AGENDA

FOR THE REGULAR MEETING
OF THE CITY COUNCIL FOR THE
CITY OF THORNE BAY, ALASKA
TUESDAY, August 5, 2025

TIME: 6:30 p.m.

THERE WILL BE A WORKSHOP BEGINNING AT 6:00PM

LOCATION: IN PERSON AT CITY HALL or TELECONFERENCE/VIDEO CONFERENCING LINE
Phone Number: 1-650-479-3208
Meeting link:
https://cityofthornebay.my.webex.com/cityofthornebay.my/j.php?MTID=m99f71eee7f975b71d7ee0f9f7c5e44a1
Meeting number: 182 323 7632 Password MghMxgJy424 (64469459 when dialing from a phone or video system)

1) CALL TO ORDER:
2) PLEDGE TO FLAG:
3) ROLL CALL:
4) APPROVAL OF AGENDA:
5) MAYOR'S REPORT:
6) ADMINISTRATIVE REPORTS:
   a) City Administrator:
   b) City Clerk
7) DEPARTMENT REPORTS:
   a) Water Report: Written report given
8) PUBLIC COMMENTS:
9) COUNCIL COMMENTS:
10) PUBLIC HEARING: Variance Application
   a) **Resolution 25-08-05-01 PZ:** Public hearing on Central Council of the Tlingit & Haida Tribes of Alaska application for a Height Requirement Variance:
11) CONSENT AGENDA:
   a) **Minutes** of the July 1, 2025, Regular City Council Meeting, action item:
12) NEW BUSINESS:
   a) **Discussion item:** Sales Tax rates; possible increase, decrease, and tax holiday, discussion item;
13) CONTINUATION OF PUBLIC COMMENT:
14) CONTINUATION OF COUNCIL COMMENT:
15) ADJOURNMENT:

POSTED: August 1, 2025

MINUTES

FOR THE REGULAR MEETING
OF THE CITY COUNCIL FOR THE
CITY OF THORNE BAY, ALASKA
TUESDAY, JULY 1, 2025 TIME:
6:30 p.m.

THERE WAS A WORKSHOP BEGINNING AT 6:00PM

1) CALL TO ORDER:

Vice Mayor called the meeting to order at 6:30pm

2) PLEDGE TO FLAG:

The audience and council stood for the pledge to the flag.

3) ROLL CALL:

Those present were:

Pesterfield, Lovell, Nyquest, Cunningham, Kaer

Those absent were:

Blair, Killian

4) APPROVAL OF AGENDA:

Vice Mayor moved to approve the Agenda, seconded,
Cunningham moved to amend the Agenda adding two items, Seconded Pesterfield

1. Grants list
2. Bid process

Discussion:

- Cunningham explained his reasons for wanting to add the items to the agenda.
- Council discussed the detriments and merits of having a grants list.
- Clerk clarified code already has a procurement section and employees follows a specific procedure for bidding processes.
- Vice Mayor restated the amended motion on the table:
  - Amend the agenda to include two additional discussion items:
    - Grants list
    - Bid process

Vice Mayor moved to amened the amended motion to state: Approval of the Agenda

MOTION: Move to approve the agenda.
F/S: Lovell/ Pesterfield
YEAS: Pesterfield, Lovell, Cunningham, Kaer, Nyquest
ABSENT: Killian, Blair
STATUS: Motion Passed

5) MAYOR'S REPORT: Kudos to John and Josh regarding the Landfill report, scored higher than previously.

6) ADMINISTRATIVE REPORTS:

a) City Administrator: See attached

b) City Clerk: Starlink for DL is ready to be installed, Starlink for ambulances are ready to be installed, working from home but available, waiting for response about gaming permit, plan to follow up this week again, election prep is happening, planning training for election workers – 2 seats will be up for election Seat C and Seat B. Will have same day absentee voting at Davidson's Landing. Looking into some training opportunities for Clerk's office to boost knowledge. Thorne Bay Days volunteers – no response, would like to seek temporary employee for events planning to take the brunt of planning and

running this event. Finance reports will be sent out, working on a new format for ease of reading and transparency.

7) DEPARTMENT REPORTS:
   a) Water Report: Written report given
   b) EMS Report: Written report given
   c) Harbor Report: Written report given
   - Oral report: fixed some issues with power stations at dock, the old system needs to be maintained and replaced – goal to replace transient parts working way in. $2200 to replace 6 stations/ year.

8) PUBLIC COMMENTS:
   Trina Pesterfield thanks for holding public discussions on ordinances and bid processes.

9) COUNCIL COMMENTS:
   a) Sean Kaer expressed appreciation to Harbormaster and piling maintenance. Agrees with bids discussion and would like to see more.
   b) Pesterfield thanks the Harbormaster and would like to see some kind of welcome with information instead of the float plane fees and the welcome fish. Commented he has spare things – windsock – he would donate to the City and assist in putting it up. Recommend cleats in stead of ropes at the end of the dock, happy to donate things to help spruce up the area and make it more welcoming. Offered to help
   c) Cunningham commented that the RV Park is a money maker and if the taxes are raised, 1% of taxes set aside for RV park improvements.
   d) Kaer questioned how to have a seconded meeting this month, Clerk responded.
   e) Nyquest thanked Pesterfield for his comments from earlier, and stated that as we place additional burdens on the City Admin and Clerk, it takes away from their other duties as well. Showed appreciation for the Harbormaster and the work that he's doing.
   f) Kaer commented that we could maybe have a local artist create something welcoming. Commented that there are things to donate to help out. Shower stalls that need to be fixed – screws need to be put into the wall. Harbormaster will look into it. Nyquest POI: the seat? Kaer confirmed.
   g) Lovell commented looks forward to discussions that are geared towards tax focus. Questioned if the City Administrator would put a report into the packet beforehand.

10) CONSENT AGENDA:
   a) Minutes of the June 17, 2025, Regular City Council Meeting, action item:

Vice Mayor moved to approved the Consent agenda, Seconded. No discussion

MOTION: Move to approve the Consent Agenda.

F/S: Lovell/ Pesterfield
YEAS: Pesterfield, Lovell, Cunningham, Kaer, Nyquest
ABSENT: Killian, Blair
STATUS: Motion Passed

11) NEW BUSINESS:
   a) Resolution 25-07-01-01: A Resolution of the City Council of the City of Thorne Bay, Alaska, Approving The Request For A 6-Month Rental Extension For Lot4, In The Thorne Bay Rv Park, discussion and action item;

Vice Mayor moved to approved Resolution 25-07-01-01, Seconded. Discussion as follows;

Pesterfield agrees with extending the rental for an additional 6 months.
Nyquest agreed with extending, would like to have discussion on RV park in general for what the future of the RV park is.
Lovell questioned if that would be discussed later.
Nyquest pointed out items to discuss in the future.
Cunningham commented on past renters in the RV park – suggested short term rental and long term rental with certain terms.
Pesterfield agreed, requires further discussion for those things. Should approve this resolution

MOTION: Move to approve Resolution 25-07-01-01.
F/S: Lovell/ Cunningham
YEAS: Pesterfield, Lovell, Cunningham, Kaer, Nyquest
ABSENT: Killian, Blair
STATUS: Motion Passed

b) **Resolution 25-07-01-02:** A Resolution of the City Council of the City of Thorne Bay, Alaska, Approving a Short-term Lease with Alaska Marine Lines at the Sort Yard, discussion and action item;

Vice Mayor moved to approved Resolution 25-07-01-02, Seconded. Discussion as follows;
Pesterfield commented on discussion of length and land needs that happened prior, Thorne Bay could potentially get more money in the future if we could rent them more property.
Cunningham questioned if the City Administrator checked into other communities' rates and would like to see an increase. $6 is not a lot. Would like to see Thorne Bay receive higher revenue.
Lovell POI is there a rubric for what we charge?
Huestis responded yes, tied to the CPI
Pesterfield commented that the rent is $266 not $6 and we are not leasing the property currently so we would be making money we are not currently.

MOTION: Move to approve Resolution 25-07-01-02.
F/S: Lovell/ Pesterfield
YEAS: Pesterfield, Lovell, Cunningham, Kaer, Nyquest
ABSENT: Killian, Blair
STATUS: Motion Passed

c) **Discussion item:** Development plan and Variance application for Central Council of the Tlingit & Haida Indian Tribes of Alaska,

Vice Mayor opened the discussion item:
Discussion as follows:
Trevor Newton provided a presentation on what the Tidal Network is, can do and why they are in need of a Variance for their tower.
Lovell: asked if the City would add their fire and EMS broadband to the tower if needed? Asked where internet is being received?
Luke Johnson: Many internet options
Trevor Newton explained further, shared slides explaining
Cunningham POI: will this tower be able to host cellular signals also?
Huestis clarified that the tower is for fixed wireless internet – being built for that purpose but could potentially house cell service later.
Newton: Tidal Network is the provider for internet. Starlink could be a potential backfall product.

The use of the tower will be to provide a structure for fixed broadband but will have ability to host other cellular providers.

Pesterfield stated that the need for the discussion item is for a height variance. Commented that there are houses close by the setbacks, and while there are fail safes for a falling tower, it does not mean that in the event of a natural disaster, it could fall onto neighboring properties. A higher tower would provide a larger range of service, there is another tower close by. Is this tower the same bandwidth as that tower?

Johnson responded 5g is a standard for technology – same frequency spectrum as 3g and 4g. explained fcc licensing numbers.

Pesterfield questioned what the height of the tower could be without the variance.

Newton responded about 150

Pesterfield what degree of degradation would it cause to have a 150 vs a 160 ft tower.

Newton responded line of sight would be interfered with, lower quality of service, less availability for other companies to add to tower, etc.

Lovell questioned if there is projected usage or coverage of customers?

Johnson responded does not have immediate numbers right this time.

Kaer questioned if any notices have been put out to the neighbors and questioned if the City will receive any revenue from this?

Clerk commented that the Clerk's office sends out notices to all neighbors.

Johnson clarified sales tax is not applied to internet providers.

Newton commented potential property tax. – **Lovell** commented there is no property tax.

Pesterfield Standalone or guidelines?

Newton – stand alone no guide wires

Cunningham questioned if this was part of the notice of intent?

Lovell questioned how the data would be repeated?

Johnson responded this model is not made as a mesh.

Huestis questioned knowledge of towers falling over due to emergency incidents?

Newton responded negative, not that he knows of. Tower will be fully engineered to prevent failure. **Huestis** question if this will be revenue mutual or is this just to supply to the company.

Johnson replied this is funded by grant monies – will intend to be cost effective.

12) CONTINUATION OF PUBLIC COMMENT:

a) **Trina Pesterfield** questioned health concerns etc.

i. Johnson responded FCC safety information available.

13) CONTINUATION OF COUNCIL COMMENT:

a) **Pesterfield** commented on the Thorne Bay Waterfront Plan from 2017. Discussion has happened a few times on the plan, and as it is 10 years old it is not considered sound for today's time. Would like to revisit and reconstruct the Waterfront Plan. Recommended a Town Hall type discussion on ways to revise the plan. Proposed a potluck style community discussion for the future of the waterfront plan. Guidance from the community would be beneficial for the future of Thorne Bay.

b) **Clerk clarified** requirements for council meeting for potluck.

c) **Cunningham** questioned limit of council members **Clerk clarified**

d) **Cunningham** requested negotiations with JS include time limits for building and operating.

Commented that he does not agree that any discussion is a waste of time.

14) ADJOURNMENT: Vice Mayor adjourned the meeting at 8:10 pm.

City of Thorne Bay
Thorne Bay, AK 999109
PHONE: (907) 828-3380; FAX: (907) 828-3374
E-MAIL: cityclerk@thornebay-ak.gov

DEPARTMENT REPORT

Subject: Monthly Department Report

Department: Water & Sewer Utility

Supervisor: Sam Sawyer, Level II Water

Employees: Sam Sawyer, Supervisor
Willy Jennings, Employee

Date: July 2025

A Departmental Overview

The Water/Sewer Department is administered by Sam Sawyer, Level II Water Operator. The Supervisor(s) and staff are responsible for the operation and maintenance of the City's four core sanitation services: Water Treatment, Water Distribution, Sewage Collection, and Sewer Treatment. Duties include maintenance, minor and major schedule and unscheduled repairs throughout all four systems, monthly reporting to the Alaska Department of Environmental Conservation as required, direct sampling as scheduled for water quality and wastewater effluent quality compliance, implementation of a preventative maintenance schedule, construction of new water distribution mains and residential /commercial service connections and wastewater collection mains and residential/commercial service connections.

Current Department Activities:

Aside from working at the water/sewer treatment facilities performing our regular duties, we are now flushing fire hydrants, pressure washing, and doing grounds keeping work during the summer months.

Central Council of the Tlingit & Haida Indian Tribes of Alaska
Tidal Network
Physical Address: PO Box 25500 • Juneau, Alaska 99802
Mailing Address: PO Box 25500 • Juneau, Alaska 99802

July 23, 2025

Caitlyn Sawyer
City Clerk – Thorne Bay, AK
PO Box 19110, Thorne Bay, AK 99919

RE: Zoning Setback Variance – Block 1, Lot 14, Thorne Bay, AK

Ms. Sawyer,

The Central Council of the Tlingit and Haida Indian Tribes of Alaska (Tlingit & Haida) kindly requests approval of our zoning variance request for the proposed communications tower at Block 1, Lot 14, Thorne Bay, AK (Property). This project satisfies all legal and planning requirements, directly addresses a critical public need, aligns with federal infrastructure funding mandates, and supports a long-term sustainable model for broadband access in Thorne Bay.

Tidal Network is a division of Tlingit & Haida, a federally recognized tribal government, whose primary mission is to provide fixed wireless broadband services to unserved and underserved communities in Southeast Alaska. As part of this, Tidal Network's first objective is to construct wireless infrastructure via the development of communications towers throughout Southeast Alaska which includes our proposed communications tower at the Property. In addition to this tower's ability to deliver fixed wireless broadband to Thorne Bay residents, it can support public safety and governmental communication systems, including potential collocation for VHF services, tsunami warning systems, city emergency radios, and other public and private telecommunications carriers.

Further, as set forth by the Thorne Bay Municipal Code under Title 17, we want to reiterate our permitted use of the land in that our Property is zoned Residential/Commercial III which includes communications-telecommunications facilities as permitted out right. Approval of this variance will allow us to optimize our use of the Property for present and future applications. Therefore, our goal with this letter is to alleviate concerns raised during your July City Council Meeting and speak to how we comply with all other design criteria outlined in Thorne Bay's Municipal Code.

Central Council of the Tlingit & Haida Indian Tribes of Alaska
Tidal Network
Physical Address: PO Box 25500 • Juneau, Alaska 99802
Mailing Address: PO Box 25500 • Juneau, Alaska 99802

Section 17.04.040.B – Criteria

1. *The applicant shall provide an analysis prepared by a radio or electrical engineer demonstrating that the proposed location of the antennas is necessary to meet the coverage and capacity needs of its system and that there is no existing antenna support structure that could adequately serve the area if antennas were placed on it.*
    a. We have provided a coverage analysis demonstrating the coverage gap that would be incurred by comparing our requested 175' tower versus an otherwise allowable 115' tower that would not trigger a setback variance requirement. Also, there are no current towers in the vicinity of our Property that would satisfy our coverage goals.

2. *The placement, design, use and operation of telecommunications facilities shall comply with the Telecommunications Act of 1996 and the rules of the Federal Communications Commission (FCC)*
    a. Our tower will be compliant with all FAA and FCC regulations. Per our funding source, we will have to fulfill even stricter FCC regulations before we are granted approval to construct. Therefore, all these steps will be completed prior to construction of a tower at the Property.

Section 17.04.040.D – Design Criteria

1. *All towers shall be designed and certified by a licensed engineer for structural soundness and conformity with all applicable State and Federal Codes and Laws.*
    a. Our tower and site will be fully engineered by licensed engineers in the State of AK and will comply with appropriate building and structural codes adopted by the State of AK. A sample tower engineering package has been provided in our packet.

2. *Freestanding towers shall be designed in all respects so as to accommodate colocation of the applicant's antennas and at least two additional users and to allow for future rearrangement of antennas upon the tower, antennas mounted at varying heights, and to accommodate supporting buildings and equipment.*
    a. Our tower is being designed to accommodate three additional users on both the tower and the ground.

3. *Towers shall be located and painted so as to minimize their visibility where practicable and except as dictated by the Federal Aviation Administration (FAA).*
    a. Our Property allows for a natural tree buffer that we plan to keep intact, as illustrated in our conceptual site plans. Our tower will have a limited viewshed impact.

4. *No telecommunications tower or facility shall be located in the required minimum setbacks in any zone, with the exception that the use of existing light poles, high voltage poles or towers, and telecommunication towers are exempt from the setback requirements; provided, that such pole or telecommunications tower is not increased in height. Placement of new towers shall be set back from adjacent property lines a distance equal to or greater than to the actual height of the tower.*
    a. To have our needed tower height, we are requesting a setback variance. To alleviate any concerns associated with the code's mandated setback requirements, we are prepared to engineer the tower with a fall zone radius that is confined to the property boundaries. This is a common practice in this industry.

5. *Towers are exempt from the height restriction set forth in the zones and subject to the following limitations:*
    a. Towers permitted out right shall not exceed 200 feet in height and can meet all the setback requirements from buildings. towers may be permitted higher than 200 feet if permitted through a conditional use.
        i. We do not request a tower in exceedance of 200 feet in height and are in a permitted out right zone (Residential/Commercial III).
    b. Towers permitted through a conditional use shall not exceed 60 feet in height unless located in an area not suitable for Residential development and can meet all the setback requirements from buildings and property lines.
        i. This criterion does not apply to us.

6. *No telecommunications tower or antennas shall be artificially illuminated unless required by law or the Federal Aviation Administration.*
    a. Per the FAA Pre-Screening Tool, we will not require any lightning and will not require notice to the FAA. As a result, we do not propose any lighting on the tower.

7. *A freestanding tower shall be enclosed by security fencing not less than eight feet in height and secured so that it is not accessible by the general public. Fence design, materials and colors shall reflect the character of the surrounding area. Climb guards are required on towers that are attached to existing structures when mounted on the ground and unable to be enclosed by fencing.*
    a. We are proposing an 8-foot security fence that can be screened with privacy slats of any required color and are not proposing a tower attached to an existing structure.

8. *Adequate access to the facility must be provided from a public right-of-way or easement consistent with the type of facility constructed. Sites off the road system do not require access via a right-of-way.*
    a. Our access abuts the right-of-way off North Road. Our access road will be designed to support construction vehicles entering and exiting the site during construction, thus ensuring adequate future access.

Section 17.04.044.D – Variance Criteria

A. *Criteria for Consideration in Establishing Approval or Denial the following criterial must be considered. After a public hearing, the planning commission must develop a resolution which addresses each of the criterial and base their decision on whether the criterial are in the affirmative or not:*
    a. *That there are exceptional physical conditions or circumstances on the property or that would relate to its intended use or development that make the variance necessary;*
        i. Due to our lot's geometry, we are unable to satisfy the code provided setbacks requirements while building our needed 175' tower. Further, due to topographic and existing tree coverage constraints, we cannot build a shorter tower as this would have an adverse effect on meeting our coverage objectives and on our ability to support future, additional users of the tower.
    b. *That the particular conditions or reasons that require the variance are not caused by the person requesting the variance;*
        i. Lot geometry, topography, tree coverage or mandated coverage objectives are not in our control.
    c. *That the strict application of the provisions of this title would result in unnecessary hardship;*
        i. Applying the provisions of the code outlined setbacks would result in an inability for us to meet our required coverage objectives and to comply with the Thorne Bay mandated provision to support up two additional users.
    d. *That approval of the variance would not be detrimental to the health, safety and welfare of other properties in the vicinity;*
        i. For reasons previously outlined, granting this variance would not be detrimental to the health, safety and welfare of other properties in the vicinity.
    e. *That the variance will not allow a land use in a zone that prohibits that particular land use;*
        i. Our land use is *permitted out right* by our Property's zoning.

Central Council of the Tlingit & Haida Indian Tribes of Alaska
Tidal Network
Physical Address: PO Box 25500 • Juneau, Alaska 99802
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f. That approval of the variance is consistent with the comprehensive plan;
   i. Our variance is consistent with the comprehensive plan as it provides critical communications infrastructure that supports economic and social development for the citizens of Thorne Bay.

g. That the variance is not requested because of monetary considerations or inconvenience.
   i. The variance is requested to meet our coverage objectives and comply with a Thorne Bay provision to support additional users.

h. That the variance request is for work yet to be performed.
   i. No work has commenced.

Acknowledgement of Concerns Raised at July City Council Meeting

We would like to reiterate that the prospective tower will be built in compliance with all authorities having jurisdiction on the matter including the FCC, FAA, NTIA and Thorne Bay. Additionally, we have provided a radio frequency safety report to alleviate any concerns related to radio frequency emissions. It should be noted that the report states we are compliant with FCC Rules and Regulations regarding human exposure to radio frequency radiation. Last, it is not our goal to build wireless infrastructure that is not engineered appropriately, considerate of environmental impacts, or that ultimately adversely affects public safety.

Commentary on Atlas Tower

We would like to note to the City Council that the recently approved and constructed Atlas Tower tower located off Sandy Beach Road was granted a Conditional Use Permit (CUP). This tower would appear to have violated two setbacks without the granting of a CUP. We kindly ask the Council to view our request for a setback variance in a consistent manner so that we, like Atlas Tower, are able to construct a tower that adequately meets our coverage objectives and supports future users.

Closing

In closing, we appreciate your consideration on this matter and kindly request approval of our setback variance request.

Respectfully,

Richard. J Peterson
President – The Central Council of the Tlingit & Haida Indian Tribes of Alaska

VARIANCE APPLICATION

For Office Use Only

Application No.: _____
Date: _____
Fee: _____

PLEASE PROVIDE IN FULL THE FOLLOWING INFORMATION (TYPE OR PRINT LEGIBLY)

New Development: Yes: X No: _____

Modification to Existing Development: Yes: _____ No: X

- Variance to Permit: Setback variance for a proposed 175' (180' top of highest) self-support tower. Due to our lot geometry and needed tower height, we must violate at least once setback.
  (Complete narrative as attachment if necessary)
- Where City Code Requires: Section 17.04.040.D.4 - Setback Variance Request

Legal Description of said Property (lot, block, tract, subdivision): Lot 4, Block 1, Tact B, ASLC 80-121

General Description of Project: Unmanned telecommunications compound and tower.

Zoning: Residential - Commercial III

Lot Area: 3.50 Acres

Square Footage of Structure: Existing: 0 Proposed: 3,600 SF

Number of Dwelling Units: Existing: 0 Proposed: 0

Agent: _____ (Signature*)

Name: Central Council of the Tlingit & Haida Indian Tribes of Alaska (Print)

Address: PO Box 25500
Juneau, AK 99802
(City State Zip)

Telephone: 907-463-8003

Email: mbruce@tlingithaida.gov

Owner: _____ (Signature**)

Name: _____ (Print)

Address: _____

_____
(City State Zip)

Telephone: _____

Email: _____

Application No.: _____
Date: _____

VARIANCE APPLICATION CHECKLIST:

An application for a platting variance shall include:

1. A drawing of the plat or photocopy of the existing survey;
   Drawing or Map must include:
   i. North point arrow, date and scale;
   ii. Exterior property boundaries and dimension;
   iii. Access;
   iv. All easements on the property;
   v. Location of all existing and proposed buildings on the property and their approximate distance from the lot lines;
   vi. Sewer and water lines and power poles serving the property.

2. Proof of title of the applicant;
   An authorization letter must be provided by the owner if an agent is providing representation.
   If ownership cannot be verified through the Alaska Recorders Office, a copy of the recorded warranty deed, a copy of a valid purchase contract, or a signed/notarized letter from the owner of record must be submitted.

3. A written application in narrative form explaining the conditions, facts and reasons why a variance should be granted and why such facts and reasons constitute compliance with each of the requirements for variance as stated herein.

4. Application shall be made to the city clerk, who shall forward the application to the Planning Official and platting board.

TNBMC Title 16.36.010 - VARIANCE REQUIREMENTS:

A variance from the requirements for this title may be granted only if the following conditions are met:

1. The granting of a platting variance will not be detrimental to the public health, safety or welfare, or injurious to adjacent property.
2. The conditions upon which the platting variance is based do not apply generally to the properties other than the property for which the variance is sought.
3. The tract to be subdivided is of such unusual size and shape or topographical configuration that strict application of the requirements of this title will result in undue and substantial hardship to the owner of the property.
4. Implementation of the variance will not cause a violation of a state fire regulation adopted pursuant to AS 18.70.080. (Ord. 87-01 § 11(part), 1987)

VARIANCE APPLICATION SITE PLAN

SITE PLAN per Section 17.04.045 (b) (i-vi) of the Thorne Bay Municipal Code

Use the space below to draw a map of the site, providing the following information as listed below and in Thorne Bay Municipal Code 17.04.045 (b) (i-vi). The State of Alaska Department of Commerce aerial maps with property lines are a useful tool to assist with developing the map.

Separate Development Plans Appended

Application No. _____
Date: _____

VARIANCE APPLICATION
APPLICANT STATEMENT
(Page 1 of 2)

Applicant certifies the following statements are true:

1. That there are exceptional physical conditions or circumstances on the property or that would relate to its intended use or development that make the variance necessary;

   ☒ True ☐ False

2. That the particular conditions or reasons that require the variance are not caused by the person requesting the variance;

   ☒ True ☐ False

3. That the strict application of the provisions of this title would result in unnecessary hardship;

   ☒ True ☐ False

4. That approval of the variance would not be detrimental to the health, safety and welfare of other properties in the vicinity;

   ☒ True ☐ False

5. That the variance will not allow a land use in a zone that prohibits that particular land use;

   ☒ True ☐ False

6. That approval of the variance is consistent with the comprehensive plan;

   ☒ True ☐ False

7. That the variance is not requested because of monetary considerations or inconvenience.

   ☒ True ☐ False

8. That the variance request is for work yet to be performed.

   ☒ True ☐ False

Application No.: _____
Date: _____

VARIANCE APPLICATION
APPLICANT STATEMENT
(Page 2 of 2)

APPLICANT STATEMENT

I, Richard Peterson, have received a copy of the ordinance and understand the ordinance requirements.

Declaration: I hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I undertake to inform you of any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, I am aware that I may be held liable for it.

Applicant(s):

Signature 6/19/25 Date

_____ Signature Date

NOTARY STATEMENT:

(May be Notary Public, Postmaster or City Clerk)

State of Alaska

City of Juneau

Sworn to and subscribed before me this 19th day of June, 20 25.

By: Genevieve McFadden Produced as ID: Genevieve McFadden

By: _____ Produced as ID: _____

Notary Public

Commission Expires: 5/14/29

GENEVIEVE MCFADDEN
Notary Public
State of Alaska
My Commission Expires May 14, 2029

PREPARED FOR:

TIDAL NETWORK

PIERSON WIRELESS

SITE NAME:

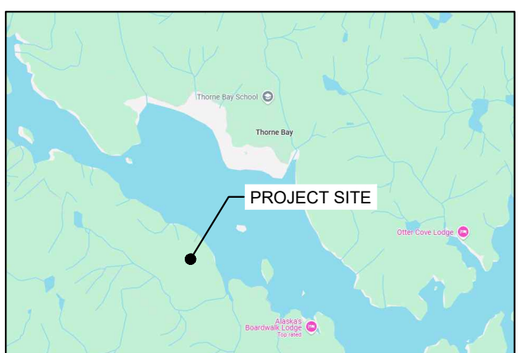
THORNE BAY ZONE 2

SITE ADDRESS (E-911 AND COORDINATES TO BE VERIFIED)

NHN NORTH ROAD
THORNE BAY, AK 99919
PRINCE OF WALES ISLAND
LATITUDE: 55° 40' 20.73" N
LONGITUDE: 132° 32' 19.16" W
PARCEL ID: SCT 33, LOT 14, BLOCK 1
ZONING: RESIDENTIAL - COMMERCIAL III

CITY OF THORNE BAY PLANNING & ZONING:
120 FREEMAN DRIVE
THORNE BAY, AK 99919
PHONE: (907) 204-8481
EMAIL: administrator@thornebay-ak.gov
ATTN: JOHN W. HUESTIS - CITY ADMINISTRATOR

PERMIT INFORMATION



VICINITY MAP

JURISDICTION:
CITY OF THORNE BAY

STATE:
ALASKA

TOWER TYPE:
SELF-SUPPORT/LATICE TOWER

TOWER HEIGHT:
175' (180' TO HIGHEST APPURTENANCE)

NUMBER OF CARRIERS:
0 EXISTING, 1 PROPOSED

EXISTING USE:
VACANT - WOODED

PROPOSED USE:
PROPOSED TELECOMMUNICATIONS TOWER AND UNMANNED GROUND EQUIPMENT

CONSTRUCTION TIMELINE:
BEGIN EARLY SPRING 2026
CONCLUDE EARLY SUMMER 2026

CONSTRUCTION TYPE:
TYPE II-B

PROJECT SUMMARY

DEVELOPER:
CENTRAL COUNCIL OF THE TLINGIT AND HAIDA INDIAN TRIBES OF ALASKA
(DBA TIDAL NETWORK)
PO BOX 25500
JUNEAU, AK 99802
PHONE: (907) 538-8255
ATTN: CHRIS CROPLEY

PROJECT COORDINATOR:
PIERSON WIRELESS
7534 F STREET
OMAHA, NE 68127
PHONE: (402) 429-7660
ATTN: JESSIE RICO

A/E CONSULTANT:
KIMLEY-HORN AND ASSOCIATES, INC.
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GA 30009
PHONE: (470) 299-7052
ATTN: TREVOR NEWTON, P.E. (GA)

PROJECT CONTACTS

alaska811 DIGLINE INC.

Sheet Number	Sheet Title
G0	COVER SHEET
C0	AERIAL PLAN VIEW
C1	PARCEL PLAN VIEW
C2	OVERALL SITE PLAN
C3	COMPOUND SITE PLAN
C4	FENCE, GATE AND COMPOUND DETAILS
C5	ANTENNA AND TOWER ELEVATION DETAILS

SHEET INDEX

PROJECT INFORMATION:
SITE NAME:
THORNE BAY ZONE 2
SITE No.: KTB-Z02

NHN NORTH ROAD
THORNE BAY, AK 99919
PRINCE OF WALES ISLAND

PLANS PREPARED FOR:
TIDAL NETWORK
PIERSON WIRELESS

PLANS PREPARED BY:
Kimley»Horn
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GA 30009
PHONE: 770-619-4280
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KHA PROJECT NUMBER:
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DRAWN BY:	CHECKED BY:
JW	TRN

SHEET TITLE:
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SHEET NUMBER:
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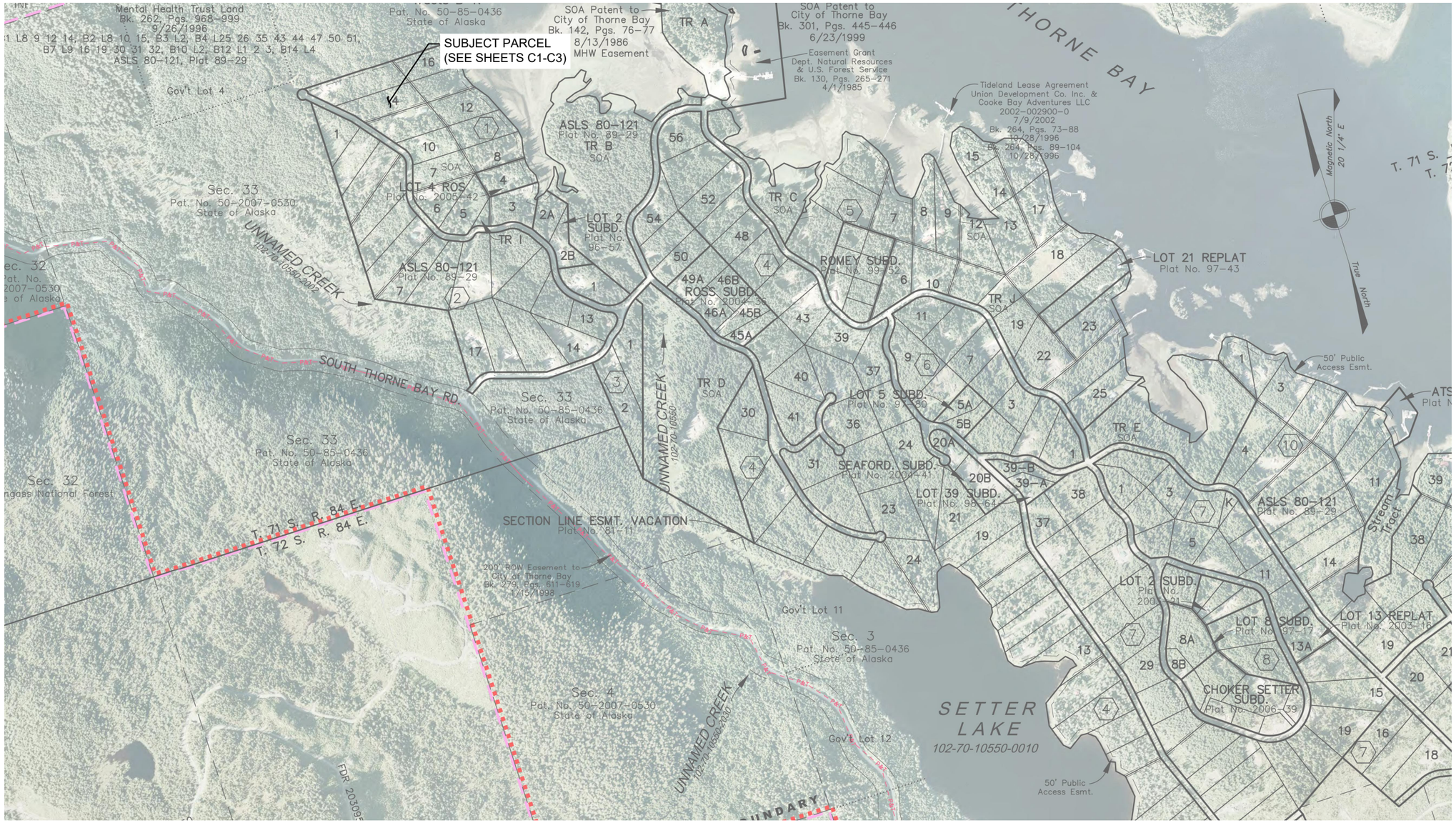

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C0

AERIAL PLAN VIEW

SCALE: 1" = 1000'

NOTE:
1. PROPOSED SITE LAYOUT, PARCEL INFORMATION AND IMAGERY WAS PRODUCED FROM ONLINE RESOURCES AND SHOULD NOT BE TAKEN AS SURVEY LEVEL INFORMATION.

NORTH

GRAPHIC SCALE IN FEET
0 500 1000 2000

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AERIAL PLAN VIEW

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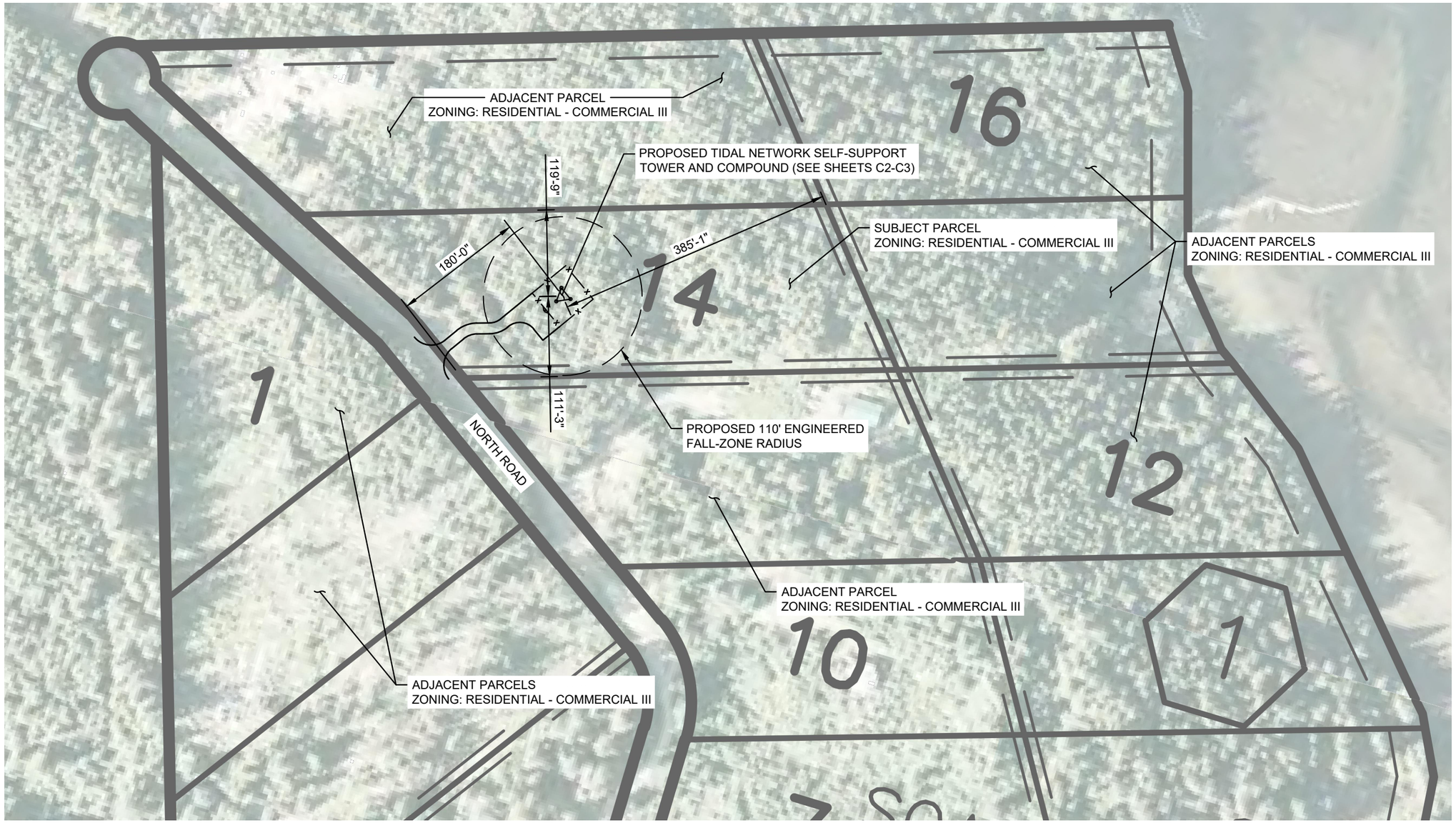

1 / C1 PARCEL PLAN VIEW

SCALE: 1" = 150'

NOTE:
1. PROPOSED SITE LAYOUT, PARCEL INFORMATION AND IMAGERY WAS PRODUCED FROM ONLINE RESOURCES AND SHOULD NOT BE TAKEN AS SURVEY LEVEL INFORMATION.

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

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SITE No.: KTB-Z02

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THORNE BAY, AK 99919
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PIERSON WIRELESS

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SHEET TITLE:
PARCEL PLAN VIEW

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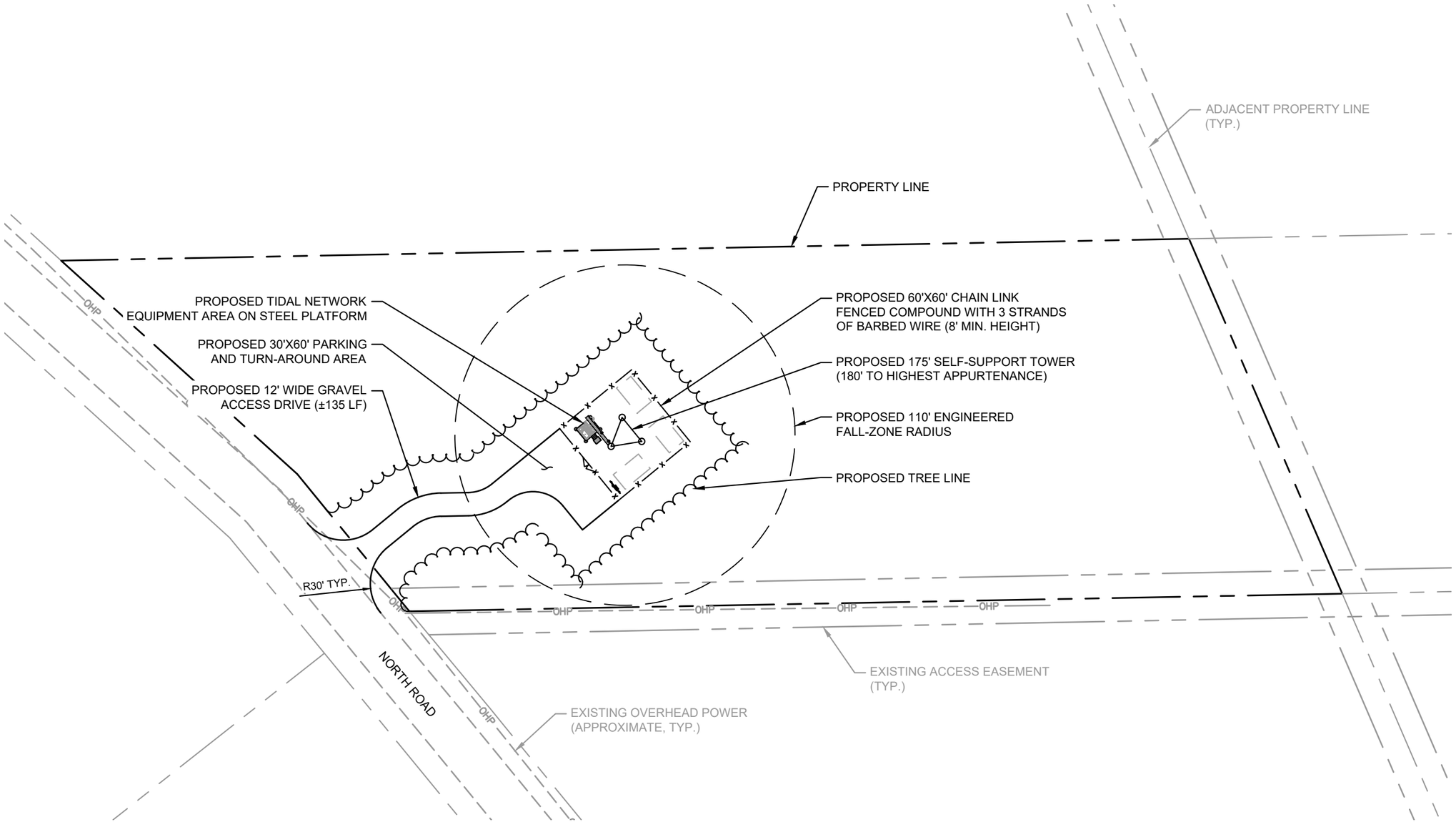

1/C2 OVERALL SITE PLAN

SCALE: 1" = 70'

NOTE:
1. PROPOSED SITE LAYOUT, PARCEL INFORMATION AND IMAGERY WAS PRODUCED FROM ONLINE RESOURCES AND SHOULD NOT BE TAKEN AS SURVEY LEVEL INFORMATION.

NORTH

GRAPHIC SCALE IN FEET
0 35 70 140

PROJECT INFORMATION:

SITE NAME:
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SITE No.: KTB-Z02

NHN NORTH ROAD
THORNE BAY, AK 99919
PRINCE OF WALES ISLAND

PLANS PREPARED FOR:

TIDAL NETWORK

PIERSON WIRELESS

PLANS PREPARED BY:

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JW	TRN

SHEET TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
C2

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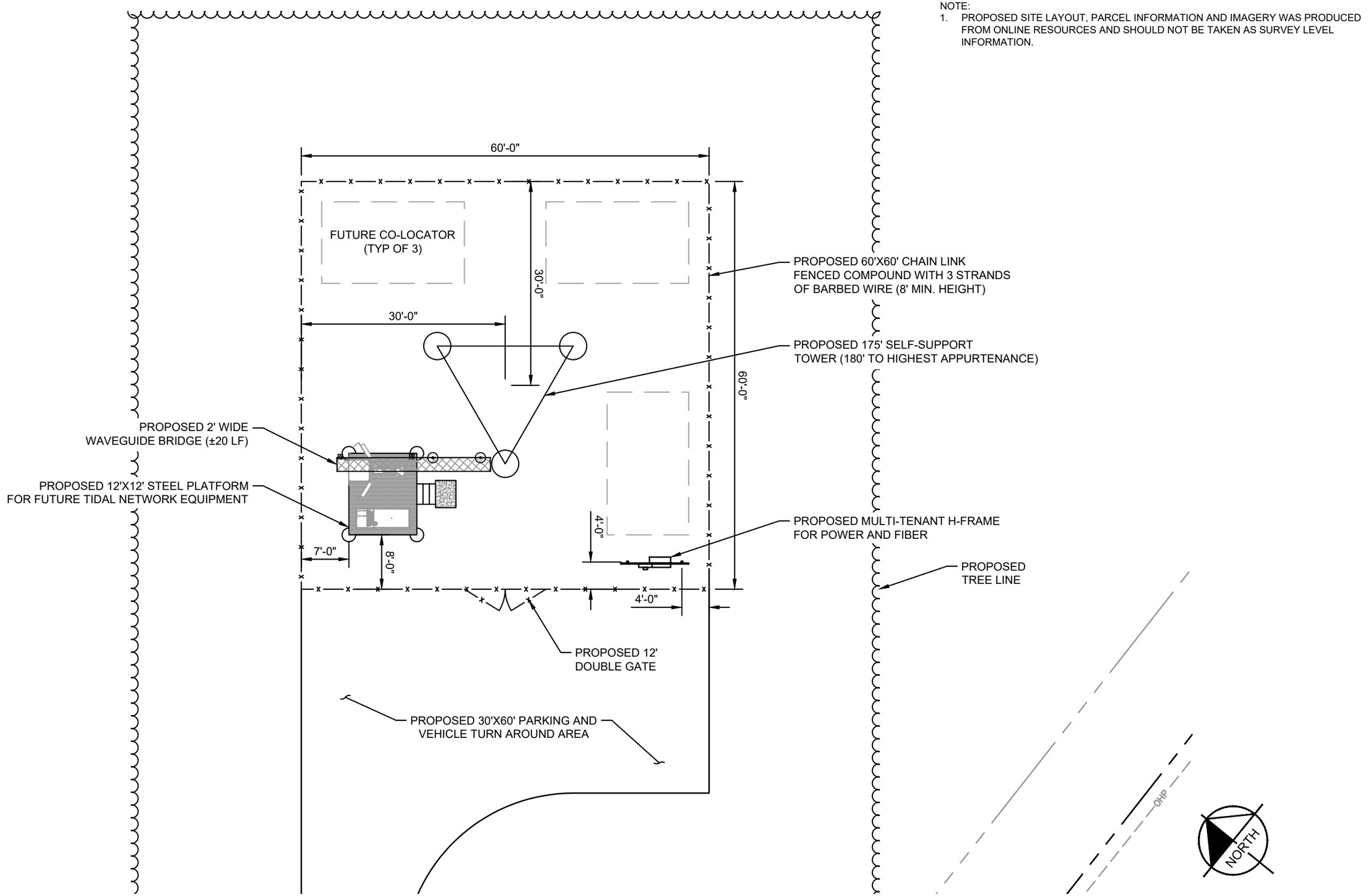

1 / C3 COMPOUND SITE PLAN

SCALE: 1" = 15'

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PROJECT INFORMATION:

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THORNE BAY ZONE 2
SITE No.: KTB-Z02

NHN NORTH ROAD
THORNE BAY, AK 99919
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PIERSON WIRELESS

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SHEET TITLE:

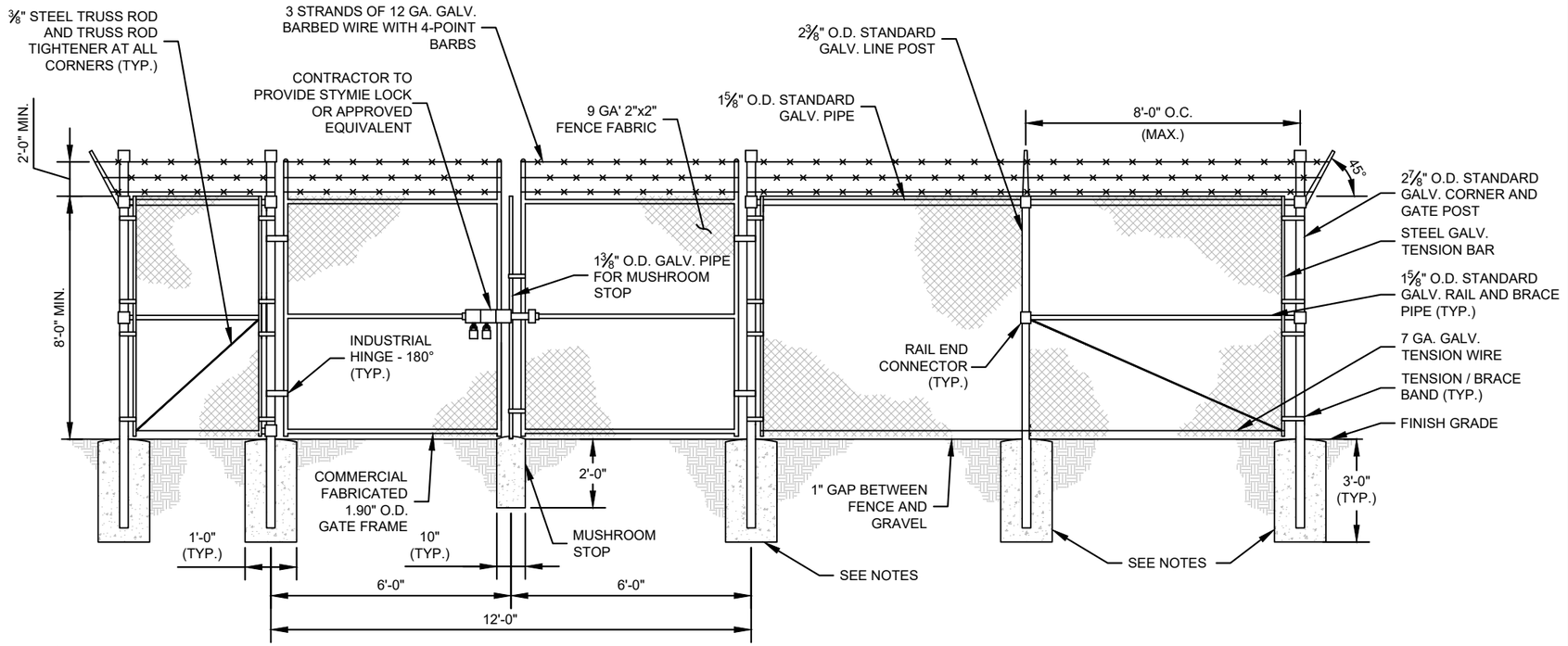
COMPOUND SITE PLAN

SHEET NUMBER:

C3

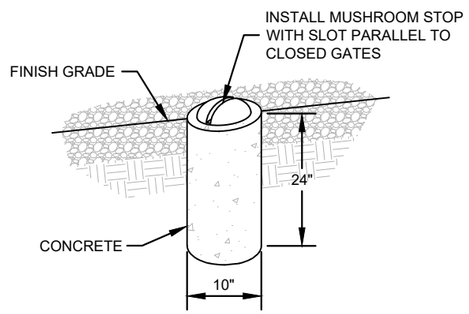
FENCE NOTES:

1. USE 3,000-PSI CONCRETE, FULLY CONSOLIDATED AROUND THE POST.
2. WHERE THE POST IS SET IN ROCK OR CONCRETE, CORE A HOLE 12" DEEP AND 1" LARGER IN DIAMETER THAN THE POST. SET THE POST AND GROUT IN PLACE USING NON-SHRINK GROUT.
3. ALL POSTS MUST BE PLUMB AND ALIGNED WITH ONE ANOTHER IN BOTH HORIZONTAL AND VERTICAL PLANES.
4. CORNERS AND GATEPOSTS FOR CHAIN LINK FENCES SHALL EXTEND ABOVE THE TOP STRAND OF BARBED WIRE TO PROVIDE TENSIONING FOR THE BARBED WIRE.
5. PROVIDE MIDRAILS AND BRACING AT ALL CORNER POSTS WHERE THE FENCE CHANGES DIRECTION BY MORE THAN 30 DEGREES.
6. THE GRADE OF THE SITE AND INSTALLATION OF THE FENCE SHALL PROVIDE FOR NO MORE THAN A 1" GAP BETWEEN THE BOTTOM OF THE FENCE MATERIAL AND FINISH GRADE.
7. CONTRACTOR SHALL PROVIDE HOLD OPEN DEVICES FOR ALL GATES AT THE SPECIFIED OPEN POSITIONS, DRIVEN PIPE TYPE RECEIVERS ARE NOT AUTHORIZED.
8. CONTRACTOR SHALL ALSO PROVIDE A MUSHROOM TYPE RECEIVER AT THE CLOSE POSITION.



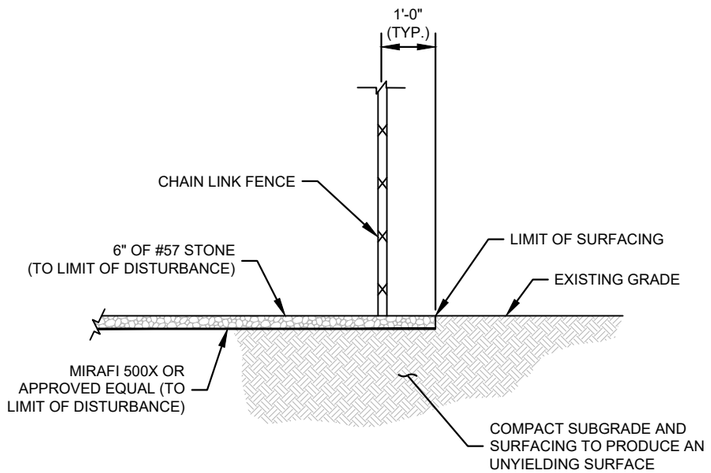
1/C4 CHAIN LINK FENCE AND GATE ELEVATION

NOT TO SCALE



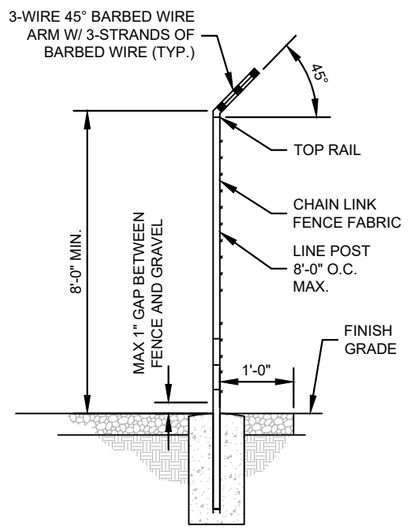
2/C4 MUSHROOM STOP

NOT TO SCALE



3/C4 SITE COMPOUND SURFACE DETAIL

NOT TO SCALE



4/C4 SECTION AT FENCE

NOT TO SCALE

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SITE NAME:
THORNE BAY ZONE 2
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NHN NORTH ROAD
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PLANS PREPARED FOR:

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PIERSON WIRELESS

PLANS PREPARED BY:

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FENCE, GATE AND COMPOUND DETAILS

SHEET NUMBER:

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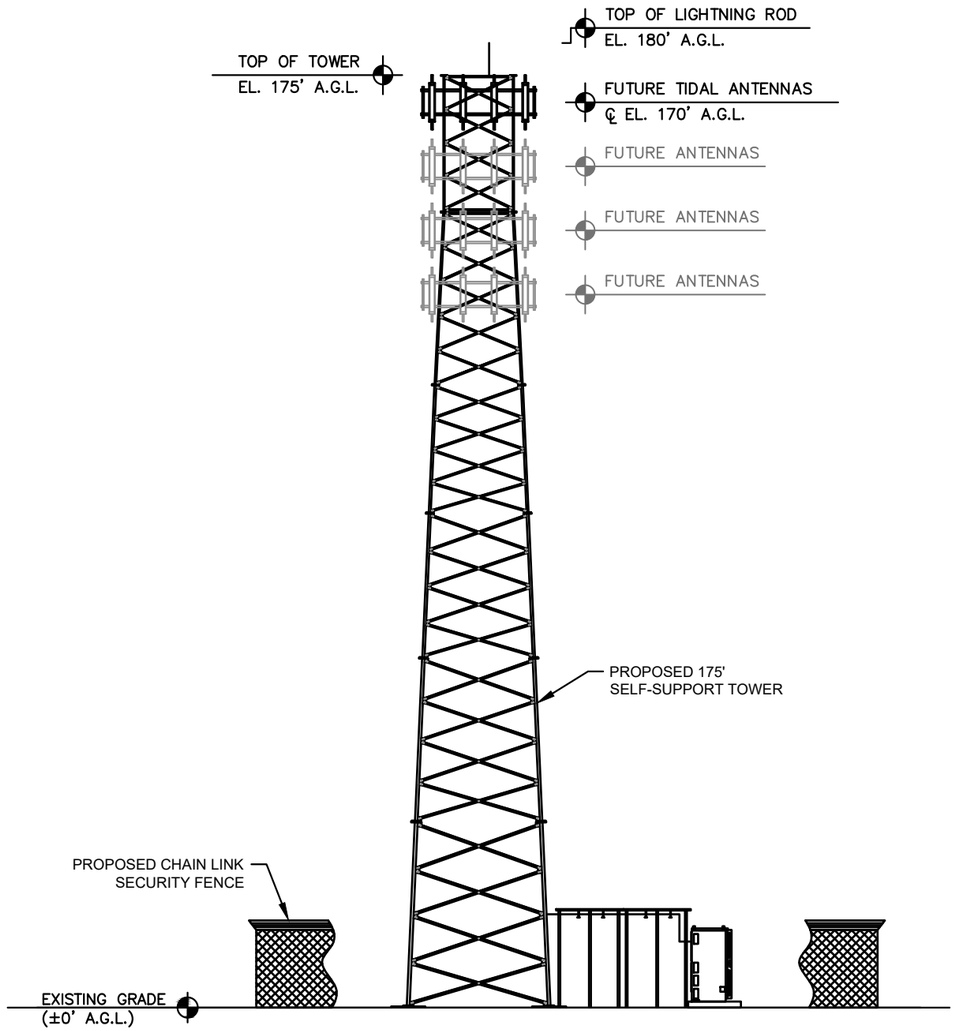

1 / C5 MONOPOLE TOWER ELEVATION

NOT TO SCALE

PROJECT INFORMATION:

SITE NAME:
THORNE BAY ZONE 2
SITE No.: KTB-Z02

NHN NORTH ROAD
THORNE BAY, AK 99919
PRINCE OF WALES ISLAND

PLANS PREPARED FOR:

TIDAL NETWORK

PIERSON WIRELESS

PLANS PREPARED BY:

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KHA PROJECT NUMBER:
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DRAWN BY: JW | CHECKED BY: TRN

SHEET TITLE:
ANTENNA AND TOWER ELEVATION DETAILS

SHEET NUMBER:
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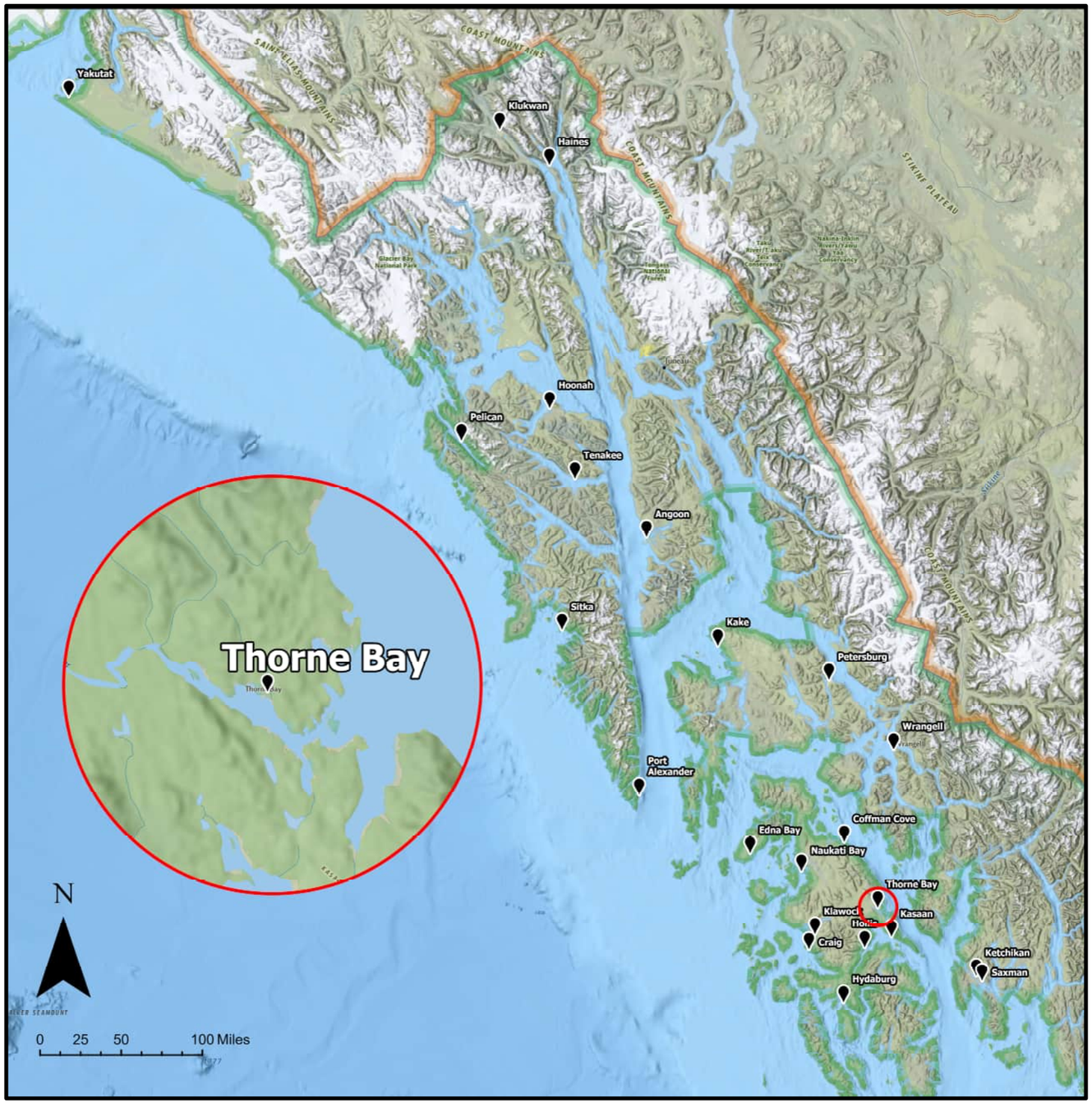
THORNE BAY ALASKA

Tidal Network Tower Height Analysis

PROJECT OVERVIEW	
PROJECT DESCRIPTION	Cellular Infrastructure Performance Analysis
NETWORK OPERATOR	Tidal Network
LOCATION	Thorne Bay, AK
POPULATION ESTIMATE (TOTAL)	470 Residents (Approx)
ESTIMATED HOUSEHOLDS	220 (Approx)

DESIGN NARRATIVE	Performance Analysis Comparing Cellular Coverage Performance between a 115' and a 175' Transmission Height

Summary of Findings	175' Tower Height provides greater coverage range from Tidal Network Site KTB-01 due to Thorne Bay ground elevation and Tree Height. 115' Transmission Height provides feasible coverage in areas of Community. 175' tower allows for additional future tenants at site to support Tidal Network muti-tenant tower development model.



PIERSON WIRELESS

Tidal NETWORK

Tlingit & Haida

PROJECT LOCATION

THORNE BAY, ALASKA

SHEET TITLE

Cover Page

SHEET NUMBER

Sheet 1

Central Council of the Tlingit & Haida Indian Tribes of Alaska
Tidal Network
Physical Address: PO Box 25500 • Juneau, Alaska 99802
Mailing Address: PO Box 25500 • Juneau, Alaska 99802

Exhibit 5 – RF Frequency Safety Predictive Report

Radio Frequency Safety Predictive Report

Prepared For: Pierson Wireless Corp On Behalf of Pierson Wireless Corp

Site Name:	General Theoretical Analysis
Site ID:	TBD
Address:	NA
County:	NA
Latitude:	NA
Longitude:	NA
Report Type:	Outdoor Macro

Additional Site Information

Customer Name:	Pierson Wireless Corp
Customer Email:	jessie.rico@piersonwireless.com
Customer Phone:	402-429-7660
Site Structure Type:	Monopole

Report Information

Report Writer:	Mohamed Ahmed
Report Date:	04/01/2025
Waterford Contact:	(703) 596-1022
Contact Email:	Support@waterfordconsultants.com
WC Project Number:	S-ORD11847
Reviewed By:	Justin Tiumalu

Compliance Statement

Based on the information provided by the client, this installation **Is Compliant** with FCC Rules and Regulations with regard to Human Exposure to Radio Frequency Radiation.

Waterford Consultants, LLC
7430 New Technology Way, Suite 150, Frederick, MD 21703
(703) 596-1022
www.waterfordconsultants.com

WATERFORD

Table of Contents

1 General Summary

Pierson Wireless Corp on behalf of Pierson Wireless Corp has contracted Waterford Consultants, LLC to conduct a ***radiofrequency (RF) electromagnetic safety and FCC compliance assessment*** of the General Theoretical Analysis site located at NA. The compliance framework is derived from the FCC Rules and Regulations for preventing human exposure in excess of the MPE (Maximum Permissible Exposure) limits.

An overview of the applicable FCC Rules and analysis guidelines is presented in Appendix A. The subsequent sections contain information regarding the radio telecommunications equipment installed at this site and the surrounding environment regarding RF Hazard compliance.

As summarized in Section 5 of this report, no potentially hazardous conditions were identified, and no further action is required to achieve or maintain compliance.

All known RF sources have been included in this analysis. Predictive modeling using worst-case operating parameters for antennas regardless of accessibility is the basis for mitigation recommendations. Similarly, theoretical assessment of antennas mounted in close proximity is used to characterize and mitigate cumulative exposure conditions.

Documents Utilized in this Analysis:
Theoretical EME Study - 3.24.25
VV-65A-R1
General Theoretical Analysis Notes

3 Antenna Inventory

The operations listed in the following tables have been compiled based on information provided by client.

Ant #	Operator	Antenna Make	Antenna Model	Type	Frequency (MHz)	Az (Deg)	Downtilt (Deg)	Horizontal Beam Width (Deg)	Antenna Length (ft)	Antenna Gain (dBd)	TPO (Watts)	Paths	Loss (dB)	Total ERP (Watts)	Total EiRP (Watts)	Antenna Centerline Ground Level (ft)
A1	VZW	COMMSCOPE	VV-65A-R1	panel	2500	0	0	61	4.56	16.23	40	4	0.5	5985.76	9820.18	100
B1	VZW	COMMSCOPE	VV-65A-R1	panel	2500	120	0	61	4.56	16.23	40	4	0.5	5985.76	9820.18	100
C1	VZW	COMMSCOPE	VV-65A-R1	panel	2500	240	0	61	4.56	16.23	40	4	0.5	5985.76	9820.18	100

NOTE 1: Waterford Consultants has assumed transmission parameters for co-located RF emitters based on similar installations found at other radio communications sites. Generic antenna models have been used where existing antenna part numbers or radiation patterns are not available. The frequencies presented in this table may have been assumed in order to represent the approximate band of operation and to support a maximum-case calculation of power density.

NOTE 2: Some antennas identified by the SON designation may employ beamsteering technology where RF energy allocated to each customer device is dynamically directed toward their location. In the analysis presented herein, predicted exposure levels are based on all beams at full utilization (i.e. full power) simultaneously focused in any direction. As this condition is unlikely to occur, the actual power density levels at ground and at adjacent structures will be less than the levels reported below.

NOTE 3: No other transmitting antennas are known to be operating in the vicinity of this site.

4 Predicted Emission Levels

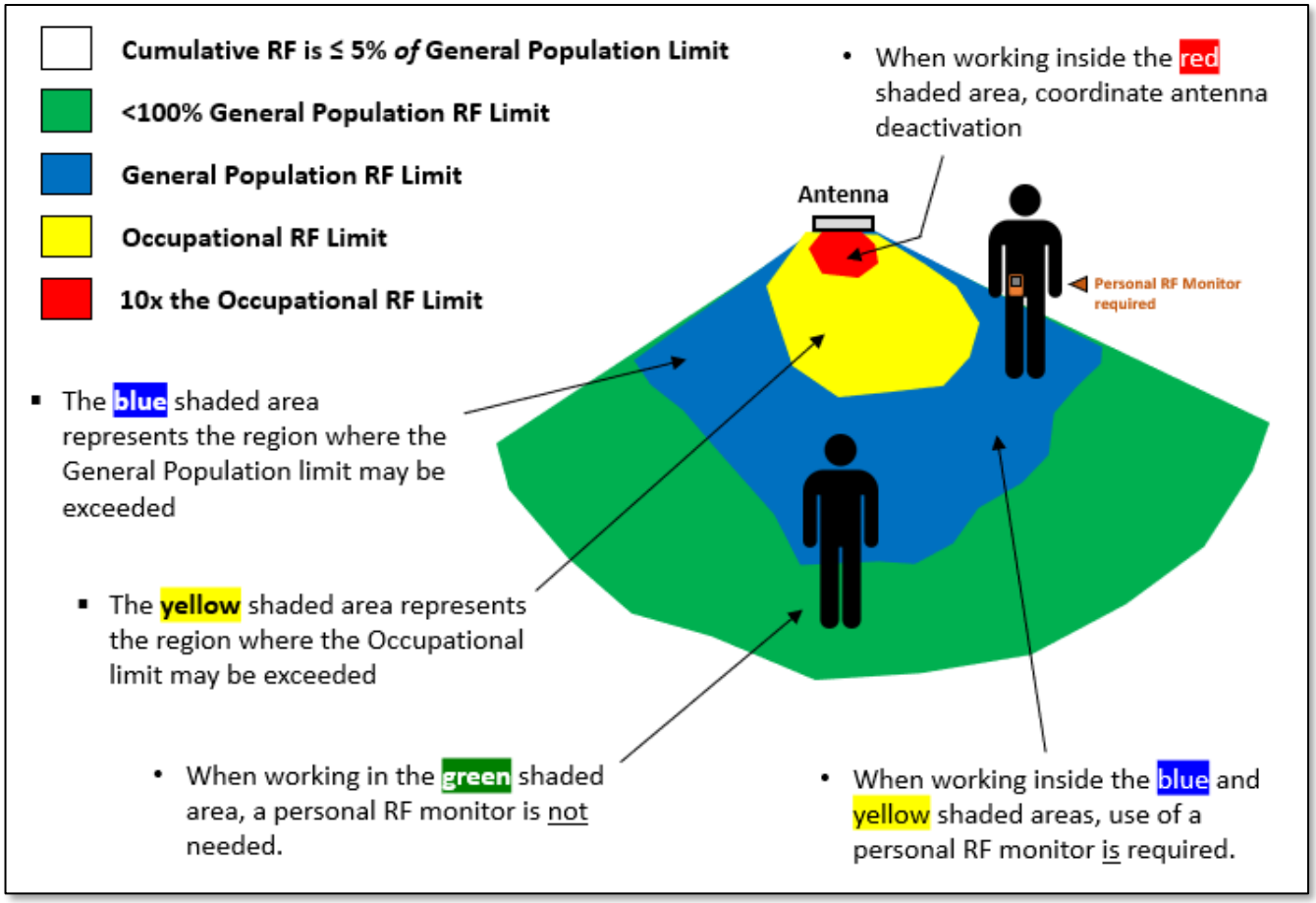
The following plots show the spatial average predicted power density level at any given location as a percentage of the FCC General Population limits. These plots depict the cumulative exposure based on all RF sources listed in the corresponding antenna table.

Exposure to non-ionizing radiation at a given spatial average power density level, during the appropriate time interval, determines hazard. MPE predictions are not dependent on the exposure duration as only the intensity of the exposure is calculated. In this manner, areas of concern are identified and delineated from areas where exposures will not exceed the FCC limits. Recommendations for mitigating these zones are recommended in this report. Rules for access to impacted area are based on policy set by property management.

Predictive MPE plots may be provided for plan view (*top-down*) or section view *(profile)* studies. Profile studies account for antennas that are placed individually with separation that assumes cumulative emissions from other antennas are negligible. Section detail plots depict spatially averaged power MPE conditions at the middle of the six-foot exposure area. Plan view studies may include cumulative analysis where the contributions of nearby antennas may impact exposure conditions and compliance recommendations. The reference plane for each plot is indicated in the caption and legend. For example, “Avg 10 to 16 Feet” appearing in the legend indicates that the top-view plot depicts spatially averaged predicted power densities between 10 and 16 feet which a person could occupy. Plots are produced for each accessible level or walking surface; areas that are not accessible are not shown. Antenna level plots are also created to depict maximum-case exposure conditions at potential elevated work areas. Unless otherwise noted, Ground Level or Main Level represents the default access elevation and is the baseline for antenna centerline reference.

PREDICTED EMISSION LEVELS

What do the shaded colors mean in the RF plots provided in this report?



SUMMARY

10X the Occupational RF exposure limit. When working inside this area, trained personnel with personal protective equipment (PPE) is required; may also require coordinating a scheduled deactivation/outage with operator.

Occupational RF exposure limit. When working inside this area, trained personnel with personal protective equipment (PPE) is required; untrained person(s) must be accompanied by trained personnel.

General Population RF exposure limit. When working inside this area, trained personnel with personal protective equipment (PPE) is required; untrained person(s) must be accompanied by trained personnel.

<100% of the General Population RF exposure limit (or <20% of the Occupational RF exposure limit). When working in this area, personal protective equipment (PPE) is not required. No special action or behavior is required to maintain a safe work environment. This area is safe for continuous exposure.

Area is outside of General Population and Occupational RF exposure limits (less than 5% of the General Population limits). When working in this area, personal protective equipment (PPE) is not required. No special action or behavior is required to maintain a safe work environment. This area is also safe for continuous exposure.

PREDICTED EMISSION LEVELS

Scenario: Antenna level

Legend

Study Zone	Elev. (ft)	Type	Exposure Profile	Max MPE	Att	Carriers
Antenna level	80.0 - 120.0	3D Area	3D Sula9 GP 5.0 res	1301.66%	0.00	UNKNOWN

100%-500%	500%-5000%	5000%+

Exposure Profile Name	Model	Exposure Area	Standard	Resolution	RCF
3D Sula9 GP 5.0 res	Sula 9	Spatial Avg. (6 ft)	FCC General Public	5	1.0

UNKNOWN

Mitigation — Existing — Proposed — Installed — To Remove — Max MPE

Grid Size: 25.00 feet

Floor = Elevation +6' | Mid-Level = Elevation +/- 3'

PREDICTED EMISSION LEVELS

Scenario: All level

Legend

Study Zone	Elev. (ft)	Type	Exposure Profile	Max MPE	Att	Carriers
Ground	0.1	Floor	2D Sula9 GP 2.5 res	0.02%	0.00	UNKNOWN

5%-100%	100%-500%	500%-5000%	5000%+

Exposure Profile Name	Model	Exposure Area	Standard	Resolution	RCF
2D Sula9 GP 2.5 res	Sula 9	Spatial Avg. (6 ft)	FCC General Public	2.5 ft3	1.0

UNKNOWN

Mitigation Existing Proposed Installed To Remove **Max MPE**

Grid Size: 25.00 feet

Floor = Elevation +6' | Mid-Level = Elevation +/- 3'

5 Recommendations for Compliance

Predictive modeling indicates that cumulative RF power densities at accessible walking surfaces as well as elevated work areas near the antennas are below the FCC General Population limits.

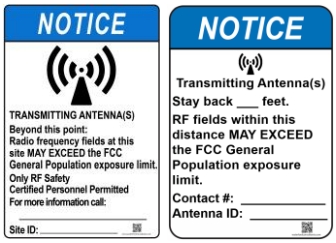
- No mitigation action required

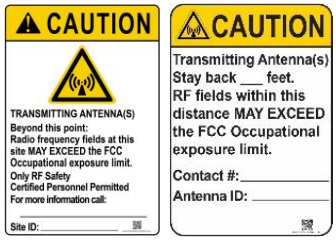
RECOMMENDATIONS FOR COMPLIANCE

Mitigation for Compliance

For any area where cumulative RF power density exceeds 100% of the FCC General Population MPE limits, access controls with appropriate RF alerting signage must be established and maintained to restrict access to authorized personnel. Signage must be posted to be visible upon approach from any direction to provide notification of potential conditions within these areas.

Category 2	Category 3	Category 4
Exceeds General Population Limit; Below Occupational Limit	*Exceeds Occupational Limit; Below 10x Occupational Limit*	*Exceeds 10x Occupational Limit*





Per FCC requirements for compliance, the following content is required on RF alerting signage:

a) RF energy advisory symbol and signal word appropriate for the potential exposure category

b) A description of the RF source (*e.g.*, transmitting antennas)

c) Behavior necessary to avoid over-exposure (*e.g.*, do not climb tower unless you know that antennas are not energized; stay behind barrier or off of markings)

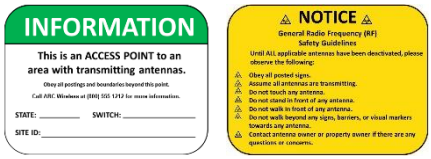
d) Up-to-date contact information (*e.g.*, monitored phone number or email address connected to someone with authority and capability to provide prompt response).

e) Any sign attached directly to an antenna must include the separation distance at a font size commensurate with the safe separation distance.

Additional Requirements

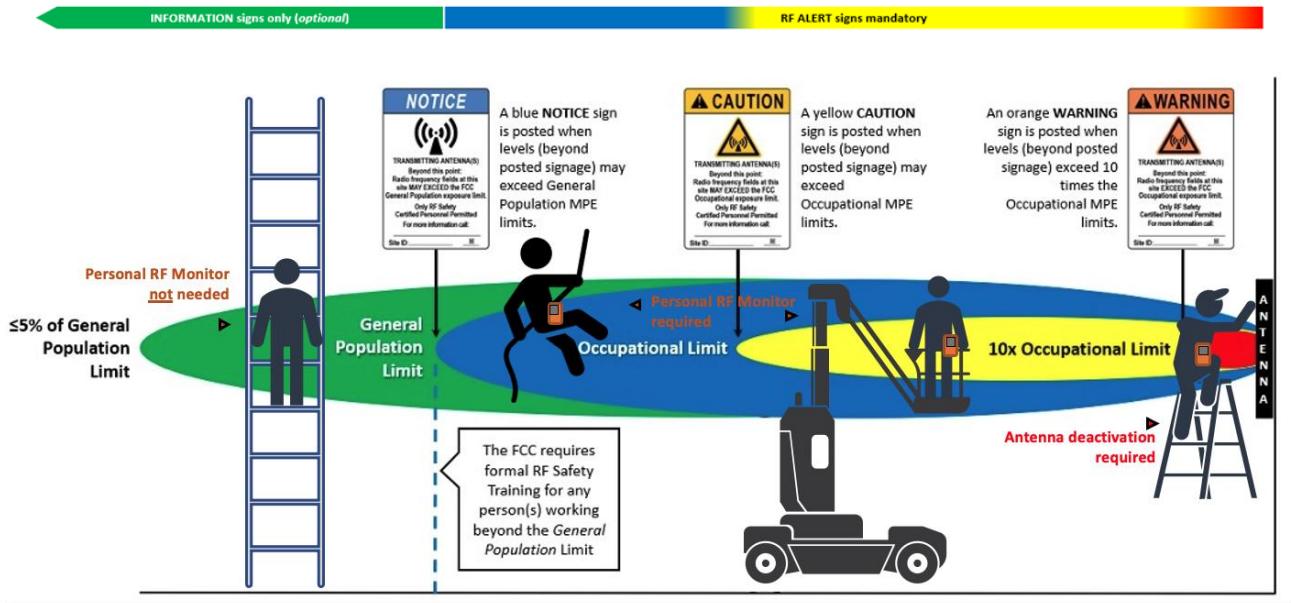
- Signage should conform to IEEE C95.2-2018 and the ANSI/NEMA Z535 series of standards.
- RF alerting signs must be legible from a distance of 5 feet from the boundary of the area where the FCC General Population limits are exceeded in accordance with OSHA rules (29 CFR § 1910.145(f)(4)(ii))).

- INFORMATION signs displaying contact information AND GUIDELINES signs are considered *optional* and may be utilized at antenna installations where the FCC limits may not be exceeded.



- **Positive access control is required to restrict access to areas where the FCC General Population limits may be exceeded.** Controls such as physical barriers to entry imposed by locked doors, hatches and ladders or other access control mechanisms may be supplemented by alarms that alert the individual and notify site management of a breach in access control.

- **Appropriate RF Safety & Awareness Training is required <u>for any person</u> that may encounter *controlled* areas in order to understand the meaning of RF alerting signage, as well as the behaviors necessary to ensure safety**. In order to perform work within restricted area where the General Population limits may be exceeded, workers should be trained in RF safety and equipped with personal protective equipment (e.g. RF personal monitor). Lockout/tagout or scheduled outages may be employed to maintain a safe work environment within these areas. Further, untrained workers should not have access to controlled locations without supervision by trained occupational personnel.



RANGE OF RF EXPOSURE CONDITIONS

NOT TO SCALE

Standard Minimum Font Sizes & Safe Viewing Distances

(Source: ANSI Z535.2-2001 (Table B1))

Minimum Safe Viewing Distance		Minimum Letter Height for FAVORABLE Reading Conditions			Minimum Recommended Sign Size *
(ft)	(m)	(point size)	(in)	(cm)	(in)
≤4	≤1.2	16	0.16	.4	5 x 7
6	1.8	24	0.24	0.6	7 x 10
8	2.4	32	0.32	0.8	8 x 12
10	3.0	40	0.40	1.0	11 x 18
15	4.6	60	0.60	1.5	15 x 24
20	6.1	80	0.80	2.0	19 x 30
30	9.1	120	1.20	3.0	TBD**
40	12.2	160	1.60	4.1	TBD**
60	18.3	240	2.40	6.1	TBD**
80	24.4	320	3.20	8.1	TBD**
100	30.5	400	4.00	10.2	TBD**
125	38.1	500	5.00	12.7	TBD**
150	45.7	600	6.00	15.2	TBD**

** Sign sizes reflect the minimum size(s) needed to meet FCC/OSHA requirements based on (i) the sign content and artwork shown in this section, and (ii) the minimum safe viewing distance, as specified by ANSI and calculated by our RoofMaster™ software.*

All minimum safe viewing distances are depicted in the RF modeling diagrams provided in this report.

*** Minimum recommended sign sizes are provided herein only for signs that require a minimum safe viewing distance of 0 – 20 feet. Signs requiring a minimum safe viewing distance >20 feet shall be graphically calculated and confirmed by Waterford on a case-by-case basi*

6 Appendix A: Technical Framework

The FCC requires licensees to ensure that new and existing wireless operations do not expose people to hazardous levels of RF electromagnetic energy. Service providers consider compliance with these rules when designing new sites or modifying existing operations that could change the RF environment. The FCC exposure rules have been codified in response to the National Environmental Policy Act of 1969 which requires government agencies to evaluate the impact of their actions on the "quality of the human environment." Documentation of adherence to these rules is typically included in the environmental compliance applications submitted to local authorities responsible for reviewing and approving new or modified telecommunications installations and is maintained by the FCC licensee.

The FCC rules are based on exposure limits established by scientific and engineering organizations that review human health research in this field. At RF frequencies, the electromagnetic waves utilized by cellular sites represent non-ionizing radiation which can be absorbed by the human body. The FCC limits include a 50-fold safety factor above exposure levels where adverse thermal effects may result. By contrast, the energy available in ionizing radiation (e.g. X-rays) is higher and has the ability to permanently damage tissue cells at the molecular level. Unlike ionizing radiation, exposure to non-ionizing radiation does not have cumulative effects and the FCC limits are based on the body's thermoregulation capabilities.

The FCC requires licensees to ensure that persons are not exposed to radiofrequency electromagnetic energy power densities in excess of the Maximum Permissible Exposure ("MPE") limits as set forth in 47 C.F.R. §§ 1.1307(b) and 1.1310. The limits are derived from maximum Specific Absorption Rate (SAR) values of the human body for two tiers of permissible exposure differentiated by the situation in which the exposure takes place and/or the status of the individuals who are subject to exposure.

> **General Population / uncontrolled** exposure limits apply to those situations in which persons may not be aware of the presence of electromagnetic energy, where exposure is not employment-related, or where persons cannot exercise control over their exposure.
>
> **Occupational / controlled** exposure limits apply to situations in which persons are exposed as a consequence of their employment, have been made fully aware of the potential for exposure, and can exercise control over their exposure.

Based on these criteria, the FCC limits for the General Population are associated with continuous exposure conditions and exposure levels below these limits are not hazardous. The FCC General Population limit is 5 times more restrictive than the Occupational limits.

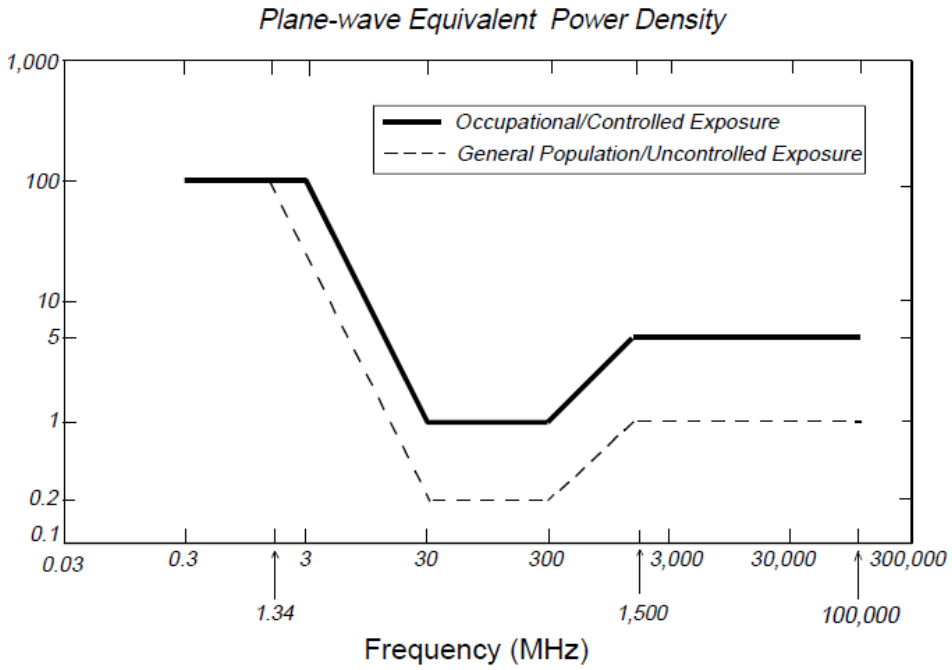
As a practical method of evaluating compliance in deployment scenarios, the FCC has set forth MPE limits shown in Table 1 below which are derived from the *whole-body SAR limits*. Specified in terms of electric field strength, magnetic field strength and equivalent plane-wave power density, compliance may be evaluated through computational or measurement methods provided in the FCC Office of Engineering & Technology Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65). Factors that determine exposure conditions include frequency, operating power, distance, and directivity of the antenna.

Table 1: FCC Exposure Limits (47 C.F.R. § 1.1310)

Frequency (MHz)	*Limits for General Population/ Uncontrolled Exposure*		*Limits for Occupational/ Controlled Exposure*	
	Power Density (mW/cm^2)	Averaging Time (minutes)	Power Density (mW/cm^2)	Averaging Time (minutes)
30-300	0.2	30	1	6
300-1500	f/1500	30	f/300	6
1500-100,000	1.0	30	5.0	6

f=Frequency (MHz)

Figure 1. *FCC Limits for Maximum Permissible Exposure (MPE)*



From OET-65

Compliance assessment involves consideration of the cumulative contributions of all wireless operations. The power density resulting from an RF source may be expressed as a percentage of the frequency-specific limits. In scenarios involving multiple RF emitters, the percentage of the FCC limits from each source are *summed* to determine if 100% of the exposure limit has been exceeded at a given location. At these areas of concern, access controls with appropriate RF alerting signage must be established and maintained to restrict access to authorized personnel.

An evaluation of existing environmental conditions may be performed through predictive modeling as set forth in OET-65 or collecting power density measurements. The impact of new or modified wireless operations must be assessed in this cumulative scenario and any area of concern that is accessible to members of the General Population must be mitigated. In situations where the predicted MPE exceeds the General Population threshold in an accessible area as a result of emissions from multiple transmitters, FCC licensees that contribute greater than 5% of the aggregate MPE share responsibility for mitigation.

APPENDIX A: TECHNICAL FRAMEWORK

Based on the computational guidelines set forth in FCC OET Bulletin 65, Waterford Consultants, LLC has developed software to predict the overall Maximum Permissible Exposure possible at any location given the spatial orientation and operating parameters of multiple RF sources. The power density in the *far-field* of an RF source is specified by OET-65 Equation 5 as follows:

$$S = \frac{EIRP}{4 \cdot \pi \cdot R^2} \ (\mathrm{mW/cm^2})$$

where EIRP is the Effective Radiated Power relative to an isotropic antenna and R is the distance between the antenna and point of study. Additionally, consideration is given to the manufacturers' horizontal and vertical antenna patterns as well as radiation reflection. At any location, the predicted power density in the *far-field* is the spatial average of points within a 0 to 6-foot vertical profile that a person would occupy. *Near-field* power density is based on OET-65 Equation 20 stated as

$$S = \left(\frac{180}{\theta_{BW}}\right) \cdot \frac{100 \cdot P_{in}}{\pi \cdot R \cdot h} \ (\mathrm{mW/cm^2})$$

where P_{in} is the power input to the antenna, θ_{BW} is the horizontal pattern beam-width and h is the aperture length.

Exposure conditions in the *near-field* of a microwave dish antenna may vary but the maximum power density is provided by OET-65 Equation 13 as follows:

$$S_{nf} = \frac{16 \ \eta \ P}{\pi \ D^2} \ (\mathrm{mW/cm^2})$$

where η is aperture efficiency (0.75) and D is the antenna diameter.

Some antennas employ beamforming technology where RF energy allocated to each customer device is dynamically directed toward their location. In this analysis, predicted exposure levels are based on all beams at full utilization (i.e. full power) simultaneously focused in any direction. As this condition is unlikely to occur, the actual power density levels at ground and at adjacent structures are expected to be less that the levels reported. These theoretical results represent worst-case predictions as all RF emitters are assumed to be operating at 100% duty cycle.

7 Appendix B: Qualifications of Waterford Consultants, LLC

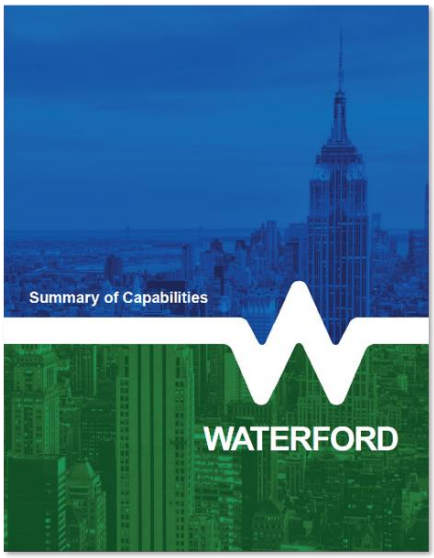
With more than 100 team-years of experience, Waterford Consultants, LLC [Waterford] provides technical consulting services to clients in the Radio Communications and antenna locating industry. Waterford retains professional engineers who are placed in responsible charge of the processes for analysis.

Waterford is familiar with 47 C.F.R. § § 1.1307(b)(3) and 1.1310 along with the general Rules, Regulations, and policies of the FCC. Waterford work processes incorporate all specifications of FCC Office of Engineering and Technology, Bulletin 65 ("OET65"), from the website: www.fcc.gov/oet/rfsafety and follow criteria detailed in 47 CFR § 1.1310 "Radiofrequency radiation exposure Limits".

Within the technical and regulatory framework detailed above, Waterford developed tools according to recognized and generally accepted good engineering practices. Permissible exposure limits are band specific, and the Waterford computerized modeling tools correctly calculate permissible exposure based on the band(s) specified in the input data. Only clients and client representatives are authorized to provide input data through the Waterford web portal. In securing that authorization, clients and client representatives attest to the accuracy of all input data.

Waterford Consultants, LLC attests to the accuracy of the engineering calculations computed by those modeling tools. Furthermore, Waterford attests that the results of those engineering calculations are correctly summarized in this report.

To download an electronic copy of our ***Summary of Capabilities*** brochure, please clicking the image below ….



8 Appendix C: RFMaster

Waterford Consultants, LLC has developed the RFMaster™ application software to support the assessment of potential for human exposure to radiofrequency emissions in environments where multiple sources may be present. Based on the computational guidelines set forth in OET Bulletin 65 from the Federal Communications Commission (FCC), RFMaster™ considers the operating parameters of specified antennas to predict the overall Maximum Permissible Exposure possible at a given location. These theoretical results represent worst-case predictions as emitters are assumed to be operating at maximum duty cycle. RFMaster™ enables the design of mitigation measures to achieve compliance with FCC Rules.

From the FCC document:

> *"The revised OET Bulletin 65 has been prepared to provide assistance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to radiofrequency (RF) fields adopted by the Federal Communications Commission (FCC). The bulletin offers guidelines and suggestions for evaluating compliance."*

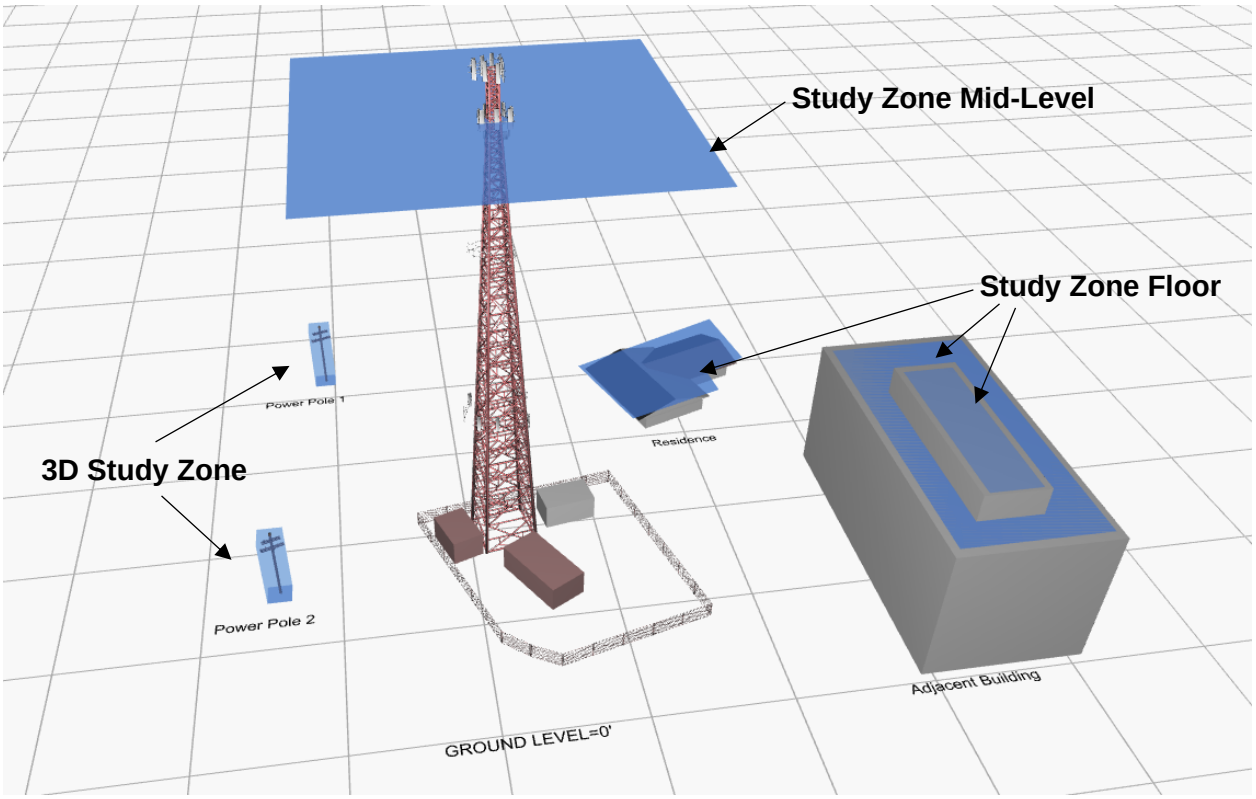
http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65.pdf

Predicted Exposure Levels

The following plots show the spatial average predicted power density level at specified locations as a percentage of the FCC General Population limits. These plots depict the cumulative exposure based on all RF sources listed in the corresponding antenna table.

Exposure to non-ionizing radiation at a given spatial average power density level, during the appropriate time interval, determines hazard. MPE predictions are not dependent on the exposure duration as only the intensity of the exposure is calculated. In this manner, areas of concern are identified and delineated from areas where conditions will not exceed the FCC limits. Recommendations for mitigating these zones are recommended in this report. Rules for access to impacted area are based on policy set by property management.

Study Zones are associated with areas of interest depicted in the scenario shown in blue. This approach enables simultaneous analysis of multiple areas located anywhere in the scenario. Common Study Zones not depicted below are ground (Floor) and Antenna Level (3D).



Study Zone Description

Study Zones types are available for different scenarios for whole-body exposures. The results are reported based on the bottom or middle of this area.

	A Mid-Level is a planar area at an elevation that a person could occupy. Predictive exposure results are depicted at the middle of the 6-foot vertical profile associated with whole-body exposure.
	A Floor is a planar area representative of a walking surface. Predictive exposure results are depicted at the base of the 6-foot vertical profile that a person could occupy while standing on the Floor.
	Predictive exposure is depicted in a 3D region. At a point within this region, predictive exposure results are depicted at the middle of the 6-foot vertical profile associated with whole-body exposure. 3D depictions represent multiple mid-level predictions, throughout the vertical dimension of the 3D area.

Study Zones are assigned Exposure Profiles where the modeling method, regulatory limits and color thresholds are specified. Additionally, attenuation may be ascribed to account for building material loss.

Legend Description

All Study Zones included in the analysis are depicted in the legend where the type, elevation and Exposure Profile are listed. The maximum calculated MPE is reported for the Carriers contributing to the study. Note that the elevation depicted in the legend represents the lowest elevation of a 3D Study Zone.

3D Study Zones

2D Study Zones

Exposure Profiles

Legend

Study Zone	Elev. (ft)	Type	Exposure Profile	Max MPE	Att	Carriers
Power Pole 2	0.0	3D Area	FCC FarField GP 3D	0.78%	0.00	Carrier A, Carrier B
Power Pole 1	0.0	3D Area	FCC FarField GP 3D	1.01%	0.00	Carrier A, Carrier B

100%-500% | 500%-5000% | 5000%-99999%

Study Zone	Elev. (ft)	Type	Exposure Profile	Max MPE	Att	Carriers
Adjacent Rooftop	55.0	Floor	FCC FarField GP Surface	6.52%	0.00	Carrier A, Carrier B
Ant Mid-Level I	169.0	Surface	FCC Sula9 GP 2D	8506.21%	0.00	Carrier A, Carrier B
Residence	10.0	Floor	FCC Sula9 GP 2D	0.72%	0.00	Carrier A, Carrier B
Adjacent Rooftop	66.1	Floor	FCC FarField GP Surface	3.86%	0.00	Carrier A, Carrier B

5%-100% | 100%-500% | 500%-5000% | 5000%-99999%

Mid-Level

Exposure Profile Name	Model	Exposure Area	Standard	Resolution	RCF
FCC FarField GP Surface	OET-65 Far Field	Spatial Average (6 ft)	FCC General Population	1.0 ft3	1.0
FCC Sula9 GP 2D	Sula 9	Spatial Average (6 ft)	FCC General Population	1.0 ft3	1.0
FCC FarField GP 3D	OET-65 Far Field	Spatial Average (6 ft)	FCC General Population	1.0 ft3	1.0

Carrier A Carrier B

Grid Size: 50.00 feet

Floor = Elevation +6' | Mid-Level = Elevation +/- 3'ion +6' | Surface = Elevation +/- 3'

9 Appendix D: Statement of Limiting Conditions

Waterford Consultants, LLC field personnel have visited the site and collected data with regard to the MPE environment. Waterford Consultants will not be responsible for matters of a legal nature that affect the site or property. The property has been analyzed under the premise that it is under responsible ownership and management and our client has the legal right to conduct business at this facility.

Due to the complexity of some wireless sites, Waterford Consultants has created this report utilizing best industry practices and due diligence. Waterford Consultants cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by Wireless Carrier, the site manager, or their affiliates, subcontractors or assigns.

Waterford Consultants has provided the results of a computer-generated model in this MPE Site Compliance Report to show approximate dimensions of the site, and the model results is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Waterford Consultants' recommendations.

Waterford Consultants will not be responsible for any existing conditions or for any engineering or testing that might be required to discover whether adverse safety conditions exist. Because Waterford Consultants is not expert in the field of mechanical engineering or building maintenance, this MPE Site Compliance Report must not be considered a structural or physical engineering report.

Waterford Consultants obtained information used in this MPE Site Compliance Report from sources that Waterford Consultants considers reliable and believes them to be true and correct. Waterford Consultants does not assume any responsibility for the accuracy of such items that were furnished by other parties.

10 Appendix E: Glossary of Terms

Definitions of the following technical words, terms, and/or phrases reflected in the report provided by Waterford are included as follows:

Compliance assessment	Sometimes referred to as a GAP assessment, it is intended to identify gaps between an existing control environment and what is required for compliance with Federal (FCC) regulations
Controlled exposure limits	Apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.
Cumulative exposure	Cumulative exposure is the total dose resulting from repeated exposures of radiation to an occupationally exposed worker to the same portion of the body, or to the whole body, over a period of time.
Effective Radiated Power (EIRP or ERP)	An IEEE standardized definition of directional radio frequency (RF) power, such as that emitted by a radio transmitter.....It is equal to the input power to the antenna multiplied by the gain of the antenna.
Electromagnetic emissions (EME)	Aka *electromagnetic radiation*, EME is energy that is propagated through free space or through a material medium in the form of electromagnetic waves, such as radio waves, visible light, and gamma rays.
Far field	The far field is the region in which the field acts as "normal" electromagnetic radiation. In this region, it is dominated by electric or magnetic fields with electric dipole characteristics.
FCC	Federal Communications Commission; an independent agency of the United States government that regulates communications by radio, television, wire, satellite, and cable across the United States. The FCC maintains jurisdiction over the areas of broadband access, fair competition, radio frequency use, media responsibility, public safety, and homeland security
General Population limit	Applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure

APPENDIX E: GLOSSARY OF TERMS

IEEE	Institute of Electrical and Electronics Engineers; a professional association for electronic engineering and electrical engineering (and associated disciplines). It was formed in 1963 from the amalgamation of the American Institute of Electrical Engineers and the Institute of Radio Engineers
Ionizing radiation	A type of energy released by atoms that travels in the form of electromagnetic waves (gamma or X-rays) or particles (neutrons, beta or alpha); can penetrate the human body and the radiation energy can be absorbed in tissue. This has the potential to cause harmful effects to people, especially at high levels of exposure
Maximum permissible exposure (MPE)	The FCC's regulations have specific MPE requirements for radiated electric fields, magnetic fields. and power density. MPEs are derived from the Specific Absorption Rate (SAR) at which tissue absorbs RF energy, usually expressed in watts per kilogram (W/kg).
Mitigation for compliance	Actions or activities required for compliance with FCC/OSHA regulations and to ensure a safe working environment. A harmonized and integrated compliance program – one that includes appropriate risk-management activities and controls – will eliminate redundant efforts, enable execution, ensure safety, and facilitate adherence to compliance requirements by the business and governing federal agencies.
Narda	A leading international supplier of measuring equipment in the EMF / EME Safety, RF Test & Measurement and EMC sectors
Near field	A part of the radiated field that is below distances shorter than the Fraunhofer distance, which is given from the source of the diffracting edge or antenna of longitude or diameter; near field, as the name suggests, is very close to the antenna while far field is further away.
Non-ionizing radiation	Non-ionizing radiation includes the spectrum of ultraviolet (UV), visible light, infrared (IR), microwave (MW), radio frequency (RF), and extremely low frequency (ELF); does not penetrate deep into the tissues but increases the risk of damage to the skin and eyes. Dependent on the energy and exposure time, non-ionising radiation can cause localised heating, or photochemical reactions can occur with possible permanent harm. Exposure should therefore be minimised.

APPENDIX E: GLOSSARY OF TERMS

Occupational limit	Apply to situations in which persons are exposed as a consequence of their employment, have been made fully aware of the potential for exposure, and can exercise control over their exposure.
OET-65	Bulletin published by the FCC's Office of Engineering & Technology in 1997; establishes guidelines for human exposure to radiofrequency electromagnetic field and achieving FCC compliance
Personal RF monitor	Part of the personal protective equipment (PPE) worn by a person working in areas exposed to radio frequency radiation. A personal RF safety monitor is typically worn either on the torso region of the body or handheld and is required by the occupational safety and health acts of many telecommunication companies
Positive access control	Refers to the practice of restricting entrance to a property, a building, or a room to authorized persons; can be achieved by a human (a guard, bouncer, or receptionist), through mechanical means such as locks and keys, or through technological means such as access control systems
Power density	The amount of power (time rate of energy transfer) per unit volume; power density may also refer to a volume. It is then also called volume power density, which is expressed as W/m3
Radio frequency (RF)	The oscillation rate of an alternating electric current or voltage or of a magnetic, electric, or electromagnetic field or mechanical system in the frequency range from around 20 kHz to around 300 GHz
Specific Absorption Rate (SAR)	A measure of the rate at which energy is absorbed per unit mass by a human body when exposed to a radio frequency (RF) electromagnetic field. ... It is defined as the power absorbed per mass of tissue and has units of watts per kilogram (W/kg)
Spatial average	The average power density observed when the Narda meter and probe is swept over an entire person (0 – 6 feet) for purposes of comparing with FCC exposure limits
Spatial peak	The maximum power density observed when the Narda meter and probe are swept over an entire person (0 – 6 feet) for purposes of comparing with FCC exposure limits; considered "*worst case*" – the average will not exceed this value
Uncontrolled exposure limits	Apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure