20.50	0.0089	10.89	8.24	8.24	0.337921	0.058609	1681	
46.0	-20.90	0.0081	9.48	7.03	7.03	0.360589	0.062562	1537	
48.0	-20.90	0.0081	8.24	6.05	6.05	0.384372	0.066627	1403	
50.0	-20.50	0.0089	7.03	5.25	5.25	0.409259	0.070802	1279	
52.0	-19.80	0.0105	6.05	4.58	4.58	0.435252	0.075039	1165	
54.0	-19.40	0.0115	5.25	3.99	3.99	0.462341	0.079341	1061	
56.0	-19.00	0.0126	4.58	3.46	3.46	0.490458	0.083709	967	
58.0	-19.20	0.0120	3.99	2.99	2.99	0.519633	0.088139	883	
60.0	-19.30	0.0117	3.46	2.60	2.60	0.549825	0.092633	808	
62.0	-19.50	0.0112	3.00	2.25	2.25	0.581187	0.097299	742	
64.0	-19.80	0.0105	2.60	1.94	1.94	0.613752	0.102139	685	
66.0	-19.80	0.0102	2.25	1.67	1.67	0.647502	0.107165	637	
68.0	-19.70	0.0107	2.00	1.42	1.42	0.682452	0.112365	597	
70.0	-19.40	0.0115	1.74	1.20	1.20	0.718502	0.117746	564	
72.0	-19.60	0.0110	1.54	1.03	1.03	0.755652	0.123293	537	
74.0	-20.00	0.0100	1.37	0.88	0.88	0.793802	0.129029	515	
76.0	-20.40	0.0091	1.23	0.76	0.76	0.832952	0.134974	497	
78.0	-21.30	0.0074	1.12	0.66	0.66	0.873102	0.141139	483	
80.0	-22.50	0.0056	1.03	0.58	0.58	0.914252	0.147524	473	
82.0	-23.50	0.0045	0.95	0.51	0.51	0.956402	0.154169	465	
84.0	-24.80	0.0033	0.88	0.45	0.45	0.999552	0.161084	461	
86.0	-26.80	0.0021	0.80	0.39	0.39	1.043702	0.168279	457	
88.0	-30.60	0.0009	0.70	0.33	0.33	1.088852	0.175754	453	
90.0	-38.40	0.0001	0.60	0.28	0.28	1.135002	0.183479	450	

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AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	115	Frequency (MHz):	869	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-0.01	0.9977	18937.45	18937.42	18937.42	0.000059	0.000010	9880205	
1.0	-0.10	0.9772	1893.84	1893.55	1893.55	0.006587	0.001011	98911	
2.0	-0.46	0.8995	946.90	946.49	946.49	0.026421	0.004043	24735	
3.0	-1.09	0.7780	631.54	630.67	630.67	0.052671	0.009092	10999	
4.0	-2.03	0.6266	473.82	472.67	472.67	0.091862	0.015857	6306	
5.0	-3.33	0.4645	378.23	377.79	377.79	0.146070	0.025213	3966	
6.0	-5.09	0.3097	316.20	314.47	314.47	0.205393	0.035453	2820	
7.0	-7.44	0.1803	271.21	269.19	269.19	0.293368	0.044622	2241	
8.0	-10.73	0.0845	237.49	235.18	235.18	0.393126	0.056339	1974	
9.0	-15.74	0.0267	211.28	208.68	208.68	0.506774	0.082614	1611	
10.0	-24.72	0.0034	190.34	187.45	187.45	0.664600	0.113363	1344	
12.0	-15.93	0.0255	158.97	155.50	155.50	0.868229	0.153308	1074	
14.0	-11.58	0.0695	136.62	132.56	132.56	1.135385	0.225556	8433	
16.0	-11.00	0.0794	119.91	115.27	115.27	1.484543	0.303703	6433	
18.0	-12.78	0.0527	106.96	101.72	101.72	1.936362	0.393095	5053	
20.0	-17.38	0.0183	96.64	90.81	90.81	2.507920	0.506829	4069	
22.0	-30.14	0.0010	88.23	81.81	81.81	3.214543	0.768887	3370	
24.0	-25.01	0.0032	81.26	74.24	74.24	4.093545	1.011141	2847	
26.0	-19.64	0.0109	75.40	67.77	67.77	5.033296	1.282469	2437	
28.0	-19.46	0.0113	70.40	62.16	62.16	6.183359	1.584828	2104	
30.0	-23.63	0.0043	66.10	57.25	57.25	7.568751	1.935308	1825	
32.0	-30.19	0.0010	62.37	52.89	52.89	9.183329	2.33308	1681	
34.0	-18.89	0.0129	59.11	49.00	49.00	10.93545	2.777343	1537	
36.0	-13.74	0.0423	55.23	45.49	45.49	13.01235	3.215343	1403	
38.0	-11.02	0.0791	53.69	42.30	42.30	15.7555	3.7343	1279	
40.0	-9.65	0.1084	51.42	38.39	38.39	18.8472	4.294437	1165	
42.0	-9.25	0.1189	49.40	36.71	36.71	22.2287	4.884828	1061	
44.0	-9.58	0.1102	47.58	34.23	34.23	25.9755	5.505081	967	
46.0	-10.51	0.0889	45.95	31.92	31.92	30.01235	6.14495	883	
48.0	-11.94	0.0640	44.48	29.76	29.76	34.7235	6.817235	808	
50.0	-13.77	0.0420	43.15	27.73	27.73	40.0472	7.5343	742	
52.0	-15.93	0.0255	41.94	25.82	25.82	46.0437	8.294437	685	
54.0	-18.41	0.0144	40.85	24.01	24.01	52.8128	9.084828	637	
56.0	-23.98	0.0040	38.97	22.29	22.29	60.41437	9.917235	597	
58.0	-26.59	0.0022	38.17	19.08	19.08	69.5353	10.79495	564	
60.0	-28.64	0.0014	37.43	17.57	17.57	79.8620	11.7235	537	
62.0	-30.30	0.0009	36.77	16.12	16.12	91.3730	12.70630	515	
64.0	-32.03	0.0006	36.18	14.72	14.72	104.128	13.75343	497	
66.0	-34.01	0.0004	35.65	13.35	13.35	118.225	14.8182	483	
68.0	-36.10	0.0002	35.17	12.03	12.03	133.5128	15.984828	473	
70.0	-37.96	0.0002	34.75	10.74	10.74	150.0467	17.2633	465	
72.0	-39.49	0.0001	34.38	9.48	9.48	167.7571	18.6533	461	
74.0	-41.20	0.0001	34.06	8.24	8.24	186.7525	20.1533	457	
76.0	-44.04	0.0000	33.79	7.03	7.03	208.0382	21.7733	453	
78.0	-47.44	0.0000	33.56	5.83	5.83	231.5424	23.5052	449	
80.0	-51.36	0.0000	33.38	4.65	4.65	257.3476	25.3571	445	
82.0	-54.36	0.0000	33.23	3.47	3.47	285.5048	27.3248	441	
84.0	-57.66	0.0000	33.13	2.31	2.31	316.0428	29.4053	437	
86.0	-61.19	0.0000	33.05	1.15	1.15	348.2506	31.6028	433	
88.0	-64.19	0.0001	33.05	0.00	0.00	381.2484	33.9248	430	
90.0	-70.19	0.0001	33.05	0.00	0.00	416.2484	36.2648	427	

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AT&T Mobility
Rebuild Lemon Creek AK
RFS:BMR6-D-B1 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	95	Frequency (MHz):	869	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-0.01	0.9977	1893.74	1893.42	1893.42	0.000028	0.000005	20769.08	
1.0	-0.10	0.9772	1893.55	1893.55	1893.55	0.002789	0.000481	20769.08	
2.0	-0.30	0.9333	946.87	946.87	946.87	0.011157	0.001926	51923	
3.0	-0.60	0.8710	631.25	631.25	631.25	0.025104	0.004333	23077	
4.0	-1.10	0.7762	473.43	472.67	472.67	0.044359	0.007657	13059	
5.0	-1.80	0.6607	378.75	377.79	377.79	0.068275	0.011785	8485	
6.0	-2.60	0.5495	315.62	314.47	314.47	0.100185	0.017293	5782	
7.0	-3.60	0.4365	270.53	269.19	269.19	0.123241	0.021273	4700	
8.0	-4.80	0.3311	236.72	235.18	235.18	0.156405	0.026997	3704	
9.0	-6.40	0.2291	210.42	208.68	208.68	0.189652	0.032736	3054	
10.0	-8.30	0.1479	185.38	187.45	187.45	0.220182	0.038006	2631	
12.0	-13.90	0.0407	157.82	155.50	155.50	0.255696	0.044136	2265	
14.0	-20.10	0.0012	135.28	132.56	132.56	0.256563	0.042886	2258	
16.0	-29.10	0.0095	118.38	115.27	115.27	0.218958	0.037795	2645	
18.0	-42.50	0.0363	105.23	101.72	101.72	0.146531	0.025293	3953	
20.0	-12.50	0.0562	94.73	90.81	90.81	0.084860	0.014648	6826	
22.0	-13.50	0.0589	86.13	81.81	81.81	0.088246	0.015232	6564	
24.0	-16.30	0.0234	78.98	74.24	74.24	0.105170	0.018154	5508	
26.0	-22.10	0.0062	67.75	62.16	62.16	0.123425	0.021305	4693	
28.0	-22.10	0.0062	67.75	62.16	62.16	0.143110	0.024702	4048	
30.0	-22.70	0.0000	63.28	57.25	57.25	0.162405	0.028344	3528	
32.0	-22.70	0.0054	59.37	52.89	52.89	0.164189	0.028341	3528	
34.0	-17.50	0.0178	55.93	49.00	49.00	0.111175	0.019190	521.1	
36.0	-15.20	0.0302	52.88	45.49	45.49	0.144887	0.025027	3995	
38.0	-14.40	0.0363	50.16	42.30	42.30	0.182453	0.031494	3175	
40.0	-14.50	0.0355	47.73	38.39	38.39	0.182453	0.031494	3175	
42.0	-15.70	0.0269	45.54	36.71	36.71	0.203514	0.035129	2846	
44.0	-18.00	0.0158	43.57	34.23	34.23	0.228514	0.038467	2599	
46.0	-22.50	0.0066	41.78	31.92	31.92	0.242856	0.041920	2385	
48.0	-35.20	0.0003	40.15	29.76	29.76	0.263462	0.045477	2198	
50.0	-27.60	0.0017	38.68	27.73	27.73	0.282676	0.048793	2049	
52.0	-20.10	0.0098	37.33	25.82	25.82	0.254380	0.043909	2277	
54.0	-16.50	0.0224	36.10	24.01	24.01	0.179357	0.030959	3230	
56.0	-14.20	0.0380	34.98	22.29	22.29	0.244632	0.042226	2368	
58.0	-12.80	0.0525	33.96	20.65	20.65	0.420311	0.072551	1378	
60.0	-11.90	0.0646	33.03	19.08	19.08	0.593723	0.102484	975	
62.0	-11.40	0.0724	32.18	17.57	17.57	0.748961	0.128280	773	
64.0	-11.20	0.0759	31.41	16.12	16.12	0.850229	0.146760	681	
66.0	-11.20	0.0759	30.71	14.72	14.72	0.909797	0.157042	636	
68.0	-11.50	0.0708	30.08	13.35	13.35	0.950695	0.164102	609	
70.0	-12.00	0.0631	29.52	12.03	12.03	0.989979	0.170883	585	
72.0	-12.60	0.0550	29.02	10.74	10.74	1.028610	0.177551	563	
74.0	-13.40	0.0457	28.57	9.48	9.48	1.063662	0.183601	544	
76.0	-14.50	0.0355	28.19	8.24	8.24	1.028811	0.177240	564	
78.0	-15.80	0.0263	27.86	7.03	7.03	0.921896	0.158131	628	
80.0	-17.30	0.0186	27.58	5.83	5.83	0.791236	0.136577	732	
82.0	-19.20	0.0120	27.35	4.65	4.65	0.632236	0.106132	916	
84.0	-21.70	0.0068	27.18	3.47	3.47	0.459466	0.079309	1260	
86.0	-25.20	0.0030	27.05	2.31	2.31	0.311429	0.053757	1860	
88.0	-31.20	0.0008	26.98	1.15	1.15	0.183958	0.031598	3164	
90.0	-49.00	0.0000	26.96	0.00	0.00	0.086753	0.014975	6677	

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AT&T Mobility
Rebuild Lemon Creek AK
ANDREW:DB589 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	98	Frequency (MHz):	869	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-1.24	0.7516	1893.74	1893.42	1893.42	0.000021	0.000004	28029.01	
1.0	-0.70	0.8511	1893.76	1893.55	1893.55	0.002059	0.000355	28140.3	
2.0	-0.30	0.9333	946.90	946.49	946.49	0.009199	0.001415	70657	
3.0	-0.10	0.9772	631.29	631.29	631.29	0.018369	0.003171	3158	
4.0	0.00	1.0000	472.67	472.67	472.67	0.024641	0.004253	2351.0	
5.0	-0.20	0.9500	378.81	377.79	377.79	0.030830	0.005322	18791	
6.0	-0.90	0.8128	315.70	314.47	314.47	0.043268	0.006393	15641	
7.0	-1.80	0.6607	270.63	269.19	269.19	0.057469	0.007469	13389	
8.0	-3.20	0.4786	236.82	235.18	235.18	0.049525	0.006549	11697	
9.0	-5.00	0.3162	210.54	208.68	208.68	0.058613	0.006334	10379	
10.0	-7.10	0.1950	189.51	187.45	187.45	0.062135	0.010725	9323	
12.0	-12.80	0.0525	157.98	155.50	155.50	0.074902	0.012929	7734	
14.0	-15.80	0.0231	135.46	132.56	132.56	0.087860	0.015166	6993	
16.0	-14.80	0.0331	118.59	115.27	115.27	0.071442	0.014442	5733	
18.0	-15.10	0.0309	105.47	101.72	101.72	0.114498	0.019764	5059	
20.0	-16.40	0.0229	94.99	90.81	90.81	0.128259	0.022139	4516	
22.0	-16.50	0.0224	86.42	81.81	81.81	0.142374	0.024575	4069	
24.0	-15.10	0.0309	79.30	74.24	74.24	0.156893	0.027082	3692	
26.0	-13.80	0.0417	73.27	67.77	67.77	0.171871	0.029667	3370	
28.0	-13.70	0.0427	68.12	62.16	62.16	0.187368	0.032342	3091	
30.0	-14.30	0.0275	63.67	57.25	57.25	0.203451	0.035118	2830	
32.0	-15.60	0.0075	59.79	52.89	52.89	0.220196	0.038009	2630	
34.0	-17.40	0.0182	56.37	49.00	49.00	0.237688	0.041028	2437	
36.0	-19.40	0.0115	53.35	45.49	45.49	0.256025	0.044193	2262	
38.0	-21.10	0.0078	50.66	42.30	42.30	0.275315	0.047523	2104	
40.0	-21.00	0.0078	48.25	39.39	39.39	0.295688	0.051039	1959	
42.0	-20.50	0.0089	46.09	36.71	36.71	0.317291	0.054768	1825	
44.0	-20.50	0.0089	44.14	34.23	34.23	0.316368	0.054609	1831	
46.0	-20.90	0.0081	42.37	31.92	31.92	0.230569	0.038602	2512	
48.0	-20.90	0.0081	40.77	29.76	29.76	0.191970	0.033136	3017	
50.0	-20.50	0.0089	39.32	27.73	27.73	0.184559	0.031857	3139	
52.0	-19.80	0.0105	37.99	25.82	25.82	0.191417	0.033041	3026	
54.0	-19.40	0.0115	36.79	24.01	24.01	0.203461	0.035120	2847	
56.0	-19.00	0.0126	35.69	22.29	22.29	0.206418	0.035630	2806	
58.0	-19.20	0.0120	34.69	20.65	20.65	0.206933	0.035719	2799	
60.0	-19.30	0.0117	33.78	19.08	19.08	0.200317	0.034577	2892	
62.0	-19.50	0.0112	32.95	17.57	17.57	0.194074	0.033500	2885	
64.0	-19.80	0.0105	32.20	16.12	16.12	0.188252	0.032495	3077	
66.0	-19.00	0.0102	31.52	14.72	14.72	0.181659	0.031356	3189	
68.0	-19.70	0.0107	30.90	13.35	13.35	0.169367	0.029235	3420	
70.0	-19.60	0.0115	30.36	12.03	12.03	0.159582	0.027546	3630	
72.0	-19.40	0.0110	29.87	10.74	10.74	0.155860	0.026903	3717	
74.0	-20.00	0.0100	29.44	9.48	9.48	0.152677	0.026354	3794	
76.0	-20.40	0.0091	29.06	8.24	8.24	0.150044	0.025899	3861	
78.0	-21.30	0.0074	28.74	7.03	7.03	0.142447	0.024588	4067	
80.0	-22.50	0.0056	28.47	5.83	5.83	0.132703	0.022906	4365	
82.0	-23.50	0.0045	28.25	4.65	4.65	0.111794	0.020229	4943	
84.0	-24.80	0.0033	28.09	3.47	3.47	0.094747	0.016354	6114	
86.0	-26.80	0.0021	27.97	2.31	2.31	0.070158	0.012110	8257	
88.0	-30.60	0.0009	27.89	1.15	1.15	0.053781	0.009283	10772	
90.0	-38.40	0.0001	27.87	0.00	0.00	0.035470	0.006123	16333	

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AT&T Mobility
Rebuild Lemon Creek AK
ANDREW:DB589 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	94	Frequency (MHz):	579.33	869	Downtilt (Degrees):	
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-1.24	0.7516	18937.44	18937.44	18937.42	0.000021	0.000004	28028954	
1.0	-0.70	0.8511	1893.74	1893.74	1893.55	0.002059	0.000355	281344	
2.0	-0.30	0.9333	946.86	946.86	946.49	0.008203	0.001416	70625	
3.0	-0.10	0.9772	631.25	631.25	630.67	0.018382	0.003173	31516	
4.0	0.00	1.0000	472.67	472.67	472.67	0.024641	0.004253	23510	
5.0	-0.20	0.9550	378.73	377.79	377.79	0.030830	0.005322	18791	
6.0	-0.90	0.8128	315.60	314.47	314.47	0.037037	0.006393	15641	
7.0	-1.80	0.6607	270.50	269.19	269.19	0.043268	0.007469	13389	
8.0	-3.20	0.4786	235.18	235.18	235.18	0.049525	0.008549	11697	
9.0	-5.00	0.3162	210.38	208.68	208.68	0.055813	0.009634	10379	
10.0	-7.10	0.1950	189.33	187.45	187.45	0.062135	0.010725	9323	
12.0	-12.80	0.0525	157.77	155.50	155.50	0.074902	0.012929	7734	
14.0	-15.80	0.0263	135.22	132.56	132.56	0.087860	0.015166	6993	
16.0	-14.80	0.0331	118.31	115.27	115.27	0.101045	0.017442	5733	
18.0	-15.10	0.0309	105.16	101.72	101.72	0.114498	0.019764	5059	
20.0	-16.50	0.0229	94.64	90.81	90.81	0.128259	0.022139	4516	
22.0	-16.50	0.0224	86.04	81.81	81.81	0.142374	0.024575	4069	
24.0	-15.10	0.0309	78.88	74.24	74.24	0.156883	0.027082	3692	
26.0	-13.80	0.0427	72.82	67.77	67.77	0.171871	0.029667	3370	
28.0	-13.70	0.0472	63.15	57.25	57.25	0.187368	0.032342	3091	
30.0	-14.30	0.0275	59.23	52.89	52.89	0.203451	0.035118	2847	
32.0	-15.60	0.0182	55.78	49.00	49.00	0.220196	0.038009	2630	
34.0	-17.40	0.0126	52.72	45.49	45.49	0.237688	0.041028	2437	
36.0	-19.40	0.0115	52.72	45.49	45.49	0.256025	0.044193	2262	
38.0	-21.10	0.0078	50.00	42.30	42.30	0.275315	0.047523	2104	
40.0	-21.10	0.0078	47.56	39.39	39.39	0.295688	0.051039	1959	
42.0	-20.50	0.0089	45.36	36.71	36.71	0.317291	0.054768	1825	
44.0	-20.50	0.0089	43.38	34.23	34.23	0.340297	0.058739	1702	
46.0	-20.90	0.0081	41.58	31.92	31.92	0.366607	0.062924	1589	
48.0	-20.90	0.0081	39.95	29.76	29.76	0.396080	0.068114	1483	
50.0	-20.50	0.0089	38.46	27.73	27.73	0.429856	0.073723	1393	
52.0	-19.80	0.0105	37.11	25.82	25.82	0.468815	0.080318	1313	
54.0	-19.40	0.0115	35.87	24.01	24.01	0.514860	0.088077	1242	
56.0	-19.00	0.0126	34.75	22.29	22.29	0.568219	0.097087	1180	
58.0	-19.20	0.0120	33.72	20.65	20.65	0.630667	0.107616	1121	
60.0	-19.30	0.0117	32.78	19.08	19.08	0.703076	0.119854	1067	
62.0	-19.50	0.0112	31.92	17.57	17.57	0.780564	0.134088	1018	
64.0	-19.80	0.0105	31.15	16.12	16.12	0.868088	0.150001	973	
66.0	-19.80	0.0102	30.44	14.72	14.72	0.968774	0.168001	928	
68.0	-19.70	0.0107	29.81	13.35	13.35	1.082071	0.188071	885	
70.0	-19.70	0.0115	29.24	12.03	12.03	1.210338	0.210338	844	
72.0	-19.60	0.0110	28.73	10.74	10.74	1.354879	0.235487	804	
74.0	-20.00	0.0100	28.29	9.48	9.48	1.518103	0.264103	766	
76.0	-20.40	0.0091	27.90	8.24	8.24	1.699405	0.296405	730	
78.0	-21.30	0.0074	27.56	7.03	7.03	1.906889	0.332889	696	
80.0	-22.50	0.0056	27.28	5.83	5.83	2.149804	0.374804	664	
82.0	-23.50	0.0045	27.05	4.65	4.65	2.429548	0.422948	633	
84.0	-24.80	0.0033	26.88	3.47	3.47	2.759309	0.479309	603	
86.0	-26.80	0.0021	26.75	2.31	2.31	3.142784	0.542784	574	
88.0	-30.60	0.0009	26.68	1.15	1.15	3.593866	0.623866	546	
90.0	-38.40	0.0001	26.65	0.00	0.00	3.987819	0.718819	519	

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AT&T Mobility
Rebuild Lemon Creek AK
RFS:BMR6-D-B1 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	95	Frequency (MHz):	579.33	869	Downtilt (Degrees):	
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-0.01	0.9977	18937.44	18937.44	18937.42	0.000028	0.000005	20769408	
1.0	-0.10	0.9772	1893.74	1893.55	1893.55	0.002789	0.000481	207694	
2.0	-0.30	0.9333	946.87	946.49	946.49	0.011507	0.001926	51923	
3.0	-0.60	0.8710	631.25	630.67	630.67	0.025114	0.004333	23077	
4.0	-1.10	0.7762	473.43	472.67	472.67	0.044359	0.007657	13059	
5.0	-1.80	0.6607	378.75	377.79	377.79	0.068275	0.011785	8485	
6.0	-2.60	0.5495	315.62	314.47	314.47	0.100195	0.017293	5782	
7.0	-3.60	0.4365	270.53	269.19	269.19	0.123241	0.021273	4700	
8.0	-4.80	0.3311	236.72	235.18	235.18	0.156405	0.026997	3704	
9.0	-6.40	0.2291	210.42	208.68	208.68	0.189652	0.032736	3054	
10.0	-8.30	0.1479	189.38	187.45	187.45	0.220182	0.038006	2631	
12.0	-13.90	0.0407	157.82	155.50	155.50	0.256696	0.044136	2265	
14.0	-29.10	0.0012	135.28	132.56	132.56	0.304286	0.052895	2258	
16.0	-20.20	0.0095	118.38	115.27	115.27	0.356563	0.063795	2645	
18.0	-14.40	0.0363	105.23	101.72	101.72	0.418531	0.075293	3953	
20.0	-12.50	0.0562	94.73	90.81	90.81	0.484648	0.091232	6564	
22.0	-13.50	0.0589	86.13	81.81	81.81	0.558246	0.105154	4893	
24.0	-16.30	0.0234	78.98	74.24	74.24	0.643105	0.123425	3528	
26.0	-22.10	0.0062	67.75	62.16	62.16	0.743110	0.147020	2408	
28.0	-99.00	0.0000	63.28	57.25	57.25	0.842405	0.176344	1528	
30.0	-22.70	0.0054	59.37	52.89	52.89	0.942615	0.203441	1028	
32.0	-17.50	0.0178	55.93	49.00	49.00	1.041889	0.232341	732	
34.0	-15.20	0.0302	52.88	45.49	45.49	1.141175	0.261910	5211	
36.0	-14.40	0.0363	50.16	42.30	42.30	1.244987	0.292027	3995	
38.0	-14.50	0.0355	47.73	39.39	39.39	1.354253	0.324494	3175	
40.0	-15.70	0.0269	45.54	36.71	36.71	1.470514	0.358129	2846	
42.0	-18.00	0.0158	43.57	34.23	34.23	1.592851	0.394677	2599	
44.0	-22.50	0.0056	41.78	31.92	31.92	1.722856	0.434920	2385	
46.0	-35.20	0.0003	40.15	29.76	29.76	1.863462	0.479477	2198	
48.0	-27.60	0.0017	38.68	27.73	27.73	2.012676	0.528793	2049	
50.0	-20.10	0.0098	37.33	25.82	25.82	2.179357	0.583909	2277	
52.0	-16.50	0.0224	36.10	24.01	24.01	2.354380	0.645959	2320	
54.0	-14.20	0.0380	34.98	22.29	22.29	2.544632	0.713577	2368	
56.0	-12.80	0.0525	33.96	20.65	20.65	2.740311	0.787551	1378	
58.0	-11.90	0.0646	33.03	19.08	19.08	2.943723	0.868088	975	
60.0	-11.40	0.0724	32.18	17.57	17.57	3.152880	0.954280	773	
62.0	-11.20	0.0759	31.41	16.12	16.12	3.368022	0.104760	681	
64.0	-11.20	0.0759	30.71	14.72	14.72	3.589979	0.157042	636	
66.0	-11.50	0.0708	30.08	13.35	13.35	3.818997	0.170883	609	
68.0	-12.00	0.0631	29.52	12.03	12.03	4.056610	0.177551	585	
70.0	-12.60	0.0550	29.02	10.74	10.74	4.302860	0.186001	563	
72.0	-13.40	0.0457	28.57	9.48	9.48	4.559662	0.196001	544	
74.0	-14.50	0.0355	28.19	8.24	8.24	4.828811	0.207240	524	
76.0	-15.80	0.0263	27.86	7.03	7.03	5.109186	0.219331	628	
78.0	-17.30	0.0186	27.56	5.83	5.83	5.401236	0.233577	732	
80.0	-19.20	0.0120	27.35	4.65	4.65	5.704332	0.249132	916	
82.0	-21.70	0.0068	27.18	3.47	3.47	6.019466	0.267909	1260	
84.0	-25.20	0.0030	27.05	2.31	2.31	6.341429	0.289577	1860	
86.0	-31.20	0.0008	26.98	1.15	1.15	6.673058	0.315598	3160	
90.0	-99.00	0.0000	26.96	0.00	0.00	6.986753	0.344975	6677	

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AT&T Mobility
Rebuild Lemon Creek AK
RFS:BMR6-D-B1 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	93	Frequency (MHz):	869	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-0.01	0.9977	1893.74	1893.42	1893.42	0.000028	0.000005	20769.06	
1.0	-0.10	0.9772	1893.55	1893.55	1893.55	0.002789	0.000481	20769.06	
2.0	-0.30	0.9333	946.49	946.49	946.49	0.011158	0.001926	51921	
3.0	-0.60	0.8710	631.22	631.22	631.22	0.025106	0.004334	23075	
4.0	-1.10	0.7762	472.67	472.67	472.67	0.044441	0.007671	13035	
5.0	-1.80	0.6607	378.70	377.79	377.79	0.068179	0.011769	8497	
6.0	-2.60	0.5495	315.57	314.47	314.47	0.099964	0.017255	5795	
7.0	-3.60	0.4365	270.47	269.19	269.19	0.123640	0.021342	4885	
8.0	-4.80	0.3311	236.65	235.18	235.18	0.157464	0.027180	3679	
9.0	-6.40	0.2291	210.34	208.68	208.68	0.191833	0.033113	3019	
10.0	-8.30	0.1479	189.29	187.45	187.45	0.224785	0.038801	2577	
12.0	-13.90	0.0407	157.71	155.50	155.50	0.264645	0.045681	2189	
14.0	-20.10	0.0095	118.24	115.27	115.27	0.239869	0.046852	2134	
16.0	-29.10	0.0012	85.94	81.81	81.81	0.167750	0.041404	2415	
18.0	-44.40	0.0063	50.55	46.42	46.42	0.028956	0.028956	3453	
20.0	-62.50	0.0021	34.51	30.38	30.38	0.016750	0.016750	6065	
22.0	-82.50	0.0008	24.15	20.02	20.02	0.009551	0.009551	6537	
24.0	-104.00	0.0003	17.57	15.12	15.12	0.005669	0.005669	5482	
26.0	-127.00	0.0001	12.71	10.47	10.47	0.003442	0.003442	4667	
28.0	-151.00	0.0000	9.46	7.71	7.71	0.002119	0.002119	4021	
30.0	-176.00	0.0000	7.25	6.16	6.16	0.001405	0.001405	3500	
32.0	-201.00	0.0000	5.73	5.00	5.00	0.000954	0.000954	3106	
34.0	-227.00	0.0000	4.56	4.00	4.00	0.000649	0.000649	3175	
36.0	-254.00	0.0000	3.65	3.25	3.25	0.000441	0.000441	4276	
38.0	-281.00	0.0000	2.94	2.64	2.64	0.000318	0.000318	4247	
40.0	-308.00	0.0000	2.39	2.19	2.19	0.000230	0.000230	3205	
42.0	-335.00	0.0000	1.98	1.78	1.78	0.000173	0.000173	2803	
44.0	-362.00	0.0000	1.66	1.46	1.46	0.000134	0.000134	2556	
46.0	-389.00	0.0000	1.40	1.20	1.20	0.000106	0.000106	2342	
48.0	-416.00	0.0000	1.19	1.09	1.09	0.000084	0.000084	2156	
50.0	-443.00	0.0000	1.02	0.92	0.92	0.000066	0.000066	1991	
52.0	-470.00	0.0000	0.88	0.78	0.78	0.000052	0.000052	1883	
54.0	-497.00	0.0000	0.76	0.66	0.66	0.000042	0.000042	1796	
56.0	-524.00	0.0000	0.66	0.56	0.56	0.000034	0.000034	1502	
58.0	-551.00	0.0000	0.58	0.48	0.48	0.000028	0.000028	1014	
60.0	-578.00	0.0000	0.51	0.41	0.41	0.000024	0.000024	779	
62.0	-605.00	0.0000	0.45	0.35	0.35	0.000021	0.000021	667	
64.0	-632.00	0.0000	0.40	0.30	0.30	0.000018	0.000018	615	
66.0	-659.00	0.0000	0.36	0.26	0.26	0.000016	0.000016	587	
68.0	-686.00	0.0000	0.32	0.22	0.22	0.000014	0.000014	541	
70.0	-713.00	0.0000	0.29	0.19	0.19	0.000012	0.000012	523	
72.0	-740.00	0.0000	0.26	0.16	0.16	0.000011	0.000011	532	
74.0	-767.00	0.0000	0.23	0.13	0.13	0.000010	0.000010	589	
76.0	-794.00	0.0000	0.21	0.11	0.11	0.000009	0.000009	684	
78.0	-821.00	0.0000	0.19	0.09	0.09	0.000008	0.000008	851	
80.0	-848.00	0.0000	0.17	0.08	0.08	0.000007	0.000007	1174	
82.0	-875.00	0.0000	0.15	0.07	0.07	0.000006	0.000006	1739	
84.0	-902.00	0.0000	0.14	0.06	0.06	0.000005	0.000005	2979	
86.0	-929.00	0.0000	0.12	0.05	0.05	0.000004	0.000004	6379	
88.0	-956.00	0.0000	0.11	0.04	0.04	0.000003	0.000003		
90.0	-983.00	0.0000	0.10	0.03	0.03	0.000002	0.000002		

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AT&T Mobility
Rebuild Lemon Creek AK
ANDREW:DB589 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		300	Height (feet):	94	Frequency (MHz):	869	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	-1.24	0.7516	1893.74	1893.42	1893.42	0.000021	0.000004	2802895.4	
1.0	-0.70	0.8511	1893.55	1893.55	1893.55	0.002059	0.000355	2813444	
2.0	-0.30	0.9333	946.49	946.49	946.49	0.008203	0.001416	70625	
3.0	-0.10	0.9772	631.22	631.22	631.22	0.018382	0.003173	23516	
4.0	0.00	1.0000	472.67	472.67	472.67	0.024641	0.004253	13035	
5.0	-0.20	0.9500	378.73	377.79	377.79	0.030830	0.005322	8497	
6.0	-0.90	0.8128	315.60	314.47	314.47	0.043268	0.006393	5795	
7.0	-1.80	0.6607	270.50	269.19	269.19	0.054969	0.007469	4885	
8.0	-3.20	0.4786	236.68	235.18	235.18	0.069525	0.009549	3679	
9.0	-5.00	0.3162	210.38	208.68	208.68	0.086813	0.012725	3019	
10.0	-7.10	0.1950	189.33	187.45	187.45	0.106213	0.016725	2577	
12.0	-12.80	0.0525	157.77	155.50	155.50	0.129229	0.021229	2189	
14.0	-18.80	0.0231	118.31	115.27	115.27	0.151666	0.027466	2134	
16.0	-25.10	0.0099	85.94	81.81	81.81	0.174442	0.031442	2415	
18.0	-31.50	0.0039	60.55	56.42	56.42	0.194498	0.036498	3453	
20.0	-38.00	0.0024	44.15	40.02	40.02	0.212579	0.041579	6065	
22.0	-44.50	0.0015	32.15	28.02	28.02	0.228259	0.046259	4885	
24.0	-51.00	0.0009	23.15	19.02	19.02	0.241772	0.049772	4021	
26.0	-57.50	0.0005	17.15	13.02	13.02	0.252667	0.051667	3500	
28.0	-64.00	0.0003	12.75	9.02	9.02	0.261442	0.053142	3106	
30.0	-70.50	0.0002	9.45	6.02	6.02	0.269196	0.054616	3175	
32.0	-77.00	0.0001	7.25	4.02	4.02	0.275923	0.056093	4276	
34.0	-83.50	0.0000	5.75	3.02	3.02	0.281748	0.057568	4247	
36.0	-90.00	0.0000	4.55	2.02	2.02	0.286675	0.059043	3205	
38.0	-96.50	0.0000	3.65	1.52	1.52	0.290702	0.060518	2803	
40.0	-103.00	0.0000	2.95	1.02	1.02	0.293927	0.062000	2556	
42.0	-109.50	0.0000	2.35	0.72	0.72	0.296352	0.063482	2342	
44.0	-116.00	0.0000	1.95	0.52	0.52	0.297977	0.064964	2156	
46.0	-122.50	0.0000	1.65	0.42	0.42	0.299702	0.066446	1991	
48.0	-129.00	0.0000	1.45	0.32	0.32	0.300527	0.067928	1883	
50.0	-135.50	0.0000	1.25	0.22	0.22	0.301452	0.069410	1796	
52.0	-142.00	0.0000	1.15	0.12	0.12	0.302477	0.070892	1502	
54.0	-148.50	0.0000	1.05	0.02	0.02	0.303502	0.072374	1014	
56.0	-155.00	0.0000	0.95	0.02	0.02	0.304627	0.073856	779	
58.0	-161.50	0.0000	0.85	0.02	0.02	0.305752	0.075338	667	
60.0	-168.00	0.0000	0.75	0.02	0.02	0.306877	0.076820	615	
62.0	-174.50	0.0000	0.65	0.02	0.02	0.308002	0.078302	587	
64.0	-181.00	0.0000	0.55	0.02	0.02	0.309127	0.079784	541	
66.0	-187.50	0.0000	0.45	0.02	0.02	0.310252	0.081266	523	
68.0	-194.00	0.0000	0.35	0.02	0.02	0.311377	0.082748	589	
70.0	-200.50	0.0000	0.25	0.02	0.02	0.312502	0.084230	684	
72.0	-207.00	0.0000	0.15	0.02	0.02	0.313627	0.085712	851	
74.0	-213.50	0.0000	0.15	0.02	0.02	0.314752	0.087194	1174	
76.0	-220.00	0.0000	0.15	0.02	0.02	0.315877	0.088676	1739	
78.0	-226.50	0.0000	0.15	0.02	0.02	0.316999	0.090158	2979	
80.0	-233.00	0.0000	0.15	0.02	0.02	0.318124	0.091640	6379	
82.0	-239.50	0.0000	0.15	0.02	0.02	0.319249	0.093122		
84.0	-246.00	0.0000	0.15	0.02	0.02	0.320374	0.094604		
86.0	-252.50	0.0000	0.15	0.02	0.02	0.321499	0.096086		
88.0	-259.00	0.0000	0.15	0.02	0.02	0.322624	0.097568		
90.0	-265.50	0.0000	0.15	0.02	0.02	0.323749	0.099050		

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AT&T Mobility
Rebuild Lemon Creek AK
RFS:BMR6-D-B1 Antenna Worksheet (0 Sector)

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):										579.33	Frequency (MHz):		869	Downlink (Degrees):		0.0	Times Below MPE		9890191					
ERP (Watts):										300	Height (feet):		93	Slant Distance (meters)		Dist From Structure (meters)		Power Density (µW/cm²)		Percent of MPE		Times Below MPE		
Depression Angle (degrees)										0.1	Relative dB		0.9977	18937.44	18937.44	0.000028	0.000005	20769406	579.33	869	869	869	869	
Relative dB										-0.01	-0.10	0.9772	1893.74	1893.74	0.002789	0.000481	0.000481	0.000481	207692	579.33	869	869	869	869
0.1	-0.01	0.9772	1893.74	1893.74	1893.74	0.002789	0.000481	0.000481	0.000481	207692	579.33	869	869	869	869	869	87	1893.74	1893.74	1893.74	1893.74	0.000558	0.001011	98988
1.0	-0.10	0.9333	946.85	946.85	946.85	0.011158	0.001926	0.001926	0.001926	51921	579.33	869	869	869	869	869	87	946.85	946.85	946.85	946.85	0.023434	0.004045	24721
2.0	-0.30	0.8710	631.22	631.22	631.22	0.025106	0.004334	0.004334	0.004334	13035	579.33	869	869	869	869	869	87	631.22	631.22	631.22	631.22	0.052736	0.009103	10985
3.0	-0.60	0.7762	473.40	473.40	473.40	0.044441	0.007671	0.007671	0.007671	13035	579.33	869	869	869	869	869	87	472.67	472.67	472.67	472.67	0.093776	0.016187	6177
4.0	-1.10	0.6607	378.70	378.70	378.70	0.068179	0.011769	0.011769	0.011769	8497	579.33	869	869	869	869	869	87	377.79	377.79	377.79	377.79	0.143234	0.024724	4044
5.0	-1.80	0.5495	315.57	315.57	315.57	0.099664	0.017255	0.017255	0.017255	5795	579.33	869	869	869	869	869	87	314.47	314.47	314.47	314.47	0.204172	0.035243	2837
6.0	-2.60	0.4365	270.47	270.47	270.47	0.123640	0.021342	0.021342	0.021342	4685	579.33	869	869	869	869	869	87	269.19	269.19	269.19	269.19	0.287520	0.049630	2014
7.0	-3.60	0.3311	236.65	236.65	236.65	0.157464	0.027180	0.027180	0.027180	3679	579.33	869	869	869	869	869	87	235.18	235.18	235.18	235.18	0.375733	0.064856	1541
8.0	-4.80	0.2291	210.34	210.34	210.34	0.191853	0.033113	0.033113	0.033113	3019	579.33	869	869	869	869	869	87	208.68	208.68	208.68	208.68	0.415044	0.071642	1395
9.0	-6.40	0.1479	189.29	189.29	189.29	0.224785	0.038801	0.038801	0.038801	2577	579.33	869	869	869	869	869	87	187.45	187.45	187.45	187.45	0.405542	0.070001	1428
10.0	-8.30	0.0407	157.71	157.71	157.71	0.264645	0.045681	0.045681	0.045681	2189	579.33	869	869	869	869	869	87	159.04	159.04	159.04	159.04	0.405542	0.070001	1428
12.0	-13.90	0.0012	135.16	135.16	135.16	0.271430	0.048552	0.048552	0.048552	2134	579.33	869	869	869	869	869	87	132.56	132.56	132.56	132.56	0.405542	0.070001	1428
14.0	-29.10	0.0012	118.24	118.24	118.24	0.239869	0.041404	0.041404	0.041404	2415	579.33	869	869	869	869	869	87	117.84	117.84	117.84	117.84	0.405542	0.070001	1428
16.0	-20.20	0.0095	118.24	118.24	118.24	0.239869	0.041404	0.041404	0.041404	2415	579.33	869	869	869	869	869	87	117.84	117.84	117.84	117.84	0.405542	0.070001	1428
18.0	-14.40	0.0363	105.08	105.08	105.08	0.167750	0.028956	0.028956	0.028956	3453	579.33	869	869	869	869	869	87	104.64	104.64	104.64	104.64	0.405542	0.070001	1428
20.0	-12.50	0.0562	94.55	94.55	94.55	0.099519	0.016488	0.016488	0.016488	6065	579.33	869	869	869	869	869	87	90.81	90.81	90.81	90.81	0.405542	0.070001	1428
22.0	-12.30	0.0589	85.94	85.94	85.94	0.089611	0.015295	0.015295	0.015295	6537	579.33	869	869	869	869	869	87	85.40	85.40	85.40	85.40	0.405542	0.070001	1428
24.0	-13.50	0.0447	78.77	78.77	78.77	0.105669	0.018240	0.018240	0.018240	5482	579.33	869	869	869	869	869	87	78.18	78.18	78.18	78.18	0.405542	0.070001	1428
26.0	-16.30	0.0234	72.71	72.71	72.71	0.124119	0.021425	0.021425	0.021425	4667	579.33	869	869	869	869	869	87	67.77	67.77	67.77	67.77	0.405542	0.070001	1428
28.0	-22.10	0.0062	67.51	67.51	67.51	0.144057	0.024866	0.024866	0.024866	4021	579.33	869	869	869	869	869	87	62.16	62.16	62.16	62.16	0.405542	0.070001	1428
30.0	-99.00	0.0000	63.02	63.02	63.02	0.165515	0.028570	0.028570	0.028570	3500	579.33	869	869	869	869	869	87	57.25	57.25	57.25	57.25	0.405542	0.070001	1428
32.0	-22.70	0.0054	59.09	59.09	59.09	0.186496	0.032191	0.032191	0.032191	3106	579.33	869	869	869	869	869	87	52.89	52.89	52.89	52.89	0.405542	0.070001	1428
34.0	-17.50	0.0178	55.64	55.64	55.64	0.182411	0.031486	0.031486	0.031486	3175	579.33	869	869	869	869	869	87	49.00	49.00	49.00	49.00	0.405542	0.070001	1428
36.0	-15.20	0.0302	52.57	52.57	52.57	0.135481	0.023386	0.023386	0.023386	4276	579.33	869	869	869	869	869	87	45.49	45.49	45.49	45.49	0.405542	0.070001	1428
38.0	-14.40	0.0363	49.84	49.84	49.84	0.136381	0.023541	0.023541	0.023541	4247	579.33	869	869	869	869	869	87	42.30	42.30	42.30	42.30	0.405542	0.070001	1428
40.0	-14.50	0.0355	47.39	47.39	47.39	0.180739	0.033198	0.033198	0.033198	3205	579.33	869	869	869	869	869	87	39.39	39.39	39.39	39.39	0.405542	0.070001	1428
42.0	-15.70	0.0269	45.18	45.18	45.18	0.206614	0.035664	0.035664	0.035664	2803	579.33	869	869	869	869	869	87	36.71	36.71	36.71	36.71	0.405542	0.070001	1428
44.0	-18.00	0.0158	43.19	43.19	43.19	0.226578	0.039110	0.039110	0.039110	2556	579.33	869	869	869	869	869	87	34.23	34.23	34.23	34.23	0.405542	0.070001	1428
46.0	-22.50	0.0056	41.39	41.39	41.39	0.247292	0.042886	0.042886	0.042886	2342	579.33	869	869	869	869	869	87	31.92	31.92	31.92	31.92	0.405542	0.070001	1428
48.0	-35.20	0.0003	39.75	39.75	39.75	0.268694	0.046380	0.046380	0.046380	2156	579.33	869	869	869	869	869	87	29.76	29.76	29.76	29.76	0.405542	0.070001	1428
50.0	-27.60	0.0017	38.25	38.25	38.25	0.290906	0.050214	0.050214	0.050214	1991	579.33	869	869	869	869	869	87	27.73	27.73	27.73	27.73	0.405542	0.070001	1428
52.0	-20.10	0.0098	36.89	36.89	36.89	0.282166	0.047005	0.047005	0.047005	2053	579.33	869	869	869	869	869	87	25.82	25.82	25.82	25.82	0.405542	0.070001	1428
54.0	-16.50	0.0224	35.65	35.65	35.65	0.215907	0.037268	0.037268	0.037268	2883	579.33	869	869	869	869	869	87	24.01	24.01	24.01	24.01	0.405542	0.070001	1428
56.0	-14.20	0.0380	34.51	34.51	34.51	0.207190	0.035764	0.035764	0.035764	2796	579.33	869	869	869	869	869	87	22.29	22.29	22.29	22.29	0.405542	0.070001	1428
58.0	-12.80	0.0525	33.48	33.48	33.48	0.385480	0.066538	0.066538	0.066538	1502	579.33	869	869	869	869	869	87	20.65	20.65	20.65	20.65	0.405542	0.070001	1428
60.0	-11.90	0.0646	32.53	32.53	32.53	0.571242	0.098603	0.098603	0.098603	1014	579.33	869	869	869	869	869	87	19.08	19.08	19.08	19.08	0.405542	0.070001	1428
62.0	-11.40	0.0724	31.67	31.67	31.67	0.742963	0.128244	0.128244	0.128244	779	579.33	869	869	869	869	869	87	17.57	17.57	17.57	17.57	0.405542	0.070001	1428
64.0	-11.20	0.0759	30.89	30.89	30.89	0.867471	0.149736	0.149736	0.149736	667	579.33	869	869	869	869	869	87	16.12	16.12	16.12	16.12	0.405542	0.070001	1428
66.0	-11.20	0.0759	30.18	30.18	30.18	0.941664	0.162543	0.162543	0.162543	615	579.33	869	869	869	869	869	87	14.72	14.72	14.72	14.72	0.405542	0.070001	1428
68.0	-11.50	0.0708	29.54	29.54	29.54	0.985510	0.170111	0.170111	0.170111	587	579.33	869	869	869	869	869	87	13.95	13.95	13.95	13.95	0.405542	0.070001	1428
70.0	-12.00	0.0631	28.96	28.96	28.96	1.027444	0.174401	0.174401	0.174401	563	579.33	869	869	869	869	869	87	12.93	12.93	12.93	12.93	0.405542	0.070001	1428
72.0	-12.60	0.0550	28.45	28.45	28.45	1.069335																		

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLH-RRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	87	Frequency (MHz):	579.33	869	Downlink (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000010	9890191		
1.0	0.00	1.0000	1893.71	1893.55	0.005868	0.001011	98988		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004045	24721		
3.0	-2.70	0.5370	631.15	630.67	0.052736	0.009103	10985		
4.0	-5.80	0.2930	473.30	472.67	0.093776	0.016187	6177		
5.0	-11.30	0.0741	378.58	377.79	0.143234	0.016187	4044		
6.0	-21.50	0.0071	315.42	314.47	0.206337	0.036616	2807		
7.0	-14.90	0.0324	270.30	269.19	0.287520	0.049630	2014		
8.0	-10.50	0.0891	236.45	235.18	0.375733	0.064856	1541		
9.0	-9.20	0.1202	210.12	208.68	0.414145	0.071486	1398		
10.0	-9.80	0.1047	189.04	187.45	0.405542	0.070001	1428		
12.0	-17.00	0.0200	157.42	155.50	0.247189	0.042668	2343		
14.0	-23.20	0.0048	134.81	132.56	0.157483	0.027183	3678		
16.0	-16.20	0.0240	117.84	115.27	0.205297	0.035437	2821		
18.0	-20.40	0.0091	104.64	101.72	0.261373	0.045116	2216		
20.0	-25.30	0.0030	94.06	90.81	0.267607	0.046192	2164		
22.0	-19.90	0.0102	85.40	81.81	0.113859	0.019654	5088		
24.0	-26.80	0.0021	78.18	74.24	0.102382	0.017672	5658		
26.0	-20.20	0.0095	72.07	67.77	0.120355	0.020775	4813		
28.0	-13.60	0.0437	66.82	62.16	0.120680	0.021763	4594		
30.0	-12.60	0.0550	62.28	57.25	0.187470	0.032360	3090		
32.0	-15.20	0.0302	58.30	52.89	0.386853	0.066776	1497		
34.0	-23.10	0.0049	54.79	49.00	0.450091	0.077691	1287		
36.0	-32.40	0.0006	51.68	45.49	0.502805	0.086790	1152		
38.0	-24.60	0.0035	48.90	42.30	0.595930	0.096582	1035		
40.0	-29.50	0.0011	46.40	38.39	0.621402	0.107262	932		
42.0	-30.00	0.0010	44.14	36.71	0.681417	0.117621	850		
44.0	-20.90	0.0081	42.10	34.23	0.672360	0.116057	861		
46.0	-18.10	0.0155	40.25	31.92	0.331223	0.057173	1749		
48.0	-18.20	0.0151	38.56	29.76	0.113831	0.019649	5089		
50.0	-20.60	0.0087	37.02	27.73	0.261088	0.045067	2218		
52.0	-25.00	0.0032	35.61	25.82	0.331583	0.057235	1747		
54.0	-32.40	0.0006	34.32	24.01	0.355614	0.061383	1629		
56.0	-44.70	0.0000	33.14	22.29	0.379333	0.065478	1527		
58.0	-35.00	0.0003	32.06	20.65	0.402370	0.069454	1439		
60.0	-31.30	0.0007	31.07	19.08	0.421847	0.072816	1373		
62.0	-29.20	0.0012	30.17	17.57	0.300985	0.051954	1924		
64.0	-28.90	0.0013	29.34	16.12	0.117399	0.020265	4934		
66.0	-30.10	0.0010	28.59	14.72	0.044331	0.007652	13068		
68.0	-32.50	0.0006	27.92	13.35	0.046123	0.007961	12560		
70.0	-34.50	0.0004	27.31	12.03	0.047444	0.008189	12210		
72.0	-34.70	0.0003	26.77	10.74	0.048822	0.008427	11866		
74.0	-34.70	0.0003	26.29	9.48	0.050550	0.008725	11460		
76.0	-34.70	0.0003	25.87	8.24	0.035618	0.006148	16295		
78.0	-35.60	0.0002	25.50	7.03	0.018297	0.003158	31662		
80.0	-37.30	0.0002	25.20	5.83	0.014934	0.002578	38792		
82.0	-37.80	0.0002	24.95	4.65	0.015114	0.002609	38329		
84.0	-38.80	0.0001	24.76	3.47	0.014239	0.002458	40687		
86.0	-41.00	0.0001	24.63	2.31	0.009151	0.001580	63308		
88.0	-43.20	0.0000	24.54	1.15	0.007486	0.001292	77387		
90.0	-48.20	0.0000	24.52	0.00	0.004785	0.000826	121070		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLH-RRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	87	Frequency (MHz):	579.33	869	Downlink (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000010	9890191		
1.0	0.00	1.0000	1893.71	1893.55	0.005868	0.001011	98988		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004045	24721		
3.0	-2.70	0.5370	631.15	630.67	0.052736	0.009103	10985		
4.0	-5.80	0.2930	473.30	472.67	0.093776	0.016187	6177		
5.0	-11.30	0.0741	378.58	377.79	0.143234	0.016187	4044		
6.0	-21.50	0.0071	315.42	314.47	0.206337	0.036616	2807		
7.0	-14.90	0.0324	270.30	269.19	0.287520	0.049630	2014		
8.0	-10.50	0.0891	236.45	235.18	0.375733	0.064856	1541		
9.0	-9.20	0.1202	210.12	208.68	0.414145	0.071486	1398		
10.0	-9.80	0.1047	189.04	187.45	0.405542	0.070001	1428		
12.0	-17.00	0.0200	157.42	155.50	0.247189	0.042668	2343		
14.0	-23.20	0.0048	134.81	132.56	0.157483	0.027183	3678		
16.0	-16.20	0.0240	117.84	115.27	0.205297	0.035437	2821		
18.0	-20.40	0.0091	104.64	101.72	0.261373	0.045116	2216		
20.0	-25.30	0.0030	94.06	90.81	0.267607	0.046192	2164		
22.0	-19.90	0.0102	85.40	81.81	0.113859	0.019654	5088		
24.0	-26.80	0.0021	78.18	74.24	0.102382	0.017672	5658		
26.0	-20.20	0.0095	72.07	67.77	0.120355	0.020775	4813		
28.0	-13.60	0.0437	66.82	62.16	0.120680	0.021763	4594		
30.0	-12.60	0.0550	62.28	57.25	0.187470	0.032360	3090		
32.0	-15.20	0.0302	58.30	52.89	0.386853	0.066776	1497		
34.0	-23.10	0.0049	54.79	49.00	0.450091	0.077691	1287		
36.0	-32.40	0.0006	51.68	45.49	0.502805	0.086790	1152		
38.0	-24.60	0.0035	48.90	42.30	0.595930	0.096582	1035		
40.0	-29.50	0.0011	46.40	38.39	0.621402	0.107262	932		
42.0	-30.00	0.0010	44.14	36.71	0.681417	0.117621	850		
44.0	-20.90	0.0081	42.10	34.23	0.672360	0.116057	861		
46.0	-18.10	0.0155	40.25	31.92	0.331223	0.057173	1749		
48.0	-18.20	0.0151	38.56	29.76	0.113831	0.019649	5089		
50.0	-20.60	0.0087	37.02	27.73	0.261088	0.045067	2218		
52.0	-25.00	0.0032	35.61	25.82	0.331583	0.057235	1747		
54.0	-32.40	0.0006	34.32	24.01	0.355614	0.061383	1629		
56.0	-44.70	0.0000	33.14	22.29	0.379333	0.065478	1527		
58.0	-35.00	0.0003	32.06	20.65	0.402370	0.069454	1439		
60.0	-31.30	0.0007	31.07	19.08	0.421847	0.072816	1373		
62.0	-29.20	0.0012	30.17	17.57	0.300985	0.051954	1924		
64.0	-28.90	0.0013	29.34	16.12	0.117399	0.020265	4934		
66.0	-30.10	0.0010	28.59	14.72	0.044331	0.007652	13068		
68.0	-32.50	0.0006	27.92	13.35	0.046123	0.007961	12560		
70.0	-34.50	0.0004	27.31	12.03	0.047444	0.008189	12210		
72.0	-34.70	0.0003	26.77	10.74	0.048822	0.008427	11866		
74.0	-34.70	0.0003	26.29	9.48	0.050550	0.008725	11460		
76.0	-34.70	0.0003	25.87	8.24	0.035618	0.006148	16295		
78.0	-35.60	0.0002	25.50	7.03	0.018297	0.003158	31662		
80.0	-37.30	0.0002	25.20	5.83	0.014934	0.002578	38792		
82.0	-37.80	0.0002	24.95	4.65	0.015114	0.002609	38329		
84.0	-38.80	0.0001	24.76	3.47	0.014239	0.002458	40687		
86.0	-41.00	0.0001	24.63	2.31	0.009151	0.001580	63308		
88.0	-43.20	0.0000	24.54	1.15	0.007486	0.001292	77387		
90.0	-48.20	0.0000	24.52	0.00	0.004785	0.000826	121070		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):										570.33	86		Frequency (MHz)		869	Downtilt (Degrees):		0.0	
ERP (Watts):	630		Height (feet)	86		Slant Distance (meters)		Dist From Structure (meters)		Power Density (µW/cm²)		Percent of MPE		Times Below MPE					
Depression Angle (degrees)	Relative dB	Relative Gain	Relative Gain	Slant Distance (meters)	Slant Distance (meters)	Dist From Structure (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Power Density (µW/cm²)	Percent of MPE	Percent of MPE	Times Below MPE	Times Below MPE	Times Below MPE	Times Below MPE	Times Below MPE	Times Below MPE	Times Below MPE	Times Below MPE
0.1	0.00	0.000	1.0000	18937.44	18937.44	18937.42	18937.42	0.000059	0.000059	0.000010	0.000010	9890191	9890191	9890191	9890191	9890191	9890191	9890191	9890191
1.0	0.00	0.000	1.0000	18937.44	18937.44	18937.42	18937.42	0.005858	0.005858	0.001011	0.001011	98888	98888	98888	98888	98888	98888	98888	98888
2.0	-0.90	0.8128	0.8128	946.49	946.49	946.49	946.49	0.023434	0.023434	0.004045	0.004045	24721	24721	24721	24721	24721	24721	24721	24721
3.0	-2.70	0.5370	0.5370	630.67	630.67	630.67	630.67	0.052738	0.052738	0.009103	0.009103	10985	10985	10985	10985	10985	10985	10985	10985
4.0	-5.80	0.2650	0.2650	473.29	473.29	472.69	472.69	0.093782	0.093782	0.016188	0.016188	6177	6177	6177	6177	6177	6177	6177	6177
5.0	-11.30	0.0741	0.0741	377.79	377.79	377.79	377.79	0.143249	0.143249	0.024727	0.024727	4044	4044	4044	4044	4044	4044	4044	4044
6.0	-21.50	0.0071	0.0071	315.40	315.40	314.47	314.47	0.204463	0.204463	0.035293	0.035293	2933	2933	2933	2933	2933	2933	2933	2933
7.0	-44.90	0.0024	0.0024	270.27	270.27	269.19	269.19	0.287579	0.287579	0.049640	0.049640	2014	2014	2014	2014	2014	2014	2014	2014
8.0	-10.50	0.0861	0.0861	236.42	236.42	235.18	235.18	0.371893	0.371893	0.064873	0.064873	1541	1541	1541	1541	1541	1541	1541	1541
9.0	-9.20	0.1202	0.1202	210.08	210.08	208.68	208.68	0.421921	0.421921	0.072829	0.072829	1373	1373	1373	1373	1373	1373	1373	1373
10.0	-9.80	0.1047	0.1047	189.00	189.00	187.45	187.45	0.424068	0.424068	0.072578	0.072578	1377	1377	1377	1377	1377	1377	1377	1377
12.0	-17.00	0.0280	0.0280	157.37	157.37	155.50	155.50	0.286914	0.286914	0.046073	0.046073	2170	2170	2170	2170	2170	2170	2170	2170
14.0	-23.20	0.0048	0.0048	134.76	134.76	132.56	132.56	0.157612	0.157612	0.027206	0.027206	3675	3675	3675	3675	3675	3675	3675	3675
16.0	-16.20	0.0240	0.0240	117.78	117.78	115.27	115.27	0.206305	0.206305	0.035611	0.035611	2213	2213	2213	2213	2213	2213	2213	2213
18.0	-20.00	0.0081	0.0081	104.57	104.57	101.72	101.72	0.261730	0.261730	0.045178	0.045178	2020	2020	2020	2020	2020	2020	2020	2020
20.0	-25.30	0.0030	0.0030	93.98	93.98	90.81	90.81	0.286746	0.286746	0.049496	0.049496	4205	4205	4205	4205	4205	4205	4205	4205
22.0	-19.90	0.0102	0.0102	85.31	85.31	81.81	81.81	0.135807	0.135807	0.023442	0.023442	4265	4265	4265	4265	4265	4265	4265	4265
24.0	-26.80	0.0021	0.0021	78.09	78.09	74.24	74.24	0.102662	0.102662	0.017121	0.017121	5643	5643	5643	5643	5643	5643	5643	5643
26.0	-20.20	0.0095	0.0095	66.71	66.71	62.16	62.16	0.120704	0.120704	0.020635	0.020635	4799	4799	4799	4799	4799	4799	4799	4799
28.0	-13.60	0.0350	0.0350	62.16	62.16	57.25	57.25	0.132701	0.132701	0.022906	0.022906	4365	4365	4365	4365	4365	4365	4365	4365
30.0	-12.60	0.0550	0.0550	58.17	58.17	52.89	52.89	0.168446	0.168446	0.029076	0.029076	3439	3439	3439	3439	3439	3439	3439	3439
32.0	-15.20	0.0049	0.0049	54.66	54.66	49.00	49.00	0.364415	0.364415	0.063248	0.063248	1581	1581	1581	1581	1581	1581	1581	1581
34.0	-23.10	0.0049	0.0049	49.00	49.00	45.49	45.49	0.451360	0.451360	0.077910	0.077910	1283	1283	1283	1283	1283	1283	1283	1283
36.0	-32.40	0.0006	0.0006	51.53	51.53	45.49	45.49	0.505831	0.505831	0.087313	0.087313	1145	1145	1145	1145	1145	1145	1145	1145
38.0	-24.60	0.0035	0.0035	48.74	48.74	42.30	42.30	0.563432	0.563432	0.097255	0.097255	1028	1028	1028	1028	1028	1028	1028	1028
40.0	-29.50	0.0011	0.0011	46.24	46.24	39.39	39.39	0.623953	0.623953	0.117072	0.117072	928	928	928	928	928	928	928	928
42.0	-20.90	0.0011	0.0011	43.97	43.97	36.71	36.71	0.687267	0.687267	0.118631	0.118631	842	842	842	842	842	842	842	842
44.0	-18.10	0.0155	0.0155	40.06	40.06	34.23	34.23	0.717246	0.717246	0.123805	0.123805	807	807	807	807	807	807	807	807
46.0	-18.10	0.0155	0.0155	40.06	40.06	34.23	34.23	0.717246	0.717246	0.123805	0.123805	807	807	807	807	807	807	807	807
48.0	-18.20	0.0087	0.0087	36.82	36.82	29.76	29.76	0.097283	0.097283	0.071789	0.071789	1382	1382	1382	1382	1382	1382	1382	1382
50.0	-20.60	0.0087	0.0087	36.82	36.82	29.76	29.76	0.097283	0.097283	0.071789	0.071789	1382	1382	1382	1382	1382	1382	1382	1382
52.0	-25.00	0.0032	0.0032	35.40	35.40	25.82	25.82	0.335850	0.335850	0.042501	0.042501	2352	2352	2352	2352	2352	2352	2352	2352
54.0	-32.40	0.0006	0.0006	34.10	34.10	24.01	24.01	0.359786	0.359786	0.062104	0.062104	1724	1724	1724	1724	1724	1724	1724	1724
56.0	-44.70	0.0000	0.0000	32.91	32.91	22.29	22.29	0.383940	0.383940	0.066273	0.066273	1508	1508	1508	1508	1508	1508	1508	1508
58.0	-35.00	0.0003	0.0003	31.82	31.82	20.65	20.65	0.408676	0.408676	0.070542	0.070542	1417	1417	1417	1417	1417	1417	1417	1417
60.0	-31.30	0.0007	0.0007	30.93	30.93	19.08	19.08	0.432809	0.432809	0.074708	0.074708	1338	1338	1338	1338	1338	1338	1338	1338
62.0	-29.20	0.0012	0.0012	29.92	29.92	17.57	17.57	0.341269	0.341269	0.058907	0.058907	1697	1697	1697	1697	1697	1697	1697	1697
64.0	-28.90	0.0013	0.0013	29.09	29.09	16.12	16.12	0.143027	0.143027	0.024688	0.024688	4050	4050	4050	4050	4050	4050	4050	4050
66.0	-30.10	0.0010	0.0010	28.33	28.33	14.72	14.72	0.047286	0.047286	0.008162	0.008162	12251	12251	12251	12251	12251	12251	12251	12251
68.0	-34.50	0.0006	0.0006	27.65	27.65	13.35	13.35	0.046814	0.046814	0.008081	0.008081	12375	12375	12375	12375	12375	12375	12375	12375
70.0	-32.50	0.0004	0.0004	27.04	27.04	12.03	12.03	0.048466	0.048466	0.008366	0.008366	11953	11953	11953	11953	11953	11953	11953	11953
72.0	-34.70	0.0003	0.0003	26.49	26.49	10.74	10.74	0.049910	0.049910	0.008615	0.008615	11607	11607	11607	11607	11607	11607	11607	11607
74.0	-37.00	0.0003	0.0003	26.00	26.00	9.48	9.48	0.051252	0.051252	0.008847	0.008847	11303	11303	11303	11303	11303	11303	11303	11303
76.0	-34.70	0.0003	0.0003	25.58	25.58	8.24	8.24	0.038406	0.038406	0.006299	0.006299	15084	15084	15084	15084	15084	15084	15084	15084
78.0	-35.60	0.0003	0.0003	25.21	25.21	7.03	7.03	0.019678	0.019678	0.003397	0.003397	29441	29441	29441	29441	29441	29441	29441	29441
80.0	-37.30	0.0002	0.0002	24.90	24.90	5.83	5.83	0.015305	0.015305	0.002642	0.002642	37852	37852	37852	37852	37852	37852	37852	37852
82.0	-37.80	0.0002	0.0002	24.65	24.65	4.65	4.65	0.015416	0.015416	0.002561	0.002561	37580	37580	37580	37580	37580	37580	37580	37580
84.0	-38.00	0.0001	0.0001	24.46	24.46	3.47	3.47	0.014621	0.014621	0.002524	0.002524	39623	39623	39623	39623	39623	39623	39623	39623
86.0	-41.80	0.0001	0.0001	24.32	24.32	2.31	2.31	0.009494	0.009494	0.001639	0.001639	61021	61021	61021	61021	61021	61021	61021	61021
88.0	-43.20	0.0000	0.0000	24.24	24.24	1.15	1.15	0.007693	0.007693	0.001328	0.001328	75302	75302	75302	75302	75302	75302	75302	75302
90.0	-48.20	0.0000	0.0000	24.21	24.21	0.00	0.00	0.004960	0.004960	0.000847	0.000847	118078	118078	118078	118078	118078	118078	118078	118078

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AT&T Mobility
Rebuild Lemon Creek AK
ANDREW:DB589 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):										579.33	
ERP (Watts):	Depression Angle (degrees)	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (μW/cm²)	Percent of MPE	Down tilt (Degrees):	86	869	
0.1	-1.24	0.7516	1893.77	1893.44	1893.42	0.00041	0.00007	0.00007	14013834	0.0	
1.0	-0.70	0.8511	1893.71	1893.55	1893.55	0.00041	0.00071	0.00071	1408613		
2.0	-0.30	0.9333	946.80	946.49	946.49	0.016420	0.002934	0.002934	35281		
3.0	-0.10	0.9772	631.14	631.14	631.14	0.036916	0.006355	0.006355	15735		
4.0	0.00	1.0000	473.29	473.29	472.67	0.052363	0.009038	0.009038	11063		
5.0	-0.20	0.9550	378.56	377.79	377.79	0.065514	0.011208	0.011208	8942		
6.0	-0.40	0.8128	315.40	314.47	314.47	0.079705	0.013895	0.013895	7300		
7.0	-1.80	0.6607	270.27	270.27	269.19	0.091944	0.015971	0.015971	6000		
8.0	-3.20	0.4796	236.42	236.42	235.18	0.105240	0.018966	0.018966	5504		
9.0	-5.00	0.3162	210.08	210.08	208.68	0.118602	0.020472	0.020472	4884		
10.0	-7.10	0.1950	189.00	189.00	187.45	0.132038	0.022791	0.022791	4367		
12.0	-12.80	0.0523	157.37	157.37	155.50	0.159107	0.032227	0.032227	3102		
14.0	-15.80	0.0263	134.76	134.76	132.56	0.180703	0.037064	0.037064	2698		
16.0	-14.80	0.0331	117.78	117.78	115.27	0.214722	0.041998	0.041998	2381		
18.0	-15.10	0.0309	104.57	104.57	101.72	0.243008	0.047045	0.047045	2124		
20.0	-16.40	0.0229	93.98	93.98	90.81	0.272599	0.052549	0.052549	1937		
22.0	-16.50	0.0224	85.31	85.31	81.81	0.302594	0.058422	0.058422	1786		
24.0	-15.10	0.0309	78.09	78.09	74.24	0.333398	0.063942	0.063942	1598		
26.0	-13.80	0.0417	71.96	71.96	67.77	0.365225	0.068727	0.068727	1455		
28.0	-13.70	0.0427	66.71	66.71	62.16	0.398157	0.074626	0.074626	1340		
30.0	-14.30	0.0372	58.17	58.17	52.89	0.467917	0.080768	0.080768	1238		
32.0	-15.60	0.0275	51.53	51.53	49.00	0.505008	0.087184	0.087184	1146		
34.0	-17.40	0.0182	54.66	54.66	45.49	0.544052	0.093910	0.093910	1064		
36.0	-19.40	0.0115	51.53	45.49	42.30	0.585050	0.100986	0.100986	990		
38.0	-21.10	0.0078	48.74	42.30	39.39	0.628338	0.108459	0.108459	922		
40.0	-21.10	0.0078	46.24	39.39	36.71	0.674244	0.116383	0.116383	859		
42.0	-20.50	0.0089	43.97	36.71	34.23	0.723130	0.124821	0.124821	801		
44.0	-20.50	0.0089	41.93	34.23	31.92	0.775429	0.133849	0.133849	747		
46.0	-20.90	0.0081	38.37	31.92	29.76	0.831653	0.143553	0.143553	696		
48.0	-20.90	0.0081	36.82	29.76	27.73	0.881575	0.155655	0.155655	647		
50.0	-20.50	0.0089	35.40	27.73	25.82	0.908335	0.168748	0.168748	603		
52.0	-19.80	0.0105	35.40	24.01	24.01	0.948137	0.184258	0.184258	566		
54.0	-19.40	0.0115	34.10	22.29	22.29	0.951071	0.198062	0.198062	535		
56.0	-19.20	0.0126	32.91	20.65	20.65	0.939221	0.209376	0.209376	504		
60.0	-19.00	0.0117	30.83	19.08	19.08	0.555685	0.095918	0.095918	1042		
62.0	-19.50	0.0112	29.92	17.57	17.57	0.543595	0.093831	0.093831	1065		
64.0	-19.80	0.0105	29.09	16.12	16.12	0.524984	0.090620	0.090620	1103		
66.0	-19.80	0.0102	28.33	14.72	14.72	0.507453	0.087593	0.087593	1141		
68.0	-19.70	0.0107	27.65	13.35	13.35	0.491164	0.084781	0.084781	1179		
70.0	-19.40	0.0115	27.04	12.03	12.03	0.457406	0.078892	0.078892	1267		
72.0	-19.60	0.0110	26.49	10.74	10.74	0.425590	0.073462	0.073462	1361		
74.0	-20.00	0.0100	26.00	9.48	9.48	0.414242	0.071563	0.071563	1398		
76.0	-20.00	0.0091	25.58	8.24	8.24	0.404627	0.069844	0.069844	1431		
78.0	-21.30	0.0074	25.21	7.03	7.03	0.396822	0.068497	0.068497	1459		
80.0	-23.50	0.0056	24.90	5.83	5.83	0.373789	0.064521	0.064521	1549		
82.0	-23.50	0.0045	24.65	4.65	4.65	0.334650	0.057765	0.057765	1731		
84.0	-24.80	0.0033	24.46	3.47	3.47	0.273428	0.047197	0.047197	2118		
86.0	-26.80	0.0021	24.32	2.31	2.31	0.199298	0.034401	0.034401	2906		
88.0	-30.60	0.0009	24.21	1.15	1.15	0.147148	0.025400	0.025400	3937		
90.0	-38.40	0.0001	24.21	0.00	0.00	0.093991	0.016224	0.016224	6163		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	86	Frequency (MHz):	579.33	869	Down tilt (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000010	9880191		
1.0	0.0	1.0000	1893.71	1893.55	0.005868	0.001011	98898		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004045	24721		
3.0	-2.70	0.5370	631.14	630.67	0.052738	0.009103	10985		
4.0	-5.80	0.2930	473.29	472.67	0.093762	0.016188	6177		
5.0	-11.30	0.0741	378.56	377.79	0.143249	0.024727	4044		
6.0	-21.50	0.0071	315.40	314.47	0.206368	0.035622	2807		
7.0	-41.90	0.0024	270.27	269.19	0.287579	0.049640	2014		
8.0	-14.90	0.0891	236.42	235.18	0.375833	0.064873	1541		
9.0	-9.20	0.1202	210.08	208.68	0.421052	0.072679	1375		
10.0	-9.80	0.1047	189.00	187.45	0.420468	0.072578	1377		
12.0	-17.00	0.0200	157.37	155.50	0.266234	0.045955	2176		
14.0	-23.20	0.0048	134.76	132.56	0.157612	0.027206	3675		
16.0	-16.20	0.0240	117.78	115.27	0.205518	0.032475	2818		
18.0	-20.40	0.0091	104.57	101.72	0.261730	0.045178	2213		
20.0	-25.30	0.0030	93.98	90.81	0.286652	0.049307	2028		
22.0	-19.90	0.0102	85.31	81.81	0.135807	0.023442	4265		
24.0	-26.80	0.0021	78.09	74.24	0.102662	0.017721	5643		
26.0	-20.20	0.0095	66.77	62.16	0.120704	0.020835	4799		
28.0	-13.60	0.0437	66.71	62.16	0.132701	0.022906	4365		
30.0	-12.60	0.0550	62.16	57.25	0.168430	0.029073	3439		
32.0	-15.20	0.0302	58.17	52.89	0.366415	0.063248	1881		
34.0	-23.10	0.0049	54.66	49.00	0.452512	0.078109	1280		
36.0	-32.40	0.0006	51.53	45.49	0.505831	0.087313	1145		
38.0	-24.60	0.0035	48.74	42.30	0.563432	0.097255	1028		
40.0	-29.50	0.0011	46.24	38.39	0.626007	0.108056	925		
42.0	-30.00	0.0010	43.97	36.71	0.687267	0.118631	842		
44.0	-20.90	0.0081	41.93	34.23	0.719740	0.124236	804		
46.0	-18.10	0.0155	40.06	31.92	0.415897	0.071789	1392		
48.0	-18.20	0.0151	38.37	29.76	0.097283	0.016792	5955		
50.0	-20.60	0.0087	36.82	27.73	0.246498	0.042549	2350		
52.0	-25.00	0.0032	35.40	25.82	0.335850	0.057972	1724		
54.0	-32.40	0.0006	34.10	24.01	0.360354	0.062201	1607		
56.0	-44.70	0.0000	32.91	22.29	0.384920	0.066442	1505		
58.0	-35.00	0.0003	31.82	20.65	0.408676	0.070542	1417		
60.0	-31.30	0.0007	30.83	19.08	0.432809	0.074708	1338		
62.0	-29.20	0.0012	29.92	17.57	0.342152	0.059060	1693		
64.0	-28.90	0.0013	29.09	16.12	0.143027	0.024688	4050		
66.0	-30.10	0.0010	28.33	14.72	0.047528	0.008204	12189		
68.0	-32.50	0.0006	27.65	13.35	0.047060	0.008123	12310		
70.0	-34.50	0.0004	27.04	12.03	0.048466	0.008366	11953		
72.0	-34.70	0.0003	26.49	10.74	0.049910	0.008615	11607		
74.0	-34.70	0.0003	26.00	9.48	0.051712	0.008926	11203		
76.0	-34.70	0.0003	25.58	8.24	0.038406	0.006629	15084		
78.0	-35.60	0.0003	25.21	7.03	0.019678	0.003387	28441		
80.0	-37.30	0.0002	24.90	5.83	0.015305	0.002642	37852		
82.0	-37.80	0.0002	24.65	4.65	0.015495	0.002675	37389		
84.0	-38.80	0.0001	24.46	3.47	0.014696	0.002537	39422		
86.0	-41.00	0.0001	24.32	2.31	0.009494	0.001639	61021		
88.0	-43.20	0.0000	24.24	1.15	0.007693	0.001328	75302		
90.0	-48.20	0.0000	24.21	0.00	0.004906	0.000847	118079		

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	86	Frequency (MHz):	579.33	869	Down tilt (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000010	9880191		
1.0	0.0	1.0000	1893.71	1893.55	0.005868	0.001011	98898		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004045	24721		
3.0	-2.70	0.5370	631.14	630.67	0.052738	0.009103	10985		
4.0	-5.80	0.2930	473.29	472.67	0.093762	0.016188	6177		
5.0	-11.30	0.0741	378.56	377.79	0.143249	0.024727	4044		
6.0	-21.50	0.0071	315.40	314.47	0.206463	0.035293	2833		
7.0	-41.90	0.0024	270.27	269.19	0.287579	0.049640	2014		
8.0	-14.90	0.0891	236.42	235.18	0.375833	0.064873	1541		
9.0	-9.20	0.1202	210.08	208.68	0.421052	0.072679	1375		
10.0	-9.80	0.1047	189.00	187.45	0.420468	0.072578	1377		
12.0	-17.00	0.0200	157.37	155.50	0.266234	0.045955	2176		
14.0	-23.20	0.0048	134.76	132.56	0.157612	0.027206	3675		
16.0	-16.20	0.0240	117.78	115.27	0.205518	0.032475	2818		
18.0	-20.40	0.0091	104.57	101.72	0.261730	0.045178	2213		
20.0	-25.30	0.0030	93.98	90.81	0.286652	0.049307	2028		
22.0	-19.90	0.0102	85.31	81.81	0.135807	0.023442	4265		
24.0	-26.80	0.0021	78.09	74.24	0.102662	0.017721	5643		
26.0	-20.20	0.0095	66.77	62.16	0.120704	0.020835	4799		
28.0	-13.60	0.0437	66.71	62.16	0.132701	0.022906	4365		
30.0	-12.60	0.0550	62.16	57.25	0.168430	0.029073	3439		
32.0	-15.20	0.0302	58.17	52.89	0.366415	0.063248	1881		
34.0	-23.10	0.0049	54.66	49.00	0.452512	0.078109	1280		
36.0	-32.40	0.0006	51.53	45.49	0.505831	0.087313	1145		
38.0	-24.60	0.0035	48.74	42.30	0.563432	0.097255	1028		
40.0	-29.50	0.0011	46.24	38.39	0.626007	0.108056	925		
42.0	-30.00	0.0010	43.97	36.71	0.687267	0.118631	842		
44.0	-20.90	0.0081	41.93	34.23	0.719740	0.124236	804		
46.0	-18.10	0.0155	40.06	31.92	0.415897	0.071789	1392		
48.0	-18.20	0.0151	38.37	29.76	0.097283	0.016792	5955		
50.0	-20.60	0.0087	36.82	27.73	0.246498	0.042549	2350		
52.0	-25.00	0.0032	35.40	25.82	0.335850	0.057972	1724		
54.0	-32.40	0.0006	34.10	24.01	0.360354	0.062201	1607		
56.0	-44.70	0.0000	32.91	22.29	0.384920	0.066442	1505		
58.0	-35.00	0.0003	31.82	20.65	0.408676	0.070542	1417		
60.0	-31.30	0.0007	30.83	19.08	0.432809	0.074708	1338		
62.0	-29.20	0.0012	29.92	17.57	0.342152	0.059060	1693		
64.0	-28.90	0.0013	29.09	16.12	0.143027	0.024688	4050		
66.0	-30.10	0.0010	28.33	14.72	0.047528	0.008204	12189		
68.0	-32.50	0.0006	27.65	13.35	0.047060	0.008123	12310		
70.0	-34.50	0.0004	27.04	12.03	0.048466	0.008366	11953		
72.0	-34.70	0.0003	26.49	10.74	0.049910	0.008615	11607		
74.0	-34.70	0.0003	26.00	9.48	0.051712	0.008926	11203		
76.0	-34.70	0.0003	25.58	8.24	0.038406	0.006629	15084		
78.0	-35.60	0.0003	25.21	7.03	0.019678	0.003387	28441		
80.0	-37.30	0.0002	24.90	5.83	0.015305	0.002642	37852		
82.0	-37.80	0.0002	24.65	4.65	0.015495	0.002675	37389		
84.0	-38.80	0.0001	24.46	3.47	0.014696	0.002537	39422		
86.0	-41.00	0.0001	24.32	2.31	0.009494	0.001639	61021		
88.0	-43.20	0.0000	24.24	1.15	0.007693	0.001328	75302		
90.0	-48.20	0.0000	24.21	0.00	0.004906	0.000847	118079		

AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	491.33	Frequency (MHz):	737	Down tilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.00	0.9993	18937.45	18937.42	0.000059	0.000012	8387896		
1.0	-0.03	0.9931	1893.84	1893.55	0.005857	0.001192	838887		
2.0	-0.23	0.9484	947.06	946.49	0.023421	0.004767	20978		
3.0	-0.60	0.8710	631.54	630.67	0.052671	0.010720	9328		
4.0	-1.14	0.7691	473.82	472.67	0.093570	0.019044	5250		
5.0	-1.88	0.6486	379.23	377.79	0.146070	0.029729	3363		
6.0	-2.83	0.5212	316.20	314.47	0.208745	0.042485	2353		
7.0	-4.03	0.3954	271.21	269.19	0.271648	0.052888	1808		
8.0	-5.53	0.2799	237.49	235.18	0.326933	0.066540	1502		
9.0	-7.40	0.1820	211.28	208.68	0.367312	0.074758	1337		
10.0	-9.80	0.1047	190.34	187.45	0.385498	0.078460	1274		
12.0	-17.75	0.0168	158.97	155.50	0.346475	0.070517	1418		
14.0	-28.89	0.0013	138.62	132.56	0.225797	0.045956	2175		
16.0	-46.32	0.0233	119.91	115.27	0.104079	0.021183	4720		
18.0	-13.07	0.0493	106.96	101.72	0.130638	0.026588	3761		
20.0	-12.17	0.0607	96.64	90.81	0.159631	0.032489	3077		
22.0	-12.60	0.0550	88.23	81.81	0.191185	0.038911	2569		
24.0	-14.01	0.0397	81.26	74.24	0.224843	0.045762	2185		
26.0	-16.18	0.0241	75.40	67.77	0.255965	0.052096	1919		
28.0	-18.78	0.0132	70.40	62.16	0.238157	0.048472	2063		
30.0	-21.20	0.0076	66.10	57.25	0.181619	0.036965	2705		
32.0	-23.07	0.0049	62.37	52.89	0.119568	0.024335	4109		
34.0	-25.11	0.0031	59.11	49.00	0.075575	0.015382	6501		
36.0	-28.23	0.0015	56.23	45.49	0.052389	0.010663	9378		
38.0	-29.95	0.0010	53.69	42.30	0.057573	0.011718	8534		
40.0	-25.96	0.0025	51.42	38.39	0.106360	0.021647	4619		
42.0	-22.15	0.0061	49.40	36.71	0.159308	0.032424	3084		
44.0	-19.70	0.0107	47.58	34.23	0.207112	0.042153	2372		
46.0	-18.18	0.0152	45.95	31.92	0.242026	0.049259	2030		
48.0	-17.30	0.0186	44.48	29.76	0.262442	0.053414	1872		
50.0	-16.87	0.0206	43.15	27.73	0.278163	0.056614	1766		
52.0	-16.77	0.0210	41.94	25.82	0.291555	0.059340	1685		
54.0	-16.97	0.0201	40.85	24.01	0.305368	0.062151	1608		
56.0	-17.48	0.0179	39.87	22.29	0.318609	0.064846	1542		
58.0	-18.34	0.0147	38.97	20.65	0.326210	0.066383	1506		
60.0	-19.61	0.0109	38.17	19.08	0.313861	0.063880	1565		
62.0	-21.31	0.0074	37.43	17.57	0.279565	0.056899	1757		
64.0	-23.37	0.0046	36.77	16.12	0.228007	0.046406	2154		
66.0	-25.63	0.0027	36.18	14.72	0.169587	0.034516	2897		
68.0	-27.78	0.0017	35.65	13.35	0.115027	0.023411	4271		
70.0	-29.57	0.0011	35.17	12.03	0.072875	0.014832	6742		
72.0	-31.00	0.0008	34.75	10.74	0.045443	0.009249	10811		
74.0	-32.44	0.0006	34.38	9.48	0.029908	0.006087	16428		
76.0	-34.28	0.0004	34.06	8.24	0.021462	0.004368	22893		
78.0	-36.41	0.0002	33.79	7.03	0.016042	0.003265	30628		
80.0	-37.63	0.0002	33.56	5.83	0.011378	0.002316	43181		
82.0	-37.21	0.0002	33.38	4.65	0.007300	0.001486	67304		
84.0	-36.55	0.0002	33.23	3.47	0.005807	0.001182	84608		
86.0	-36.45	0.0002	33.13	2.31	0.005803	0.001181	84667		
88.0	-36.85	0.0002	33.05	1.15	0.005785	0.001177	84928		
90.0	-37.42	0.0002	33.05	0.00	0.005754	0.001171	85392		

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AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	491.33	Frequency (MHz):	737	Down tilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.00	0.9993	18937.45	18937.42	0.000059	0.000012	8387895		
1.0	-0.03	0.9931	1893.84	1893.55	0.005857	0.001192	838887		
2.0	-0.23	0.9484	947.06	946.49	0.023421	0.004767	20978		
3.0	-0.60	0.8710	631.54	630.67	0.052671	0.010720	9328		
4.0	-1.14	0.7691	473.82	472.67	0.093570	0.019044	5250		
5.0	-1.88	0.6486	379.23	377.79	0.146070	0.029729	3363		
6.0	-2.83	0.5212	316.20	314.47	0.208745	0.042485	2353		
7.0	-4.03	0.3954	271.21	269.19	0.271648	0.052888	1808		
8.0	-5.53	0.2799	237.49	235.18	0.326933	0.066540	1502		
9.0	-7.40	0.1820	211.28	208.68	0.367312	0.074758	1337		
10.0	-9.80	0.1047	190.34	187.45	0.385498	0.078460	1274		
12.0	-17.75	0.0168	158.97	155.50	0.346475	0.070517	1417		
14.0	-28.89	0.0013	138.62	132.56	0.225797	0.045956	2175		
16.0	-46.32	0.0233	119.91	115.27	0.104119	0.021191	4718		
18.0	-13.07	0.0493	106.96	101.72	0.130637	0.025588	3761		
20.0	-12.17	0.0607	96.64	90.81	0.159733	0.032510	3075		
22.0	-12.60	0.0550	88.23	81.81	0.191185	0.038911	2569		
24.0	-14.01	0.0397	81.26	74.24	0.224843	0.045762	2185		
26.0	-16.18	0.0241	75.40	67.77	0.255965	0.052096	1919		
28.0	-18.78	0.0132	70.40	62.16	0.238157	0.048472	2063		
30.0	-21.20	0.0076	66.10	57.25	0.181805	0.037002	2702		
32.0	-23.07	0.0049	62.37	52.89	0.119568	0.024335	4109		
34.0	-25.11	0.0031	59.11	49.00	0.075604	0.015387	6498		
36.0	-28.23	0.0015	56.23	45.49	0.052389	0.010663	9378		
38.0	-29.95	0.0010	53.69	42.30	0.057573	0.011718	8534		
40.0	-25.96	0.0025	51.42	38.39	0.106251	0.021625	4624		
42.0	-22.15	0.0061	49.40	36.71	0.159308	0.032424	3084		
44.0	-19.70	0.0107	47.58	34.23	0.206743	0.042078	2376		
46.0	-18.18	0.0152	45.95	31.92	0.242026	0.049259	2030		
48.0	-17.30	0.0186	44.48	29.76	0.262442	0.053414	1872		
50.0	-16.87	0.0206	43.15	27.73	0.277208	0.056420	1772		
52.0	-16.77	0.0210	41.94	25.82	0.291555	0.059340	1685		
54.0	-16.97	0.0201	40.85	24.01	0.305368	0.062151	1608		
56.0	-17.48	0.0179	39.87	22.29	0.318609	0.064846	1542		
58.0	-18.34	0.0147	38.97	20.65	0.326210	0.066383	1506		
60.0	-19.61	0.0109	38.17	19.08	0.313861	0.063880	1565		
62.0	-21.31	0.0074	37.43	17.57	0.279565	0.056899	1757		
64.0	-23.37	0.0046	36.77	16.12	0.228007	0.046406	2154		
66.0	-25.63	0.0027	36.18	14.72	0.169587	0.034516	2897		
68.0	-27.78	0.0017	35.65	13.35	0.115027	0.023411	4271		
70.0	-29.57	0.0011	35.17	12.03	0.072875	0.014832	6742		
72.0	-31.00	0.0008	34.75	10.74	0.045443	0.009249	10811		
74.0	-32.44	0.0006	34.38	9.48	0.029908	0.006087	16428		
76.0	-34.28	0.0004	34.06	8.24	0.021462	0.004368	22893		
78.0	-36.41	0.0002	33.79	7.03	0.016042	0.003265	30628		
80.0	-37.63	0.0002	33.56	5.83	0.011378	0.002316	43181		
82.0	-37.21	0.0002	33.38	4.65	0.007300	0.001486	67304		
84.0	-36.55	0.0002	33.23	3.47	0.005807	0.001182	84608		
86.0	-36.45	0.0002	33.13	2.31	0.005803	0.001181	84667		
88.0	-36.85	0.0002	33.05	1.15	0.005785	0.001177	84928		
90.0	-37.42	0.0002	33.05	0.00	0.005754	0.001171	85392		

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XXLHH-RRRR Antenna Worksheet (0 Sector)

AT&T Mobility
Rebuild Lemon Creek AK
Kathrein-Scala:800-10865 Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	491.33	Frequency (MHz):	737	Down tilt (Degrees):	0.0	
Depression Angle (degrees)	Relative dB	Relative dB	Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE	
0.1	0.0	0.0	1.0000	18937.44	18937.42	0.000059	0.000012	8387884	
1.0	0.0	0.0	1.0000	1893.71	1893.55	0.005858	0.001192	83875	
2.0	-0.90	-0.90	0.8128	946.80	946.49	0.023434	0.004769	20966	
3.0	-2.70	-2.70	0.5370	631.15	630.67	0.052736	0.010733	9316	
4.0	-5.80	-5.80	0.2830	473.30	472.67	0.093776	0.019086	5239	
5.0	-11.30	-11.30	0.0741	378.58	377.79	0.143234	0.029152	3430	
6.0	-21.50	-21.50	0.0071	315.42	314.47	0.204172	0.041555	2406	
7.0	-41.90	-41.90	0.0024	270.30	269.19	0.287520	0.058518	1708	
8.0	-10.50	-10.50	0.0891	236.45	235.18	0.375733	0.076472	1307	
9.0	-9.20	-9.20	0.1202	210.12	208.68	0.415044	0.084473	1183	
10.0	-9.80	-9.80	0.1047	189.04	187.45	0.405542	0.082539	1211	
12.0	-17.00	-17.00	0.0200	157.42	155.50	0.247820	0.050438	1982	
14.0	-23.20	-23.20	0.0048	134.81	132.56	0.157483	0.032052	3119	
16.0	-16.20	-16.20	0.0240	117.84	115.27	0.206083	0.041944	2384	
18.0	-20.40	-20.40	0.0091	104.64	101.72	0.261373	0.053197	1879	
20.0	-25.30	-25.30	0.0030	94.06	90.81	0.268633	0.054674	1829	
22.0	-19.90	-19.90	0.0102	85.40	81.81	0.113860	0.023174	4315	
24.0	-26.80	-26.80	0.0021	78.18	74.24	0.102382	0.020838	4799	
26.0	-20.20	-20.20	0.0095	72.07	67.77	0.120355	0.024496	4082	
28.0	-13.60	-13.60	0.0437	66.82	62.16	0.126080	0.025661	3896	
30.0	-12.60	-12.60	0.0950	62.28	57.25	0.187426	0.038146	2621	
32.0	-15.20	-15.20	0.0302	58.30	52.89	0.386853	0.078735	1270	
34.0	-23.10	-23.10	0.0049	54.79	49.00	0.448945	0.091373	1094	
36.0	-32.40	-32.40	0.0006	51.68	45.49	0.502805	0.102335	977	
38.0	-24.60	-24.60	0.0035	48.90	42.30	0.559530	0.113880	878	
40.0	-29.50	-29.50	0.0011	46.40	38.39	0.619110	0.126006	793	
42.0	-30.00	-30.00	0.0010	44.14	36.71	0.681417	0.136887	721	
44.0	-20.90	-20.90	0.0081	42.10	34.23	0.670319	0.136429	732	
46.0	-18.10	-18.10	0.0155	40.25	31.92	0.331223	0.067413	1483	
48.0	-18.20	-18.20	0.0151	38.56	29.76	0.113831	0.023168	4316	
50.0	-20.60	-20.60	0.0087	37.02	27.73	0.260914	0.053103	1883	
52.0	-25.00	-25.00	0.0032	35.61	25.82	0.331583	0.067486	1481	
54.0	-32.40	-32.40	0.0006	34.32	24.01	0.354882	0.072230	1384	
56.0	-44.70	-44.70	0.0000	33.14	22.29	0.378368	0.077008	1298	
58.0	-35.00	-35.00	0.0003	32.06	20.65	0.402370	0.081893	1221	
60.0	-31.30	-31.30	0.0007	31.07	19.08	0.421847	0.085858	1164	
62.0	-29.20	-29.20	0.0012	30.17	17.57	0.300079	0.061074	1637	
64.0	-28.90	-28.90	0.0013	29.34	16.12	0.117399	0.023894	4185	
66.0	-30.10	-30.10	0.0010	28.59	14.72	0.044104	0.008976	11140	
68.0	-32.50	-32.50	0.0006	27.92	13.35	0.045963	0.009334	10712	
70.0	-34.50	-34.50	0.0004	27.31	12.03	0.047444	0.009656	10355	
72.0	-34.70	-34.70	0.0003	26.77	10.74	0.048822	0.009937	10063	
74.0	-34.70	-34.70	0.0003	26.29	9.48	0.050101	0.010197	9806	
76.0	-34.70	-34.70	0.0003	25.87	8.24	0.035618	0.007249	13794	
78.0	-35.60	-35.60	0.0002	25.50	7.03	0.018297	0.003724	26852	
80.0	-37.30	-37.30	0.0002	25.20	5.83	0.014934	0.003039	32900	
82.0	-37.80	-37.80	0.0002	24.96	4.65	0.015038	0.003061	32673	
84.0	-38.80	-38.80	0.0001	24.76	3.47	0.014166	0.002883	34683	
86.0	-41.20	-41.20	0.0001	24.63	2.31	0.009151	0.001862	53691	
88.0	-43.00	-43.00	0.0000	24.54	1.15	0.007486	0.001524	65632	
90.0	-48.20	-48.20	0.0000	24.52	0.00	0.004785	0.000974	102679	

AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	87	Frequency (MHz):	491.33	737	Down tilt (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.0	1.0000	18937.44	18937.42	0.000059	0.000012	8387884		
1.0	0.0	1.0000	1893.71	1893.55	0.005868	0.001192	83875		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004769	20966		
3.0	-2.70	0.5370	631.15	630.67	0.052736	0.010733	9316		
4.0	-5.80	0.2630	473.30	472.67	0.093776	0.019066	5239		
5.0	-11.30	0.0741	378.58	377.79	0.143234	0.029152	3430		
6.0	-21.50	0.0071	315.42	314.47	0.206172	0.041555	2406		
7.0	-41.90	0.0024	270.30	269.19	0.287520	0.058518	1708		
8.0	-14.90	0.0891	236.45	235.18	0.375733	0.076472	1307		
9.0	-9.20	0.1202	210.12	208.68	0.414145	0.084290	1186		
10.0	-9.80	0.1047	189.04	187.45	0.405542	0.082539	1211		
12.0	-17.00	0.0200	157.42	155.50	0.247189	0.050310	1987		
14.0	-23.20	0.0048	134.81	132.56	0.157483	0.032052	3119		
16.0	-16.20	0.0240	117.84	115.27	0.205297	0.041784	2393		
18.0	-20.40	0.0091	104.64	101.72	0.261373	0.053197	1879		
20.0	-25.30	0.0030	94.06	90.81	0.267607	0.054466	1836		
22.0	-19.90	0.0102	85.40	81.81	0.113859	0.023174	4315		
24.0	-26.80	0.0021	78.18	74.24	0.102382	0.020838	4799		
26.0	-20.20	0.0095	72.07	67.77	0.120355	0.024496	4082		
28.0	-13.60	0.0437	66.82	62.16	0.126080	0.025661	3896		
30.0	-12.60	0.0550	62.28	57.25	0.187470	0.038155	2620		
32.0	-15.20	0.0302	58.30	52.89	0.386853	0.078735	1270		
34.0	-23.10	0.0049	54.79	49.00	0.450091	0.091606	1091		
36.0	-32.40	0.0006	51.68	45.49	0.502805	0.102335	977		
38.0	-24.60	0.0035	48.90	42.30	0.595930	0.113980	878		
40.0	-29.50	0.0011	46.40	38.39	0.621402	0.126473	790		
42.0	-30.00	0.0010	44.14	36.71	0.681417	0.136687	721		
44.0	-20.90	0.0081	42.10	34.23	0.672360	0.136844	730		
46.0	-18.10	0.0155	40.25	31.92	0.331223	0.067413	1483		
48.0	-18.20	0.0151	38.56	29.76	0.113831	0.023168	4316		
50.0	-20.60	0.0087	37.02	27.73	0.261088	0.053139	1881		
52.0	-25.00	0.0032	35.61	25.82	0.331583	0.067486	1481		
54.0	-32.40	0.0006	34.32	24.01	0.355614	0.072377	1381		
56.0	-44.70	0.0000	33.14	22.29	0.379333	0.077205	1295		
58.0	-35.00	0.0003	32.06	20.65	0.402370	0.081893	1221		
60.0	-31.30	0.0007	31.07	19.08	0.421847	0.085658	1164		
62.0	-29.20	0.0012	30.17	17.57	0.300985	0.061259	1632		
64.0	-28.90	0.0013	29.34	16.12	0.117399	0.023894	4185		
66.0	-30.10	0.0010	28.59	14.72	0.044331	0.009023	11083		
68.0	-32.50	0.0006	27.92	13.35	0.046123	0.009387	10652		
70.0	-34.50	0.0004	27.31	12.03	0.047444	0.009656	10355		
72.0	-34.70	0.0003	26.77	10.74	0.048822	0.009937	10063		
74.0	-34.70	0.0003	26.29	9.48	0.050550	0.010288	9719		
76.0	-34.70	0.0003	25.87	8.24	0.035618	0.007249	13794		
78.0	-35.60	0.0003	25.50	7.03	0.018297	0.003724	28852		
80.0	-37.30	0.0002	25.20	5.83	0.014934	0.003039	32900		
82.0	-37.80	0.0002	24.95	4.65	0.015114	0.003076	32507		
84.0	-38.80	0.0001	24.76	3.47	0.014239	0.002888	34506		
86.0	-41.00	0.0001	24.63	2.31	0.009151	0.001862	53691		
88.0	-43.20	0.0000	24.54	1.15	0.007486	0.001524	65632		
90.0	-48.20	0.0000	24.52	0.00	0.004785	0.000974	102680		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	86	Frequency (MHz):	491.33	737	Down tilt (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.00	1.0000	18937.44	18937.42	0.000059	0.000012	8387884		
1.0	0.00	1.0000	1893.71	1893.55	0.005858	0.001192	83875		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004770	20966		
3.0	-2.70	0.5370	631.14	630.67	0.052738	0.010734	9316		
4.0	-5.80	0.2930	473.29	472.67	0.093782	0.019087	5239		
5.0	-11.30	0.0741	378.56	377.79	0.143249	0.029155	3429		
6.0	-21.50	0.0071	315.40	314.47	0.204463	0.041614	2403		
7.0	-41.90	0.0024	270.27	269.19	0.287579	0.058530	1708		
8.0	-14.90	0.0891	236.42	235.18	0.375833	0.076492	1307		
9.0	-9.20	0.1202	210.08	208.68	0.421921	0.085873	1164		
10.0	-9.80	0.1047	189.00	187.45	0.420468	0.085577	1168		
12.0	-17.00	0.0200	157.37	155.50	0.266234	0.054186	1845		
14.0	-23.20	0.0048	134.76	132.56	0.157612	0.032078	3117		
16.0	-16.20	0.0240	117.78	115.27	0.205518	0.041829	2390		
18.0	-20.40	0.0091	104.57	101.72	0.261730	0.053269	1877		
20.0	-25.30	0.0030	93.98	90.81	0.285652	0.056138	1720		
22.0	-19.90	0.0102	85.31	81.81	0.135807	0.027641	3617		
24.0	-26.80	0.0021	78.09	74.24	0.102662	0.020895	4785		
26.0	-20.20	0.0095	71.96	67.77	0.120704	0.024567	4070		
28.0	-13.60	0.0437	66.71	62.16	0.132701	0.027008	3702		
30.0	-12.60	0.0550	62.16	57.25	0.168430	0.034280	2917		
32.0	-15.20	0.0302	58.17	52.89	0.366415	0.074576	1340		
34.0	-23.10	0.0049	54.66	49.00	0.452512	0.092099	1085		
36.0	-32.40	0.0006	51.53	45.49	0.505831	0.102951	971		
38.0	-24.60	0.0035	48.74	42.30	0.563432	0.114674	872		
40.0	-29.50	0.0011	46.24	38.39	0.626007	0.127410	784		
42.0	-30.00	0.0010	43.97	36.71	0.687267	0.139878	714		
44.0	-20.90	0.0155	40.06	34.23	0.719740	0.146487	682		
46.0	-18.10	0.0151	38.37	31.92	0.415897	0.084647	1181		
48.0	-20.60	0.0087	36.82	29.76	0.097283	0.019800	5950		
50.0	-25.00	0.0032	35.40	27.73	0.246498	0.050169	1993		
52.0	-25.00	0.0032	35.40	25.82	0.068355	0.015305	1462		
54.0	-32.40	0.0006	34.10	24.01	0.360354	0.073342	1363		
56.0	-44.70	0.0000	32.91	22.29	0.384920	0.078342	1276		
58.0	-35.00	0.0003	31.82	20.65	0.408676	0.083177	1202		
60.0	-31.30	0.0007	30.83	19.08	0.432809	0.088089	1135		
62.0	-29.20	0.0012	29.92	17.57	0.342152	0.069637	1436		
64.0	-28.90	0.0013	29.09	16.12	0.143027	0.029110	3435		
66.0	-30.10	0.0010	28.33	14.72	0.047528	0.009673	10337		
68.0	-32.50	0.0006	27.65	13.35	0.047060	0.009578	10440		
70.0	-34.50	0.0004	27.04	12.03	0.048466	0.009864	10137		
72.0	-34.70	0.0003	26.49	10.74	0.049910	0.010158	9844		
74.0	-34.70	0.0003	26.00	9.48	0.051252	0.010525	9501		
76.0	-34.70	0.0003	25.58	8.24	0.038406	0.007817	12793		
78.0	-35.60	0.0003	25.21	7.03	0.019678	0.004005	24968		
80.0	-37.30	0.0002	24.90	5.83	0.015305	0.003115	32103		
82.0	-37.80	0.0002	24.65	4.65	0.003138	0.001354	31709		
84.0	-38.80	0.0001	24.46	3.47	0.002976	0.001495	33434		
86.0	-41.00	0.0001	24.32	2.31	0.009494	0.001566	51752		
88.0	-43.20	0.0000	24.24	1.15	0.007683	0.001566	63864		
90.0	-48.20	0.0000	24.21	0.00	0.004906	0.000999	100143		

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRRR Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	86	Frequency (MHz):	491.33	737	Down tilt (Degrees):	0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	0.00	1.0000	18937.44	18937.42	0.000059	0.000012	8387884		
1.0	0.00	1.0000	1893.71	1893.55	0.005858	0.001192	83875		
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004770	20966		
3.0	-2.70	0.5370	631.14	630.67	0.052738	0.010734	9316		
4.0	-5.80	0.2930	473.29	472.67	0.093782	0.019087	5239		
5.0	-11.30	0.0741	378.56	377.79	0.143249	0.029155	3429		
6.0	-21.50	0.0071	315.40	314.47	0.204463	0.041614	2403		
7.0	-41.90	0.0024	270.27	269.19	0.287579	0.058530	1708		
8.0	-14.90	0.0891	236.42	235.18	0.375833	0.076492	1307		
9.0	-9.20	0.1202	210.08	208.68	0.421921	0.085873	1164		
10.0	-9.80	0.1047	189.00	187.45	0.420468	0.085577	1168		
12.0	-17.00	0.0200	157.37	155.50	0.266234	0.054186	1840		
14.0	-23.20	0.0048	134.76	132.56	0.157612	0.032078	3117		
16.0	-16.20	0.0240	117.78	115.27	0.205518	0.041829	2381		
18.0	-20.40	0.0091	104.57	101.72	0.261730	0.053269	1877		
20.0	-25.30	0.0030	93.98	90.81	0.285652	0.056138	1713		
22.0	-19.90	0.0102	85.31	81.81	0.135807	0.027641	3617		
24.0	-26.80	0.0021	78.09	74.24	0.102662	0.020895	4785		
26.0	-20.20	0.0095	71.96	67.77	0.120704	0.024567	4070		
28.0	-13.60	0.0437	66.71	62.16	0.132701	0.027008	3702		
30.0	-12.60	0.0550	62.16	57.25	0.168446	0.034283	2916		
32.0	-15.20	0.0302	58.17	52.89	0.366415	0.074576	1340		
34.0	-23.10	0.0049	54.66	49.00	0.451360	0.091864	1088		
36.0	-32.40	0.0006	51.53	45.49	0.505831	0.102951	971		
38.0	-24.60	0.0035	48.74	42.30	0.563432	0.114674	872		
40.0	-29.50	0.0011	46.24	38.39	0.623953	0.126992	787		
42.0	-30.00	0.0010	43.97	36.71	0.687267	0.139878	714		
44.0	-20.90	0.0155	40.06	34.23	0.717246	0.145980	685		
46.0	-18.10	0.0151	38.37	31.92	0.415897	0.084647	1181		
48.0	-20.60	0.0087	36.82	29.76	0.097283	0.019800	5950		
50.0	-25.00	0.0032	35.40	27.73	0.246222	0.050113	1995		
52.0	-25.00	0.0032	35.40	25.82	0.068355	0.015305	1462		
54.0	-32.40	0.0006	34.10	24.01	0.359786	0.073227	1365		
56.0	-44.70	0.0000	32.91	22.29	0.383940	0.078142	1279		
58.0	-35.00	0.0003	31.82	20.65	0.408676	0.083177	1202		
60.0	-31.30	0.0007	30.83	19.08	0.432809	0.088089	1135		
62.0	-29.20	0.0012	29.92	17.57	0.341269	0.069458	1439		
64.0	-28.90	0.0013	29.09	16.12	0.143027	0.029110	3435		
66.0	-30.10	0.0010	28.33	14.72	0.047286	0.009624	10390		
68.0	-32.50	0.0006	27.65	13.35	0.046814	0.009528	10495		
70.0	-34.50	0.0004	27.04	12.03	0.048466	0.009864	10137		
72.0	-34.70	0.0003	26.49	10.74	0.049910	0.010158	9844		
74.0	-34.70	0.0003	26.00	9.48	0.051252	0.010431	9986		
76.0	-34.70	0.0003	25.58	8.24	0.038406	0.007817	12793		
78.0	-35.60	0.0003	25.21	7.03	0.019678	0.004005	24968		
80.0	-37.30	0.0002	24.90	5.83	0.015305	0.003115	32103		
82.0	-37.80	0.0002	24.65	4.65	0.003138	0.001354	31871		
84.0	-38.80	0.0001	24.46	3.47	0.002976	0.001495	33604		
86.0	-41.00	0.0001	24.32	2.31	0.009494	0.001566	51752		
88.0	-43.20	0.0000	24.24	1.15	0.007683	0.001566	63864		
90.0	-48.20	0.0000	24.21	0.00	0.004906	0.000999	100142		

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Alaska Digital
Rebuild Lemon Creek AK
RFS-APXV18-206516S-C Antenna Worksheet (0 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	1945	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		17071680
0.1	-0.04	0.9920	18937.44	18937.42	0.000059	0.000006			17071680
1.0	-0.35	0.9226	1893.72	1893.55	0.005858	0.000586			17071680
2.0	-1.24	0.7516	946.49	946.49	0.023434	0.002343			42675
3.0	-2.72	0.5346	631.18	630.67	0.052730	0.005273			18964
4.0	-4.91	0.3228	473.35	472.67	0.093722	0.009372			10669
5.0	-8.00	0.1985	378.64	377.79	0.145951	0.014595			6951
6.0	-12.15	0.0610	315.50	314.47	0.208219	0.020822			4802
7.0	-16.38	0.0230	270.39	269.19	0.243245	0.024324			4111
8.0	-16.77	0.0210	235.18	235.18	0.278421	0.027842			3591
9.0	-15.17	0.0304	210.23	208.68	0.313771	0.031377			3187
10.0	-14.68	0.0340	187.45	187.45	0.349316	0.034932			2862
12.0	-18.56	0.0139	155.50	155.50	0.240520	0.024052			4157
14.0	-33.96	0.0094	134.98	132.56	0.093863	0.009386			10653
16.0	-20.47	0.0090	118.04	115.27	0.079165	0.007917			12631
18.0	-20.54	0.0088	104.85	101.72	0.079165	0.007917			15988
20.0	-31.09	0.0068	94.30	90.81	0.085315	0.008532			17121
22.0	-22.55	0.0066	85.67	81.81	0.048050	0.004805			20811
24.0	-17.93	0.0161	78.47	74.24	0.051203	0.005120			19529
26.0	-18.85	0.0130	72.38	67.77	0.083024	0.008302			12044
28.0	-26.62	0.0022	67.16	62.16	0.097472	0.009747			10259
30.0	-26.40	0.0023	62.64	57.25	0.111775	0.011178			8946
32.0	-18.89	0.0129	58.69	52.89	0.127014	0.012701			7873
34.0	-17.45	0.0180	55.21	49.00	0.143062	0.014306			6989
36.0	-18.62	0.0137	52.12	45.49	0.164458	0.016446			6080
38.0	-21.78	0.0066	49.36	42.30	0.191411	0.019141			5224
40.0	-25.12	0.0031	46.89	38.39	0.211314	0.021131			4732
42.0	-26.67	0.0022	44.66	36.71	0.232022	0.023202			4309
44.0	-29.42	0.0011	42.64	34.23	0.253459	0.025346			3945
46.0	-39.67	0.0001	40.81	31.92	0.275393	0.027539			3631
48.0	-34.46	0.0004	39.15	29.76	0.254135	0.025414			3834
50.0	-26.99	0.0020	37.63	27.73	0.151047	0.015105			6620
52.0	-24.23	0.0038	36.24	25.82	0.075903	0.007590			13174
54.0	-23.65	0.0043	34.98	24.01	0.062742	0.006274			15938
56.0	-24.21	0.0038	33.82	22.29	0.098462	0.009846			10156
58.0	-25.75	0.0027	32.76	20.65	0.107605	0.010761			9293
60.0	-27.82	0.0017	31.80	19.08	0.113481	0.011348			8812
62.0	-30.08	0.0010	30.91	17.57	0.119151	0.011915			8392
64.0	-31.43	0.0007	30.11	16.12	0.124588	0.012459			8026
66.0	-32.72	0.0005	29.38	14.72	0.129004	0.012900			7751
68.0	-33.64	0.0004	28.72	13.35	0.097451	0.009745			10261
70.0	-35.37	0.0003	28.13	12.03	0.060920	0.006092			16415
72.0	-37.78	0.0002	27.61	10.74	0.034814	0.003481			28723
74.0	-41.18	0.0001	27.14	9.48	0.025083	0.002508			39867
76.0	-44.94	0.0000	26.73	8.24	0.019974	0.001997			50063
78.0	-44.04	0.0000	26.39	7.03	0.013046	0.001305			76652
80.0	-44.93	0.0001	26.09	5.83	0.006949	0.000695			143910
82.0	-40.20	0.0001	25.85	4.65	0.004388	0.000439			227890
84.0	-40.02	0.0001	25.67	3.47	0.004472	0.000447			223602
86.0	-41.78	0.0001	25.54	2.31	0.004476	0.000447			223390
88.0	-43.29	0.0000	25.46	1.15	0.004476	0.000447			223951
90.0	-45.95	0.0000	25.43	0.00	0.003725	0.000373			268437

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AT&T Mobility
Rebuild Lemon Creek AK
Powerwave:P65-16-XLLHH-RRR Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	491.33	Frequency (MHz):	737	Downtilt (Degrees):		0.0
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		8387884
0.1	0.00	1.0000	18937.44	18937.42	0.000059	0.000012			8387884
1.0	0.00	1.0000	1893.71	1893.55	0.005858	0.001192			8387884
2.0	-0.90	0.8128	946.80	946.49	0.023434	0.004770			20966
3.0	-2.70	0.5370	631.14	630.67	0.052738	0.010734			5239
4.0	-5.80	0.2630	473.29	472.67	0.093762	0.019087			5239
5.0	-11.30	0.0741	378.56	377.79	0.143249	0.029155			3429
6.0	-21.50	0.0071	315.40	314.47	0.206368	0.042002			2380
7.0	-14.90	0.0324	270.27	269.19	0.287579	0.058530			1708
8.0	-10.50	0.0891	236.42	235.18	0.375833	0.076492			1307
9.0	-9.20	0.1202	210.08	208.68	0.421921	0.085873			1164
10.0	-9.80	0.1047	189.00	187.45	0.419388	0.085359			1171
12.0	-17.00	0.0200	157.37	155.50	0.266914	0.054324			1840
14.0	-23.20	0.0048	134.76	132.56	0.157011	0.031956			3129
16.0	-16.20	0.0240	117.78	115.27	0.104989	0.041989			2381
18.0	-20.40	0.0091	104.57	101.72	0.260731	0.053066			1884
20.0	-25.30	0.0030	93.98	90.81	0.286746	0.058361			1713
22.0	-19.90	0.0102	85.31	81.81	0.135289	0.027535			3631
24.0	-26.80	0.0021	78.09	74.24	0.102401	0.020841			4798
26.0	-20.20	0.0095	71.96	67.77	0.120397	0.024504			4080
28.0	-13.60	0.0437	66.71	62.16	0.132411	0.026949			3710
30.0	-12.60	0.0550	62.16	57.25	0.168446	0.034283			2916
32.0	-15.20	0.0302	58.17	52.89	0.366883	0.074671			1339
34.0	-23.10	0.0049	54.66	49.00	0.451360	0.091864			1088
36.0	-32.40	0.0006	51.53	45.49	0.507122	0.103213			968
38.0	-24.60	0.0035	48.74	42.30	0.565435	0.115082			868
40.0	-29.50	0.0011	46.24	38.39	0.623953	0.126992			787
42.0	-30.00	0.0010	43.97	36.71	0.689380	0.140308			712
44.0	-20.90	0.0081	41.93	34.23	0.717246	0.145980			685
46.0	-18.10	0.0155	40.06	31.92	0.416958	0.084863			1178
48.0	-18.20	0.0151	38.37	29.76	0.097407	0.019825			5044
50.0	-20.60	0.0087	36.82	27.73	0.246222	0.050113			1995
52.0	-25.00	0.0032	35.40	25.82	0.335917	0.068368			1462
54.0	-32.40	0.0006	34.10	24.01	0.393786	0.073227			1365
56.0	-44.70	0.0000	32.91	22.29	0.383940	0.078142			1279
58.0	-35.00	0.0003	31.82	20.65	0.409476	0.083340			1199
60.0	-31.30	0.0007	30.83	19.08	0.433913	0.088313			1132
62.0	-29.20	0.0012	29.92	17.57	0.341269	0.069458			1439
64.0	-28.90	0.0013	29.09	16.12	0.143758	0.029259			3417
66.0	-30.10	0.0010	28.33	14.72	0.047286	0.009624			10390
68.0	-32.50	0.0006	27.65	13.35	0.046813	0.009528			10495
70.0	-34.50	0.0004	27.04	12.03	0.048812	0.009935			10065
72.0	-34.70	0.0003	26.49	10.74	0.050358	0.010249			9596
74.0	-34.70	0.0003	26.00	9.48	0.051252	0.010431			9986
76.0	-34.70	0.0003	25.58	8.24	0.038750	0.007887			12679
78.0	-35.60	0.0003	25.21	7.03	0.019829	0.004036			24778
80.0	-37.30	0.0002	24.90	5.83	0.015383	0.003131			31939
82.0	-37.80	0.0002	24.65	4.65	0.015416	0.003138			31871
84.0	-38.80	0.0001	24.46	3.47	0.014621	0.002976			33604
86.0	-41.00	0.0001	24.32	2.31	0.009518	0.001937			51620
88.0	-43.20	0.0000	24.24	1.15	0.007703	0.001568			6782
90.0	-48.20	0.0000	24.21	0.00	0.004919	0.001001			99888

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Alaska Digital
Rebuild Lemon Creek AK
RFS:APXV18-206516S-C Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	90	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)
Down tilt (Degrees):		1945							
Depression Angle (degrees)		Relative dB	Relative Gain	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	-0.04	0.9920	1893.74	1893.72	0.00059	0.000006	17071680		
1.0	-0.35	0.9226	1893.72	1893.55	0.00586	0.000586	1707112		
2.0	-1.24	0.7516	946.49	946.49	0.02343	0.002343	42675		
3.0	-2.72	0.5346	631.18	630.67	0.05273	0.005273	18964		
4.0	-4.91	0.3228	473.35	472.67	0.09376	0.009376	10665		
5.0	-8.00	0.1585	377.79	377.79	0.14652	0.014652	6824		
6.0	-12.15	0.0610	315.50	314.47	0.208219	0.020822	4802		
7.0	-16.38	0.0230	270.39	269.19	0.243245	0.024324	4111		
8.0	-16.77	0.0210	236.55	235.18	0.279421	0.027842	3591		
9.0	-15.17	0.0304	210.23	208.68	0.313771	0.031377	3187		
10.0	-14.68	0.0340	189.16	187.45	0.349316	0.034932	2862		
12.0	-18.56	0.0139	157.56	155.50	0.240559	0.024052	4157		
14.0	-33.96	0.0004	134.98	132.56	0.093886	0.009389	10651		
16.0	-20.47	0.0090	118.04	115.27	0.062507	0.006251	15998		
18.0	-31.09	0.0088	104.85	101.72	0.079106	0.007911	12641		
20.0	-31.09	0.0088	94.30	90.81	0.085315	0.008532	11721		
22.0	-22.55	0.0161	85.67	81.81	0.048032	0.004803	20819		
24.0	-17.93	0.0130	72.38	74.24	0.051170	0.005117	19542		
26.0	-18.85	0.0130	67.77	67.77	0.049377	0.004938	12051		
28.0	-26.62	0.0022	62.16	62.16	0.097387	0.009740	10267		
30.0	-26.40	0.0023	62.64	57.25	0.111775	0.011178	8946		
32.0	-18.89	0.0129	58.69	52.89	0.128928	0.012893	7878		
34.0	-17.45	0.0180	55.21	49.00	0.143062	0.014306	6989		
36.0	-18.62	0.0137	52.12	45.49	0.164387	0.016439	6083		
38.0	-21.78	0.0066	49.36	42.30	0.191339	0.019134	5226		
40.0	-25.12	0.0031	46.89	38.39	0.211314	0.021131	4732		
42.0	-26.67	0.0022	44.66	36.71	0.232043	0.023204	4309		
44.0	-29.42	0.0011	42.64	34.23	0.253459	0.025346	3945		
46.0	-39.67	0.0001	40.81	31.92	0.275357	0.027536	3631		
48.0	-34.46	0.0004	39.15	29.76	0.253924	0.025392	3838		
50.0	-26.99	0.0020	37.63	27.73	0.15047	0.015045	6620		
52.0	-24.23	0.0038	36.24	25.82	0.075855	0.007585	13183		
54.0	-23.65	0.0043	34.98	24.01	0.062742	0.006274	15938		
56.0	-24.21	0.0038	33.82	22.29	0.098462	0.009846	10156		
58.0	-25.75	0.0027	32.76	20.65	0.107455	0.010745	9306		
60.0	-27.82	0.0017	31.80	19.08	0.113292	0.011329	8826		
62.0	-30.08	0.0010	30.91	17.57	0.119151	0.011915	8392		
64.0	-31.43	0.0007	30.11	16.12	0.124418	0.012442	8037		
66.0	-32.72	0.0005	29.38	14.72	0.129004	0.012900	7751		
68.0	-33.64	0.0004	28.72	13.35	0.097451	0.009745	10261		
70.0	-35.37	0.0003	28.13	12.03	0.060816	0.006082	16443		
72.0	-37.78	0.0002	27.61	10.74	0.034775	0.003477	28756		
74.0	-41.18	0.0001	27.14	9.48	0.025083	0.002508	39867		
76.0	-44.94	0.0000	26.73	8.24	0.019911	0.001991	50222		
78.0	-44.04	0.0000	26.38	7.03	0.013021	0.001302	76800		
80.0	-41.93	0.0001	26.09	5.83	0.006937	0.000694	144159		
82.0	-40.20	0.0001	25.85	4.65	0.004388	0.000439	227890		
84.0	-40.02	0.0001	25.67	3.47	0.004472	0.000447	223602		
86.0	-41.78	0.0001	25.54	2.31	0.004463	0.000446	224058		
88.0	-43.29	0.0000	25.46	1.15	0.004445	0.000445	224894		
90.0	-45.95	0.0000	25.43	0.00	0.003714	0.000371	269277		

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Alaska Digital
Rebuild Lemon Creek AK
RFS:APXV18-206516S-C Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):									
ERP (Watts):		630	Height (feet):	1000	Frequency (MHz):	90	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)
Down tilt (Degrees):		1945							
Depression Angle (degrees)		Relative dB	Relative Gain	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	-0.04	0.9920	1893.74	1893.72	0.00059	0.000006	17071680		
1.0	-0.35	0.9226	1893.72	1893.55	0.00586	0.000586	1707112		
2.0	-1.24	0.7516	946.49	946.49	0.02343	0.002343	42675		
3.0	-2.72	0.5346	631.18	630.67	0.05273	0.005273	18964		
4.0	-4.91	0.3228	473.35	472.67	0.09376	0.009376	10665		
5.0	-8.00	0.1585	377.79	377.79	0.14652	0.014652	6824		
6.0	-12.15	0.0610	315.50	314.47	0.208219	0.020822	4802		
7.0	-16.38	0.0230	270.39	269.19	0.243245	0.024324	4111		
8.0	-16.77	0.0210	236.55	235.18	0.279421	0.027842	3591		
9.0	-15.17	0.0304	210.23	208.68	0.313771	0.031377	3187		
10.0	-14.68	0.0340	189.16	187.45	0.349316	0.034932	2862		
12.0	-18.56	0.0139	157.56	155.50	0.240559	0.024052	4157		
14.0	-33.96	0.0004	134.98	132.56	0.093886	0.009389	10651		
16.0	-20.47	0.0090	118.04	115.27	0.062507	0.006251	15998		
18.0	-31.09	0.0088	104.85	101.72	0.079106	0.007911	12641		
20.0	-31.09	0.0088	94.30	90.81	0.085300	0.008530	11723		
22.0	-22.55	0.0161	85.67	81.81	0.048050	0.004805	20811		
24.0	-17.93	0.0130	72.38	74.24	0.051204	0.005120	12044		
26.0	-18.85	0.0130	67.77	67.77	0.049302	0.004932	12044		
28.0	-26.62	0.0022	62.16	62.16	0.097472	0.009747	10259		
30.0	-26.40	0.0023	62.64	57.25	0.111692	0.011169	8953		
32.0	-18.89	0.0129	58.69	52.89	0.127014	0.012701	7873		
34.0	-17.45	0.0180	55.21	49.00	0.143005	0.014305	6980		
36.0	-18.62	0.0137	52.12	45.49	0.164458	0.016446	6090		
38.0	-21.78	0.0066	49.36	42.30	0.191411	0.019141	5224		
40.0	-25.12	0.0031	46.89	38.39	0.211287	0.021129	4732		
42.0	-26.67	0.0022	44.66	36.71	0.232022	0.023202	4309		
44.0	-29.42	0.0011	42.64	34.23	0.253394	0.025339	3946		
46.0	-39.67	0.0001	40.81	31.92	0.275393	0.027539	3631		
48.0	-34.46	0.0004	39.15	29.76	0.254135	0.025414	3834		
50.0	-26.99	0.0020	37.63	27.73	0.150933	0.015093	6625		
52.0	-24.23	0.0038	36.24	25.82	0.075903	0.007590	13174		
54.0	-23.65	0.0043	34.98	24.01	0.062684	0.006268	15952		
56.0	-24.21	0.0038	33.82	22.29	0.098324	0.009832	10170		
58.0	-25.75	0.0027	32.76	20.65	0.107605	0.010761	9293		
60.0	-27.82	0.0017	31.80	19.08	0.113481	0.011348	8812		
62.0	-30.08	0.0010	30.91	17.57	0.118955	0.011896	8406		
64.0	-31.43	0.0007	30.11	16.12	0.124588	0.012459	8026		
66.0	-32.72	0.0005	29.38	14.72	0.128866	0.012886	7760		
68.0	-33.64	0.0004	28.72	13.35	0.097361	0.009736	10271		
70.0	-35.37	0.0003	28.13	12.03	0.060920	0.006092	16415		
72.0	-37.78	0.0002	27.61	10.74	0.034814	0.003481	28723		
74.0	-41.18	0.0001	27.14	9.48	0.025049	0.002505	39821		
76.0	-44.94	0.0000	26.73	8.24	0.019974	0.001997	50663		
78.0	-44.04	0.0000	26.38	7.03	0.013046	0.001305	76652		
80.0	-41.93	0.0001	26.09	5.83	0.006949	0.000695	143910		
82.0	-40.20	0.0001	25.85	4.65	0.004376	0.000438	228509		
84.0	-40.02	0.0001	25.67	3.47	0.004459	0.000446	224243		
86.0	-41.78	0.0001	25.54	2.31	0.004476	0.000448	223390		
88.0	-43.29	0.0000	25.46	1.15	0.004465	0.000447	223951		
90.0	-45.95	0.0000	25.43	0.00	0.003723	0.000372	268590		

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Alaska Digital
Rebuild Lemon Creek AK
RFS:APXV18-206516S-C Antenna Worksheet (0 Sector)

Alaska Digital
Rebuild Lemon Creek AK
RFS:APXV18-206516S-C Antenna Worksheet (120 Sector)

Maximum Permissible Exposure (MPE):										1000	
ERP (Watts):	600	Height (feet):	79	Frequency (MHz):	1945	Downtilt (Degrees):	0.0	Times Below MPE	0.0		
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	0.1	Times Below MPE	0.0		
0.1	-0.04	0.9920	18937.43	18937.42	0.000056	0.000006	0.000056	17925254	17925254		
1.0	-0.35	0.9226	1893.68	1893.55	0.005579	0.00058	0.005579	179240	179240		
2.0	-1.24	0.7516	946.74	946.49	0.022321	0.00232	0.002232	44801	44801		
3.0	-2.72	0.5346	631.06	630.67	0.050239	0.00502	0.050232	19904	19904		
4.0	-4.91	0.3228	473.18	472.67	0.089355	0.008936	0.08935	11191	11191		
5.0	-8.00	0.1585	378.43	377.79	0.139480	0.013948	0.139480	7169	7169		
6.0	-12.15	0.0610	315.24	314.47	0.198304	0.019830	0.19830	5042	5042		
7.0	-16.38	0.0230	270.09	269.19	0.231662	0.023166	0.231662	4316	4316		
8.0	-16.77	0.0210	236.21	235.18	0.265163	0.026516	0.265163	3771	3771		
9.0	-15.17	0.0304	209.85	208.68	0.298829	0.029883	0.298829	3346	3346		
10.0	-14.68	0.0340	188.74	187.45	0.332682	0.033268	0.332682	3005	3005		
12.0	-18.56	0.0139	157.06	155.50	0.401037	0.040104	0.401037	2493	2493		
14.0	-33.96	0.0004	134.39	132.56	0.281462	0.028146	0.281462	3552	3552		
16.0	-20.47	0.0090	117.36	115.27	0.120007	0.012001	0.120007	8332	8332		
18.0	-20.54	0.0088	104.09	101.72	0.076554	0.007655	0.076554	13062	13062		
20.0	-31.09	0.0088	93.46	90.81	0.094925	0.009493	0.094925	10534	10534		
22.0	-22.55	0.0056	84.73	81.81	0.112825	0.011283	0.112825	8863	8863		
24.0	-17.93	0.0161	77.45	74.24	0.078307	0.007831	0.07831	12770	12770		
26.0	-18.85	0.0130	71.27	67.77	0.095361	0.009536	0.095361	17742	17742		
28.0	-26.62	0.0022	65.97	62.16	0.081907	0.008191	0.081907	12209	12209		
30.0	-26.40	0.0023	61.36	57.25	0.111408	0.01141	0.111408	8975	8980		
32.0	-18.89	0.0129	57.32	52.69	0.127372	0.012737	0.127372	7850	7850		
34.0	-17.45	0.0180	53.75	49.00	0.144548	0.014455	0.144548	6918	6923		
36.0	-18.62	0.0137	50.57	45.49	0.162903	0.016290	0.162903	6138	6138		
38.0	-21.78	0.0066	47.72	42.30	0.182332	0.018233	0.182332	5484	5484		
40.0	-25.12	0.0031	45.16	39.39	0.209420	0.020942	0.209420	4775	4777		
42.0	-26.67	0.0022	42.84	36.71	0.242046	0.024205	0.242046	4131	4131		
44.0	-29.42	0.0011	40.73	34.23	0.266703	0.026670	0.266697	3749	3749		
46.0	-39.67	0.0001	38.81	31.92	0.292599	0.029259	0.292599	3417	3417		
48.0	-34.46	0.0004	37.06	29.76	0.319662	0.031966	0.319662	3128	3128		
50.0	-26.99	0.0020	35.45	27.73	0.347638	0.034764	0.347638	2876	2876		
52.0	-24.23	0.0038	33.98	25.82	0.376367	0.037637	0.376367	3121	3121		
54.0	-23.65	0.0043	32.62	24.01	0.385811	0.038581	0.385811	5381	5385		
56.0	-24.21	0.0038	31.38	22.29	0.091136	0.009114	0.091136	10972	10979		
58.0	-25.75	0.0027	30.23	20.65	0.082720	0.008272	0.082720	12088	12088		
60.0	-27.82	0.0017	29.18	19.08	0.129596	0.012960	0.129596	7716	7716		
62.0	-30.08	0.0010	28.22	17.57	0.137878	0.013788	0.137878	7252	7262		
64.0	-31.43	0.0007	27.34	16.12	0.145864	0.014586	0.145864	6855	6855		
66.0	-32.72	0.0005	26.53	14.72	0.153504	0.015350	0.153504	6514	6523		
68.0	-33.64	0.0004	25.80	13.35	0.160893	0.016089	0.160893	6215	6220		
70.0	-35.37	0.0003	25.14	12.03	0.139934	0.013993	0.139934	7146	7146		
72.0	-37.78	0.0002	24.55	10.74	0.089295	0.008930	0.089295	11198	11198		
74.0	-41.18	0.0001	24.03	9.48	0.047261	0.004726	0.047261	21158	21181		
76.0	-44.94	0.0000	23.57	8.24	0.031813	0.003181	0.031813	31433	31433		
78.0	-44.04	0.0000	23.17	7.03	0.002409	0.002409	0.002409	41509	41509		
80.0	-41.93	0.0001	22.84	5.83	0.014429	0.001443	0.014429	69306	69306		
82.0	-40.20	0.0001	22.56	4.65	0.006367	0.000637	0.006367	175070	175453		
84.0	-40.02	0.0001	22.35	3.47	0.005664	0.000564	0.005664	174726	177796		
86.0	-41.78	0.0001	22.20	2.31	0.005656	0.000566	0.005656	176906	176906		
88.0	-43.29	0.0000	22.11	1.15	0.005651	0.000561	0.005651	176958	176958		
90.0	-45.95	0.0000	22.08	0.00	0.004707	0.000471	0.00471	212440	212561		

Alaska Digital
Rebuild Lemon Creek AK
RFS:APXV18-206516S-C Antenna Worksheet (240 Sector)

Maximum Permissible Exposure (MPE):									
1000									
ERP (Watts):	600	Height (feet):	79	Frequency (MHz):	1945	Downtilt (Degrees):	0.0		
Depression Angle (degrees)	Relative dB	Relative Gain	Slant Distance (meters)	Dist From Structure (meters)	Power Density (µW/cm²)	Percent of MPE	Times Below MPE		
0.1	-0.04	0.9920	18937.43	18937.42	0.000056	0.000006	17925254		
1.0	-0.35	0.9226	1893.68	1893.55	0.005579	0.000558	179240		
2.0	-1.24	0.7516	946.74	946.49	0.022321	0.002232	44801		
3.0	-2.72	0.5346	631.06	630.67	0.050239	0.005024	19904		
4.0	-4.91	0.3228	473.18	472.67	0.089355	0.008936	11191		
5.0	-8.00	0.1585	378.43	377.79	0.139702	0.013970	7158		
6.0	-12.15	0.0610	315.24	314.47	0.198304	0.019830	5042		
7.0	-16.38	0.0230	270.09	269.19	0.231662	0.023166	4316		
8.0	-16.77	0.0210	236.21	235.18	0.265163	0.026516	3771		
9.0	-15.17	0.0304	209.85	208.68	0.298829	0.029883	3346		
10.0	-14.68	0.0340	188.74	187.45	0.332662	0.033268	3005		
12.0	-18.56	0.0139	157.06	155.50	0.401037	0.040104	2493		
14.0	-33.96	0.0004	134.39	132.56	0.120007	0.012001	8332		
16.0	-20.47	0.0090	117.36	115.27	0.076564	0.007656	13061		
18.0	-31.09	0.0088	93.46	90.81	0.094925	0.009493	10534		
20.0	-31.09	0.0088	93.46	90.81	0.112798	0.011280	8865		
22.0	-22.55	0.0056	84.73	81.81	0.078292	0.007829	12772		
24.0	-17.93	0.0161	77.45	74.24	0.056318	0.005632	17756		
26.0	-18.85	0.0130	71.27	67.77	0.111408	0.011141	8975		
28.0	-26.62	0.0022	65.97	62.16	0.081855	0.008185	12216		
30.0	-26.40	0.0023	61.36	57.25	0.127301	0.012730	7855		
32.0	-18.89	0.0129	57.32	52.89	0.144548	0.014455	6918		
34.0	-17.45	0.0180	53.75	49.00	0.162797	0.016280	6142		
36.0	-18.62	0.0137	50.57	45.49	0.182303	0.018230	5485		
38.0	-21.78	0.0066	47.72	42.30	0.209420	0.020942	4775		
40.0	-25.12	0.0031	45.16	39.39	0.241955	0.024196	4132		
42.0	-26.67	0.0022	42.84	36.71	0.266703	0.026670	3749		
44.0	-29.42	0.0011	40.73	34.23	0.292615	0.029261	3417		
46.0	-38.67	0.0001	38.81	31.92	0.319580	0.031958	3129		
48.0	-34.46	0.0004	37.06	29.76	0.347635	0.034764	2876		
50.0	-26.99	0.0020	35.45	27.73	0.320100	0.032010	3124		
52.0	-24.23	0.0038	33.98	25.82	0.185811	0.018581	5381		
54.0	-23.65	0.0043	32.62	24.01	0.091136	0.009114	10972		
56.0	-24.21	0.0038	31.38	22.29	0.082630	0.008263	12102		
58.0	-25.75	0.0027	30.23	20.65	0.129414	0.012941	7727		
60.0	-27.82	0.0017	29.18	19.08	0.137878	0.013788	7252		
62.0	-30.08	0.0010	28.22	17.57	0.145607	0.014561	6867		
64.0	-31.43	0.0007	27.34	16.12	0.153504	0.015350	6514		
66.0	-32.72	0.0005	26.53	14.72	0.160893	0.016089	6215		
68.0	-33.64	0.0004	25.80	13.35	0.139794	0.013979	7153		
70.0	-35.37	0.0003	25.14	12.03	0.089178	0.008918	11213		
72.0	-37.78	0.0002	24.55	10.74	0.047261	0.004726	21158		
74.0	-41.18	0.0001	24.03	9.48	0.031769	0.003177	31476		
76.0	-44.94	0.0000	23.57	8.24	0.024018	0.002402	41635		
78.0	-44.04	0.0000	23.17	7.03	0.014404	0.001440	69426		
80.0	-41.93	0.0001	22.84	5.83	0.006367	0.000637	157070		
82.0	-40.20	0.0001	22.56	4.65	0.005636	0.000564	177426		
84.0	-40.02	0.0001	22.35	3.47	0.005641	0.000564	177281		
86.0	-41.78	0.0001	22.20	2.31	0.005625	0.000562	177793		
88.0	-43.29	0.0000	22.11	1.15	0.004693	0.000469	213105		
90.0	-45.95	0.0000	22.08	0.00					

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White paper

Base station antenna selection for LTE networks

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Executive summary

Rapid mobile data growth is requiring the industry to use more sophisticated, higher-capacity access technologies like LTE, which supports many advanced antenna techniques. LTE requires precise containment of RF signals used to transmit mobile data, which can only be accomplished with high-performance antennas. This paper gives an overview of antennas and their application in practical configurations for various types of LTE antenna techniques.

Antenna overview

Antenna parameters can be separated into two categories, as shown below. Primary parameters (Table 1) are those specifically mentioned when defining the type of antenna used in a particular application. For a given antenna vendor, the primary parameters are enough to identify a specific model that can be used. Secondary parameters (Table 2) are those that impact performance and can be used to differentiate between similar models offered by different vendors

Unfortunately, many of these parameters have not been clearly defined from an industry perspective. In an effort to bring consistency to the industry, the Next Generation Mobile Networks (NGNM) Alliance has released a BASTA white paper that suggests a single definition for each parameter.¹

Beamforming antennas are becoming increasingly important in LTE networks. Column patterns, broadcast patterns, and service beams are all formed and the parameters in Tables 1 and 2 apply to each.

LTE fundamentals

The fuel cell solution was installed in various configurations at several locations around the world to test the operational reliability and durability of the system in different climate conditions with varying quality of power grids. These deployments ranged from outdoor and indoor wireless cell sites to wireline huts and shelters in Asia, Europe and North America.

Long-term evolution (LTE) is a 3GPP-based standard using orthogonal frequency division multiple access (OFDMA) on the downlink and single carrier-frequency division multiple access (SC-FDMA) on the uplink. LTE supports:

- Multiple channel (e.g., carrier) sizes (1.4, 3, 5, 10, 15 and 20 MHz) with carrier aggregation (CA) up to 100 MHz
- More than 40 defined bands supporting spectrum from 450 MHz to 3.8 GHz
- Both time division duplexing (TDD) and frequency division duplexing (FDD)
- Multiple antenna-related technologies, including various flavors of multiple input multiple output (MIMO) and beamforming (BF) for up to eight downlink and four uplink antennas

The first LTE specification is part of 3GPP Release 8, which was frozen in December 2008. LTE-Advanced generally refers to the LTE features that are found in Release 10 and beyond. LTE-Advanced features include CA, eight-layer DL transmission, four-layer UL transmission, and enhanced inter-cell interference coordination (eICIC).² Release 10 features are just now being deployed. Release 11 introduces features such as coordinated multipoint (CoMP) and further enhanced ICIC (feICIC). In March 2015, 3GPP is due to complete Release 12, which contains features such as a new 3D channel model, active antenna systems (AAS), and eight receive antennas. 3GPP has started work on features for Release 13, which should include full dimension MIMO (FD-MIMO or massive MIMO) and vertical beamforming (V-BF).

MIMO increases throughput by transmitting distinct data streams over different antennas using the same resources in both frequency and time. MIMO requires a high signal-to-interference-plus-noise ratio (SINR) and low correlation of each path. The de-correlation can be obtained by antennas (polarization or spatial diversity) or the environment (rich scattering). There are several types of MIMO: single-user MIMO (SU-MIMO), multi-user MIMO (MU-MIMO), and massive MIMO.

SU-MIMO—or spatial multiplexing (SM)—requires multiple antennas at both ends of the link to spatially multiplex channels to a single user. SU-MIMO is most often used on the DL as there are antenna and power limits to device designs. Figure 1 shows an example of 2x2 SU-MIMO where the transmitting equipment has two antennas and the receiving equipment has two antennas. The end of the link with the least number of antennas sets the theoretical maximum bound on achievable throughput.

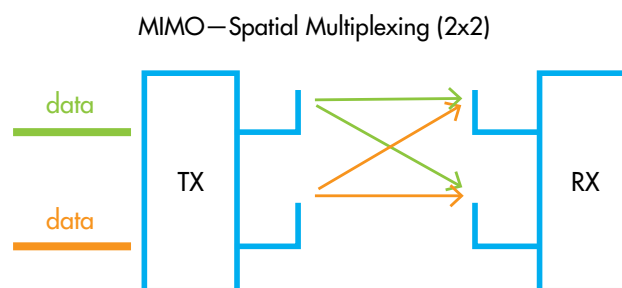


Figure 1: Example of 2x2 MIMO

Parameter	Definitions and/or notes
Number of arrays	Modern antennas have 1-5 arrays or columns—possibly more if internal duplexing is used
Frequency band	Band of operation for each array in the antenna; affects size
Horizontal HPBW (half-power beamwidth)	Horizontal (azimuth) width of antenna's main beam; drives overlap between sectors; also called horizontal beamwidth (HBW)
Length	Physical length; drives the elevation HPBW and gain; a concern for zoning and site leasing
Gain	Maximum power radiated in any direction; driven by length and azimuth HPBW

Table 1: Primary antenna parameters

Parameter	Definitions and/or notes
PIM (passive intermodulation)	FDD antennas can generate nonlinear noise that degrades system performance
Return loss	Amount of energy reflected back from an antenna RF port
Port-to-port isolation	Isolation between different RF ports of the antenna. Can be defined between orthogonally-polarized ports of the same array (intra-band) or between arrays (inter-band)
Polarization	Most modern antennas radiate two orthogonal polarizations from each array
Upper sidelobe suppression	Level of upper sidelobe relative to main beam; important for reducing system interference
Vertical HPBW	Width of the antenna's main beam in the vertical (elevation) direction; also called vertical beamwidth (VBW)
Vertical tilt	Peak position of the main beam in the vertical direction
Tilt range	Range of values for the main beam maximum below the horizon that can be set for a given antenna
Null fill	Reduce depth of lower nulls; often refers to first null below the main beam; coverage gaps may result if a narrow elevation HPBW is combined with shallow tilt and a deep null
Suppression-on-horizon	Maximum value of energy suppression, measured by the energy at 0 degrees compared to the main beam maximum
Front-to-back ratio (F/B)	Measure of how much energy is radiated behind the antenna
Azimuth beam squint	Difference between azimuth beam maximum and the antenna physical boresight
Port-to-port tracking	Difference between the azimuth patterns of the two polarizations, measured over the sector in decibels (dB)
Desired/undesired (D/U)	Measure of how well energy in the azimuth pattern is confined within the sector of operation; expressed as the percentage of the sector where the difference between the in-sector beam and out-of-sector beam exceeds a certain level in decibels (dB)
Sector power ratio (SPR)	Measure of how well the energy in the azimuth pattern is confined within the sector of operation
Cross-pol isolation	Separation between co-pol and x-pol energy for a given port; typically measured as worst case value for a region

Table 2: Secondary antenna parameters

Multi-user MIMO (MU-MIMO) combines multiple “de-correlated” users onto the same resources. MU-MIMO does not increase peak user throughput, but it does increase average user throughput and sector capacity. Both UL and DL MU-MIMO are possible. Massive MIMO uses a two-dimensional array of closely spaced antennas, MU-MIMO with tens of devices, and an AAS.

Beamformers use an array of antenna elements that are individually phased in such a way as to form beams (or nulls) in a desired direction. Typical beamforming antennas have highly correlated, closely spaced elements and columns. Passive antennas can support horizontal beamforming. An AAS integrates the active transceiver array and the passive antenna array into one radome, supporting two-dimensional (azimuth) and 3D (both azimuth and tilt) antenna array configurations. Several AAS applications are illustrated in Figure 2. An AAS base station can direct beams in different horizontal and vertical directions for different operations, frequency bands, network standards, and links (downlink and uplink).

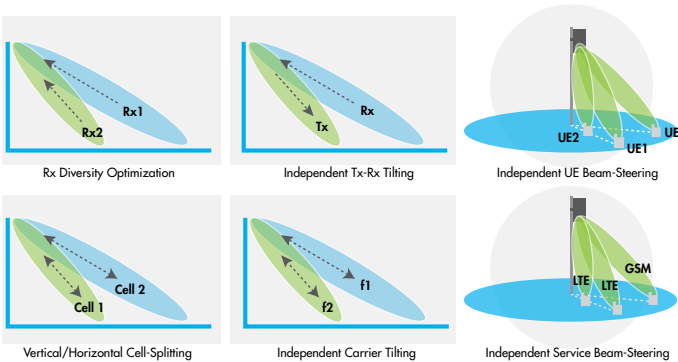


Figure 2: AAS applications

CoMP is intended to improve network performance at cell and sector edges by coordinating reception or transmission from multiple cells (either inter-site or inter-sector), providing both interference suppression and a signal strength boost. Possible CoMP techniques include joint reception for UL and joint transmission and dynamic point selection for the DL. Inter-site CoMP can require a significant increase in backhaul capacity as well as near-zero backhaul latency in order to provide capacity gain.

To date there are 10 transmission modes defined by LTE.³ The description in Table 3 lists the primary mode of operation, but Modes 3-10 also fall back to transmit diversity. Modes 3-5 and 8-10 have some form of MIMO, while Modes 3, 4 and 7-10 all have some form of beamforming. Modes 9 and 10 encompass SU-MIMO, MU-MIMO, and beamforming. CoMP is possible with TM9, but CoMP performance is optimized in TM10.

Uplink coverage improvement is achieved primarily by increasing the number of base station receive antennas using familiar techniques such as maximum ratio combining (MRC) and interference rejection combining (IRC). Techniques such as UL MU-MIMO and UL CoMP can provide throughput gain with no additional backhaul impacts when used inter-sector.

3GPP release	3GPP release	Description	Maxrank (TX streams)
8	Mode 1	Single-antenna port	1
	Mode 2	Transmit diversity	1
	Mode 3	Open-loop spatial multiplexing	4
	Mode 4	Closed-loop spatial multiplexing	4
	Mode 5	Multi-use MIMO	1
	Mode 6	Single layer close-loop spatial multiplexing	1
	Mode 7	Single-layer beamforming	1
9	Mode 8	Dual-layer beamforming	2
10	Mode 9	Multi-layer transmission	8
11	Mode 10	Multi-layer transmission	8

Table 3: LTE transmission modes

Selecting the optimum antenna for your network

With the many antenna techniques LTE supports—and the often highly differing antenna design requirements as well as different network designs—it can be challenging to select a single antenna to fit all scenarios. For example, SU-MIMO and Rx diversity thrive on de-correlated antennas (e.g., widely-spaced columns), while MU-MIMO and BF work best with correlated antennas. UL CoMP provides decreasing improvements with an increasing number of receivers, while MU-MIMO is most effective with four or more antennas. Many techniques have decreasing gains with increasing inter-site distances (ISD)—such as DL CoMP, whose gains are negligible with ISDs greater than 500 meters, a configuration that is relatively common in the United States. In short, operators must choose antennas based on the techniques that will be most advantageous to their network design and needs. Table 4 summarizes some general preferences for selecting the best macro base station antenna for a given application. Primarily addressed are the 3GPP techniques found in Releases 8-11. Operators with frequency bands below 1 GHz are most likely to use a single-column cross-polarized antenna due to size limitations inherent with leasing and zoning (typically ≤24x72 inches), while antennas serving the 1 to 2 GHz range will typically be limited to no more than two cross-polarized columns. Size constraints likewise limit 2.5 GHz four-column (eight-port) antennas to a column spacing ≤0.65λ (0.65 wavelengths), which can give sub-optimal uplink performance compared to 1λ.

The four-column antennas shown are more optimized for beamforming and likely limited to a MIMO rank commensurate with two-column antennas. Since rank is also limited by the device antennas, this may not be a concern unless operators target 8x8 DL SU-MIMO for very high peak speeds for larger fixed devices in the future. Assuming the RF environment can support ranks >4 (the most typical measured to date are rank 1-2⁴), the four-column antenna designs shown may be sub-optimal for 8x8 MIMO performance.

		Optimum application	Downlink (TM)	Uplink	SPR	VoLTE	CoMP	Coverage or capacity
Single-column	45° HBW	Dense site spacing, high traffic areas	MIMO (2 and 3 optimal; 4 and 6 limited)	MRC	Best	Risk	Inter-site	Capacity
	65° HBW	All sites, all speeds. Best all-around			Good	Good	Inter- and intra-site	Both
	85° HBW	Rural sites, coverage challenges			Poor	Better		Coverage
Two-column	0.7 λ column spacing	Correlated/beamforming; cell edge DL throughput	MIMO, BF (2, 3, 4, 5 and 6)	MRC, IRC, MIMO	UL:Poor DL:Best	Good	Inter- and intra-site	Coverage
	1 λ column spacing	Decorrelated/multi-layer; DL cell peak throughput; UL cell edge throughput	MIMO (2 and 3 optimal; 4 and 6 limited)	MRC, SU-MIMO	UL:Best DL:Poor	Best	Inter- and intra-site	Capacity
Four-column	0.5 λ column spacing	Correlated/beamforming; DL cell edge throughput	BF, MIMO (8 optimal; 3, 4, 5, 6, 7 and 9 limited)	MRC, IRC, MIMO	UL:Poor DL:Best	Good	Reduced benefit	Both
	0.65 λ column spacing	Best column pattern/uplink cell edge throughput	BF, MIMO (8 and 9 optimal; 3, 4, 5, 6 and 7 possible)	MRC, IRC, MIMO	UL:Best DL:Poor	Best	Reduced benefit	Both

Table 4: Cross-polarized antenna selection summary

Conclusion

Antenna selection is a key decision in today's LTE wireless network design. This paper has explored several antenna options available to RF engineers and their managers for today's LTE networks. The function and application of base station antennas has been discussed and recommendations made for the selection of antennas in various deployment conditions.

References

- ¹ http://www.ngmn.org/uploads/media/NGMN-N-P-BASTA_White_Paper_V9_6.pdf
- ² <http://www.3gpp.org/technologies/keywords-acronyms/97-lte-advanced>
- ³ 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Procedures," 3GPP Technical Specification, v12.4.0, Dec., 2014.
- ⁴ http://www.ericsson.com/res/thecompany/docs/publications/ericsson_review/2010/lte-mimo.pdf

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Basic Antenna Principles for Mobile Communications

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Mobile Communications - Antenna Technology

1. Introduction

In the last few years a large technological jump has taken place in the field of mobile communications due to the introduction of new mobile communication networks (GSM/PCN). The number of subscribers worldwide has risen to over 150 Million. Fig. 1 shows an overview of the mobile communications services and the relevant frequency ranges within Germany alone.

The requirements on the antennas needed for the ever expanding networks are becoming continually higher:

- strictly defined radiation patterns for a most accurate network planning.
- growing concern for the level of intermodulation due to the radiation of many HF-carriers via one antenna.
- dual polarization
- electrical down-tilting of the vertical diagram.
- unobtrusive design.

The following essay will give an insight into antenna theory in general, as well as the most important types of antennas and the special methods used for GSM/PCN systems.

2. Theory

Antennas transform wire propagated waves into space propagated waves. They receive electromagnetic waves and pass them onto a receiver or they transmit electromagnetic waves which have been produced by a transmitter. As a matter of principle all the features of passive antennas can be applied for reception and transmission alike (reciprocity). From a connection point of view the antenna appears to be a dual gate, although in reality it is a quad gate. The connection which is not made to a RF-cable is connected to the environment, therefore one must always note, that the surroundings of the antenna have a strong influence on the antennas electrical features (Fig. 2).

The principle of an antenna can be shown by bending a co-axial cable open (Fig. 3):

- a) A transmitter sends a high frequency wave into a co-axial cable. A pulsing electrical field is created between the wires, which cannot free itself from the cable.
- b) The end of the cable is bent open. The field lines become longer and are orthogonal to the wires.
- c) The cable is bent open at right angles. The field lines have now reached a length, which allows the wave to free itself from the cable.
The apparatus radiates an electromagnetic wave, whereby the length of the two bent pieces of wire corresponds to half of the wave length.

This simplified explanation describes the basic principle of almost every antenna - the $\lambda/2$ -dipole. Not only is an electrical field (E) created due to the voltage potential (U) but also a magnetic field (H) which is based on the current (I) (Fig.4). The amplitude distribution of both fields corresponds to the voltage and current distribution on the dipole.

The free propagation of the wave from the dipole is achieved by the permanent transformation from electrical into magnetic energy and vice versa.

The thereby resulting electrical and magnetic fields are at right angles to the direction of propagation (Fig.5).

3. Definitions

3.1 Polarization

Polarization can be defined as the direction of oscillation of the electrical field vector.

Mobile communications: vertical polarization

Broadcast systems: horizontal polarization

3.2 Propagation Pattern

In most cases the propagation characteristic of an antenna can be described via elevations through the horizontal and vertical radiation diagrams. In mobile communications this is defined by the magnetic field components (H-plane) and the electrical field components (E-plane). Very often a 3-dimensional description is chosen to describe a complex antenna.

3.3 Half-Power-Beam-Width

This term defines the aperture of the antenna. The HPBW is defined by the points in the horizontal and vertical diagram, which show where the radiated power has reached half the amplitude of the main radiation direction. These points are also called 3 dB points.

3.4 Gain

In reality one does not achieve an increment in energy via antenna gain. An antenna without gain radiates energy in every direction. An antenna with gain concentrates the energy in a defined angle segment of 3-dimensional space. The $\lambda/2$ -dipole is used as a reference for defining gain. At higher frequencies the gain is often defined with reference to the isotropic radiator. The isotropic radiator is a non-existent ideal antenna, which has also an omnidirectional radiation characteristic in the E-plane and H-plane.

Calculation:

Gain (with reference to the isotropic radiator dBi) = Gain (with reference to $\lambda/2$ -Dipole dBd) + 2.15 dB

The gain of an antenna is linked to the radiation characteristic of the antenna. The gain can be roughly calculated by checking the HPBW's in the horizontal and vertical planes (Fig.6).

3.5 Impedance

The frequency dependant impedance of a dipole or antenna is often adjusted via a symmetry or transformation circuit to meet the 50 Ohm criterion. Adjustment across a wider frequency range is achieved using compensation circuits.

3.6 VSWR /Return Loss

An impedance of exactly 50 Ohm can only be practically achieved at one frequency. The VSWR defines how far the impedance differs from 50 Ohm with a wide-band antenna. The power delivered from the transmitter can no longer be radiated without loss because of this incorrect compensation. Part of this power is reflected at the antenna and is returned to the transmitter (Fig.7). The forward and return power forms a standing wave with corresponding voltage minima and maxima ($U_{\min}/U_{\max}$). This wave ratio (**V**oltage **S**tanding **W**ave **R**atio) defines the level of compensation of the antenna and was previously measured by interval sensor measurements.

A VSWR of 1.5 is standard within mobile communications. In this case the real component of the complex impedance may vary between the following values:

Maximum Value: $50 \text{ Ohms} \times 1,5 = 75 \text{ Ohms}$

Minimum Value: $50 \text{ Ohms} : 1,5 = 33 \text{ Ohms}$

The term return loss attenuation is being used more often in recent times. The reason for this is that the voltage ratio of the return to the forward-wave U_R/U_V can be measured via a directional coupler. This factor is defined as the co-efficient of reflection. Figure 7 shows the relationship between the coefficient of reflection, return loss attenuation, VSWR and reflected power.

3.7 Mechanical features

Antennas are always mounted at exposed sites. As a result the antenna must be designed to withstand the required mechanical loading. Vehicle antennas, for example, must withstand a high wind velocity, vibrations, saloon washing and still fulfill a limited wind noise requirement. Antennas for portable radio equipment are often exposed to ill-handling and sometimes even played with by the user. Base station antennas are exposed to high wind speed, vibrations, ice, snow, a corrosive environment and of course also extreme electrostatic loading via lightning.

4. Base Station Antennas

4.1 Omnidirectional Antennas

4.1.1 Groundplane and $\lambda/4$ Skirt Antennas in Comparison

The classical omnidirectional $\lambda/2$ antennas are of a groundplane or $\lambda/4$ -skirt nature (Fig. 8). The names indicate how the antenna is decoupled from the mast. In the first case a conductive plane is achieved via 3 counterweighted poles, in the other case the decoupling is achieved by using a $\lambda/4$ -skirt. The second type however only works across a very limited bandwidth, so that for example three versions are needed to cover the 2-m band. The groundplane antenna on the other hand can cover the complete frequency range because it is a wideband antenna.

4.1.2 Side-mounted Omnidirectional Antennas

Unfortunately it is not always possible to mount one of the above antennas on the tip of a mast because this position is not always available. As a result one cannot avoid mounting an omnidirectional antenna on the side of a mast which results in a significant change in the horizontal diagram. The distance to the mast has a decisive influence on the radiation characteristic. If the distance is $\lambda/4$ then an off-set characteristic is achieved, if on the other hand the mast-antenna distance is $\lambda/2$ a bi-directional diagram is the result (see Fig. 9).

The radiation diagram can therefore be compensated by varying the mast-antenna distance in order to supply the required area with coverage.

In order to achieve this effect one chooses a groundplane or $\lambda/4$ skirt antenna with a corresponding bracket arm or one uses a dipole which has a special mounting bracket supplied.

4.1.3 Omnidirectional Antennas with Gain

The $\lambda/2$ antennas discussed up until now have all radiated the same power from the tip of the mast in all azimuth directions (Fig.8). The vertical half power beamwidth was 78 Degrees. One can see that a large proportion of the energy is radiated both upwards and downwards, as a result a lot of power is lost in the desired horizontal plane.

By connecting single, and vertically stacked dipoles at a middle distance of one wavelength the half power beamwidth can be reduced (Fig.10). As a result the radiated power in the horizontal plane is increased. This increase is called gain, which is nothing other than binding the radiated power in a defined direction. A doubling of the number of dipoles results in a gain increase of 3 dB (double the power). Fig.11 shows an example of a GSM-Gain antenna which has several dipoles stacked inside a common fibre-glass tube.

4.2 Directional Antennas

4.2.1 Gain Achieved via Horizontal Beaming

Gain can also be achieved via beaming in the horizontal plane if the radiation is not omnidirectional. By radiating the existing energy in a semi-circle (180°) one achieves 3dB gain; 6dB gain can be achieved by radiating in a quadrant (90°). The patterns shown in Figure 12 are purely theoretical because in reality directional antennas cannot produce such sharp corner points.

4.2.2 End-fire Arrays

Directional antennas whose mechanical features are parallel to the main radiation beam are called "End-fire Arrays".

Yagi and logarithmic periodic (log-per) antennas are typical examples of this type of antenna (Fig.13). Yagi antennas are very common due to their simple and cheap method of construction.

However, Yagi antennas are only sometimes suitable for professional applications. The gain and bandwidth of Yagi antennas are electrically coupled with one other which is an electrical disadvantage, i.e. one criterion is weighed off the other. The mechanical concept is not suitable for extreme climatic conditions because ice and snow have a strong influence on the radiation diagram.

A "log-per" is often used because it is less sensitive to ice and its radiation diagram is constant over a wide frequency range, furthermore there are fewer side-lobes. A "log-per" antenna is often used for applications where an exact radiation diagram is needed.

4.2.3 Broadside Arrays

Directional antennas whose mechanical features are orthogonal to the main radiation beam are called "Broadside Arrays".

Panels and corner reflector antennas are typical for this type (Fig.14).

Panel antennas are made up of several dipoles mounted in front of a reflector so that gain can be achieved from both the horizontal and vertical plane. This type of antenna is very well suited for antenna combinations. An antenna with 6 dipoles is referred to as a "zwölfer-Feld" (12 dipole panel), which is a little confusing. Theoretically the reflector plate can be replaced with a second set of dipoles which radiate with the inverted phase. The virtual dipoles are counted and find their way into the above mentioned name.

The reflector plate of a corner reflector antenna is, as the name suggests, not straight but bent forwards. The chosen angle influences the horizontal half-power-beamwidth, normally the angle is 90° . The corner reflector antenna is only used singly, for example: for the coverage of railway lines and motorways.

4.2.4 Antenna Systems

Special applications which cannot be realised by using a single antenna are very often achieved via antenna combinations. The combination is made up of several single antennas and a distribution system (power splitter and connecting cable). Very often a combination is designed in order to achieve a higher gain. Many different antennas are also used to achieve a wide range of horizontal radiation characteristics by varying the number of antennas, the azimuth direction, the spacing, the phase and the power ratio. Figure 15 shows 3 simple examples.

A quasi-omnidirectional pattern can also be produced. The required number of antennas increases with the diameter of the tower. For examples 8 Panels are required at 900MHz for a mast with a diameter of approximately 1.5m. The omnidirectional radiation is not continuous but a result of the one or two optimas per panel mounting diameter.

The calculation of such radiation patterns is achieved via vector addition of the amplitude and phase of each antenna. The amplitude of each pattern can be read from the data sheet but the phase is only known by the antenna manufacturer. However the phase is the most important factor for the calculation because a rough estimate using only the amplitude can lead to completely incorrect results.

5. Particular Techniques used in GSM and DCS 1800

5.1 Diversity

Diversity is used to increase the signal level from the mobile to the base station (uplink). The problem with this path is the fact that the mobile telephone only works with low power and a short antenna. Diversity is applied on the reception side of the base station.

A transmitted signal extremely rarely reaches the user via the most direct route. The received signal is very often a combination of direct and reflected electromagnetic waves (Fig.16). The reflected waves have differing phase and polarization characteristics.

As a result there may be an amplification or in extreme cases a cancelling of the signal at specific locations. It is not unknown, that the reception field strength may vary 20-30 dB within several meters.

Operation in a canyon-like street is often only possible by using these reflections. These reflections from buildings, masts or trees are especially common, because mobile communications predominantly uses vertical polarization.

5.1.1 Space Diversity

This system consists of two reception antennas spaced a distance apart. One antenna has a certain field strength profile with maxima and minima from its coverage area, the other antenna has a completely different field strength profile although only spaced a few meters away. Ideally the minima of one antenna will be completely compensated by the maxima of the other (Fig. 17). The improvement in the average signal level achieved with this method is called diversity-gain.

Diversity antennas are not RF-combined because this would lead to an unfavourable radiation characteristic. Both antennas function separately on different reception paths, whereby the higher signal per channel and antenna is chosen by the base station. Separation in the horizontal plane is preferred (horizontal diversity).

The results of vertical diversity are considerably worse.

5.1.1.1 Omni Base Station

The typical GSM Omni Base Station is made up of 3 antennas (Fig. 18):

- one transmitting antenna (Tx)
- two receiving antennas (Rx)

The transmitting antenna is mounted higher and in the middle in order to guarantee a cleaner omnidirectional characteristic. Furthermore the influence of the Rx and Tx antennas on each other is reduced (higher isolation). The two receiving antennas are spaced at $12-20 \lambda$ to achieve a diversity gain of 4-6 dB.

5.1.1.2 Sectorized Base Station

Omni base stations are mainly installed in regions with a relatively low number of subscribers. For capacity reasons the communications cell is divided into 3 sectors of 120° in urban areas. Directional antennas, for example panels, are used to cover these sectors. All 3 antennas per sector can be mounted at the same height because directional antennas have higher isolation in comparison to omnidirectional antennas.

5.1.2 Polarization Diversity

The reflections which take place within urban areas are not all of the same polarization, ie. horizontal components also exist. Furthermore a mobile telephone is never held exactly upright which means that all polarizations between vertical and horizontal are possible. It is therefore logical that these signals be also used. Space diversity uses 2 vertically polarized antennas as reception antennas and compares the signal level. Polarization diversity uses 2 orthogonally polarized antennas and compares the resulting signals.

5.1.2.1 Horizontal and Vertical Polarization

The dipoles of both antenna systems are horizontally and vertically polarized respectively. A spacial separation is not necessary which means that the differently polarized dipoles can be mounted in a common housing. Sufficient isolation can be achieved even if the dipoles are interlocked into one unit so that the dimensions of a dual-polarized antenna are not greater than that of a normal polarized antenna.

As a result there are the following advantages:

- 2 antennas only are now needed per sector:
 - 1 x hor./vert. for polarization diversity
 - 1 x vert. for Tx
 - (Figure 20)
- A minimum horizontal spacing is only required between the antennas, the antennas can also be mounted one above the other on the same mast. This makes the complete sector very compact, thereby easing permission procedures.

- If in addition the vertical path of the dual polarized antenna is fed via a duplexer for Rx and Tx, then only one antenna is needed per sector. As a result all 3 sectors can be supplied from one mast (Fig. 21).

The diversity gain in urban areas is the same as that achieved via space diversity (4-6 dB).

5.1.2.2 Polarization +45°/-45°

It is also possible to use dipoles at +45°/-45° instead of horizontally and vertically (0°/90°) placed. One now has two identical systems which are able to handle both horizontally and vertically polarized components. This combination brings certain advantages in flat regions because the horizontal components are fewer due to the fewer reflections. A further advantage is that both antenna systems can be used to transmit. Experiments have shown that pure horizontal polarization achieves considerably lower results than vertical polarization when transmitting.

Two transmitting channels using hor/ver antennas are combined via a 3-dB-coupler onto the vertical path. As a result half the power of both transmitting channels was lost.

Both polarizations are fully suitable for Tx if you use cross-polarized antennas resulting in a system as in Figure 22.

5.2 Indoor Antennas

It is often difficult to supply the inside of buildings with radio coverage at higher frequencies. Mirrored windows and steel-webbed concrete walls block the electro-magnetic waves.

As a result airports, underground railway stations, shopping or office centres are very often supplied with their own small lower power network via a repeater which is connected to the next base station. Special indoor antennas are mounted in the various rooms and corridors in an unobtrusive design which blend in with the surroundings.

For example there are wide-band omnidirectional antennas available which can be mounted on the ceiling and can be used for GSM as well as DCS 1800 (DECT) systems. If used in conjunction with wide-band splitters then an indoor network can be achieved which covers several mobile communications services.

Extremely flat directional antennas can be mounted on walls (Fig. 24). The small depth of the antenna is achieved using so-called "Patch Technology". A rectangular metal plate is thereby mounted over a conductive plane (Fig. 25). The patch is electrically fed via the middle of one of its sides, thereby creating an electrical field between the patch and the conductive plane. The field strength vectors of the slit of the feed-point and the opposite point of the conductive plane have the same phase and therefore define the direction of polarization. The field strength vectors of both of the other patch sides are counter-phased and cancel each other.

6. Car Antennas

Are car antennas needed at all these days?

Operating a hand-held portable within a vehicle without a mounted antenna is very often possible, especially with public mobile networks. However, the use of an externally mounted antenna is recommended in every case!

Mobile telephones are at the centre of the controversial discussions over the effects of electromagnetic waves on the human body. As a result the output power of the base station is controlled to a minimum required for operation. The power of the mobile telephone, on the other hand, has to be turned to maximum inside the car so that the connection with the base station, and thereby the conversation, be upheld because the car attenuates the signal significantly. As a result the mobile subscriber submits himself unnecessarily to a higher level of electromagnetic radiation. If an externally mounted car antenna is used then the occupant is protected via the shielding of the car body.

6.1 $\lambda/4$ Antenna on the Car Roof

The $\lambda/4$ -antenna is the basic car antenna just as the $\lambda/2$ -dipole is the basic antenna for base station systems (Fig. 26). However, the $\lambda/4$ antenna cannot function on its own. The $\lambda/4$ -antenna needs a conductive plane which virtually substitutes an image of the antenna under test. This virtual length increases the electrical length of the antenna to $\lambda/2$.

Electrically speaking the best place to mount a car antenna is the car roof. The electrical characteristic of this antenna is shown in Fig. 27. The lifting of the radiation pattern is caused by the relatively small counter weight of the car roof surface area and the thereby resulting incorrectly closed field lines. This lifting of the pattern is inversely proportional to the surface area, theoretically if an infinite conductive area was available then the pattern would be untilted.

If the antenna is mounted at the side of the roof then the horizontal pattern is no longer circular because the surface area in all directions is no longer the same. As a result the vertical pattern shows variations with the corresponding different antenna gain in the horizontal plane.

The above description is only valid if the car roof is made of metal. Sometimes car roofs are made of plastic. If this is the case then a conductive surface has to be brought into contact with the antenna base. This surface should have a diameter of at least one wavelength and be made of brass, copper or aluminium foil, brass-plated material, mesh, etc.

6.2 Gain Antennas

The reference antenna for gain measurements for car antennas is the $\lambda/4$ -antenna. In order to achieve a higher gain the vertical dimensions of the antenna must be increased. Figure 27 shows the vertical pattern of a $5/8 \lambda$ antenna. The additional gain of 2 dB is achieved mainly by the tilting of the vertical pattern.

If the length of the radiating element is further increased then the current components of opposite phase become too high and a phase inversion becomes necessary. The correct phasing of a $\lambda/4$ and $\lambda/2$ radiating elements results in an antenna gain of 4dB (Figure 28).

6.3 Rear Mount Antennas

Many customers do not favour roof-mounted antennas. Firstly, the installation is difficult and secondly drilling a hole in the roof reduces the re-sale value of the car. The required feeder cable is relatively long and the resulting attenuation is significant. Rear-mounted antennas offer an alternative as they can be mounted in already existing drilled car radio holes.

$\lambda/4$ or 4 dB-gain antennas create unsymmetrical horizontal radiation patterns which show shadows in the direction of the car when mounted on the rear of the car (Figure 30). A rear-mounted antenna must be significantly longer so that a proportion of the antenna is higher than the car roof. Figure 30 shows an example of an NMT rear-mounted antenna with an approximately 900 mm long radiating element ($2 \times \lambda/2$ elements vertically stacked with a phasing section in between).

The car inner cell causes more significant distortion at 900 MHz because of the shorter antenna lengths. As a result so called elevated antennas are used. The feed point of the antenna is not the base but the middle of the antenna, whereby the radiating upper part of the antenna is extruding above the car roof. An almost ideal omnidirectional characteristic is the result (Figure 31).

6.4 Screen Surface Direct Mounting Antennas

Screenfix antennas offer mounting without drilling any holes. These antennas are made up of two functioning parts (Figure 32):

- Exterior part: radiating element
- Interior part: coupling unit with electrical counter weight and connecting cable

Both parts are stuck on either the inner or outer side of the rear, front or side window.

Both parts are capacitively coupled through the glass and are therefore electrically connected to one another. One works predominantly with decoupled radiating elements because the electrical counter weight of this type of antenna is very small. A colinear antenna is used, which in the case of a good Screenfix antenna is made up of 2 $\lambda/2$ elements and a phasing system. The electrical counter weight which defines the dimensions of the coupling unit prevents radiation into the inside of the vehicle and therefore should not be too small.

6.5 Clip-on Antennas

If the vehicle antenna is only needed periodically and should be removed easily then a series of clip-on antennas as well as magnetically mounted antennas are available (Figure 33).

The antenna is mounted on the upper edge of a wound-down window and then clipped into place. The window can then be wound back up. The antenna is electrically made up of an elevated $\lambda/2$ Antenna, ie. the part below the thickening is only a coaxial section. As a result the radiation takes place above the car roof top and a good omnidirectional pattern is achieved.

6.6 Electrically Shortened Antennas

Even $\lambda/4$ antennas are too long for some applications. For example buses or building site vehicles very often demand extremely short antennas. Figure 34 shows a "Miniflex Antenna" for the 2-m-Band with a length of $L = 170\text{mm}$ which is composed of a metal spiral in a plastic coating. The antenna is very narrow banded due to the extremely short dimensions. Tuning to the operating frequency is achieved via the compensation circuit underneath the mounting surface.

A further possibility of shortening the antenna length can be found by using a top loading capacitance which artificially lengthens the radiating element. With this method it is possible to construct very flat antennas. Figure 34 shows a 70-cm-Band antenna with a vertical length of 70mm. The resulting gain of these shortened antennas depends on the degree of shortening whereby the thickness of the radiating element plays an important role.

6.7 Train Antennas

Car antennas are generally not DC grounded. Train antennas on the other hand must be designed to withstand possible electrical contact with the overhead lines, ie. a high level of safety is required. The train driver must not be exposed to any danger via the feeder cable of the antenna.

According to the test requirements of the German Railway Authority (Deutsche Bahn AG) the antenna must be able to withstand a voltage of 16.6 kV and a current of 40 kA, whereby a voltage of not more than 60 V is measured at the RF-connector.

Figure 35 shows a train antenna for the 450 MHz frequency range. The bandwidth is increased by using a sword-like radiating element. A short circuiting rod connects the upper end of the radiating element with ground. This short circuiting rod has an electrical length of $\lambda/4$ (approximately). Due to this length, the radiator is grounded for DC or low frequencies but open for the working frequency.

In order to have sufficient distance between the antenna and the overhead lines the length of the antenna at lower frequencies has to be less than $\lambda/4$.

Figure 36 shows a $\lambda/4$ antenna in the 2-m band. The antenna has a narrow bandwidth and has to be trimmed via 2 capacitors as a result of the mechanical shortening. The parallel capacitor C_p electrically lengthens the antenna, the capacitor in series C_s , on the other hand, trims the VSWR.

The antenna is grounded via a central vertical conductive rod.

7. Antennas for Portables

The antenna is increasingly becoming an integral part of the handheld unit especially in communication services at higher frequencies such as GSM and DCS 1800. This has the advantage that the impedance at the interface is no longer critical (50 Ω impedance at the connector).

Handheld equipment is available on the market with extendable antennas. These fulfill the criterion of $\lambda/4$ antennas if not extended (the handheld mobile must always be available). These antennas reach an electrical length of $\lambda/2$ if extended resulting in the required gain for mobile transmitting operation.

7.1 $\lambda/4$ Antennas

An electrical counterweight is required similar to the situation described for vehicle antennas for portable antennas, this counterweight is performed by the housing of the radio. The user of the mobile distorts the antenna - counterweight system because he carries it within its own radiation field. The performance of the antenna may vary strongly depending on the user and his habits.

Electrical interference of the mobile itself is possible, because the mobile is part of the antenna. The very simple construction of this antenna is its main advantage. A sufficient electrical compensation for 50 Ω is achieved without special measures. The antenna itself is a lengthened inner conductor of a coaxial cable.

7.2 $\lambda/2$ Antennas (Gainflex)

If the antenna has a length of $\lambda/2$ than no electrical counterweight is needed. The antenna functions independently of the mobile and one therefore speaks of a decoupled antenna. The resulting advantages are as follows:

- practically insensitive of handling/operating position.
- a defined radiation characteristic and the thereby practical gain of approximately 4 dB with reference to a $\lambda/4$ antenna.
- interference of the mobile's electronics is avoided via the decoupling of the antenna from the mobile.

The impedance at the base of this antenna is very high. Therefore a relatively complicated matching circuit at the base of the antenna is needed to compensate the impedance to 50 Ω .

7.3 Shortened Antennas

Shortened $\lambda/4$ antennas are generally used at lower frequencies. They are composed of spiral radiating elements which have a physical length of approximately $\lambda/4$ if extended to full length. Therefore a good matching is achieved.

7.4 Field Strength Measurements

Mobiles are always operated near the human body which may act either as a reflector or absorber thereby influencing the radiation characteristic. Figure 37 shows a comparison of the above described antennas with this in mind. The noted gain values are made with reference to a $\lambda/2$ dipole without any influence from the human body, ie. reference 0 dB.

Appendix

Figure 1: Mobile communication services in Germany

Frequency	Communication Service / Operator
13 – 47 MHz	CB-Radio Paging systems
47 – 68 MHz	TV Band I
68 – 88 MHz	“BOS“-Services (Security Services) e.g. Police, Fire Brigade, Rescue Services, Energy Supply Services
88 – 108 MHz	UKW-Broadcasting
108 – 144 MHz	VHF ground-to-air communication VOR
146 – 174 MHz	BOS services Train Communications Public Services Taxifunk ERMES (European Radio Messaging System)
174 – 225 MHz	TV Band III
225 – 380 MHz	UHF ground-to-air communication ILS (Instrument Landing System)
380 – 400 MHz	TETRA (Trans European Trunked Radio)
400 – 430 MHz	Trunking System (Checker / Modacom / Mobitex)
450 – 470 MHz	450 MHz Mobile Network (C-Net), Train Communications Paging Systems
470 – 860 MHz	TV Band IV / V
870 – 960 MHz	GSM Mobile Network (D-Net) DIBMOF (digital train radio system)
960 – 1215 MHz	DME (Distance Measuring Equipment)
1452 – 1492 MHz	DAB Digital Audio Broadcasting
1710 – 1880 MHz	PCN Mobile Network (E-Net)
1880 – 1900 MHz	DECT (Digital European Cordless Telephone)

Figure 2: The antenna as quad-gate

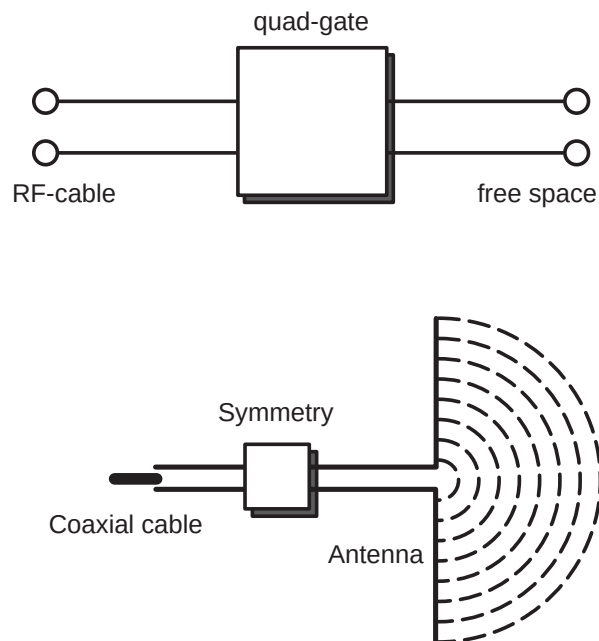


Figure 3: Evolving an antenna from a coaxial cable

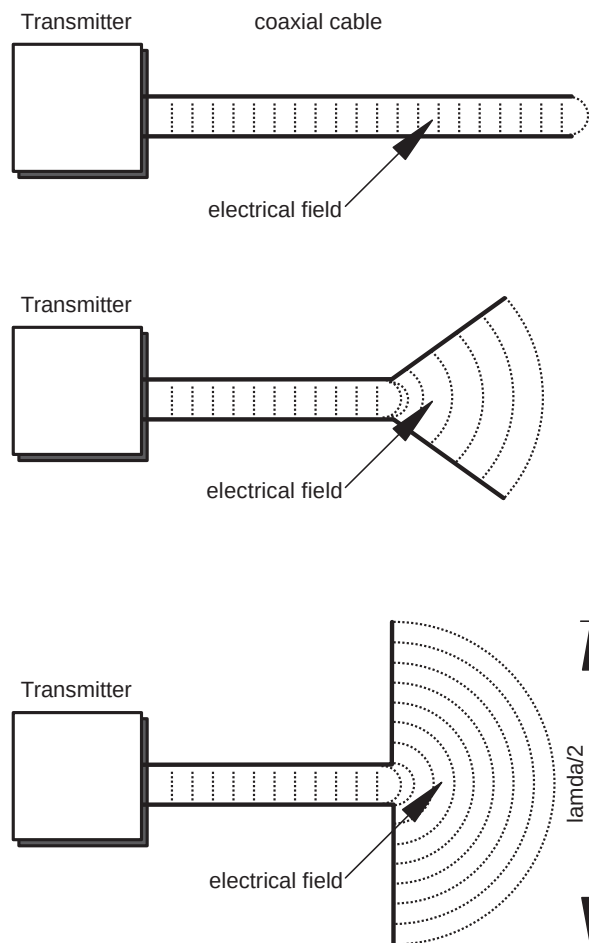


Figure 4: Field distribution on a $\lambda/2$ Dipole

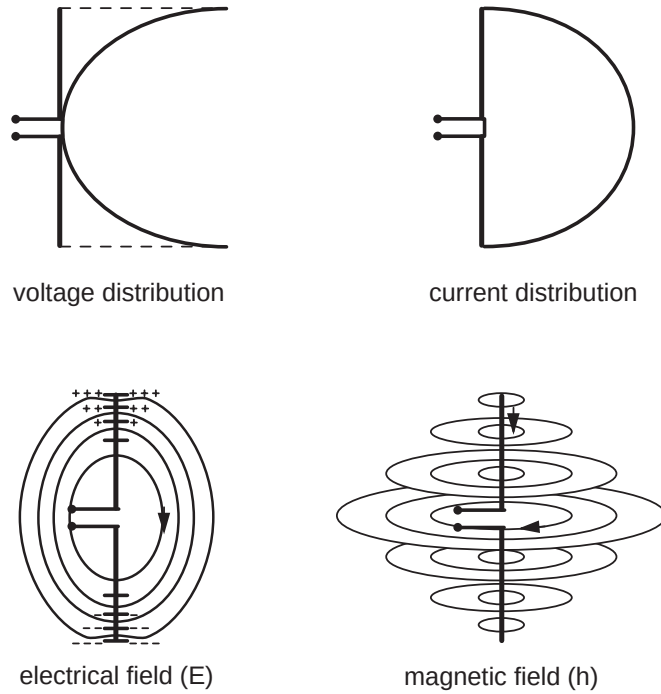


Figure 5: Wave propagation

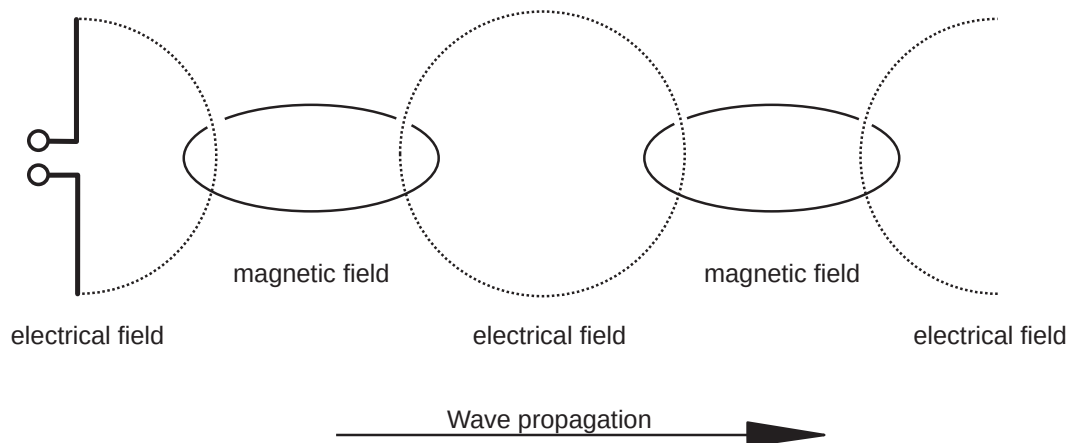


Figure 6: Antenna gain vs half-power beam width

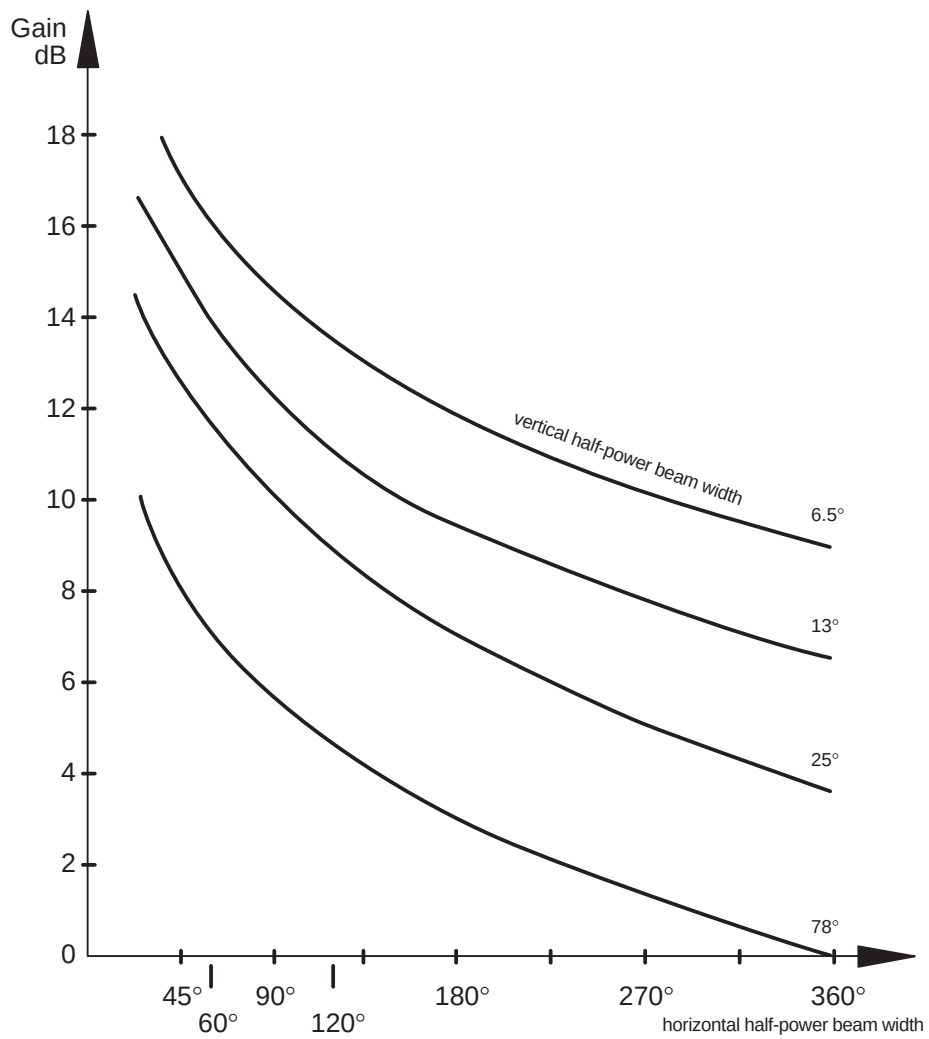
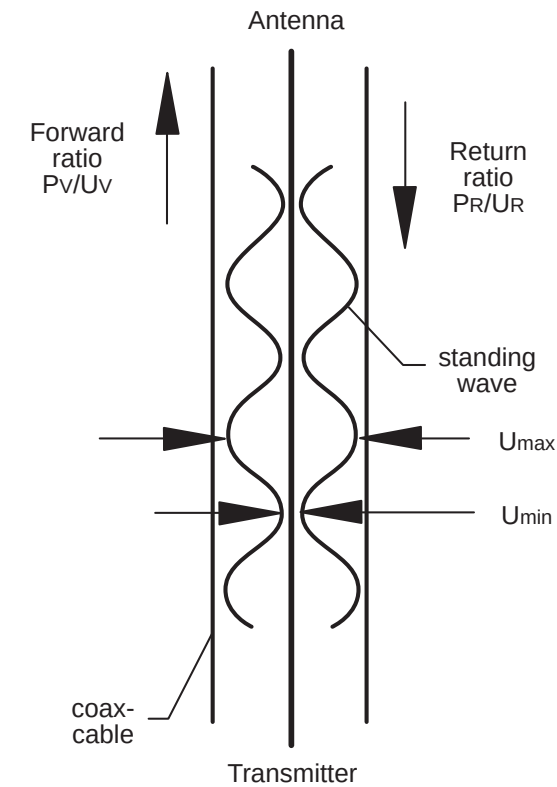


Figure 7: VSWR, Return Loss Attenuation and Factor of Reflection



VSWR s

$$s = \frac{U_{max}}{U_{min}} = \frac{1 + r}{1 - r}$$

Return loss attenuation a_r

$$\text{Factor of reflection } r = \frac{U_R}{U_V} = \frac{s - 1}{s + 1}$$

$$a_r [\text{dB}] = -20 \log r$$

Reflected power

$$\frac{P_R}{P_V} = 100 r^2 \quad [\%]$$

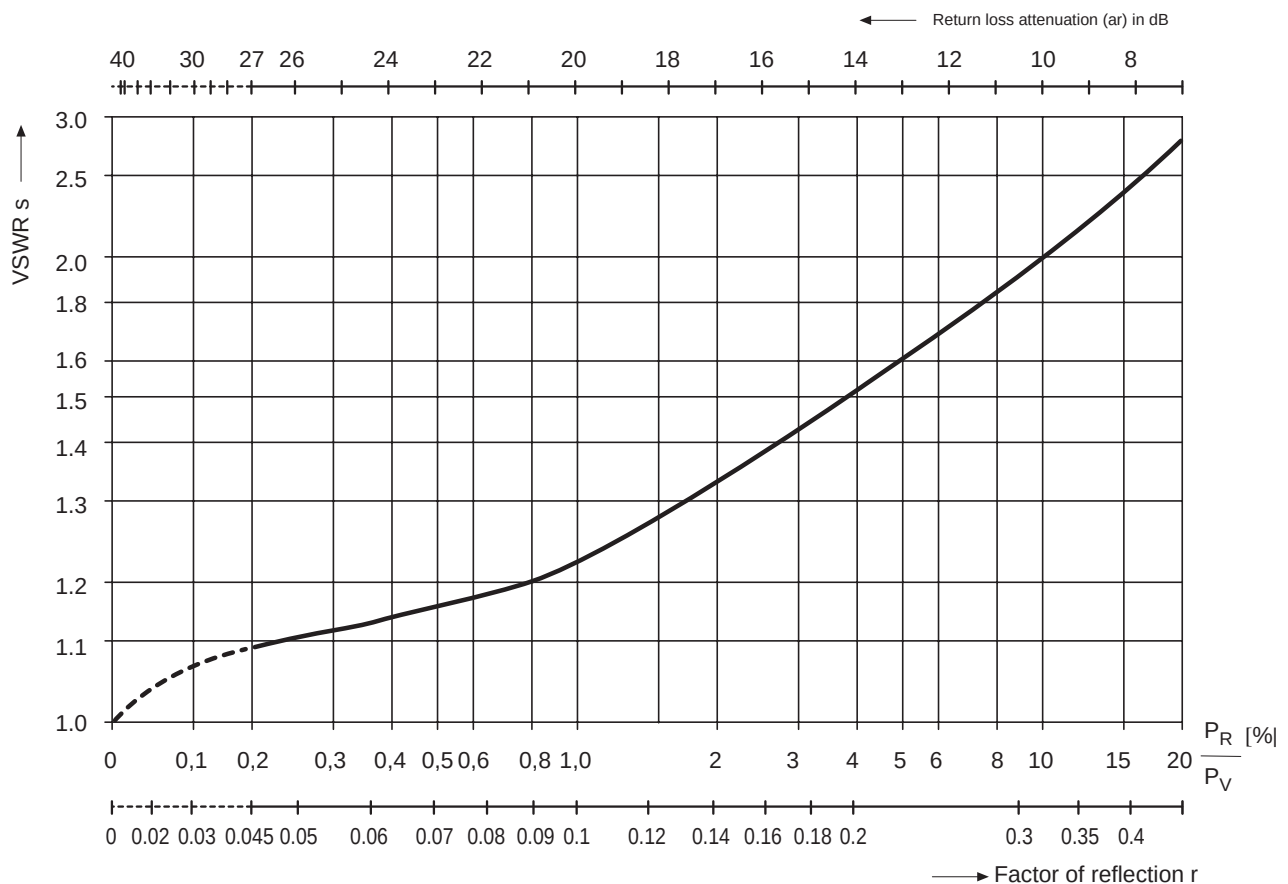
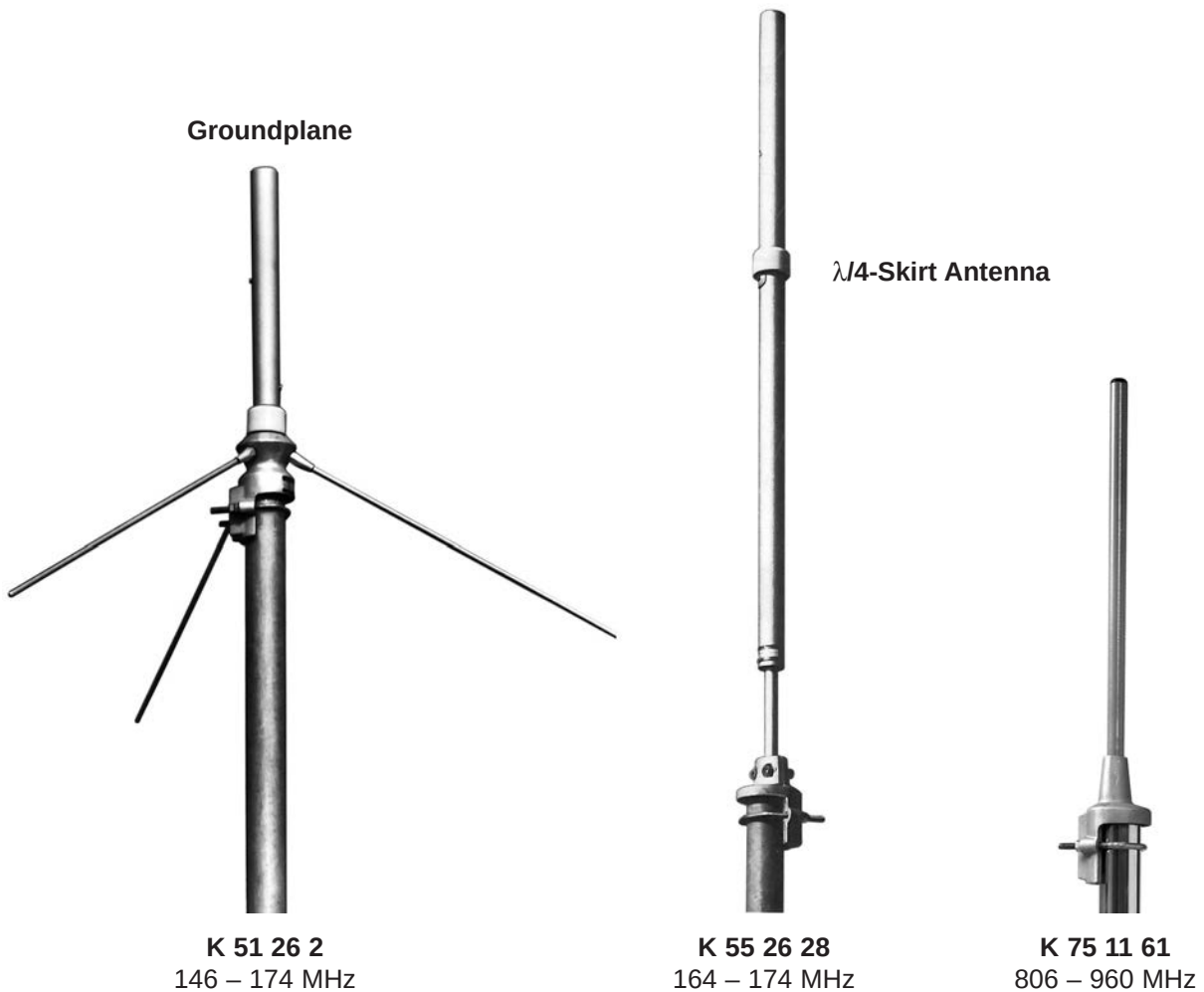


Figure 8: Groundplane and $\lambda/4$ -Skirt Antenna



Radiation diagrams with relative field strengths

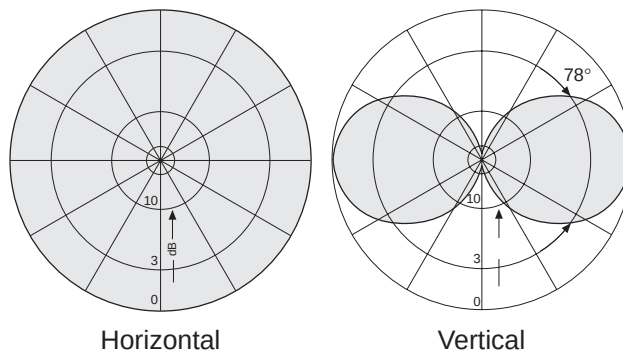
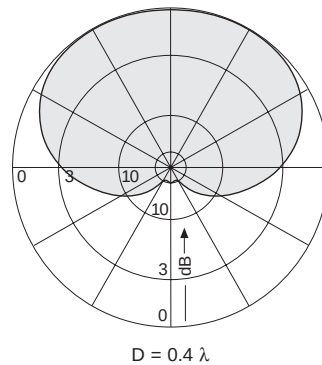
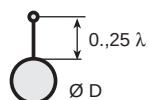
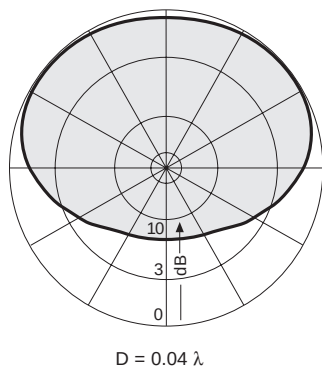


Figure 9: Offset omnidirectional antenna



K 55 29 2..
146 – 174 MHz

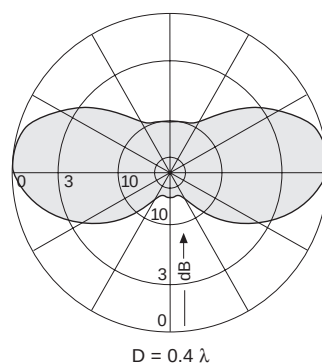
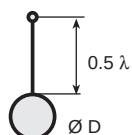
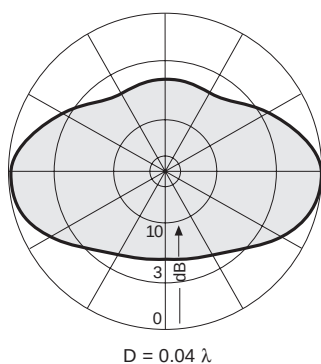


Figure 10: Gain via vertical beaming

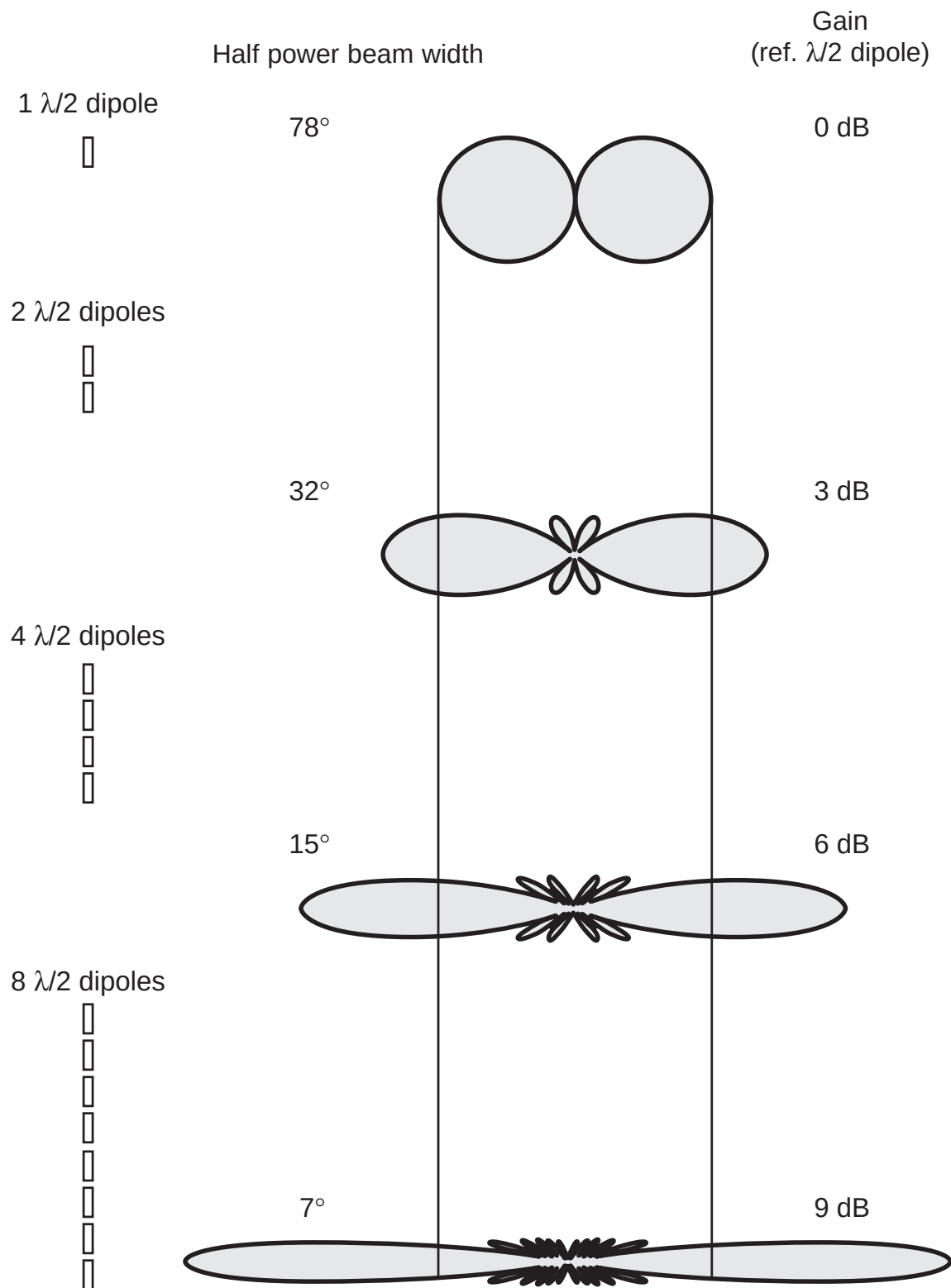
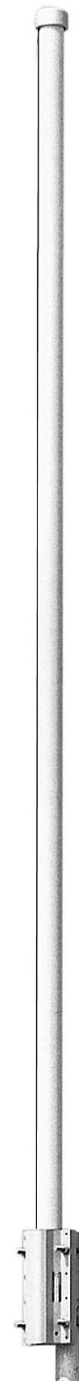
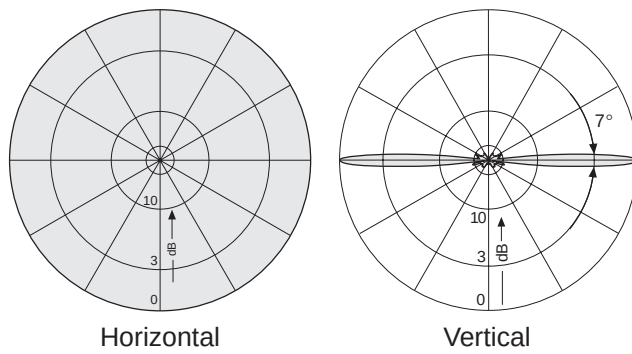


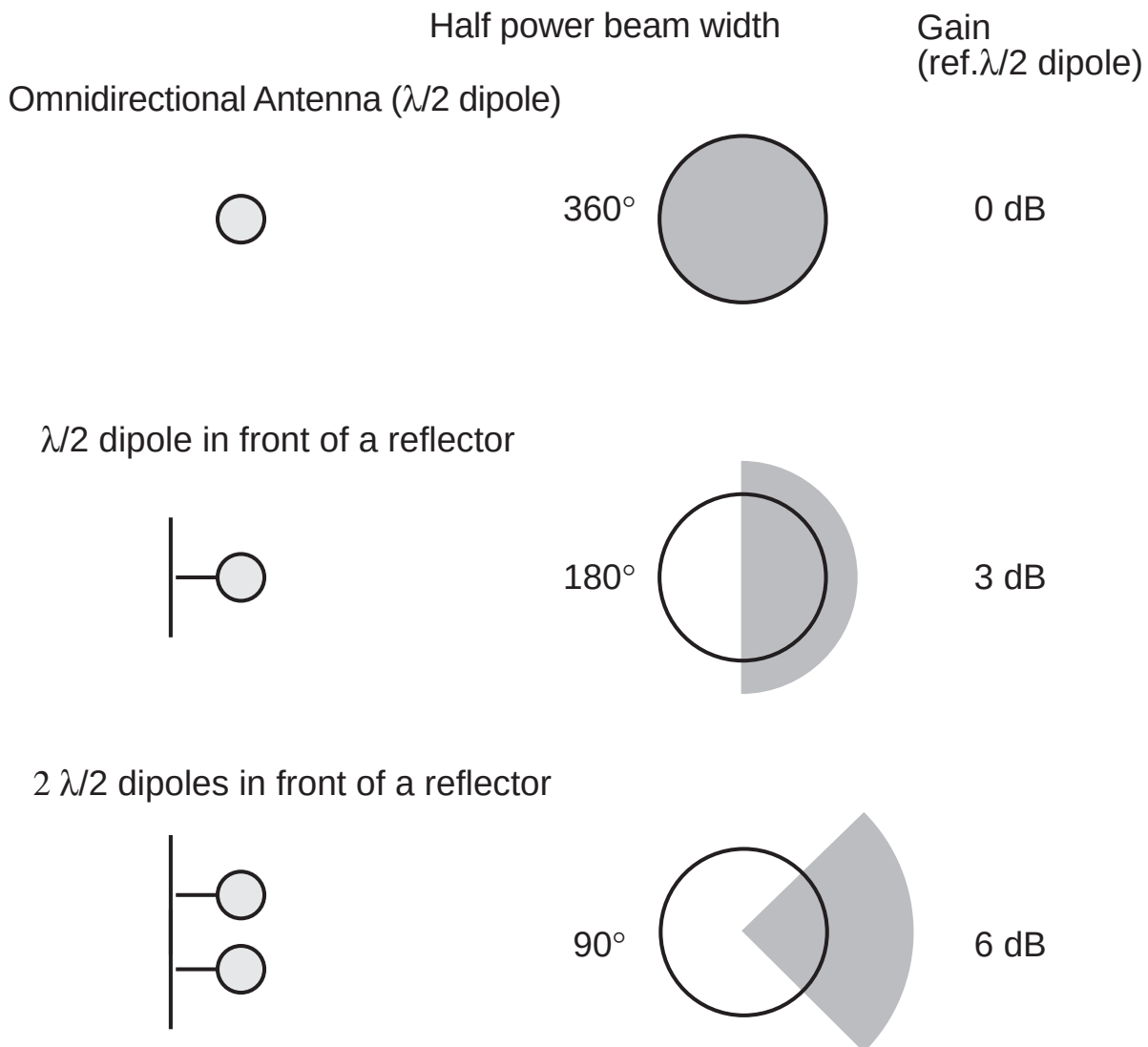
Figure 11: 9 dB Omnidirectional Gain Antenna

Radiation diagrams with relative field strength



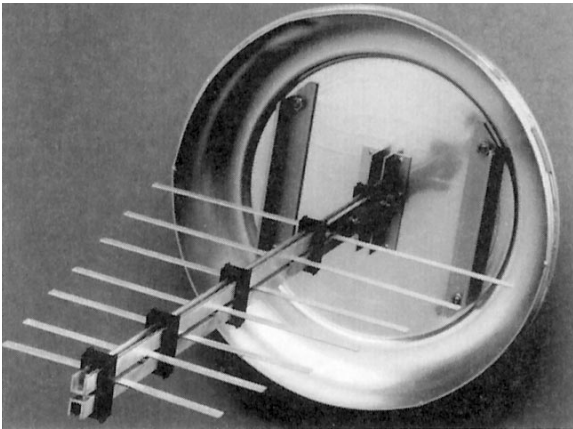
736 347
870 – 960 MHz

Figure 12: Gain via horizontal beaming



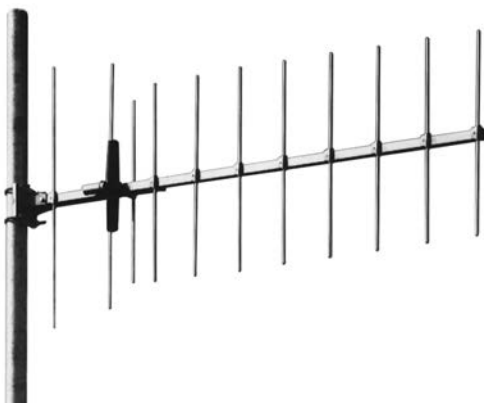
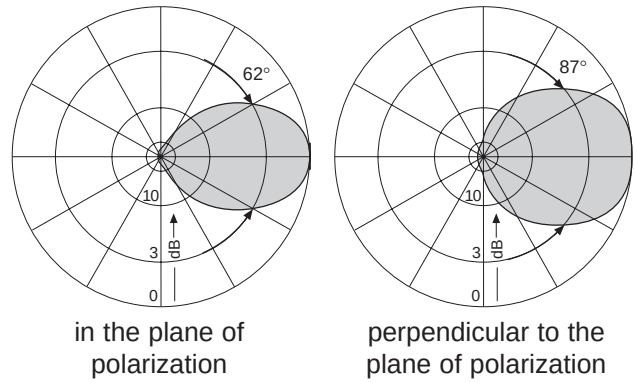
(theoretical radiation diagrams)

Figure 13: Yagi – and log.-per. Antennas



log.-per. Antenna K 73 23 2
406 – 512 MHz

Radiation diagrams with relative field strength



Yagi-Antenna K 52 07 21
146 – 174 MHz

Radiation diagrams with relative field strength

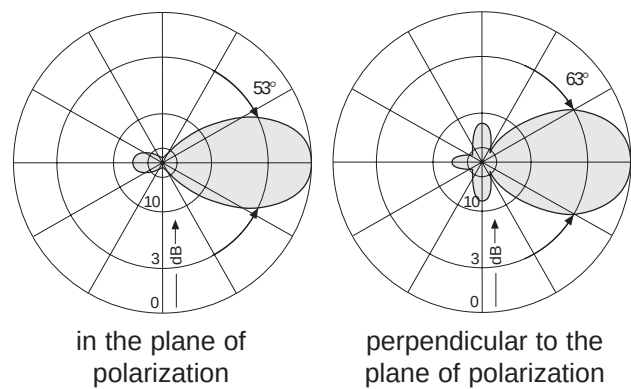
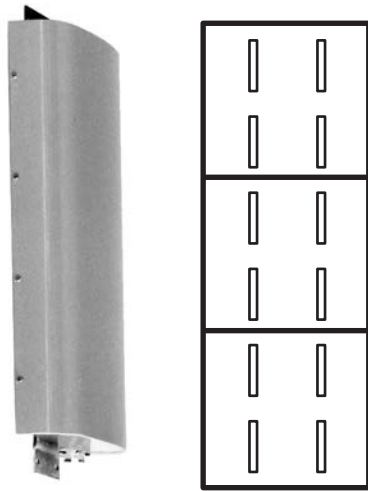
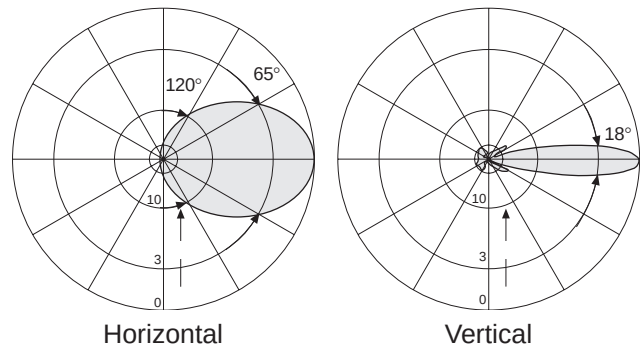


Figure 14: Panel Antennas and Corner Reflector Antennas



Panel 730 684
890 – 960 MHz

Radiation diagrams with relative field strength



Corner Reflector Antenna K 73 12 21
400 – 700 MHz

Radiation diagrams with relative field strength

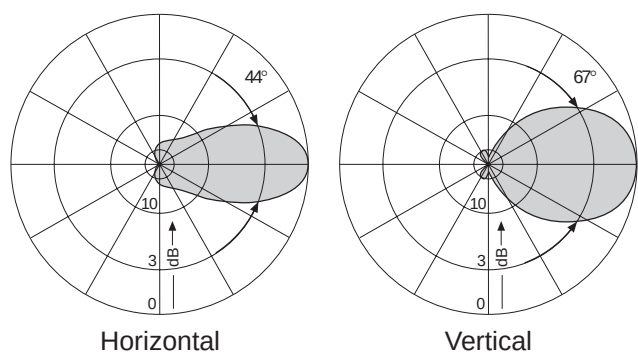
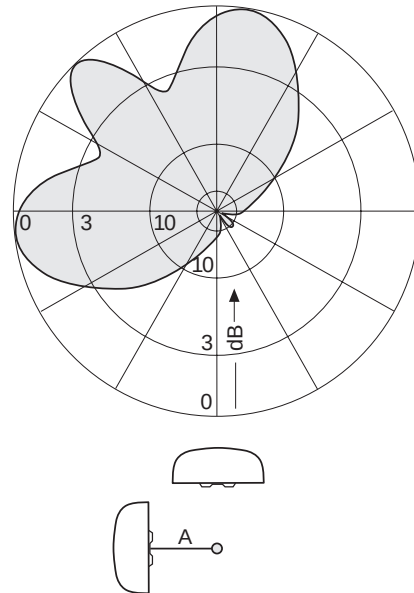
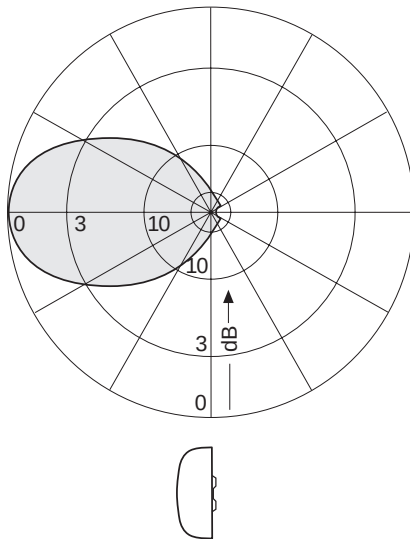


Figure 15: Directional antenna systems



Distance A = 200 mm
947 MHz
Antenna 730 360

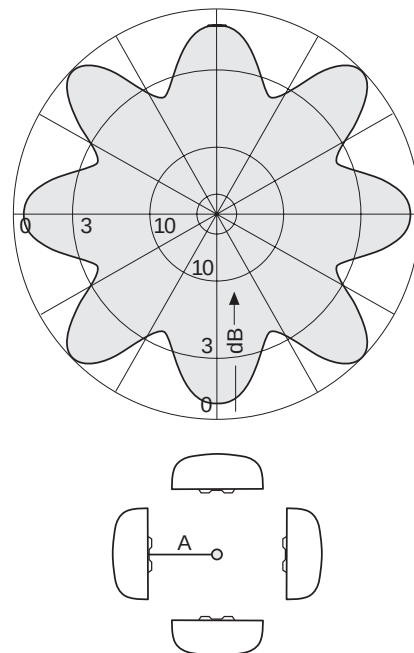
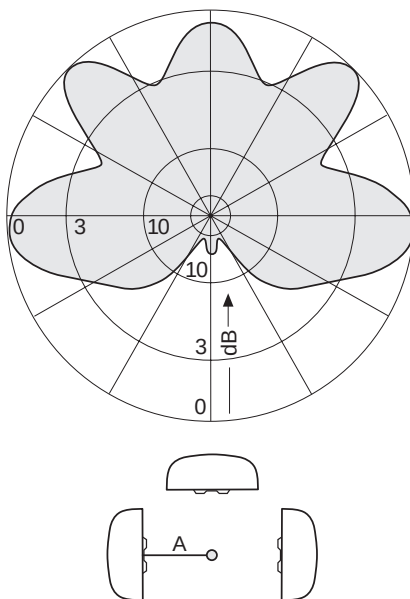


Figure 16: Multiple path propagation via reflections

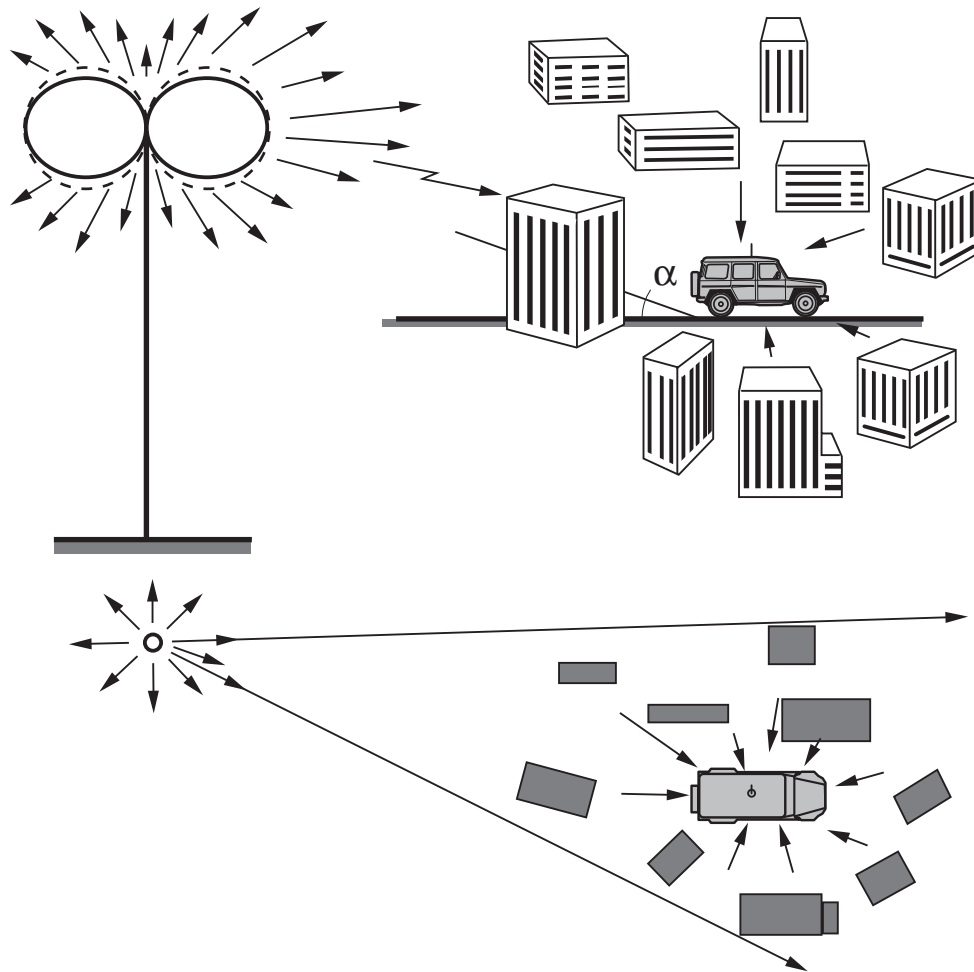
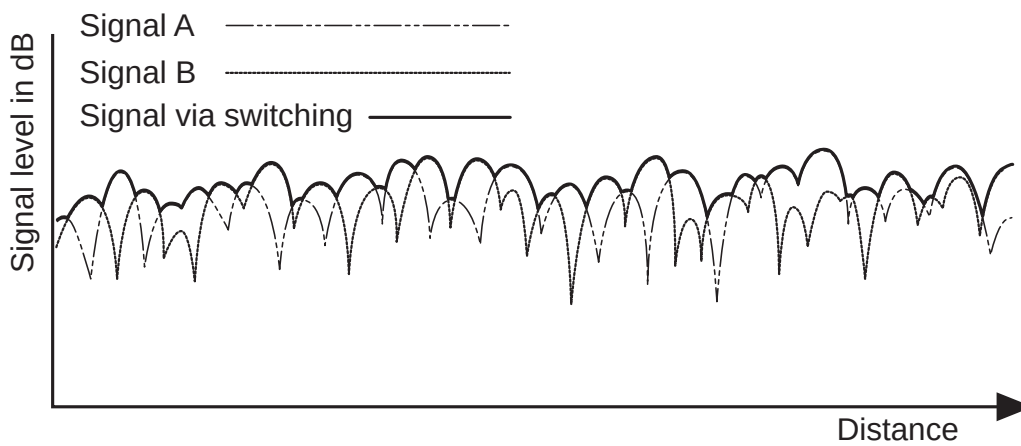


Figure 17: Signal level improvement using diversity



Source: William C.Y. Lee, Mobile Communications Design Fundamentals

Figure 18: Omni Base Station

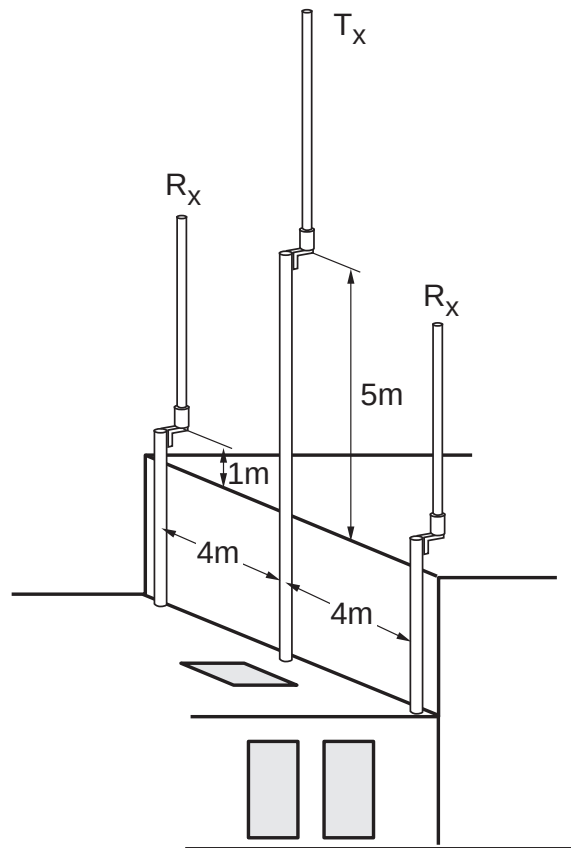


Figure 19: Sector Base Station

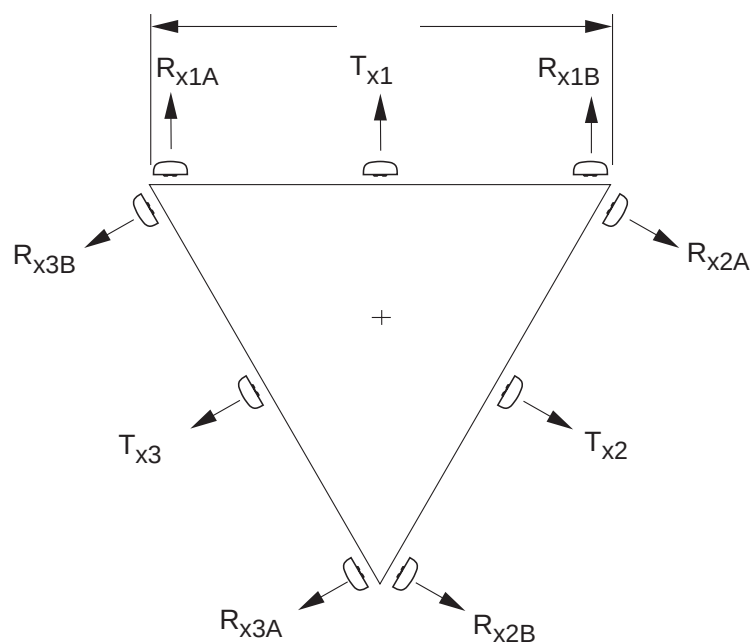


Figure 20: 2-Antenna Sector System

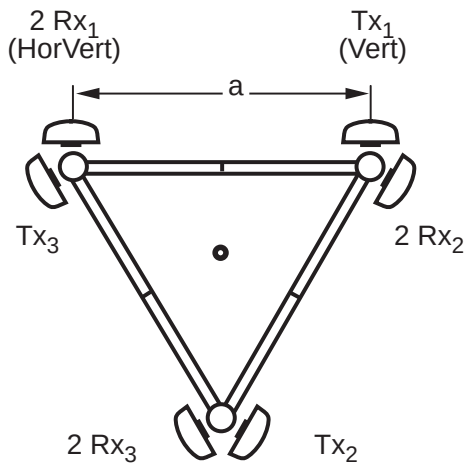
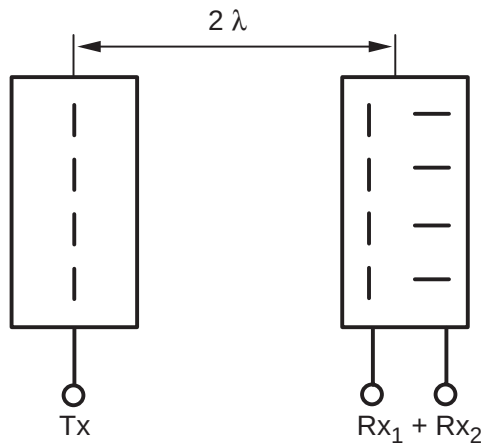


Figure 21: 1-Antenna Sector System

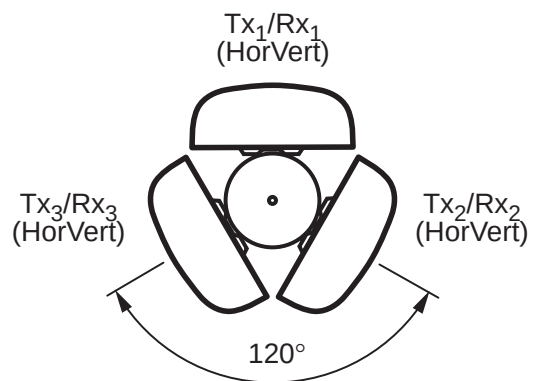
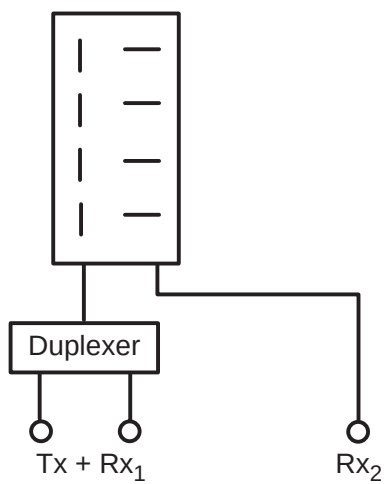


Figure 22: X-Pol Antenna System

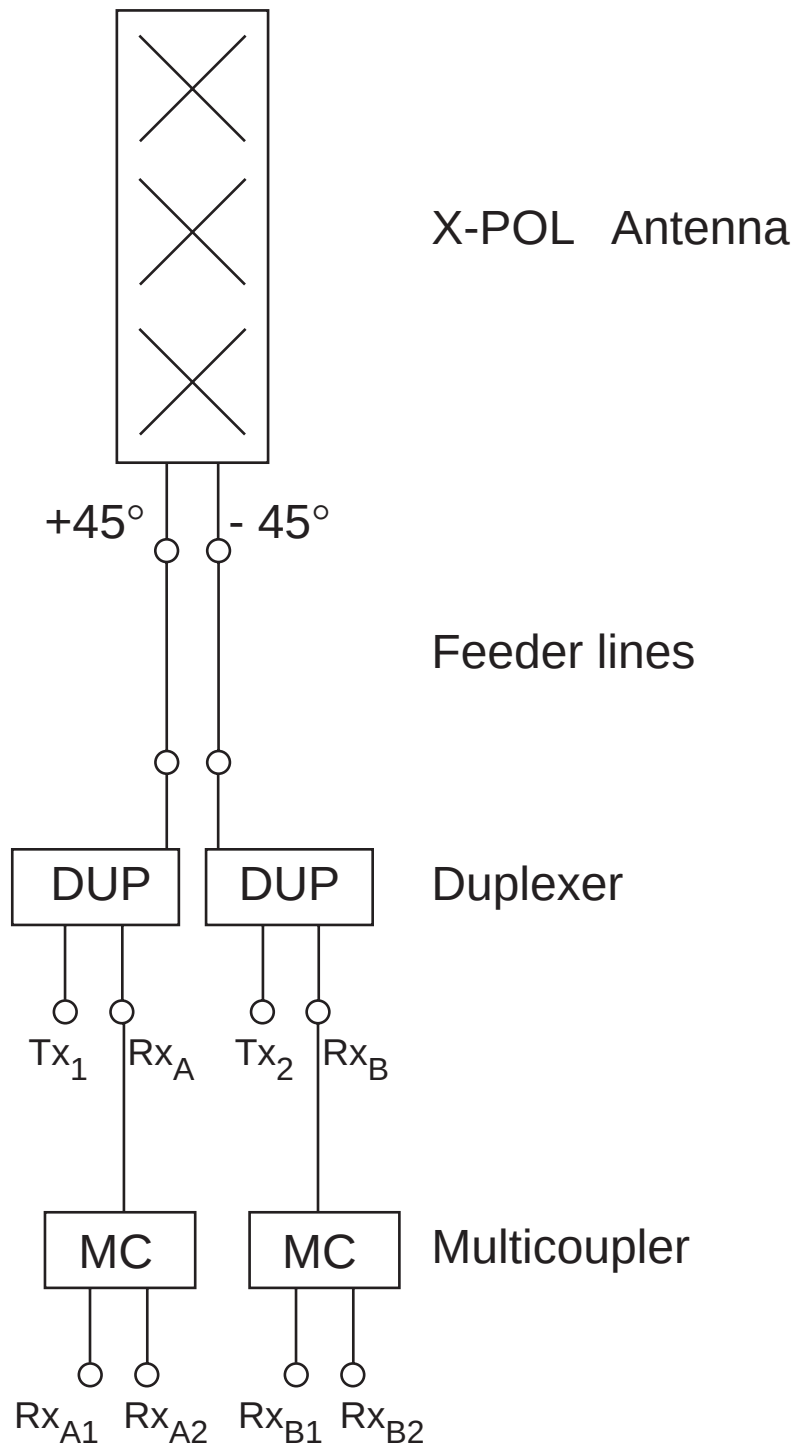


Figure 23: Indoor Omnidirectional Antenna



870 – 960 MHz / 1710 – 1900 MHz
(GSM / DCS 1800 / DECT)

Figure 24: Indoor Patch Antenna (Depth 20 mm)



1710 – 1900 MHz
(DCS 1800 / DECT)

Radiation diagrams with relative field strength

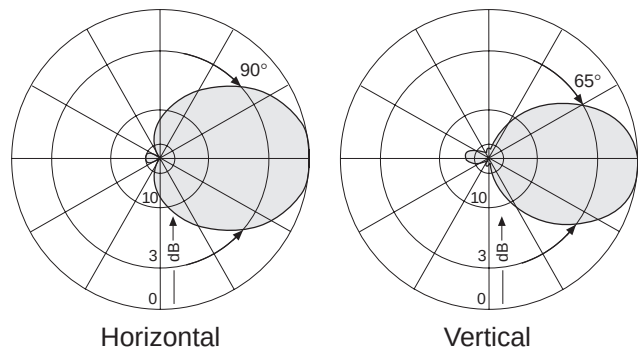
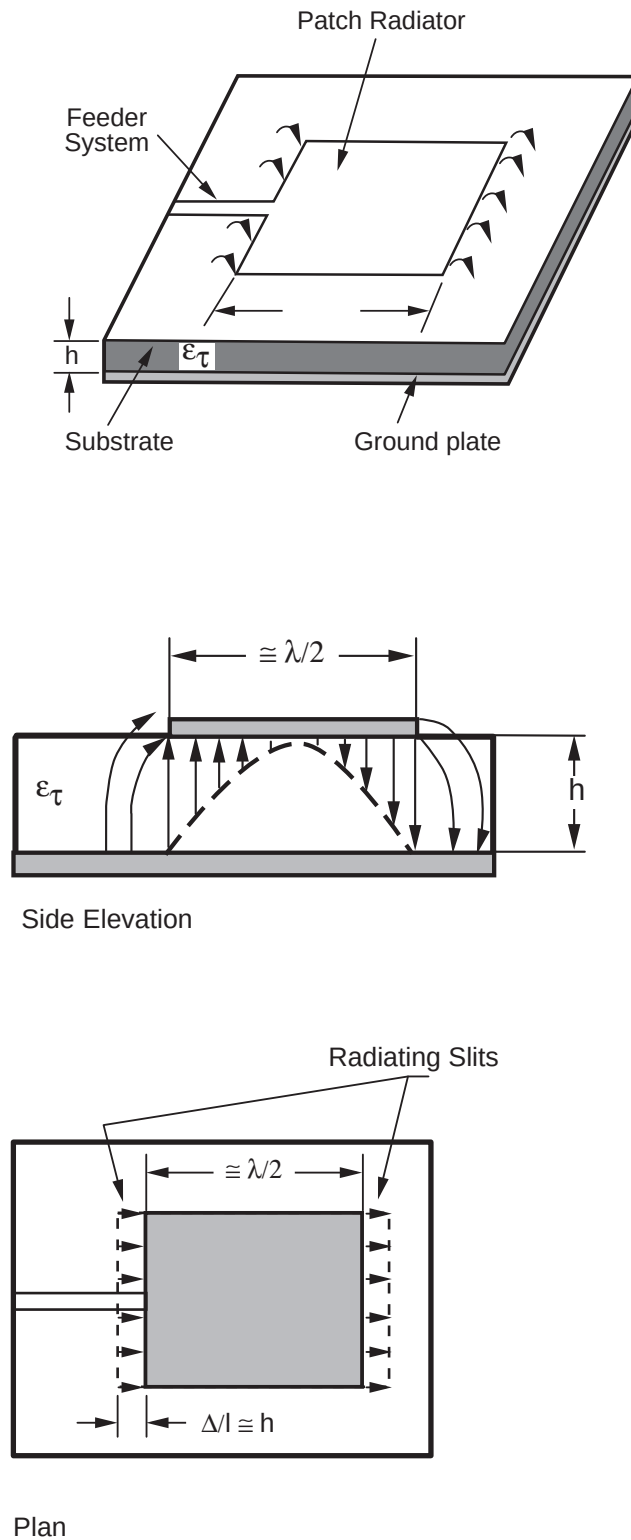


Figure 25: Schematic of a Patch Antenna



Source: Bahl / Bhartia "Microstrip Antennas"

Figure 26: Electrical field distribution of a $\lambda/4$ antenna across a conductive plane

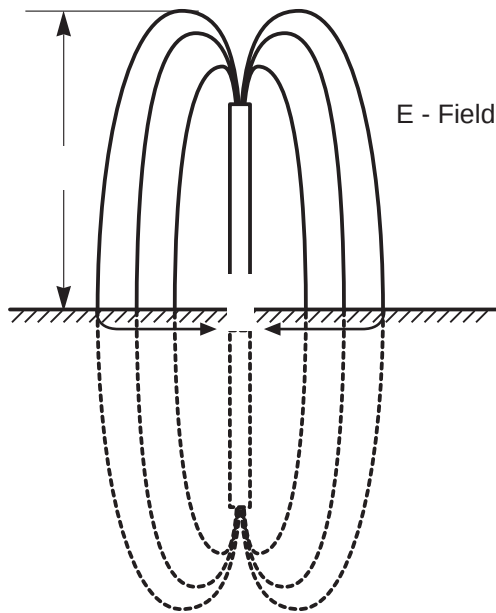


Figure 27: Vertical Radiation Diagram, center of vehicle roof

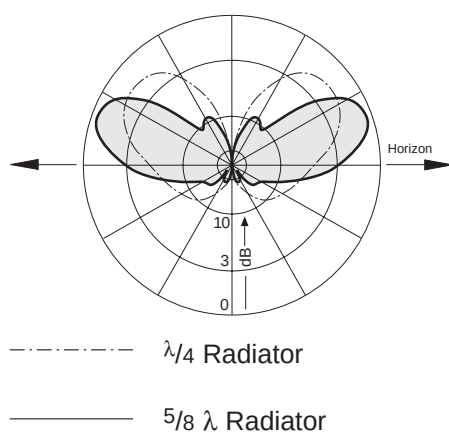


Figure 28: 4 dB Gain antenna 450 MHz

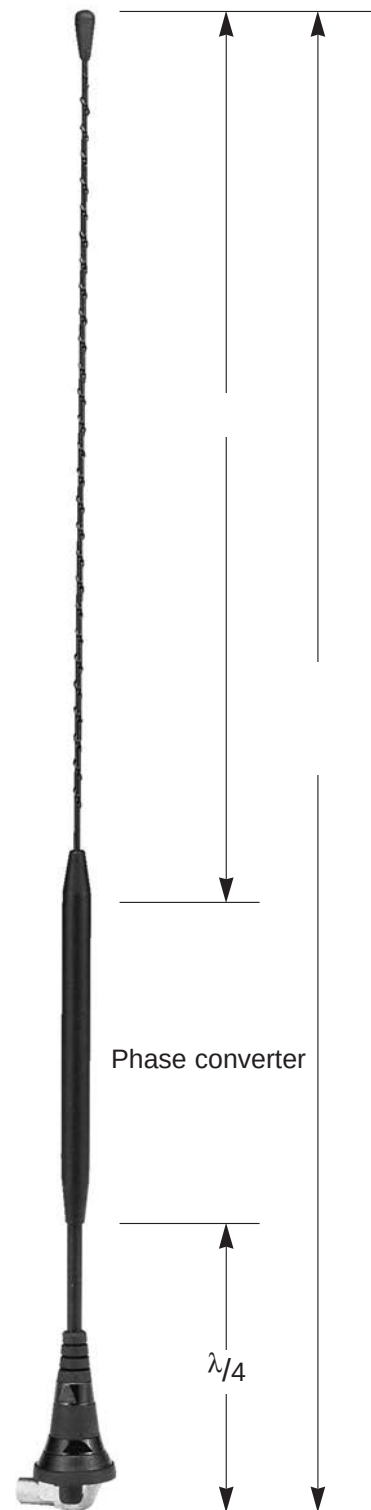


Figure 29: Changes in radiation pattern and gain by tilting the antenna

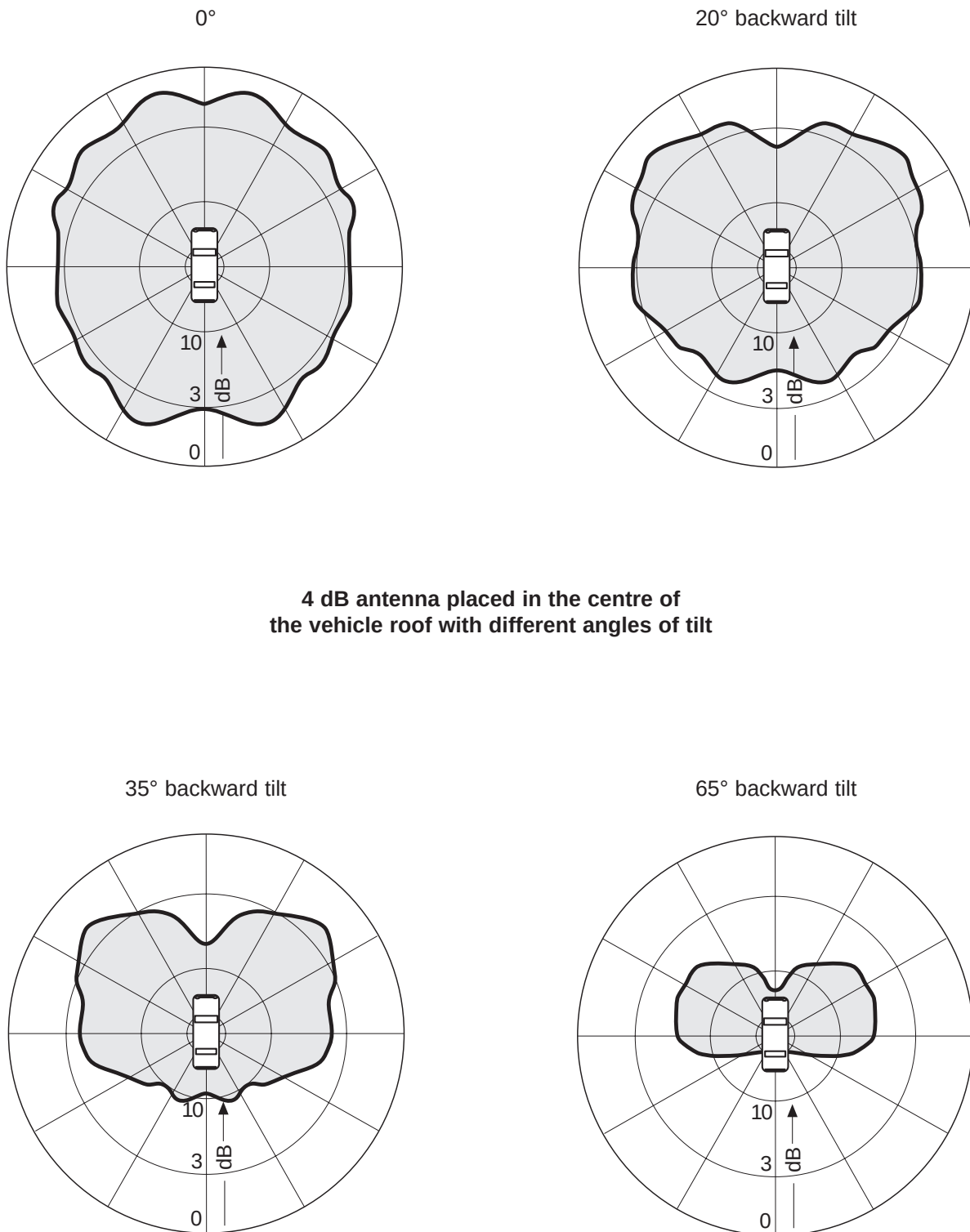
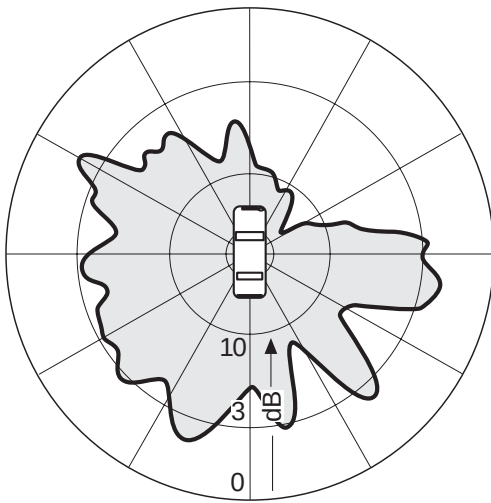
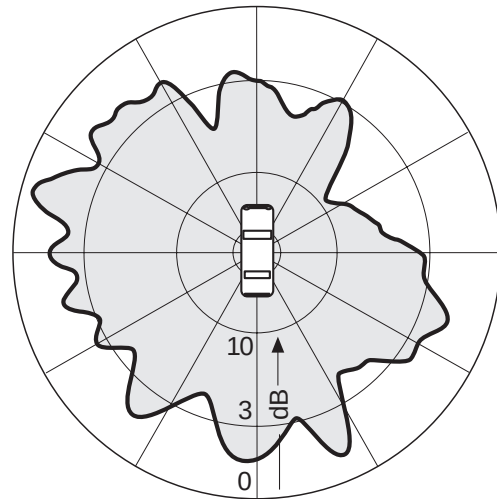


Figure 30: Horizontal diagram of rear-mounted antennas

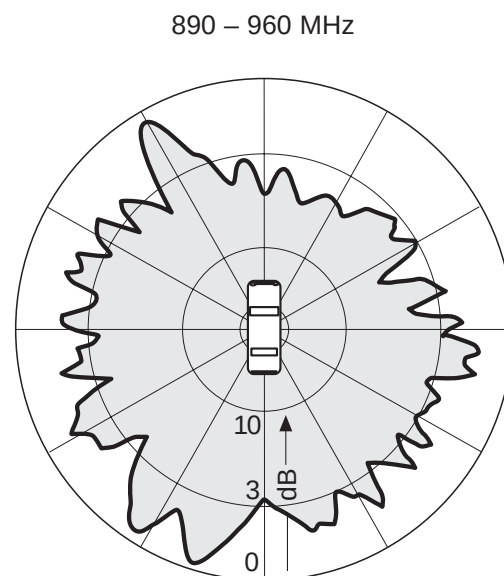
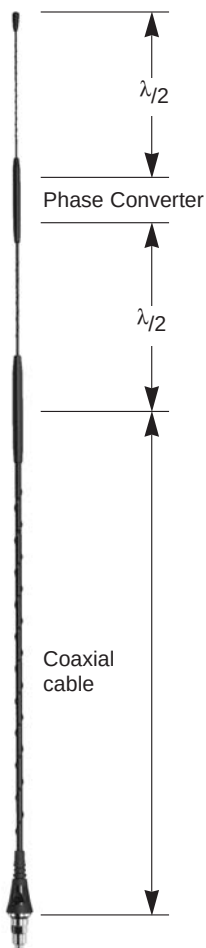


Car antenna mounted on the car roof
with 4 dB gain,
mounting point: left wing, 453 MHz



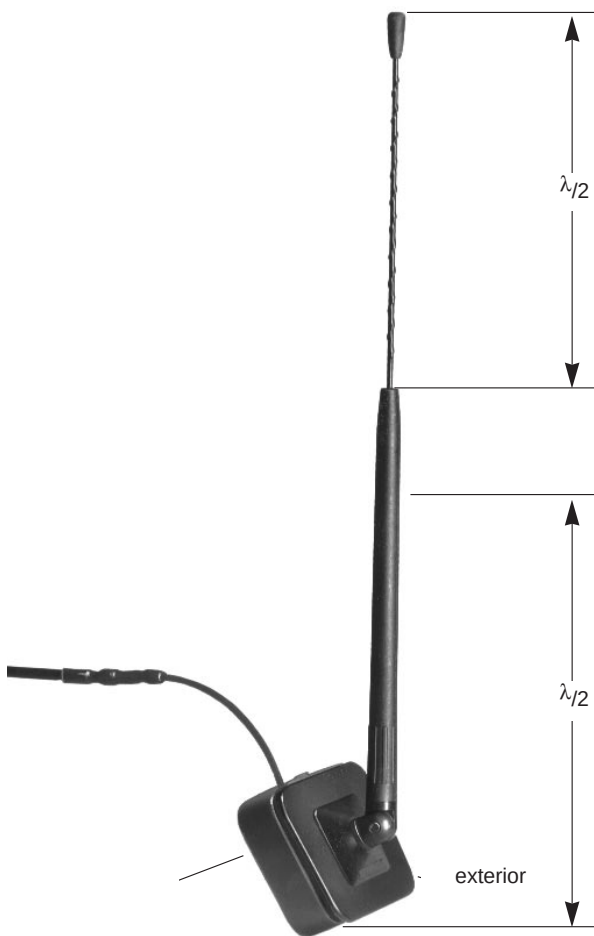
Car antenna mounted on the car roof
length 900 mm,
mounting point: left wing, 453 MHz

Figure 31: 900 MHz rear mounted antennas



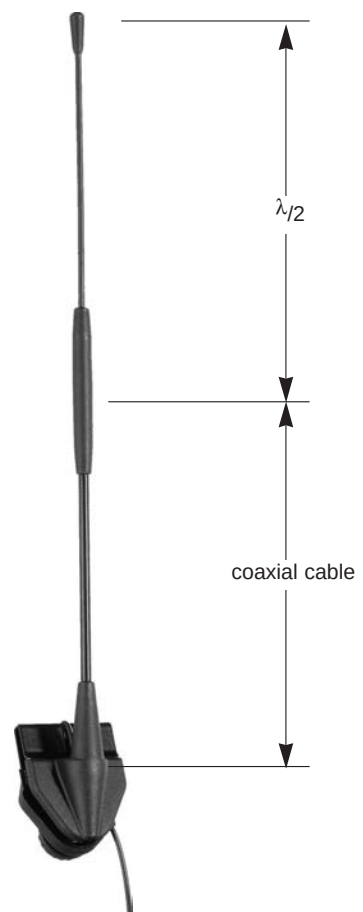
900 MHz rear-mounted antenna with ele-
vated radiator base, mounted on the left
wing

Figure 32: Screen surface direct mounting Antenna



Screenfix Antenna
870 – 960 MHz

Figure 33: Clip-on antenna



Classic Antenna
890 – 960 MHz

Figure 34: Shortened vehicle antennas

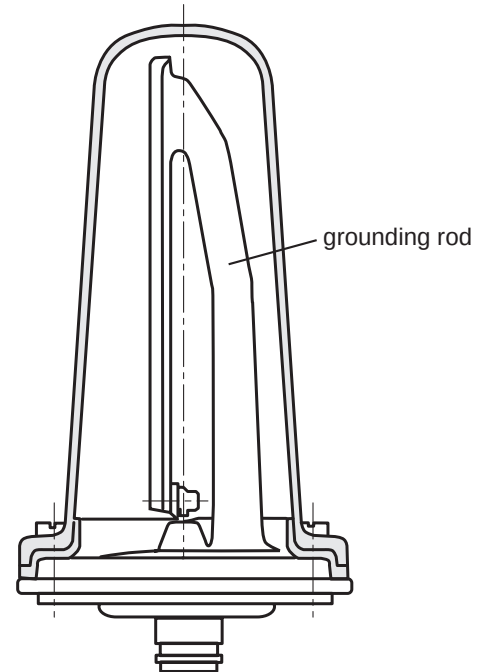


Miniflex Antenna
K 50 39 2 ..
146 ... 174 MHz



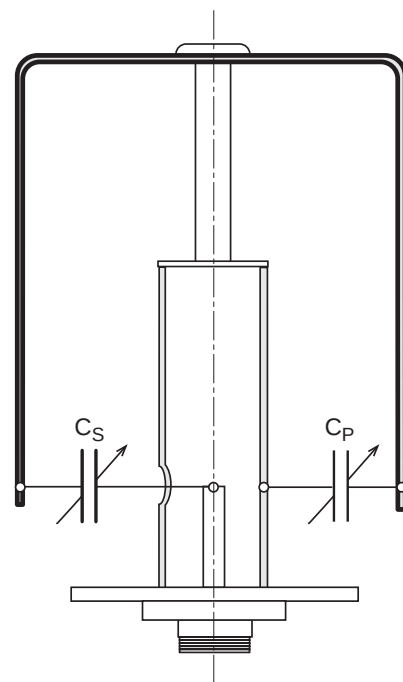
Vehicle Antenna
K 70 23 2 ..
406 ... 470 MHz

Figure 35: Train Antenna at 450 MHz



Train antenna
K 70 20 21
406 – 470 MHz

Figure 36: Shortened train antenna 2 m Band



Basic Principle

Train Antenna
K 50 21 22
146 ... 174 MHz

Figure 37: Comparable field strength measurements of antennas for portable radio sets

Frequency range: 400 - 470 MHz		antenna type					
Antenna		Gainflex antenna K 71 51 2..		$\lambda/4$ Stump antenna		Miniflex Antenna K 71 39 2	
							
Position		Portables at head height	Portables placed in breast pocket	Portables at head height	Portables placed in breast pocket	Portables at head height	Portables placed in breast pocket
Shape of the horizontal radiation pattern							
Field strength*	in the preferred direction	0 dB	0 dB	- 4 dB	- 6 dB	- 4 dB	- 6 dB
	in the shadowed direction	- 4 dB	-10 dB	- 12 dB	- 20 dB	- 13 dB	- 21 dB
	Average	2.5 dB	3.5 dB	- 7 dB	- 12.5 dB	- 7 dB	- 12.5 dB

* with reference to a decoupled $\lambda/2$ dipole without interference from the human body.



BSA Technical Information

Electrical Isolation of Co-Located Horizontally and Vertically Stacked Antennas

Introduction:

Service providers are facing rapidly increasing pressure from zoning boards to co-locate their base station antennas on the same tower structure as other providers. Traditionally, these antenna installations have been vertically spaced about 15 to 20 feet apart to ensure adequate antenna electrical isolation, intermodulation and harmonic signal rejection, and resistance to receiver noise desensitization. This note addresses the electrical coupling between horizontally and vertically spaced antennas. For in-band carriers (i.e. co-located A and B band 800 MHz carriers), a minimum of 50 dB isolation between the stacked antennas is frequently required. Measurement data presented in this note concludes that this required isolation can be achieved easily with just a few inches of vertical spacing. This is true even for small, low gain antennas with wide beamwidths. This allows the antennas to be stacked more closely together, thus conserving expensive tower space, reducing total tower count, and allowing higher center lines for providers who are not located on the top position on the monopole. Also, horizontal antenna spacing is sometimes used to achieve co-location as well as greater transmit channel capacity by installing additional antennas. Data presented here concludes that >35 dB electrical isolation is easily achieved with horizontal spacings of just 12 inches or less (for azimuth beamwidths <105 degrees). This allows packing the antennas quite tightly together, thus further conserving expensive tower space.

Coupling Test Procedure and Results:

A.) In-Band Measurements: A variety of electrical isolation tests were run at both 800 and 1900 MHz. A pair of like antennas was placed at various distances from each other, either end-to-end, or side-to-side, to simulate co-located antennas on a tower or monopole. A network analyzer was used to inject a signal into one antenna. Then, transmission loss (S21) at the other antenna port was swept and plotted for the appropriate band (806—896 MHz or 1850—1990 MHz). These tests were run mostly in an anechoic chamber to avoid extraneous reflections. When the antenna spacing was too large to fit in the chamber, the antennas were placed on their backs, outdoors on the ground, so the environment was essentially reflectionless.

Vertical antenna separation distance was defined as shown in Figure 1, and horizontal separation distance was defined as shown in Figure 2. Then, for each frequency band, the antenna azimuth beamwidth and gain were varied to sample typical coupling values. Also, during the vertical separation test, the top antenna was mechanically downtilted 10 degrees, and the coupling test was repeated.

The 800 MHz cellular tests and results are detailed in Table 1. These results are plotted in Figures 3, 4, and 5.

1900 MHz PCS tests and results are shown in Table 2. These results are plotted in Figures 6 and 7.

B.) Cross-Band Measurements: In these tests, an FV105-12-00DA2 800 MHz antenna and an RV90-17-00DP 1900 MHz antenna were stacked horizontally and vertically, as shown in Figures 8 and 9. Two network analyzer insertion loss sweeps were performed: One at 806—896 MHz, and another at 1850—1990 MHz. Results were tabulated in Table 3, and plotted in Figures 10 and 11.

Only vertically polarized antennas were used in this experiment. It was expected that the worst case isolation results would be found using vertically polarized antennas throughout so that the antenna pairs would be co-polarized relative

to each other. Slant 45 dual polarized models could also be tested, but the results should be similar to those presented here.

Conclusions:

A.) In-Band Isolation of Horizontally Spaced Antennas:

1. In every measured case, isolation of horizontally spaced 90 or 65 degree antennas was greater than 30 dB with as little as six inches spacing between the antennas.
2. In every measured case, isolation of 105 degree antennas was greater than 30 dB with as little as 18 inches of spacing between the antennas.
3. Isolation of horizontally spaced antennas was driven most strongly by the antenna's azimuth beamwidth. Broad beamwidth models (105 degrees) had the worst isolation.

B.) In-Band Isolation of Vertically Spaced Antennas:

1. In every measured case, isolation was greater than 50 dB with as little as six inches of spacing between the antennas. Overall, isolation was excellent regardless of gain or frequency band.
2. A moderate amount of mechanical downtilt did not appreciably degrade the isolation.
3. Vertically spaced isolation was not driven by the antenna's gain (and, therefore, the antenna's elevation beamwidth).

C.) Cross-Band Isolation:

1. With Cellular and PCS antennas stacked vertically, isolation was typically 60-70 dB, and varied little with spacing.
2. With Cellular and PCS antennas stacked horizontally, the isolation was quite different, depending on whether the test was run at 800 or 1900 MHz. However, even a worst case result of 40 dB was easily achieved with only 18 inches spacing between the antennas.

It should be noted that these results may vary if the antennas are located behind architectural screening material for "stealth" applications. The scattering environment for these types of set-ups can be quite complex, and requires analysis of the particular site layout to be confident with the results.

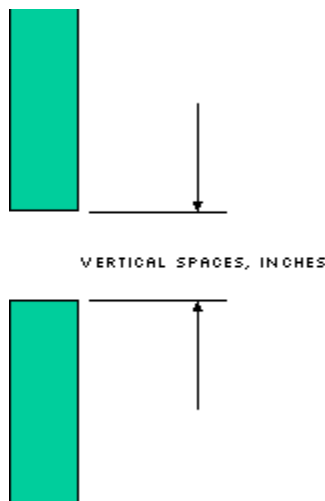


Figure 1: Antenna Vertical Spacing Definition

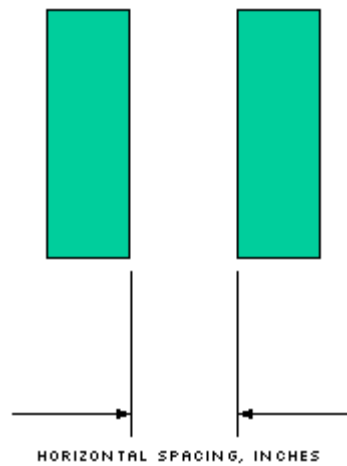


Figure 2: Antenna horizontal spacing definition

Table 1: Cell Band Coupling Tests:			
1.) Broad beamwidth, Low gain antennas (2 x FV90-09-00DA2):			
	Vertical Spacing		Horizontal Spacing
Spacing	0 deg d/t	10 deg d/t	0 deg d/t
0	-56.3	-69.8	-38.3
6	-59.5	-77.9	-41.0
12	-65.8	-78.9	-43.7
18	-68.6	-81.8	-45.2
24	-66.0	-86.6	-47.9
30	-68.8	-89.9	-48.9
36	-69.9	-85.0	-48.6
2.) Broad beamwidth, High gain antennas (2 x FV 103-12-00DA2):			
	Vertical Spacing		Horizontal Spacing
Spacing	0 deg d/t	10 deg d/t	0 deg d/t
0	-60.7	-56.9	-23.9
6	-62.1	-64.2	-26.0
12	-62.1	-61.8	-27.6
18	-62.7	-63.1	-30.0
24	-64.0	-66.3	-29.8
30	-65.1	-65.7	-31.2
36	-67.3	-68.0	-31.7
3.) Narrow beamwidth, Low gain antennas (2 x FV65-11-00DA2):			
	Vertical Spacing		Horizontal Spacing
Spacing	0 deg d/t	10 deg d/t	0 deg d/t
0	-44.8	-45.3	-30.5
6	-57.3	-52.9	-35.3
12	-57.3	-52.8	-37.7
18	-61.8	-57.0	-39.9
24	-62.3	-60.0	-46.0
30	-64.6	-62.2	-49.0
36	-61.9	-57.4	-47.3

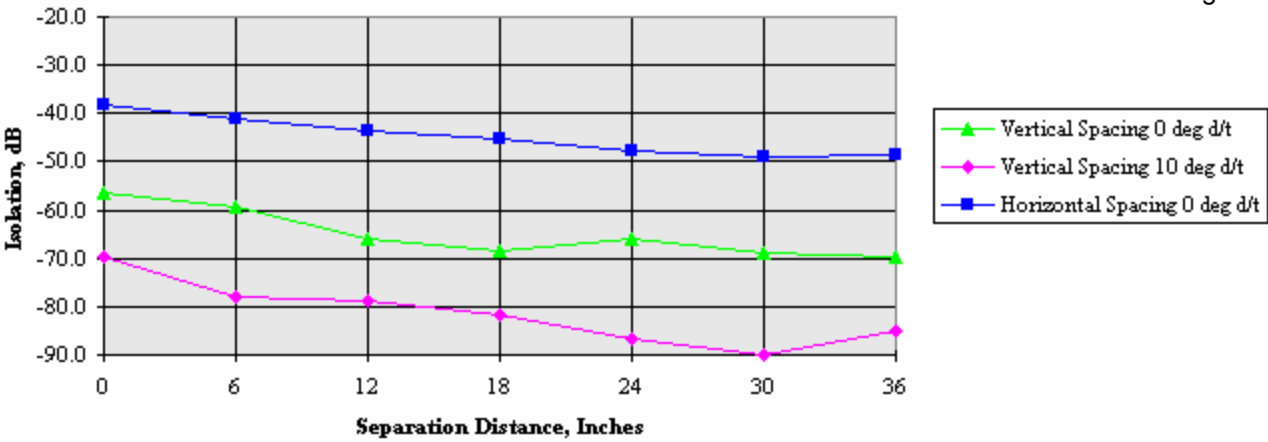


Figure 3: Broad Azimuth Beamwidth, Low Gain Isolation Test 800 Mhz (2 x FV90-09-00DA2)

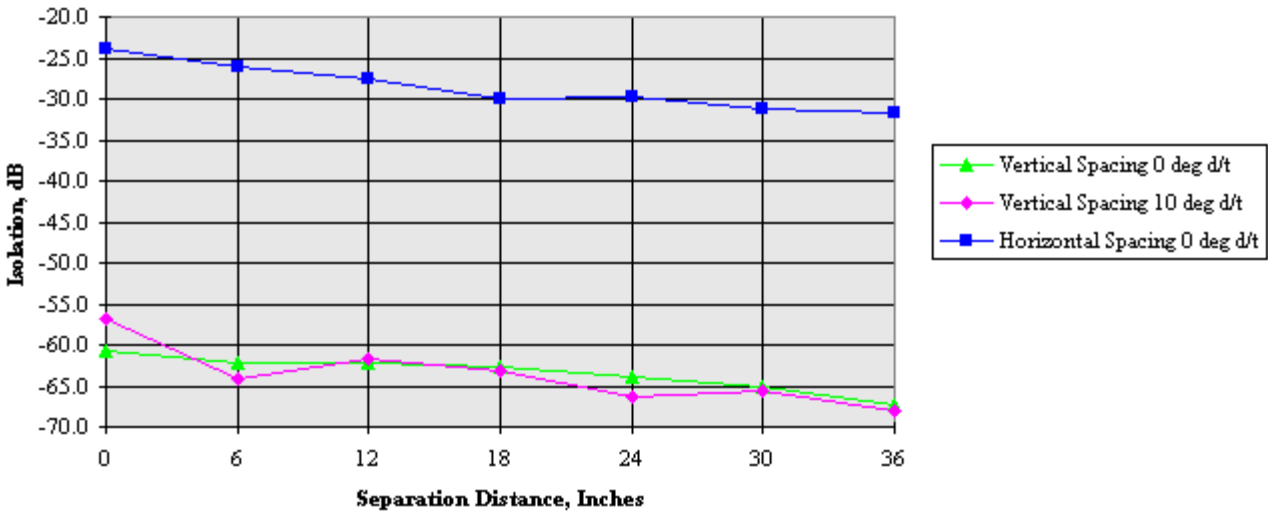


Figure 4: Broad Azimuth Beamwidth, High Gain Isolation Test 800 Mhz (2 x FV105-12-00DA2)

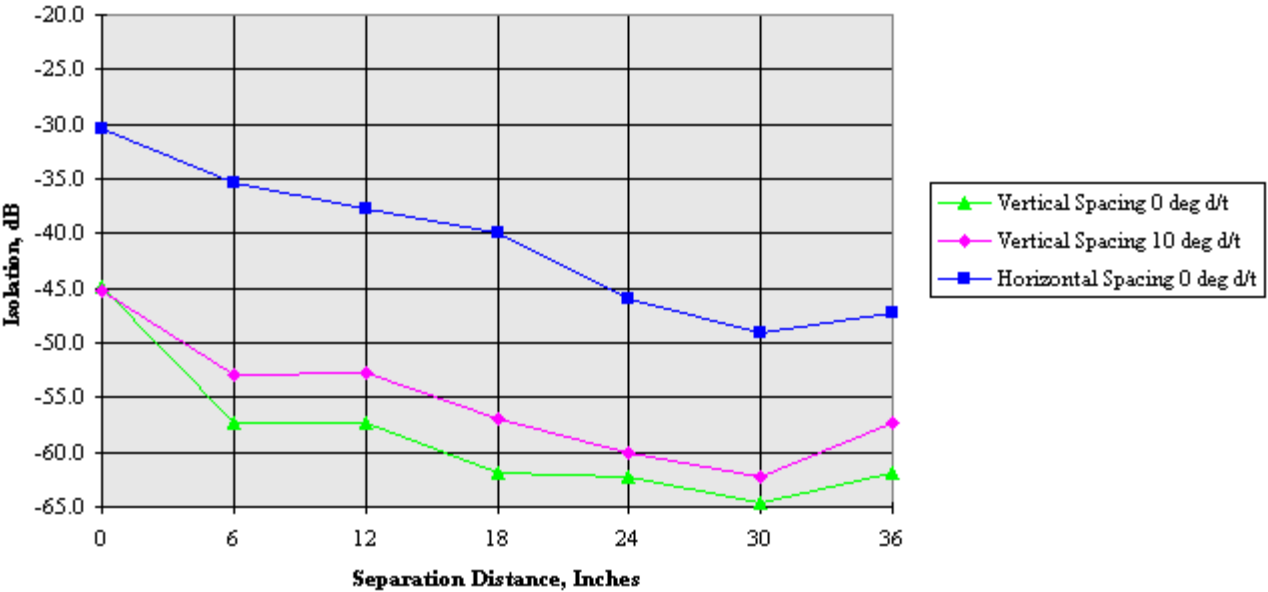


Figure 5: Narrow Azimuth Beamwidth, Low Gain Isolation Test 800 Mhz (2 x FV65-11-00DA2)

Table 2: PCS Band Coupling Tests**1) Broad beamwidth, High gain (2 x RV90-17-00DP)**

Spacing, inches	Vertical Spacing		Horizontal Spacing
	0 deg d/t	10 deg d/t	0 deg d/t
0	-64.0	-63.5	-27.2
6	-71.7	-71.5	-30.2
12	-71.9	-73.8	-35.9
18	-74.1	-74.5	-39.1
24	-73.9	-75.6	-39.2
30	-76.4	-75.6	-38.8
36	-76.8	-72.8	-40.3

2) Narrow beamwidth, High gain (2 x RV65-18-00DP)

Spacing, inches	Vertical Spacing		Horizontal Spacing
	0 deg d/t	10 deg d/t	0 deg d/t
0	-62.2	-64.2	-32.5
6	-71.1	-71.6	-37.1
12	-74.6	-73.1	-40.1
18	-74.6	-77.8	-40.1
24	-76.4	-77.0	-42.5
30	-77.7	-77.5	-42.9
36	-79.1	-77.5	-43.9

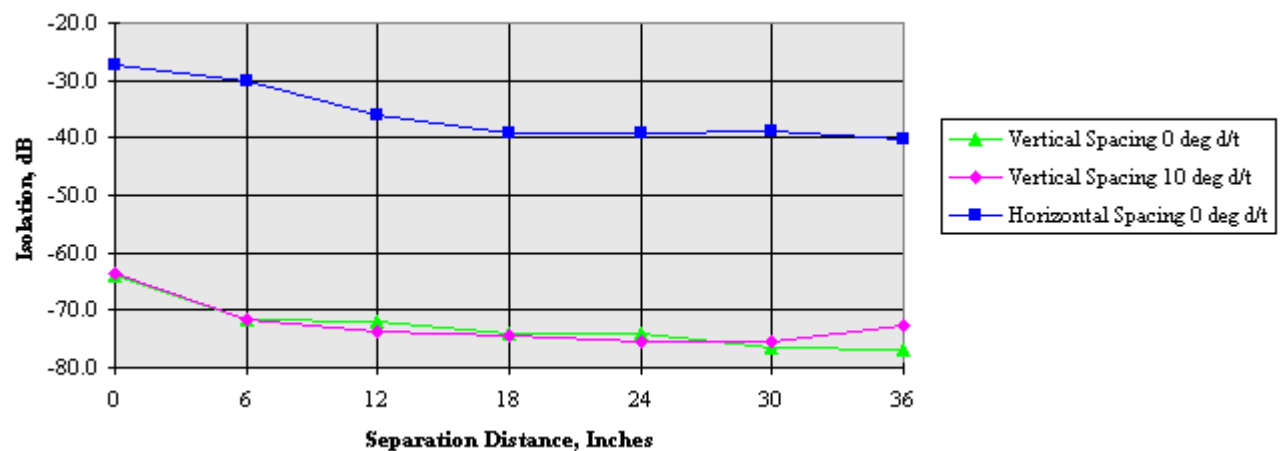


Figure 6: Broad Azimuth Beamwidth, High Gain Isolation Test 1900 Mhz (2 x RV90-17-00DP)

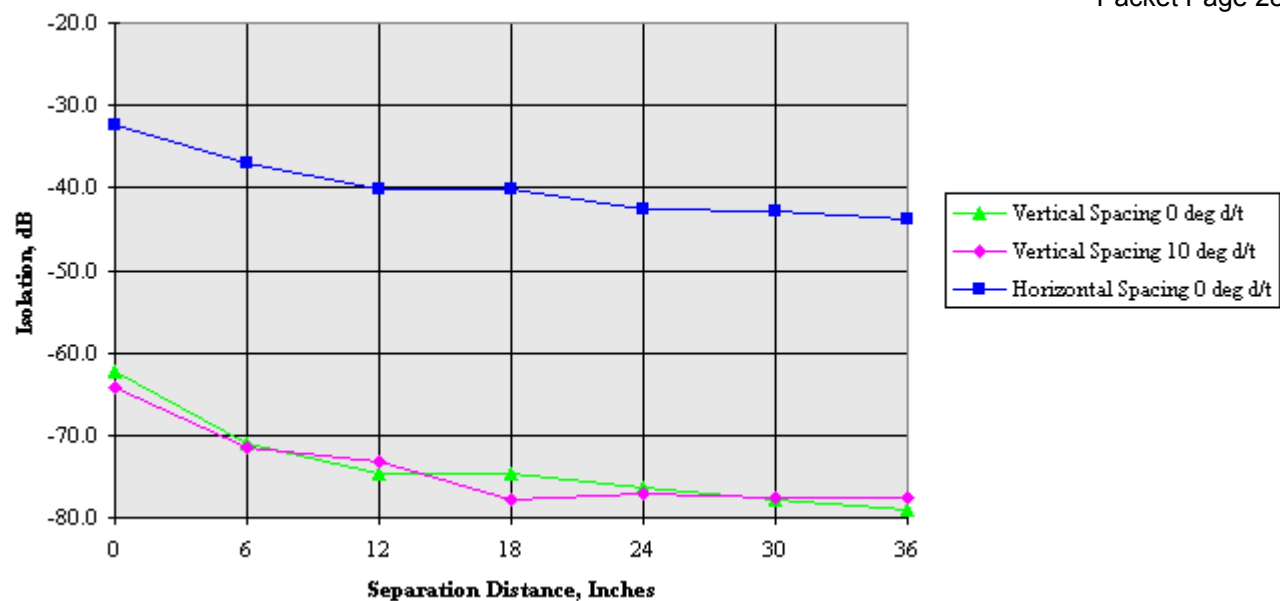


Figure 7: Narrow Azimuth Beamwidth, High Gain Isolation Test 1900 Mhz (2 x RV65-18-00DP)

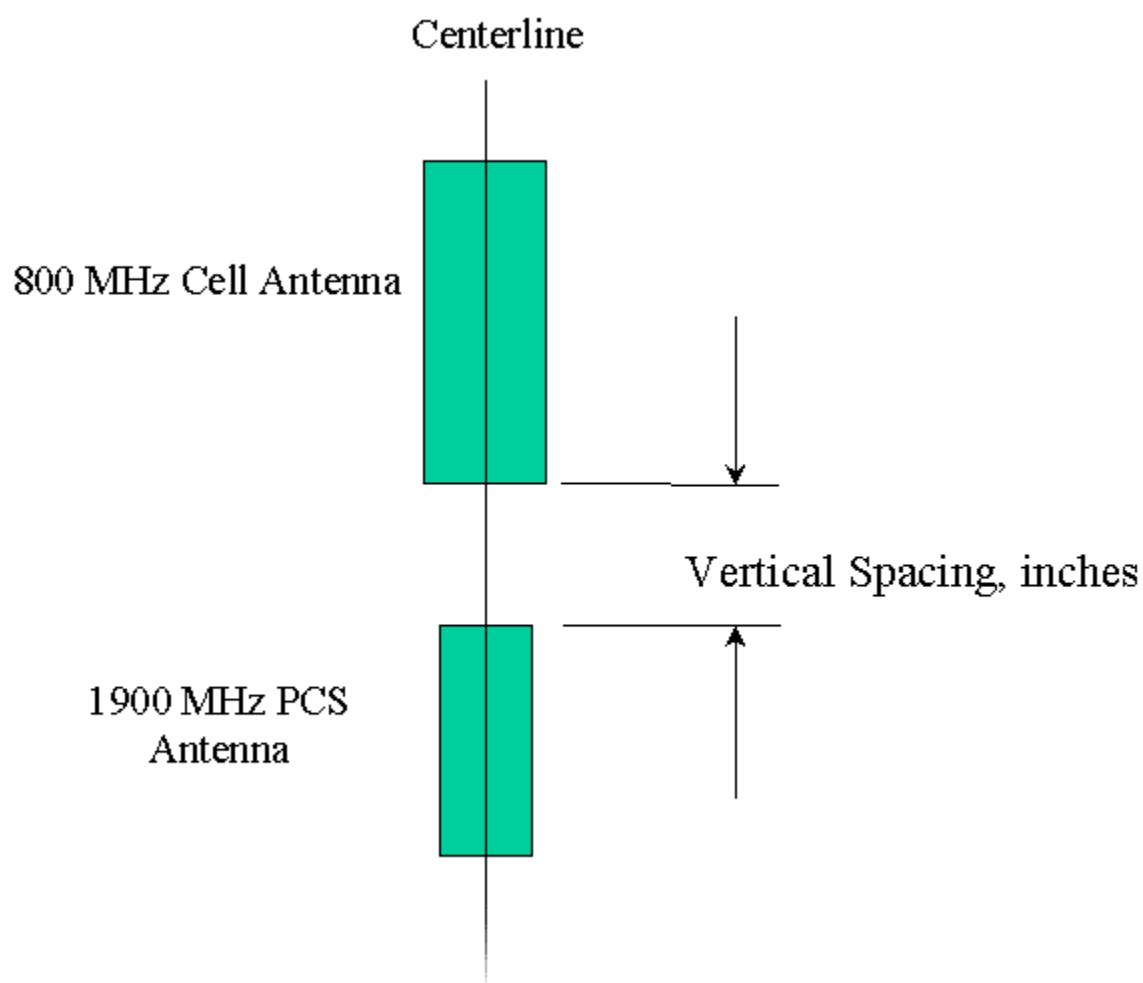


Figure 8: Cross-Band Isolation Test, Vertical Stacking

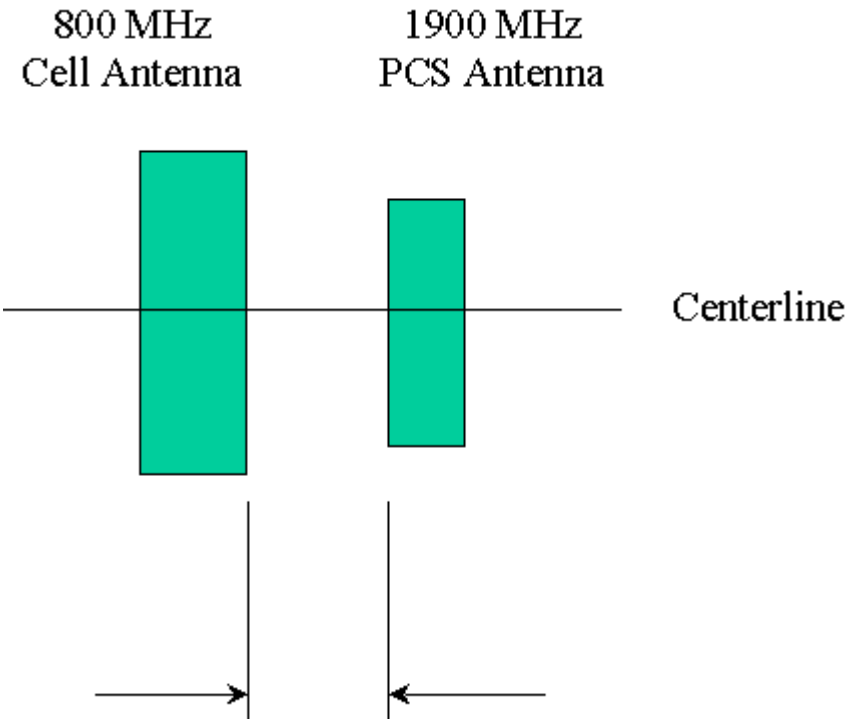


Figure 9: Cross-Band Isolation Test, Horizontal Stacking

Horizontal Spacing, inches

1.) Swept at 800 MHz:			
Spacing	Vertical Spacing	Horizontal Spacing	
0	-68.9	-53.3	
6	-69.5	-56.5	
12	-71.0	-57.3	
18	-72.0	-58.9	
24	-73.0	-61.5	
30	-73.5	-62.4	
36	-74.0	-60.5	
2.) Swept at 1900 MHz:			
Spacing	Vertical Spacing	Horizontal Spacing	
0	-63.5	-33.5	
6	-65.8	-36.4	
12	-66.1	-38.6	
18	-67.6	-40.3	
24	-65.4	-41.6	
30	-67.2	-42.2	
36	-67.2	-42.4	

Table 3: Cross-Band Coupling Tests

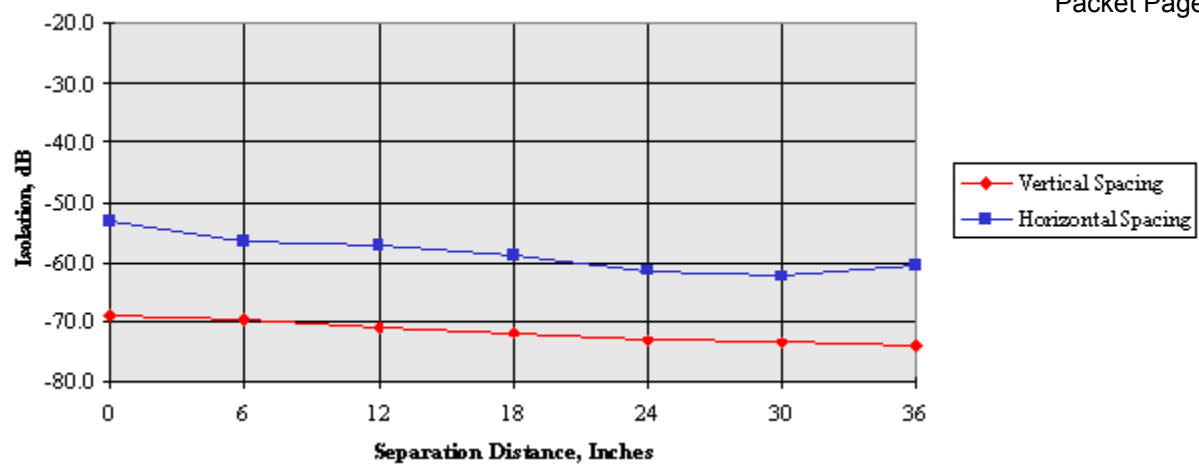


Figure 10: Cross Band Coupling Tests - 800 MHz Sweeps

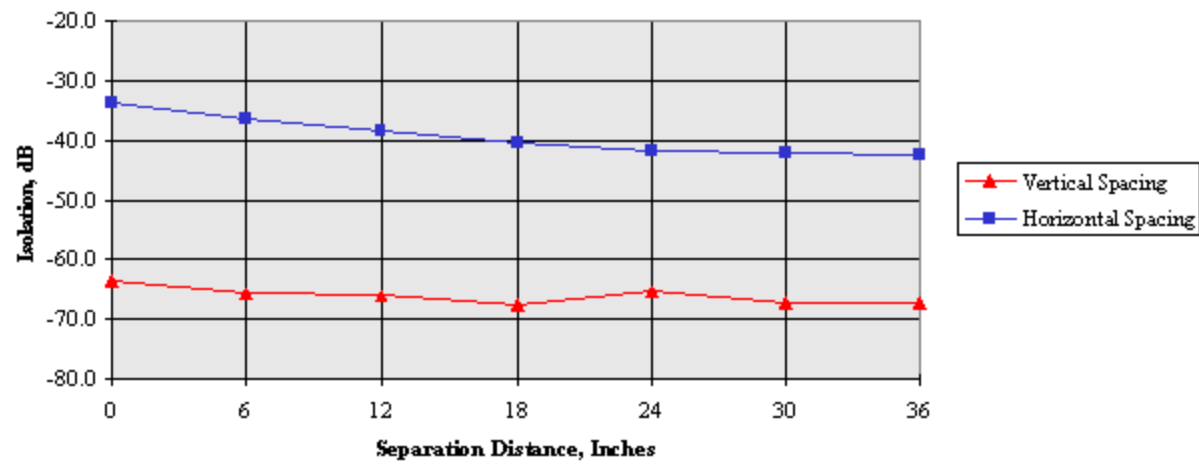
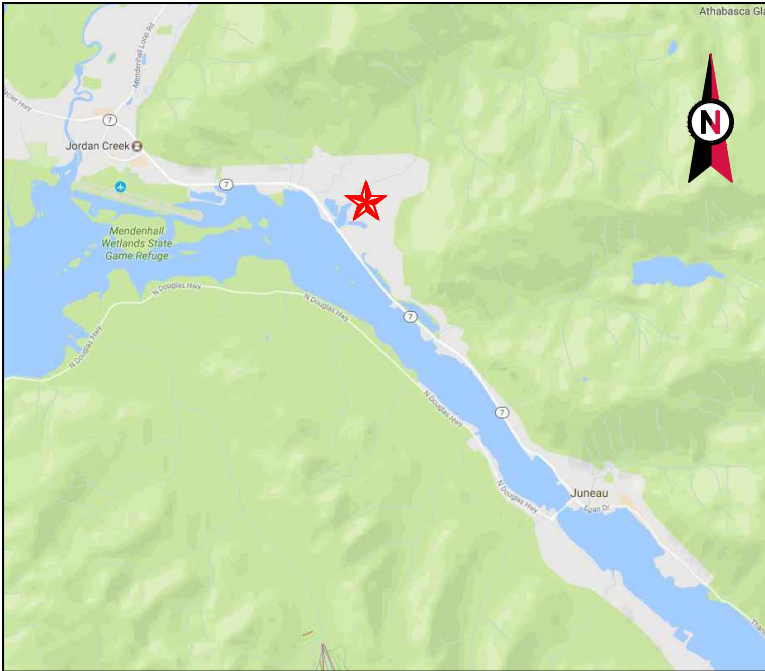


Figure 11: Cross Band Coupling Tests - 1900 MHz Sweeps

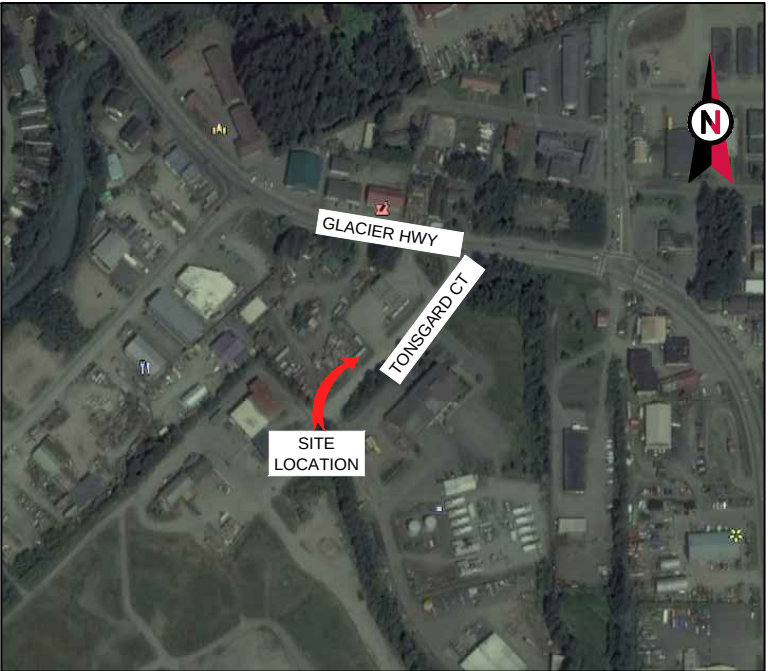


VICINITY MAP



AMERICAN TOWER®

SITE NAME: REBUILD LEMON CREEK
SITE NUMBER: 202533
SITE ADDRESS: 5594 TONSGARD CT
JUNEAU, AK 99801



LOCATION MAP

DROP AND SWAP

COMPLIANCE CODE	PROJECT SUMMARY	PROJECT DESCRIPTION	SHEET INDEX					
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES. 1. INTERNATIONAL BUILDING CODE (IBC) 2. NATIONAL ELECTRIC CODE (NEC) 3. LOCAL BUILDING CODE 4. CITY/COUNTY ORDINANCES	<u>SITE ADDRESS:</u> 5594 TONSGARD CT JUNEAU, AK 99801 COUNTY: JUNEAU BOROUGH <u>GEOGRAPHIC COORDINATES:</u> LATITUDE: 58.35472 LONGITUDE: -134.49722 GROUND ELEVATION: 29' AMSL <u>ZONING INFORMATION:</u> JURISDICTION: CITY OF JUNEAU, AK PARCEL NUMBER: 5B1201060242 ZONING: INDUSTRIAL	THE PROPOSED PROJECT INCLUDES ERECTING A NEW MONOPOLE AND REMOVING AN EXISTING WOOD POLE TOWER.	SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:	
			G-001	TITLE SHEET	0	02/16/17	JN	
			1 OF 1	SURVEY				
		PROJECT NOTES		G-002	GENERAL NOTES	0	02/16/17	JN
				C-101	OVERALL SITE PLAN	0	02/16/17	JN
		1. THE FACILITY IS UNMANNED. 2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE. 3. EXISTING FACILITY MEETS OR EXCEEDS ALL FAA AND FCC REGULATORY REQUIREMENTS. 4. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE. 5. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED. 6. HANDICAP ACCESS IS NOT REQUIRED.	C-102	DETAILED SITE PLAN	0	02/16/17	JN	
			C-201	TOWER ELEVATION	0	02/16/17	JN	
			C-501	SIGNAGE	0	02/16/17	JN	
			C-502	DETAILS	0	02/16/17	JN	
			E-501	GROUNDING PLAN	0	02/16/17	JN	
	E-401		STANDARD GROUNDING DETAILS	0	02/16/17	JN		
	PROJECT LOCATION DIRECTIONS							
	FROM JUNEAU, AK: HEAD SOUTHWEST ON W 9TH ST TOWARD D ST. TURN RIGHT ONTO GLACIER AVE. TURN LEFT AT THE 1 ST CROSS STONTO W 10TH ST. TURN RIGHT AT THE 2ND CROSS ST INTO EGAN DR. CONTINUE ONTO GLACIER HWY. AT THE TRAFFIC CIRCLE, TAKE THE 2ND EXIT AND STAY ON GLACIER HWY. TURN LEFT ONTO SHINE ACCESS ROAD.							



AMERICAN TOWER®
ATC TOWER SERVICES
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: 6260F

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATION AS INSTRUMENTS OR SERVICE ARE THE EXCLUSIVE PROPERTY OF AMERICAN TOWER. THEIR USE AND PUBLICATION SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY ARE PREPARED. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO AMERICAN TOWER OR THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. TITLE TO THESE DOCUMENTS SHALL REMAIN THE PROPERTY OF AMERICAN TOWER WHETHER OR NOT THE PROJECT IS EXECUTED. NEITHER THE ARCHITECT NOR THE ENGINEER WILL BE PROVIDING ON-SITE CONSTRUCTION REVIEW OF THIS PROJECT. CONTRACTOR(S) MUST VERIFY ALL DIMENSIONS AND ADVISE AMERICAN TOWER OF ANY DISCREPANCIES. ANY PRIOR ISSUANCE OF THIS DRAWING IS SUPERSEDED BY THE LATEST VERSION ON FILE WITH AMERICAN TOWER.

REV.	DESCRIPTION	BY	DATE
0	FOR PERMITTING	JN	02/16/17

ATC SITE NUMBER:
202533

ATC SITE NAME:
REBUILD LEMON CREEK AK

SITE ADDRESS:
5594 TONSGARD CT
JUNEAU, AK 99801

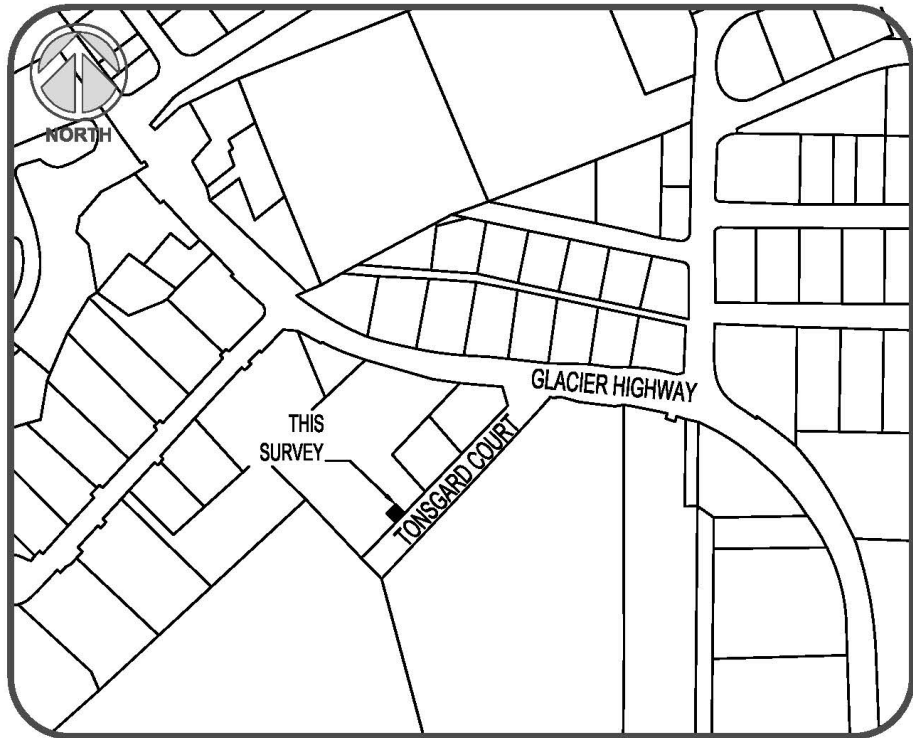
SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

TITLE SHEET

SHEET NUMBER:
G-001

REVISION:
0

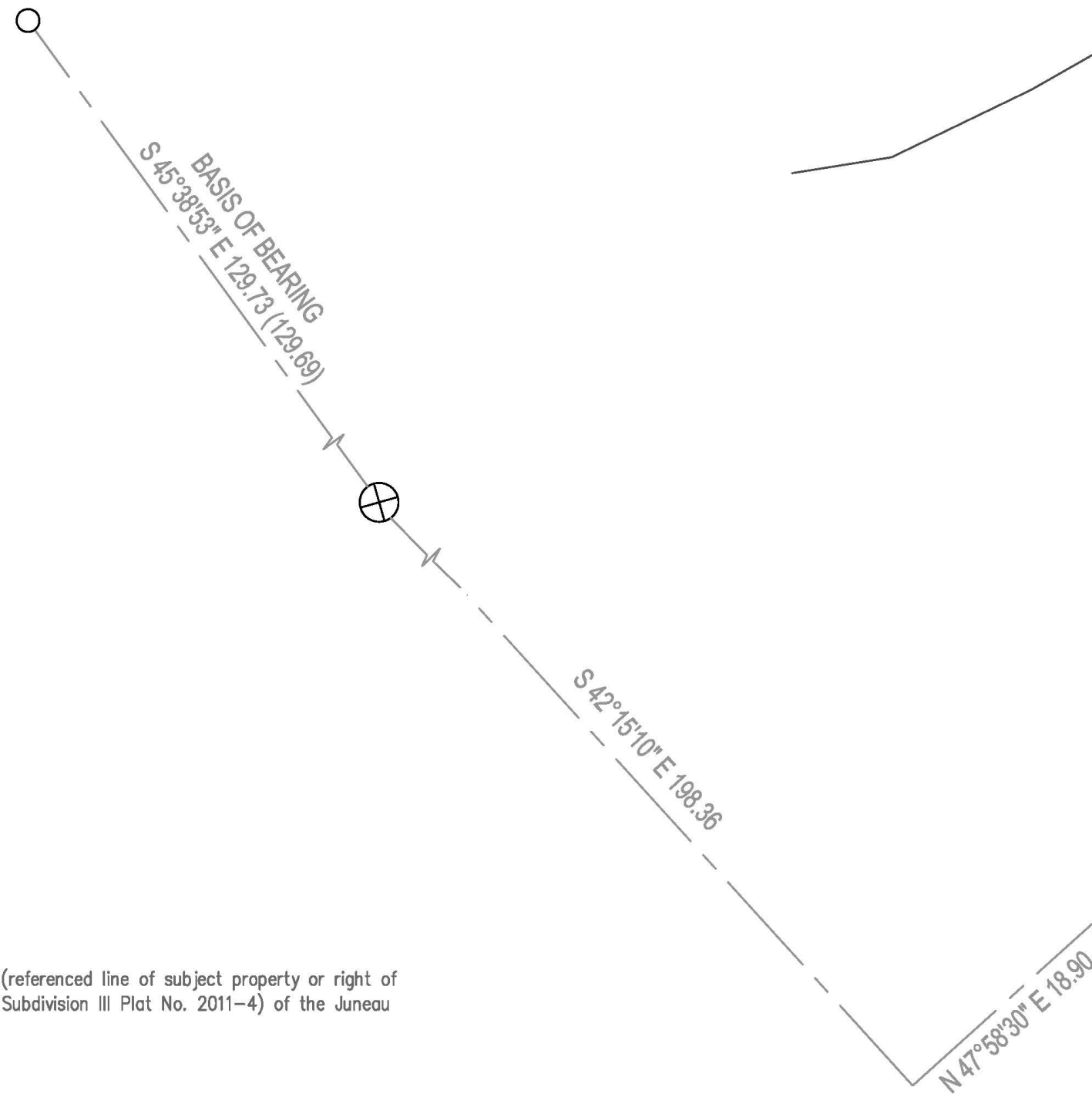


VICINITY MAP

NOT TO SCALE
City & Borough of Juneau Basemap

SURVEY LEGEND

- PRIMARY MONUMENT RECOVERED
- SECONDARY MONUMENT RECOVERED #5 REBAR WITH DOWL 7712-S PLASTIC CAP
- SECONDARY MONUMENT RECOVERED DISTURBED AND WITHOUT CAP
- SET MAG NAIL IN CONCRETE
- SANITARY SEWER MANHOLE
- STORM AREA DRAIN
- WATER VALVE
- LEASE BOUNDARY
- PARCEL BOUNDARY



BASIS OF BEARINGS

The basis for all bearings shown hereon is the (referenced line of subject property or right of way), known as being (S45°35'53"E, per Hildre Subdivision III Plat No. 2011-4) of the Juneau Recording District.

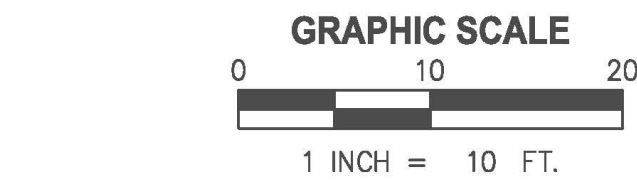
ZONING DATA

ZONE	INDUSTRIAL
SETBACK:	
FRONT	10'
SIDE	10'
REAR	10'
HEIGHT	0'

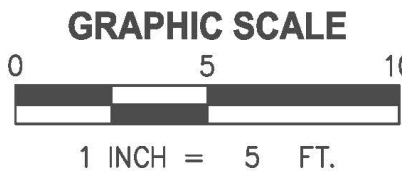
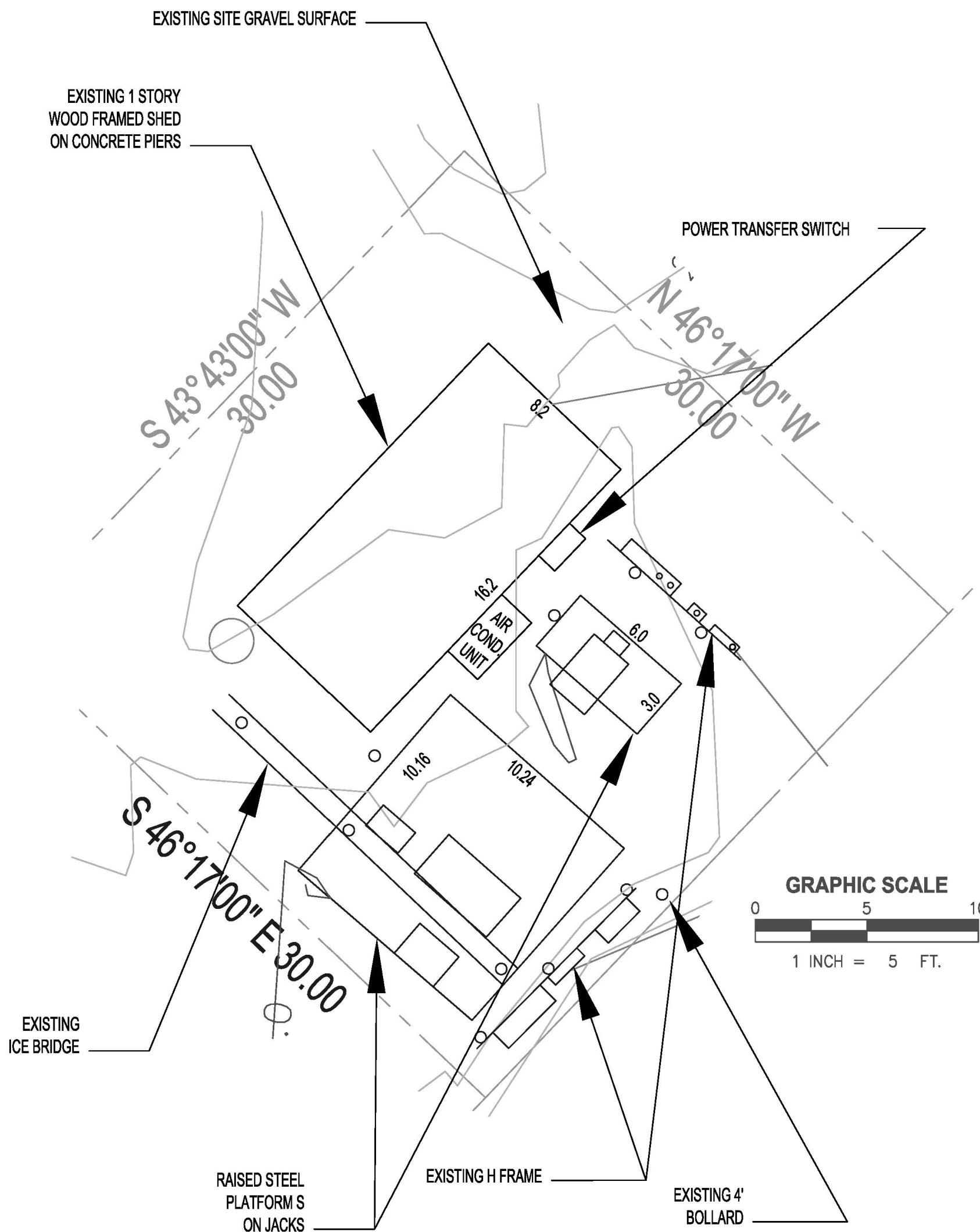
ALL SITE RESTRICTIONS WERE OBTAINED PER THE CITY & BOROUGH OF JUNEAU COMMUNITY DEVELOPMENT DEPARTMENT
CONTACT: (907) 586-0770

MISCELLANEOUS NOTES

- The lease area is contiguous to Tongard Court, a public right-of-way. Therefore, no access easement is needed.
- The locations of all utilities shown on the survey are from visible surface evidence only.
- At the time of this survey there was no observable surface evidence of earth moving work, building construction or building additions within recent months.
- At the time of this survey, there was no observable evidence of the subject property being used as a solid waste dump, sump or sanitary landfill.
- At the time of this survey, there was no observable evidence of any recent changes in street right-of-way lines either completed or proposed, and available from the controlling jurisdiction.
- At the time of this survey, there was no observable evidence of any recent street or sidewalk construction or repairs.
- This survey was prepared for American Tower Corporation.
- Basis of elevation is NAVD 88 GNSS derived orthometric heights using Geoid 12B.
- Contour interval 0.5'
- Lot 3A1 is used as a storage yard and shipping containers located on the northwest lease boundary.
- Site is serviced by fiber optic lines that were not locatable by GCI on 29 August 2016
- Lease site is not fenced.



COMPOUND DETAIL



SURVEYOR CERTIFICATE

I HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF ALASKA, AND THAT THIS PLAT REPRESENTS THE SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THE MONUMENTS SHOWN HEREON ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT.

DATED:



Drawn By: J. Ivaniszek Checked By: J.Ivaniszek

DATE: 9/2/2016		
REVISIONS		
NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		

SURVEYOR:

CHILKAT SURVEYING & MAPPING, LLC
10654 PORTER LANE
JUNEAU, ALASKA 99801
907-957-1908

SURVEYOR DRAWING NUMBER
1629

SHEET TITLE
SITE TOPo MAP

PREPARED FOR:

AMERICAN TOWER CORP.
10 Presidential Way
Woburn, MA 01801

PROJECT NUMBER
370067

SITE ADDRESS
**5594 TONGARD COURT
JUNEAU, ALASKA, 99801**

WORK COORDINATED BY:

COX LEVIN
National Land Survey Consultants
1264 Main Street • Waltham, MA 02451
781-640-3309 • www.coxlevin.com

SITE NAME
LEMON CREEK

SHEET NUMBER
1 of 1

GENERAL CONSTRUCTION NOTES:

- ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/ITIA-222, AND COMPLY WITH ATC MASTER SPECIFICATIONS FOR WIRELESS TOWER SITES.
- CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
- ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
- DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
- DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
- THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
- CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
- INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ATC CM PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE ATC CM PRIOR TO PROCEEDING.
- EACH CONTRACTOR SHALL COOPERATE WITH THE ATC CM, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
- CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE ATC CONSTRUCTION MANAGER.
- ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
- WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR WILL NOTIFY THE ATC CONSTRUCTION MANAGER IMMEDIATELY.
- CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
- ALL ROOF WORK SHALL BE DONE BY A QUALIFIED AND EXPERIENCED ROOFING CONTRACTOR IN COORDINATION WITH ANY CONTRACTOR WARRANTING THE ROOF TO ENSURE THAT THE WARRANTY IS MAINTAINED.
- CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
- CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
- CONTRACTOR SHALL FURNISH ATC WITH THREE AS-BUILT SETS OF DRAWINGS UPON COMPLETION OF WORK.
- PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH ATC CM TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
- PRIOR TO SUBMISSION OF BID, CONTRACTOR WILL COORDINATE WITH ATC CONSTRUCTION MANAGER TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY ATC. ALL REQUIRED PERMITS NOT OBTAINED BY ATC MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
- CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO ATC FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO ATC SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
- THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- CONTRACTOR SHALL NOTIFY ATC CM A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.

EROSION AND SEDIMENTATION CONTROL PLAN NOTES:

THIS PLAN HAS BEEN DEVELOPED TO PROVIDE A STRATEGY FOR CONTROLLING SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION OF THE PROPOSED FACILITY. THE EQUIPMENT ANTICIPATED TO BE USED FOR THE CONSTRUCTION INCLUDES THE FOLLOWING: BACKHOES, BULLDOZERS, LOADERS, TRUCKS, CRANES, COMPACTORS, AND GRADERS. THE FOLLOWING MEASURES WILL BE UNDERTAKEN TO PROVIDE MAXIMUM PROTECTION TO THE SOIL, WATER, AND ABUTTING LANDS:

- ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM AMERICAN TOWER PRIOR TO IMPLEMENTATION.
- THE LIMITS OF DISTURBANCE (LOD) SHOULD BE MARKED PRIOR TO DISTURBANCE ACTIVITIES (I.E. SURVEY STAKES, POSTS & ROPE, CONSTRUCTION FENCE, ETC.).
- A COPY OF THE SEDIMENT AND EROSION CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE DURING CONSTRUCTION UNTIL THE SITE IS STABILIZED. (AS APPLICABLE)
- PRIOR TO GRUBBING OR ANY EARTHMOVING OPERATION, SILTATION FENCE WILL BE INSTALLED ACROSS THE SLOPE ON THE CONTOUR AT THE DOWNHILL LIMIT OF THE WORK AS PROTECTION AGAINST CONSTRUCTION RELATED EROSION. (CONSULT ATC CM AS REQUIRED)
- STONE CHECK DAMS WILL BE INSTALLED IN THE DRAINAGE DITCHES TO PREVENT EROSION PRIOR TO THE STABILIZATION OF THE CHANNELS. EROSION CONTROL BLANKETS WILL ALSO BE INSTALLED IN ALL DITCHES TO BE REVEGETATED.
- PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY UNDISTURBED LAND AREA WILL BE COMPLETED WITHIN FIFTEEN CALENDAR DAYS AFTER FINAL GRADING HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE OR PRACTICAL TO PERMANENTLY STABILIZE DISTURBED LAND, TEMPORARY EROSION CONTROL MEASURES WILL BE IMPLEMENTED WITHIN THIRTY CALENDAR DAYS OF EXPOSURE OF SOIL. ALL DISTURBED AREAS WILL BE MULCHED FOR EROSION CONTROL UPON COMPLETION OF ROUGH GRADING. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED.
- ANY EXPOSED SLOPES GREATER THAN 2:1 AND NEWLY CONSTRUCTED DRAINAGE DITCHES WILL

- BE STABILIZED WITH EROSION CONTROL BLANKET TO PREVENT EROSION DURING CONSTRUCTION AND TO FACILITATE REVEGETATION AFTER LOAMING AND SEEDING.
- TO PROVIDE PROTECTION AGAINST EROSION, RIPRAP WILL BE PLACED AT ALL CULVERT INLETS AND OUTLETS AS SHOWN ON THE ATTACHED DRAWINGS.
- IN AREAS OF CONSTRUCTION DEWATERING, ISOLATED SETTLEMENT TRAPS WILL BE CONSTRUCTED ADJACENT TO THE ACTIVITY. WATER WILL BE PUMPED FROM THE EXCAVATIONS TO THESE DEPRESSION AREAS FOR SEDIMENT REMOVAL. ADDITIONAL SEDIMENTATION PROTECTION WILL BE PROVIDED BY THE INSTALLATION OF HAYBALE BARRIERS BETWEEN THE BASINS AND THE RECEIVING DRAINAGE COARSE.
- NATIVE TOPSOIL SHALL BE SAVED, STOCKPILED, MULCHED, AND REUSED AS MUCH AS POSSIBLE ON THE SITE. SILTATION FENCE SHALL BE INSTALLED AT THE BASE OF STOCKPILES AT THE DOWNHILL LIMIT TO PROTECT AGAINST EROSION. STOCKPILES WILL BE STABILIZED BY SEEDING AND MULCHING UPON FORMATION OF THE PILES. UPHILL OF THE STOCKPILES, STABILIZED DITCHES AND/OR BERMS WILL BE CONSTRUCTED TO DIVERT STORMWATER RUNOFF AWAY FROM THE PILES.
- FINAL SEEDING WILL BE APPLIED IN ACCORDANCE WITH THE AMERICAN TOWER CORPORATION MASTER SPECIFICATION.
- SHOULD CONSTRUCTION OCCUR AFTER NOVEMBER 15, ADDITIONAL EROSION CONTROL METHODS WILL BE IMPLEMENTED. ALL DISTURBED AREAS WILL BE MINIMIZED AS MUCH AS POSSIBLE. PRIOR TO FREEZING, ADDITIONAL EROSION CONTROL DEVICES WILL BE INSTALLED AS APPROPRIATE INSPECTION OF THESE EROSION CONTROL ITEMS WILL BE CONSTANT, WITH PARTICULAR ATTENTION PAID TO WEATHER PREDICTIONS TO ENSURE THAT THESE MEASURES ARE PROPERLY IN PLACE TO HANDLE LARGE AMOUNTS OF RUNOFF FROM HEAVY RAINS OR THAWS.
- FOR AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OR PHASE OF AN ACTIVITY TO BE CONSIDERED PERMANENTLY STABILIZED, THE DISTURBED AREAS SHALL BE COVERED BY A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.
- THE CONTRACTOR WILL REGULARLY INSPECT THE PROJECT'S EROSION AND SEDIMENTATION CONTROLS DURING THE ENTIRE ACTIVE CONSTRUCTION STAGES. THE INSPECTIONS WILL BE PERFORMED WEEKLY AND AFTER ALL RUNOFF EVENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION, OPERATION, MAINTENANCE, AND REMOVAL OF ALL EROSION AND SEDIMENTATION CONTROLS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT REPAIR, REPLACEMENT, REGRAIDING, RESEEDING, REMULCHING, AND RENETTING MUST BE PERFORMED IMMEDIATELY. SEDIMENT THAT HAS BEEN TRAPPED BY THE SILT BARRIER WILL BE REMOVED AS REQUIRED, AND IN ALL CASES, BEFORE THE ACCUMULATION HAS REACHED HALF THE HEIGHT OF THE FENCE. THE SILT BARRIER WILL BE RE-ANCHORED, REPAIRED, OR REPLACED AS NECESSARY. ALL OTHER CONTROLS WILL BE INSPECTED ON THE SAME SCHEDULE. IF EROSION AND SEDIMENT CONTROL BMP'S FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMP'S, OR MODIFICATION OF THOSE INSTALLED WILL BE REQUIRED.
- ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
- ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
- FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
- SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE AMERICAN TOWER CORPORATION MASTER SPECIFICATION AND/OR THE CONTRACTOR SHALL NOTIFY THE ATC CONSTRUCTION MANAGER.
- SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORK DAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEEPED INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.

CONSTRUCTION SEQUENCE:

- INSTALL NEW TOWER FOUNDATION
- ERECT TOWER
- INSTALL PROPOSED ICE BRIDGE
- AFTER THE NEW TOWER HAS BEEN ERECTED AND OPERATIONAL. REMOVE EXISTING WOOD POLE TOWER.
- IF CONSTRUCTION IS TERMINATED OR SUSPENDED PRIOR TO CONSTRUCTION COMPLETION, ALL EXPOSED SOIL AREAS SHALL BE SEEDED WITH TEMPORARY SEEDING AND MULCHED IMMEDIATELY.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL SEDIMENT AND EROSION CONTROL FACILITIES IN EFFECTIVE WORKING ORDER DURING CONSTRUCTION AND UNTIL ALL EXPOSED SOIL AREAS HAVE BEEN STABILIZED.
- AFTER FINAL STABILIZATION HAS BEEN ACHIEVED, TEMPORARY BMP'S SHALL BE REMOVED. ACHIEVING 70% STABILIZATION, THE E&S CONTROLS CAN BE REMOVED. STONE IS CONSIDERED TO BE STABILIZED. AREAS DISTURBED DURING REMOVAL OR TEMPORARY E&S BMP'S REMOVAL ARE TO BE STABILIZED IMMEDIATELY.

CONCRETE AND REINFORCING STEEL NOTES:

- DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF ALL APPLICABLE CODES INCLUDING: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", AND ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
- MIX DESIGN SHALL BE APPROVED BY OWNER'S REPRESENTATIVE AND SUBMITTED TO ENGINEER PRIOR TO PLACING CONCRETE.
- CONCRETE SHALL BE NORMAL WEIGHT, 6 % AIR ENTRAINED (+/- 1.5%) WITH A MAXIMUM 4" SLUMP AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI UNLESS OTHERWISE NOTED.

- THE FOLLOWING MATERIALS SHALL BE USED:
PORTLAND CEMENT: ASTM C-150, TYPE 1 OR 2
REINFORCEMENT: ASTM A-185, PLAIN STEEL WELDED WIRE FABRIC
REINFORCEMENT BARS: ASTM A615, GRADE 60, DEFORMED
NORMAL WEIGHT AGGREGATE: ASTM C-33
WATER: DRINKABLE
ADMIXTURES: NON-CHLORIDE CONTAINING
- MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS (UNLESS OTHERWISE NOTED):
A. CONCRETE CAST AGAINST EARTH: 3"
B. ALL OTHER CONCRETE: 2"
- A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE IN ACCORDANCE WITH ACI 301 SECTION 4.2.4, UNLESS NOTED OTHERWISE.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL, OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ATC CM APPROVAL WHEN DRILLING HOLES IN CONCRETE.
- ADMIXTURES SHALL CONFORM TO THE APPROPRIATE ASTM STANDARD AS REFERENCED IN ACI 301.
- DO NOT WELD OR TACK WELD REINFORCING STEEL.
- ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, GROUNDS AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT.
- REINFORCEMENT SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED.
- DO NOT PLACE CONCRETE IN WATER, ICE, OR ON FROZEN GROUND.
- DO NOT ALLOW REINFORCEMENT, CONCRETE OR SUBBASE TO FREEZE DURING CONCRETE CURING AND SETTING PERIOD, OR FOR A MINIMUM OF 3 DAYS AFTER PLACEMENT.
- FOR COLD-WEATHER AND HOT-WEATHER CONCRETE PLACEMENT, CONFORM TO APPLICABLE ACI CODES AND RECOMMENDATIONS. IN EITHER CASE, MATERIALS CONTAINING CHLORIDE, CALCIUM, SALTS, ETC. SHALL NOT BE USED. PROTECT FRESH CONCRETE FROM WEATHER FOR 7 DAYS, MINIMUM.
- CONCRETE SHALL BE RUBBED TO A ROUGH GROUT FINISH. PADS SHALL BE SEALED BY STEEL TROWEL.
- UNLESS OTHERWISE NOTED:
A. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
B. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- SPlicing OF REINFORCEMENT IS PERMITTED ONLY AT LOCATIONS SHOWN IN THE CONTRACT DRAWINGS OR AS ACCEPTED BY THE ENGINEER. UNLESS OTHERWISE SHOWN OR NOTED REINFORCING STEEL SHALL BE SPliced TO DEVELOP ITS FULL TENSILE CAPACITY (CLASS A) IN ACCORDANCE WITH ACI 318.
- REINFORCING BAR DEVELOPMENT LENGTHS, AS COMPUTED IN ACCORDANCE WITH ACI 318, FORM THE BASIS FOR BAR EMBEDMENT LENGTHS AND BAR SPliced LENGTHS SHOWN IN THE DRAWINGS. APPLY APPROPRIATE MODIFICATION FACTORS FOR TOP STEEL, BAR SPACING, COVER AND THE LIKE.
- DETAILING OF REINFORCING STEEL SHALL CONFORM TO "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
- ALL SLAB CONSTRUCTION SHALL BE CAST MONOLITHICALLY WITHOUT HORIZONTAL CONSTRUCTION JOINTS, UNLESS SHOWN IN THE CONTRACT DRAWINGS.
- LOCATION OF ALL CONSTRUCTION JOINTS ARE SUBJECT TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, CONFORMANCE WITH ACI 318, AND ACCEPTANCE OF THE ENGINEER. DRAWINGS SHOWING LOCATION OF DETAILS OF THE PROPOSED CONSTRUCTION JOINTS SHALL BE SUBMITTED WITH REINFORCING STEEL PLACEMENT DRAWINGS
- SPlices OF WWF, AT ALL SPliced EDGES, SHALL BE SUCH THAT THE OVERLAP MEASURED BETWEEN OUTERMOST CROSS WIRES OF EACH FABRIC SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRE PLUS 2 INCHES, NOR LESS THAN 8".
- BAR SUPPORTS SHALL BE ALL-GALVINIZED METAL WITH PLASTIC TIPS.
- ALL REINFORCEMENT SHALL BE SECURELY TIED IN PLACE TO PREVENT DISPLACEMENT BY CONSTRUCTION TRAFFIC OR CONCRETE. TIE WIRE SHALL BE 16 GAUGE CONFORMING TO ASTM A82
- SLAB ON GROUND
A. COMPACT STRUCTURAL FILL TO 95% DENSITY AND THEN PLACE 6" GRAVEL BENEATH SLAB.
B. PROVIDE VAPOR BARRIER BENEATH SLAB ON GROUND.

GENERAL FOUNDATION NOTES:

(APPLICABLE FOR EQUIPMENT SHELTER ONLY)

- THOROUGHLY COMPACT BOTTOM OF EXCAVATIONS PRIOR TO PLACING RIGID INSULATION BARRIER. BACKFILL AND COMPACTION PROCEDURES SHALL BE DONE PER INDUSTRY STANDARDS.
- ALL REINFORCING STEEL SHALL BE ASTM A615 - GRADE 60. SECURE REINFORCING IN PLACE TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT.
- VERIFY DETAILS AND DIMENSIONS WITH SHELTER DRAWINGS. NOTIFY ATC CM OF ANY DISCREPANCIES.
- INSULATION BARRIER PROVIDED IS FOR FROST PROTECTION IN LIEU OF STANDARD FOUNDATIONS WITH BEARING AT CODE REQUIRED FROST DEPTH.
- SHELTER MUST BE ANCHORED TO ITS FOUNDATION. ANCHOR IN ACCORDANCE WITH SHELTER MANUFACTURER SPECIFICATIONS.



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REV.	DESCRIPTION	BY	DATE
	FOR PERMITTING	JN	02/16/17

ATC SITE NUMBER:
202533

ATC SITE NAME:
**REBUILD
LEMON CREEK AK**

SITE ADDRESS:
5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

GENERAL NOTES

SHEET NUMBER: G-002	REVISION: 0
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ZONING INFORMATION		
DISTRICT: INDUSTRIAL		
MIN AREA:	REQUIRED:	EXISTING:
MAX HEIGHT:	NONE	900 SQ FT
MIN FRONTAGE:	120'	125'
MIN DEPTH:	N/A	N/A
MIN FRONT YARD SETBACK:	N/A	N/A
MIN SIDE YARD SETBACK:	22'	25'±
MIN REAR YARD SETBACK:	22'	78'±
	22'	292'±

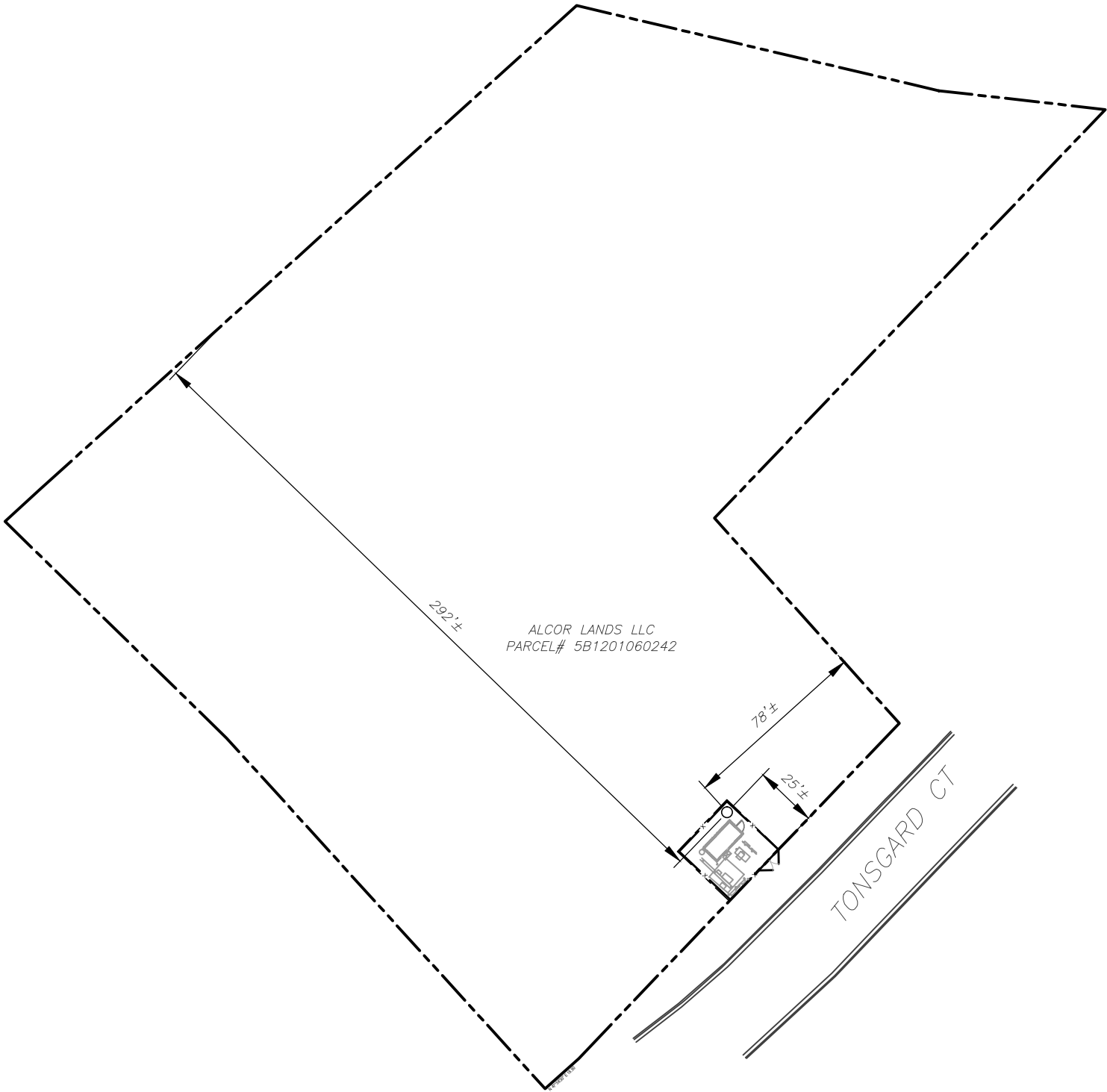


1 GIS PARCEL IMAGE
SCALE: NOT TO SCALE

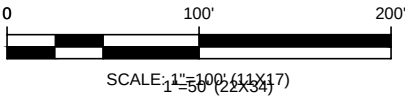


SURVEY LEGEND	
	EXISTING PROPERTY
	EXISTING ROAD (PAVED)
	EXISTING LEASE AREA

- NOTES:
- THIS SET OF DRAWINGS ARE THE SUBMITTAL FOR THE PERMIT TO ERECT A NEW MONOPOLE TOWER.
 - FIELD SURVEY DATE: 09/02/2016
 - BOUNDARY INFORMATION OBTAINED FROM: CHILKAT SURVEYING AND MAPPING, LLC.



2 OVERALL SITE PLAN



SCALE: 1"=100' (11X17)
1"=50' (22X34)



AMERICAN TOWER®
ATC TOWER SERVICES
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: 6260F

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATION AS INSTRUMENTS OR SERVICE ARE THE EXCLUSIVE PROPERTY OF AMERICAN TOWER. THEIR USE AND PUBLICATION SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY ARE PREPARED. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO AMERICAN TOWER OR THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. TITLE TO THESE DOCUMENTS SHALL REMAIN THE PROPERTY OF AMERICAN TOWER WHETHER OR NOT THE PROJECT IS EXECUTED. NEITHER THE ARCHITECT NOR THE ENGINEER WILL BE PROVIDING ON-SITE CONSTRUCTION REVIEW OF THIS PROJECT. CONTRACTOR(S) MUST VERIFY ALL DIMENSIONS AND ADVISE AMERICAN TOWER OF ANY DISCREPANCIES. ANY PRIOR ISSUANCE OF THIS DRAWING IS SUPERSEDED BY THE LATEST VERSION ON FILE WITH AMERICAN TOWER.

REV.	DESCRIPTION	BY	DATE
△0	FOR PERMITTING	JN	02/16/17
△1			
△2			
△3			
△4			

ATC SITE NUMBER:
202533

ATC SITE NAME:
**REBUILD
LEMON CREEK AK**

SITE ADDRESS:
5594 TONGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

OVERALL SITE PLAN

SHEET NUMBER: C-101	REVISION: 0
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ATC TOWER SERVICES
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SUITE 100
CARY, NC 27518
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ATC SITE NUMBER:
202533

ATC SITE NAME:
**REBUILD
LEMON CREEK AK**

SITE ADDRESS:
5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

DETAILED SITE PLAN

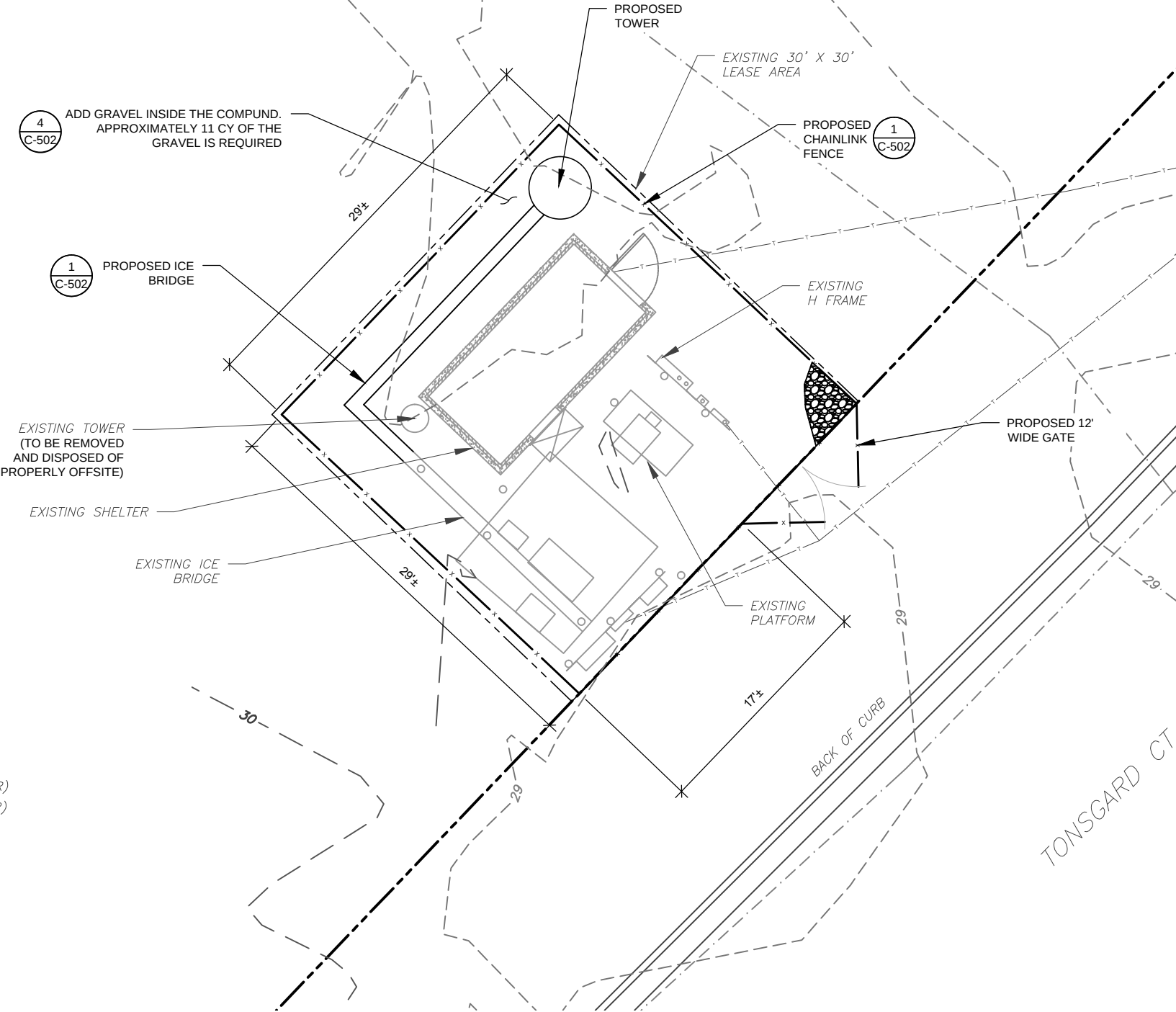
SHEET NUMBER: C-102	REVISION: 0
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- SURVEY LEGEND**

 - EXISTING PROPERTY
 - EXISTING ADJ. PROPERTY
 - EXISTING CONTOUR (MAJOR)
 - EXISTING CONTOUR (MINOR)
 - EXISTING BUILDING
 - EXISTING ROAD (STONE)
 - EXISTING ROAD (PAVED)
 - EXISTING CONCRETE
 - EXISTING LEASE AREA

CIVIL LEGEND

 - PROPOSED CHAINLINK FENCE



1

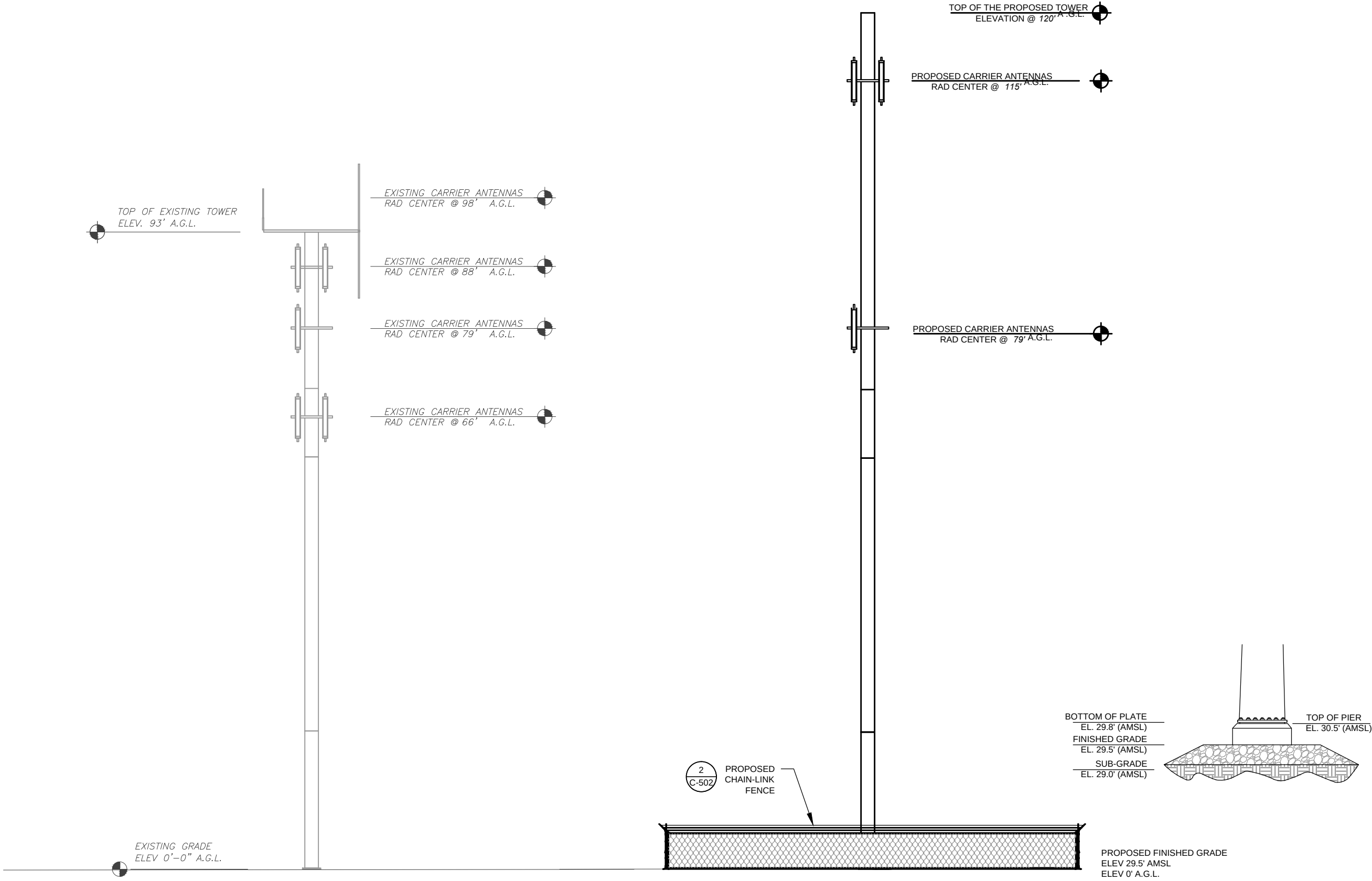
DETAILED SITE PLAN

01020

SCALE: 1"=10' (11X17)
1"=5' (22X34)

N

NOTE:
HIGHEST APPURTENANCE APPROVED BY FAA WILL BE 125'
AGL.





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CARY, NC 27518
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202533

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**REBUILD
LEMON CREEK AK**

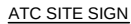
SITE ADDRESS:
5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

TOWER ELEVATION

SHEET NUMBER: C-201	REVISION: 0
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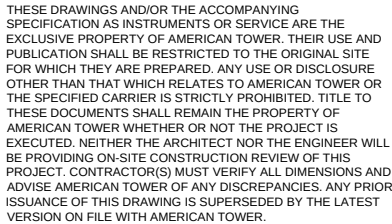


REPLACEMENT OF SIGNAGE:

AS SIGNAGE BECOMES STOLEN, DAMAGED, BRITTLE OR FADED, IT SHOULD BE REPLACED WITH SIGNAGE PER THIS SPECIFICATION. ANY ACQUIRED SITE SHOULD HAVE NEW SIGNS POSTED WITHIN 60 DAYS UNLESS OTHERWISE SPECIFIED. ANY SITE SOLD SHOULD HAVE THE ATC SIGNS REMOVED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. ALL FCC OR REGULATORY SIGNAGE MUST BE INSTALLED OR REPLACED AS REQUIRED TO MEET OUR STANDARD. SIGNS SHOULD BE REPLACED ON NORMAL, QUARTERLY MAINTENANCE VISITS BY CONTRACTORS OR SITE MANAGERS, UNLESS OTHERWISE REQUIRED ON A CASE-BY-CASE BASIS.

NOTE:

EXTERIOR SIGNS ARE NOT PROPOSED EXCEPT AS REQUIRED BY THE FCC. ALL EXISTING SIGNAGE AND ANY FUTURE SIGNAGE WILL BE COMPLIANT WITH STATUTE 164-43.4 NO HIGH-VOLTAGE SIGNAGE IS NECESSARY. NO HIGH-VOLTAGE EQUIPMENT PRESENT.



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202533

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REBUILD

LEMON CREEK AK

SITE ADDRESS:

5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
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DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

SIGNAGE

SHEET NUMBER:

C-501

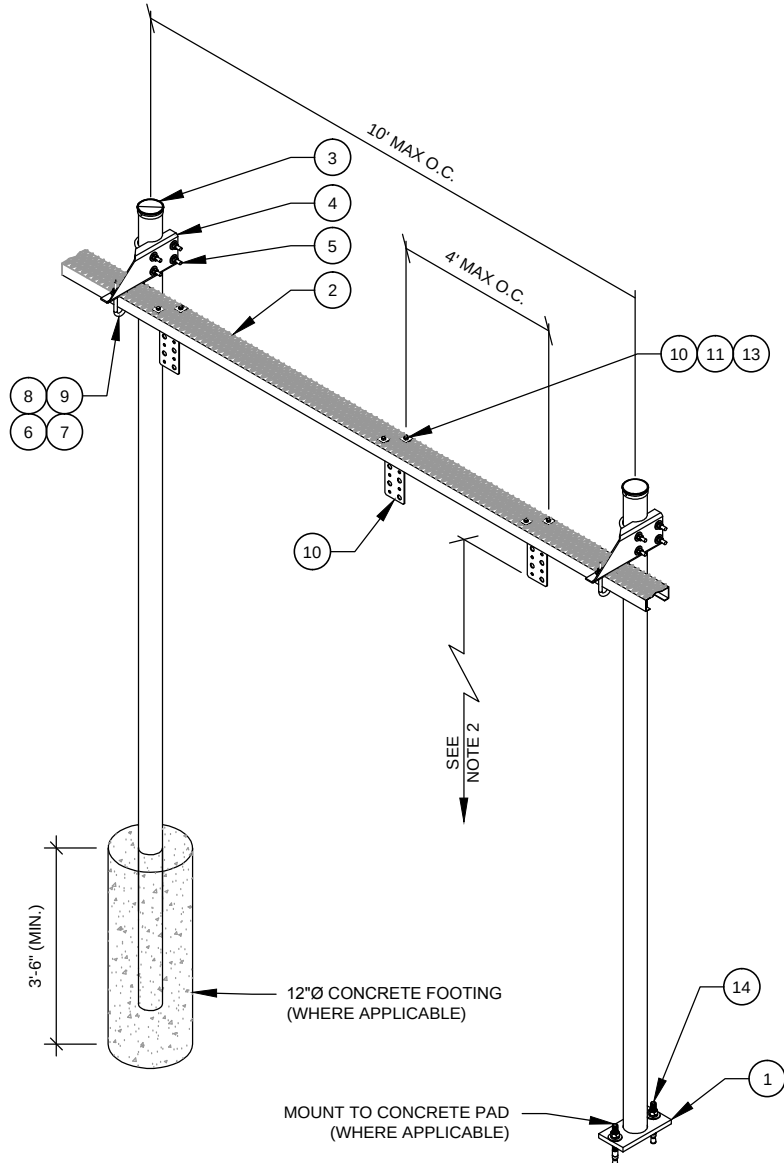
REVISION:

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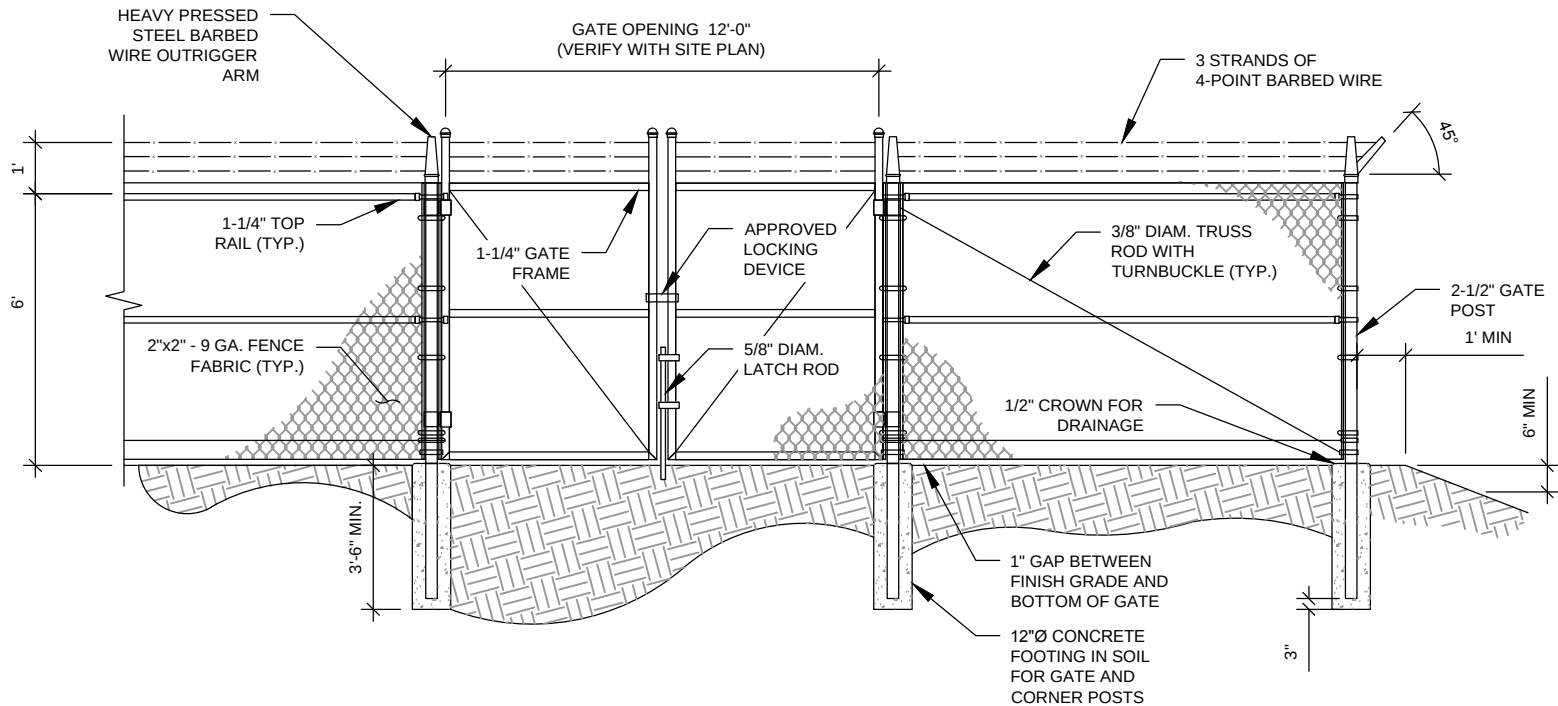
CONSTRUCTION NOTE:

- WHERE POSSIBLE AND AS APPLICABLE, THE CONTRACTOR SHALL UTILIZE EXISTING ICE BRIDGE, CABLE LADDER, COAX SUPPORTS, AND COAX PORTS. BEFORE UTILIZING, CONTRACTOR SHALL VERIFY THAT ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF NEW ICE BRIDGE, CABLE LADDER, COAX SUPPORT, AND COAX PORT, AS REQUIRED, WITH THE ATC CONSTRUCTION MANAGER.
- INSTALL ICE BRIDGE TO ALLOW 7 FEET CLEARANCE ABOVE GRADE TO LOWEST APPURTENANCE.



CABLE LADDER - BILL OF MATERIALS					
ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	MF126.01	BASE SHOE	8	GWL-04	1/2" GALV LOCK WASHER
2	WB-CY210	SAFETY GRATING 24" X 10'	9	GN-04	1/2" GALV HEX NUT
3	PC-034	PIPE CAP 3-1/2"	10	ZBV601	SINGLE 6 CABLE BRACKET
4	WBLB0501	5" WAVEGUIDE BRIDGE SUPPORT BRACKET	11	MT-387	SQUARE WASHER, 1-1/2" X 1-1/2" W/ 7/16" HOLE
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	12	GWF-03	3/8" GALV FLAT WASHER
6	WB-JB-6	1/2" J-BOLT	13	GB-03205	3/8" X 2" GALV BOLT KIT
7	GWF-04	1/2" GALV FLAT WASHER	14	MT-287	3/4" x 7" WEDGE ANCHOR
NOTE: CONTRACTOR SHALL USE PARTS MANUFACTURED BY COMMSCOPE AS SHOWN OR APPROVED EQUIVALENT.					

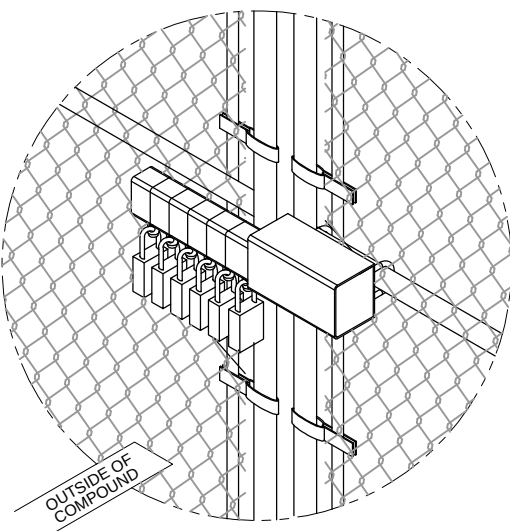
1 WAVEGUIDE BRIDGE KIT
SCALE: NOT TO SCALE



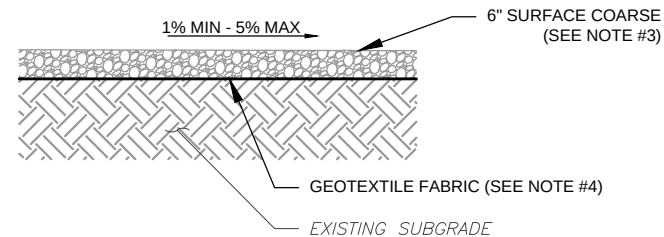
FENCE NOTES:

- ATTACH EACH GATE WITH 1-1/2 PAIR OF NON-LIFT-OFF TYPE, MALLEABLE IRON OR FORGING, PIN-TYPE HINGES. ASSEMBLIES SHALL ALLOW FOR 180° OF GATE TRAVEL.
- PROVIDE TAC WELD AT BOLT HINGES. TWO HINDGE BOLTS PER GATE.

2 GATE AND FENCE DETAIL
SCALE: N.T.S.



3 MULTI-LOCK DETAIL
SCALE: N.T.S.



NOTES:

- CONTRACTOR TO CONTACT ALL UTILITIES FOR LOCATION OF UNDERGROUND SERVICES. SERVICE LOCATIONS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
- REMOVE ALL UNSUITABLE OR DELETERIOUS MATERIAL AS REQUIRED. COMPACT UNDERLYING SOIL TO 90% OF MAXIMUM DENSITY. REPLACE REMOVED SOIL WITH 8" LIFTS OF GRANULAR "B" MATERIAL TO A DEPTH OF 4" BELOW PROPOSED GRADE. COMPACT TO MINIMUM 95% OF MAXIMUM DRY DENSITY ALL COMPACTION SHALL BE IN ACCORDANCE WITH THE 2006 IBC. REVIEW WITH PROJECT MANAGER AND GEOTECT PRIOR TO CONSTRUCTION.
- SURFACE COARSE OF GRANULAR "A" MATERIAL SHALL CONSIST OF EVENLY GRADED MIXTURE OF CRUSHED STONE OR GRAVEL, WITH 100% PASSING THROUGH 1 1/2" SIEVE AND NOT MORE THAN 5% PASSING THROUGH #4 SIEVE. COMPACT TO 95% OF MAXIMUM DRY DENSITY.
- PROVIDE GEOTEXTILE FABRIC UNDER WASHED CHIPPED STONE COMPOUND UNLESS NOTED OTHERWISE. WOVEN GEOTEXTILE: APPROVED PRODUCTS ARE US FABRICS: US 200 AND TENCATE: 160N. CONTRACTOR MAY SUBMIT DESIGN ALTERNATIVE AS OUTLINED IN THE AMERICAN TOWER MASTER SPECIFICATIONS.

4 COMPOUND CROSS SECTION
SCALE: NOT TO SCALE

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2			
3			
4			

ATC SITE NUMBER:

202533

ATC SITE NAME:

REBUILD
LEMON CREEK AK

SITE ADDRESS:

5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

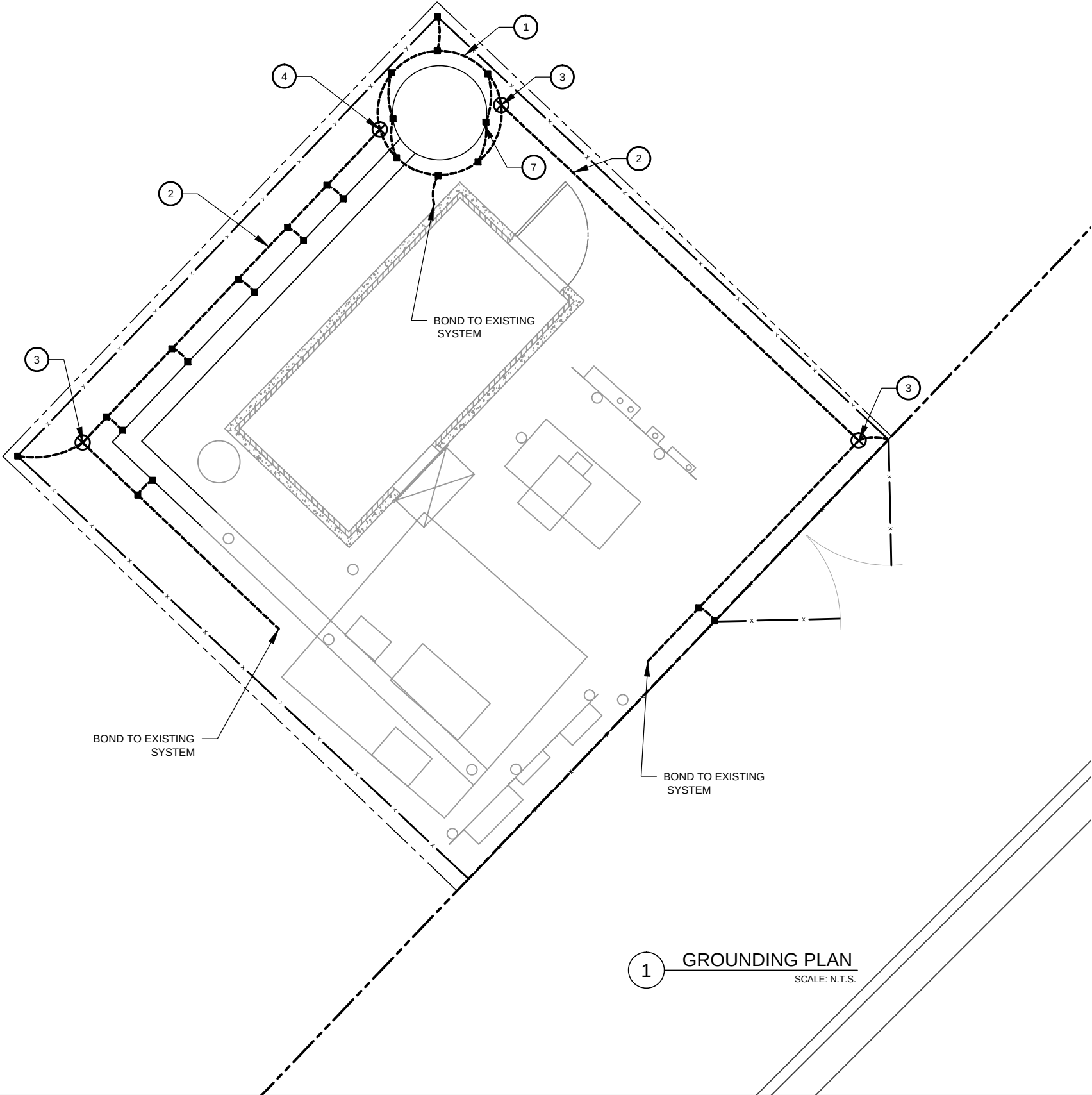
DETAILS

SHEET NUMBER:

C-502

REVISION:

0



- 1. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
- 2. ALL GROUND CONNECTIONS SHALL BE EXOTHERMIC WELDED. ALL WIRES SHALL BE COPPER.
- 3. CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE. GROUNDING AND OTHER OPERATIONAL TESTING WILL BE WITNESSED BY OWNER REPRESENTATIVE.
- 4. REFER TO ATC MASTER SPEC AND COMPLY WITH ALL REQUIREMENTS OF GROUNDING STANDARDS.
- 5. ELECTRICAL CONTRACTOR TO PROVIDE DETAILED DESIGN OF GROUNDING SYSTEM, AND RECEIVE APPROVAL OF DESIGN BY OWNER REPRESENTATIVE, PRIOR TO INSTALLATION OF GROUNDING SYSTEM. PHOTO DOCUMENT ALL CONNECTIONS AND GROUND RING.
- 6. NOTIFY CONSTRUCTION MANAGER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.
- 7. TO AVOID TOWER FOUNDATION, GROUND RODS MAY BE INSTALLED AT AN ANGLE OR TOWER GROUND RING MAY BE EXTENDED AS NEEDED.

KEYED NOTES:

- 1 #2 AWG SBTC TOWER GROUND RING. (MIN 2 FT FROM FOUNDATION)
- 2 #2 AWG SBTC TOWER RING RADIALS. GROUNDING RADIAL (TYP.) SEE TRENCH DETAIL 3 ON SHEET E-501.
- 3 5/8Ø" X 10 FT GROUND ROD (TYP). SEE DETAILS 4 & 8 ON SHEET E-401
- 4 5/8Ø" X 10 FT GROUND ROD WITH TEST WELL (MIN. ONE PER SITE ON TOWER GROUND RING). SEE DETAIL 5 ON SHEET E-401.
- 5 BOND TO ELECTRICAL SERVICE AT MAIN BONDING JUMPER WITH #2 AWG SBTC. PARALLEL CONNECTION AWAY FROM TOWER. SEE DETAIL 1 ON SHEET E-501.
- 6 SERVICE GROUND ROD SIZE MINIMUM PER NEC OR AS OTHERWISE INDICATED. PLACE MINIMUM OF 10' FROM ALL OTHER GROUND RODS.
- 7 TOWER TO GROUND RING BONDS. SEE DETAIL 6 & 7 ON SHEET E-501.
- 8 ADDITIONAL ROD (TYP) (IF REQUIRED, SEE INSTALL NOTES)
- 9 ADDITIONAL RADIAL EXTENSION IN ROAD CENTER WITH GEM (80' MAX. OR TO RIGHT OF WAY, WHICHEVER IS SHORTER) SEE DETAIL 2 ON SHEET E-401.
- 10 ADDITIONAL RADIAL TO LEASE AREA BOUNDARY EQUIDISTANT FROM EXISTING RADIALS AT ENDS WITH GEM (TYP). SEE DETAIL 2 ON SHEET E-401

INSTALLATION NOTES:

- 1. INSTALL STANDARD BASE DESIGN AS SHOWN.
- 2. MEASURE GROUNDING SYSTEM RESISTANCE WITH A 3-PROBE TEST AND PRIOR TO CONNECTION OF UTILITY POWER NEUTRAL TO THE SYSTEM.
- 3. IF RESISTANCE (STEP 2) IS GREATER THAN 10 OHMS, INSTALL ADDITIONAL SYSTEM AS SHOWN.
- 4. MEASURE GROUNDING SYSTEM RESISTANCE WITH A 3-PROBE TEST AND PRIOR TO CONNECTION OF UTILITY POWER NEUTRAL TO THE SYSTEM.
- 5. IF RESISTANCE (STEP 4) IS GREATER THAN 10 OHMS AFTER INSTALLATION OF ADDITIONAL SYSTEM, COORDINATE WITH ATC ENGINEER OF RECORD FOR RESOLUTION.

GROUNDING PLAN LEGEND:

- | | | | |
|-------|-----------------|---|-------------------|
| ----- | GROUND WIRE | ⊗ | COPPER GROUND ROD |
| — | GROUND BAR | ⊗ | TEST WELL |
| ■ | EXOTHERMIC WELD | | |
| ● | MECHANICAL WELD | | |



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0	FOR PERMITTING	JN	02/16/17

ATC SITE NUMBER:

202533

ATC SITE NAME:

REBUILD
LEMON CREEK AK

SITE ADDRESS:

5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

GROUNDING PLAN

SHEET NUMBER:

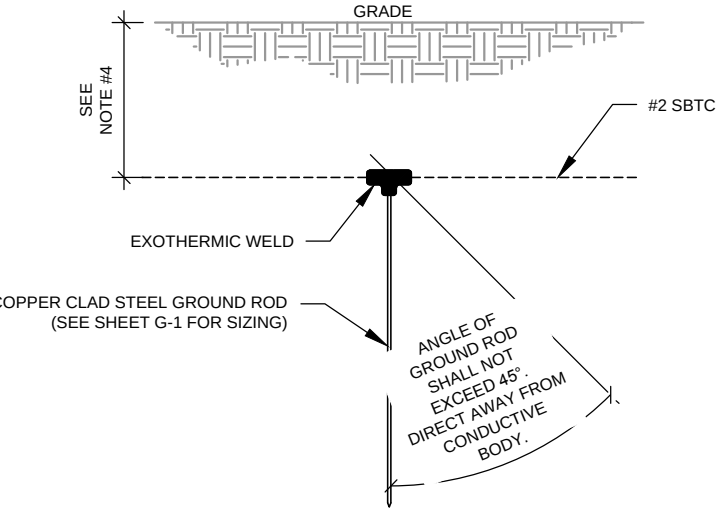
E-501

REVISION:

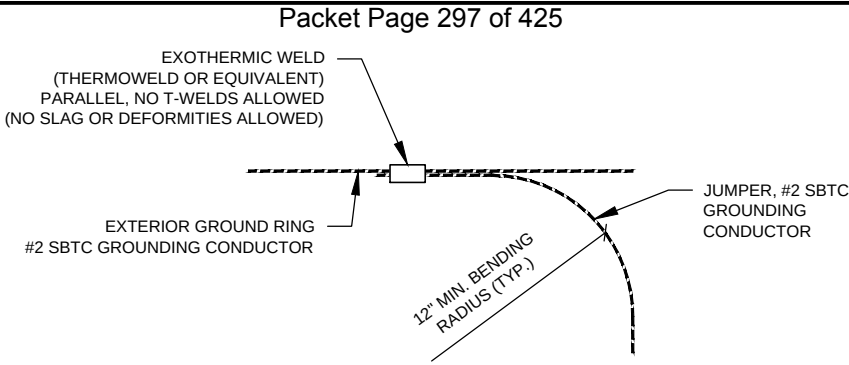
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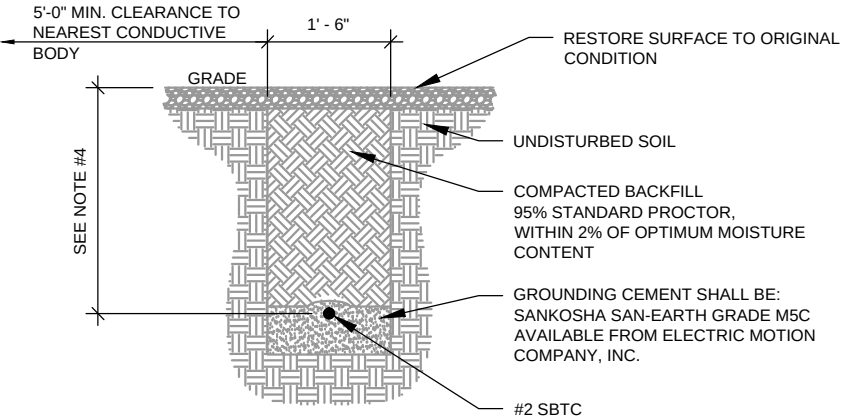
1. SEPARATION DIMENSION TO BE VERIFIED WITH LOCAL UTILITY COMPANY REQUIREMENTS.
2. COORDINATE UTILITY, LOCATE BEFORE DIGGING.
3. CONDUIT TRENCHING DEPTHS AT 36" OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.
4. ALL RING AND RADIAL DEPTHS AT 30" OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.
5. WELD GROUND TO FENCE AS LOW AS POSSIBLE TO DETER COPPER THEFT



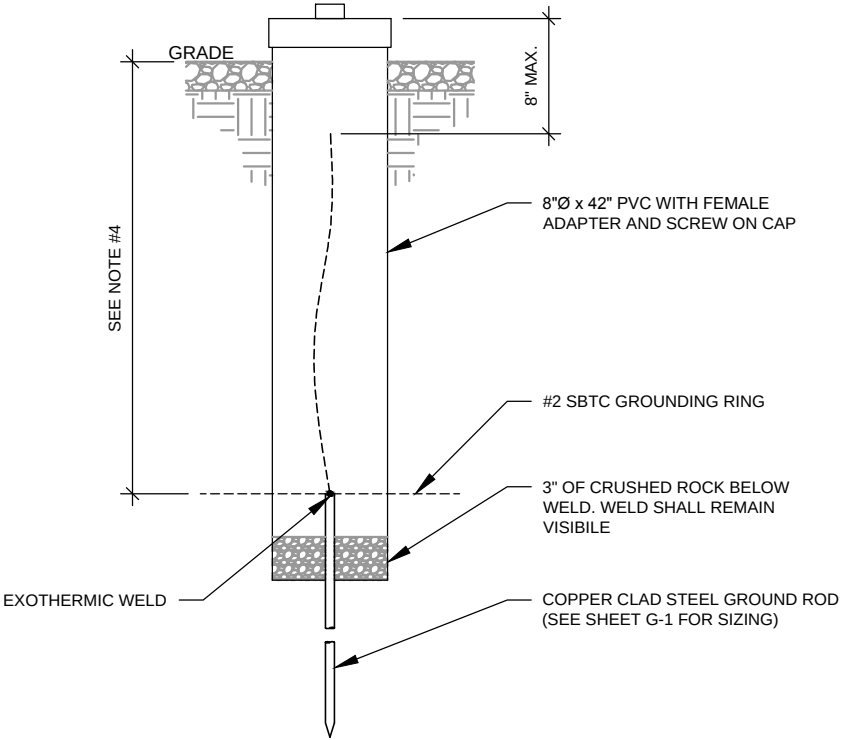
2 GROUND ROD DETAIL
SCALE: N.T.S.



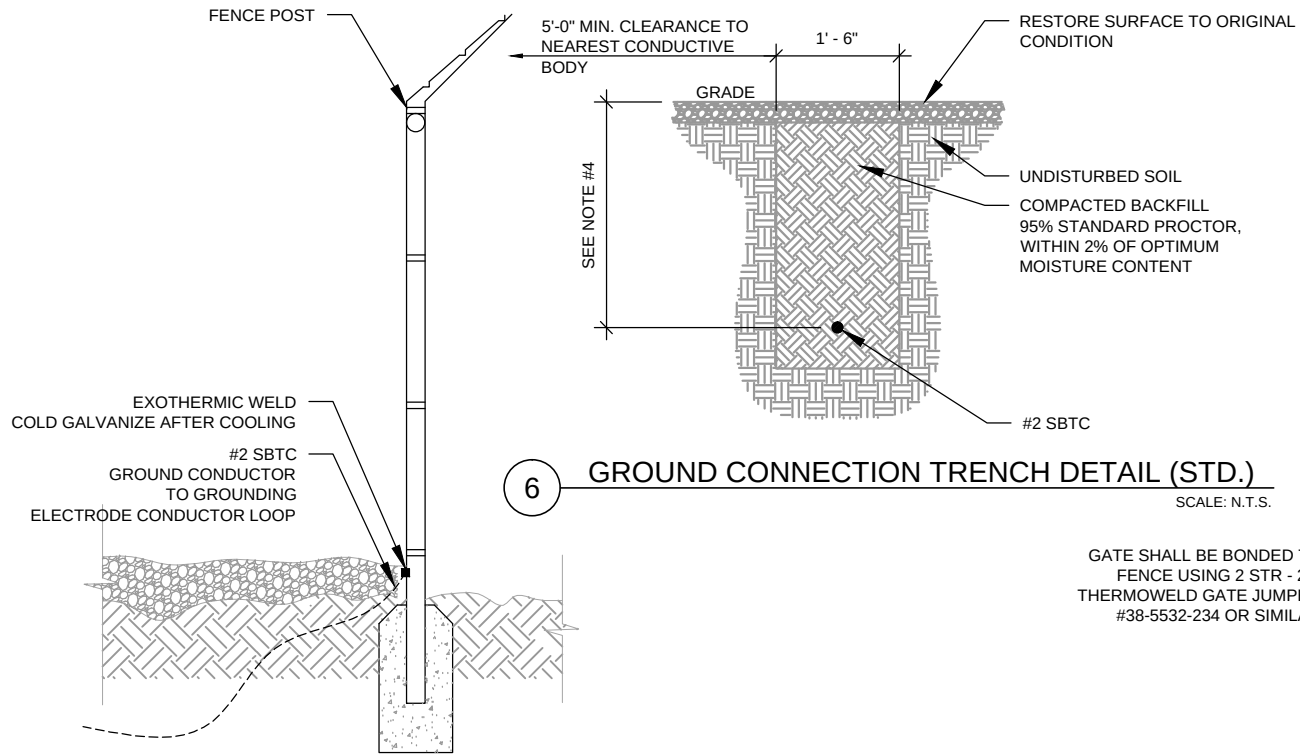
1 TIE CONNECTION DETAIL
SCALE: N.T.S.



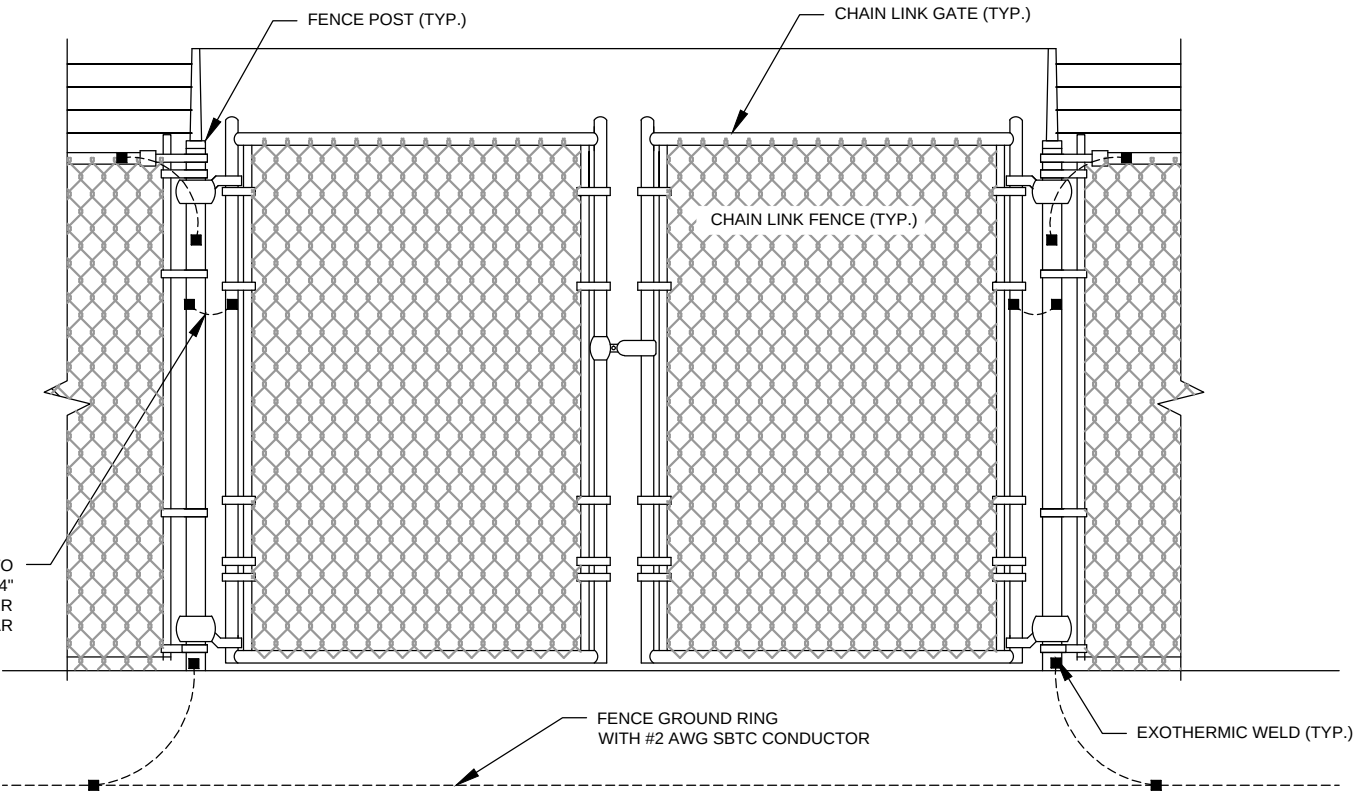
3 GROUND CONNECTION TRENCH DETAIL
SCALE: N.T.S.



4 TEST WELL DETAIL
SCALE: N.T.S.



5 FENCE GROUNDING DETAIL
SCALE: N.T.S.



7 GATE GROUNDING DETAIL
SCALE: N.T.S.



AMERICAN TOWER®
ATC TOWER SERVICES
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: 6260F

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REV.	DESCRIPTION	BY	DATE
△	FOR PERMITTING	JN	02/16/17
△			
△			
△			
△			

ATC SITE NUMBER:
202533

ATC SITE NAME:
**REBUILD
LEMON CREEK AK**

SITE ADDRESS:
5594 TONSGARD CT
JUNEAU, AK 99801

SEAL:

DRAWN BY:	JN
APPROVED BY:	KRF
DATE DRAWN:	02/16/17
ATC JOB NO:	12029062

STANDARD GROUNDING
DETAILS

SHEET NUMBER:	REVISION:
E-401	0



March 1, 2017

**Ref: Design and Failure Modes for a 120-ft AGL Tapered Monopole
Quality of Steel and Fabrication of a Monopole Structure
Valmont Project No. 352620
Site: Lemon Creek Rebuild, AK, 202553
Pole Designed with a maximum Theoretical Fall Radius of 22.5'.**

In order to assure you of the high quality of all Valmont products, we would like to offer the following comments:

- Communications monopole structures designed by Valmont are sized in accordance with the latest governing revision of the ANSI/TIA 222 standard unless otherwise requested by our customer. This standard has been approved by ANSI/ASCE-7, which has dealt with the design of antenna support structures for over 40 years. The TIA standard, based on provisions of this nationally known specification, has a long history of reliability. At its core philosophy is its first and foremost priority to safeguard and maintain the health and welfare of the public.
- The TIA standard designates a minimum wind loading for each county in the United States. Valmont uses the wind loading listed in the TIA standard unless a greater value is specified by our customer. Structures are also designed for radial ice at a code specified reduced design wind loading. Code designated coefficients are used to ensure that the structure will survive the designed wind speed. The structure can usually survive even a greater wind load than the basic design wind speed because of these conservative coefficients.
- Design and loading assumptions that are used for the analyses of these structures are very conservative in nature when compared to other codes, which makes structural failure highly improbable.
- Failure of a steel monopole occurs when a point is reached where the induced stresses exceed the yield strength of the material. At this point, the deflections induced in the material are no longer temporary. Hence, a permanent deflection in the monopole would exist.
- The term failure above refers to local buckling at a designated point on the pole. Local buckling does not cause a free falling pole; rather it relieves the stresses from the pole at this location. Monopoles are flexible, forgiving structures, which are not generally susceptible to damage by impact loads such as wind gust or earthquake shocks.
- When local buckling occurs, a relatively small portion of the shaft distorts and "kinks" the steel. When the pole begins to bend the exposure area is reduced and therefore, the force due to wind is decreased as well. Even though buckling exists, the cross section of the pole is capable of carrying the entire vertical load. Therefore, wind induced loads could not conceivably bring this type of structure to the ground due to the excellent ductile properties, design criteria, and failure mode.
- Valmont's communication poles have proven to be very reliable products. Valmont has provided structures that have performed well during earthquakes in California, hurricanes in the South (including Hugo, Andrew, Opal and Katrina), and a number of tornadoes. In over 25 years of engineering and fabricating thousands of monopoles, to our knowledge Valmont has never experienced an in service failure of a communication pole due to weather induced overloading, even though, as in the cases of Hurricanes Hugo, Andrew and Katrina, the wind speeds exceeded the design wind speed. We use the latest standards, wind speed information, and sophisticated analytical tools to ensure that we maintain our unblemished record for quality.



Valmont Quality of Steel and Manufacturing:

- Monopoles are fabricated from ASTM A572 Grade 65 material with a controlled silicon content of 0.06% maximum to ensure a uniform galvanized coating. The base material is fabricated from Grade 50 material. All plate material meets a V-Notch toughness requirement of 15 ft-lbs. @ -20 degrees Fahrenheit. By meeting the strict toughness requirement, monopoles are best suited to resist the cyclic/fatigue type loading (i.e. wind induced loading) these structures exhibit.
- Valmont's anchor bolts are fabricated from A615 Grade 75 material. The bolts are 2 ¼ in diameter, made from #18J bar stock. Anchor bolts come complete with five (5) A194 Grade 2H hex nuts.
- For the past 40 years, our company has always guaranteed the quality of the steel used in building our structures. Material Certifications are available on all material at the time of fabrication. Fabrication of the monopole is performed in accordance with the provisions of the AISC Manual of Steel Construction and ASCE Design of steel Transmission Pole Structures. All welding and inspection is in accordance with the American Welding Society's Specification D1.1-latest revision. Testing and inspection reports are available upon request at the time of fabrication.

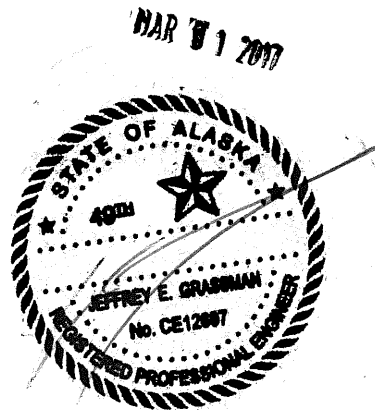
In addition, we have designed this monopole with a theoretical break point at approximately 102.58-ft elevation, by purposely over designing the pole sections below this point. In the unlikely event the pole were to fail at this point, the significant loading reduction caused by the removal of the tower wind area and weight above would greatly reduce any chance that the remaining tower would have any structural damage, thereby providing a theoretical failure zone of approximately 17.42-ft for the 120-ft AGL monopole.

I hope these comments address any issues that you might encounter relative to the anticipated performance of monopole structures and quality of steel fabrication. If you have additional questions or comments, I may be reached at 503-589-6639.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathon Neumann", written over a horizontal line.

Jonathon Neumann
Associate Engineer, EIT
Valmont Microflect





STRUCTURES

VALMONT MICROFLECT
3575 25th St. SE
Salem, OR 97302
PHONE: 1-800-547-2151
ENGINEER: Jonathon Neumann
Reviewed by: JDN

COMMUNICATION POLE DESIGN CALCULATIONS



ATC
VALMONT ORDER# 352620
SITE NAME: LEMON CREEK REBUILD, AK, 202533
POLE HEIGHT: 119FT (120 FT AGL)

valmont

STRUCTURES

3/1/17
ENGINEERING DATA
 for
ATC
LEMON CREEK REBUILD, AK, 202533
VALMONT QUOTATION 352620

- 1) STRUCTURE DESIGN CONFORMS TO EIA/TIA-222-G INCLUDING:
 105.0 MPH WIND (3 SECOND GUST, 50 YR. RETURN PERIOD)
 60.0 MPH ICE WIND (50 YR. RETURN PERIOD)
 DESIGN ICE THICKNESS = 0.25 INCHES
 EXPOSURE CATEGORY C
 STRUCTURE CLASSIFICATION II
 TOPOGRAPHIC CATEGORY 1
 60.0 MPH BASIC WIND SPEED WITH NO ICE FOR TWIST AND SWAY
 SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS AND 1 SEC.: $S_s = 0.57$ & $S_1 = 0.37$
- 2) FEEDLINES ARE ASSUMED TO BE PLACED INTERIOR TO THE POLE.
- 3) ALL MICROWAVE ASSUMED TO BE 6 GHz UNLESS OTHERWISE NOTED.
- 4) TOTAL POLE HEIGHT IS 120 FT AGL.
- 5) ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE (APPROX. 1 FT AGL).
- 6) POLE HAS A MAXIMUM THEORETICAL FALL ZONE RADIUS OF 22.5 FT.
- 7) LOADING AS FOLLOWS:
 119.0' POLE
 1 - CARRIER #1 @ 114.0
 1 - CARRIER #2 @ 110.0
 1 - CARRIER #3 @ 100.0

STRUCTURE ANCHORAGE INFORMATION

POLE HEIGHT(FT):	119	NUMBER OF A.B.'s:	18
BOLT CIRCLE(IN):	46.10	DIA. OF A.B.'s(IN):	2.25
BASE VERTICAL(K):	32.98	LENGTH OF A.B.'s(IN):	66.00
BASE SHEAR(K):	38.44	PROJECTION LENGTH(IN):	12.50
BASE MOMENT(FT-K):	3810	TEMPLATE OD(IN):	49.60



STRUCTURES

 BY _____ DATE _____
 CHKD. BY _____ DATE _____

SHEET NO. _____

3/1/17

ENGINEERING DATA

for

ATC

LEMON CREEK REBUILD, AK, 202533

VALMONT QUOTATION 352620

EIA/TIA-222-G

 BASIC WIND: 105.0 MPH
 WIND & ICE: 60.0 MPH
 TWIST & SWAY: 60.0 MPH
 S₅: 0.57
 S₁: 0.37

 DESIGN ICE THICKNESS: 0.25 IN.
 EXPOSURE CATEGORY: C
 STRUCTURE CLASS.: II
 TOPOGRAPHIC CATEGORY: 1

QTY DESCRIPTION	HEIGHT	DATA W.O. ICE		DATA W/ ICE	
		EPA	WT	EPA	WT
1 CARRIER #1	@ 114.0'	175.00	2250	197.80	3390
1 CARRIER #2	@ 110.0'	175.00	2250	197.80	3390
1 CARRIER #3	@ 100.0'	125.00	2000	147.80	3140

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

*** SUMMARY ***

Design Code: TIA-222-G Addendum 2

DESIGN SUMMARY

Height Above Base Plate (ft)	119.00	Ground Line Diameter (in)	39.000	Pole Shaft Weight (lbs)	19034
		Top Diameter (in)	19.999		
		Pole Taper (in/ft)	0.17438	Shape:	18 Sides

Connections Between Sections	/First/	/Second/	/Third/
Height Above Ground (ft)	38.50	72.00	101.58
Type	Slip Joint	Slip Joint	Flange Joint
Overlap Length (in)	65	58	0
Maximum Axial Force (lbs)	25142	17150	9241

Section Characteristics	/First/	/Second/	/Third/	/Fourth/
Base Diameter (in)	39.000	34.231	29.038	23.036
Top Diameter (in)	32.286	27.445	23.036	19.999
Thickness (in)	0.56250	0.50000	0.37500	0.21875
Length (ft)	38.500	38.917	34.417	17.417
Weight (lbs)	8205	6376	3577	876
Yield Strength (ksi)	65.00	65.00	65.00	65.00

ANALYSIS SUMMARY

	Pt. of Fixity	Governing Level Sec.1	Governing Level Sec.2	Governing Level Sec.3	Governing Level Sec.4	Pole Top
Governing Load Case	WIND	WIND	WIND	WIND	WIND	WIND
Height (ft)	0.00	0.00	38.50	72.00	101.58	119.00
Resultant Moment (in-kips)	45718	45718	28364	14250	2894	0
Shear Force (lbs)	38538	38538	36407	33670	23374	0
Axial Force (lbs)	31376	31376	18209	9138	3038	0
Effective Yield Strength (ksi)	82.55	82.55	82.55	82.55	81.63	82.55
Combined Interaction Value	0.96	0.96	0.92	0.86	0.46	0.00
Total Deflection (in)	0.00	0.00	13.69	48.95	97.65	131.03

Note: Diameters are outside, measured across the flats
Forces and moments are reported in the local element coordinate system

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

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----- SUMMARY OF SECTION DIMENSIONS AS DETAILED -----

Height Above Base Plate (ft) 119.00 Ground Line Diameter (in) 39.000 Pole Shaft Weight (lbs) 19034

Top Diameter (in) 19.999

Pole Taper (in/ft) 0.17438 Shape: 18 Sides

Connections Between Sections /First/ /Second/ /Third/

Height Above Ground (ft) 38.50 72.00 101.58

Type Slip Joint Slip Joint Flange Joint

Flange Thickness (in) 1.500

Weld Root Gap (in) 0.250

Theoretical Design Section Dimension /First/ /Second/ /Third/ /Fourth/

Base Diameter (in) 39.000 34.231 29.038 23.036

Top Diameter (in) 32.286 27.445 23.036 19.999

Thickness (in) 0.56250 0.50000 0.37500 0.21875

Length (ft) 38.500 38.917 34.417 17.417

As Detailed Section Characteristic /First/ /Second/ /Third/ /Fourth/

Base Diameter (in) 39.000 34.231 29.038 23.011

Top Diameter (in) 32.286 27.445 23.062 19.999

Thickness (in) 0.56250 0.50000 0.37500 0.21875

Length (ft) 38.500 38.917 34.271 17.271

Note: Diameter are outside, measured across the flats

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017
Fuse 1.13.0.0

*** POLE SHAFT POINT OF FIXITY REACTIONS ***

Loading Case Identifier	Moments About X-Axis (in-kips)	Moments About Y-Axis (in-kips)	Moments Resultant (X & Y) (in-kips)	Moments Torsional (in-kips)	Vertical Force (lbs)	Shear In X-Direction (lbs)	Shear In Y-Direction (lbs)	Shear Resultant (X & Y) (lbs)	Notes
WIND	35022	-29387	45718	0	31491	24711	29450	38444	
ICE + WIND	9199	-7719	12008	0	37183	6787	8088	10559	
T+S	6394	-5365	8347	0	25562	4524	5391	7038	
Seismic	3150	-2643	4112	0	30641	2314	2757	3599	

Note: Positive vertical force is downward.
Reactions are considered in the global coordinate system.

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2
Loading Case WIND

Basic Wind Velocity is 105.00 mph Ice Thickness 0.00
Wind Orientation is 50.0 Degrees Clockwise From +X Axis
Structure Weight Overload Factor is 1.200
Exposure C, Gust Factor 1.10
Structure Category 2, Topographic Category 1, Crest Height 0.00 ft
Orientations are Measured Clockwise From +X Axis
Positive Y Axis is 90 Degrees Clockwise From +X Axis
Foundation Rotation of 0.00 Degrees
Elevation of structure base above surrounding terrain = 1.00 ft

Orientation of System
+***** +X-Axis
* * (Transverse)
* *
* *
(Longitudinal) * * (Vertical)
+Y-Axis * * +Z-Axis

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	114.00	114.00	0.00	50.00	6919	8246	2700	175.00	1-CARRIER #1
2	110.00	110.00	0.00	50.00	6868	8184	2700	175.00	1-CARRIER #2
3	100.00	100.00	0.00	50.00	4809	5731	2400	125.00	1-CARRIER #3

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017
Fuse 1.13.0.0

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2
Loading Case ICE + WIND

Basic Wind Velocity is 60.00 mph Ice Thickness 0.25
Wind Orientation is 50.0 Degrees Clockwise From +X Axis
Structure Weight Overload Factor is 1.200
Exposure C, Gust Factor 1.10
Structure Category 2, Topographic Category 1, Crest Height 0.00 ft
Orientations are Measured Clockwise From +X Axis
Positive Y Axis is 90 Degrees Clockwise From +X Axis
Foundation Rotation of 0.00 Degrees
Elevation of structure base above surrounding terrain = 1.00 ft

Orientation of System
+***** +X-Axis
* * (Transverse)
* *
* *
(Longitudinal) * * (Vertical)
+Y-Axis * * +Z-Axis

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	114.00	114.00	0.00	50.00	1596	1902	4068	197.80	1-CARRIER #1
2	110.00	110.00	0.00	50.00	1584	1888	4068	197.80	1-CARRIER #2
3	100.00	100.00	0.00	50.00	1160	1383	3768	147.80	1-CARRIER #3

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2

Loading Case T+S

Basic Wind Velocity is 60.00 mph Ice Thickness 0.00
 Wind Orientation is 50.0 Degrees Clockwise From +X Axis
 Structure Weight Overload Factor is 1.000
 Exposure C, Gust Factor 1.10
 Structure Category 2, Topographic Category 1, Crest Height 0.00 ft
 Orientations are Measured Clockwise From +X Axis
 Positive Y Axis is 90 Degrees Clockwise From +X Axis
 Foundation Rotation of 0.00 Degrees
 Elevation of structure base above surrounding terrain = 1.00 ft

Orientation of System
 +***** +X-Axis
 * * (Transverse)
 * *
 * *
 * *
 (Longitudinal) * * (Vertical)
 +Y-Axis * * +Z-Axis

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	114.00	114.00	0.00	50.00	1263	1506	2250	175.00	1-CARRIER #1
2	110.00	110.00	0.00	50.00	1254	1494	2250	175.00	1-CARRIER #2
3	100.00	100.00	0.00	50.00	878	1046	2000	125.00	1-CARRIER #3

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2

Loading Case Seismic

Seismic analysis following the equivalent modal analysis procedure

Structure Category: 2

Site Class: D

Response Acceleration at short periods: 0.57

Response Acceleration at one second: 0.37

The above are used to obtain the acceleration and velocity based site coefficients F_a and F_v

Foundation Rotation of 0.00 Degrees

Elevation of structure base above surrounding terrain = 1.00 ft

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft ²)	
1	114.00	114.00	0.00	50.00	0	0	2700	175.00	1-CARRIER #1
2	110.00	110.00	0.00	50.00	0	0	2700	175.00	1-CARRIER #2
3	100.00	100.00	0.00	50.00	0	0	2400	125.00	1-CARRIER #3

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017
Fuse 1.13.0.0

*** Properties ***

Connection Locations	Distance From Base (ft)	Diameter Across Flats (in)	Wall Thickness (in)	D/t Across Flats	w/t Across Flats	Moments of Inertia (in^4)	Area (in^2)
op of Sect 4	119.00	19.999	0.2188	91.42	14.36	679	13.73
PA 1	114.00	20.871	0.2188	95.41	15.06	772	14.34
PA 2	110.00	21.568	0.2188	98.60	15.62	853	14.82
	109.00	21.743	0.2188	99.40	15.76	874	14.94
	104.00	22.615	0.2188	103.38	16.47	985	15.55
	101.58	23.036	0.2188	105.31	16.81	1042	15.84
op of Sect 3	101.58	23.036	0.3750	61.43	9.07	1749	26.97
PA 3	100.00	23.312	0.3750	62.17	9.20	1814	27.30
	99.00	23.487	0.3750	62.63	9.28	1856	27.51
	94.00	24.358	0.3750	64.96	9.69	2074	28.55
	89.00	25.230	0.3750	67.28	10.10	2308	29.58
	84.00	26.102	0.3750	69.61	10.51	2560	30.62
	79.00	26.974	0.3750	71.93	10.92	2829	31.66
	74.00	27.846	0.3750	74.26	11.33	3116	32.70
	72.00	28.195	0.3750	75.19	11.49	3237	33.11
op of Sect 2	72.00	27.445	0.5000	54.89	7.92	3921	42.76
	69.00	27.968	0.5000	55.94	8.10	4154	43.59
ase of Sect 3	67.17	28.288	0.5000	56.58	8.21	4301	44.10
	64.00	28.840	0.5000	57.68	8.41	4562	44.97
	59.00	29.712	0.5000	59.42	8.71	4996	46.36
	54.00	30.584	0.5000	61.17	9.02	5457	47.74
	49.00	31.455	0.5000	62.91	9.33	5946	49.12
	44.00	32.327	0.5000	64.65	9.64	6462	50.51
	39.00	33.199	0.5000	66.40	9.94	7008	51.89
	38.50	33.286	0.5000	66.57	9.98	7064	52.03
op of Sect 1	38.50	32.286	0.5625	57.40	8.36	7200	56.64
	34.00	33.071	0.5625	58.79	8.60	7747	58.04
ase of Sect 2	33.08	33.231	0.5625	59.08	8.65	7862	58.32
	29.00	33.943	0.5625	60.34	8.88	8387	59.59
	24.00	34.815	0.5625	61.89	9.15	9062	61.15
	19.00	35.687	0.5625	63.44	9.42	9772	62.71
	14.00	36.559	0.5625	64.99	9.70	10517	64.26
	9.00	37.431	0.5625	66.54	9.97	11300	65.82
	4.00	38.302	0.5625	68.09	10.24	12121	67.38
t of Fixity	0.00	39.000	0.5625	69.33	10.46	12806	68.62

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case WIND

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
119.00	0	0	0	0	0	0	0	0
114.00	9	-7	11	0	239	284	371	283
114.00	9	-7	11	0	7347	8755	11429	1215
110.00	434	-365	567	0	7544	8990	11736	1450
110.00	434	-365	567	0	14601	17400	22714	2406
109.00	644	-540	840	0	14648	17456	22788	2509
104.00	1700	-1427	2219	0	14898	17755	23178	2885
101.58	2217	-1860	2894	0	15025	17906	23374	3038
101.58	2217	-1860	2894	0	15021	17901	23369	3081
100.00	2558	-2147	3340	0	15112	18010	23510	3254
100.00	2558	-2147	3340	0	20098	23952	31267	4504
99.00	2846	-2388	3715	0	20147	24011	31344	4704
94.00	4297	-3606	5610	0	20421	24337	31770	5447
89.00	5768	-4840	7530	0	20695	24663	32195	6250
84.00	7259	-6091	9476	0	20966	24987	32618	7108
79.00	8769	-7358	11448	0	21235	25307	33036	8014
74.00	10299	-8642	13444	0	21516	25641	33472	8872
72.00	10916	-9160	14250	0	21643	25793	33670	9138
72.00	10916	-9160	14250	0	21618	25764	33632	9276
69.00	11849	-9942	15467	0	21823	26008	33951	10334
67.17	12423	-10424	16217	0	21936	26142	34126	11047
64.00	13421	-11261	17520	0	22094	26331	34372	11843
59.00	15012	-12597	19597	0	22356	26643	34780	13054
54.00	16623	-13948	21699	0	22611	26947	35177	14300
49.00	18251	-15315	23825	0	22858	27242	35561	15580
44.00	19898	-16696	25974	0	23097	27526	35933	16894
39.00	21561	-18092	28146	0	23370	27851	36357	18103
38.50	21728	-18232	28364	0	23402	27889	36407	18209
38.50	21728	-18232	28364	0	23354	27832	36333	18357
34.00	23241	-19502	30340	0	23624	28154	36752	20537
33.08	23552	-19762	30744	0	23635	28167	36769	21102
29.00	24939	-20926	32556	0	23784	28344	37001	22354
24.00	26651	-22362	34790	0	23966	28561	37284	23883
19.00	28375	-23809	37041	0	24131	28759	37542	25441
14.00	30110	-25266	39306	0	24278	28934	37770	27030
9.00	31856	-26730	41585	0	24411	29092	37977	28648
4.00	33611	-28203	43876	0	24553	29262	38198	30266
0.00	35022	-29387	45718	0	24771	29521	38538	31376

Deflections and Stresses for Pole

Loading Case WIND

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
119.00	84.2	100.4	131.0	7.9	9.28	0.00	0.00	0.00	0.00	0.01	82.55
114.00	78.0	93.0	121.4	7.2	9.28	0.00	0.00	0.00	0.00	0.01	82.55
114.00	78.0	93.0	121.4	7.2	9.28	0.00	0.00	0.05	0.00	0.01	82.55
110.00	73.0	87.0	113.6	6.5	9.24	0.00	0.10	0.05	0.00	0.10	82.55
110.00	73.0	87.0	113.6	6.5	9.24	0.00	0.10	0.11	0.00	0.11	82.55
109.00	71.8	85.6	111.7	6.4	9.23	0.00	0.14	0.10	0.00	0.16	82.55
104.00	65.7	78.3	102.2	5.6	9.03	0.00	0.35	0.10	0.00	0.36	82.03
101.58	62.8	74.8	97.7	5.3	8.89	0.00	0.44	0.10	0.00	0.46	81.63
101.58	62.8	74.8	97.7	5.3	8.89	0.00	0.26	0.06	0.00	0.27	82.55
100.00	60.9	72.6	94.7	5.0	8.82	0.00	0.29	0.06	0.00	0.30	82.55
100.00	60.9	72.6	94.7	5.0	8.82	0.00	0.29	0.08	0.00	0.30	82.55
99.00	59.7	71.2	92.9	4.9	8.77	0.00	0.32	0.08	0.00	0.33	82.55
94.00	53.9	64.3	83.9	4.2	8.49	0.00	0.45	0.08	0.00	0.46	82.55
89.00	48.3	57.6	75.2	3.6	8.14	0.00	0.56	0.07	0.00	0.57	82.55
84.00	43.0	51.2	66.9	3.0	7.72	0.00	0.66	0.07	0.00	0.67	82.55
79.00	38.0	45.2	59.1	2.5	7.26	0.00	0.75	0.07	0.00	0.75	82.55
74.00	33.3	39.6	51.7	2.0	6.77	0.00	0.82	0.07	0.00	0.83	82.55
72.00	31.5	37.5	48.9	1.9	6.56	0.00	0.85	0.07	0.00	0.86	82.55
72.00	31.5	37.5	48.9	1.9	6.56	0.00	0.68	0.05	0.00	0.69	82.55
69.00	28.9	34.4	44.9	1.7	6.30	0.00	0.71	0.05	0.00	0.72	82.55
67.17	27.3	32.6	42.5	1.5	6.14	0.00	0.73	0.05	0.00	0.74	82.55
64.00	24.8	29.5	38.6	1.3	5.85	0.00	0.76	0.05	0.00	0.76	82.55
59.00	21.0	25.0	32.7	1.0	5.39	0.00	0.80	0.05	0.00	0.80	82.55
54.00	17.5	20.9	27.3	0.8	4.92	0.00	0.83	0.05	0.00	0.84	82.55
49.00	14.4	17.1	22.4	0.6	4.45	0.00	0.86	0.05	0.00	0.87	82.55
44.00	11.5	13.8	18.0	0.4	3.97	0.00	0.89	0.05	0.00	0.90	82.55
39.00	9.0	10.8	14.1	0.3	3.50	0.00	0.91	0.05	0.00	0.92	82.55
38.50	8.8	10.5	13.7	0.3	3.45	0.00	0.91	0.05	0.00	0.92	82.55
38.50	8.8	10.5	13.7	0.3	3.45	0.00	0.87	0.04	0.00	0.88	82.55
34.00	6.8	8.1	10.6	0.2	3.03	0.01	0.89	0.04	0.00	0.89	82.55
33.08	6.5	7.7	10.1	0.2	2.95	0.01	0.89	0.04	0.00	0.90	82.55
29.00	5.0	5.9	7.7	0.1	2.57	0.01	0.90	0.04	0.00	0.91	82.55
24.00	3.4	4.0	5.3	0.1	2.11	0.01	0.91	0.04	0.00	0.92	82.55
19.00	2.1	2.5	3.3	0.0	1.66	0.01	0.92	0.04	0.00	0.93	82.55
14.00	1.1	1.4	1.8	0.0	1.21	0.01	0.93	0.04	0.00	0.94	82.55
9.00	0.5	0.6	0.7	0.0	0.77	0.01	0.94	0.04	0.00	0.95	82.55
4.00	0.1	0.1	0.1	0.0	0.34	0.01	0.95	0.04	0.00	0.96	82.55
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.95	0.04	0.00	0.96	82.55

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case ICE + WIND

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
119.00	0	0	0	0	0	0	0	0
114.00	3	-3	5	0	97	115	151	357
114.00	3	-3	5	0	1799	2145	2799	4319
110.00	109	-91	142	0	1879	2239	2923	4615
110.00	109	-91	142	0	3569	4254	5553	8579
109.00	160	-134	209	0	3587	4275	5580	8657
104.00	420	-352	548	0	3685	4392	5734	9048
101.58	548	-460	716	0	3736	4452	5812	9241
101.58	548	-460	716	0	3733	4449	5808	9244
100.00	633	-531	827	0	3769	4491	5863	9444
100.00	633	-531	827	0	5022	5985	7813	13139
99.00	705	-592	921	0	5038	6004	7838	13273
94.00	1070	-897	1396	0	5140	6125	7996	13936
89.00	1441	-1209	1881	0	5240	6245	8152	14626
84.00	1820	-1527	2376	0	5339	6363	8306	15342
79.00	2206	-1851	2880	0	5437	6479	8458	16084
74.00	2599	-2181	3393	0	5541	6603	8620	16844
72.00	2758	-2315	3601	0	5590	6661	8696	17150
72.00	2758	-2315	3601	0	5578	6648	8678	17159
69.00	2999	-2517	3916	0	5651	6735	8792	18202
67.17	3148	-2642	4110	0	5690	6782	8853	18852
64.00	3408	-2859	4449	0	5748	6850	8943	19501
59.00	3823	-3208	4991	0	5845	6966	9094	20546
54.00	4246	-3563	5542	0	5941	7080	9242	21623
49.00	4675	-3923	6103	0	6034	7191	9388	22730
44.00	5111	-4288	6672	0	6125	7300	9529	23867
39.00	5553	-4660	7249	0	6230	7424	9691	25026
38.50	5598	-4697	7307	0	6242	7439	9710	25142
38.50	5598	-4697	7307	0	6225	7418	9684	25152
34.00	6002	-5036	7835	0	6325	7538	9840	27357
33.08	6085	-5106	7944	0	6330	7544	9848	27820
29.00	6458	-5419	8430	0	6391	7617	9943	28905
24.00	6919	-5806	9032	0	6466	7705	10059	30260
19.00	7385	-6197	9641	0	6535	7789	10167	31648
14.00	7856	-6592	10256	0	6599	7864	10266	33067
9.00	8332	-6991	10876	0	6659	7936	10359	34517
4.00	8812	-7394	11503	0	6722	8011	10458	35993
0.00	9199	-7719	12008	0	6806	8111	10588	37175

Deflections and Stresses for Pole

Loading Case ICE + WIND

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
119.00	21.7	25.9	33.8	0.5	2.37	0.00	0.00	0.00	0.00	0.01	82.55
114.00	20.1	24.0	31.3	0.5	2.37	0.00	0.00	0.00	0.00	0.01	82.55
114.00	20.1	24.0	31.3	0.5	2.37	0.00	0.00	0.01	0.00	0.01	82.55
110.00	18.9	22.5	29.4	0.5	2.36	0.00	0.02	0.01	0.00	0.03	82.55
110.00	18.9	22.5	29.4	0.5	2.36	0.01	0.02	0.03	0.00	0.03	82.55
109.00	18.6	22.1	28.9	0.4	2.36	0.01	0.04	0.03	0.00	0.04	82.55
104.00	17.0	20.2	26.4	0.4	2.31	0.01	0.09	0.03	0.00	0.10	82.03
101.58	16.2	19.3	25.3	0.4	2.27	0.01	0.11	0.03	0.00	0.12	81.63
101.58	16.2	19.3	25.3	0.4	2.27	0.00	0.06	0.01	0.00	0.07	82.55
100.00	15.8	18.8	24.5	0.4	2.26	0.00	0.07	0.01	0.00	0.08	82.55
100.00	15.8	18.8	24.5	0.4	2.26	0.01	0.07	0.02	0.00	0.08	82.55
99.00	15.4	18.4	24.0	0.3	2.25	0.01	0.08	0.02	0.00	0.09	82.55
94.00	14.0	16.6	21.7	0.3	2.18	0.01	0.11	0.02	0.00	0.12	82.55
89.00	12.5	14.9	19.5	0.3	2.09	0.01	0.14	0.02	0.00	0.15	82.55
84.00	11.1	13.3	17.3	0.2	1.98	0.01	0.17	0.02	0.00	0.17	82.55
79.00	9.9	11.7	15.3	0.2	1.87	0.01	0.19	0.02	0.00	0.20	82.55
74.00	8.6	10.3	13.4	0.2	1.74	0.01	0.21	0.02	0.00	0.21	82.55
72.00	8.2	9.7	12.7	0.1	1.69	0.01	0.21	0.02	0.00	0.22	82.55
72.00	8.2	9.7	12.7	0.1	1.69	0.01	0.17	0.01	0.00	0.18	82.55
69.00	7.5	8.9	11.7	0.1	1.63	0.01	0.18	0.01	0.00	0.19	82.55
67.17	7.1	8.5	11.1	0.1	1.58	0.01	0.18	0.01	0.00	0.19	82.55
64.00	6.4	7.7	10.0	0.1	1.51	0.01	0.19	0.01	0.00	0.20	82.55
59.00	5.5	6.5	8.5	0.1	1.39	0.01	0.20	0.01	0.00	0.21	82.55
54.00	4.6	5.4	7.1	0.1	1.28	0.01	0.21	0.01	0.00	0.22	82.55
49.00	3.7	4.5	5.8	0.0	1.15	0.01	0.22	0.01	0.00	0.23	82.55
44.00	3.0	3.6	4.7	0.0	1.03	0.01	0.23	0.01	0.00	0.23	82.55
39.00	2.4	2.8	3.7	0.0	0.91	0.01	0.23	0.01	0.00	0.24	82.55
38.50	2.3	2.7	3.6	0.0	0.90	0.01	0.24	0.01	0.00	0.24	82.55
38.50	2.3	2.7	3.6	0.0	0.90	0.01	0.22	0.01	0.00	0.23	82.55
34.00	1.8	2.1	2.8	0.0	0.79	0.01	0.23	0.01	0.00	0.24	82.55
33.08	1.7	2.0	2.6	0.0	0.77	0.01	0.23	0.01	0.00	0.24	82.55
29.00	1.3	1.5	2.0	0.0	0.67	0.01	0.23	0.01	0.00	0.24	82.55
24.00	0.9	1.1	1.4	0.0	0.55	0.01	0.24	0.01	0.00	0.24	82.55
19.00	0.6	0.7	0.9	0.0	0.43	0.01	0.24	0.01	0.00	0.25	82.55
14.00	0.3	0.4	0.5	0.0	0.32	0.01	0.24	0.01	0.00	0.25	82.55
9.00	0.1	0.1	0.2	0.0	0.20	0.01	0.25	0.01	0.00	0.25	82.55
4.00	0.0	0.0	0.0	0.0	0.09	0.01	0.25	0.01	0.00	0.26	82.55
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.25	0.01	0.00	0.26	82.55

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017

Fuse 1.13.0.0

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case T+S

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
119.00	0	0	0	0	0	0	0	0
114.00	2	-1	2	0	43	51	67	239
114.00	2	-1	2	0	1349	1607	2098	2430
110.00	80	-67	104	0	1384	1650	2154	2628
110.00	80	-67	104	0	2680	3194	4170	4820
109.00	118	-99	154	0	2688	3204	4182	4872
104.00	312	-262	407	0	2733	3257	4252	5133
101.58	407	-341	531	0	2756	3284	4287	5262
101.58	407	-341	531	0	2755	3283	4285	5264
100.00	469	-394	613	0	2771	3302	4311	5410
100.00	469	-394	613	0	3684	4391	5731	7372
99.00	522	-438	682	0	3692	4400	5744	7468
94.00	788	-661	1029	0	3739	4456	5817	7950
89.00	1057	-887	1380	0	3786	4512	5890	8452
84.00	1330	-1116	1736	0	3833	4567	5962	8972
79.00	1606	-1348	2097	0	3879	4623	6034	9511
74.00	1885	-1582	2461	0	3928	4681	6111	10065
72.00	1998	-1677	2608	0	3951	4708	6146	10289
72.00	1998	-1677	2608	0	3946	4702	6138	10294
69.00	2168	-1819	2830	0	3981	4744	6193	11080
67.17	2273	-1907	2967	0	4000	4767	6223	11569
64.00	2455	-2060	3205	0	4028	4800	6266	12057
59.00	2745	-2303	3583	0	4074	4855	6338	12843
54.00	3038	-2549	3966	0	4120	4909	6409	13653
49.00	3335	-2798	4354	0	4164	4963	6478	14487
44.00	3635	-3050	4745	0	4208	5015	6546	15344
39.00	3938	-3304	5141	0	4257	5074	6623	16221
38.50	3968	-3330	5180	0	4263	5081	6632	16309
38.50	3968	-3330	5180	0	4255	5071	6620	16314
34.00	4244	-3561	5540	0	4304	5129	6695	18004
33.08	4301	-3609	5614	0	4307	5132	6700	18356
29.00	4553	-3821	5944	0	4335	5167	6745	19185
24.00	4865	-4082	6351	0	4371	5209	6800	20222
19.00	5180	-4346	6762	0	4404	5249	6852	21285
14.00	5496	-4612	7175	0	4434	5285	6899	22375
9.00	5815	-4880	7591	0	4463	5319	6943	23491
4.00	6136	-5149	8010	0	4493	5354	6990	24633
0.00	6394	-5365	8347	0	4533	5402	7052	25559

Deflections and Stresses for Pole

Loading Case T+S

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
119.00	15.4	18.4	24.0	0.3	1.70	0.00	0.00	0.00	0.00	0.01	82.55
114.00	14.3	17.0	22.2	0.3	1.70	0.00	0.00	0.00	0.00	0.01	82.55
114.00	14.3	17.0	22.2	0.3	1.70	0.00	0.00	0.01	0.00	0.01	82.55
110.00	13.4	15.9	20.8	0.2	1.69	0.00	0.02	0.01	0.00	0.02	82.55
110.00	13.4	15.9	20.8	0.2	1.69	0.00	0.02	0.02	0.00	0.02	82.55
109.00	13.1	15.7	20.5	0.2	1.69	0.00	0.03	0.02	0.00	0.03	82.55
104.00	12.0	14.3	18.7	0.2	1.65	0.00	0.06	0.02	0.00	0.07	82.03
101.58	11.5	13.7	17.9	0.2	1.62	0.00	0.08	0.02	0.00	0.09	81.63
101.58	11.5	13.7	17.9	0.2	1.62	0.00	0.05	0.01	0.00	0.05	82.55
100.00	11.1	13.3	17.3	0.2	1.61	0.00	0.05	0.01	0.00	0.06	82.55
100.00	11.1	13.3	17.3	0.2	1.61	0.00	0.05	0.01	0.00	0.06	82.55
99.00	10.9	13.0	17.0	0.2	1.60	0.00	0.06	0.01	0.00	0.06	82.55
94.00	9.9	11.8	15.3	0.2	1.55	0.00	0.08	0.01	0.00	0.09	82.55
89.00	8.8	10.5	13.8	0.1	1.49	0.00	0.10	0.01	0.00	0.11	82.55
84.00	7.9	9.4	12.2	0.1	1.41	0.00	0.12	0.01	0.00	0.13	82.55
79.00	6.9	8.3	10.8	0.1	1.33	0.00	0.14	0.01	0.00	0.14	82.55
74.00	6.1	7.2	9.5	0.1	1.24	0.00	0.15	0.01	0.00	0.15	82.55
72.00	5.8	6.9	8.9	0.1	1.20	0.00	0.16	0.01	0.00	0.16	82.55
72.00	5.8	6.9	8.9	0.1	1.20	0.00	0.12	0.01	0.00	0.13	82.55
69.00	5.3	6.3	8.2	0.1	1.15	0.00	0.13	0.01	0.00	0.13	82.55
67.17	5.0	6.0	7.8	0.1	1.12	0.00	0.13	0.01	0.00	0.14	82.55
64.00	4.5	5.4	7.0	0.1	1.07	0.00	0.14	0.01	0.00	0.14	82.55
59.00	3.8	4.6	6.0	0.0	0.98	0.00	0.15	0.01	0.00	0.15	82.55
54.00	3.2	3.8	5.0	0.0	0.90	0.00	0.15	0.01	0.00	0.16	82.55
49.00	2.6	3.1	4.1	0.0	0.81	0.00	0.16	0.01	0.00	0.16	82.55
44.00	2.1	2.5	3.3	0.0	0.73	0.00	0.16	0.01	0.00	0.17	82.55
39.00	1.6	2.0	2.6	0.0	0.64	0.00	0.17	0.01	0.00	0.17	82.55
38.50	1.6	1.9	2.5	0.0	0.63	0.00	0.17	0.01	0.00	0.17	82.55
38.50	1.6	1.9	2.5	0.0	0.63	0.00	0.16	0.01	0.00	0.16	82.55
34.00	1.2	1.5	1.9	0.0	0.55	0.00	0.16	0.01	0.00	0.17	82.55
33.08	1.2	1.4	1.8	0.0	0.54	0.00	0.16	0.01	0.00	0.17	82.55
29.00	0.9	1.1	1.4	0.0	0.47	0.00	0.16	0.01	0.00	0.17	82.55
24.00	0.6	0.7	1.0	0.0	0.39	0.00	0.17	0.01	0.00	0.17	82.55
19.00	0.4	0.5	0.6	0.0	0.30	0.00	0.17	0.01	0.00	0.17	82.55
14.00	0.2	0.2	0.3	0.0	0.22	0.00	0.17	0.01	0.00	0.18	82.55
9.00	0.1	0.1	0.1	0.0	0.14	0.01	0.17	0.01	0.00	0.18	82.55
4.00	0.0	0.0	0.0	0.0	0.06	0.01	0.17	0.01	0.00	0.18	82.55
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.17	0.01	0.00	0.18	82.55

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017
Fuse 1.13.0.0

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case Seismic

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
119.00	0	0	0	0	0	0	0	0
114.00	3	-3	4	0	92	110	143	284
114.00	3	-3	4	0	841	1002	1309	2967
110.00	53	-45	69	0	900	1072	1400	3204
110.00	53	-45	69	0	1480	1764	2303	5891
109.00	74	-62	97	0	1492	1778	2321	5952
104.00	183	-153	239	0	1543	1838	2400	6263
101.58	237	-198	309	0	1562	1861	2430	6417
101.58	237	-198	309	0	1561	1860	2428	6418
100.00	272	-228	355	0	1579	1882	2456	6593
100.00	272	-228	355	0	1805	2151	2808	8989
99.00	298	-250	389	0	1813	2161	2821	9101
94.00	429	-360	560	0	1846	2200	2872	9674
89.00	562	-471	733	0	1860	2217	2894	10269
84.00	695	-583	907	0	1861	2218	2896	10886
79.00	828	-695	1081	0	1855	2211	2886	11524
74.00	961	-806	1254	0	1850	2205	2878	12183
72.00	1013	-850	1323	0	1851	2206	2879	12451
72.00	1013	-850	1323	0	1848	2202	2875	12452
69.00	1093	-917	1427	0	1851	2207	2880	13392
67.17	1142	-958	1490	0	1855	2211	2886	13975
64.00	1226	-1029	1600	0	1860	2217	2893	14552
59.00	1360	-1141	1775	0	1877	2237	2921	15486
54.00	1495	-1255	1952	0	1904	2269	2962	16449
49.00	1633	-1370	2131	0	1938	2309	3014	17439
44.00	1773	-1488	2314	0	1975	2354	3073	18458
39.00	1916	-1608	2501	0	2018	2405	3140	19504
38.50	1930	-1620	2520	0	2023	2411	3147	19611
38.50	1930	-1620	2520	0	2018	2405	3140	19612
34.00	2063	-1731	2693	0	2103	2507	3272	21633
33.08	2091	-1754	2729	0	2117	2523	3293	22052
29.00	2216	-1859	2892	0	2149	2561	3343	23037
24.00	2371	-1990	3095	0	2188	2608	3404	24272
19.00	2529	-2122	3302	0	2225	2651	3461	25538
14.00	2690	-2257	3512	0	2259	2692	3514	26837
9.00	2853	-2394	3724	0	2288	2727	3559	28167
4.00	3018	-2532	3939	0	2308	2751	3591	29529
0.00	3150	-2643	4112	0	2319	2764	3608	30640

Deflections and Stresses for Pole

Loading Case Seismic

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
119.00	7.6	9.1	11.9	0.1	0.86	0.00	0.00	0.00	0.00	0.01	82.55
114.00	7.1	8.4	11.0	0.1	0.86	0.00	0.00	0.00	0.00	0.01	82.55
114.00	7.1	8.4	11.0	0.1	0.86	0.00	0.00	0.01	0.00	0.01	82.55
110.00	6.6	7.9	10.3	0.1	0.85	0.00	0.01	0.01	0.00	0.02	82.55
110.00	6.6	7.9	10.3	0.1	0.85	0.01	0.01	0.01	0.00	0.02	82.55
109.00	6.5	7.7	10.1	0.1	0.85	0.01	0.02	0.01	0.00	0.02	82.55
104.00	5.9	7.1	9.2	0.1	0.83	0.01	0.04	0.01	0.00	0.04	82.03
101.58	5.7	6.7	8.8	0.1	0.81	0.01	0.05	0.01	0.00	0.05	81.63
101.58	5.7	6.7	8.8	0.1	0.81	0.00	0.03	0.01	0.00	0.03	82.55
100.00	5.5	6.5	8.5	0.1	0.81	0.00	0.03	0.01	0.00	0.03	82.55
100.00	5.5	6.5	8.5	0.1	0.81	0.00	0.03	0.01	0.00	0.04	82.55
99.00	5.4	6.4	8.4	0.1	0.80	0.00	0.03	0.01	0.00	0.04	82.55
94.00	4.9	5.8	7.5	0.0	0.77	0.00	0.04	0.01	0.00	0.05	82.55
89.00	4.3	5.2	6.8	0.0	0.74	0.00	0.05	0.01	0.00	0.06	82.55
84.00	3.9	4.6	6.0	0.0	0.70	0.01	0.06	0.01	0.00	0.07	82.55
79.00	3.4	4.1	5.3	0.0	0.65	0.01	0.07	0.01	0.00	0.08	82.55
74.00	3.0	3.5	4.6	0.0	0.61	0.01	0.08	0.01	0.00	0.08	82.55
72.00	2.8	3.4	4.4	0.0	0.59	0.01	0.08	0.01	0.00	0.08	82.55
72.00	2.8	3.4	4.4	0.0	0.59	0.00	0.06	0.00	0.00	0.07	82.55
69.00	2.6	3.1	4.0	0.0	0.56	0.00	0.07	0.00	0.00	0.07	82.55
67.17	2.4	2.9	3.8	0.0	0.55	0.00	0.07	0.00	0.00	0.07	82.55
64.00	2.2	2.6	3.4	0.0	0.52	0.00	0.07	0.00	0.00	0.07	82.55
59.00	1.9	2.2	2.9	0.0	0.48	0.00	0.07	0.00	0.00	0.08	82.55
54.00	1.6	1.9	2.4	0.0	0.44	0.00	0.07	0.00	0.00	0.08	82.55
49.00	1.3	1.5	2.0	0.0	0.40	0.01	0.08	0.00	0.00	0.08	82.55
44.00	1.0	1.2	1.6	0.0	0.35	0.01	0.08	0.00	0.00	0.08	82.55
39.00	0.8	1.0	1.3	0.0	0.31	0.01	0.08	0.00	0.00	0.09	82.55
38.50	0.8	0.9	1.2	0.0	0.31	0.01	0.08	0.00	0.00	0.09	82.55
38.50	0.8	0.9	1.2	0.0	0.31	0.00	0.08	0.00	0.00	0.08	82.55
34.00	0.6	0.7	1.0	0.0	0.27	0.01	0.08	0.00	0.00	0.08	82.55
33.08	0.6	0.7	0.9	0.0	0.26	0.01	0.08	0.00	0.00	0.08	82.55
29.00	0.4	0.5	0.7	0.0	0.23	0.01	0.08	0.00	0.00	0.09	82.55
24.00	0.3	0.4	0.5	0.0	0.19	0.01	0.08	0.00	0.00	0.09	82.55
19.00	0.2	0.2	0.3	0.0	0.15	0.01	0.08	0.00	0.00	0.09	82.55
14.00	0.1	0.1	0.2	0.0	0.11	0.01	0.08	0.00	0.00	0.09	82.55
9.00	0.0	0.1	0.1	0.0	0.07	0.01	0.08	0.00	0.00	0.09	82.55
4.00	0.0	0.0	0.0	0.0	0.03	0.01	0.09	0.00	0.00	0.09	82.55
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.09	0.00	0.00	0.09	82.55

MINIMUM DEFLECTION RATIO // DEFLECTION LIMIT / DEFLECTION // IS

FLANGE ANALYSIS Version IMPAX-16.1.2017

FLANGE FOR THE C - D JOINT : CONTROLLING LOAD CASE WIND

Input Data

=====

Applied Reactions

Resultant Moment = 2,894 in-kips
Torsion = 0 in-kips
Resultant Shear = 23,374 lbs
Axial = -3,038 lbs

Bolts

Number of Bolts = 8
Bolt Diameter = 1.00 in
Bolt Material = A325
Bolt Circle = 27.02 in

Flange

Outside Diameter = 29.52 in
Thickness = 1.500 in
Yield Strength = 50 ksi
Tensile Strength = 65 ksi
Valmont Material Spec. = S-56

Tube

No. of sides = 18
Design Diameter = 23.036 in
Detailed "C" Sect. Dia = 23.062 in
Detailed "D" Sect. Dia = 23.011 in
Thickness = 0.3750 in
Yield = 65 ksi

Results

=====

Bolts

Maximum Bolt Axial Force = 53,946 lbs
Maximum Bolt Shear = 2,922 lbs
Tensile Strength = 120 ksi
Combined Stress Ratio = 0.99

Flange

Weight = 146 lbs
Controlling Stress = Shear
Maximum Stress Ratio = 0.65
Bending Stress Ratio = 0.23
Shear Stress Ratio = 0.65
Bearing Stress Ratio = 0.04

*** BOLT COORDINATES ***

BOLT NO.	X-COORD	Y-COORD		BOLT NO.	X-COORD	Y-COORD
1	13.51	0.00	*	2	9.55	9.55
3	0.00	13.51	*			

BY VALMONT INDUSTRIES FOR: ATC 120.0' POLE, SITE: LEMON CREEK REBUILD, AK, 202533

DATE 03/01/2017
Fuse 1.13.0.0

*** ANCHOR BOLT CHARACTERISTICS GOVERNED BY LOADING CASE WIND ***

NUMBER OF BOLTS	DIAMETER (IN.)	LENGTH (IN.)	WEIGHT (LB.)	SHIPPED AS	PROJECTION LENGTH (IN.)	GALVANIZED LENGTH (IN.)	THREAD SIZE
18	2.250	66	1954	BOLTS, TEMPLATES	12.50	66.00	4.5-UNC-2A
STEEL SPECIF.	MAXIMUM BOLT FORCE (LB.)	MAXIMUM BOLT SHEAR FORCE (LB.)	FACTORED NOMINAL TENS. STRENGTH (LB.)	STRESS AREA (SQ. IN.)	INTERACTION VALUE	CONFIGURATION OF BOTTOM END	
A615	222127	2136	260000	3.250	0.87	THREADED WITH HEAVY HEX HEAD NUT	

NOTE: BOLT INTERACTION VALUE WAS CALCULATED BY DIVIDING SHEAR FORCE BY FACTOR RELATED TO DETAIL TYPE d) IN EIA-G SPECS.

*** BOLT COORDINATES AND FORCES ***

BOLT NO.	X-COORD	Y-COORD	MAX TENSION-LB	MAX FORCE-LB	*	BOLT NO.	X-COORD	Y-COORD	MAX TENSION-LB	MAX FORCE-LB
1	23.051	0.00	36518	40017	*	2	21.661	7.884	108441	111940
3	17.658	14.817	167070	170569	*	4	11.525	19.963	205338	208837
5	4.003	22.701	218628	222127	*					

MAX. BOLT CIRCLE = 46.10 IN.

TEMPLATE DIAMETER = 52.10 IN.

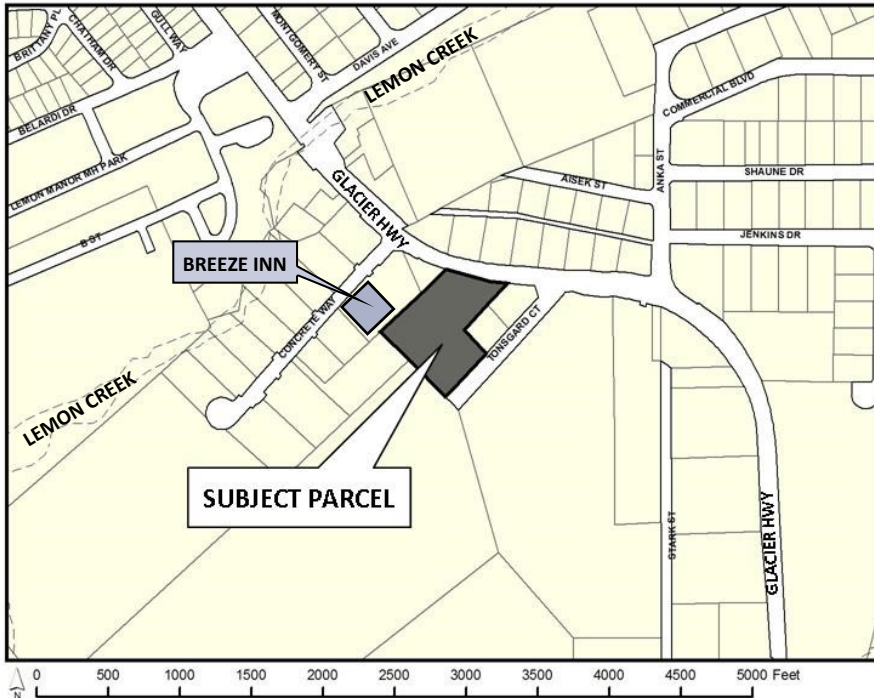
*** BASE PLATE CHARACTERISTICS GOVERNED BY LOADING CASE WIND ***

DRAWING NUMBER	OVERALL LENGTH (IN.)	OVERALL WIDTH (IN.)	THICKNESS (IN.)	ACTUAL WEIGHT (LB.)	RAW MATERIAL WEIGHT (LB.)	SIDE LENGTH (IN.)
SD18-99	52.10	52.91	3.5000	1491	2733	9.19
TOP WIDTH (IN.)	POLE DIAM. (MAJOR DIAM.) (IN.)		CRITICAL FAILURE MODE	TOTAL LENGTH OF FAIL MODE LINE (IN.)	EFFECTIVE LENGTH (IN.)	TOTAL MOMENT ALONG FAIL LINE (IN.-LB.)
9.19	39.00		2	62.11	53.61	4305927

STEEL SPECIF.	BENDING STRESS (PSI)	EFFECTIVE YIELD STRESS (PSI)	MAX. VERTICAL SHEAR STRESS (PSI)
VALMONT	OTHER		
S56	A572	39342	50000
			13255

** LOADS AT POLE BASE IN THE GLOBAL COORDINATE SYSTEM *****					LOADING CASES *****	
LOADING CASE IDENTIFICATION	WIND	ICE	T+S	Seis	]MAX CRITERION- LOAD CASE	
MOMENT ABT. X-AXIS (IN-KIP)	35022	9199	6394	3150	]MOMENT ABT. X WIND	
MOMENT ABT. Y-AXIS (IN-KIP)	- 29387	- 7719	- 5366	- 2643	]MOMENT ABT. Y WIND	
SHEAR FORCE (LB.)	38444	10559	7038	3599	]RES. MOMENT WIND	
VERTICAL FORCE (LB.)	31491	37183	25563	30641	]SHEAR FORCE WIND	
					]BOLT FORCE WIND	
					]BOLT TENSION WIND	

NOTICE OF PUBLIC HEARING



City & Borough of Juneau

Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:



PROPOSAL: A Wireless Communications Facility application to replace an existing 90 ft. tower with a 120 ft. tower.

NOTE: A balloon test will occur from June 30 to July 3, 2017. A balloon will be flown from the top of the existing tower at a height of 120 ft. in order to illustrate the height of the proposed tower.

File No:	WCF2017 0007	Applicant:	American Tower Co.
To:	Adjacent Property Owners	Property PCN:	5B1201060073
Hearing Date:	July 11, 2017	Owner:	Harvey A. Hildre
Hearing Time:	7:00 PM	Lot Size:	100,841 sq. ft. (2.32 acres)
Place:	Assembly Chambers	Zoned:	Industrial (I)
	Municipal Building	Site Address:	5641 Glacier Hwy / 5594 Tongsgard Court
	155 South Seward Street, Juneau, Alaska 99801	Accessed Via:	Glaciery Hwy / Tongsgard Court

PROPERTY OWNERS PLEASE NOTE:

You are invited to attend this Public Hearing and present oral testimony. The Planning Commission will also consider written testimony. You are encouraged to submit written material to the Community Development Department 14 days prior to the Public Hearing. Materials received by this deadline are included in the information packet given to the Planning Commission a week before the Public Hearing. Written material received after the deadline will be provided to the Planning Commission at the Public Hearing.



If you have questions, please contact Jill Maclean at jill.maclean@juneau.org or (907) 586-0756.

Planning Commission Agendas, Staff Reports and Meeting Results can be viewed at <http://www.juneau.org/assembly/novus.ph>

Date notice was printed: June 9, 2017

WCF2017 0007

A Wireless Communication Facility application to replace a 90 foot wooden tower with a 120 foot steel monopole tower.

Planning Commission Hearing

July 11, 2017



WCF2017 - 07

Applicant: American Tower Company

Property Owner: Harvey A. Hildre

Property Address: 5641 Glacier Highway /
5594 Tonsgard Court

Site Size: 100,841 sq. ft. (2.32 acres)

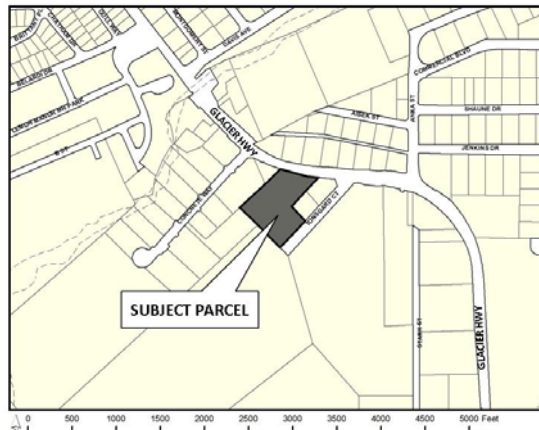
**Comprehensive Plan Future
Land Use Designation:** Heavy Industrial

Zoning: Industrial (I)

Utilities: CBJ Water/Sewer

Access: Glacier Highway / Tonsgard
Court

Existing Land Use: Existing wireless
tower, warehouse, single-family
residence, storage and containers



Surrounding Land Use:

North – Breeze-In Grocery

South – AEL&P

East – Gas N Go, Glacier Hwy

West – Capitol Disposal Landfill

WCF2017 - 07

A **special use permit** is required for WCF that do not fall under the categories of 49.65.930 Table 1 (see Attachment D).

This application requires a **SUP** per the following requirements:

1. The proposed antennas are not flush-mounted, per the requirements of 49.65.930.
2. The proposed antennas are not flush-mounted and thus are not concealed per the definition found in 49.80.120 (see Attachment E):
 - a. A Concealed WCF is defined as a “WCF equipment compound that is not readily identifiable as such (emphasis added), and is designed to be aesthetically compatible with existing and proposed building(s), vegetation, natural features, and uses on the site.”
 - i. The proposed WCF may be appropriate to the site, but due to the non-flush mounted antennas it is readily identifiable as a WCF.
3. The proposed project exceeds the “eligible facility request” standards as shown in 49.65.950 Table 1 (see Attachment C):
 - a. No substantial change as provided in 49.65.950 (b)—there is substantial change in the height of the existing and proposed towers (**30 foot increase**); and
 - b. New non-concealed tower in an Industrial zone measuring over 60 feet in height—the proposed tower is non-concealed and measures **120 feet in height**.

Comments

WCF2017 - 07

PUBLIC COMMENTS

No comments received.

WCF2017 - 07

AGENCY REVIEW

CDD conducted an Agency Review Period from May 28, 2017 to June 12, 2017. Comments received are listed below:

CBJ Building Division – No issues at this time.

Capital City Fire/Rescue – No issues at this time.

CBJ General Engineering – No issues at this time.

Juneau Police Department – No issues at this time.

CBJ Assessor's Department – No issues at this time.

AKDOT&PF – No issues at this time.

Juneau International Airport – No comments received.

FAA – As stated in their letter dated March 6, 2017 (refer to Attachment I), the FAA finds that the aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s) listed in their letter are met.

**Compliance
w/Adopted Plans**

WCF2017 - 07

2013 Comprehensive Plan:

POLICY 12.11. TO PLAN FOR AND TO ESTABLISH LAND USE CONTROLS ON WIRELESS COMMUNICATIONS FACILITIES IN A MANNER THAT IS APPROPRIATE FOR THE COMMUNITY AND WITHIN THE PARAMETERS ESTABLISHED BY FEDERAL LAW.

The subject property has a Comprehensive Land Use designation of Heavy Commercial (HI). The HI land use designation is defined as follows:

Land to be developed for heavy industrial uses such as large scale food production and/or processing; large-scale or industrial-related repair activities; metal fabrication; wholesale trade; manufacturing processes; warehousing; outdoor storage; trucking; animal kennels; crematoria; repair and maintenance uses; resource extraction and processing such as gravel pits, rock crushing facilities, cement batch plants, asphalt plants, fuel tanks, stump dumps, salvage yards, landfill sites; aircraft facilities; and other similar large-scale or noisy and/or noxious industrial activities...

WCF are deemed appropriate to the zoning and considered “other similar large-scale industrial activity”.

The project complies with the *2013 Comprehensive Plan*.

Compliance w/Adopted Plans

WCF2017 - 07

Wireless Telecommunications Master Plan (WMP):

Adopted October 29, 2014, the WMP serves as a planning tool for the City and Borough of Juneau (CBJ) that guides the future development of wireless telecommunication facilities.

POLICY 1. TO ENSURE THE PROTECTION OF THE HEALTH AND SAFETY OF THE PUBLIC WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

POLICY 2. TO PROTECT AVIATION SAFETY BY COORDINATING WITH FEDERAL AVIATION ADMINISTRATION (FAA) WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

POLICY 3. TO PROTECT THE NATURAL ENVIRONMENT WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

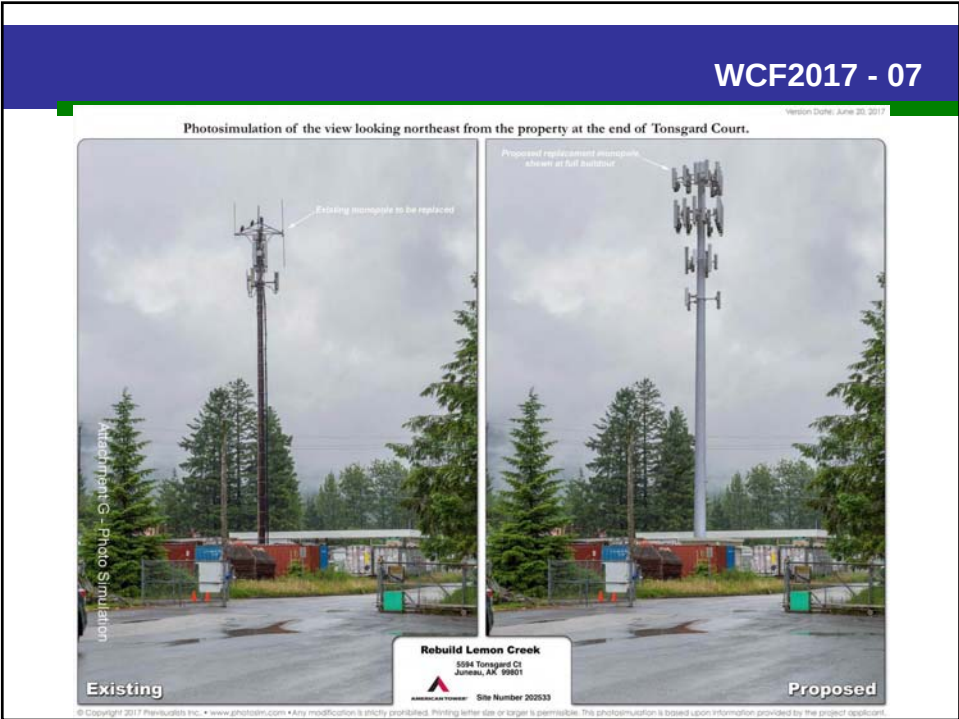
POLICY 5. PROMOTE LAND USE EFFICIENCY WITH THE COLLOCATION OF WIRELESS COMMUNICATION FACILITIES TO EXISTING STRUCTURES.

POLICY 6. TO PRESERVE THE SCENIC VIEWSHEDS AND CORRIDORS LISTED IN THE 2013 COMPREHENSIVE PLAN WITH THE DEVELOPMENT OF WIRELESS COMMUNICATION FACILITIES.

The project generally complies with the Wireless Telecommunications Master Plan.

WCF2017 - 07







WCF2017 - 07

Revision Date: June 30, 2017

Existing

Photosimulation of the view looking south from the nearest point along Glacier Hwy.

Rebuild Lemon Creek
5594 Tongard Ct
Juneau, AK 99901
Site Number 202533

Attachment G - Photo Simulation

Proposed

Photosimulation of the view looking south from the nearest point along Glacier Hwy.

Rebuild Lemon Creek
5594 Tongard Ct
Juneau, AK 99901
Site Number 202533

Existing monopoles to be replaced

Proposed replacement monopoles shown as proposed

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WCF2017 - 07

Revision Date: June 30, 2017

Existing

Photosimulation of the view looking south from the nearest point along Glacier Hwy.

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Existing monopoles to be replaced

Proposed replacement monopoles shown as proposed

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7

Recommendation

Per CBJ 49.65.970(d) and (f), the Director finds the proposed development is compliant.

It is recommended that the Planning Commission adopt the Director's analysis and findings and grant the requested Special Use Permit. The permit would allow the development of a wireless communication facility to replace a 90 foot wooden WCF with a 120 foot steel monopole WCF, and up to four (4) non-concealed antenna arrays, with the following conditions, and any changes to these conditions may require a new SUP:

1. Steel monopole must be matte gray in color;
2. Site security and signage must be installed and maintained as according to plan;
3. Lighting is not to be added to the WCF.

WCF2017 0007

A Wireless Communication Facility application to replace a 90 foot wooden tower with a 120 foot steel monopole tower.

QUESTIONS?





Community Development

(907) 586-0715

PC_Comments@juneau.org

www.juneau.org/plancomm

155 S. Seward Street • Juneau, AK 99801

COMMUNITY DEVELOPMENT NOTICE OF DECISION

Date: July 13, 2017

File No.: WCF2017 0007

American Tower Co.
ATTN: Murray Walsh
2974 Foster Ave
Juneau, AK 99801

Application For: A Wireless Communication Facility Permit to replace a 90 foot wooden tower with a 120 foot steel monopole tower and up to four (4) non-concealed antenna arrays.

Legal Description: Hildre III, Lot 3A1

Property Address: 5641 Glacier Highway / 5594 Tonsgard Court

Parcel Code No.: 5-B12-0-106-007-3

The Planning Commission, at its regular public meeting, adopted the analysis and findings listed in the attached memorandum dated July 6, 2017, and approved the replacement of a 90 foot wooden pole wireless communication facility with a 120 foot steel tower and up to four (4) non-concealed antenna arrays, to be conducted as described in the project description and project drawings submitted with the application and with the following conditions (any changes to these conditions may require a new Special Use Permit):

1. Steel monopole must be matte gray in color;
2. Site security and signage must be installed and maintained as according to plan;
3. Lighting is not to be added to the steel monopole.

This Notice of Decision does not authorize construction activity. Prior to starting any project, it is the applicant's responsibility to obtain the required building permits.

This Notice of Decision constitutes a final decision of the CBJ Planning Commission. Appeals must be brought to the CBJ Assembly in accordance with CBJ 01.50.030. Appeals must be filed by 4:30 P.M. on the day twenty days from the date the decision is filed with the City Clerk,

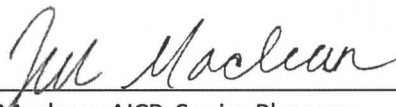
American Tower Co.
Case No.: WCF2017 0007
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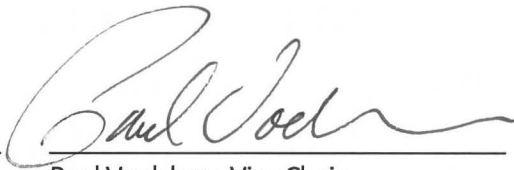
pursuant to CBJ 01.50.030 (c). Any action by the applicant in reliance on the decision of the Planning Commission shall be at the risk that the decision may be reversed on appeal (CBJ 49.20.120).

Effective Date: The permit is effective upon approval by the Commission, July 11, 2017.

Expiration Date: The permit will expire 18 months after the effective date, or January 11, 2019, if no building permit has been issued and substantial construction progress has not been made in accordance with the plans for which the development permit was authorized. Application for permit extension must be submitted thirty days prior to the expiration date.

Project Planner:


Jill Maclean, AICP, Senior Planner
Community Development Department


Paul Voelckers, Vice Chair
Planning Commission



July 18, 2017

Filed With City Clerk

Date

cc: Plan Review

NOTE: The Americans with Disabilities Act (ADA) is a federal civil rights law that may affect this development project. ADA regulations have access requirements above and beyond CBJ-adopted regulations. Owners and designers are responsible for compliance with ADA. Contact an ADA - trained architect or other ADA trained personnel with questions about the ADA: Department of Justice (202) 272-5434, or fax (202) 272-5447, NW Disability Business Technical Center (800) 949-4232, or fax (360) 438-3208.



(907) 586-0715
CDD_Admin@juneau.org
www.juneau.org/CDD
155 S. Seward Street • Juneau, AK 99801

DATE: July 6, 2017

TO: Planning Commission

FROM: Laura A. Boyce, AICP, Planner

Community Development Department

FILE NO.: AME2017 0004

PROPOSAL: A rezone request for the property at 9990 Mendenhall Loop Road from D-5 (single-family residential, 5 dwelling units per acre) to D-10 (multi-family residential, 10 dwelling units per acre).

Applicant: Duran Construction Company, LLC

Property Owner: Duran Construction Company, LLC

Property Address: 9990 Mendenhall Loop Road

Legal Description: Tract B, Blueberry Acres

Parcel Code No.: 4B2901050010

Site Size: 3.647 acres (158,863 sf)

Zoning: D-5

Comprehensive Plan
Land Use Designation: ULDR (Urban Low Density Residential)

Utilities: CBJ Water and Sewer

Access: Mendenhall Loop Road

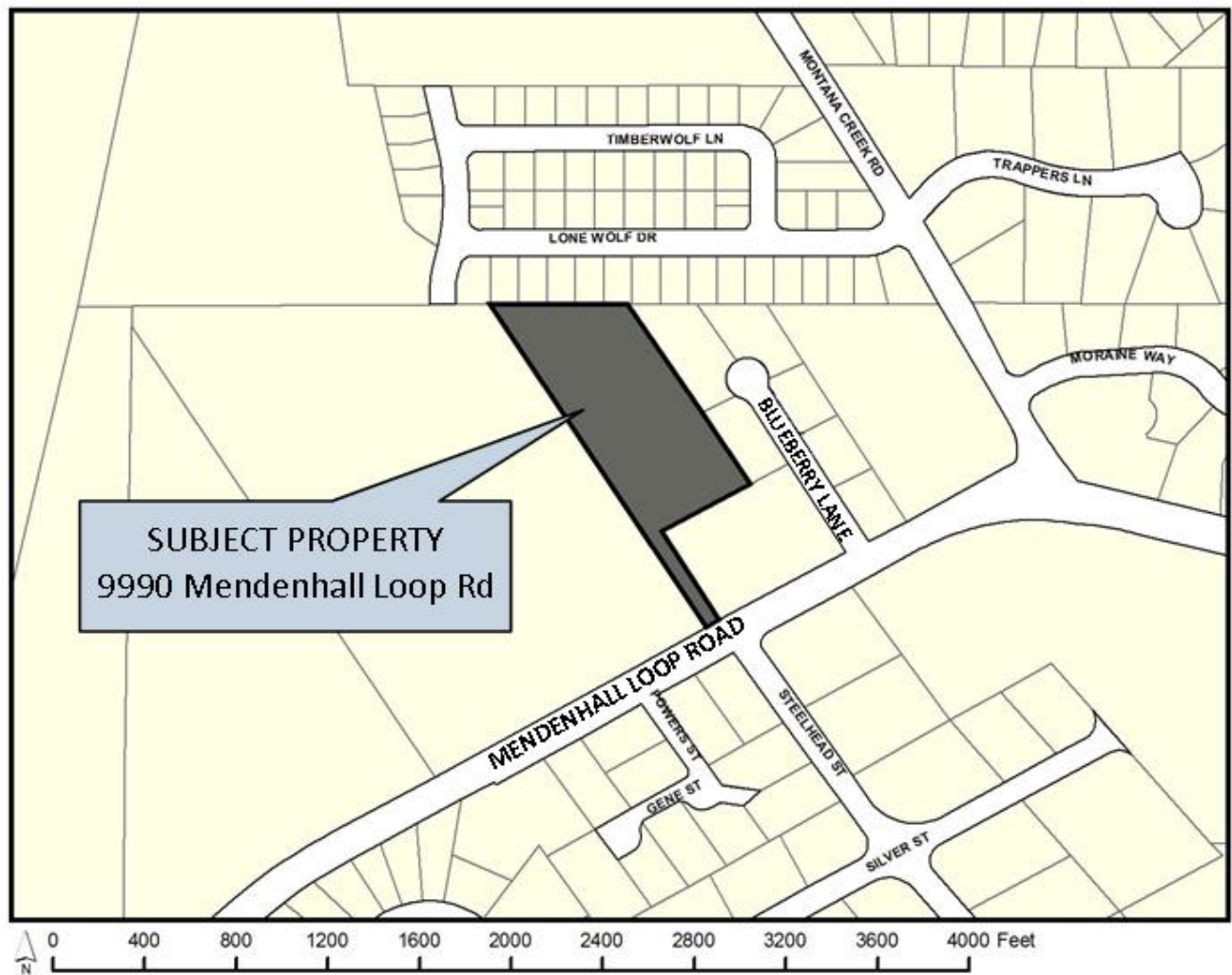
Existing Land Use: Vacant

Surrounding Land Use: North - Montana Creek West Subdivision, D-3 (Planned Unit Development developed at a density of 5/ dwelling units/acre)

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South - Single-family Residential (D-3)
 East - Single-family Residential, (D-3)
 West - Vacant (D-5), Spruce Meadow RV Park (D-1)

Vicinity Map



Attachments

Attachment A	Application Materials
Attachment B	Neighborhood Meeting Materials
Attachment C	Public Comments

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INTRODUCTION

The City and Borough of Juneau Code states in CBJ 49.10.170(d) that the Commission shall make recommendations to the Assembly on all proposed amendments to this title, zonings and re-zonings, indicating compliance with the provisions of this title and the Comprehensive Plan.

PROPOSAL

The applicant is requesting a rezone of an approximately 3.64 acre site from the existing D-5 zone district (single-family residential, five dwelling units per acre) to D-10, a multifamily designation that could allow up to 10 dwelling units per acre. The applicant states in the project narrative that the request is needed in order to provide affordable housing; the zone change to D-10 would allow for a common wall project. The applicant has stated an intention to develop common wall structures on this site at a density lower than 10 dwelling units per acre.

BACKGROUND

The subject property, Tract B of Blueberry Acres subdivision, was created by a 1980 subdivision. The property is located in the upper west Mendenhall Valley, along Mendenhall Loop Road, approximately 850 feet west of the Montana Creek Road intersection, and is located within the Urban Service Area. The 3.64 acre parcel is vacant and was cleared by the previous owner. Prior to 2005, the property was zoned D-1. In 1997 sewer was extended into the area and a number of rezones soon followed. In 2005, a number of property owners requested zone change requests to D-5; however, this property was approved for a zone change to D-3 instead of the requested D-5 (MAP2005 00006). In 2013, the subject property's owners requested, and were approved, for a zone change to D-5 (AME 2013 0004). A conditional Use permit (USE2013 0030) for a seasonal horse boarding operation for up to 40 horses was denied in 2013.

ZONE CHANGE INITIATION

The Land Use Code outlines the procedure and requirements regarding rezone requests at CBJ 49.75 *Article I, Rezoning*s.

CBJ 49.75.110. Initiation. A rezoning may be initiated by the director, the commission or the assembly at any time during the year. A developer or property owner may initiate a request for rezoning in January or July only. Adequate public notice shall be provided by the director to inform the public that a rezoning has been initiated.

1. Was the proposed zone change initiated by the property owner during the appropriate time frame OR was the zone change initiated by the commission, assembly or director?

YES. The application for the subject zone change was initiated by the property owner in January, 2017.

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2. Has the director provided adequate public notice through newspaper advertising, property owner mailings, and by requiring a public notice sign be posted on-site?

YES. A Notice of a Neighborhood Meeting regarding the rezone request was mailed to all property owners within 500 feet of the subject parcel. A Notice of Public Hearing was mailed to the same owners advising them of a July 11, 2017, hearing date. Public notice of this project was provided in the June 30, 2017 and July 10, 2017 issues of the Juneau Empire in the "Your Municipality" section.

Moreover, a public notice sign was posted on the site on Monday, June 25, visible from the right-of-way, which was at least two weeks prior to the scheduled Planning Commission hearing.

RESTRICTIONS AND PROCEDURE

The CBJ Land Use Code provides restrictions for zone district change requests.

CBJ 49.75.120. Restrictions on Rezoning. Rezoning requests covering less than two acres shall not be considered unless the rezoning constitutes an expansion of an existing zone. Rezone requests which are substantially the same as a rezoning request rejected within the previous twelve months shall not be considered. A rezoning shall only be approved upon a finding that the proposed zone district and the used allowed therein are in substantial conformance with the land use maps of the comprehensive plan.

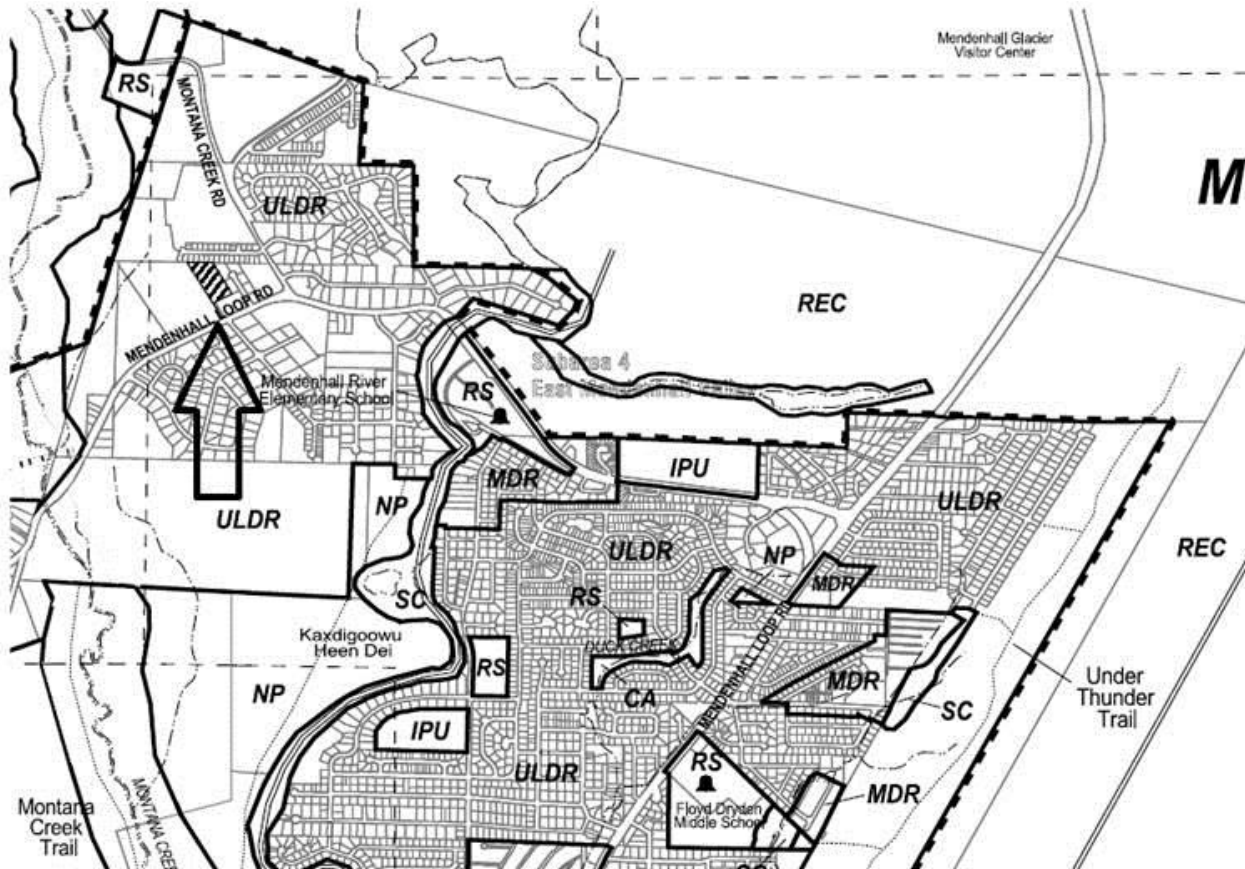
This proposal conforms to these restrictions:

1. **MET.** This is not an expansion of an existing district, but the property is more than two acres in size.
2. **MET.** There has not been a similar request made for the property within the past year.

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COMPLIANCE WITH THE 2013 JUNEAU COMPREHENSIVE PLAN

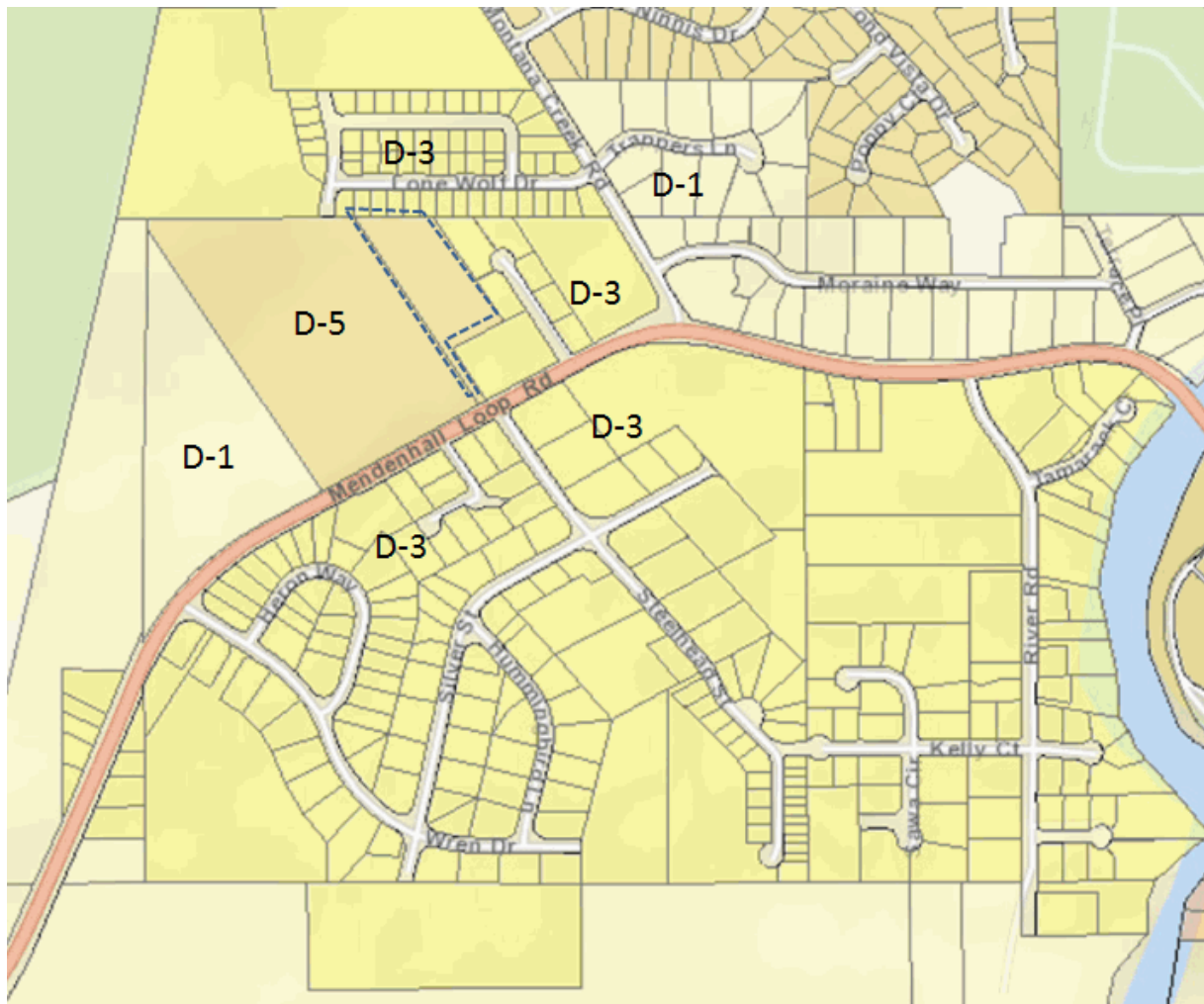
The Comprehensive Plan land use designations and zoning districts are shown on the map below:



The subject property is zoned D-5 (residential, 5 dwelling units per acre) and the 2013 Comprehensive Plan land use designation is Urban Low Density Residential (ULDR). The requested zone district of D-10 is not located in any ULDR areas within the Mendenhall Valley. Properties zoned D-15 are located east of the Mendenhall River along Riverside Drive and the Chelsea Court area, appropriately located in a Medium Density Residential (MDR, 6 to 20 dwelling units per acre) designated area. West of the subject property, D-10 and D-15 zoned properties are located in an MDR designated area around the University of Alaska near the neighborhood center of Auke Bay.

The Montana Creek West subdivision, which is a planned unit development (PUD), is zoned D-3, yet is built to cluster the development at a D-5 density. Brigadoon Estates and Montana Creek subdivisions are zoned D-5 and have densities of 4 dwelling units per acre and 2 dwelling units per acres, respectively. Multifamily zoning of D-10 would be out of character for the vicinity and in this ULDR area. The ULDR designation does not envision multifamily development within it.

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Comprehensive Plan Land Use Designations

This property is located in Subarea 3 of the 2013 Comprehensive Plan (Map E). The plan designates this property as ULDR, Urban/Low Density Residential. ULDR is described as:

These lands are characterized by urban or suburban residential lands with detached single-family units, duplex, cottage or bungalow housing, zero-lot-line dwelling units and manufactured homes on permanent foundations at densities of one to six units per acre. Any commercial development should be of a scale consistent with a single-family residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).

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The area in which the subject property is located within Subarea 3 is described as “Suburban” which is the existing character outlined in Chapter 3, Community Form, as:

Suburban areas can be found in the area east of the Mendenhall River, north of the airport and west of Thunder Mountain. This area contains the suburban scale neighborhoods of Hidden Lakes, Pleasant Gardens, Mountain View, Kristel Meadows, Montana Creek Road, the Mendenhall Loop Road area, and Glacier Village, among others. Some commercial and industrial developments can be found in clusters within these suburban areas. These non-residential uses should provide land areas that serve as buffer zones between their operations and adjacent residential uses. The suburban scale is characterized by low densities represented by single-family, detached homes built to 3 to 5 units per acre. Typical suburban mass and scale reflects 1 to 2-story homes with attached garages on parcels smaller than 1/3 acre. Discretely integrated within these suburban neighborhoods are smaller accessory apartment dwelling units located within the principal home, above or within a garage, or separately on the property. Structures are separated by modest yards, streets, sidewalks, and landscaping. Where the carrying capacity of roads permit, vacant parcels within the suburban neighborhoods served by sewers should be developed at higher residential densities to make the most efficient use of public services and infrastructure therein. Accessory apartments and/or small bungalow homes on small lots can achieve this higher density while maintaining the suburban character of the neighborhood.

The Comprehensive Plan includes “Guidelines and Considerations” for each Subarea that should influence land use decisions in those particular areas. There are nine subareas within the CBJ. Subarea 3, which includes the subject property, as well as Auke Bay and the Mendenhall Peninsula, lists 20 guidelines and considerations that are meant to influence the future direction of the area. The following is especially relevant to the proposed rezone request:

9. Encourage in-fill, small house development in the West Mendenhall Valley. However, in doing so in the West Valley, continue to protect wetlands, avoid flood hazards and provide buffer vegetation and open space/natural areas for privacy and to maintain the rural character of the West Valley community. Encourage clustering of the small cottage and bungalow houses on larger parcels to maximize the land left in a natural state to assure privacy and provide a visual and sound buffer from existing adjacent lower density residential development. New in-fill development should: (1) Preserve as much of the existing wooded areas as is practical; (2) design new building forms to mimic adjacent rural development in scale and massing while increasing density; (3) place parking out of view of the street; and (4) incorporate other appropriate building siting, orientation and design techniques to maintain the rural character of the West Valley. In new subdivisions on large parcels, encourage mixed use density developments, such as duplex, accessory dwellings and multi-family units interspersed in suitable locations within the development.

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The following policies are pertinent to this rezone request:

POLICY 3.1 TO BALANCE AVAILABILITY OF SUFFICIENT LAND WITHIN THE DESIGNATED URBAN SERVICE AREA BOUNDARY THAT IS SUITABLY LOCATED AND PROVIDED WITH THE APPROPRIATE PUBLIC SERVICES AND FACILITIES TO MEET THE COMMUNITY'S FUTURE GROWTH NEEDS AND THE PROTECTION OF NATURAL RESOURCES, FISH AND WILDLIFE HABITAT AND SCENIC CORRIDORS.

POLICY 3.2 TO PROMOTE COMPACT URBAN DEVELOPMENT WITHIN THE DESIGNATED URBAN SERVICE AREA TO ENSURE EFFICIENT UTILIZATION OF LAND RESOURCES AND TO FACILITATE COST EFFECTIVE PROVISION OF COMMUNITY SERVICES AND FACILITIES WHILE BALANCING PROTECTION OF NATURAL RESOURCES, FISH AND WILDLIFE HABITAT AND SCENIC CORRIDORS.

POLICY 4.1 TO FACILITATE THE PROVISION AND MAINTENANCE OF SAFE, SANITARY AND AFFORDABLE HOUSING FOR ITS RESIDENTS.

POLICY 4.8 TO BALANCE THE PROTECTION AND PRESERVATION OF THE CHARACTER AND QUALITY OF LIFE OF EXISTING NEIGHBORHOODS WITHIN THE URBAN SERVICE AREA WHILE PROVIDING OPPORTUNITIES FOR A MIXTURE OF NEW HOUSING TYPES.

POLICY 8.8 TO RESPOND TO THE SPECIAL TRANSPORTATION NEEDS OF EACH SUBAREA OF THE CBJ AND TO INTEGRATE THEM INTO A BOROUGH-WIDE COMPREHENSIVE TRANSPORTATION PLAN, THIS SYSTEM SHOULD SEEK TO REDUCE THE CONSUMPTION OF FOSSIL FUELS BY FACILITATING EFFICIENT ROUTES OF TRAVEL, CONVENIENT AND RAPID TRANSIT, AND SAFE MOTORIZED- AND NON-MOTORIZED TRAVELWAYS.

8.8 – IA10 Work with ADOT&PF to undertake roadway capacity, vehicular turning movement, bus pullouts and pedestrian and bicycle safety improvements within the Urban Service Area where an existing intersection Level of Service on the state route is compromised (LOS D or worse); priority improvements should be given to intersections that would serve new high-density housing developments.

POLICY 10.1 TO FACILITATE AVILABILITY OF SUFFICIENT LAND WITH ADEQUATE PUBLIC FACILITIES AND SERVICES FOR A RANGE OF HOUSING TYPES AND DENSITIES TO ENABLE THE PUBLIC AND PRIVATE SECTORS TO PROVIDE AFFORDABLE HOUSING OPPORTUNITIES FOR ALL JUNEAU RESIDENTS.

10.1 – SOP2 Designate sufficient land on the Comprehensive Plan Land Use Maps and zoning maps to provide for a full range of housing types and desired by resident households. Provide choices in residential neighborhood character such that residents can choose to live in urban, suburban, and rural residential settings and neighborhoods.

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POLICY 10.2 TO ALLOW FLEXIBILITY AND A WIDE RANGE OF CREATIVE SOLUTIONS IN RESIDENTIAL AND MIXED USE LAND DEVELOPMENT WITHIN THE URBAN SERVICE AREA.

POLICY 10.4 TO MINIMIZE CONFLICTS BETWEEN RESIDENTIAL AREAS AND NEARBY RECREATIONAL, COMMERCIAL, OR INDUSTRIAL USES THAT WOULD GENERATE ADVERSE IMPACTS TO EXISTING RESIDENTIAL AREAS THROUGH APPROPRIATE LAND USE LOCATIONAL DECISIONS AND REGULATORY MEASURES.

If approved, the rezone will allow for higher residential densities in an area served by City Water and Sewer Utilities within the Urban Service Area. All new homes must be built to comply with the latest applicable building codes of the City & Borough.

The need to protect the character of existing neighborhoods from incompatible development is an important value in our community, expressed in both the Comprehensive Plan and the Land Use Code. While development such as common wall dwellings, as the applicant has stated they wish to build, are allowed in both single-family and multifamily zone districts, multifamily development is only allowed in multifamily zones. If approved, this rezone request could change the suburban character of this neighborhood to more urban. This rezone to D-10, if approved, could allow multifamily development which is not compatible with the existing character of this neighborhood.

Discussion

As described in more detail below, Staff finds this rezone does not comply with 49.75 Article I because a rezone from D5 to D10 does not substantially conform to the land use maps of the comprehensive plan. CBJ 49.75.120 requires that a rezone can only be approved when the proposed district and uses allowed therein are in substantial conformance with the land use maps of the comprehensive plan. The ULDR designation is for Urban and Suburban areas. This portion of Subarea 3 is designated as "Suburban" in community form; it is not urbanized and thus doesn't lend itself to higher densities. Multifamily developments at densities of D-10 are not consistent with suburban areas. Also the density of 10 dwelling units per acre exceeds the maximum density of 6 dwelling units per acre in the ULDR designation. Staff finds that the requested rezone to D-10 is not in substantial conformance with the maps of the Comprehensive Plan.

Additionally, while the proposed rezone is more than 2 acres and can, according to CBJ 49.75.120, be considered without the need to be an expansion of an existing zoning district, if approved, it would be unlike any other zoning in the surrounding area. The requested rezone will provide the greatest benefit to the property owner by allowing the development of the site at a density greater than the surrounding suburban development.

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COMPLIANCE WITH CBJ LAND USE CODE

In evaluating the dimensional standards and allowed uses the primary difference between the existing zoning district and the requested zoning district is that the requested zoning allows for multifamily development. The dimensional standards, lot size, width and depth, and setbacks are the same.

According to the Land Use Code, all residential districts are established to provide a healthy, safe and pleasant environment for residential living protected from incompatible and disruptive activities. The existing D-5 zone district and the proposed D-10 district are described as follows:

The D-5, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of five dwelling units per acre. D-5 zoned lands are located in the urban service boundary and are served or can be served by public water and sewer.

The D-10 and D-15, residential districts, are intended to accommodate primarily multifamily residential development at ten and 15 units per acre respectively. These are relatively low-density multifamily districts.

Dimensional Standard Analysis

Title 49 requires that the proposed zoning district and the uses allowed therein are in substantial conformance with the land use maps of the comprehensive plan. With the exception of density and vegetative cover, the dimensional requirements between the two zone districts are the same.

Use Analysis

As stated above, a rezone can be approved when the uses allowed in the requested district substantially conform to the comprehensive plan maps. Regarding uses, both D-5 and D-10 allow almost identical uses. However, D-10 allows multifamily and small restaurants, which D-5 does not. D-5 allows for day animal services which D-10 does not.

The comprehensive plan land use designations are to be used to guide the formation of zoning regulations. The land use designations and their allowed uses reflect cultural values and economic and societal needs, and over time, the Comprehensive Plan descriptions of land use categories will change to reflect changing values and circumstances.

While the ULDR Comprehensive Plan land use designation allows for densities up to 6 dwelling units per acre, there isn't a zone district established that can achieve this higher limit of the density; there is no D-6 zone district. However, the Land Use Code does allow for the approval of density bonuses with a planned unit development (PUD). A 15% residential bonus could be applied, therefore, up to 25 dwelling units could be built on this property. While site constraints may hinder the full density potential afforded by such a bonus, it is an option available in Code to reach a higher density on the property without the need for a zone change.

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The applicant states in the narrative (see Attachment A) that a PUD isn't an option for this site because a PUD in D-5 requires that 40% of the land be set aside for common open space. In the D-10 zone district, a PUD requires that only 30% of land be allotted for common open space. The minimum site area for a PUD in D-5 is 3 acres and in D-10 is 2 acres. Single-family and multifamily units are allowed in residential PUDs regardless of the zone district. However, the 25 foot wide buffer surrounding the PUD helps ensure compatibility with the surrounding development from the more compact PUD.

Safe access to the property is crucial. Mendenhall Loop Road is a state-owned and maintained right-of-way. ADOT&PF provided comments stating that a traffic impact analysis may be required at the time of any development. The property has thirty (30) feet of frontage on the public right-of-way. The Land Use Code requires a minimum of 60 feet of right-of-way for a public street with average daily traffic trips (ADT) of 500 or less, which may be reduced to 35 feet in width. The subject property does not have enough width to provide a public street for any proposed development; thus a driveway, such as with a multifamily development or with an approved PUD, must be constructed. While there is adequate frontage (30 feet) on the public right-of-way for this property, as required by Code, a subdivision of the property isn't currently feasible without additional land area to provide a public street. The access for this potential development may be an issue unless a private driveway for multifamily development or a PUD is constructed, or the applicant acquires land from an abutting parcel.

As discussed above, the UDLR designation calls for single family development at densities up to 6 units per acre. The requested D10 zoning allows for multifamily development at a density of 10 units per acre. A multifamily development could apply for density bonuses, further increasing the density. For these reasons the requested D10 zoning is not in substantial conformance with the land use designation of UDLR and therefore not in conformance with the maps of the comprehensive plan.

PUBLIC COMMENT

The neighborhood meeting was held May 2, 2017, at the Mendenhall Valley Library. The residents that attended were concerned about traffic and safety impacts from the proposed development along Mendenhall Loop Road, the change in density and character of the area.

Written comments from concerned citizens opposing the request are in Attachment C.

SUMMARY

Many policies in the Comprehensive Plan support changing zoning to more dense zones within the Urban Service Area. However, this is also balanced with the community forms discussed in Chapter 3. The Subarea map for this area identifies this portion of the Mendenhall Valley as suburban. The suburban area is described as generally being one to two-story single-family and duplex homes at densities of 3 to 5 dwelling units per acre. The Plan recognizes an acceptable

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range of densities of 1 to 6 dwelling units per acre. The existing zoning is already consistent with those densities. A rezone request approval to D-10 would allow for densities exceeding those in the ULDR designation. No other higher density zone district, such as D-10, D-15, or even D-10 SF, is located in the vicinity. Staff finds that the request is not in substantial conformance with the maps of the Comprehensive Plan. While it is evident that this property is suitable for development, and there is a need for affordable housing, it is also clear from the Plan that D-10 densities would not be in character with the surrounding area.

FINDINGS

After review of the application materials, the CBJ Land Use Code, and the 2013 Comprehensive Plan, the Director makes the following findings:

1. The request meets the submittal requirements and the rezoning initiation, zone change restrictions, and procedural requirements of the CBJ Land Use Code. The application was timely filed in January, is more than two acres in size, and is not similar to a request made in the previous two years.
2. As discussed in the previous analysis, the request is not in substantial compliance with the Land Use maps of the Comprehensive Plan.
3. Density bonuses are existing options that the applicant may pursue in order to increase density and still be in compliance with the Comprehensive Plan land use designation of ULDR that allows densities of 1 to 6 units per acre.

STAFF RECOMMENDATION

Staff recommends that the Planning Commission adopt the Director's analysis and findings and deny the zone change from D-5 to D-10.

DEVELOPMENT PERMIT APPLICATION

Project Number AME 2017 0004	CITY and BOROUGH of JUNEAU	Date Received: 1/31/16
Project Name (City Staff to Assign Name)		

INFORMATION	Project Description Zone change from D-5 to D-10		
	PROPERTY LOCATION		
	Street Address 9990 Mendenhall Loop RD		City/Zip Juneau
	Legal Description(s) of Parcel(s) (Subdivision, Survey, Block, Tract, Lot) Blueberry Acres TR B		
	Assessor's Parcel Number(s) 4B2901050010		
	LANDOWNER/ LESSEE		
	Property Owner's Name Duran Construction Company, LLC.		Contact Person: Marciano Duran
	Mailing Address P.O. Box 32634		Work Phone: 907-780-6161
	E-mail Address mduran@acsalaska.net		Home Phone: 907-780-6162
			Other Contact Phone Number(s): 586-6161
PROJECT / APPLICANT	LANDOWNER/ LESSEE CONSENT ****Required for Planning Permits, not needed on Building/ Engineering Permits****		
	I am (we are) the owner(s) or lessee(s) of the property subject to this application and I (we) consent as follows:		
	A. This application for a land use or activity review for development on my (our) property is made with my complete understanding and permission.		
	B. I (we) grant permission for officials and employees of the City and Borough of Juneau to inspect my property as needed for purposes of this application.		
	X Landowner/Lessee Signature		Date 1/19/12
	X Landowner/Lessee Signature		Date
	NOTICE: The City and Borough of Juneau staff may need access to the subject property during regular business hours and will attempt to contact the landowner in addition to the formal consent given above. Further, members of the Planning Commission may visit the property before the scheduled public hearing date.		
	APPLICANT If the same as OWNER, write "SAME" and sign and date at X below		
	Applicant's Name Same		Contact Person:
	Mailing Address		Work Phone:
E-mail Address		Home Phone:	
		Fax Number:	
		Other Contact Phone Number(s):	
X Applicant's Signature		Date of Application 1/19/14	

STAFF APPROVALS	OFFICE USE ONLY BELOW THIS LINE			
	☒	Permit Type Building/Grading Permit	***SIGN	Date Received
		City/State Project Review and City Land Action		Application Number(s)
		Inquiry Case (Fee In Lieu, Letter of ZC, Use Not Listed)		
		Mining Case (Small, Large, Rural, Extraction, Exploration)		
		Sign Approval (If more than one, fill in all applicable permit #'s)		
		Subdivision (Minor, Major, PUD, St. Vacation, St. Name Change)		
		Use Approval (Allowable, Conditional, Cottage Housing, Mobile Home Parks, Accessory Apartment)		
		Variance Case (De Minimis and all other Variance case types)		
		Wetlands Permits		
	Zone Change Application		AME 2017 0004	
	Other (Describe)			
***Public Notice Sign Form filled out and in the file.				
Comments:			Permit Intake Initials 	

NOTE: DEVELOPMENT PERMIT APPLICATION FORMS MUST ACCOMPANY ALL OTHER COMMUNITY DEVELOPMENT DEPARTMENT APPLICATIONS

ZONE CHANGE APPLICATION

TO BE COMPLETED BY THE APPLICANT

Project Number	Project Name (15 characters)	Case Number AME 20170004	Date Received																																			
LEGAL DESCRIPTION(S) AND LIMITS OF PROPERTY TO BE REZONED: Blueberry Acres TR B, Parcel# 4B2901050010																																						
IS THIS AN EXPANSION OF AN EXISTING ZONE? ☐ Yes ☒ No																																						
Total Land Area of Proposed Change <u>3.7</u> acres		Comp Plan Designation <u>ULDR</u>																																				
Current Zone(s) <u>D-5</u>		Comp Plan Map <u>E</u>																																				
New Zone Requested <u>D-10</u>																																						
TYPE OF ZONE CHANGE REQUESTED: ☒ Regular ☐ Transition																																						
HAS THIS OR A SIMILAR ZONE CHANGE BEEN REQUESTED IN THE PREVIOUS 12 MONTHS? ☐ Yes ☒ No																																						
UTILITIES AVAILABLE: WATER: ☒ Public ☐ On Site SEWER: ☒ Public ☐ On Site																																						
PURPOSE OF THE REQUESTED ZONE CHANGE: Increase density for potential development.																																						
IS THERE A PROPOSED USE OF THE LAND? ☒ Yes ☐ No PROPOSED BUFFERS TO ADJACENT ZONES? ☒ Yes ☐ No																																						
DESCRIBE (INCLUDING TYPE AND DENSITY OF PROPOSED DEVELOPMENT): Build 24 Zero Lots Homes. Need a D-6 zone which doesn't exist.																																						
DESCRIBE ANY POTENTIAL IMPACTS TO PUBLIC INFRASTRUCTURE: STREETS: Access to and from Mendenhall Loop Road WATER: City water stub on site SEWER: City sewer stub on site																																						
For more information regarding the permitting process and the submittals required for a complete application, please see the reverse side. If you need any assistance filling out this form, please contact the Permit Center at 586-0770.	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:40%;">ZONE CHANGE FEES</th> <th style="width:10%;">Fees</th> <th style="width:10%;">Check No.</th> <th style="width:10%;">Receipt</th> <th style="width:10%;">Date</th> </tr> </thead> <tbody> <tr> <td>Application Fees</td> <td>\$ 600⁰⁰</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Admin. of Guarantee</td> <td>\$</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Adjustment</td> <td>\$</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pub. Not. Sign Fee</td> <td>\$ 50⁰⁰</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pub. Not. Sign Deposit</td> <td>\$ 100⁰⁰</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Fee</td> <td>\$ 750⁰⁰</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			ZONE CHANGE FEES	Fees	Check No.	Receipt	Date	Application Fees	\$ 600 ⁰⁰				Admin. of Guarantee	\$				Adjustment	\$				Pub. Not. Sign Fee	\$ 50 ⁰⁰				Pub. Not. Sign Deposit	\$ 100 ⁰⁰				Total Fee	\$ 750⁰⁰			
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NOTE: MUST BE ACCOMPANIED BY DEVELOPMENT PERMIT APPLICATION FORM

Zone Change Application Instructions

Pre-Application Conference: A pre-application conference is required prior to submitting an application. The applicant will meet with City & Borough of Juneau staff to discuss the proposed Zone Change, the permit procedure and the application fee. To schedule a pre-application conference, please contact the Permit Center at 586-0770 or via e-mail at Permits@ci.juneau.ak.us.

Application: An application for a Zone Change will not be accepted by the Community Development Department until it is determined to be complete. **A developer or property owner may apply for a Zone Change only in the months of January and July.** The items needed for a complete application are:

Forms: A completed Zone Change Application and Development Permit Application form. The "land owner or lessee consent" signature is mandatory for all landowners on the Development Permit Application form.

Fees: The fee for Zone Change Application is \$600.00. Any development, work or use done without a permit issued will be subject to double fees. All fees are subject to change.

Project Description: A detailed letter or narrative describing the purpose for the requested change.

Plans: A traffic study may be required for zone changes. A site plan, drawn to scale, is required for all Zone Change Applications. The site plan should include the following information:

- A. The boundaries of the existing and proposed zone change and proposed buffers;
- B. The location of existing structures (i.e. buildings, fences, signs, parking areas, etc.); and
- C. The location of existing physical features of the site (i.e. drainage, topography, eagle trees, hazard areas, salmon streams, wetlands, etc.).

Document Format: All information that is submitted as part of an application shall be submitted in either of the following formats:

- A. Electronic copies may be submitted by CD, DVD or E-mail in the following formats: .doc, .txt, .xls, .bmp, .pdf, .jpg, .gif, .xlm, .rtf or other formats pre-approved by the Community Development Department.
- B. Paper copies may not be larger than 11" X 17" (Unless a larger paper size is preapproved by the Community Development Department).

Application Review & Hearing Procedure: Once the application is determined to be complete, the Community Development Department will initiate the review and scheduling of the application. This process includes:

Review: As part of the review process the Community Development Department will evaluate the application for consistency with all applicable City & Borough of Juneau codes and adopted plans. Depending on unique characteristics of the Zone Change Application request, the application may be required to be reviewed by other municipal boards and committees. During this review period, the Community Development Department will coordinate the review of this application by other agencies, as necessary. Review comments may require the applicant to provide additional information, clarification, or submit modifications/alterations for the proposed Zone Change.

Hearing: All Zone Change Applications must be reviewed by the Planning Commission who sends a recommendation to the Assembly. Once an application has been reviewed by all applicable parties the Community Development Department will schedule the zone change for the next appropriate Planning Commission meeting. Following a recommendation of approval by the Planning Commission, the Community Development Department will coordinate the zone change review by the Assembly. In order for zone changes to become effective, they must be adopted by ordinance by the CBJ Assembly.

Public Notice Responsibilities: As part of the Zone Change process, all requests must be given proper public notice, which consists of the following:

Community Development Department: Will give notice of the pending Planning Commission meeting and its agenda in the local newspaper a minimum of 10-days prior to the meeting. Furthermore, the department will mail abutters notices to all property owners within 500-feet of the project site.

Applicant: Will post a sign on the site at least 14-days prior to the meeting. Signs may be produced by the Community Development Department for a preparation fee of \$50, and a \$100 deposit that will be refunded in full if the sign is returned by 4:30 p.m. on the Monday following the scheduled hearing date. If the sign is returned later than the Monday after the Planning Commission meeting, but within two weeks of the meeting, \$50.00 may be refunded. The applicant may make and erect their own sign. Please speak with the Community Development Department for more information.

INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED

Zone Change Request Narrative:

Property for consideration is owned by Duran Construction Co, LLC, and is located at 9990 Mendenhall Loop road in Juneau Alaska.

The property is easily accessed off of Back Loop Road and is within the CBJ Urban Service Area serviced by CBJ water, sewer and bus service. The topography is fairly flat. It has been cleared and filled by the previous owner and is currently vacant, less a couple storage tents.

This property is located close to recreation including hiking trails, Mendenhall River School and not far from UAS.

The current zone is D-5. We are requesting a change to D-10, although the proposed project is less the 10 units per acre.

Why D-5 doesn't work?

In an effort to bring affordable housing to Juneau, Duran Construction Co, LLC, as the Developer and Contractor we are looking at developing this property at a lower price point than other developments we have been and currently working on. We are proposing 20 common wall units at a sales price of \$299,000 and under. At the existing D-5 zoning we could develop 12 single family homes on this property with sales price of \$450,000 or more. The re-zone would allow a sales price of \$299,000 which would bring more affordable housing units to Juneau's tight housing market.

D-5 dimensional standards do not allow the 20 units proposed on this site. The 7,000 s.f. minimum lot size constricts the feasibility of the zero-lot development units. To meet this standard, 14,000 s.f. lots would be needed for common wall development.

D-10 dimensional standards require a 5,000 s.f minimum lot size. This reduction in lot size from 7,000 to 5,000 s.f. minimum allows for this project to be realized.

Why not PUD?

Current code requires a 40% common open space in D-5. The size of this property is 3.7 acres or 158,863 s.f. The 40% common space is a reduction of 63,545.20 s.f., leaving only 95,317 s.f. for construction of 20 common wall units, the access street, sidewalk and improvements, and drainage. To meet the common open space an approximate 43' set back will be required. Implementing all the restrictions/ requirements reduces the units and makes the project unfeasible.

Comprehensive Plan:

The proposed re-zone is in keeping with the Comprehensive Plan ULDR Zone which is described as "zero-lot line dwellings...at densities of one to six units per acre."

Parcel #	Street Address	Legal Description 1
4B2901050010	MENDENHALL LOOP RD 9990	BLUEBERRY ACRES TR B

Owner's Name and Address

DURAN CONSTRUCTION COMPANY LLC
PO BOX 32634
JUNEAU AK
99803

Previous Owner	Site Value	Building PV	Total PV
ROBERT & KELLY PETER	\$ 166300.00	\$ 3800.00	\$ 170100.00

Use Code	Exempt	Zoning	Tax Year
Vacant	No Data	-Single Family and Duplex -7,000 sq.ft minimum lot size -5 units per acre	2016

Number of Units	Year Built	Gross Living Area
001	1971	000672 sq.ft.

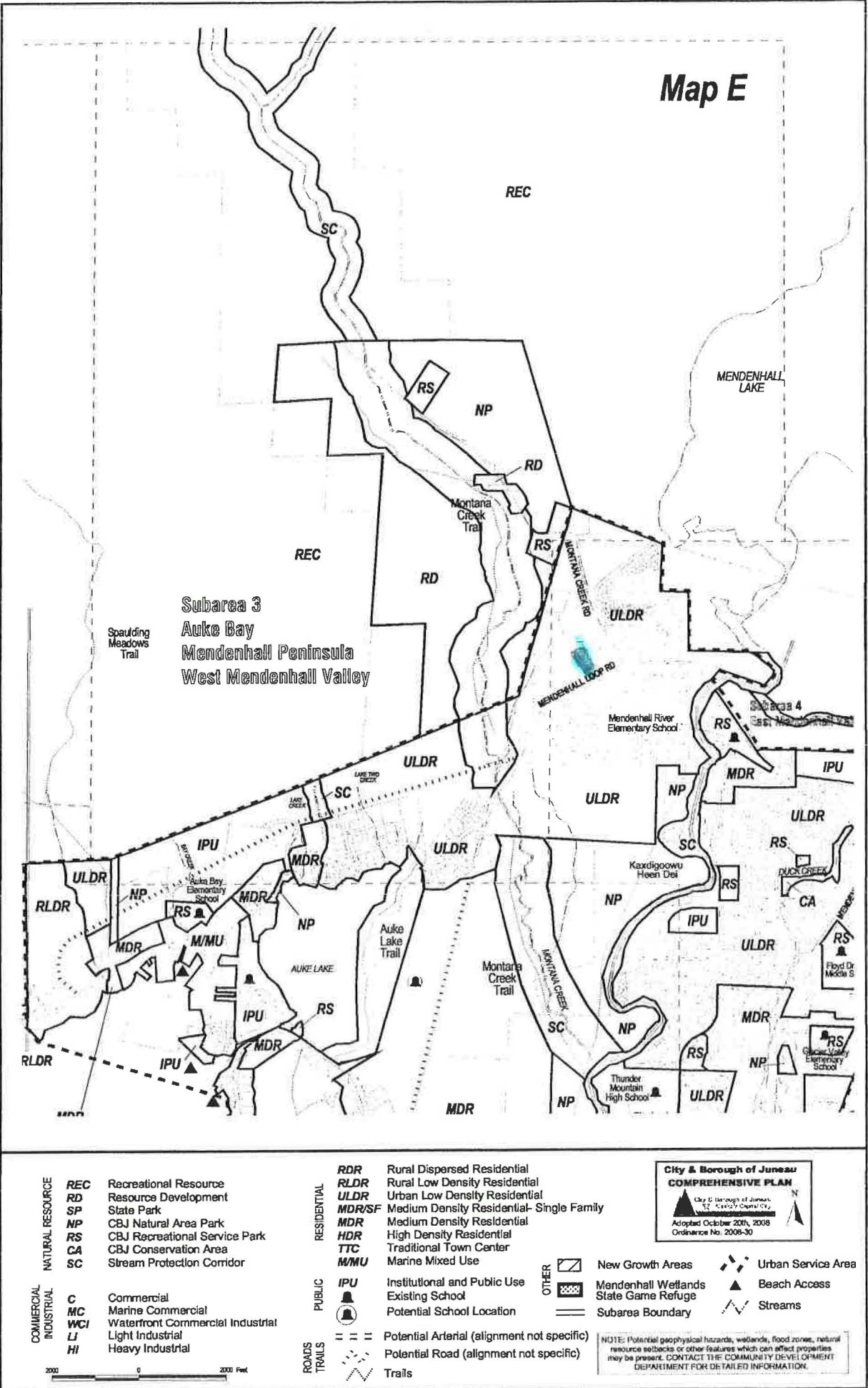
Garage	Garage Area	Lot Size	Last Trans
No	N/A	158863.00 sq. ft.	0505

City Water Available	City Sewer Available
Yes	Yes

Exempt Land	Exempt Building	Exempt Total	Road/No Road
N/A	N/A	N/A	Roaded

Back

D-5

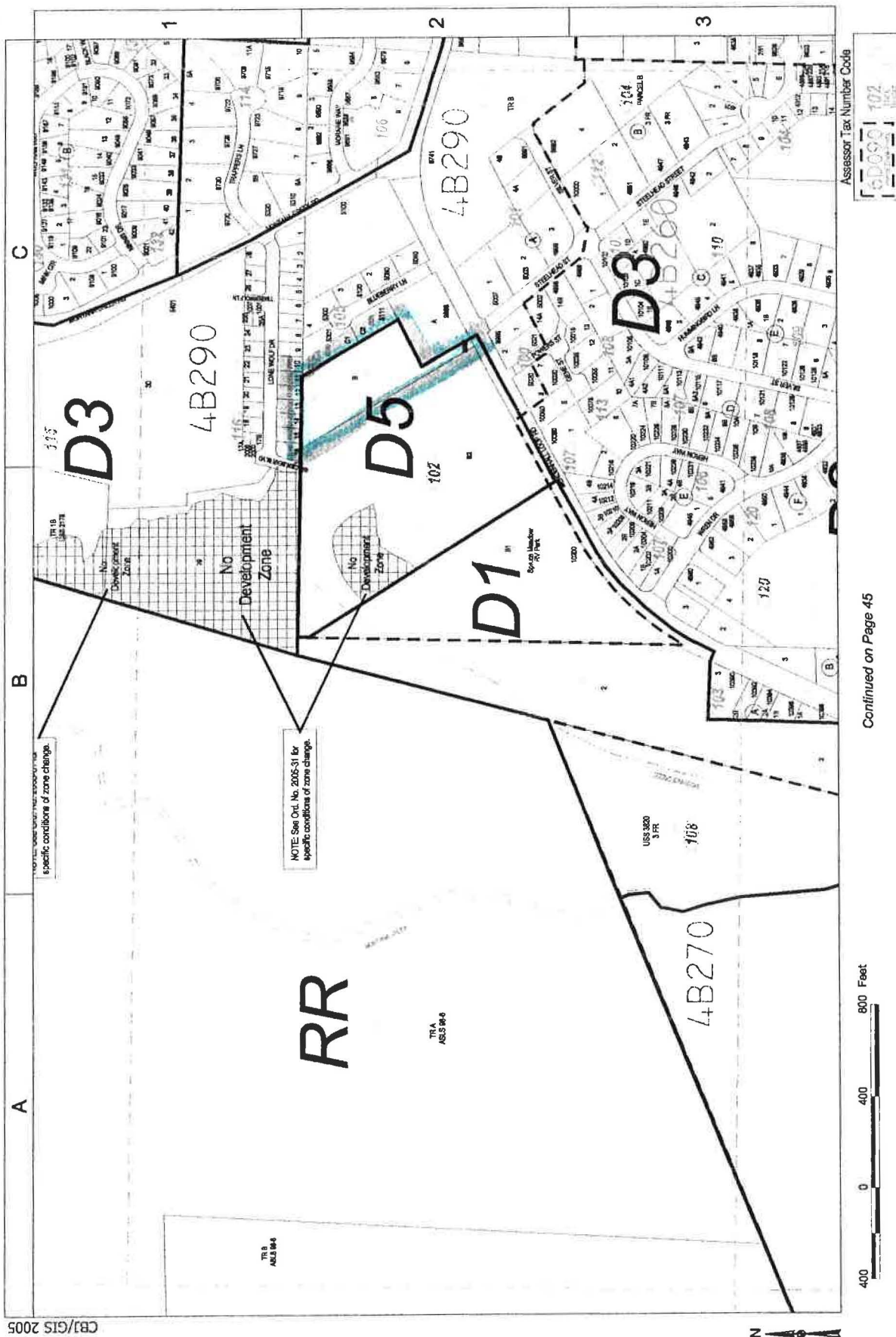


4B290/4B270

Continued on Page 43

Continued on Page 40

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AGENDA

Neighborhood Meeting For Proposed Rezone of 3.7 acres FROM: D-5 TO: D-10

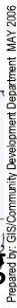
May 2nd, 2017
Valley Library
6:30pm

- Welcome – Introductions
- Why we are here? – Application and Rezone Process
- Proposed Project –
 - o Applicant
- What happens next? –
 - o Review and Staff Report – Please send comments to:
Laura A. Boyce, Senior Planner or laura.boyce@juneau.org
155 S. Seward St.
Community Development Department
Juneau, AK 99801
Ph: (907)586-0753
 - o Planning Commission public hearing (notice will be mailed to you) **(TBD)**
 - o Assembly meetings – two meetings
 - Ordinance Introduction
 - Ordinance Public Hearing
 - If approved – ordinance goes into effect 30 days after public hearing
- Questions, Comments, and Concerns -

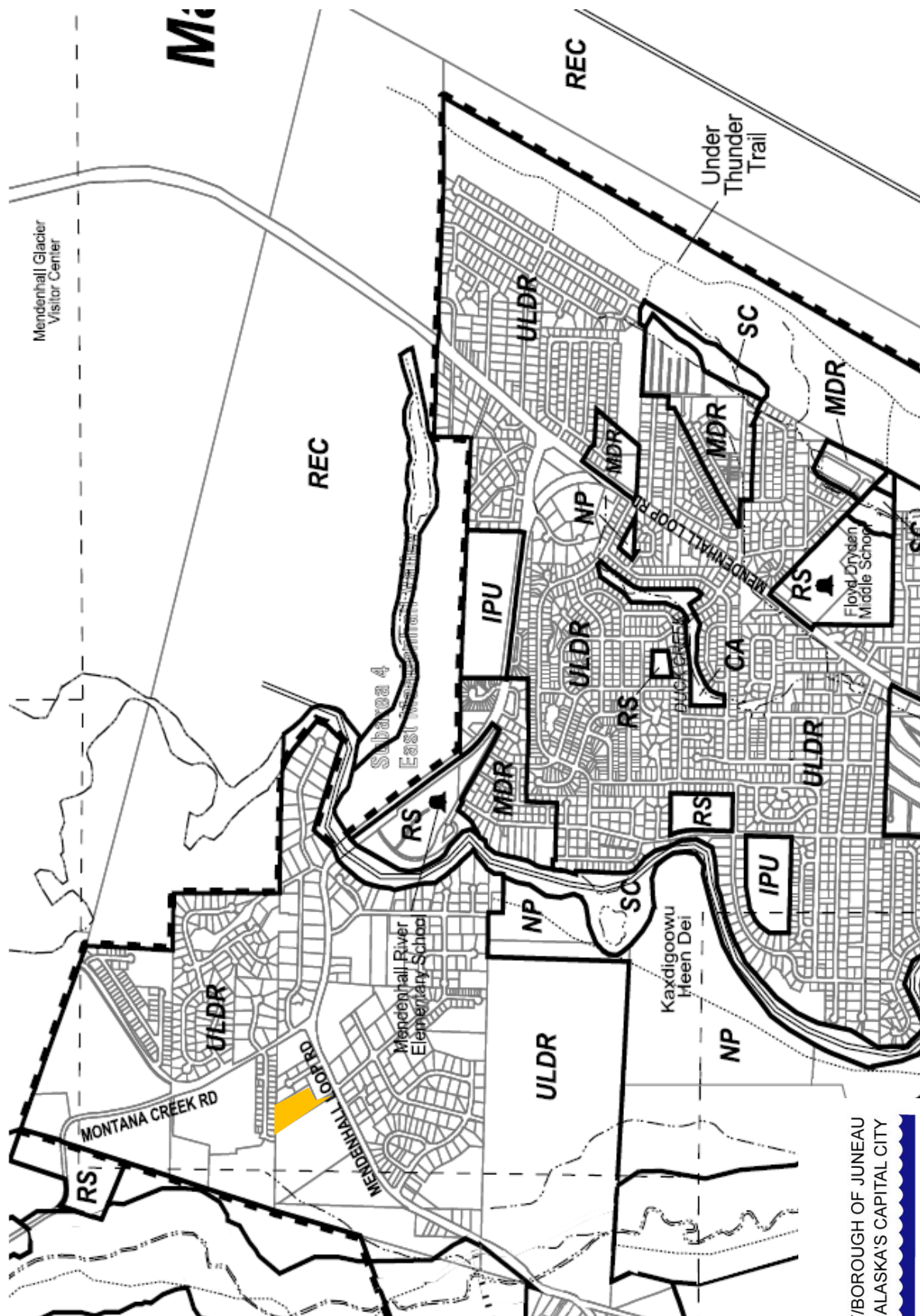
Proposed Rezone of Property Parcel No. 4B2901050010 9990 Mendenhall Loop Road

**Neighborhood Meeting
May 2, 2017**

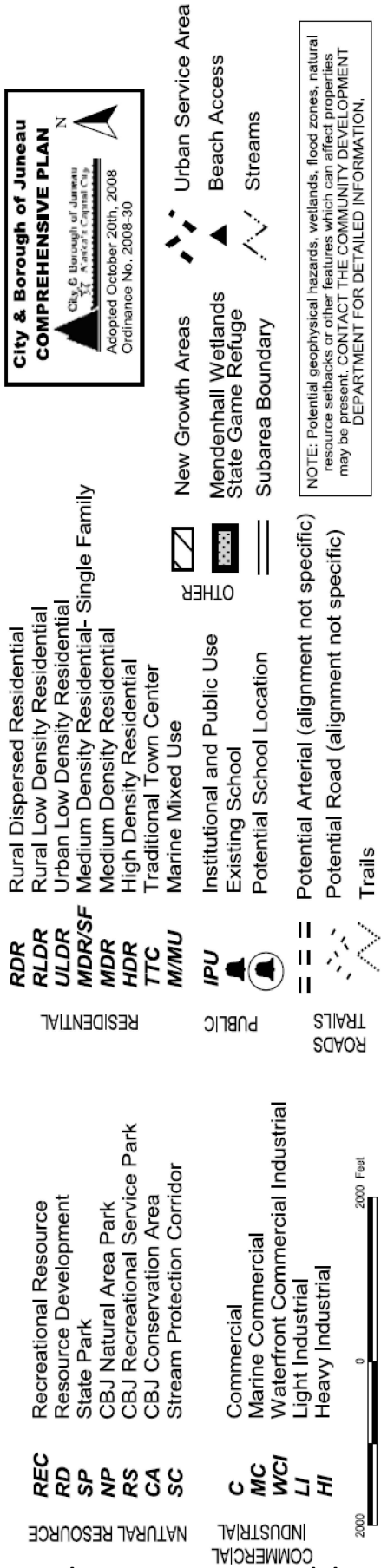
A revision to the official Zoning Atlas of the CBJ



Comprehensive Plan Land Use Designation



Comprehensive Plan Land Use Designation



Urban/Low Density Residential (ULDR).

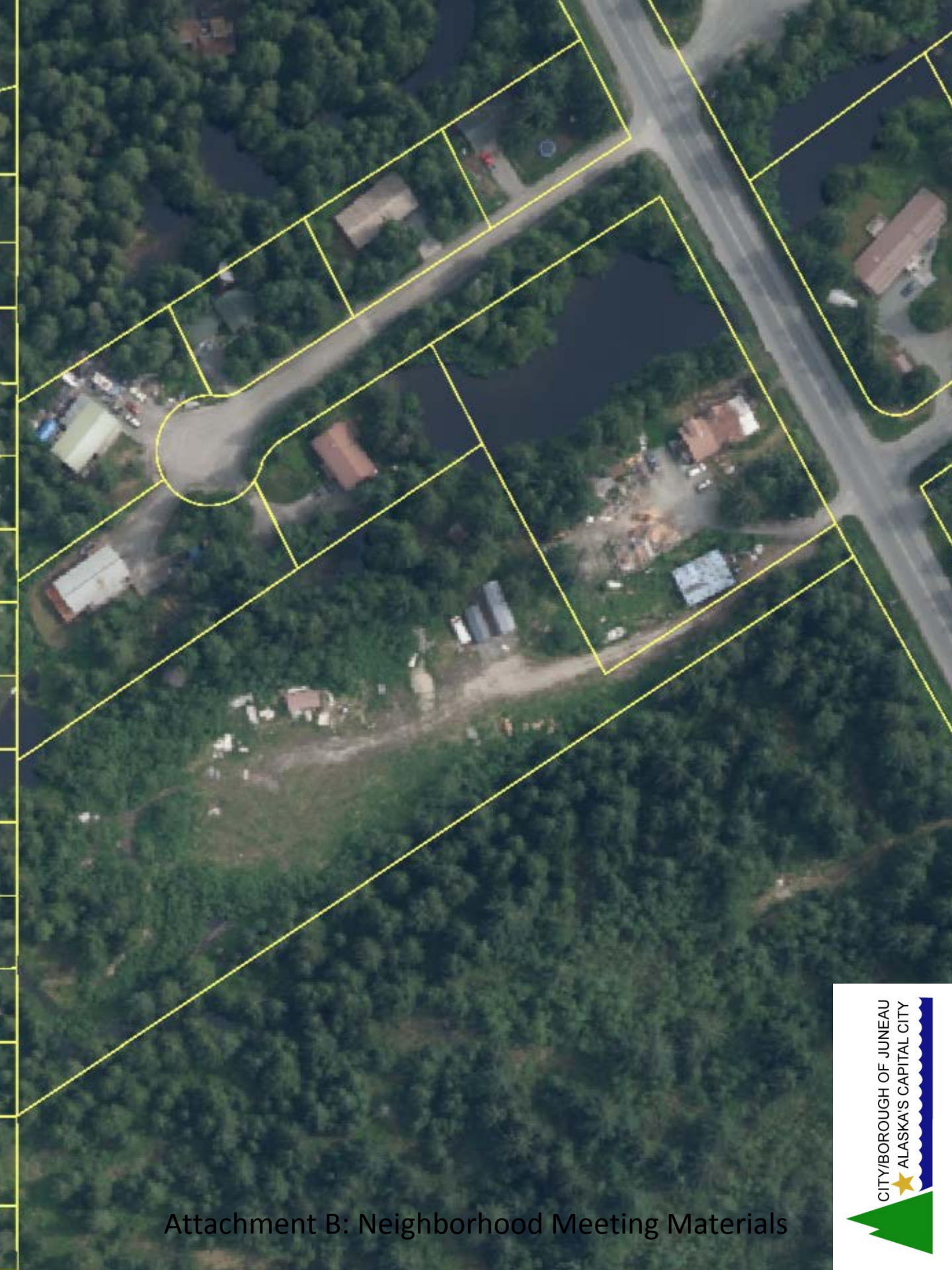
These lands are characterized by urban or suburban residential lands with detached single-family units, duplex, cottage or bungalow housing, zero-lot-line dwelling units and manufactured homes on permanent foundations at densities of one to six units per acre. Any commercial development should be of a scale consistent with a single-family residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).

Medium Density Residential (MDR).

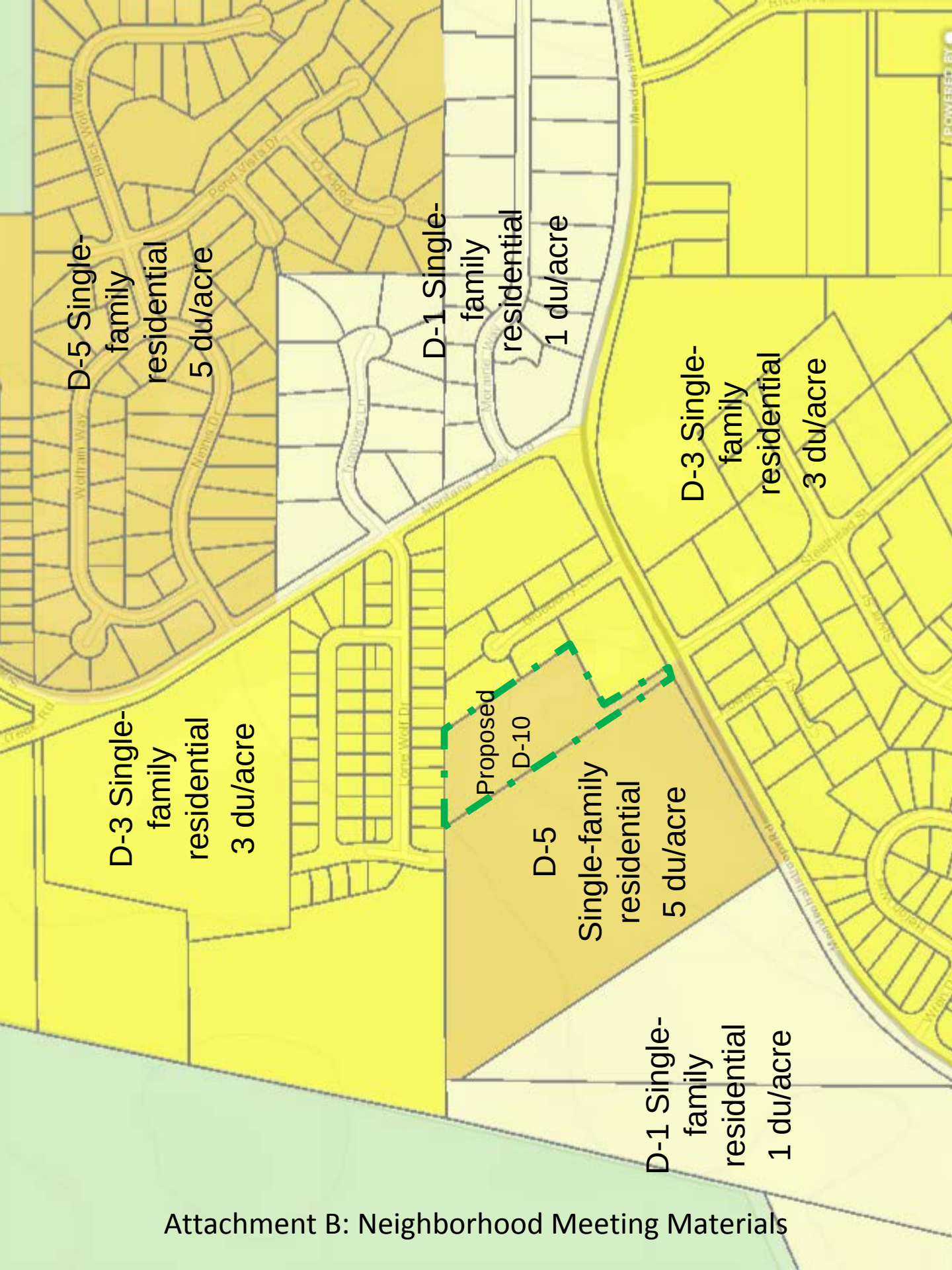
These lands are characterized by urban residential lands for multifamily dwelling units at densities ranging from 5 to 20 units per acre. Any commercial development should be of a scale consistent with a residential neighborhood, as regulated in the Table of Permissible Uses (CBJ 49.25.300).



Attachment B: Neighborhood Meeting Materials



Attachment B: Neighborhood Meeting Materials



Rezone Request

19.25.210 Residential districts.

The following districts are established to provide a healthy, safe and pleasant environment for residential living protected from incompatible and disruptive activities:

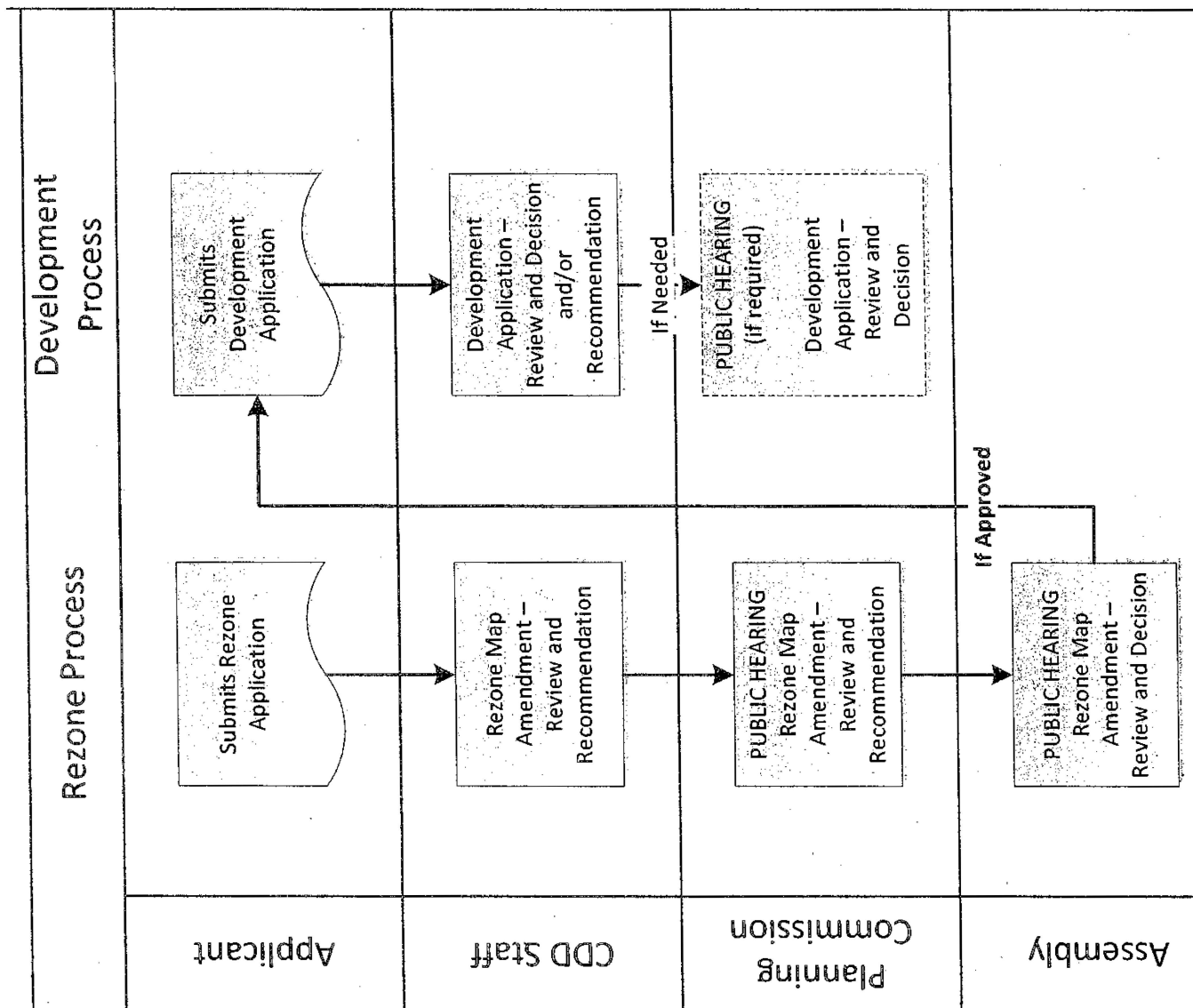
(b) The D-3, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of three dwelling units per acre. D-3 zoned lands are primarily located outside the urban service boundary where public utilities are not provided. The density reflects the existing pattern of development of properties in the district. There is a limited amount of D-3 zoned lands located within the urban service boundary. These are lands for which a lower density is deemed appropriate or, in the case of transition zones, where the zoning will be changed to a higher density when sewer and water are provided.

(c) The D-5, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of five dwelling units per acre. D-5 zoned lands are located in the urban service boundary and are served or can be served by public water and sewer.

(d) The D-10 and D-15, residential districts, are intended to accommodate primarily multifamily residential development at ten and 15 units per acre respectively. These are relatively low-density multifamily districts.

Rezone Request

Table of Dimensional Standards Existing site – 3.7 acres	D-5 (5 du/acre)	D-10 (10 du/acre)
Number of Units (max*)	19 dwelling units	37 dwelling units
Maximum Height Limit	35 feet	35 feet
Maximum Lot Coverage	50%	50%
Vegetative Cover	20%	30%
Minimum Lot Size	7,000 sf	6,000 sf
Minimum Lot Depth	85 feet	85 feet
Minimum Lot Width	70 feet	50 feet
Common Wall Lot Size	7,000 sf	5,000 sf
Common Wall Lot Width	60 feet	40 feet
Common Wall Lot Depth	85 feet	85 feet



Any questions?



Attachment B: Neighborhood Meeting Materials

Laura Boyce

From: Val Horner <hornak49v@gci.net>
Sent: Saturday, June 17, 2017 9:40 AM
To: Laura Boyce
Subject: File number AME2017 0004

Laura, please see my original message below your response of May 02. I appreciate the notice sent to us about the proposed rezone of acreage across from Steelhead Street for Duran's complex.

My husband and I continue to be in strong opposition to Duran's proposal to change the zoning to 10 units per acre, regardless of how many acres he proposes to use. I repeat that this area of the valley is zoned for family residential units of single or duplex design. The original planners did not intend this area to be apartment complexes or high occupancy per acre or the original planning would have included that.

Opening these 3.6 acres to 10 per acre will set a precedence that other acreage in the neighborhoods can be zoned for 10 units per acre.

We are unable to attend the public meeting. Please ensure our objection to the rezoning will be presented to the Planning Commission as if we were able to attend the meeting.

Val and Bob Horner
 4999 Steelhead Street

From: Laura Boyce [<mailto:Laura.Boyce@juneau.org>]
Sent: Tuesday, May 02, 2017 8:19 AM
To: Val Horner
Subject: RE: Rezone of Mendenhall Loop Road Property

Mr. and Mrs. Horner,

Thank you for your comments. They will be included in the staff report to the Planning Commission for their consideration.

I'm attaching the applicant's project narrative and application materials for your use. If you have any additional questions or comments, please contact me. We will let you know when the Planning Commission public hearing has been scheduled.

Thank you for your time,

Laura

Laura A. Boyce, AICP
Senior Planner

Community Development Department
 City and Borough of Juneau
 907.586.0753

laura.boyce@juneau.org

From: Val Horner [<mailto:hornak49v@gci.net>]
Sent: Monday, May 01, 2017 11:30 AM
To: Laura Boyce
Subject: Rezone of Mendenhall Loop Road Property

I cannot make the meeting tomorrow May 2 at the Mendenhall Library.

My husband and I have a home on Steelhead Street. We are opposed to changing the zoning to 10 units per acre.

This area is a family/residential area. 10 units per acre must mean apartment buildings. This will change the nature of our family neighborhoods. All the homes in this area, including the Montana Creek area, are single or duplex homes. They are in quiet neighborhoods with a reasonable population in each subdivision. My understanding is that Duran has approximately 5 acres, meaning at least 50 units. This can only be an apartment complex. Rezoning will also open it up to other developers to put in apartment complexes.

Also, the proposed site for Duran's development is near a curve in the road that will cause a traffic hazard with such an increased volume of traffic. Traffic has increased considerably on the Back Loop over the past 10 years, including many buses. Putting this particular development in is a traffic issue and not a good idea.

Just because Juneau housing is needed does not mean we should ignore common sense and the nature of the established neighborhoods, not to mention the original intent of the Planning Commission and established zoning requirements.

Val and Bob Horner
4999 Steelhead Street
Juneau, AK 99801

Attachment B: Neighborhood Meeting Materials

Laura Boyce

From: Allan <aculbreath@gci.net>
Sent: Monday, July 03, 2017 12:44 PM
To: Laura Boyce
Subject: Proposed Duran Rezone

Laura,

I strongly request that you consider the following while evaluating Duran's proposal for rezoning at 9990 Loop Road; I reside at 5111 Blueberry Lane in a quite rural subdivision comprised of six single family homes located directly adjacent to the properties identified for rezoning. I purchased the property, then D-1, in 1994 because of it's county type setting with ponds on two sides of the property. Since then the city has allowed Bicknell Construction and Duran's property to be rezoned to allow D-5 alongside and behind Blueberry Lane that is at present D-3. Now the City has been asked to consider Duran's proposal to go to D-10 adding 20 units on 3.7 acres in any area that has been dedicated to single family homes not apartment type dwellings. How can this even be a zoning consideration for this area. In all fairness consider the property owners my neighbors on both sides of the Loop Road that payed for one thing and now have the potential to get something entirely different. I am stongly opposed and can only hope that the City can for-see the repercussions a change like the one proposed will have on the adjacent home owners.

Thanks for your consideration
 Sincerely; Allan Culbreath

Laura Boyce

From: Karen & Jed Dinnan <dinnans@gmail.com>
Sent: Wednesday, June 28, 2017 11:30 PM
To: Laura Boyce
Subject: Rezoning of Blueberry Lane

The rezone request for Blueberry Lane seems inappropriate, haphazard and unfair to the other residents. According to the comprehensive plan, because of the wetlands in this area, development should be limited. The increased density could affect the water table, and would most likely affect existing homeowners' property values and quality of life. Please reject this rezone request on Blueberry Lane.

Sincerely,
Karen Dinnan
10905 Mendenhall Loop Rd
Juneau, AK 99801

Laura Boyce

From: Val Horner <hornak49v@gci.net>
Sent: Saturday, June 17, 2017 9:40 AM
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Laura

Laura A. Boyce, AICP
Senior Planner

Community Development Department
 City and Borough of Juneau
 907.586.0753

laura.boyce@juneau.org

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Val and Bob Horner
4999 Steelhead Street
Juneau, AK 99801

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Val and Bob Horner
4999 Steelhead Street
Juneau, AK 99801

Laura Boyce

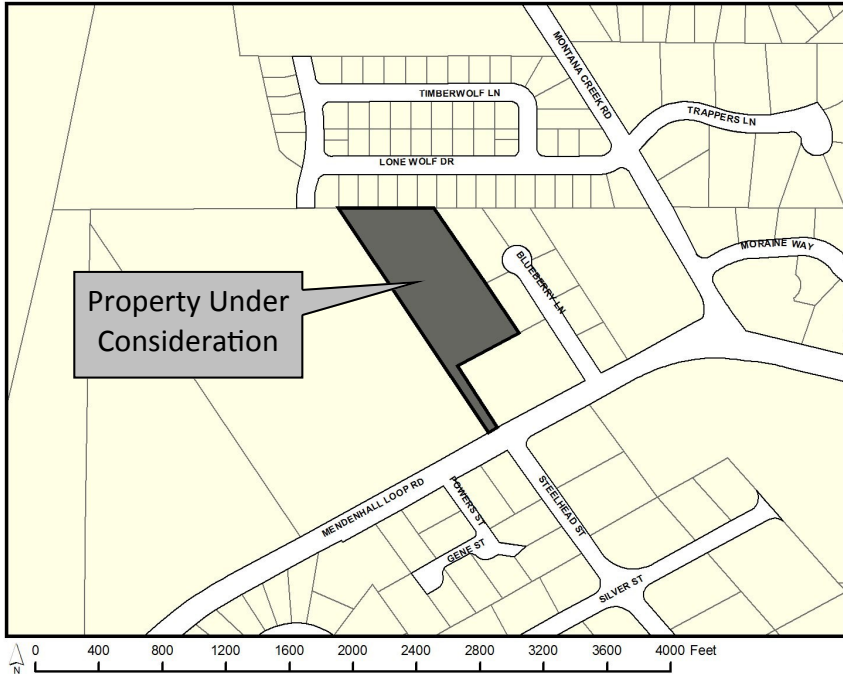
From: kach-mor@gci.net
Sent: Sunday, July 02, 2017 11:30 AM
To: Laura Boyce
Subject: 9990 mendenhall loop rd

Laura,

My name is John Etheridge I live at 5301 Blueberry Lane . And am opposed to Duran Construction rezoning proposal at 9990 loop road . I have lived on blueberry adjacent to Duran property for 22 years when I built in 1995 it was D1 zoning wanting a rural setting since then the city has allowed Bicknell construction to go D5 right behind and now thinking of letting Duran go to D10 right next to me and wondering in all fairness to me and the rest of my neighbors how can this be happening? I hope that the city will give great thought to this and the repercussions will cause to all the house holds next to him.

Thanks for your consideration,
John Etheridge

NOTICE OF NEIGHBORHOOD MEETING



City & Borough of Juneau
Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:



Notice of Neighborhood Information Meeting for a Proposed Rezone of a Mendenhall Loop Road Property

Mendenhall Valley Public Library
Tuesday, May 2, 6:30 to 8:00 pm

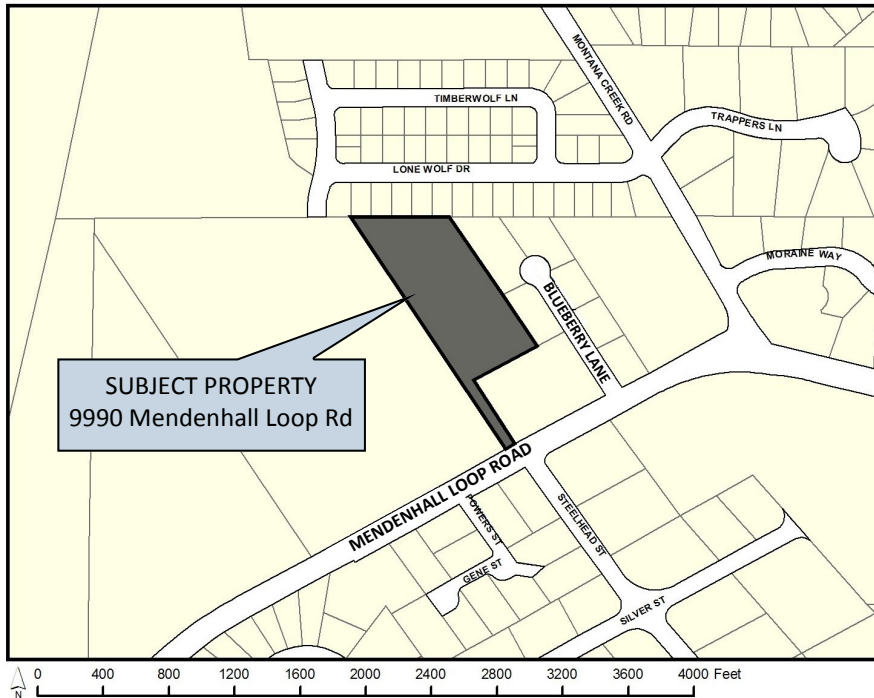
Dear Resident,

The **CBJ Community Development Department** is **hosting a neighborhood meeting** to discuss a proposal from Duran Construction Company to rezone the property at 9990 Mendenhall Loop Road from D5 (single-family residential, 5 dwelling units per acre) to D10 (multi-family residential, 10 dwelling units per acre). We encourage you to share your comments, questions and any concerns on **Tuesday, May 2, from 6:30 to 8 pm at the Mendenhall Valley Library large meeting room.**

If you are not able to attend the meeting but would like more information or to offer your comments, please contact Laura Boyce, Community Development Planner, at 586-0753 or laura.boyce@juneau.org.

The proposal, AME2017 0004, has not yet been scheduled for **review by the Planning Commission**, however once it is scheduled to be heard, all landowners within 500 feet of the proposed rezone will receive a separate notice with details on how and where to submit comments or testify on the proposal.

NOTICE OF PUBLIC HEARING



City & Borough of Juneau

Community Development Department
155 S Seward St • Juneau, Alaska 99801

SHIP TO:



PROPOSAL: A rezone request for the property at 9990 Mendenhall Loop Road from D-5 (single-family residential, 5 dwelling units per acre) to D-10 (multi-family residential, 10 dwelling units per acre).

File No:	AME2017 0004	Applicant:	Duran Construction Co. LLC
To:	Adjacent Property Owners	Property PCN:	4B2901050010
Hearing Date:	July 11, 2017	Owner:	Duran Construction Co. LLC
Hearing Time:	7:00 PM	Lot Size:	158,862 sq. ft. (3.6 acres)
Place:	Assembly Chambers Municipal Building 155 South Seward Street Juneau, Alaska 99801	Zoned:	D-5
		Site Address:	9990 Mendenhall Loop Road
		Accessed Via:	Mendenhall Loop Road

PROPERTY OWNERS PLEASE NOTE:

You are invited to attend this Public Hearing and present oral testimony. The Planning Commission will also consider written testimony. You are encouraged to submit written material to the Community Development Department 14 days prior to the Public Hearing. Materials received by this deadline are included in the information packet given to the Planning Commission a week before the Public Hearing. Written material received after the deadline will be provided to the Planning Commission at the Public Hearing.



If you have questions, please contact Laura Boyce at laura.boyce@juneau.org or (907) 586-0753.

Planning Commission Agendas, Staff Reports and Meeting Results can be viewed at <http://www.juneau.org/assembly/novus.php>

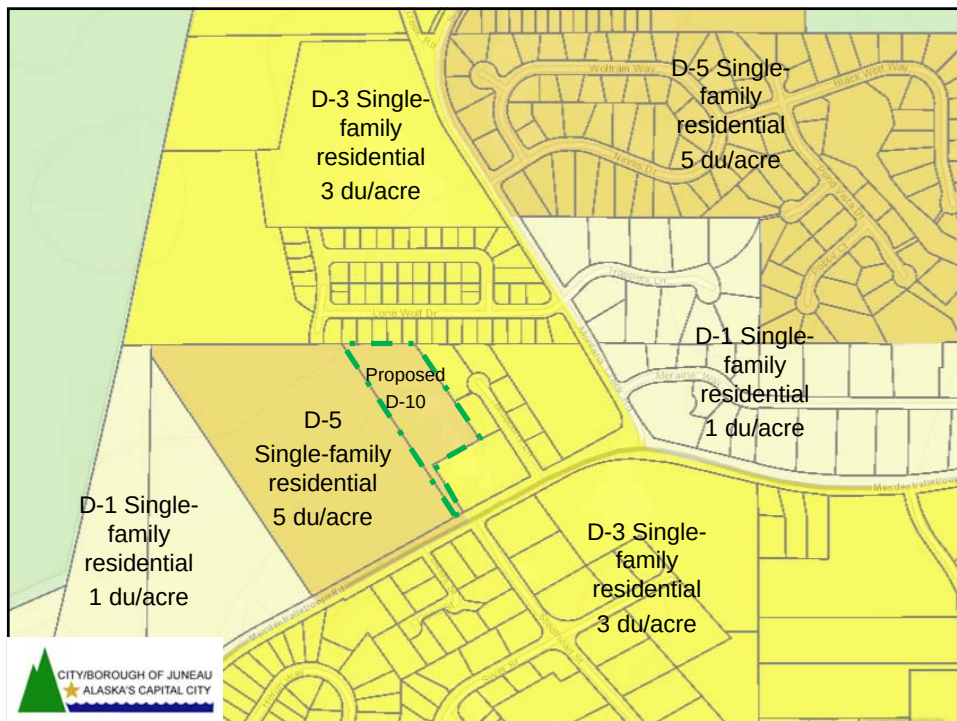
Proposed Rezone of Property Parcel No. 4B2901050010 9990 Mendenhall Loop Road

Planning Commission Meeting
July 11, 2017



Overview

Site Size:	3.64 acres (158,863 square feet)
Property Owner/Applicant:	Duran Construction Company, LLC.
Existing Zoning:	D-5 (5 du/acre)
Comprehensive Plan Land Use Designation:	ULDR (Urban Low Density Residential)
Utilities:	City water and sewer
Access:	Mendenhall Loop Road
Existing Land Use:	Vacant



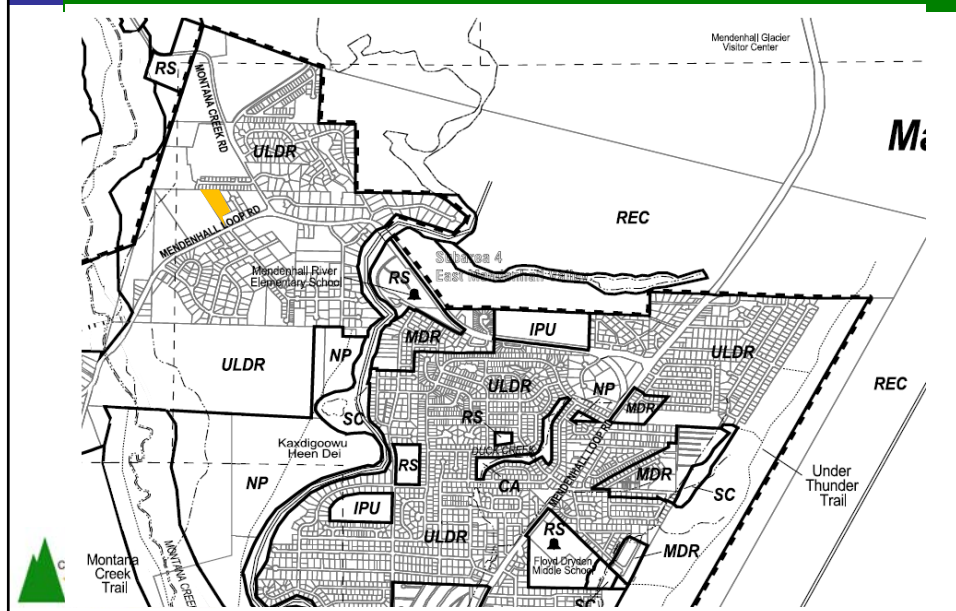
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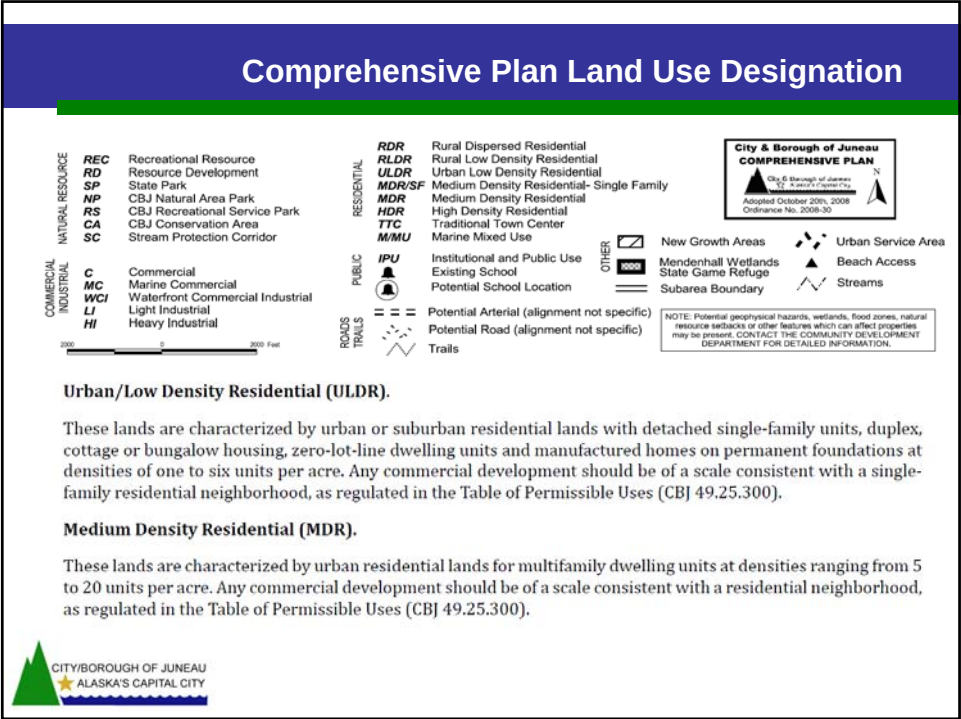
Zoning History:

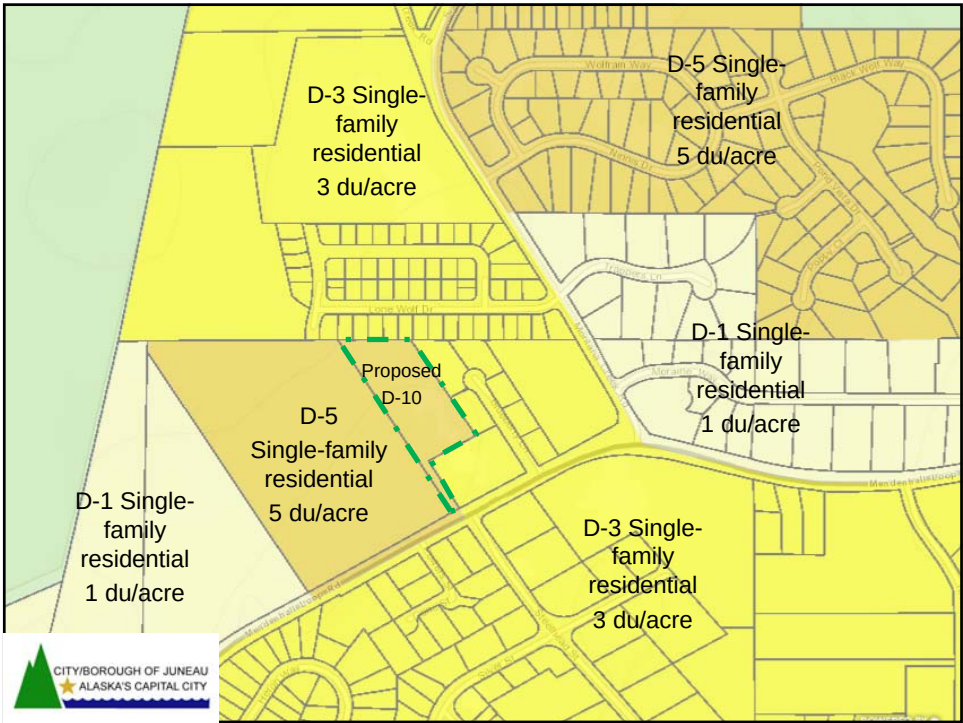
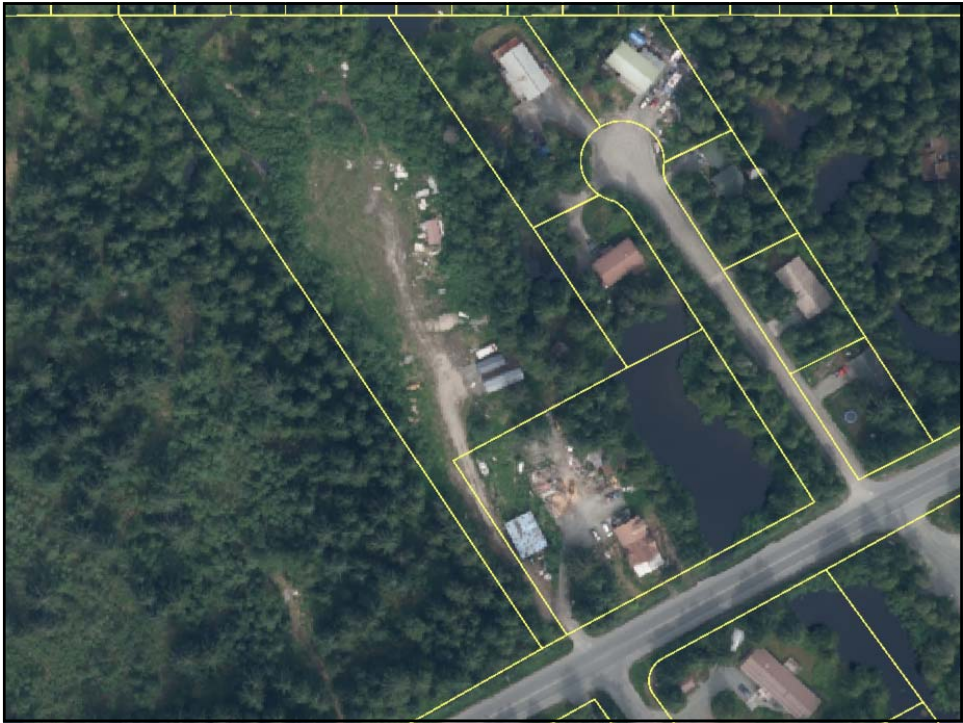
- 1987 – D-1
- 2005 – Rezoned to D-3
- 2013 – Rezoned to D-5
- 2017 – Request to D-10



Comprehensive Plan Land Use Designation







Rezone Request

49.25.210 Residential districts.

The following districts are established to provide a healthy, safe and pleasant environment for residential living protected from incompatible and disruptive activities:

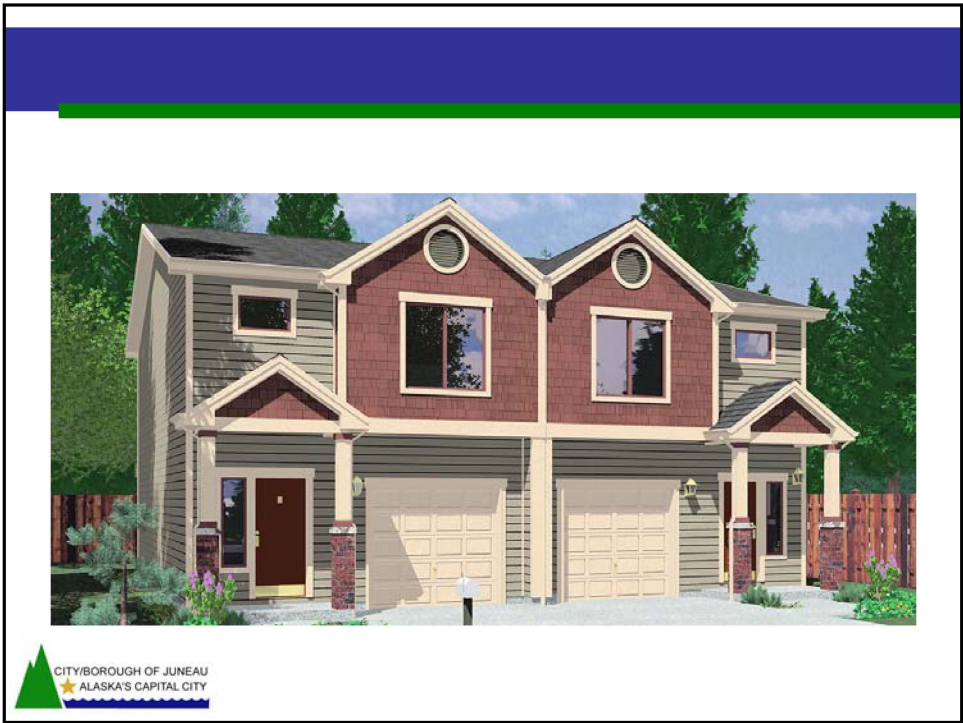
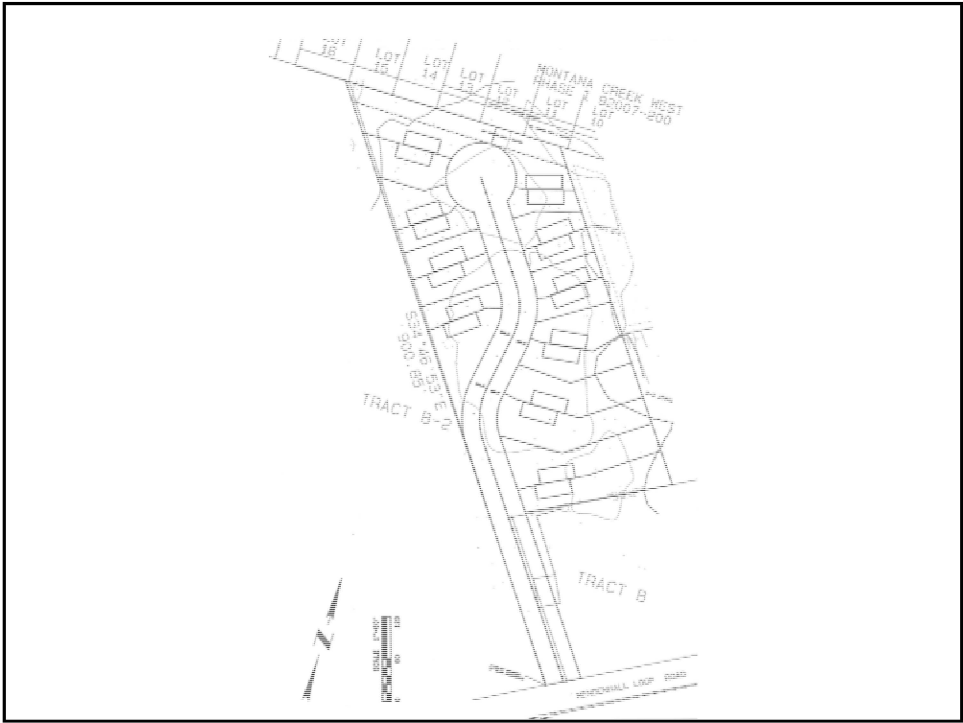
- (b) The D-3, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of three dwelling units per acre. D-3 zoned lands are primarily located outside the urban service boundary where public utilities are not provided. The density reflects the existing pattern of development of properties in the district. There is a limited amount of D-3 zoned lands located within the urban service boundary. These are lands for which a lower density is deemed appropriate or, in the case of transition zones, where the zoning will be changed to a higher density when sewer and water are provided.
- (c) The D-5, residential district, is intended to accommodate primarily single-family and duplex residential development at a density of five dwelling units per acre. D-5 zoned lands are located in the urban service boundary and are served or can be served by public water and sewer.
- (d) The D-10 and D-15, residential districts, are intended to accommodate primarily multifamily residential development at ten and 15 units per acre respectively. These are relatively low-density multifamily districts.

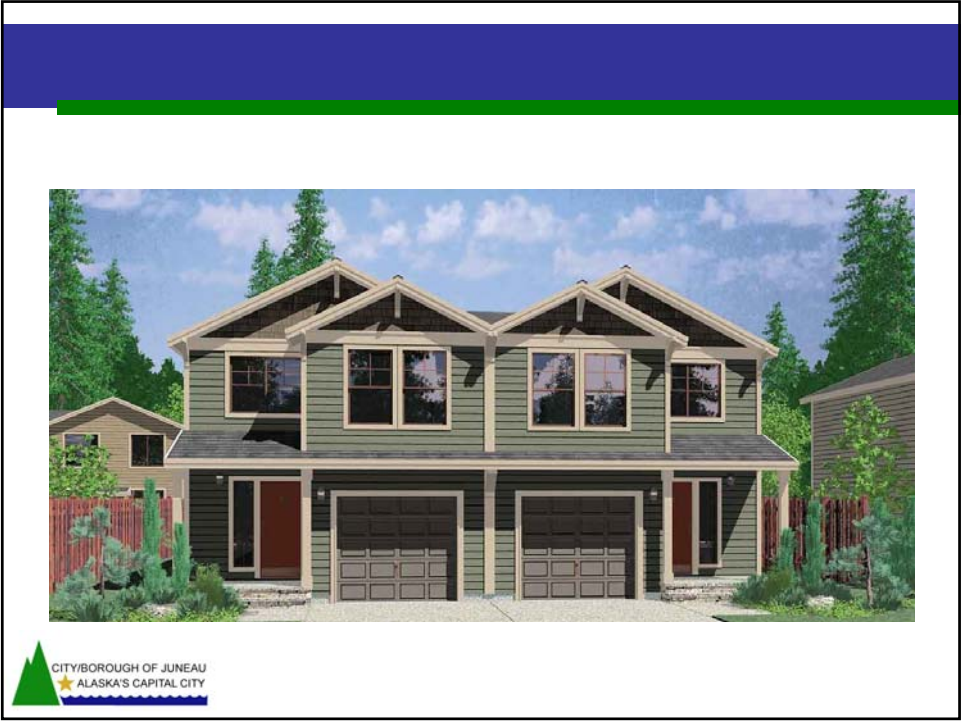


Rezone Request

Table of Dimensional Standards Existing site 3.64 acres/158,863 sf	D-5 (5 du/acre)	D-10 (10 du/acre)
Number of Units (max*)	22 dwelling units	37 dwelling units
Maximum Height Limit	35 feet	35 feet
Maximum Lot Coverage	50%	50%
Vegetative Cover	20%	30%
Minimum Lot Size	7,000 sf	6,000 sf
Minimum Lot Depth	85 feet	85 feet
Minimum Lot Width	70 feet	50 feet
Common Wall Lot Size	7,000 sf	5,000 sf
Common Wall Lot Width	60 feet	40 feet
Common Wall Lot Depth	85 feet	85 feet







Development Scenarios		
	D-5	D-10
Maximum Density	22 DU (calculated by lot size (7,000 sf))	34 DU (calculated by du/acre)
PUD	25 DU (15% bonus)	39 DU
Density Bonuses	Not applicable	51 DU
Common Wall Units with accessory apartments	23 DU with one accessory apartment per lot	32 DU with one accessory apartment per lot
Traditional lot with Bungalow Lot (2:1)	11 traditional lots with 22 bungalow lots	13 traditional lots with 26 bungalow lots

Rezone Requirements

CBJ 49.75.120. RESTRICTIONS ON REZONINGS

Rezoning must be more than two acres OR an expansion of an existing zone.

The rezone request is more than 2 acres and is NOT an expansion of an existing zone

Requests which are substantially the same as a rezoning request rejected within the previous twelve months shall not be considered.

A similar request has not been made within the previous twelve months



Rezone Requirements

49.75.120 Restrictions on Rezoning

A rezoning shall only be approved upon a finding that the proposed zoning district and the uses allowed therein are in substantial conformance with the land use maps of the comprehensive plan.



Zone Change Options and Alternatives

ZONE CHANGE OPTIONS AND ALTERNATIVES

The applicant has requested to have 3.64 acres rezoned from D-5 to D-10.

The options are to recommend approval to the Assembly for the request as submitted, deny the request as submitted, or recommend an alternative to the Assembly.



Comprehensive Plan Policies and Guidance

In considering re-zoning requests, the Planning Commission and the Assembly should aim to promote the highest and best use of the land under consideration and all new zoning or re-zoning designations are required to be substantially consistent with the Comprehensive Plan and associated land use maps. In some cases, the highest and best use may be increased density or more intensive use of the land; in other cases, the highest and best use may be preservation in an undisturbed state for purposes of habitat preservation, flood control, or providing a buffer between development and areas subject to natural hazards. (Page 147)



Findings

RESTRICTIONS ON REZONINGS

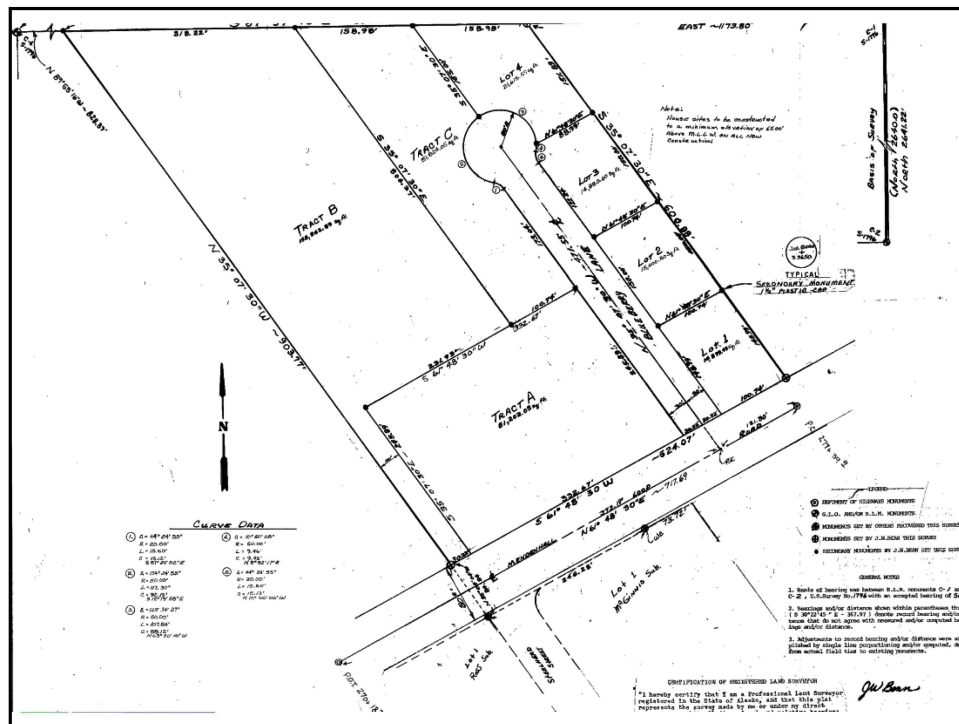
1. The request meets the submittal requirements and the rezoning initiation, zone change restrictions, and procedural requirements of the CBJ Land Use Code as the application was submitted timely and is for an area larger than two acres in size.
2. This proposal does not substantially conform to the Land Use Maps of the Comprehensive Plan.
3. Density bonuses are existing options that the applicant may pursue in order to increase density and still be in compliance with the Comprehensive Plan land use designation of ULDR that allows densities of 1 to 6 units per acre.



Staff Recommendation

Staff recommends that the Planning Commission concur with the Director's analysis and findings and deny the rezone of 3.64 acres from D-5 to D-10.







(907) 586-0715
PC_Comments@juneau.org
www.juneau.org/plancomm
155 S. Seward Street • Juneau, AK 99801

**PLANNING COMMISSION
NOTICE OF RECOMMENDATION**

Date: July 19, 2017
File No.: AME2017 0004

City and Borough of Juneau
City and Borough Assembly
155 South Seward Street
Juneau, AK 99801

Proposal: Planning Commission Recommendation for the denial of a rezone request for the property at 9990 Mendenhall Loop Road from D-5 (single-family residential, 5 dwelling units per acre) to D-10 (multifamily residential, 10 dwelling units per acre).

Property Address: 9990 Mendenhall Loop Road

Legal Description: Tract B, Blueberry Acres

Parcel Code Number: 4B2901050010

Hearing Date: July 11, 2017

The Planning Commission, at its regular public meeting, adopted the analysis and findings listed in the attached memorandum dated July 6, 2017, and recommended that the City and Borough Assembly adopt staff's recommendation for denial of the rezone request to D-10 from D-5 for the 3.64 acre property.

Attachments: July 6, 2017, memorandum from Laura A. Boyce, AICP, Community Development, to the CBJ Planning Commission regarding AME2017 0004.

This Notice of Recommendation constitutes a decision of the CBJ Planning Commission. Decisions to recommend denial of a rezone shall be deemed disapproved unless the applicant files a notice of protest in accordance with CBJ 49.75.130(b). An applicant may protest the commission's recommendation to deny the rezoning by filing a written statement with the municipal clerk within 20

City and Borough Assembly

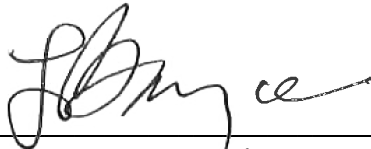
File No.: AME2017 0004

July 19, 2017

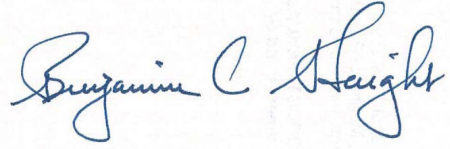
Page 2 of 2

days of the commission's written notice of recommendation for denial, requesting that an ordinance amending the zoning map as set out in the application be submitted for action by the assembly.

Project Planner:



Laura A. Boyce, AICP, Planner
Community Development Department



Benjamin Haight, Chair
Planning Commission



Filed With City Clerk

July 21, 2017

Date

cc: Plan Review

NOTE: The Americans with Disabilities Act (ADA) is a federal civil rights law that may affect this recommended text amendment. ADA regulations have access requirements above and beyond CBJ - adopted regulations. Contact an ADA - trained architect or other ADA trained personnel with questions about the ADA: Department of Justice (202) 272-5434, or fax (202) 272-5447, NW Disability Business Technical Center (800) 949-4232, or fax (360) 438-3208.

Date: July 6, 2017

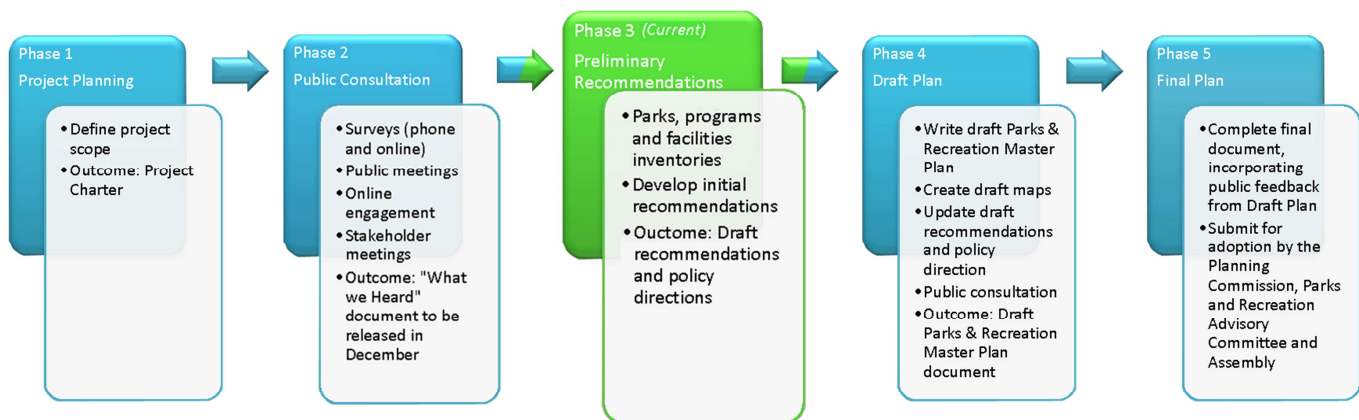
To: Planning Commission, Assembly

Cc: Parks and Recreation Advisory Committee

From: Alexandra Pierce, Project Manager

Subject: Parks and Recreation Master Plan

The objective of this project is to develop a Parks and Recreation Master Plan that serves the needs of the community of Juneau and addresses gaps in the current system over the next 10 to 20 years. The Plan will answer the question, “what does the department look like in 20 years?” and will provide a roadmap to achieve that long-term vision with policies and recommendations to be executed over the next 10 years. The Plan will be easily updatable and will also identify opportunities for partnerships with community organizations and will seek to gather and reflect the needs of the broader public, not just current Parks and Recreation facility users. The most recent Parks and Recreation Comprehensive Plan was adopted in 1997, with the recommendations chapter updated in 2007. Since the completion of the 1997 plan, several new facilities have been developed or acquired by the community and shifts in community needs and priorities have not been assessed in relation to Parks and Recreation. The process has been divided into five phases as shown below:



Phase 1: Project Planning

Phase 1 completed in summer of 2016 with identification of the project scope and objectives. Centennial Hall and Parking are outside the core function of Parks & Recreation and are excluded from the project. All other Parks & Recreation programs and facilities fall within the scope of the Master Plan.

Phase 2: Public Consultation

Parks & Rec staff completed Phase 2 in late 2016 by conducting public outreach and releasing a document, “What we Heard” in December. The following topics emerged from our public consultation.

Themes:

- Affordability
- Community value
- Maintain what we have
- Support for seniors

- Support for underserved residents
- Partnerships
- Youth activities

Topics Identified for Further Discussion

- Augustus Brown Pool
- Additional indoor ice surface
- Off road vehicles

Requested Additions and Upgrades

- Additional bike trails/paths
- Additional dog parks
- Indoor recreation space
- Lemon Creek park space
- Pipeline Skate Park improvements
- Restroom facilities at parks
- Trail maintenance and upgrades
- Turf fields

Phase 3: Inventories

We are currently in Phase 3, with the following tasks in progress:

- Special Committee – A demographically representative Master Plan advisory group was formed as a special committee of the Parks and Recreation Advisory Committee (PRAC). The committee is vetting plan outcomes and public materials before they are reviewed by the public. The committee has met five times and has established the following mission, vision and guiding principles. These statements will shape the direction of the Plan.
 - Mission Statement: To establish Parks & Recreation's role as an essential partner in a healthy community
 - Vision Statement: Guiding future decisions to provide the highest possible quality Parks & Recreation facilities, programs and services for all regardless of age, income, or ability
 - Guiding Principles: The Parks and Recreation Master Plan will guide the department in:
 - Promoting community engagement, health, and wellness
 - Managing our assets effectively
 - Ensuring financial sustainability
 - Supporting community partnerships
 - Engaging youth and encouraging lifelong wellness
 - Serving the needs of a diverse and changing population
 - Fostering environmental stewardship
 - Increasing cultural awareness
- Parks, Programs, Facilities Inventories
 - The parks inventory will include:
 - A review of existing parks facilities
 - An evaluation of the physical condition and functionality of city managed parks, and an analysis of the park system to determine whether Juneau has the right parks in the right places with the right equipment. This will inform future decisions on capital improvement project spending.

- A policy and process for parkland acquisition and disposal and a review of Parks & Recreation managed lands that meet a set of criteria for potential divestment. Park lands identified as potentially available will be subject to a more stringent disposal or sale process than other CBJ managed lands.
- The programs and facilities inventory will include a list of needed capital projects reconciled with community recommendations and input, as well as benchmarking of Juneau's recreation offerings against other communities.
- Assessment of trails will include a review of the non-motorized transportation plan for connectivity between parks, programs and trail systems and will identify recommendations for large trail projects. We will recommend developing a new Trails Plan and have already put this project on the 1% list. We will propose a set of trails standards to be applied in the new trails plan and to create management objectives for CBJ trails.
- Recommendations
 - Attached is a list of recommendations, vetted by the committee, which is currently with stakeholders for review. Recommendations are categorized as required actions (required to continue operating successfully), recommended actions (suggested improvements to facilities and services), or potential actions (requested by community members or groups but not currently operationally and/or financially feasible) and will include capital costs.
- Public Consultation
 - We are posting a project update on PlaceSpeak and vetting the recommendations with our stakeholders. The draft plan will receive a full public review in late 2017 including public meetings, stakeholder review, and online engagement.

Phase 4: Draft Plan

The draft plan will be a first draft document submitted to the public for review in late 2017. The project team will reach out to stakeholders and the public through a series of meetings and online to ensure that the draft plan and recommendations are in line with the interests and needs of the community.

Draft Plan

- Outline of how document will be organized to be accepted by special committee and presented to the public for comment through the following channels:
 - Stakeholder meetings
 - Public meetings
 - Online engagement

Draft Maps

- Visual component of Plan to be accepted by special committee and presented to public for comment through the following:
 - Stakeholder meetings
 - Public meetings
 - Online engagement

Draft Recommendations

- Recommendations with timeline and budget estimates to be accepted by the special committee and presented for public comment through the following channels:
 - Stakeholder meetings
 - Public meetings
 - Online engagement

Phase 5: Final Plan

The final document will be presented in a complete, visually appealing format and providing community-verified direction for how Juneau Parks and Recreation looks over the next one to two decades. The Final Plan will be completed in 2018.

Acceptance Criteria

- Acceptance by PRAC
- Acceptance of any lands-related recommendations by Planning Commission
- Acceptance by CBJ Assembly

Attachments: Draft Policy Statements and Recommendations

Mission, Vision, and Guiding Principles

These statements will shape the direction of the Plan. The mission is what we are seeking to accomplish with the planning process, the vision is our long-term, overarching goal for the process, and we will consider all plan elements in terms of the guiding principles:

Mission Statement

To establish Parks & Recreation's role as an essential partner in a healthy community

Vision Statement

Guiding future decisions to provide the highest possible quality Parks & Recreation facilities, programs and services for all regardless of age, income, or ability

Guiding Principles

The Parks and Recreation Master Plan will guide the department in:

- Promoting community engagement, health, and wellness
- Managing our assets effectively
- Ensuring financial sustainability
- Supporting community partnerships
- Engaging youth and encouraging lifelong recreation
- Serving the needs of a diverse and changing population
- Fostering environmental stewardship
- Increasing cultural awareness

Policy Statements and Recommendations

Policy statements form the goals and objectives of the plan. Recommendations are specific, measurable action items to be completed over the coming years. Recommendations are divided into three categories: required actions, recommended actions, and potential actions. Required actions are needed tasks and improvements and are generally short-term. Recommended actions are improvements to our programs and services to be made as time and funds become available. Potential actions are generally longer-term, higher cost items that are desired by a community group and may become more feasible in the future. Recommendations are also categorized as short-term (0-5 years), medium-term (5-10 years) or long-term (10+ years), and include a capital budget estimate where possible. In this document, policy statements and recommendations are organized under the guiding principle that they support. The final plan will present recommendations at the end of each section, as well as in compiled format as shown herein.

Guiding Principle

Promoting community engagement, health and wellness

Policy Statements

- *Find efficiencies that increase cost savings and/or revenue potential*
- *Find creative ways to rent or program our facilities for use by community groups outside of the traditional facility user group*
- *Provide opportunities for self-directed active recreation opportunities for all ages and abilities*

Recommendations:

Recommendation	Timeline	Capital \$
Department-Wide		
Required Action		
Develop and implement a department-wide fees and charges policy	Short	Staff time
Recommended Action		
Devote staff resources to evaluate grant and alternative funding opportunities	Medium	Staff time

Recommendation	Timeline	Capital \$
Parks		
Recommended Action		
Work with community partners to identify site for future bike skills park for all ages and abilities	Medium	Staff time
Commercial Use		
Required Action		
As part of a broader fees and charges strategy, adjust commercial use fees for parks and trails to ensure charges are commensurate with cost of use	Short	Staff time – potential revenue source

Guiding Principle:*Managing our assets effectively***Policy Statements:**

- *Maintain our current assets and facilities to a high standard and avoid deferring needed maintenance*
- *Facility improvements should increase community benefit, facility safety, and/or revenue potential*
- *Provide a venue for the community that provides affordable recreation opportunities for all of the Juneau Community.*
- *Develop and support a sustainable funding mix for aquatics in Juneau*
- *Promote revenue generating opportunities at Eagle Valley Center*
- *Maintain our parks to a high standard and avoid deferring needed maintenance*
- *Fund improvements for entire parks: develop a list of priorities and complete each project sequentially*
- *Priority should be given to park projects where a park master plan already exists*
- *Establish priorities for trail maintenance and construction*
- *Working with other government agencies, engage in long-term planning for the trail networks*
- *On an ongoing basis, evaluate landscaping staff capacity against number of sites requiring maintenance*

Recommendations:

Recommendation	Timeline	Capital \$
All Parks & Rec Facilities		
Required Action		
Evaluate facility conditions and establish minimum condition and service levels	Short	Staff time

Recommendation	Timeline	Capital \$
Treadwell Arena Facility		
Required Action		
Continue to maintain Treadwell Arena, including replacing the roof	Short	\$950,000
Improve lighting in Treadwell Arena parking lot	Short	?
Establish policy for vendors	Short	Staff time
Recommended Action		
Add gym space to Treadwell Arena for sports team dryland training and to house activities currently located in Mt. Jumbo Gym	Medium	?
Complete small facility renovations to improve user and spectator amenities.	Medium	?
Assess the feasibility of vending and equipment	Medium	Staff time – potential

sales		revenue source
Potential Actions		
Add a second sheet of ice with an addition to the existing structure at Treadwell Arena as demand warrants	Long	?

Recommendation	Timeline	Capital \$
Facilities (Youth Services)		
Recommended Action		
Continue to provide multi-use indoor training/gym space	Medium	?
Potential Action		
Construct an additional field house facility in the downtown / Douglas area	Long	?
Provide geographically distributed multi-use indoor gym spaces	Long	TBC

Recommendation	Timeline	Capital \$
Aquatics		
Required Action		
Update condition survey of Augustus Brown Pool and determine updated cost of required repairs and building lifespan if those repairs are completed	Short	Staff time
Complete facility survey of Dimond Park Aquatic Center and replacement schedule for all fixtures and equipment with associated costs	Short	Staff time
Establish alternative funding sources for both pools	Short	Staff time
Recommended Action		
Pending community support for adequate funding for these projects, complete required capital projects to keep Augustus Brown Pool in working order	Short	\$5.8 million

Recommendation	Timeline	Capital \$
Eagle Valley Center		
Required Action		
Continue to promote and improve facility rental program with an eventual goal of a break even budget including a maintenance fund	Short	Staff time – revenue source
Improve on site infrastructure	Short	?
Develop facility management plan to determine carrying capacity and a sustainable funding mix	Short	Staff time
Recommended Action		
Develop small-scale cabins, tent platforms or yurts for nightly rental	Medium	?

Recommendation	Timeline	Capital \$
Parks		
Required Action		
Develop and implement a replacement schedule for park equipment.	Short	Staff time
Recommended Action		
Evaluate which parks require restrooms and add to CIP budget	Medium	Staff time to evaluate - \$400k per site
Field Use		
Required Action		
Continue to maintain fields , working with partners to mitigate schedule conflicts	Short	Staff time
Recommended Action		
Provide tournament size baseball and softball fields with turf	Medium	\$6-8 million
Potential Actions		
Resurface all actively used fields with artificial turf	Long	\$4 million/ field
Improve bleacher/spectator seating as upgrades to parks with sports fields are planned. Add covered seating where possible.	Long	\$200k per field
Dogs in Parks		
Recommended Action		
Evaluate and if appropriate establish additional off-leash areas	Short	Cost of garbage cans and fences?

Recommendation	Timeline	Capital \$
Trails General		
Recommended Action		
Update Juneau Trails Plan and work with State and Federal partners on pursuing	Short	Staff time

updates to the inter-agency trails plan		
Adopt or develop a set of trails standards	Short	Staff time
Include trails funding in park maintenance budget	Short	Staff time + budget increase
Potential Actions		
Identify and complete connections between existing trail networks	Long	TBC
Identify and complete longer "hut to hut" trail opportunities	Long	TBC

Recommendation	Timeline	Capital \$
Landscape		
Required Action		
Prioritize areas for planting and landscaping. Consider costs and level of impact	Short	Staff time
Develop defensible tree policy to guide and inform management of trees	Short	Staff time

Guiding Principle:*Supporting community partnerships***Policy Statements:**

- *Continue working with community partners to provide ADA accessible facilities and/or adaptive programming for residents with disabilities*
- *Manage demands for facility time fairly, with youth activities taking highest priority*
- *Encourage collaboration between community partners and internal collaboration between Parks & Recreation facilities and programs*
- *Balance needs of community partners operating at the Eagle Valley Center to ensure that services are complimentary and provide the best possible array of opportunities for the community*
- *Encourage and support community partners in fundraising initiatives to make improvements to parks, trails and recreational facilities*
- *Encourage and foster collaboration among and with community partners on trail projects*
- *Provide leadership to trail user groups in navigating land management issues*

Recommendations:

Recommendation	Timeline	Capital \$
Treadwell Arena Programming		
Required Action		
Continue to work with partner organizations to balance ice time needs	Short	Staff time
Increase community outreach and promotion of activities at Treadwell Arena, as well as cross-promotional opportunities with other CBJ facilities	Short	Staff time
Continue to support/promote adaptive skating	Short	Staff time

Recommendation	Timeline	Capital \$
Eagle Valley Center		
Required Action		
Continue to work with partners to re-open the ropes course	Short	Staff time – potential revenue source
Continue to evaluate businesses and non-profits operating in the area for community benefit and fit with other stakeholders	Short	Staff time
Continue to work with partners to enhance educational programming	Short	Staff time
Recommended Action		
Continue to explore options for small-scale agriculture	Medium	Staff time – potential revenue source

Work with community partners to improve trail system to enhance ADA accessibility	Medium	\$ Grant funding
Fund road and facility improvements through a combination of rental revenue and value in kind donations	Short	Staff time
Potential Action		
Work with Trail Mix to connect EVC to other surrounding parks and amenities as delineated in the Northern Green Zone Plan	Long	\$100,000?

Recommendation	Timeline	Capital \$
Off Road Vehicle (ORV) Use		
Recommended Action		
Encourage ORV community to organize and set priorities for future ORV development	Short	Staff time
Work with ORV user groups and neighbors to identify acceptable areas for ORV activities	Short	Staff time
Facilitate development of viable opportunities for ORV recreation	Medium	Staff time (potential capital costs)

Recommendation	Timeline	Capital \$
Trails General		
Required Action		
Convene a trails advisory group to address ongoing trail management issues and to provide feedback on suitability for various trail uses.	Short	Staff time
Work with non-motorized trail user groups to support and assist trail development and/or improvement projects	Short	Staff time
Work with Nordic skiing organizations to identify space for a biathlon range	Short	TBC

Guiding Principle

Ensuring Financial Sustainability

Policy Statements

- *Encourage fundraising by community partners and provide matching or bridge funding when appropriate*
- *Ensure commercial trail use aligns with community needs and interests*
- *Find efficiencies that increase cost savings and/or revenue potential*
- *Find creative ways to rent or program our facilities for use by community groups outside of the traditional facility user group*

Recommendation	Timeline	Capital \$
Treadwell Arena		
Recommended Action		
Expand season to include summer programming	Short	Staff time
Work within CBJ to improve/streamline the alcohol permitting process to simplify process for community partners to serve alcohol at events or through concessions.	Short	Staff time – potential revenue source

Recommendation	Timeline	Capital \$
Trails General		
Recommended Action		
Partner with non-motorized trail user groups to fund trail development and/or improvement projects	Medium	TBC depending on project
Commercial Use		
Recommended Action		
Work with community partners to identify areas for accessible tour opportunities	Medium	Staff time – potential revenue source
Regularly review commercial trail use and rate structure	Short	Staff time – potential revenue source

Recommendation	Timeline	Capital \$
Jensen-Olson Arboretum		
Recommended Action		
Grow arboretum revenue opportunities with the goal of becoming self-sustaining	Medium	Staff time

Guiding Principle:*Engaging youth and encouraging lifelong wellness***Policy Statements:**

- *Develop and support programs that provide access to recreation for all Juneau's youth*
- *Ensure programs are equitable and affordable by identifying and removing barriers to participation*
- *On an ongoing basis, work with community partners to identify gaps in recreation, prevention and social service offerings for youth in Juneau; and take a leadership role in developing evaluation tools and ensuring those gaps are filled*

Recommendations:

Recommendation	Timeline	Capital \$
Youth Programming		
Required Action		
Evaluate affordability of youth programs as part of a fees and charges analysis	Short	Staff time
Work with community partners to expand appropriate early childhood programming in the short-term	Short	Staff time – potential revenue source
Work with community partners to expand youth programming to include increased outdoor programs	Short	Staff time – potential revenue source
Continue to work with community partners to simplify youth activities scholarship process for low income families	Short	Staff time
Invest in expanded after school programming	Medium	Staff time
Continue to work with and engage community partners within the youth programming domain.	Short	Staff time
Recommended Action		
Expand youth programming to include more outdoor programs or work with community partner(s) to ensure outdoor programs are expanded.	Short	Staff time – potential revenue source
Provide community leadership to other social service and government agencies to identify biggest barriers for youth and marshal resources to solve them	Short	Staff time
Work with community partners to Expand programs for preschool age children throughout Juneau, including equitable access to programs.	Short	Staff time – potential revenue source

Recommendation	Timeline	Capital \$
Expand youth scholarship programs and explore options for linking programs to free and reduced lunch list	Short	Staff time
Potential Action		
Expand services to include transportation to sports activities, particularly for youth residing in Lemon Creek and other neighborhoods with a large concentration of young people and few recreation amenities	Long	TBC

Guiding Principle:

Serving the needs of a diverse and changing population

Policy Statements:

- *Ensure Parks & Recreation and its community partners are balancing programs and services across neighborhoods*
- *Continue working with community partners to provide ADA accessible facilities and/or adaptive programming for residents with disabilities*
- *Manage demands for facility time fairly among all user groups*
- *Encourage educational programming*
- *Consider Juneau's growing senior population in decisions regarding programming and facility upgrades*
- *Consider community safety and wellbeing in facility maintenance and upgrades*
- *Support collaboration between community partners and internal collaboration between Parks & Recreation facilities and programs*
- *Park improvements should improve safety and/or user experience*
- *Consider ADA accessibility as parks are improved*
- *Improve active transportation throughout Juneau*
- *Improve trail system connectivity*
- *Ensure trail maintenance funding is commensurate with need*

Recommendations:

Recommendation	Timeline	Capital \$
Youth Services		
Potential Action		
If demand warrants, expand Zach Gordon facilities to other locations in the community including Lemon Creek and the Mendenhall Valley	Long	TBC

Recommendation	Timeline	Capital \$
Aquatics		
Required Action		
Continually evaluate pool programming to determine how best to meet community need	Short	Staff time
Increase community outreach and promotion of activities at the pools as well as cross-promotional opportunities with other CBJ facilities	Short	Staff time
Continue to support/promote adaptive aquatic activities	Short	Staff time

Recommendation	Timeline	Capital \$
Parks General		
Required Action		
Develop additional park space in Lemon Creek	Short	Staff time
Work with community partners to increase ADA accessibility as CBJ replaces park/playground equipment	Short	Staff time
Recommended Action		
Develop low impact camping facilities in appropriate parks	Medium	TBC
Support residents to add or increase community garden space in parks	Medium	TBC

Recommendation	Timeline	Capital \$
Trails General		
Recommended Action		
Improve lighting on public bike paths	Long	TBC
Work with partners to improve/upgrade existing trails to create more ADA accessible paths	Long	TBC
Consider winter use when improving trails	Short	TBC

Guiding Principle

Increasing Cultural Awareness

Policy Statements

- *Work with community partners to identify and install signage and markers to inform park users about Juneau's cultural heritage*
- *Respect the wishes of cultural communities regarding development or programming in culturally sensitive areas*
- *Improve trail signage and cultural programming*

Recommendation	Timeline	Capital \$
Parks General		
Recommended Action		
Improve system-wide informational/wayfinding/interpretive signage at parks. Include Alaska Native cultural history and significance.	Short	\$2K - \$5K per site

Recommendation	Timeline	Capital \$
Trails General		
Required Action		
Improve system-wide informational/wayfinding/interpretive signage at trailheads and on trail networks. Include cultural information and traditional languages, consistent and compatible with CBJ branding	Medium	\$2K - \$5K per site

Guiding Principle

Fostering Environmental Stewardship

Policy Statements

- *Consider environmental sustainability in materials and site selection for capital projects, including trails.*
- *Consider environmentally sustainable facility or process upgrades*

Recommendation	Timeline	Capital \$
Department-Wide		
Recommended Action		
Add electric vehicle charging stations at parks and facilities, as appropriate.	Medium	?
As CBJ adds or improves composting infrastructure, establish policy for composting landscaping waste and food waste from facilities	Medium	?

NOTICE

Memorandum decisions of this court do not create legal precedent. A party wishing to cite such a decision in a brief or at oral argument should review Alaska Appellate Rule 214(d).

THE SUPREME COURT OF THE STATE OF ALASKA

ANTHONY ZENK and RUTH	)	
BAUMGARTNER,	)	Supreme Court No. S-16118
	)	
Appellants,	)	Superior Court No. 1JU-14-00957 CI
	)	
v.	)	<u>MEMORANDUM OPINION</u>
	)	<u>AND JUDGMENT</u> *
CITY & BOROUGH OF JUNEAU,	)	
DAVID LENDRUM, ELIZABETH	)	No. 1639 – June 28, 2017
MIYASATO, G. OLE OLSON, and	)	
DAVID WILSON,	)	
	)	
Appellees.	)	
	)	

Appeal from the Superior Court of the State of Alaska, First Judicial District, Juneau, Philip M. Pallenberg, Judge.

Appearances: Anthony Zenk and Ruth Baumgartner, pro se, Juneau, Appellants. Robert H. Palmer III, Assistant Municipal Attorney, City & Borough of Juneau Law Department, Juneau, for Appellee City & Borough of Juneau. No appearance by Appellees David Lendrum, Elizabeth Miyasato, G. Ole Olson, and David Wilson.

Before: Stowers, Chief Justice, Winfree, Maassen, Bolger, and Carney, Justices.

* Entered under Alaska Appellate Rule 214.

I. INTRODUCTION

Homeowners in a residential subdivision sought a conditional use permit to relocate their existing greenhouse and landscaping business to their property. They then initiated the process to lease an adjacent municipally owned property and later amended the use permit application to include the municipal property. Neighbors opposed the permit, arguing that the business would negatively impact home values, unduly increase traffic, expose them to increased runoff, and potentially decrease water pressure to their homes. The borough planning commission held a hearing on the use permit without considering the lease application and issued a conditional use permit, subject to a list of conditions, for both lots. The neighbors appealed first to the borough assembly, which affirmed the decision to issue the permit, and then to the superior court, which affirmed the borough's decision. We affirm the superior court's decision.

II. FACTS AND PROCEEDINGS

Anthony Zenk and Ruth Baumgartner (Zenk¹) own residential property, Lot 1 of Bonnie Subdivision, in Juneau. Their property has two houses, both accessed by a driveway shared with the other two Bonnie Subdivision lots. Margaret Tharp and David Lendrum (Lendrum²) own Lot 2, which has one house on it. The City and Borough of Juneau owns Lot 3, which is vacant. The shared driveway crosses Lots 2 and 3. Lot 1 fronts Mendenhall Loop Road, but, according to the City, the subdivision plat restricts Lot 1's road access to the shared driveway. Lot 1 is downslope from Lot 2, and there is apparent agreement that the shared driveway has a steep grade of more

¹ We refer to both Zenk and Baumgartner as "Zenk" because Zenk is listed as the author of the briefs filed in this court and participated at oral argument before us.

² We refer to both Tharp and Lendrum as "Lendrum" because Lendrum participated in the administrative appeal and testified at the public hearing on the permit.

than ten percent at the top. The three subdivision lots share both city water and sewer lines.

Lendrum has owned and operated Landscape Alaska — providing landscaping services and selling plants — for many years in Juneau; he began looking for a place to relocate the business after the land where it had been operating was sold. Lendrum bought the Bonnie Subdivision property with the intent of shifting some business to that site. The property's zoning allows a commercial greenhouse with retail sales if the City issues a conditional use permit.³

In July 2013 Lendrum applied for a conditional use permit for a retail greenhouse as well as a residence on Lot 2. Lendrum also applied for a development permit. Drawings in the record show the conditional use permit application was related mainly or only to Lot 2, although an accompanying narrative expressed a desire to lease a portion of the City's Lot 3. On August 9 the City gave notice scheduling an August 15 neighborhood meeting about the proposed commercial greenhouse and indicating the Planning Commission would review the proposal at its August 27 meeting. Eighteen neighbors signed a petition opposing the conditional use permit, raising concerns about traffic, increased noise, and potential "harmful runoff from pesticides and fertilizers." According to a staff memorandum to the Planning Commission, 16 community members, in addition to the applicants and City staff, attended the scheduled neighborhood meeting. At the August 27 meeting the City rescheduled consideration of the application to a later date because Lendrum needed to supply additional information.

³ Operating a commercial greenhouse with retail sales is a permissible use in all areas of Juneau except the waterfront districts, although most retail sales require obtaining a conditional use permit like the one at issue here. City and Borough of Juneau Code (CBJ) 49.25.250, (2012); CBJ 49.25.300 & table (2015).

In August 2013 Lendrum expanded the commercial greenhouse proposal to include leasing the City's adjacent Lot 3 and putting one greenhouse, additional parking, and some nursery stock on it.⁴ He filed a different type of application for the proposed lease, but that application referenced the conditional use permit at issue in this appeal. A development permit application form, signed by a City employee as the applicant, was filed with the lease application.⁵ In October 2013 Lendrum supplemented the conditional use permit application file with more detailed drawings and a longer narrative summary about developing both Lots 2 and 3.

As part of the conditional use permit application Lendrum obtained a permit from the Alaska Department of Transportation (DOT) related to the Mendenhall Loop Road driveway entrance; the entrance required some modification to allow an adequate turning radius. The permit indicated that the maximum number of vehicles "in any [one] hour" was ten; this was Lendrum's estimate, not a limit set by DOT.

Neighbors expressed opposition to the commercial greenhouse operation on Lots 2 and 3 in writing. Concerns focused on: (1) increased traffic, particularly the safety of using the shared driveway to access a business; (2) aesthetic values, such as views and buffering; and (3) issues related to water use and runoff drainage. Only

⁴ He began the lease process earlier, having Lot 3 appraised in July. With some exceptions, CBJ 53.20.040 (1971) requires land leased from CBJ to be appraised before the beginning of a lease term.

⁵ The proposal for leasing CBJ's Lot 3 was a separate proceeding with a different file number, although the notice for the rescheduled hearing at which the conditional use permit was eventually approved listed the lease file number as well. The Planning Commission took the lease proposal off the agenda because it was not yet ready for review. The only material in the record related to the lease file is a staff memorandum attachment that was later adopted by the Planning Commission.

Zenk's property shares water access and a driveway with the Lendrum and City properties.

In response to public comments the water utility suggested Lendrum have an engineer evaluate the water supply, noting that answers to the concerns raised in the comments depended on the plumbing code. A mechanical engineer gave the opinion that Lendrum's estimated water use for the greenhouses would not cause Zenk water pressure problems. The engineer also noted the existence of a capped water line to supply the City's Lot 3 if the lease were approved.

A City staff memorandum report recommended approval of both the conditional use permit and a lease for the City's Lot 3. The report suggested addressing some of the neighbors' concerns by limiting retail sales hours and requiring a grading and draining permit. The report found that the proposed greenhouse was consistent with the 2008 Juneau Comprehensive Plan "by providing opportunities for employment and by developing a diverse economy." The report also found that the proposed conditional use permit would not "materially endanger public health and safety" and would "maintain values and . . . not be out of harmony with the neighboring area." The report recommended approval of both the conditional use permit, subject to eight conditions, and the "[p]roject review" associated with the proposed lease of Lot 3, subject to a commercial use agreement between the City and Lendrum "prior to issuance of a building permit." The report indicated that the commercial use agreement would establish "[t]he maximum number of vehicles per hour" and set out a process for modifying the commercial use agreement.

The Planning Commission held a public hearing on the conditional use permit application in February 2014. The notice indicated the hearing was about both the conditional use permit and lease applications, but the Planning Commission took the lease off the agenda and did not hear testimony about it because the City Assembly had

not yet authorized lease negotiations.⁶ The Planning Commission nonetheless considered the conditional use permit application for both lots.

At the hearing the City first outlined the staff report recommending approval. Lendrum then made a presentation about the business, its history in Juneau, his qualifications, and the proposed use of the lots; he also discussed some of the neighbors' concerns. The engineer who assessed the water supply testified that Lendrum's proposed use should not cause water pressure problems at Zenk's property. Public comments both supported and opposed the conditional use permit. Public comments were limited to three minutes each to allow everyone an opportunity to speak. Following the public testimony Lendrum was allowed to (and did) offer rebuttal comments. Planning Commission members also commented and asked questions. City staff recommended issuing the permit with easily measurable conditions allowing them to clearly evaluate possible violations.

After the discussion the Planning Commission approved the conditional use permit — listing nine conditions — in a 5-1 vote. The decision notice “adopted the analysis and findings” of the staff memorandum. The notice also stated, “Prior to starting any project, it is the applicant's responsibility to obtain a Lease and City Review Permit approval and any required building permits.”

Five neighbors appealed the Planning Commission's decision to the City Assembly. Lendrum intervened in the appeal. After hearing arguments at an August 2014 meeting the City Assembly denied the appeal, deciding that the Planning Commission: (1) relied on substantial evidence for its decision; (2) had made adequate findings; and (3) “properly adhered to its rules of procedure with respect to hearing public testimony.”

⁶ CBJ 53.09.260 (2013) sets out the process for negotiated leases.

Four neighbors appealed the City Assembly’s decision to the superior court. The court considered arguments about multiple ordinance or regulation violations, due process, privacy and possible nuisance, the City having “a ‘significant financial interest’ in the approval of this conditional use permit,” spot zoning, and a trial de novo request. On the record without a trial de novo the superior court affirmed the City Assembly’s decision affirming the Planning Commission’s decision.

Zenk — self-represented — appeals.

III. STANDARD OF REVIEW

When the superior court acts as an intermediate court of appeal in a zoning matter, we independently review the record.⁷ “[J]udicial review of zoning board decisions is narrow and . . . a presumption of validity is accorded those decisions.”⁸ We “will uphold the [b]oard’s decision as long as it is, ‘in the light of the whole record, . . . supported by substantial evidence.’ ”⁹ We review questions of law such as questions of due process using our independent judgment.¹⁰ “In a case that involves a zoning board’s interpretation of zoning ordinances and planning documents, [we] will give such interpretations ‘considerable deference.’ ”¹¹

⁷ *Native Vill. of Eklutna v. Bd. of Adjustment for Municipality of Anchorage*, 995 P.2d 641, 643 (Alaska 2000) (quoting *S. Anchorage Concerned Coal., Inc. v. Coffey*, 862 P.2d 168, 173 (Alaska 1993)).

⁸ *Id.* (second alteration in original) (quoting *Coffey*, 862 P.2d at 173).

⁹ *Id.* (alteration in original) (quoting *Coffey*, 862 P.2d at 173).

¹⁰ *Griswold v. City of Homer*, 252 P.3d 1020, 1025 (Alaska 2011) (quoting *May v. State, Commercial Fisheries Entry Comm’n*, 168 P.3d 873, 879 (Alaska 2007)).

¹¹ *Native Vill. of Eklutna*, 995 P.2d at 643 (quoting *Coffey*, 862 P.2d at 173 n.12).

IV. DISCUSSION

A. The Superior Court Correctly Concluded That The Conditional Use Permit Did Not Constitute Spot Zoning.

Zenk argues that the City engaged in spot zoning by permitting Lendrum to operate a commercial business in a residential area.¹² The City responds that under our precedent a conditional use permit issued by the Planning Commission acting in a quasi-judicial capacity can never be spot zoning. The City is correct.

Zenk relies on *Griswold v. City of Homer*, in which we first considered spot zoning and adopted a three-part test to evaluate whether an ordinance constitutes spot zoning.¹³ Zenk contends that each of the three parts of the spot zoning test are met in this case. The City responds that under *Cabana v. Kenai Peninsula Borough*¹⁴ a litigant cannot challenge spot zoning through an administrative appeal but must instead bring an original action in the superior court. Because we have defined spot zoning as “an arbitrary exercise of *legislative* power”¹⁵ and because the City did not act in a legislative capacity here, issuing the conditional use permit cannot be spot zoning.

¹² “[S]pot zoning is ‘the process of singling out a small parcel of land for a use classification totally different from that of the surrounding area’ ” *Griswold v. City of Homer*, 925 P.2d 1015, 1020 (Alaska 1996) (quoting 1 ROBERT M. ANDERSON, AMERICAN LAW OF ZONING 3D § 5.12, at 359 (1986)).

¹³ *Id.* at 1020 (adopting three evaluation factors: “(1) the consistency of the amendment with the comprehensive plan; (2) the benefits and detriments of the amendment to the owners . . . ; and (3) the size of the area ‘rezoned.’ ” (citing 3 EDWARD H. ZIEGLER JR., RATHKOPH’S THE LAW OF ZONING AND PLANNING § 28.01, at 28-3 (4th ed. 1995))).

¹⁴ 21 P.3d 833 (Alaska 2001).

¹⁵ *Griswold*, 925 P.2d at 1020 n.6 (emphasis added).

In *Cabana* a Homer resident challenged a Kenai Peninsula Borough ordinance reclassifying Homer land to light industrial use so that it could be exchanged for privately held land in Anchor Point.¹⁶ Distinguishing our precedent from that of other state courts, we chose “to treat small-scale rezonings [i.e. spot zonings] as legislative decisions”¹⁷ rather than quasi-judicial ones. In contrast “an entity which normally acts as a legislative body” is acting in a quasi-judicial capacity when it “applies general policy to particular persons in their private capacities.”¹⁸ So in this case, because the Planning Commission and then the City Assembly were applying general policy to particular persons in their private capacities, their actions were quasi-judicial rather than legislative; thus, this is not a case of spot zoning.

In *Cabana* we also held that a decision of a legislative body, such as the Assembly, “is subject to review by appeal [rather than direct action] *only* where the decision is a quasi-judicial one.”¹⁹ When considering conditional use permit appeals we have examined the application of permitting ordinances to the facts of the case, discussing whether substantial evidence supported the decision.²⁰ Spot zoning, as a legislative act, requires an entirely different type of procedural challenge and legal

¹⁶ 21 P.3d at 834-35.

¹⁷ *Id.* at 836 (first citing *Balough v. Fairbanks N. Star Borough*, 995 P.2d 245, 249 (Alaska 2000); then citing *Griswold*, 925 P.2d at 1019 n.3).

¹⁸ *Id.* at 835-36 (second alteration in original) (quoting *Kollodge v. State*, 757 P.2d 1028, 1033 (Alaska 1988)).

¹⁹ *Id.* (emphasis added) (citing 4 KENNETH H. YOUNG, ANDERSON’S AMERICAN LAW OF ZONING § 27.06 (4th ed. 1997)).

²⁰ *E.g.*, *Native Vill. of Eklutna v. Bd. of Adjustment for the Municipality of Anchorage*, 995 P.2d 641, 643-44 (Alaska 2000); *S. Anchorage Concerned Coal. v. Coffey*, 863 P.2d 168, 175-76 (Alaska 1993).

analysis.²¹ If granting the conditional use permit were spot zoning, Zenk would have been required to challenge it in an original action in the superior court.²² He did not, choosing instead to file an administrative appeal and argue about substantial evidence.

Perhaps more problematic for Zenk’s contention that the conditional use permit amounted to spot zoning is the list of permissible uses set out in City ordinances. As the City points out, operating a commercial greenhouse with retail sales is a permissible use in nearly all Juneau zoning districts, although most retail sales require obtaining a permit like the one at issue here.²³ Although Zenk correctly observes that our precedent shows that simply because a use is allowed under a zoning ordinance does not mean that the use must be permitted,²⁴ that statement was made in the context of a conditional use permit appeal — not in the context of a spot zoning challenge — and is thus irrelevant to the spot zoning question.²⁵ The superior court correctly concluded that this case does not involve spot zoning.

²¹ *Griswold v. City of Homer*, 925 P.2d 1015, 1021-25 (Alaska 1996) (discussing spot zoning test factors and concluding ordinance was not spot zoning).

²² *See Cabana*, 21 P.3d at 836 & n.12 (affirming dismissal of administrative appeal and noting appellants could “obtain review” of decision through original action).

²³ CBJ 49.25.250, (2012); CBJ 49.25.300 & table (2015).

²⁴ *See Coffey*, 862 P.2d at 175-76 (“Simply because ‘natural resource extraction’ is permitted as a conditional use in R-2A areas doesn’t mean that large-scale commercial mining must be permitted anywhere in the area so long as the mine operator takes every reasonable precaution to conduct the operation carefully.” (citing *Byrum v. Bd. of Supervisors*, 225 S.E.2d 369, 373 (Va. 1976))).

²⁵ *Id.* at 171-72 (setting out procedural history).

B. The Planning Commission's Decision Was Supported By Substantial Evidence And Permissible Interpretations Of Ordinances.

Zenk contends that the Planning Commission did not comply with all applicable ordinances and that its findings were not all supported by the evidence. The City responds that the Planning Commission complied with the law and that its findings are supported by substantial evidence. The City contends that Zenk's underlying argument has not really changed and that Zenk is effectively asking us to reassess the evidence to reach a different decision than did the Planning Commission.

Our review of zoning board decisions is deferential; we use the reasonable basis standard of review for most legal issues related to zoning ordinances²⁶ and the substantial evidence standard for factual issues.²⁷ We may apply our independent judgment to zoning ordinance interpretations when an ordinance is procedural and interpretation "does not 'implicate special agency expertise or the determination of fundamental policies within the scope of the agency's statutory function.'"²⁸ Because the questions presented here implicate agency expertise, we apply a deferential review.

Zenk first argues that the Planning Commission erred by scheduling a meeting and considering Lendrum's conditional use permit application because the application was not complete and City ordinances permit accepting only complete

²⁶ *Lazy Mountain Land Club v. Matanuska-Susitna Borough Bd. of Adjustment & Appeals*, 904 P.2d 373, 385 & n.68 (Alaska 1995).

²⁷ *Native Vill. of Eklutna v. Bd. of Adjustment for Municipality of Anchorage*, 995 P.2d 641, 643 (Alaska 2000) (quoting *Coffey*, 862 P.2d at 173).

²⁸ *S. Anchorage Concerned Coal., Inc. v. Municipality of Anchorage Bd. of Adjustment* (S. Anchorage 2007), 172 P.3d 768, 771 (Alaska 2007) (quoting *Alaska Pub. Emps. Ass'n v. State*, 831 P.2d 1245, 1247 (Alaska 1992)).

applications.²⁹ Zenk illustrates this argument with specific items the conditional use permit application form lists as necessary for a “complete” application. For example, Zenk argues “Lendrum’s statement that he will plant ‘native vegetation’ along boundaries does not comply with” requirements that plans “be drawn to scale and clearly show existing and proposed vegetation with location, area, height, and type of plantings.”³⁰ Zenk similarly faults the Planning Commission for failing to “recognize[] that important physical features, such as drainage details, were missing from [the] project development plans,” even though drainage and concerns about runoff were discussed in written testimony. These illustrations directly relate to two neighborhood concerns, encroachment on privacy and potential for harmful runoff from the landscaping business. Zenk also contends that the City did “not have discretion to schedule a [Planning Commission] hearing and then accept information to complete the application.”

Zenk’s arguments related to completeness and the City accepting the application without all of the information detailed on the form implicitly rely on a theory that because the City’s application ordinance uses *must* — a mandatory term under another City ordinance³¹ — strict, rather than substantial, compliance with the ordinance

²⁹ CBJ 49.15.130 (1991) provides that permit applications must be complete and describes a complete application “contain[ing] all of the information necessary to determine if the development will comply with all of the requirements of the permit applied for.” The conditional use permit application instructions detail a list of information that should be included in plans as well as formatting expectations.

³⁰ These requirements are part of the conditional use permit application form instructions and are not, as far as we have been able to determine, set out in an ordinance.

³¹ CBJ 49.15.130(a) (“All applications for permits must be complete, signed and accompanied by the applicable fee before the permit-issuing authority can accept the application.”); CBJ 01.15.010 (“*Must* and *shall* are each mandatory.” (emphasis in original)).

and the application form requirements is necessary. Zenk frames this as a plain meaning and mandatory language argument, but his reasoning assumes that an applicant must provide all the specific details listed on the conditional use permit application form.

City planning staff used substantial, not strict, compliance to evaluate the conditional use permit application's completeness: The staff memorandum adopted by the Planning Commission indicated that the application "substantially conforms to the requirements of CBJ Chapter 49.15."³² Zenk argues that the statutory language is "clear" and "unambiguous" in requiring a complete application, but he does not explain why strict, rather than substantial, compliance with the statutory requirements is needed. We have permitted substantial rather than strict compliance in a variety of contexts,³³ and nothing here suggests that the City's use of substantial compliance to evaluate the conditional use permit application was impermissible. We give considerable deference

³² Substantial compliance can be used with both procedural and substantive statutes, although the doctrine is somewhat different in the two contexts. *Compare Adamson v. Municipality of Anchorage*, 333 P.3d 5, 12-13 (Alaska 2014) (discussing application of substantial compliance doctrine to substantive requirements), *with S. Anchorage 2007*, 172 P.3d at 771-72 (discussing substantial compliance with procedural requirement).

³³ *See, e.g., Adamson*, 333 P.3d at 13-15 (allowing substantial compliance with statutory and regulatory requirements for exposure to toxins because to do otherwise would be contrary to legislative intent); *Kim v. Alyeska Seafoods, Inc.*, 197 P.3d 193, 196 (Alaska 2008) (holding that procedural statute was directory, rather than mandatory, and strict compliance was unnecessary); *S. Anchorage 2007*, 172 P.3d at 771-72 (discussing substantial compliance with procedural requirement); *Grimm v. Wagoner*, 77 P.3d 423, 429 (Alaska 2003) (holding that substantial compliance was consistent with legislative purpose of disclosure law); *Jones v. Short*, 696 P.2d 665, 667 (Alaska 1985) (holding that substantial compliance was appropriate standard to evaluate whether contractor complied with contractor-registration statute).

to zoning board decisions,³⁴ and we are not persuaded the determination that Lendrum's application substantially complied with the requirements for completeness was erroneous either legally or factually.

As a legal matter the conditional use permit application provided sufficient detail for neighbors to comment, both in writing and orally at the meeting on the permit, and for Planning Commission members to question staff and Lendrum about the proposed land use. The application information thus fulfilled its purpose of giving neighbors and the Planning Commission adequate information about the proposed use for neighbors to make their concerns known and the Planning Commission to address them.³⁵ The permit itself imposed conditions addressing neighbors' concerns, including use of "Best Management Practices to protect the adjacent properties," a prohibition on water quality impairment, a limitation on retail hours, and improvements to the shared driveway.

As a factual matter the July narrative and plan, dealing only with Lot 2, showed display gardens on the property boundary and discussed drainage. The more detailed drawings and narrative amending the application to include Lot 3, filed after neighbors had voiced concerns, likewise showed gardens and native vegetation along boundaries, discussed runoff and drainage, and indicated that plants would screen

³⁴ See *Native Vill. of Eklutna v. Bd. of Adjustment for Municipality of Anchorage*, 995 P.2d 641, 643 (Alaska 2000) (setting out established standards of review for zoning board decisions, including "a presumption of validity" for the decisions and "considerable deference" to "a zoning board's interpretation of zoning ordinances and planning documents" (quoting *S. Anchorage Concerned Coal., Inc. v. Coffey*, 862 P.2d 168, 173 & n.12 (Alaska 1993))).

³⁵ Cf. *Jones*, 696 P.2d at 667 n.10 (noting in context of contractor-registration statute that "substantial compliance involves conduct which falls short of strict compliance with the statutory registration requirements, but which affords the public the same protection that strict compliance would offer").

neighbors' view of the property. This constitutes substantial evidence to support a determination that the application substantially conformed to the applicable requirements for completeness.

Zenk argues separately that the conditional use permit application should not have been accepted because it was not signed by anyone who owned or leased the City's Lot 3, even though: (1) the October narrative and diagram included development of Lot 3; (2) notice of the permit application public hearing included Lot 3 (and listed the City as an owner); and (3) the conditional use permit listed the City's Lot 3 as part of the property's legal description. The City responds that the signature of Greg Chaney, a City employee, on the development permit application form accompanying the request for a lease sufficiently fulfilled the signature requirement. The City adds that the process resolved "a chicken and egg type of conundrum" by having Chaney sign the form, after which the Planning Commission reviewed the conditional use permit application for both lots before considering the lease application for Lot 3 and "conditioning its approval on Lendrum obtaining a lease before operating on [City] Lot 3." The City also asserts that "[t]o allay any potential confusion, the Planning Commission explicitly imposed a condition that Lendrum could not use [City] Lot 3 until and unless the [City] Assembly authorizes the lease." The City indicated at oral argument before us that the conditional use permit allows Lendrum to use Lot 2 as a commercial greenhouse independently of a lease for Lot 3.

"Applications for permits will be accepted only from persons who have, or upon issuance of the permit, will have the legal authority to take action in accordance with the permit. All applications must be signed by the owners or lessees of the land to

be subject to the permit.”³⁶ Lendrum’s July initial conditional use permit application clearly met this requirement because it covered only Lot 2, which Lendrum owned. By the time the conditional use permit application was amended in October to include Lot 3 in the drawing and narrative, Chaney had signed a form in the lease file referencing the conditional use permit application “for project details.” In light of the “considerable deference” we give zoning boards when they interpret zoning ordinances and planning documents,³⁷ the Planning Commission could reasonably conclude that Chaney’s signature was adequate for purposes of CBJ 49.15.120(a).

Zenk additionally argues that the applications did not have sufficient detail related to parking, lighting, and structures, contending that these issues “were briefly discussed in testimony.” But both the July and October plans show buildings and parking areas; the accompanying narratives indicate no lighting will be used because the business will not operate in winter and specializes in native plants that will not need additional greenhouse lighting. Although it is true that the plans’ parking areas do not show each space’s exact dimensions, City ordinances have minimum dimensions for parking spaces, with additional specific requirements for van-accessible spaces.³⁸ The number of parking spaces was, according to the staff memorandum, dependent on the area of the buildings and type of use; the memorandum calculated that at least eight parking spaces were needed for the business, one of which had to be van accessible, and two additional spaces were required for the residence. The ordinance together with the memorandum and plans contained adequate information for the Planning Commission

³⁶ CBJ 49.15.120(a) (1987).

³⁷ *Native Vill. of Eklutna*, 995 P.2d at 643 (quoting *Coffey*, 862 P.2d at 173 n.12).

³⁸ CBJ 49.40.210(b)(1), (3)(C)-(D) (2010).

to assess whether the proposed development of the lots met parking requirements. Again, we give considerable deference to a zoning board's interpretation of planning documents and ordinances.³⁹

In sum the Planning Commission's acceptance of the conditional use permit application and issuance of the permit were supported by substantial evidence and permissible interpretations of the applicable zoning ordinances and documents. The City Assembly's decision affirming the Planning Commission's decision was not erroneous, and we affirm the superior court's decision affirming the City Assembly's decision.

C. The Superior Court Correctly Concluded That No Due Process Violation Occurred.

Zenk argues that the conditional use permit approval process deprived him of procedural due process. In particular he notes that: (1) each member of the public was limited to three minutes of testimony, while Lendrum was given unlimited time; (2) those opposing the conditional use permit were not given an opportunity to rebut what they saw as "false and/or misleading statements made by the applicant"; and (3) "administrative efficiency took precedence over fair and just procedures." The City argues that Zenk does not have a property interest subject to due process or alternatively that the process used was adequate.

We do not need to consider the exact nature of the property interest at stake here because we agree with the City that the process used was more than sufficient to protect Zenk's interests. Zenk received notice of meetings about the conditional use permit, had the opportunity to (and did) submit written comments, testified in opposition to the conditional use permit at the public hearing, and was afforded the opportunity to appeal the decision first to the City Assembly, next to the superior court, and then to this

³⁹ See *Native Vill. of Eklutna*, 995 P.2d at 643 (quoting *Coffey*, 862 P.2d at 173 n.12).

court. The record shows that the Planning Commission considered the neighbors' objections to the proposed use and imposed a number of conditions attempting to accommodate concerns.

In a similar case the Maine Supreme Court decided that a town had "adequately protected" the due process rights of a landowner whose property abutted a proposed 17-lot subdivision.⁴⁰ As in this case, the abutting landowner received notice of the land-use proposal and testified about the development at public meetings.⁴¹ The landowner's concerns were addressed in some fashion by the town,⁴² just as the City considered and attempted to address the neighbors' concerns when it imposed a list of conditions on Lendrum's development of the property. The Maine court observed that the landowner "was able to participate meaningfully throughout the permit approval process,"⁴³ and the same is true of Zenk.

Because Zenk had notice of the proposed land use and a meaningful opportunity to have his objections to that use considered, we see no due process violation in the specific procedures the City used in this case. We affirm the superior court's decision on this issue.

V. CONCLUSION

We AFFIRM the superior court's decision.

⁴⁰ *Glasser v. Town of Northport*, 589 A.2d 1280, 1281, 1284 (Me. 1991).

⁴¹ *Id.* at 1284.

⁴² *Id.*

⁴³ *Id.*