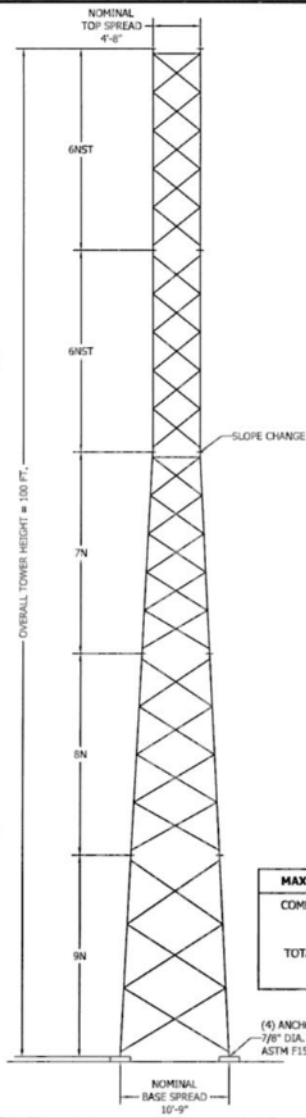


## Attachment D Site plan



MAXIMUM FACTORED REACTIONS	
COMPRESSION	= 163.6 KIPS
TENSION	= 147.3 KIPS
TOTAL SHEAR	= 25.7 KIPS
O.T.M.	= 1,489.5 FT-KIPS

(4) ANCHOR BOLTS (12 TOTAL)  
7/8" DIA. X 60" LONG  
ASTM F1554 Gr. 105

TOWER DESIGN LOADING		
DESIGN WIND LOAD PER ANSI/TIA-222-G: ASCE 7-10 FACTORED WIND SPEED (NO ICE) = 115 MPH STRUCTURE CLASS = II EXPOSURE CATEGORY = B TOPOGRAPHIC CATEGORY = 4 (250 FT)		
THIS TOWER IS DESIGNED TO SUPPORT THE FOLLOWING LOADS:		
ELEVATION (FT)	ANTENNA TYPE	LINE SIZE (NO)
102	BEACON AND LIGHTING ROD	(1) 1 1/2", (1) 1
95	(2)SD3ft TIA w/o radome (AZ. 60 & 180 DEG)	(2) EW63
95	SD4ft TIA w/o radome (AZ. 60 DEG)	(1) EW63
95	SD2ft TIA w/o radome (AZ. 180 DEG)	(1) EW63
95	60 SQFT*	(5) 1 5/8"
80	LIGHT CARRIER(55 SQFT)	(9) 1 5/8"

LINES ARE STACKED

\*60 SQFT SHOULD COVER ALL SPECIFIED PANEL ANTENNAS AND MOUNTING. IF THE MOUNTING CAUSES THE TOTAL EPA TO EXCEED 60 SQFT THEN THE TOWER WILL NEED TO BE REDESIGNED

# PRELIMINARY NOT FOR CONSTRUCTION

SECTION MAIN MEMBER SCHEDULE		
SECTION	LEG	DIAGONAL
6NST	PIPE 2.875x0.203	L1 3/4x1 3/4x3/16 (
6NST	PIPE 2.875x0.276	L1 3/4x1 3/4x3/16 (
7N	PIPE 3.500x0.300	L1 3/4x1 3/4x3/16 (
8N	PIPE 4x0.318	L1 3/4x1 3/4x3/16 (
9N	PIPE 4.500x0.337	L2x2x3/16 (3)

NOTE: SECTION NUMBERS ARE FOR REFERENCE ONLY. FOR NOMI  
FACE WIDTH DIMENSIONS, REFER TO THE STRESS ANALYSIS.  
THE NUMBERS SHOWN IN PARENTHESES INDICATE THE NUMBER O  
BAYS FROM TOP TO BOTTOM.



## Answers to Special Review Application Questions

- A. Presently there is a considerable demand for data services in Billings largely due to the size of Billings in relation to the rest of Montana and the surrounding states. Other factors include the large medical community that exists here and more recently the influx of people and businesses involved in the energy field. There are multiple objectives under the Economic Development Element related to the promotion and development of businesses and my intent is to greatly increase the quality, quantity and coverage of data services not just between the Heights and the rest of the city, but to all of Billings and its surrounding areas. If Billings is going to continue to develop economically we will have to compete with other cities in states that are more closely located to technology centers such as California, Colorado and New Mexico which has allowed them to build much more advanced data infrastructure. Unfortunately there are limited data service options in Billings right now, so if you are in the right area you may have services from one or two large carriers, but for most others there will only be a single carrier available and the lack of competition has resulted in limited capabilities and high cost.
- B. The need for the use of this particular site is explained in section D-3 below.
- C. The purpose of the proposed installation is to support businesses requiring very reliable data transport services. This single site will be able to provide services to hundreds of businesses and by extension affect thousands of people. As a result it is likely that this installation will be connected to more people than the nearby Verizon tower.
- D. The property in consideration is presently unused space which for this project would be used to locate a tower on an 18 by 18 foot foundation. An existing fence would be enlarged to enclose the proposed space and provide a visual barrier. There is an existing concrete pad with an adjacent power pedestal that will be used for the new installation. The special review is required in this case for the following reasons:
1. According to the Unified Zoning Code (UCZ) antenna support structures more than 50 feet in height require special review. The height of the proposed tower was derived from a need for a clear line of site to the Heights, additional room for expansion and to provide a more balanced perspective with the existing Verizon tower and the elevated reservoir.
  2. Per article 27-620 sub-section g-5-b *General Requirements, Fencing and Buffering, Landscaping*. For the site in consideration there is an adjacent Verizon tower lease which the proposed site would share a fence with. The airport has requested that a similar type of fencing be used for the new fence which would include color coordinated slats in the chain link. There is no shrubbery or grass within the vicinity of the structures near this site including the adjacent buildings, reservoir and tower. This would make a hedge appear out of place, particularly because the soil and other conditions on the bluff would make a hedge look artificial and would make its maintenance resource intensive. A consistent ground cover of the existing prairie grass and a gravel buffer around the fence would seem more appropriate and would blend better with the existing surroundings.
  3. Per article 27-620 sub-section g-11 *Antenna support structure separation*. The site in consideration was carefully selected, is the most suitable for this installation for a variety of reasons, and is also the only option for certain other reasons. On the bluff bisecting Billings there is little space available with most of it owned by the airport and the rest either being too far west which is too far from the Heights, or being designated as park land.

This particular site has the appropriate view of the necessary locations while being as far from the road as possible. If it were even only 100 feet farther north it would interfere on airport airspace. It is also located where it can use existing utilities on a partially prepared site formerly used as a communications installation. Working with Verizon I was able to determine the minimum distance of 70 feet that would be required between the towers. This distance presents a much less obvious obstruction since the existing nearby elevated reservoir and the two towers which are almost identical in size would, from many perspectives, obscure the existence of the new tower. The airport administration also agreed that this location presents a much less obvious installation, and expressed a preference that I use the existing site next to the Verizon tower, which they indicated was one of the few sites which wouldn't interfere with airport operations or airspace. There is an existing tower farm located 1.8 miles to the west near Zimmerman Trail.

### **Additional Information**

Per article 27-600 sub-section k-7 *Availability of suitable existing or approved antenna support structures.*

For the site in consideration there is a 100 foot Verizon tower 70 feet to the east, that after much review, I deemed unsuitable for my needs for the following reasons:

1. The existing Verizon tower is of a similar model and of similar dimension to the proposed tower except that it is of lighter duty construction. The tower was constructed in 1997 and has already been reinforced either because of its age or in order to support the new 4G antennas. The antenna load that would be placed on the proposed tower would exceed that which the existing Verizon tower could hold, thereby preventing future growth and as a result would require a new tower anyways.
2. The agent with Verizon that I contacted for information about collocation was initially amenable to the request, but provided an initial estimate which he had seen in other situations like this and which was already more than the monthly estimated cost for an entirely new heavier tower with services. The Verizon estimate did not include the ground rent and antenna fee that would be due to the airport as a landlord or the other expenses since only tower space can be leased and ground space, enclosures and utilities must be obtained separately.
3. Verizon made it clear that the purpose of their tower is to support their hardware and that they will provide collocation only as a secondary concern, partially because of wording in their land lease contract that requires them to do so. This is entirely understandable; however, it is difficult for me to provide the necessary level of reliability to my customers if I cannot ensure the highest priority for my installation.

Due to the location of this tower and at the request of the airport, authorization from the FAA was required. I filed form 7460 with the FAA and received a *Determination of No Hazard to Air Navigation* in response. The response letter from the FAA can be produced upon request.





