

TO: Zoning Board of Adjustment
FROM: Matt Wyant, County Planning Director
DATE: November 1, 2023

RE: Case #ZV-2023-02

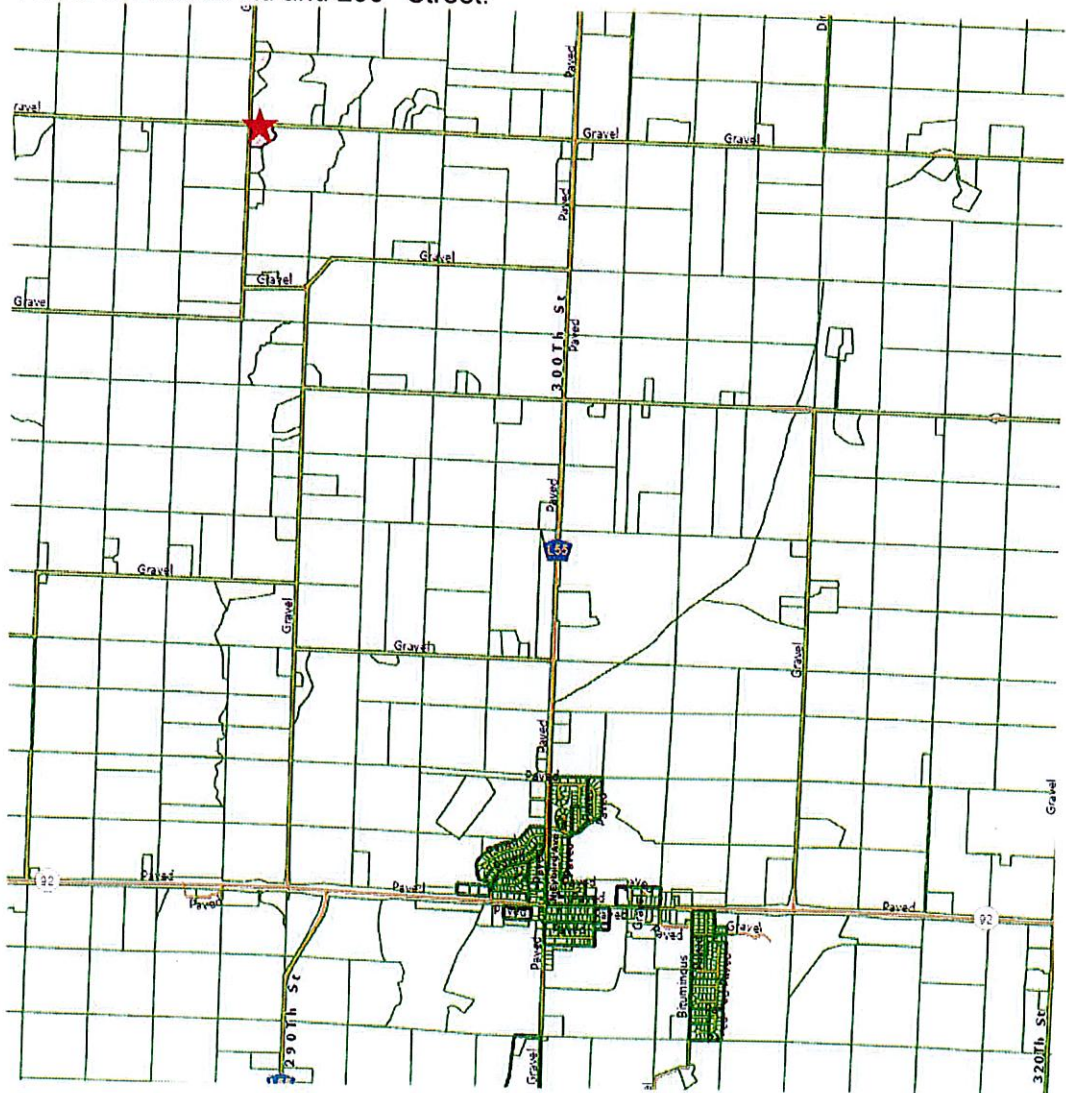
REQUEST: A 5' height variance to allow the construction of a barn with a height of 27' in lieu of 22'.

LOCATION: 17963 290th St

Hardin Township

26-75-42 NE NE COMM NW COR TH S451.19' E269.11' NE408.39' NW110.29'
N113.87' W481.63' TO POB (PARCEL 21275)

The subject property is approximately 2.5 miles north west of city limits of Treynor at the corner of Elmtree Rd and 290th Street.

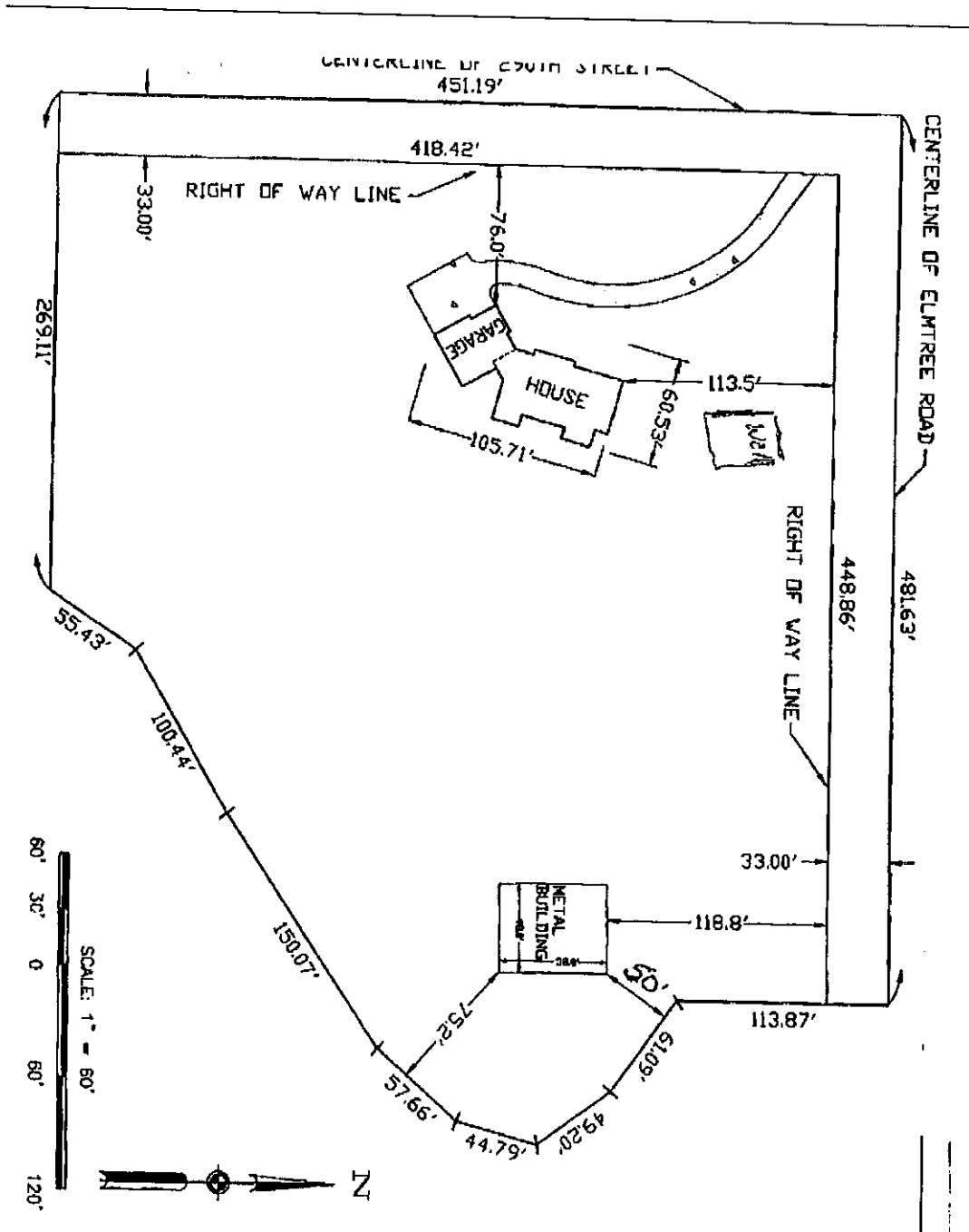


APPLICANT: Seth – Sally Christensen

GENERAL INFORMATION:

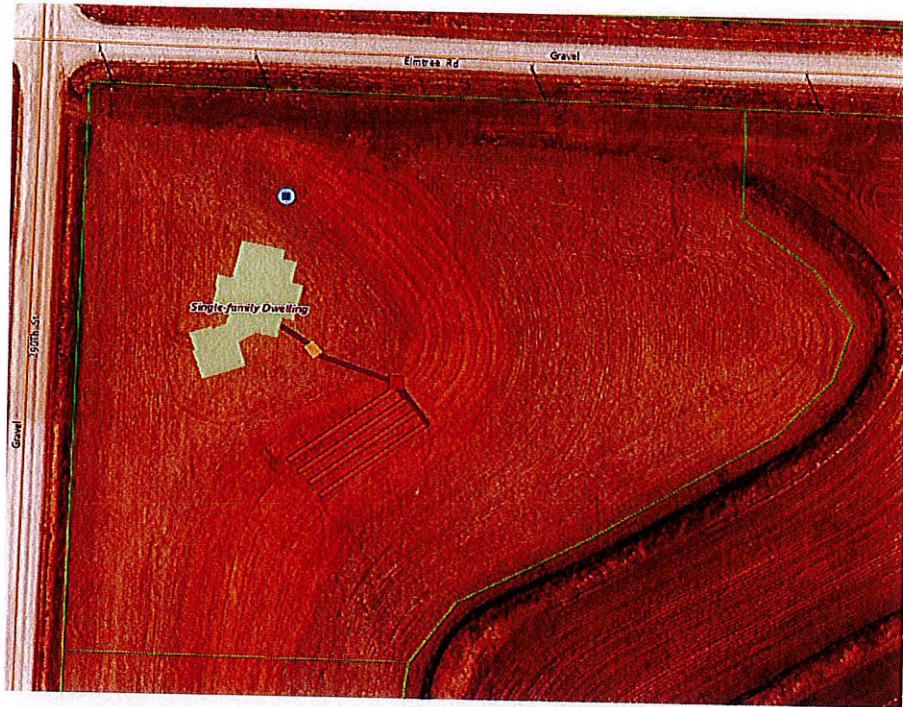
The applicant has made this request in order to allow a 5' height variance to allow the construction of a 48' x 58' barn with a height of 27' in lieu of 22'.

The following is the applicant's site plan:



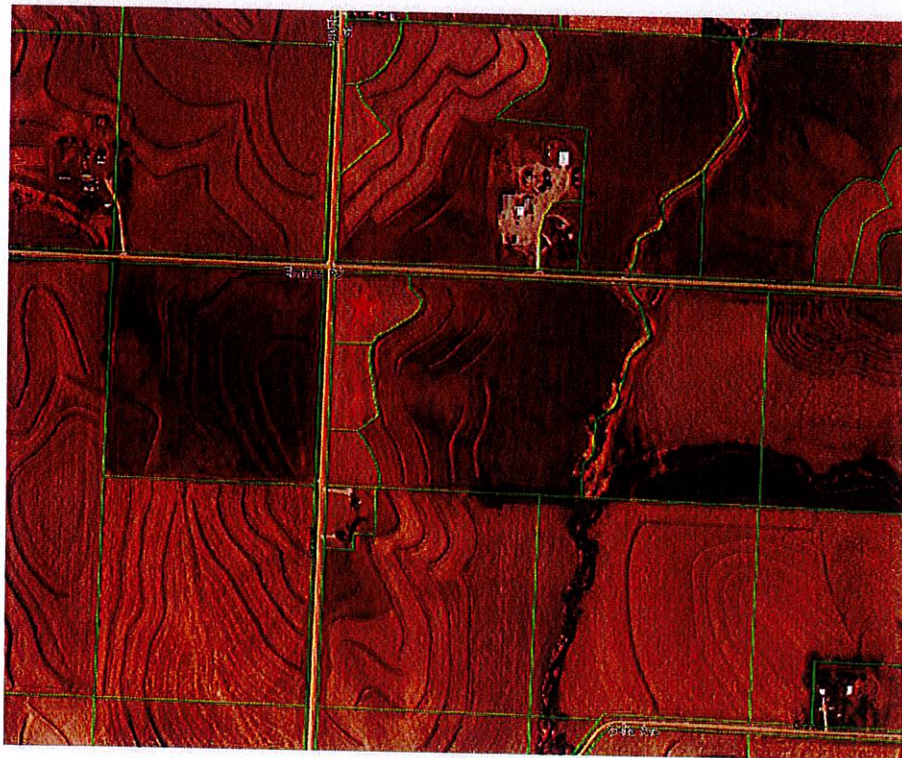
SITE REVIEW:

A proposed single family dwelling, well and septic system for which permits were secured are all on the 4.10 acre lot.



AREA REVIEW:

The use of properties in the area are a combination of primarily residential and agricultural.



ZONING:

The subject property is located in a Class R-1 (Ag-Urban Transitional) District.

The current maximum standards for the R-1 District are as follows:

8.015.060 HEIGHT REQUIREMENT: The maximum height of Buildings and structures in a Class R-1 District, shall be thirty-five (35) feet or two and one-half (2 1/2) stories, whichever is lower, and an accessory building shall not exceed a height of twenty-two (22) feet or two (2) stories, whichever is lower. (Ordinance #2004-14/07-01-04)

Section 8.096.030.02 of the County Code states "No variance from the terms of this Ordinance shall be granted unless the Board specifically finds":

- .02 The Board shall have the power to hear and decide appeals for variances from the specific terms of this Ordinance which will not be contrary to the public interest and where, owing to special conditions, a literal enforcement of the provisions of this Ordinance will, in an individual case, result in unnecessary hardship, and provided, that the spirit of the Ordinance shall be observed, public safety and welfare secured, and substantial justice done.

No variance from the terms of this Ordinance shall be granted unless the Board is satisfied that granting the variance:

- A. Is necessary to alleviate a demonstrable hardship or difficulty so great as to warrant the variance;
- B. Will not merely serve as a convenience to the applicant;
- C. Will not impair the general purpose and intent of the regulations and provisions contained in this Ordinance;
- D. Will not impair an adequate supply of light and air to adjacent properties;
- E. Will not increase the hazard from fire and other damages to said property;
- F. Will not diminish the value of land and buildings in the County;
- G. Will not increase the congestion and traffic hazards on public roads; and
- H. Will not otherwise impair the public health, safety and general welfare of the inhabitants of the County.
- I. Is not based on the nonconforming use of neighboring lands, structures or buildings in the same district, and the permitted or nonconforming use of lands, structures, or buildings in other districts is not grounds for the issuance of the variance.
- J. Will not, under any circumstances, allow a use not permissible under the terms of this Ordinance in the district involved, or any use expressly or by implication prohibited by the terms of this Ordinance in said district.

FLOOD HAZARD: The Flood Insurance Study prepared by the Federal Emergency Management Agency for the County designates in the Flood Insurance Rate Maps that the property as being in a Zone X-Areas of minimum flooding.

STAFF

RECOMMENDATION: Based on the above information, the preliminary recommendation by the Planning Department is to approve the application, subject to the following condition:

- 1. The proposed building shall be setback at a minimum of fifty (50) feet from the side yard and fifty (50) feet from the rear yard.

Based on the following finding of facts:

1. The applicants' lot size is sufficient to support proposed structure.
2. The property is not in a platted subdivision.
3. The subject building is not going to be used for any commercial activities.
4. The aforementioned facts reduce the potential visual and aesthetic impacts on the line of sight for which the height restriction was adopted.

This recommendation is subject to change, based on evidence and information presented by the applicant and interested parties at the public hearing.

TO: Zoning Board of Adjustment
FROM: Matt Wyant, County Planning Director
DATE: November 1, 2023

RE: Case #ZV-2023-03

REQUEST: A 20' side yard setback variance to allow the construction of an industrial building with a side yard setback of 30' in lieu of 50'.

LOCATION: Lewis Township

I-29/I-80 INDUSTRIAL PARK LT 13

The subject property is located approximately 900 feet east of the city limits of Council Bluffs on N 193rd Circle.



APPLICANT: Nick Petersen

GENERAL INFORMATION: The applicant has made this request in order to allow the construction of an industrial building with a side yard setback of 30' in lieu of the required 50' side yard setback.

The following is the applicant's request:



**K.C. PETERSEN
CONSTRUCTION CO., INC.**
General Contractors

PO Box 128
COUNCIL BLUFFS, IOWA 51502-0128
PHONE (712) 328-0123
FAX (712) 323-5890

Oct 20, 2023

Pottawattamie County
Board of Adjustments
227 S 6th St.
Council Bluffs, IA 51501

To Whom It May Concern:

On lot 14 (13899 N 193rd Cir Council Bluffs) the property is currently Zoned Industrial I-1. The adjacent properties that abut this lot are I-1 and A-3. The current set backs off an A-3 zoning district are 50' from the property line. We are requesting a 20' variance to the side yard back set on the north side of the property. That property is currently zoned A-3 but in the future master plan as going to industrial. Which would have a 0' side yard setback. A few other reasons for wanting to push the side yard setback are as follows

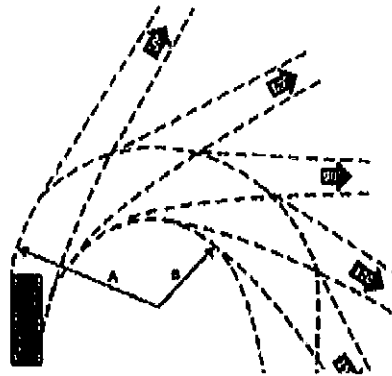
- With the approved variance with the building being 30' back from the lot line we are able to not disturb the current storm water drainage ditch from the current development on the west side of this lot.
- With the approved variance we are able to provide proper turn around distance for a standard ambulance vehicle turning radius. 42' is the minimum distance for an ambulance to turn around.
- With your approval of this variance we are able to provide additional ADA Parking in front of every suite

Very truly yours,

Nick Petersen, Vice President
KC Petersen Construction, Inc.

Q what is the turning radius of an ambulance

All Images Videos News Maps Shopping



Select Vehicle Dimensions and Turning Radii

Symbol	Design Vehicle Type	A. Minimum Design Turning Radius (ft)
P	Passenger Car	24
SU	Single Unit Truck/Ambulance	42
BUS-40	Intercity Bus	45
A-BUS	Articulated Bus	39.8

10 more rows

<https://www.chescoplanning.org> · 2...

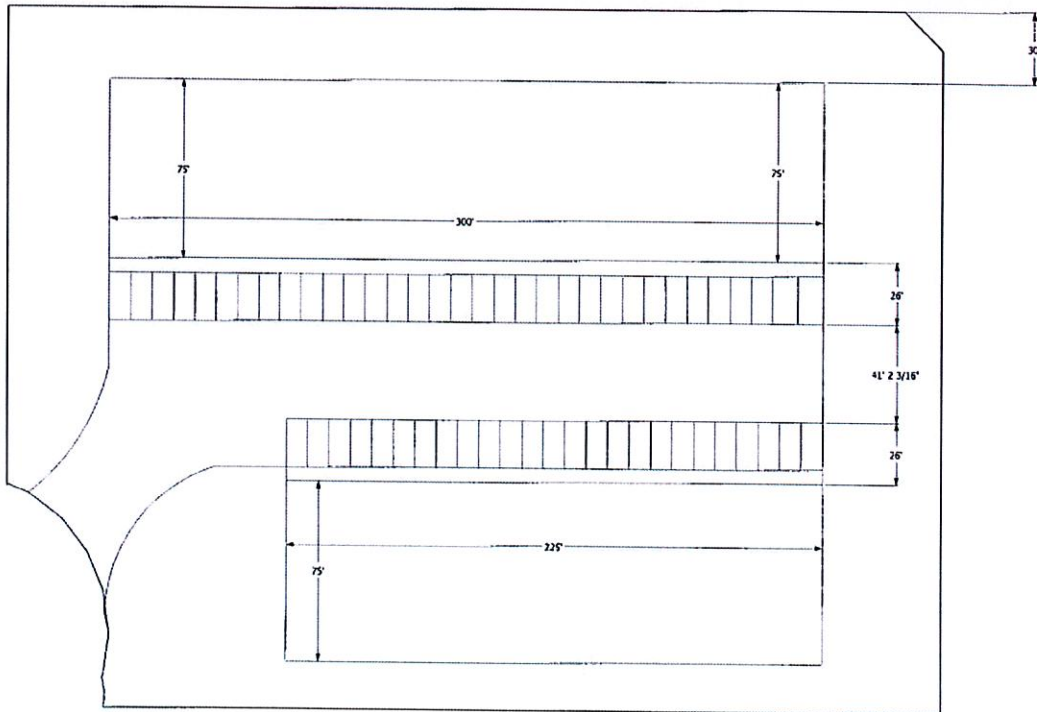
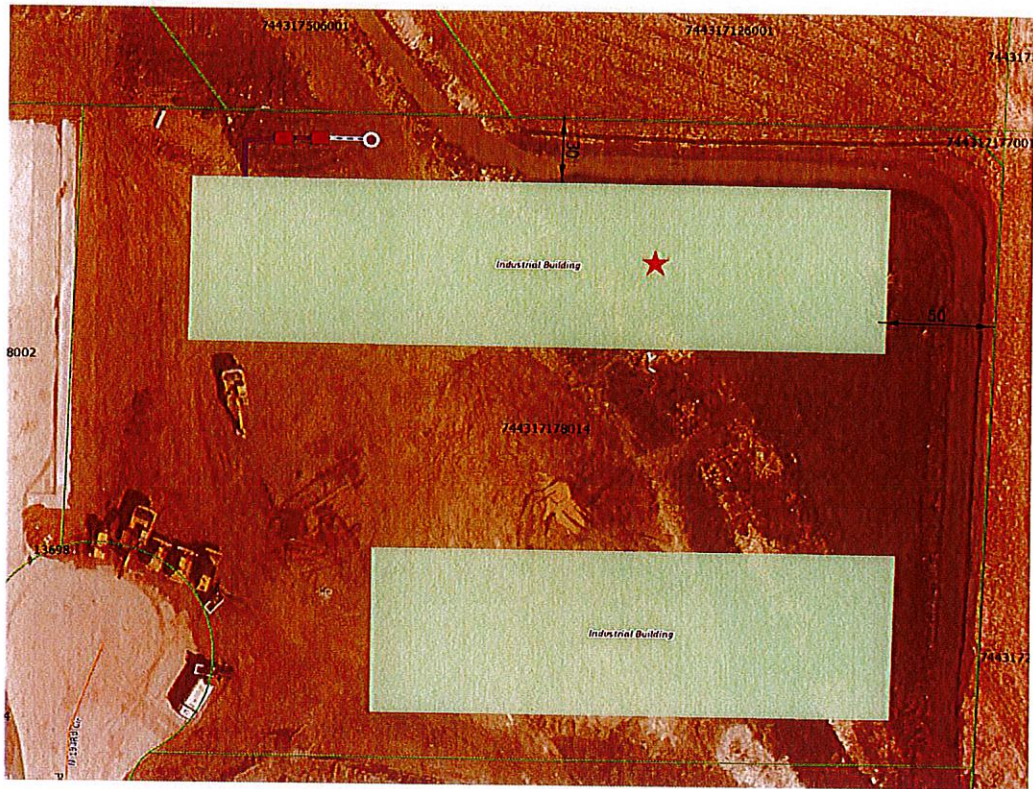
Vehicle Characteristics - Multi-modal Handbook

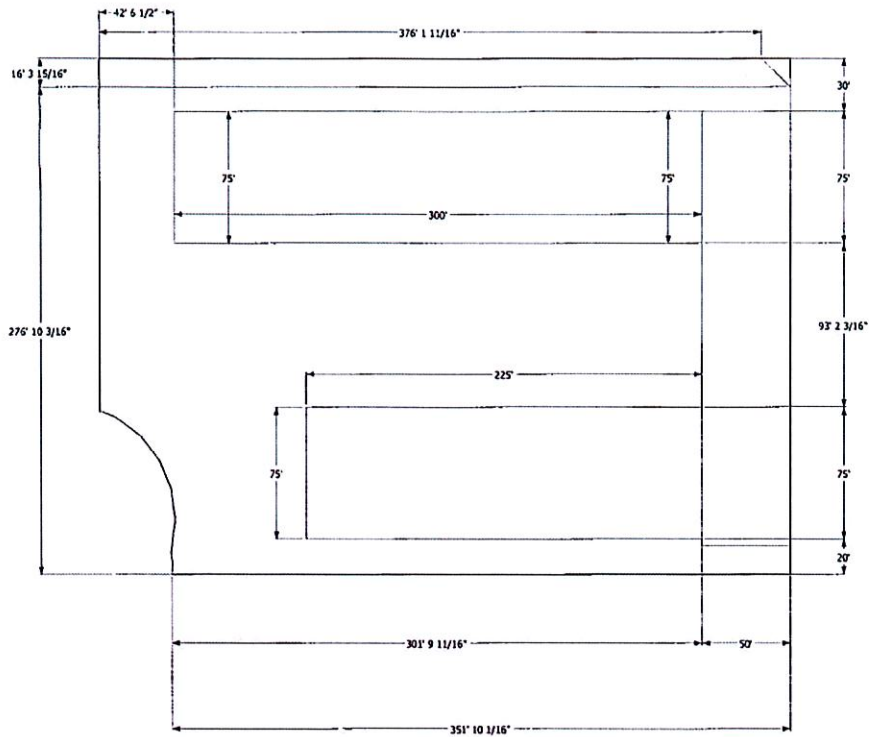
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SITE REVIEW:

The 2.52 acre parcel is currently undeveloped. Two industrial buildings and a septic system are proposed. The northern building is the one for which a variance is requested. The southern building meets required setbacks.





AREA REVIEW:

The use of properties in the area is primarily agricultural and industrial. There is one house to the north which is the only house that can be constructed in the 1/4 1/4 section (which is under one ownership) due to the zoning of A-3 (River Front and Agricultural Production).



ZONING:

The subject property is located in a Class I-1 (Limited Industrial) District.

The current minimum standards for the 1-1 District are as follows:

- 8.055.070 SETBACK REQUIREMENTS: The setback requirements for buildings and structures in a Class I-1 District shall be as follows: (Ordinance #81-6/10-01-81)
- .01 The front yard setback shall be a minimum of twenty-five (25) feet. (Ordinance #81-6/10-01-81)
 - .02 The side yard setback shall be a minimum of fifty (50) feet when such yard abuts a Class "A" District and shall be a minimum of seventy-five (75) feet when such yard abuts a Class "R" District or platted residential subdivision. (Ordinance #2004-14/07-01-04)
 - .03 The rear yard setback shall be a minimum of fifty (50) feet when such yard abuts a Class "A" District and shall be a minimum of seventy-five (75) feet when such yard abuts a Class "R" District or platted residential subdivision. (Ordinance #2004-14/07-01-04)
 - .04 The minimum setback between buildings situated on the same site shall be ten (10) feet. (Ordinance #81-6/10-01-81)

Section 8.096.030.02 of the County Code states "No variance from the terms of this Ordinance shall be granted unless the Board specifically finds":

- .02 The Board shall have the power to hear and decide appeals for variances from the specific terms of this Ordinance which will not be contrary to the public interest and where, owing to special conditions, a literal enforcement of the provisions of this Ordinance will, in an individual case, result in unnecessary hardship, and provided, that the spirit of the Ordinance shall be observed, public safety and welfare secured, and substantial justice done.

No variance from the terms of this Ordinance shall be granted unless the Board is satisfied that granting the variance:

- A. Is necessary to alleviate a demonstrable hardship or difficulty so great as to warrant the variance;
- B. Will not merely serve as a convenience to the applicant;
- C. Will not impair the general purpose and intent of the regulations and provisions contained in this Ordinance;
- D. Will not impair an adequate supply of light and air to adjacent properties;
- E. Will not increase the hazard from fire and other damages to said property;
- F. Will not diminish the value of land and buildings in the County;
- G. Will not increase the congestion and traffic hazards on public roads; and
- H. Will not otherwise impair the public health, safety and general welfare of the inhabitants of the County.
- I. Is not based on the nonconforming use of neighboring lands, structures or buildings in the same district, and the permitted or nonconforming use of lands, structures, or buildings in other districts is not grounds for the issuance of the variance.
- J. Will not, under any circumstances, allow a use not permissible under the terms of this Ordinance in the district involved, or any use expressly or by implication prohibited by the terms of this Ordinance in said district.

FLOOD HAZARD: The Flood Insurance Study prepared by the Federal Emergency Management Agency for the County designates in the Flood Insurance Rate Maps the majority of the property as being in a Zone A-Areas subject to inundation by the 1% annual chance flood event.

ROADS & TRAFFIC: Access to the subject property is from 192nd St, Portland Street and N 193rd Circle, all paved county roads. The 2016 Iowa Department of Transportation Traffic Flow Map indicated an average traffic flow on 192nd Street of 430 vehicles per day.

STAFF

RECOMMENDATION:

Based on the above information, the preliminary recommendation by the Planning Department is to approve the application based on the following findings of fact:

1. The building at the proposed setback is not merely for convenience. It will not impair the general purpose and intent of the Zoning Ordinance, it will not impair supply of light and air to adjacent properties, it will not increase the hazards to said property, it will not diminish property values, it will not increase congestion of public roads, nor will it impair the public health, safety and general welfare of area residents.
2. The property to which the proposed setback abuts is part $\frac{1}{4}$ $\frac{1}{4}$ section that is zoned A-3 which prohibits more than one home per $\frac{1}{4}$ $\frac{1}{4}$ section. There is already a home in that $\frac{1}{4}$ $\frac{1}{4}$ section. Said property is under one ownership.
3. The future land use plan designates this entire area as Urban Transitional, lands within $\frac{1}{2}$ mile of each of the cities should be the area of concentration for non-farm dwellings, and commercial and industrial uses.
4. The variance will provide proper turn around distance for emergency vehicles.

This recommendation is subject to change, based on evidence and information presented by the applicant and interested parties at the public hearing.

TO: Zoning Board of Adjustment
FROM: Matt Wyant, Planning Director
DATE: November 3, 2023

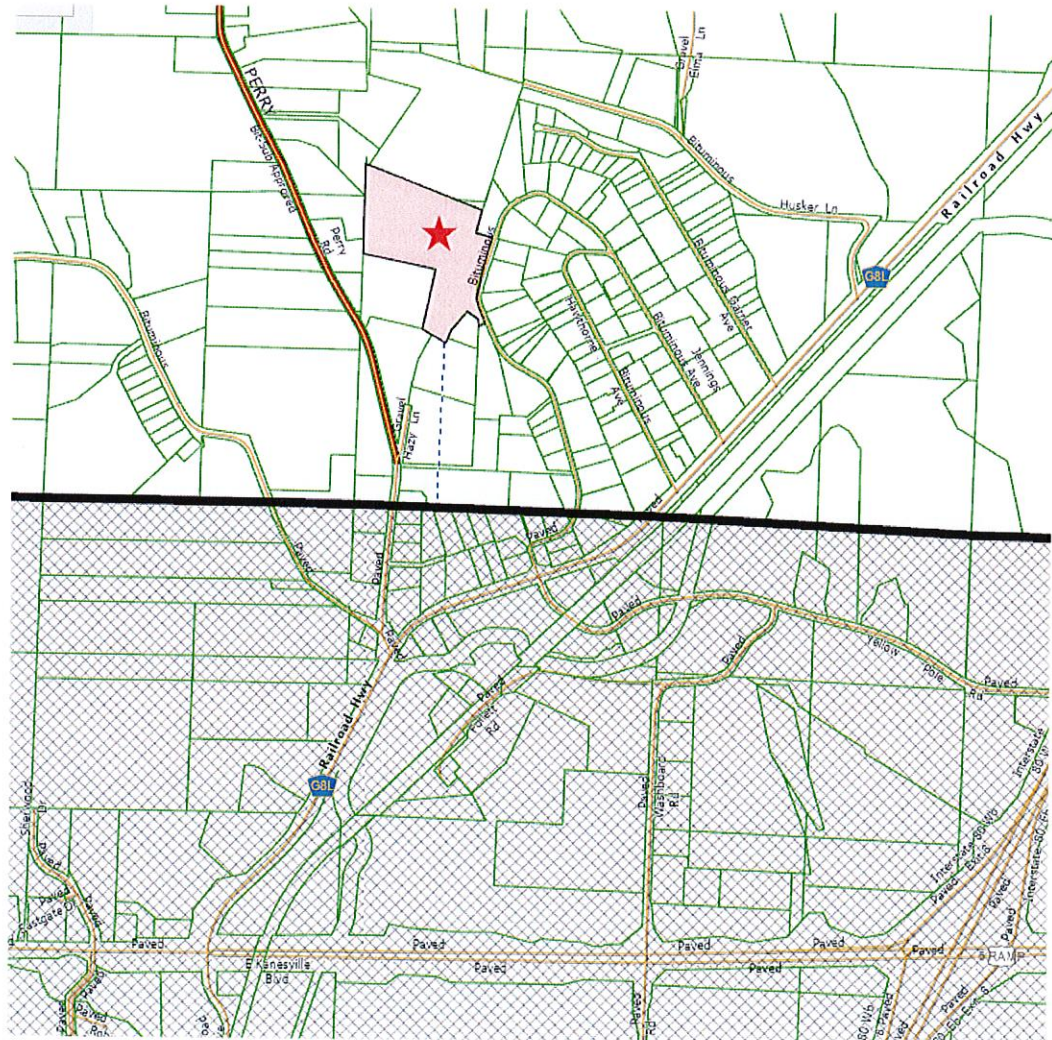
RE: Case #CU-2023-05

REQUEST: Conditional use approval to permit construction of a communication tower and equipment building in a Class R-2 (Urban Transitional) District.

LOCATION: Garner Township

AUD SUB NW SW 16-75-43 ALL LT 5 & PT LTS 4 & 7 COMM NE COR LT 3 PATTENS SUB TH NW99.13' NLY1132.5' SE278.34' SWLY909.24' SE APPROX 180' SW196.74' S84.33' SW48.13' NW134.25' TO POB & W131' N318' LT 1, ALL LT 2, TRI NW COR LT 3 & PATTENS SUB LT 1 & GLENDALE ACRES O/L A EXC S40'

The subject parcel is located approximately ¼ mile to the north of the city limits of Council Bluffs at 1474 Jennings Avenue.

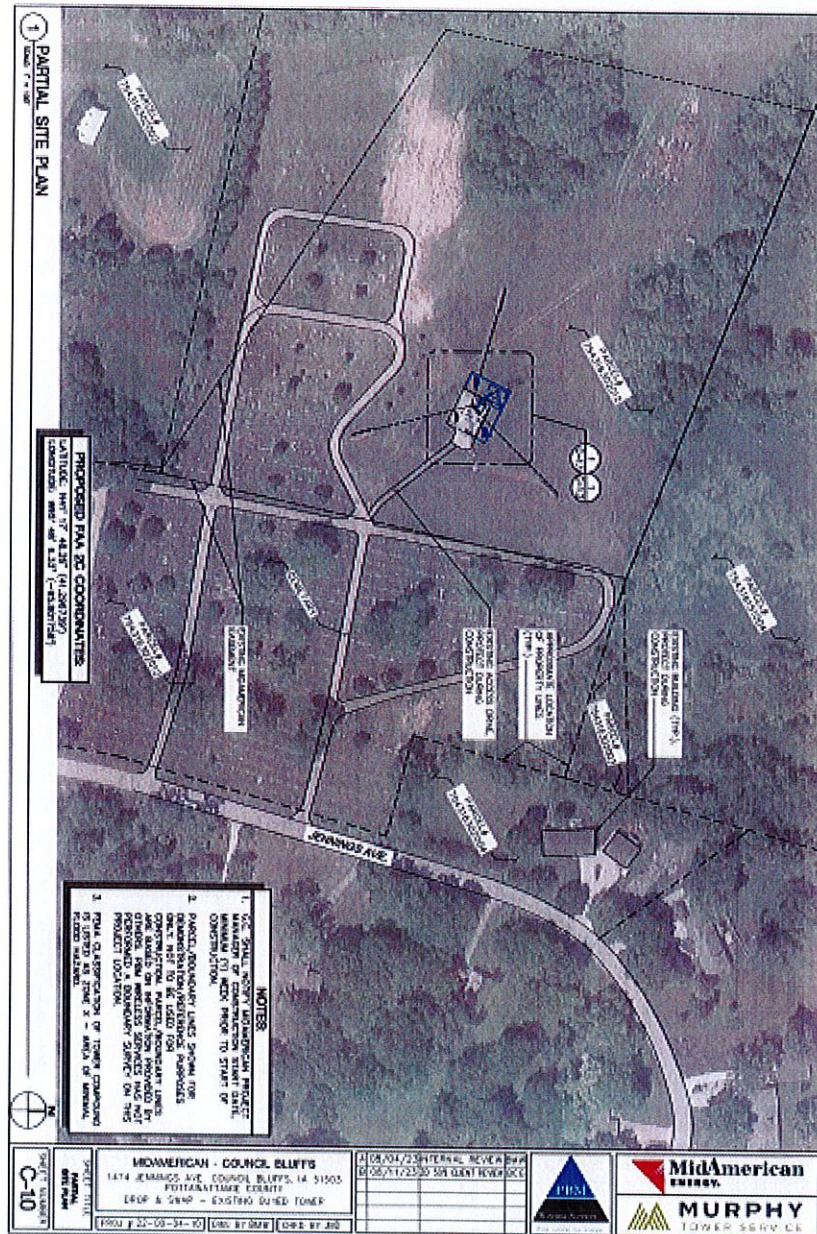


PROPERTY OWNER:Mid American

REPRESENTED BY: PBM Wireless Services

GENERAL INFORMATION: Mid American Energy has made this request in order to allow them to replace an existing 199' communication tower with a 195' foot communication tower

SITE REVIEW: The existing tower was constructed in 1968 and there is a perpetual easement and lease in place (See attachment #1). The tower located in a cemetery.



**ZONING
STANDARDS FOR
TOWERS:**

Section 8.004.220 of the Zoning Ordinance stipulates the standards and requirements that shall govern the design, development and placement of towers and antennas.
SEE ATTACHED DOCUMENTS supplied by PBM Wireless Services.

AREA REVIEW:

The subject property currently is and will remain zoned R-2 (Urban Transitional). The properties in the area are utilized for agricultural and rural residential land uses.

CURRENT ZONING: The subject parcel is located in a Class R-2 Urban Transitional) District.

Section 8.020.030 of the Code states that the following conditional use shall be permitted in a Class R-2 (Urban Transitional) District, when authorized in accordance with the requirements of 8.096:

- .10 Towers with a height exceeding one hundred (100) feet, subject to the requirements of Section 8.004.220.

Section 8.096.030.03 of the County Code states:

.03 The Board shall have the power to hear and decide only such appeals for conditional uses as the Board is specifically authorized to pass on by the term of this Ordinance; to decide such questions as are involved in determining whether conditional uses should be granted; and to grant conditional uses with such conditions and safeguards as are appropriate under this Ordinance; or to deny conditional uses when not in harmony with the purpose and intent of this Ordinance. In reviewing an application for a conditional use permit, findings based on the following criteria shall be made and serve as the basis for approval or denial of the request:

- A. *Does the proposed use conform to the Land Use Policy Plan?*
- B. *Is the site suitable for the proposed use? Such factors as size and shape of the property, topographic conditions, soil conditions to support water and septic systems, accessibility to transportation facilities, and soil erosion problems shall be considered.*
- C. *Is the proposed use compatible with surrounding property use? Such factors as the activities and function of the proposed use should be considered to determine if the proposed use conflicts with or reduces the usefulness or value or creates other negative impacts on adjoining property or properties in the general area, including public health, safety and welfare.*
- D. *Is the adjoining road system adequate to accommodate the proposed use in terms of the present traffic volume vs. road capacity and the general condition of the road system?*

- E. *Can adequate measures be taken to minimize any potential adverse impacts on adjoining property? If so, stipulate such measures as required by the ordinance or special conditions that would be required.*
- F. *Does the conditional use comply with all conditions imposed on it by the provisions of the district in which such conditional use may be authorized? (Ordinance #2004-14/07-01-04)*

FLOOD HAZARD: The Flood Insurance Study prepared by the Federal Emergency Management Agency for the County designates the property as being in a Zone X, Areas of minimal flooding.

ROADS & TRAFFIC: Access to the subject property is gained from Jennings Avenue, a paved county road.

STAFF

RECOMMENDATION: Based on the above information, the preliminary recommendation by the Planning Department is to **approve** the application based on the following findings of fact:

1. The subject property is located in the R-2 (Urban Transitional) District. The County Zoning Ordinance, which is adopted in conjunction with the Land Use Plan, stipulates that the proposed land use is a permitted conditional use in the R-2 District. The Land Use Plan recognizes the need for adequate utilities to accommodate existing and future development.
2. A commercial telecommunication tower already exists and will simply be replaced which will not create a detrimental effect on adjacent properties.
3. The subject property consists of 21.7 acres and the replacement of a commercial telecommunication tower is not foreseen to have any negative impact on area properties.
4. The only time the proposed commercial telecommunication tower will have any utilization of the road system is primarily during its initial construction. Traffic to the tower site will be minimal after construction. The existing road system is adequate to accommodate said delivery and no negative impact should be encountered.
5. The proposed tower will meet the criteria set forth by the Zoning Ordinance.

This recommendation is subject to change, based on evidence and information presented by the applicant and interested parties at the public hearing.

UNIMPAID

Grantor shall be entitled to continue to use any part of the easement property outside of Grantee's fences enclosing its facilities thereon, provided, however, that such use shall not interfere with or obstruct Grantee's use of the property for the purposes contemplated by this easement.

The Grantee is given the right reasonably to trim, cut and clear away any trees, limbs, brush, structures or other obstructions whether located on the above described easement property or adjacent to and overhanging the same, wherever in its judgment such will interfere with or endanger the construction, operation or maintenance of said facilities and to renew, replace, add to and otherwise change the facilities and any part thereof and all appurtenances thereto and the location thereof within the easement property.

In consideration of such grant, Grantee agrees that it will repair or pay for any damage which may be caused to crops, fences or other property of the undersigned by the construction, operation, maintenance, inspection, patrolling or removal of said facilities. Grantor(s) covenants that no act will be permitted within the easement property which is inconsistent with the rights hereby granted; that no building or structures will be erected upon said property and that the present grade or ground level thereof will not be changed by excavation or filling.

Grantee, its contractor or agents, may enter said premises for the purpose of making surveys and preliminary estimates immediately upon the execution of this easement but the easement shall not otherwise by operative nor shall construction begin until the full consideration is paid as hereinafter provided.

The Grantor(s) acknowledges payment of \$ 50.00 hereunder and it is agreed that if the additional sum of \$ 6,454.00 is paid the undersigned Grantor(s) within 120 days from date hereof or the release of this easement from any liens or encumbrances of record, whichever date is later, this agreement shall become binding upon all parties hereto but shall terminate upon the permanent removal or abandonment of all facilities and appurtenances of Grantee upon the easement property. If the additional amount of consideration is not paid within the time above stated, then the initial payment shall be forfeited to the Grantor(s) and both parties shall be released from all further obligation hereunder.

This agreement shall run with the land and bind and inure to the benefit of the heirs, successors and assigns of the parties.

Dated this 25th day of November, 1967.

Herbert E. Patten
Herbert E. Patten

Haliye Patten
Haliye Patten

ACKNOWLEDGMENT

STATE OF IOWA)
COUNTY OF POTTAWATTAMIE) SS

On this 25th day of November, A.D., 1967, before me, a Notary Public in and for said County and State, personally appeared Herbert E. Patten and Haliye Patten.

to me known to be the person(s) whose name(s) (or are) named in and who executed the foregoing instrument, and acknowledged that they executed the same as their voluntary act and deed.



Noran L. Davis
Notary Public
in and for said County and State.
Noran L. Davis

COMPARED

Parcel No. _____
Job No. _____
Draft No. _____
Structures No. _____

STATE OF IOWA, Pottawattamie County
Filed for record the 24 day of Sept 1961
at _____
In book 1461 page 75
Dorothy Steiner
Recorder
BY _____
Deputy

Located in
State of Iowa
County of Pottawattamie
Township 75 North
Range 43 West of the
5th P.M., Section 16

BOX 1235824

MICROWAVE TOWER EASEMENT

3614
7-2-50

KNOW ALL MEN BY THESE PRESENTS:

The undersigned Owners, _____

Herbert E. Patten and Hallye Patten, husband and wife

and the undersigned Tenant, _____
(hereinafter called the Grantor(s)) in consideration of the sum of One Dollar and other valuable considerations in hand paid, do hereby grant to Iowa Power and Light Company, an Iowa corporation (hereinafter called the Grantee,) the perpetual right and easement to construct, reconstruct, repair, maintain, operate, inspect, patrol and remove a microwave tower and appurtenant building and other facilities and necessary lighting, communication and electrical facilities and protective devices and fencing (which may be erected at different times) and all necessary foundations, poles, wires, cables, conduit, guys, anchors, braces, fittings, equipment and appurtenances for the convenient construction, reconstruction, repair, maintenance, operation, inspection, patrolling and removal of said tower and other facilities and appurtenances over, along, across and under the following described premises situated in Pottawattamie County, Iowa, to-wit:

A part of the West Half (W 1/2) of the Southwest Quarter (SW 1/4) of Section Sixteen (16), Township Seventy-five (75) North, Range Forth-three (43) West of the 5th P.M., Pottawattamie County, Iowa.

Grantee shall also have as an access from the existing public highway a 16 foot easement, same to be adjacent to the existing fences and also subject to a survey approved by Grantors.

The microwave site of 8.13 acres to be located on the level tract of land lying West of the Garner Township Gemetery.

The portion of the above property which shall be subject to the uses described in the above grant of easement (the easement property) is described as follows:

Commencing at the Southwest corner of Section 16, Township 75 North, Range 43 West of the 5th P.M., thence East 333.45 feet; thence North 5°21'52" East for a distance of 287.0'; thence North 8°9'57" East for a distance of 571.0 feet; thence North 11°58'27" East for a distance of 408.0 feet; thence North 27°21'47" East for a distance of 235.65 feet; thence North 58°48'13" West for a distance of 99.13 feet; thence North 10°46'17" East for a distance of 514.50 feet to the point of beginning; thence continuing along the last mentioned course for a distance of 618.0 feet; thence 80°30' to the left for a distance of 650.0 feet; thence 99°30' to the left for a distance of 487.07 feet; thence 69°37' to the left for a distance of 683.91 feet to the point of beginning, said tract containing 8.13 acres.

The Grantor warrants and covenants unto Grantee that, subject to liens and encumbrances of record at the date of this easement, it is the owner of the above described land and has full right and authority to validly grant this easement, and that Grantee may quietly enjoy the premises.

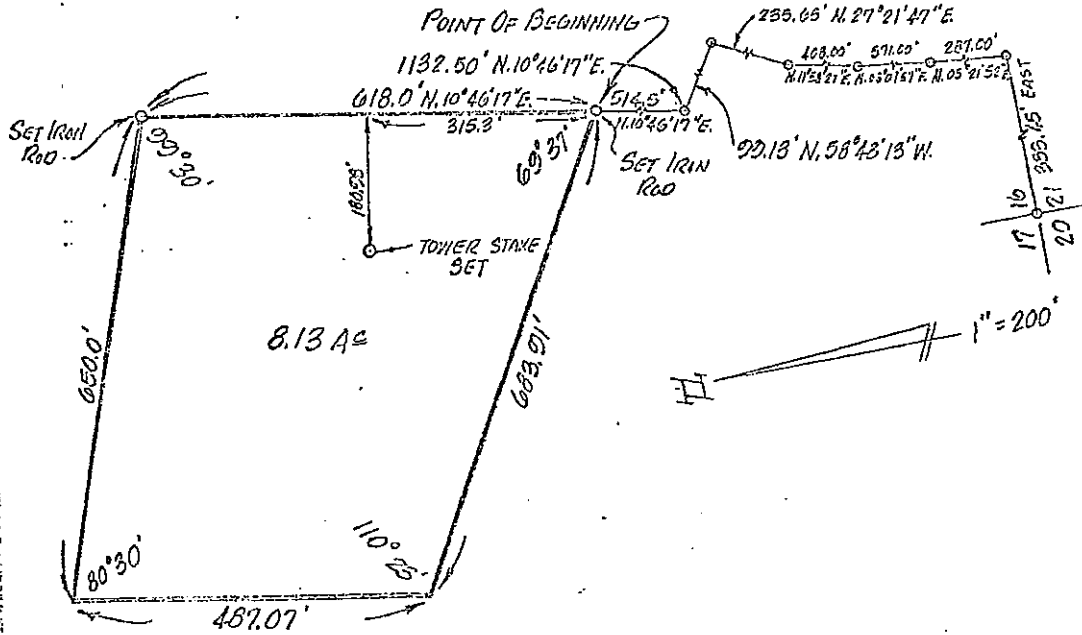
As part of the grant herein, Grantee shall have a reasonable right of access to the easement property from the public highway over Grantor's other property above described, with the right of itself and its contractors, agents and employees to pass to and from the easement property over such access. Grantee may, if necessary, improve the access route so as to make the same useable by its construction and other equipment.

The grant herein shall also include the right on the part of Grantee to construct, operate and maintain an electric supply line with poles, wires and necessary equipment incidental thereto upon and over Grantor's remaining property to provide electric power and energy for Grantee's facilities on the easement property, including the right to enter upon Grantor's remaining property to construct, maintain or remove such line, and the right to trim or remove with reasonable care such trees and underbrush as may interfere with the proper operation and maintenance of such line, but said electric supply line shall be erected along the 16 foot access easement aforementioned.

101
IOWA POWER & LIGHT COMPANY
of
Microwave Tower Site at
Council Bluffs, Iowa

EASEMENT LEGAL DESCRIPTION :

"That part of the West 1/2 Sec. 16, Township 75 North, Range 43 West of the 5th Principal Meridian, Pottawattamie County, Iowa described as follows: Commencing at the Southwest corner of Section 16, Township 75 North, Range 43 West of the 5th Principal Meridian; thence East 333.45 feet; thence North 5° 21' 52" East for a distance of 287.0'; thence North 8° 9' 57" East for a distance of 571.0' ft.; thence North 11° 58' 27" East for a distance of 408.0 feet; thence North 27° 21' 47" East for a distance of 235.65 feet; thence North 58° 48' 13" West for a distance of 99.13 feet; thence North 10° 46' 17" East for a distance of 514.50 feet to the point of beginning; thence continuing along the last mentioned course for a distance of 618.0 feet; thence 80° 30' to the left for a distance of 650.0 feet; thence 99° 30' to the left for a distance of 487.07 feet; thence 69° 37' to the left for a distance of 663.91 feet to the point of beginning. Said tract containing 8.13 acres."



C E R T I F I C A T I O N

I hereby certify that this Plat and Survey was made by me or under my direct personal supervision, and that I am a duly registered Land Surveyor under the laws of the State of Iowa.



ANDERSON ENGINEERING COMPANY
Des Moines, Iowa 50309

By *Donald A. Anderson*

Donald A. Anderson
Reg. C. E. & L. S. # 25346

Date: 25 January, 1968.

No 29

Herbert E. Patten and Hallye
Patten, husband and wife

MICROWAVE TOWER EASEMENT

Book 4461

Dated 25 November, 1967

Page 75

to

Filed 29 April, 1968

Iowa Power and Light Company

Grant the perpetual right and easement to construct, reconstruct, repair, maintain, operate, inspect, patrol and remove a microwave tower and appurtenant building and other facilities and necessary lighting, communication and electrical facilities and protective devices and fencing (which may be erected at different times) and all necessary foundations, poles, wires, cables, conduit, guys, anchors, braces, fittings, equipment and appurtenances for the convenient construction, reconstruction, repair, maintenance, operation, inspection, patrolling and removal of said tower and other facilities and appurtenances over, along, across and under the following described premises situated in Pottawattamie County, Iowa, to-wit:

A part of the $W\frac{1}{2}$ of the $SW\frac{1}{4}$ of Section 16, Township 75, North, Range 43, Pottawattamie County, Iowa.

Grantee shall also have as an access from the existing public highway

•
•
ABSTRACT GUARANTY COMPANY
221 South Main ~ Council Bluffs, Iowa

No 29 continued

a 16 foot easement, same to be adjacent to the existing fences and also subject to a survey approved by Grantors.

The microwave site of 8.13 acres to be located on the level tract of land lying West of the Garner Township Cemetery.

The portion of the above property which shall be subject to the uses described in the above grant of easement (the easement property) is described as follows: Commencing at the Southwest corner of Section 16, Township 75, Range 43, thence East 333.45 feet; thence North $5^{\circ}21'52''$ East for a distance of 287.0'; thence North $8^{\circ}9'57''$ East for a distance of 571.0 feet; thence North $11^{\circ}58'27''$ East for a distance of 408.0 feet; thence North $27^{\circ}21'47''$ East for a distance of 235.65 feet; thence North $58^{\circ}48'13''$ West for a distance of 99.13 feet; thence North $10^{\circ}46'17''$ East for a distance of 514.50 feet to the point of beginning; thence continuing along the last mentioned course for a distance of 618.0 feet; thence $80^{\circ}30'$ to the left for a distance of 650.0 feet; thence $99^{\circ}30'$ to the left for a distance of 487.07 feet; thence $60^{\circ}37'$ to the left for a distance of 683.91 feet to the point of beginning, said tract containing 8.13 acres.

The Grantor warrants and covenants unto Grantee that, subject to liens and encumbrances of record at the date of this easement, it is the owner of the above described land and has full right and authority to validly grant this easement, and that Grantee may quietly enjoy the premises.

As part of the grant herein, Grantee shall have a reasonable right of access to the easement property from the public highway over Grantor's other property above described, with the right of itself and its contractors agents and employees to pass to and from the easement property over such access. Grantee may, if necessary, improve the access route so as to make the same useable by its construction and other equipment.

The grant herein shall also include the right on the part of Grantee to construct, operate and maintain an electric supply line with poles, wires and necessary equipment incidental thereto upon and over Grantor's remaining property to provide electric power and energy for Grantee's facilities on the easement property, including the right to enter upon Grantor's remaining property to construct, maintain or remove such line, and the right to trim or remove with reasonable care such trees underbrush

as may interfere with the proper operation and maintenance of such line, but said electric supply line shall be erected along the 16 foot access easement aforementioned.

Grantor shall be entitled to continue to use any part of the easement property outside of Grantee's fences enclosing its facilities thereon, provided, however, that such use shall not interfere with or obstruct Grantee's use of the property for the purposes contemplated by this easement.

The Grantee is given the right reasonably to trim, cut and clear away any trees, limbs, brush, structures or other obstructions whether located on the above described easement property or adjacent to and overhanging the same, wherever in its judgment such will interfere with or endanger the construction, operation or maintenance of said facilities and to renew, replace, add to and otherwise change the facilities and any part hereof and all appurtenances thereto and the location thereof within the easement property.

In consideration of such grant, Grantee agrees that it will repair or pay for any damage which may be caused to crops, fences or other property of the undersigned by the construction, operation, maintenance, inspection, patrolling or removal of said facilities. Grantor(s) covenants that no act will be permitted within the easement property which is inconsistent with the rights hereby granted; that no building or structures will be erected upon said property and that the present grade or ground level thereof will not be changed by excavation or filling.

Grantee, its contractor or agents, may enter said premises for the purpose of making surveys and preliminary estimates immediately upon the execution of this easement but the easement shall not otherwise by operative nor shall construction begin until the full consideration is paid as hereinafter provided.

The Grantor(s) acknowledges payment of \$50.00 hereunder and it is agreed that if the additional sum of \$6,454.00 is paid the undersigned Grantor(s) within 120 days from date hereof or the release of this easement from any liens or encumbrances of record, whichever date is later, this agreement shall become binding upon all parties hereto but shall terminate upon the permanent removal or abandonment of all facilities and

No 29 continued

appurtenances of Grantee upon the easement property. If the additional amount of consideration is not paid within the time above stated, then the initial payment shall be forfeited to the Grantor(s) and both parties shall be released from all further obligation hereunder.

This agreement shall run with the land and bind and inure to the benefit of the heirs, successors and assigns of the parties.

Note:- Shown for reference. Abstracter

No 30	Herbert E. Patten and Hallye Patten husband and wife	WARRANTY DEED \$1.00
Book 77	to	Dated 18 March, 1977
Page 16144	Paul B. Perry and Patricia A. Perry	Filed 21 March, 1977

Conveys:- A part of Lot 6, Auditor's Subdivision of the SW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 16, Township 75 North, Range 43, Pottawattamie County, Iowa, more particularly described as follows: Beginning at the SW corner of said Section 16, thence N 00°01'11" E (assumed bearing) along the west line of the SW $\frac{1}{4}$ of said Section 16 distant 248.74 feet; thence S89°58'49" E distant 355.49 feet; thence along the centerline of a county road along a curve to the right having a radius of 1100.00 feet and a chord of 249.54 feet bearing S 04°36'46"W distant 250.08 feet; thence N 89°58'49"W distant 335.51 feet to the point of beginning.

Said Tract Contains 2.00 acres. Tract is subject to County Right-of-Way Easement.

Revenue \$4.95 affixed and cancelled.

Note:- Shown for reference only. Abstracter

No 31 NOTICE IS HEREBY GIVEN, that pursuant to Section 614.21 of the 1958 Code of Iowa and Section 1.9 of Iowa Land Title Examination Standards, there has been expressly omitted from this Abstract of Title all mortgages, school fund mortgages and trust deeds, together with



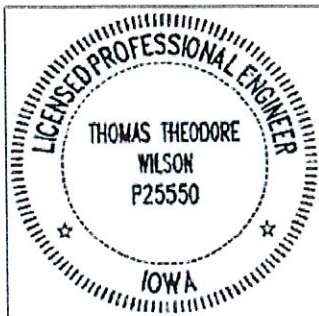
Structural Design Report
195' S3R Series SD Self-Supporting Tower
Site: Council Bluffs, IA

Prepared for: MURPHY TOWER SERVICE LLC
by: Sabre Industries™

Job Number: 533238

October 19, 2023

Tower Profile.....	1-2
Foundation Design Summary (Option 1).....	3
Foundation Design Summary (Option 2).....	4
Maximum Leg Loads.....	5
Maximum Diagonal Loads.....	6
Maximum Foundation Loads.....	7
Calculations.....	8-29



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the Laws of the State of Iowa.

Thomas Theodore Wilson (signature)

10-19-2023 (dated)

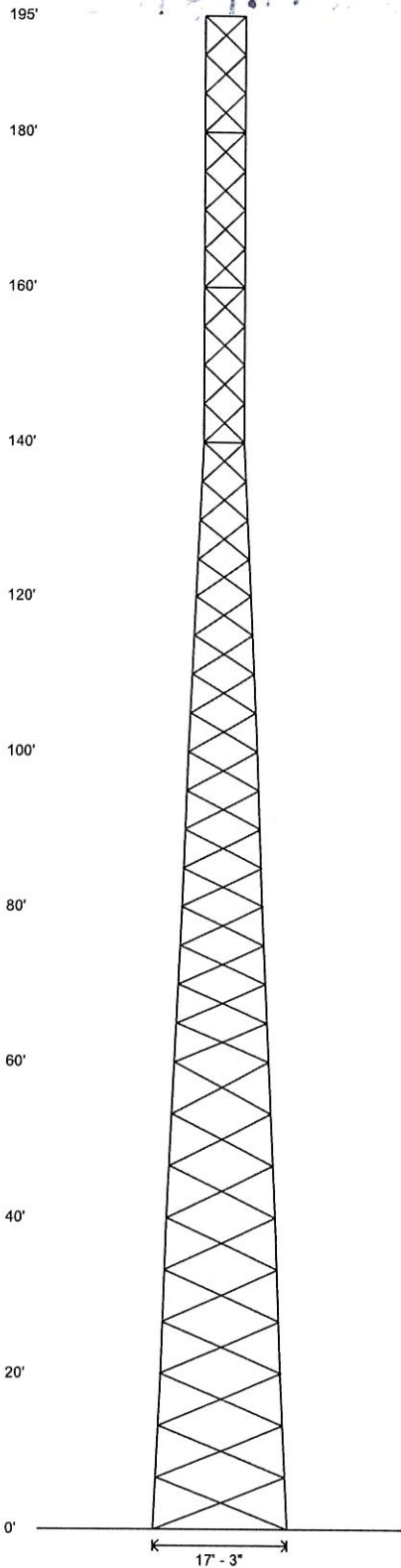
THOMAS THEODORE WILSON

My license renewal date is December 31, 2024.

Pages or sheets covered by this seal: 1-29

Digitally Signed By
Thomas T. Wilson
DN: c=US,
st=Texas,
l=Alvarado,
o=SABRE
INDUSTRIES,
INC., cn=Thomas
T. Wilson,
email=twilson@sa
breindustries.com

Legs	3.5 S.R.	3.0 S.R.	2.75 S.R.	2.5 S.R.	2.25 S.R.	2.0 S.R.	1.75 S.R.
Diagonals	L 3 X 3 X 3/16	L 2 1/2 X 2 1/2 X 3/16	L 2 X 2 X 3/16	L 2 X 2 X 1/8			
Horizontals	NONE						
Brace Bolts	(1) 3/4"	(1) 5/8"					
Top Face Width	15.5'	13.75'	12'	10.25'	8.5'	6.75'	5'
Panel Count/Height	3543	9 @ 6.6667'	3135	2463	1941	1586	1150
Section Weight	3543	3227	3135	2463	1941	1586	1150



Design Criteria - ANSI/TIA-222-H

Wind Speed (No Ice)	111 mph
Wind Speed (Ice)	40 mph
Design Ice Thickness	1.50 in
Risk Category	II
Exposure Category	C
Topographic Factor Procedure	Method 1 (Simplified)
Topographic Category	1
Ground Elevation	1214 ft
Seismic Importance Factor, I _e	1.00
0.2-sec Spectral Response, S _s	0.07 g
1-sec Spectral Response, S ₁	0.046 g
Site Class	D (DEFAULT)
Seismic Design Category	B
Basic Seismic Force-Resisting System	Telecommunication Tower (Truss: Steel)

Base Reactions - Wind/Ice

Total Foundation		Individual Footing	
Shear (kips)	31.35	Shear (kips)	18.95
Axial (kips)	84.18	Compression (kips)	237
Moment (ft-kips)	3365	Uplift (kips)	194

Base Reactions - Seismic


Total Foundation		Individual Footing	
Shear (kips)	0.96	Shear (kips)	1.3
Axial (kips)	40.34	Compression (kips)	22
Moment (ft-kips)	123	Uplift (kips)	0

Material List

Display	Value
A	L 2 X 2 X 1/8

Notes


- 1) All legs are A572 Grade 50.
- 2) All braces are A572 Grade 50.
- 3) All brace bolts are A325-X.
- 4) The tower model is S3R Series SD.
- 5) Transmission lines are to be attached to standard 12 hole waveguide ladders with stackable hangers.
- 6) Azimuths are relative (not based on true north).
- 7) Foundation loads shown are maximums.
- 8) All unequal angles are oriented with the short leg vertical.
- 9) Weights shown are estimates. Final weights may vary.
- 10) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2015 International Building Code.
- 11) Tower Rating: 99.41%
- 12) No grout is required under the base plates.

 Sabre Industries 7101 Southbridge Drive P.O. Box 658 Sioux City, IA 51102-0658 Phone: (712) 258-6690 Fax: (712) 279-0814 <small>Information contained herein is the sole property of Sabre Communications Corporation, constitutes a trade secret as defined by Iowa Code Ch. 550 and shall not be reproduced, copied or used in whole or part for any purpose whatsoever without the prior written consent of Sabre Communications Corporation.</small>	Job:	533238
	Customer:	MURPHY TOWER SERVICE LLC
	Site Name:	Council Bluffs, IA
	Description:	195' S3R
	Date:	10/19/2023	By: TTW

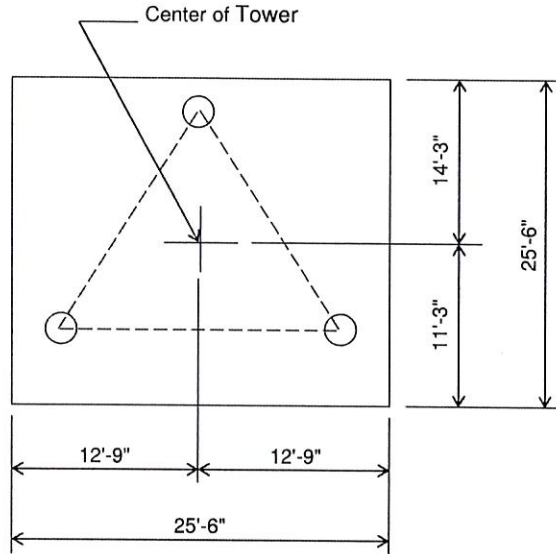
Designed Appurtenance Loading

Elev	Description	Tx-Line
192	Leg Dish Mount	
192	(1) 10' H.P. Dish	(2) E65
170	3ft Sidearm	
170	(1) DS4C08F36U-D	(1) 7/8"
154	Leg Dish Mount	
154	(1) 8' H.P. Dish	(2) E65

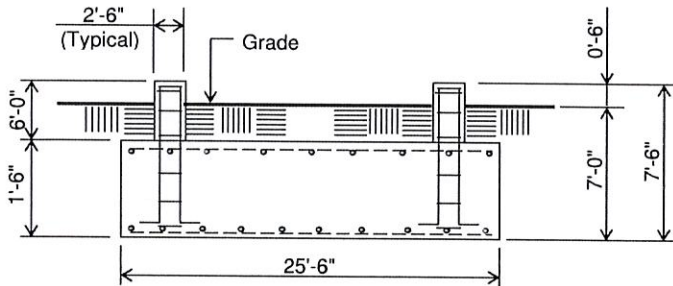
Elev	Description	Tx-Line
140	3ft Sidearm	
140	(1) DS4C08F36U-D	(1) 7/8"
115	(1) 40,000 sq. in. antenna loading (below top)	(6) 1 5/8"
50	Leg Dish Mount	
50	(1) 6' H.P. Dish	(2) E65

 <p>Sabre Industries INNOVATION DELIVERED</p>	<p>Sabre Industries 7101 Southbridge Drive P.O. Box 658 Sioux City, IA 51102-0658 Phone: (712) 258-6690 Fax: (712) 279-0814</p>	Job: 533238
		Customer: MURPHY TOWER SERVICE LLC
<small>Information contained herein is the sole property of Sabre Communications Corporation, constitutes a trade secret as defined by Iowa Code Ch. 550 and shall not be reproduced, copied or used in whole or part for any purpose whatsoever without the prior written consent of Sabre Communications Corporation.</small>		Site Name: Council Bluffs, IA
		Description: 195' S3R
		Date: 10/19/2023 By: TTW

Customer: MURPHY TOWER SERVICE LLC
Site: Council Bluffs, IA
195 ft. Model S3R Series SD Self Supporting Tower



PLAN VIEW



ELEVATION VIEW

(39.4 cu. yds.)
(1 REQD.; NOT TO SCALE)

CAUTION: Center of tower is
not in center of slab.

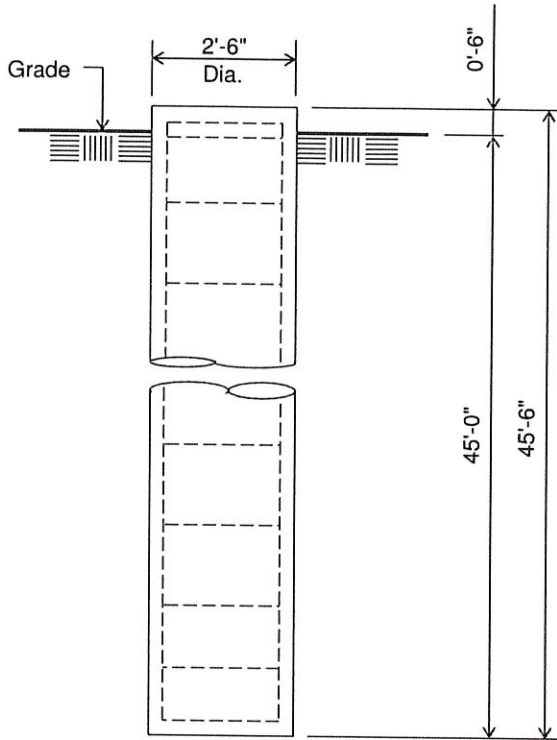
Notes:

- 1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
- 2) Rebar to conform to ASTM specification A615 Grade 60.
- 3) All rebar to have a minimum of 3" concrete cover.
- 4) All exposed concrete corners to be chamfered 3/4".
- 5) The foundation design is based on the geotechnical report by SGS Project No. 2309296, Date: 10/5/2023
- 6) See the geotechnical report for compaction requirements, if specified.
- 7) 5.5' of soil cover is required over the entire area of the foundation slab.
- 8) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.

Rebar Schedule per Mat and per Pier	
Pier	(12) #7 vertical rebar w/ hooks at bottom w/ #4 rebar ties, two (2) within top 5" of pier then 4" C/C
Mat	(48) #5 horizontal rebar evenly spaced each way top and bottom. (192 total)
Anchor Bolts per Leg	
(6) 1" dia. x 51" F1554-105 on a 8" B.C. w/ 7" max. projection above concrete.	

Information contained herein is the sole property of Sabre Industries, constitutes a trade secret as defined by Iowa Code Ch. 550 and shall not be reproduced, copied or used in whole or part for any purpose whatsoever without the prior written consent of Sabre Industries.

Customer: MURPHY TOWER SERVICE LLC
Site: Council Bluffs, IA
195 ft. Model S3R Series SD Self Supporting Tower



ELEVATION VIEW
(8.3 cu. yds.)
(3 REQUIRED; NOT TO SCALE)

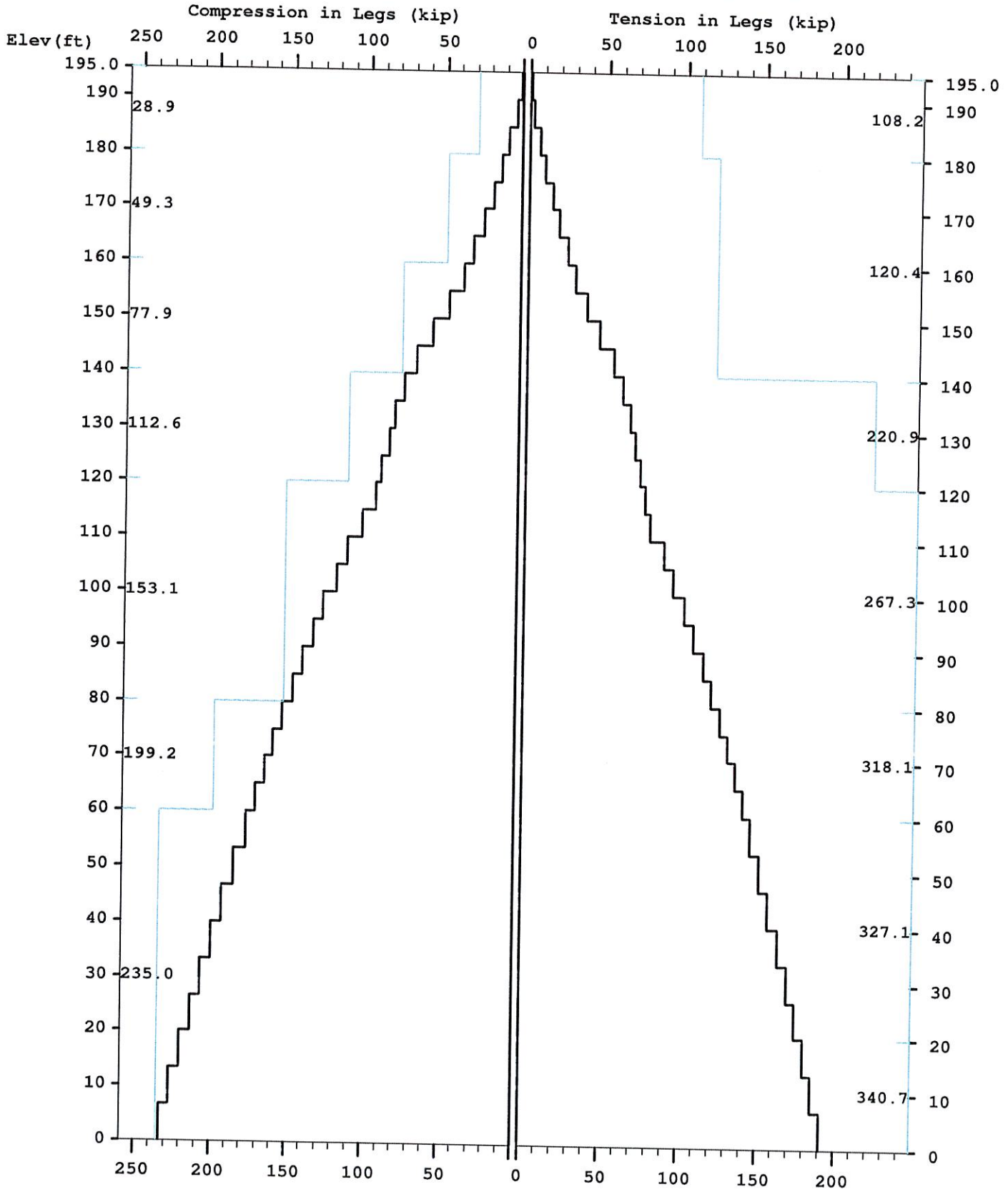
Notes:

- 1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
- 2) Rebar to conform to ASTM specification A615 Grade 60.
- 3) All rebar to have a minimum of 3" concrete cover.
- 4) All exposed concrete corners to be chamfered 3/4".
- 5) The foundation design is based on the geotechnical report by SGS Project No. 2309296, Date: 10/5/2023
- 6) See the geotechnical report for drilled pier installation requirements, if specified.
- 7) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.

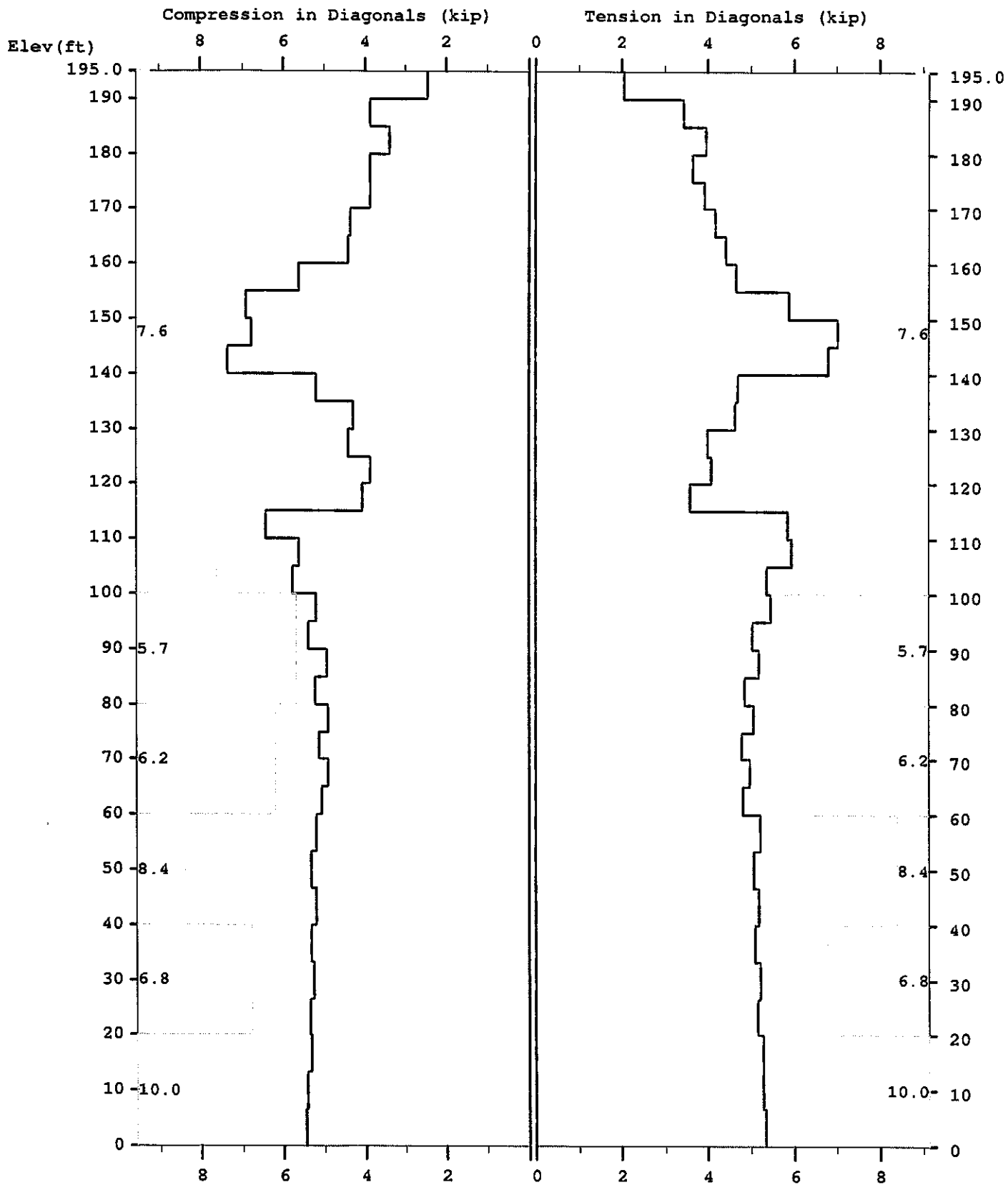
Rebar Schedule per Pier	
Pier	(10) #9 vertical rebar w/ #4 ties, two (2) within top 5" of pier then 12" C/C
Anchor Bolts per Leg	
	(6) 1" dia. x 51" F1554-105 on a 8" B.C. w/ 7" max. projection above concrete.

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Maximum

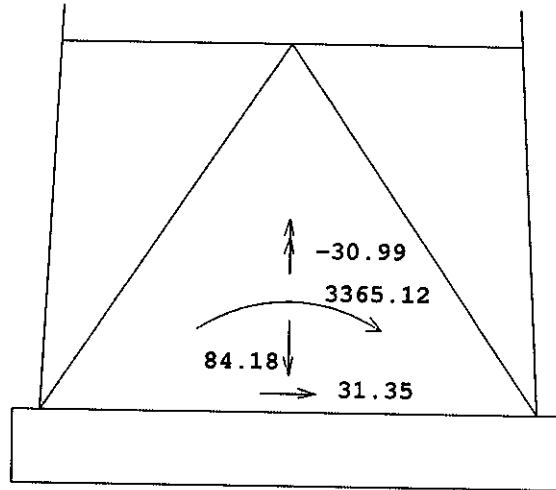


Maximum

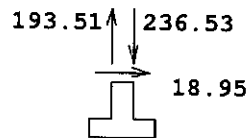
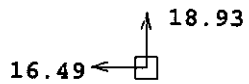


Maximum

TOTAL FOUNDATION LOADS (kip, ft-kip)



INDIVIDUAL FOOTING LOADS (kip)



Sabre Towers and Poles on: 19 oct 2023 at: 14:13:57
 =====

MAST GEOMETRY (ft)
 =====

PANEL TYPE	NO.OF LEGS	ELEV.AT BOTTOM	ELEV.AT TOP	F.W..AT BOTTOM	F.W..AT TOP	TYPICAL PANEL HEIGHT
X	3	190.00	195.00	5.00	5.00	5.00
X	3	180.00	190.00	5.00	5.00	5.00
X	3	175.00	180.00	5.00	5.00	5.00
X	3	160.00	175.00	5.00	5.00	5.00
X	3	155.00	160.00	5.00	5.00	5.00
X	3	140.00	155.00	5.00	5.00	5.00
X	3	135.00	140.00	5.44	5.00	5.00
X	3	120.00	135.00	6.75	5.44	5.00
X	3	100.00	120.00	8.50	6.75	5.00
X	3	80.00	100.00	10.25	8.50	5.00
X	3	60.00	80.00	12.00	10.25	5.00
X	3	40.00	60.00	13.75	12.00	6.67
X	3	20.00	40.00	15.50	13.75	6.67
X	3	0.00	20.00	17.25	15.50	6.67

MEMBER PROPERTIES
 =====

MEMBER TYPE	BOTTOM ELEV ft	TOP ELEV ft	X-SECTN AREA in.sq	RADIUS OF GYRAT in	ELASTIC MODULUS ksi	THERMAL EXPANSN /deg
LE	180.00	195.00	2.405	0.438	29000.	0.0000117
LE	160.00	180.00	3.142	0.438	29000.	0.0000117
LE	140.00	160.00	3.976	0.438	29000.	0.0000117
LE	120.00	140.00	4.909	0.438	29000.	0.0000117
LE	80.00	120.00	5.940	0.438	29000.	0.0000117
LE	60.00	80.00	7.069	0.438	29000.	0.0000117
LE	0.00	60.00	9.621	0.438	29000.	0.0000117
DI	80.00	195.00	0.484	0.626	29000.	0.0000117
DI	60.00	80.00	0.715	0.626	29000.	0.0000117
DI	20.00	60.00	0.902	0.626	29000.	0.0000117
DI	0.00	20.00	1.090	0.626	29000.	0.0000117
HO	190.00	195.00	0.484	0.626	29000.	0.0000117
HO	175.00	180.00	0.484	0.626	29000.	0.0000117
HO	155.00	160.00	0.484	0.626	29000.	0.0000117
HO	135.00	140.00	0.484	0.626	29000.	0.0000117

FACTORED MEMBER RESISTANCES
 =====

BOTTOM ELEV ft	TOP ELEV ft	LEGS		DIAGONALS		HORIZONTALS		INT BRACING	
		COMP kip	TENS kip	COMP kip	TENS kip	COMP kip	TENS kip	COMP kip	TENS kip
190.0	195.0	28.89	108.24	7.62	7.62	7.37	7.37	0.00	0.00
180.0	190.0	28.89	108.24	7.62	7.62	0.00	0.00	0.00	0.00
175.0	180.0	49.29	120.41	7.62	7.62	7.37	7.37	0.00	0.00
160.0	175.0	49.29	120.41	7.62	7.62	0.00	0.00	0.00	0.00
155.0	160.0	77.87	120.41	7.62	7.62	7.37	7.37	0.00	0.00
140.0	155.0	77.87	120.41	7.62	7.62	0.00	0.00	0.00	0.00
135.0	140.0	112.60	220.89	7.62	7.62	7.37	7.37	0.00	0.00
120.0	135.0	112.60	220.89	7.62	7.62	0.00	0.00	0.00	0.00
100.0	120.0	153.15	267.28	7.62	7.62	0.00	0.00	0.00	0.00
80.0	100.0	153.15	267.28	5.68	5.68	0.00	0.00	0.00	0.00
60.0	80.0	199.21	318.09	6.19	6.19	0.00	0.00	0.00	0.00
40.0	60.0	234.96	327.10	8.39	8.39	0.00	0.00	0.00	0.00
20.0	40.0	234.96	327.10	6.77	6.77	0.00	0.00	0.00	0.00
0.0	20.0	234.96	340.73	10.03	10.03	0.00	0.00	0.00	0.00

=====
 * Only 5 condition(s) shown in full

* Some wind loads may have been derived from full-scale wind tunnel testing

=====
 LOADING CONDITION A =====

111 mph wind with no ice. Wind Azimuth: 0° (1.2 D + 1.0 Wo)

MAST LOADING
 =====

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD..AT AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	170.0	0.00	0.0	0.0	0.35	0.24	0.00	0.00
C	140.0	0.00	0.0	0.0	0.34	0.24	0.00	0.00
C	115.0	0.00	0.0	0.0	6.32	7.20	0.00	0.00
D	195.0	0.00	318.0	0.0	0.06	0.06	0.00	-0.01
D	190.0	0.00	318.0	0.0	0.06	0.06	0.00	-0.01
D	190.0	0.00	318.0	0.0	0.07	0.05	0.01	-0.03
D	180.0	0.00	318.0	0.0	0.07	0.05	0.01	-0.03
D	180.0	0.00	318.0	0.0	0.07	0.07	0.01	-0.03
D	160.0	0.00	318.0	0.0	0.07	0.06	0.01	-0.03
D	160.0	0.00	318.0	0.0	0.08	0.08	0.01	-0.03
D	140.0	0.00	318.0	0.0	0.07	0.07	0.02	-0.04
D	140.0	0.00	324.9	0.0	0.08	0.09	0.02	-0.04
D	120.0	0.00	318.9	0.0	0.08	0.09	0.02	-0.04
D	120.0	0.00	326.8	0.0	0.09	0.10	0.02	-0.04
D	115.0	0.00	326.8	0.0	0.09	0.10	0.02	-0.04
D	115.0	0.00	330.9	0.0	0.11	0.11	0.05	-0.07
D	100.0	0.00	328.2	0.0	0.11	0.11	0.04	-0.07
D	100.0	0.00	335.2	0.0	0.11	0.12	0.05	-0.06
D	80.0	0.00	332.1	0.0	0.11	0.12	0.05	-0.07
D	80.0	0.00	338.5	0.0	0.11	0.15	0.06	-0.06
D	60.0	0.00	336.1	0.0	0.11	0.15	0.05	-0.06
D	60.0	0.00	339.8	0.0	0.11	0.18	0.06	-0.06
D	40.0	0.00	340.6	0.0	0.11	0.19	0.07	-0.06
D	40.0	0.00	343.0	0.0	0.11	0.19	0.08	-0.05
D	20.0	0.00	341.7	0.0	0.11	0.19	0.07	-0.05
D	20.0	0.00	344.6	0.0	0.11	0.21	0.09	-0.05
D	0.0	0.00	343.6	0.0	0.11	0.21	0.08	-0.05

ANTENNA LOADING
 =====

.....ANTENNA..... TYPE	ATTACHMENT				.....ANTENNA FORCES.....			
	ELEV ft	AZI	RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip
HP	192.0	68.0	4.4	120.0	1.83	-1.12	0.65	-0.38
HP	154.0	68.0	4.4	120.0	1.12	-0.68	0.54	-0.18
HP	50.0	194.0	8.9	240.0	-0.67	0.08	0.34	0.12

=====
 LOADING CONDITION M =====

111 mph wind with no ice. Wind Azimuth: 0° (0.9 D + 1.0 Wo)

MAST LOADING
 =====

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD..AT AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	170.0	0.00	0.0	0.0	0.35	0.18	0.00	0.00
C	140.0	0.00	0.0	0.0	0.34	0.18	0.00	0.00
C	115.0	0.00	0.0	0.0	6.32	5.40	0.00	0.00
D	195.0	0.00	318.0	0.0	0.06	0.04	0.00	-0.01
D	190.0	0.00	318.0	0.0	0.06	0.04	0.00	-0.01
D	190.0	0.00	318.0	0.0	0.07	0.04	0.01	-0.03
D	180.0	0.00	318.0	0.0	0.07	0.04	0.01	-0.03
D	180.0	0.00	318.0	0.0	0.07	0.05	0.01	-0.03
D	160.0	0.00	318.0	0.0	0.07	0.05	0.01	-0.03

D	160.0	0.00	318.0	0.0	0.08	0.06	0.01	-0.03
D	140.0	0.00	318.0	0.0	0.07	0.06	0.01	-0.04
D	140.0	0.00	324.9	0.0	0.08	0.07	0.02	-0.04
D	120.0	0.00	318.9	0.0	0.08	0.07	0.01	-0.04
D	120.0	0.00	326.8	0.0	0.09	0.08	0.02	-0.04
D	115.0	0.00	326.8	0.0	0.09	0.08	0.02	-0.04
D	115.0	0.00	330.9	0.0	0.11	0.08	0.03	-0.07
D	100.0	0.00	328.2	0.0	0.11	0.09	0.03	-0.07
D	100.0	0.00	335.2	0.0	0.11	0.09	0.04	-0.06
D	80.0	0.00	332.1	0.0	0.11	0.09	0.04	-0.07
D	80.0	0.00	338.5	0.0	0.11	0.11	0.04	-0.06
D	60.0	0.00	336.1	0.0	0.11	0.11	0.04	-0.06
D	60.0	0.00	339.8	0.0	0.11	0.14	0.05	-0.06
D	40.0	0.00	340.6	0.0	0.11	0.14	0.05	-0.06
D	40.0	0.00	343.0	0.0	0.11	0.14	0.06	-0.05
D	20.0	0.00	341.7	0.0	0.11	0.14	0.06	-0.05
D	20.0	0.00	344.6	0.0	0.11	0.15	0.07	-0.05
D	0.0	0.00	343.6	0.0	0.11	0.16	0.06	-0.05

ANTENNA LOADING
=====

..... ANTENNA	ATTACHMENT				..... ANTENNA FORCES			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	192.0	68.0	4.4	120.0	1.83	-1.12	0.49	-0.38
HP	154.0	68.0	4.4	120.0	1.12	-0.68	0.40	-0.18
HP	50.0	194.0	8.9	240.0	-0.67	0.08	0.25	0.12

=====
LOADING CONDITION Y

40 mph wind with 1.5 ice. Wind Azimuth: 0° (1.2 D + 1.0 Di + 1.0 Wi)

MAST LOADING
=====

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD AT AZI	LOAD AZI	..... FORCES .....		..... MOMENTS	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	170.0	0.00	0.0	0.0	0.09	0.51	0.00	0.00
C	140.0	0.00	0.0	0.0	0.09	0.50	0.00	0.00
C	115.0	0.00	0.0	0.0	1.38	17.40	0.00	0.00
D	195.0	0.00	318.0	0.0	0.02	0.20	0.03	0.00
D	190.0	0.00	318.0	0.0	0.02	0.20	0.03	0.00
D	190.0	0.00	318.0	0.0	0.02	0.18	0.07	-0.01
D	180.0	0.00	318.0	0.0	0.02	0.18	0.07	-0.01
D	180.0	0.00	318.0	0.0	0.02	0.23	0.07	-0.01
D	175.0	0.00	318.0	0.0	0.02	0.23	0.07	-0.01
D	175.0	0.00	318.0	0.0	0.02	0.19	0.07	-0.01
D	160.0	0.00	318.0	0.0	0.02	0.20	0.08	-0.01
D	160.0	0.00	318.0	0.0	0.02	0.24	0.08	-0.01
D	155.0	0.00	318.0	0.0	0.02	0.24	0.08	-0.01
D	155.0	0.00	318.0	0.0	0.02	0.21	0.09	-0.01
D	140.0	0.00	318.0	0.0	0.02	0.22	0.10	-0.01
D	140.0	0.00	325.0	0.0	0.02	0.27	0.12	-0.01
D	135.0	0.00	325.0	0.0	0.02	0.27	0.12	-0.01
D	135.0	0.00	323.0	0.0	0.02	0.24	0.11	-0.01
D	120.0	0.00	319.0	0.0	0.02	0.24	0.10	-0.01
D	120.0	0.00	326.8	0.0	0.02	0.26	0.12	-0.01
D	115.0	0.00	326.8	0.0	0.02	0.26	0.12	-0.01
D	115.0	0.00	330.9	0.0	0.02	0.30	0.22	-0.01
D	100.0	0.00	328.2	0.0	0.02	0.30	0.20	-0.01
D	100.0	0.00	335.2	0.0	0.02	0.31	0.25	-0.01
D	80.0	0.00	332.1	0.0	0.02	0.32	0.23	-0.01
D	80.0	0.00	338.5	0.0	0.02	0.35	0.28	-0.01
D	60.0	0.00	336.1	0.0	0.02	0.36	0.26	-0.01
D	60.0	0.00	339.8	0.0	0.02	0.39	0.29	-0.01
D	53.3	0.00	339.8	0.0	0.02	0.39	0.29	-0.01
D	53.3	0.00	340.2	0.0	0.02	0.39	0.31	-0.01
D	46.7	0.00	340.2	0.0	0.02	0.39	0.31	-0.01
D	46.7	0.00	340.6	0.0	0.02	0.40	0.33	-0.01
D	40.0	0.00	340.6	0.0	0.02	0.40	0.33	-0.01
D	40.0	0.00	343.0	0.0	0.02	0.40	0.36	-0.01
D	20.0	0.00	341.7	0.0	0.02	0.41	0.35	-0.01
D	20.0	0.00	344.6	0.0	0.02	0.38	0.14	-0.01

D	13.3	0.00	344.6	0.0	0.02	0.38	0.14	-0.01
D	13.3	0.00	344.1	0.0	0.02	0.40	0.23	-0.01
D	6.7	0.00	344.1	0.0	0.02	0.40	0.23	-0.01
D	6.7	0.00	343.6	0.0	0.02	0.40	0.32	-0.01
D	0.0	0.00	343.6	0.0	0.02	0.40	0.32	-0.01

ANTENNA LOADING
=====

.....ANTENNA.....	ATTACHMENT				.....ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	192.0	68.0	4.4	120.0	0.25	-0.15	3.14	-0.05
HP	154.0	68.0	4.4	120.0	0.16	-0.09	2.29	-0.03
HP	50.0	194.0	8.9	240.0	-0.09	0.01	1.02	0.02

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LOADING CONDITION k =====

Seismic - Azimuth: 0° (1.2 D + 1.0 Ev + 1.0 Eh)

MAST LOADING
=====

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD AT AZI	LOAD AZIFORCES.....	MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	192.0	0.00	0.0	0.0	0.05	0.84	0.00	0.00
C	192.0	0.00	0.0	0.0	0.05	0.90	0.00	0.00
C	192.0	0.00	0.0	0.0	0.00	0.06	0.00	0.00
C	187.5	0.00	0.0	0.0	0.05	0.93	0.00	0.00
C	186.0	0.00	0.0	0.0	0.00	0.07	0.00	0.00
C	175.0	0.00	0.0	0.0	0.00	0.06	0.00	0.00
C	170.0	0.00	0.0	0.0	0.01	0.24	0.00	0.00
C	170.0	0.00	0.0	0.0	0.07	1.40	0.00	0.00
C	165.0	0.00	0.0	0.0	0.00	0.07	0.00	0.00
C	157.0	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	154.0	0.00	0.0	0.0	0.03	0.73	0.00	0.00
C	154.0	0.00	0.0	0.0	0.00	0.06	0.00	0.00
C	154.0	0.00	0.0	0.0	0.04	0.79	0.00	0.00
C	150.0	0.00	0.0	0.0	0.07	1.63	0.00	0.00
C	147.0	0.00	0.0	0.0	0.00	0.11	0.00	0.00
C	140.0	0.00	0.0	0.0	0.01	0.24	0.00	0.00
C	130.0	0.00	0.0	0.0	0.01	0.17	0.00	0.00
C	130.0	0.00	0.0	0.0	0.07	1.93	0.00	0.00
C	117.5	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	115.0	0.00	0.0	0.0	0.23	7.29	0.00	0.00
C	110.0	0.00	0.0	0.0	0.07	2.26	0.00	0.00
C	107.5	0.00	0.0	0.0	0.01	0.24	0.00	0.00
C	90.0	0.00	0.0	0.0	0.01	0.32	0.00	0.00
C	90.0	0.00	0.0	0.0	0.05	2.36	0.00	0.00
C	70.0	0.00	0.0	0.0	0.01	0.32	0.00	0.00
C	70.0	0.00	0.0	0.0	0.05	2.99	0.00	0.00
C	55.0	0.00	0.0	0.0	0.00	0.16	0.00	0.00
C	50.0	0.00	0.0	0.0	0.01	0.52	0.00	0.00
C	50.0	0.00	0.0	0.0	0.00	0.06	0.00	0.00
C	50.0	0.00	0.0	0.0	0.01	0.58	0.00	0.00
C	50.0	0.00	0.0	0.0	0.04	3.81	0.00	0.00
C	45.0	0.00	0.0	0.0	0.00	0.17	0.00	0.00
C	30.0	0.00	0.0	0.0	0.00	0.35	0.00	0.00
C	30.0	0.00	0.0	0.0	0.02	3.92	0.00	0.00
C	10.0	0.00	0.0	0.0	0.00	0.35	0.00	0.00
C	10.0	0.00	0.0	0.0	0.01	4.30	0.00	0.00
D	195.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00
D	0.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00

ANTENNA LOADING
=====

.....ANTENNA.....	ATTACHMENT				.....ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	192.0	68.0	4.4	120.0	0.00	0.00	0.00	0.00
HP	154.0	68.0	4.4	120.0	0.00	0.00	0.00	0.00
HP	50.0	194.0	8.9	240.0	0.00	0.00	0.00	0.00

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LOADING CONDITION n
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Seismic - Azimuth: 0 (0.9 D - 1.0 Ev + 1.0 Eh)

MAST LOADING
=====

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AZI	AT AZIFORCES.....	MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	192.0	0.00	0.0	0.0	0.05	0.61	0.00	0.00
C	192.0	0.00	0.0	0.0	0.05	0.65	0.00	0.00
C	192.0	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	187.5	0.00	0.0	0.0	0.05	0.68	0.00	0.00
C	186.0	0.00	0.0	0.0	0.00	0.05	0.00	0.00
C	175.0	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	170.0	0.00	0.0	0.0	0.01	0.18	0.00	0.00
C	170.0	0.00	0.0	0.0	0.07	1.02	0.00	0.00
C	165.0	0.00	0.0	0.0	0.00	0.05	0.00	0.00
C	157.0	0.00	0.0	0.0	0.00	0.03	0.00	0.00
C	154.0	0.00	0.0	0.0	0.03	0.53	0.00	0.00
C	154.0	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	154.0	0.00	0.0	0.0	0.04	0.58	0.00	0.00
C	150.0	0.00	0.0	0.0	0.07	1.18	0.00	0.00
C	147.0	0.00	0.0	0.0	0.00	0.08	0.00	0.00
C	140.0	0.00	0.0	0.0	0.01	0.18	0.00	0.00
C	130.0	0.00	0.0	0.0	0.01	0.13	0.00	0.00
C	130.0	0.00	0.0	0.0	0.07	1.40	0.00	0.00
C	117.5	0.00	0.0	0.0	0.00	0.03	0.00	0.00
C	115.0	0.00	0.0	0.0	0.23	5.31	0.00	0.00
C	110.0	0.00	0.0	0.0	0.07	1.65	0.00	0.00
C	107.5	0.00	0.0	0.0	0.01	0.18	0.00	0.00
C	90.0	0.00	0.0	0.0	0.01	0.24	0.00	0.00
C	90.0	0.00	0.0	0.0	0.05	1.72	0.00	0.00
C	70.0	0.00	0.0	0.0	0.01	0.24	0.00	0.00
C	70.0	0.00	0.0	0.0	0.05	2.18	0.00	0.00
C	55.0	0.00	0.0	0.0	0.00	0.12	0.00	0.00
C	50.0	0.00	0.0	0.0	0.01	0.38	0.00	0.00
C	50.0	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	50.0	0.00	0.0	0.0	0.01	0.42	0.00	0.00
C	50.0	0.00	0.0	0.0	0.04	2.77	0.00	0.00
C	45.0	0.00	0.0	0.0	0.00	0.13	0.00	0.00
C	30.0	0.00	0.0	0.0	0.00	0.25	0.00	0.00
C	30.0	0.00	0.0	0.0	0.02	2.86	0.00	0.00
C	10.0	0.00	0.0	0.0	0.00	0.25	0.00	0.00
C	10.0	0.00	0.0	0.0	0.01	3.14	0.00	0.00
D	195.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00
D	0.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00

ANTENNA LOADING
=====

..... ANTENNA	ATTACHMENT				..... ANTENNA FORCES			
	TYPE	ELEV ft	AZI	RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip
HP	192.0	68.0	4.4	120.0	0.00	0.00	0.00	0.00
HP	154.0	68.0	4.4	120.0	0.00	0.00	0.00	0.00
HP	50.0	194.0	8.9	240.0	0.00	0.00	0.00	0.00

=====
MAXIMUM ANTENNA AND REFLECTOR ROTATIONS:
=====

ELEV ft	AZI deg	TYPE	..... BEAM DEFLECTIONS (deg)			
			ROLL	YAW	PITCH	TOTAL
192.0	68.0	HP	-1.001 Q	1.408 T	1.062 B	1.714 B
154.0	68.0	HP	-0.879 Q	0.989 T	0.935 B	1.335 B
50.0	194.0	HP	0.202 G	0.076 N	-0.224 C	0.234 C

=====
MAXIMUM TENSION IN MAST MEMBERS (kip)
=====

ELEV ft	LEGS	DIAG	HORIZ	BRACE
195.0	0.85 P	2.05 T	0.03 D	0.00 A
190.0	2.57 Q	3.43 H	0.09 H	0.00 A
185.0	6.63 U	3.96 P	0.06 C	0.00 A
180.0	10.20 U	3.63 P	0.23 I	0.00 A
175.0	14.63 U	3.93 C	0.08 I	0.00 A
170.0	19.37 U	4.17 P	0.02 O	0.00 A
165.0	24.95 U	4.41 C	0.08 I	0.00 A
160.0	30.19 U	4.67 U	0.70 B	0.00 A
155.0	37.49 U	5.88 C	0.13 E	0.00 A
150.0	45.92 U	7.02 C	0.04 c	0.00 A
145.0	54.62 U	6.80 O	0.14 E	0.00 A
140.0	60.94 U	4.70 T	0.47 C	0.00 A
135.0	65.51 U	4.63 C	0.16 I	0.00 A
130.0	68.88 U	3.97 O	0.02 I	0.00 A
125.0	72.77 U	4.08 C	0.05 H	0.00 A
120.0	75.82 U	3.60 T	0.15 I	0.00 A
115.0	79.41 U	5.86 U	0.09 S	0.00 A
110.0	87.96 U	5.95 C	0.17 I	0.00 A
105.0	94.49 U	5.36 P	0.04 G	0.00 A
100.0	101.69 U	5.45 C	0.12 I	0.00 A
95.0	107.61 U	5.02 P	0.02 E	0.00 A
90.0	113.89 U	5.18 G	0.09 I	0.00 A
85.0	119.32 U	4.84 M	0.02 H	0.00 A
80.0	124.94 U	5.06 G	0.06 I	0.00 A
75.0	129.95 U	4.78 S	0.02 H	0.00 A
70.0	135.08 U	4.98 G	0.06 I	0.00 A
65.0	139.78 U	4.80 S	0.02 H	0.00 A
60.0	145.28 U	5.21 G	0.06 E	0.00 A
53.3	151.22 U	5.06 G	0.03 I	0.00 A
46.7	157.12 U	5.17 G	0.05 A	0.00 A
40.0	163.02 U	5.09 G	0.03 I	0.00 A
33.3	168.83 U	5.20 G	0.04 A	0.00 A
26.7	174.40 U	5.15 G	0.03 I	0.00 A
20.0	179.87 U	5.26 G	0.04 A	0.00 A
13.3	185.15 U	5.26 G	0.00 a	0.00 A
6.7	190.78 M	5.33 G	0.03 A	0.00 A
0.0			0.00 A	0.00 A

MAXIMUM COMPRESSION IN MAST MEMBERS (kip)

=====

ELEV ft	LEGS	DIAG	HORIZ	BRACE
195.0	-----	-----	-0.40 b	0.00 A
	-1.26 i	-2.45 C		
190.0	-----	-----	-0.09 O	0.00 A
	-3.70 C	-3.88 P		
185.0	-----	-----	-0.05 T	0.00 A
	-8.82 C	-3.40 H		
180.0	-----	-----	-0.24 P	0.00 A
	-13.41 C	-3.86 C		
175.0	-----	-----	-0.08 O	0.00 A
	-19.08 C	-3.88 O		
170.0	-----	-----	-0.02 I	0.00 A
	-25.09 C	-4.34 C		
165.0	-----	-----	-0.09 O	0.00 A
	-31.92 C	-4.41 C		
160.0	-----	-----	-0.52 N	0.00 A
	-38.21 C	-5.59 C		
155.0	-----	-----	-0.13 O	0.00 A
	-47.38 C	-6.88 C		
150.0	-----	-----	-0.03 E	0.00 A
	-57.78 C	-6.76 O		
145.0	-----	-----	-0.16 O	0.00 A
	-68.24 C	-7.35 C		
140.0	-----	-----	-0.44 E	0.00 A
	-76.08 C	-5.18 C		
135.0	-----	-----	-0.17 O	0.00 A
	-81.80 C	-4.30 O		
130.0	-----	-----	-0.02 O	0.00 A
	-85.87 C	-4.41 C		
125.0	-----	-----	-0.06 O	0.00 A
	-90.69 C	-3.87 C		
120.0	-----	-----	-0.14 O	0.00 A
	-94.44 C	-4.05 C		
115.0	-----	-----	-0.10 A	0.00 A
	-102.99 C	-6.40 C		
110.0	-----	-----	-0.16 O	0.00 A
	-112.53 C	-5.60 P		
105.0	-----	-----	-0.04 M	0.00 A
	-119.70 C	-5.76 C		
100.0	-----	-----	-0.11 O	0.00 A
	-127.78 C	-5.19 P		
95.0	-----	-----	-0.01 X	0.00 A
	-134.40 C	-5.40 G		
90.0	-----	-----	-0.08 O	0.00 A
	-141.51 C	-4.93 S		
85.0	-----	-----	-0.02 O	0.00 A
	-147.64 C	-5.21 G		
80.0	-----	-----	-0.06 O	0.00 A
	-154.11 C	-4.89 G		
75.0	-----	-----	-0.02 O	0.00 A
	-159.92 C	-5.11 G		
70.0	-----	-----	-0.06 O	0.00 A
	-165.93 C	-4.89 G		
65.0	-----	-----	-0.02 O	0.00 A
	-171.45 C	-5.06 G		
60.0	-----	-----	-0.05 O	0.00 A
	-178.01 C	-5.20 G		
53.3	-----	-----	-0.03 O	0.00 A
	-185.37 C	-5.32 G		
46.7	-----	-----	-0.04 O	0.00 A
	-192.87 C	-5.19 G		
40.0	-----	-----	-0.03 O	0.00 A
	-199.85 C	-5.31 G		
33.3	-----	-----	-0.04 O	0.00 A
	-206.98 C	-5.24 G		
26.7	-----	-----	-0.03 O	0.00 A
	-213.68 C	-5.35 G		
20.0	-----	-----	-0.04 O	0.00 A
	-220.50 C	-5.32 G		
13.3	-----	-----	0.00 c	0.00 A
	-227.02 C	-5.40 G		
6.7	-----	-----	-0.03 O	0.00 A
	-233.59 C	-5.44 G		
0.0	-----	-----	0.00 A	0.00 A

FORCE/RESISTANCE RATIO IN LEGS

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MAST ELEV ft	-- LEG COMPRESSION --			---- LEG TENSION ----		
	MAX COMP	COMP RESIST	FORCE/ RESIST RATIO	MAX TENS	TENS RESIST	FORCE/ RESIST RATIO
195.00	1.26	28.89	0.04	0.85	108.24	0.01
190.00	3.70	28.89	0.13	2.57	108.24	0.02
185.00	8.82	28.89	0.31	6.63	108.24	0.06
180.00	13.41	49.29	0.27	10.20	120.41	0.08
175.00	19.08	49.29	0.39	14.63	120.41	0.12
170.00	25.09	49.29	0.51	19.37	120.41	0.16
165.00	31.92	49.29	0.65	24.95	120.41	0.21
160.00	38.21	77.87	0.49	30.19	120.41	0.25
155.00	47.38	77.87	0.61	37.49	120.41	0.31
150.00	57.78	77.87	0.74	45.92	120.41	0.38
145.00	68.24	77.87	0.88	54.62	120.41	0.45
140.00	76.08	112.60	0.68	60.94	220.89	0.28
135.00	81.80	112.60	0.73	65.51	220.89	0.30
130.00	85.87	112.60	0.76	68.88	220.89	0.31
125.00	90.69	112.60	0.81	72.77	220.89	0.33
120.00	94.44	153.15	0.62	75.82	267.28	0.28
115.00	102.99	153.15	0.67	79.41	267.28	0.30
110.00	112.53	153.15	0.73	87.96	267.28	0.33
105.00	119.70	153.15	0.78	94.49	267.28	0.35
100.00	127.78	153.15	0.83	101.69	267.28	0.38
95.00	134.40	153.15	0.88	107.61	267.28	0.40
90.00	141.51	153.15	0.92	113.89	267.28	0.43
85.00	147.64	153.15	0.96	119.32	267.28	0.45
80.00	154.11	199.21	0.77	124.94	318.09	0.39
75.00	159.92	199.21	0.80	129.95	318.09	0.41
70.00	165.93	199.21	0.83	135.08	318.09	0.42
65.00	171.45	199.21	0.86	139.78	318.09	0.44
60.00	178.01	234.96	0.76	145.28	327.10	0.44
53.33	185.37	234.96	0.79	151.22	327.10	0.46
46.67	192.87	234.96	0.82	157.12	327.10	0.48
40.00	199.85	234.96	0.85	163.02	327.10	0.50
33.33	206.98	234.96	0.88	168.83	327.10	0.52
26.67	213.68	234.96	0.91	174.40	327.10	0.53
20.00	220.50	234.96	0.94	179.87	340.73	0.53
13.33	227.02	234.96	0.97	185.15	340.73	0.54
6.67	233.59	234.96	0.99	190.78	340.73	0.56

0.00 -----

FORCE/RESISTANCE RATIO IN DIAGONALS

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MAST ELEV ft	- DIAG COMPRESSION -			--- DIAG TENSION ---		
	MAX COMP	COMP RESIST	FORCE/ RESIST RATIO	MAX TENS	TENS RESIST	FORCE/ RESIST RATIO
195.00						
	2.45	7.62	0.32	2.05	7.62	0.27
190.00	3.88	7.62	0.51	3.43	7.62	0.45
185.00	3.40	7.62	0.45	3.96	7.62	0.52
180.00	3.86	7.62	0.51	3.63	7.62	0.48
175.00	3.88	7.62	0.51	3.93	7.62	0.52
170.00	4.34	7.62	0.57	4.17	7.62	0.55
165.00	4.41	7.62	0.58	4.41	7.62	0.58
160.00	5.59	7.62	0.73	4.67	7.62	0.61
155.00	6.88	7.62	0.90	5.88	7.62	0.77
150.00	6.76	7.62	0.89	7.02	7.62	0.92
145.00	7.35	7.62	0.96	6.80	7.62	0.89
140.00	5.18	7.62	0.68	4.70	7.62	0.62
135.00	4.30	7.62	0.56	4.63	7.62	0.61
130.00	4.41	7.62	0.58	3.97	7.62	0.52
125.00	3.87	7.62	0.51	4.08	7.62	0.54
120.00	4.05	7.62	0.53	3.60	7.62	0.47
115.00	6.40	7.62	0.84	5.86	7.62	0.77
110.00	5.60	7.62	0.74	5.95	7.62	0.78
105.00	5.76	7.62	0.76	5.36	7.62	0.70
100.00	5.19	5.68	0.91	5.45	5.68	0.96
95.00	5.40	5.68	0.95	5.02	5.68	0.88
90.00	4.93	5.68	0.87	5.18	5.68	0.91
85.00	5.21	5.68	0.92	4.84	5.68	0.85
80.00	4.89	6.19	0.79	5.06	6.19	0.82
75.00	5.11	6.19	0.83	4.78	6.19	0.77
70.00	4.89	6.19	0.79	4.98	6.19	0.80
65.00	5.06	6.19	0.82	4.80	6.19	0.78
60.00	5.20	8.39	0.62	5.21	8.39	0.62
53.33	5.32	8.39	0.63	5.06	8.39	0.60
46.67	5.19	8.39	0.62	5.17	8.39	0.62
40.00	5.31	6.77	0.78	5.09	6.77	0.75
33.33	5.24	6.77	0.77	5.20	6.77	0.77
26.67	5.35	6.77	0.79	5.15	6.77	0.76
20.00	5.32	10.03	0.53	5.26	10.03	0.52
13.33	5.40	10.03	0.54	5.26	10.03	0.52
6.67						

0.00 5.44 10.03 0.54 5.33 10.03 0.53

MAXIMUM INDIVIDUAL FOUNDATION LOADS: (kip)

NORTH	LOAD		COMPONENTS		TOTAL SHEAR
	EAST		DOWN	UPLIFT	
18.93 G	-16.49 C		236.53 C	-193.51 M	18.95 G

MAXIMUM TOTAL LOADS ON FOUNDATION : (kip & kip-ft)

NORTH	HORIZONTAL		DOWN	OVERTURNING		TORSION
	EAST	TOTAL @ 2.8		NORTH	EAST	
31.3 G	-26.8 P	31.3 G	84.2 d	3199.4 G	-3032.5 D	3365.1 C
						TOTAL @ 241.0 B

Latticed Tower Analysis (Unguyed)
Processed under license at:

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Sabre Towers and Poles

on: 19 oct 2023 at: 14:14:15

***** Service Load Condition *****

* Only 1 condition(s) shown in full
* Some wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A

60 mph wind with no ice. Wind Azimuth: 0° (1.0 D + 1.0 Wo)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY. LOAD. AT		LOAD AZI	FORCES		MOMENTS	
		RADIUS ft	AZI		HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	170.0	0.00	0.0	0.0				
C	140.0	0.00	0.0	0.0	0.10	0.20	0.00	0.00
C	115.0	0.00	0.0	0.0	0.10	0.20	0.00	0.00
D	195.0	0.00	318.0	0.0	1.85	6.00	0.00	0.00
D	180.0	0.00	318.0	0.0	0.02	0.05	0.00	0.00
D	180.0	0.00	318.0	0.0	0.02	0.05	0.01	0.00
D	160.0	0.00	318.0	0.0	0.02	0.06	0.01	-0.01
D	160.0	0.00	318.0	0.0	0.02	0.06	0.01	-0.01
D	140.0	0.00	318.0	0.0	0.02	0.05	0.01	-0.01
D	140.0	0.00	318.0	0.0	0.02	0.07	0.01	-0.01
D	120.0	0.00	324.9	0.0	0.02	0.06	0.01	-0.01
D	120.0	0.00	318.9	0.0	0.02	0.08	0.02	-0.01
D	115.0	0.00	326.8	0.0	0.02	0.07	0.01	-0.01
D	115.0	0.00	326.8	0.0	0.03	0.09	0.02	-0.01
D	100.0	0.00	330.9	0.0	0.03	0.09	0.02	-0.01
D	100.0	0.00	328.2	0.0	0.03	0.09	0.04	-0.02
D	80.0	0.00	335.2	0.0	0.03	0.10	0.03	-0.02
D	80.0	0.00	332.1	0.0	0.03	0.10	0.04	-0.02
D	60.0	0.00	338.5	0.0	0.03	0.10	0.04	-0.02
D	60.0	0.00	336.1	0.0	0.03	0.12	0.05	-0.02
D	60.0	0.00	339.8	0.0	0.03	0.13	0.05	-0.02
					0.03	0.15	0.05	-0.02

D	40.0	0.00	340.6	0.0	0.03	0.16	0.06	-0.02
D	40.0	0.00	343.0	0.0	0.03	0.16	0.07	-0.01
D	20.0	0.00	341.7	0.0	0.03	0.16	0.06	-0.02
D	20.0	0.00	344.6	0.0	0.03	0.17	0.07	-0.01
D	0.0	0.00	343.6	0.0	0.03	0.18	0.07	-0.01

ANTENNA LOADING
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..... ANTENNA ANTENNA FORCES				
TYPE	ELEV ft	AZI	ATTACHMENT RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip
HP	192.0	68.0	4.4	120.0	0.54	-0.33	0.54	-0.11
HP	154.0	68.0	4.4	120.0	0.33	-0.20	0.45	-0.05
HP	50.0	194.0	8.9	240.0	-0.19	0.02	0.28	0.04

MAXIMUM MAST DISPLACEMENTS:
=====

ELEV ft	-----DEFLECTIONS (ft)-----			--TILTS (DEG)--		TWIST DEG
	NORTH	EAST	DOWN	NORTH	EAST	
195.0	0.519 G	-0.553 D	0.005 C	0.281 G	-0.318 D	0.414 H
190.0	0.494 G	-0.525 D	0.005 C	0.281 G	-0.318 D	0.408 H
185.0	0.469 G	-0.497 D	0.005 C	0.280 G	-0.317 D	0.393 H
180.0	0.445 G	-0.469 D	0.005 C	0.278 G	-0.314 D	0.377 H
175.0	0.420 G	-0.442 D	0.005 C	0.275 G	-0.310 D	0.361 H
170.0	0.396 G	-0.415 D	0.004 C	0.272 G	-0.305 D	0.344 H
165.0	0.372 G	-0.388 D	0.004 C	0.266 G	-0.297 D	0.328 H
160.0	0.349 G	-0.362 D	0.004 C	0.260 G	-0.288 D	0.311 H
155.0	0.326 G	-0.336 D	0.004 C	0.253 G	-0.280 D	0.293 H
150.0	0.304 G	-0.312 D	0.004 C	0.244 G	-0.269 D	0.269 H
145.0	0.282 G	-0.288 D	0.004 C	0.234 G	-0.256 D	0.242 H
140.0	0.261 G	-0.266 D	0.004 C	0.222 G	-0.241 D	0.214 H
135.0	0.242 G	-0.245 D	0.004 C	0.211 G	-0.227 D	0.189 H
130.0	0.224 G	-0.225 D	0.003 C	0.201 G	-0.215 D	0.168 H
125.0	0.207 G	-0.207 D	0.003 C	0.190 G	-0.202 D	0.150 H
120.0	0.190 G	-0.189 D	0.003 C	0.180 G	-0.190 D	0.135 H
115.0	0.175 G	-0.173 D	0.003 C	0.172 G	-0.180 D	0.121 H
110.0	0.159 G	-0.157 D	0.003 C	0.164 G	-0.171 D	0.108 H
105.0	0.144 G	-0.142 D	0.003 C	0.155 G	-0.161 D	0.096 H
100.0	0.130 G	-0.127 D	0.003 C	0.146 G	-0.151 D	0.086 H
95.0	0.117 G	-0.114 D	0.003 C	0.137 G	-0.141 D	0.076 H
90.0	0.104 G	-0.101 D	0.002 C	0.128 G	-0.130 D	0.066 H
85.0	0.093 G	-0.089 D	0.002 C	0.118 G	-0.120 D	0.057 H
80.0	0.082 G	-0.078 D	0.002 C	0.108 G	-0.109 D	0.049 H
75.0	0.072 G	-0.069 D	0.002 C	0.100 G	-0.101 D	0.043 H
70.0	0.063 G	-0.060 D	0.002 C	0.092 G	-0.092 D	-0.038 B
65.0	0.055 G	-0.052 D	0.002 C	0.083 G	-0.083 D	-0.033 B
60.0	0.047 G	-0.044 D	0.002 C	0.075 G	-0.074 D	-0.028 B
53.3	0.038 G	-0.035 D	0.001 C	0.067 G	-0.066 D	-0.024 B
46.7	0.030 G	-0.028 D	0.001 C	0.058 G	-0.057 D	-0.020 B
40.0	0.023 G	-0.021 D	0.001 H	0.050 G	-0.049 D	-0.017 B
33.3	0.017 G	-0.015 D	0.001 H	0.042 G	-0.041 D	-0.014 B
26.7	0.011 G	-0.010 D	0.001 C	0.033 G	-0.033 D	-0.010 B
20.0	0.007 G	-0.006 D	0.001 C	0.025 G	-0.024 D	-0.007 B
13.3	0.004 G	-0.003 D	0.000 C	0.017 G	-0.016 D	-0.005 B
6.7	0.001 G	-0.001 D	0.000 H	0.008 G	-0.008 D	-0.002 B
0.0	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS:
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ELEV ft	AZI deg	TYPE * BEAM DEFLECTIONS (deg)			
			ROLL	YAW	PITCH	TOTAL
192.0	68.0	HP	0.294 K	0.411 H	0.312 B	0.503 B
154.0	68.0	HP	0.258 K	0.289 H	0.275 B	0.392 B
50.0	194.0	HP	0.059 G	0.022 B	-0.066 C	0.069 C

MAXIMUM TENSION IN MAST MEMBERS (kip)
=====

ELEV ft	LEGS	DIAG	HORIZ	BRACE
195.0	-----	-----	0.01 D	0.00 A

190.0	0.10 D	0.57 H		
185.0	0.58 I	1.02 H	0.03 H	0.00 A
180.0	1.76 I	1.14 D	0.02 C	0.00 A
175.0	2.74 I	1.06 D	0.09 J	0.00 A
170.0	3.96 I	1.15 C	0.03 I	0.00 A
165.0	5.25 I	1.22 D	0.01 C	0.00 A
160.0	6.82 I	1.29 C	0.03 I	0.00 A
155.0	8.33 I	1.32 I	0.24 B	0.00 A
150.0	10.31 I	1.76 C	0.04 E	0.00 A
145.0	12.67 I	2.08 C	0.02 E	0.00 A
140.0	15.18 I	1.96 C	0.05 E	0.00 A
135.0	16.90 I	1.34 H	0.14 C	0.00 A
130.0	18.10 I	1.37 C	0.05 I	0.00 A
125.0	19.01 I	1.16 C	0.01 I	0.00 A
120.0	20.03 I	1.20 C	0.02 H	0.00 A
115.0	20.84 I	1.03 H	0.05 I	0.00 A
110.0	20.33 I	1.68 D	0.03 G	0.00 A
105.0	22.65 I	1.77 C	0.06 I	0.00 A
100.0	24.50 I	1.55 D	0.01 G	0.00 A
95.0	26.45 I	1.61 C	0.04 I	0.00 A
90.0	28.11 I	1.46 D	0.01 E	0.00 A
85.0	29.80 I	1.53 G	0.03 I	0.00 A
80.0	31.30 I	1.40 A	0.01 H	0.00 A
75.0	32.79 I	1.49 G	0.02 I	0.00 A
70.0	34.13 I	1.39 G	0.01 H	0.00 A
65.0	35.47 I	1.46 G	0.02 I	0.00 A
60.0	36.71 I	1.40 G	0.01 H	0.00 A
53.3	38.12 I	1.53 G	0.02 E	0.00 A
46.7	39.54 I	1.48 G	0.01 I	0.00 A
40.0	40.90 I	1.52 G	0.02 A	0.00 A
33.3	42.43 I	1.49 G	0.01 I	0.00 A
26.7	43.84 I	1.53 G	0.02 A	0.00 A
20.0	45.25 I	1.51 G	0.01 I	0.00 A
13.3	46.57 I	1.54 G	0.01 A	0.00 A
6.7	47.92 A	1.54 G	0.00 H	0.00 A
0.0	49.37 A	1.56 G	0.01 A	0.00 A
			0.00 A	0.00 A

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MAXIMUM COMPRESSION IN MAST MEMBERS (kip)

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ELEV Ft	LEGS	DIAG	HORIZ	BRACE
195.0	-----			
190.0	-0.47 K	-0.74 C	-0.08 D	0.00 A
185.0	-1.32 K	-1.12 D	-0.02 C	0.00 A
180.0	-2.76 C	-1.01 H	-0.01 H	0.00 A
175.0	-4.17 C	-1.14 C	-0.05 D	0.00 A
170.0	-5.91 C	-1.13 C	-0.02 C	0.00 A
165.0	-7.77 C	-1.27 C	-0.01 I	0.00 A
160.0	-9.84 C	-1.29 C	-0.02 C	0.00 A
155.0	-11.71 C	-1.68 C	-0.12 B	0.00 A
150.0	-14.54 C	-2.04 C	-0.04 C	0.00 A
145.0	-17.69 C	-1.95 C	-0.01 E	0.00 A
140.0	-20.79 C	-2.18 C	-0.05 C	0.00 A
135.0	-23.21 C	-1.54 C	-0.14 E	0.00 A
130.0	-25.01 C	-1.25 C	-0.04 C	0.00 A
125.0	-26.27 C	-1.31 C	0.00 C	0.00 A
120.0	-27.79 C	-1.13 C	-0.02 C	0.00 A
115.0	-28.96 C	-1.20 C	-0.04 C	0.00 A
110.0	-32.84 C	-1.92 C	-0.03 A	0.00 A
105.0	-35.81 C	-1.62 D	-0.04 C	0.00 A
100.0	-37.97 C	-1.72 C	-0.01 A	0.00 A
95.0	-40.49 C	-1.51 D	-0.03 C	0.00 A
90.0	-42.51 C	-1.60 G	0.00 L	0.00 A
85.0	-44.73 C	-1.44 G	-0.02 C	0.00 A
80.0	-46.62 C	-1.54 G	0.00 C	0.00 A
75.0	-48.66 C	-1.43 G	-0.01 C	0.00 A
70.0	-50.49 C	-1.51 G	0.00 C	0.00 A
65.0	-52.39 C	-1.43 G	-0.01 C	0.00 A
60.0	-54.14 C	-1.49 G	0.00 C	0.00 A
53.3	-56.25 C	-1.53 G	-0.01 C	0.00 A
46.7	-58.70 C	-1.57 G	-0.01 G	0.00 A
40.0	-61.24 C	-1.53 G	-0.01 C	0.00 A
33.3	-63.48 C	-1.57 G	-0.01 G	0.00 A
26.7	-65.84 C	-1.54 G	-0.01 C	0.00 A
20.0	-68.00 C	-1.58 G	-0.01 G	0.00 A
13.3	-70.27 C	-1.57 G	-0.01 C	0.00 A
6.7	-72.42 C	-1.59 G	0.00 L	0.00 A
0.0	-74.61 C	-1.60 G	-0.01 C	0.00 A
	-----		0.00 A	0.00 A

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MAXIMUM INDIVIDUAL FOUNDATION LOADS: (kip)

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LOAD		COMPONENTS		TOTAL
NORTH	EAST	DOWN	UPLIFT	SHEAR
5.85 G	-5.08 C	75.59 C	-50.04 A	5.85 G

MAXIMUM TOTAL LOADS ON FOUNDATION : (kip & kip-ft)

HORIZONTAL			DOWN	OVERTURNING			TORSION
NORTH	EAST	TOTAL		NORTH	EAST	TOTAL	
	@	2.8				@ 240.9	
9.1 G	-7.8 D	9.2 G	28.3 C	938.6 G	-891.2 D	988.7 C	-9.1 B

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Risk Category	Parameters	Description	h _L (ft.)	w _L (kips)	W ₂ (kips)	Vertical Distribution of Seismic Forces			0.9 D - 1.0 E _v (kips)	
						w/h ^{1.5}	F _x or E _h (kips)	E _v (kips)		
II	R	Antenna Load	192.00	0.6900	0.6900	432.4074	0.0489	0.0103	0.8383	
	S _s	Mount Load	192.00	0.0500	0.0500	31.3339	0.0035	0.0008	0.6107	
	S ₁	Mount/Antenna Load	192.00	0.7400	0.7400	463.7412	0.0525	0.0111	0.0442	
	D (default)		Structure - Section 1	187.50	0.7660	0.4979	466.2892	0.0528	0.0115	0.6549
		T _L (sec)	Ladder/Line	186.00	0.0600	0.0600	36.1663	0.0041	0.0009	0.6779
	F _a	Ladder/Line	175.00	0.0500	0.0000	27.9699	0.0032	0.0008	0.0531	
	F _v	Mount/Antenna Load	170.00	0.2000	0.0000	107.9767	0.0122	0.0030	0.0442	
	S _{MS}	Structure - Section 2	170.00	1.1500	0.0000	620.8658	0.0702	0.0172	0.1770	
	S _{M1}	Ladder/Line	165.00	0.0554	0.0000	28.8355	0.0033	0.0008	1.0178	
	S _S	Ladder/Line	157.00	0.0332	0.0000	16.2598	0.0018	0.0005	0.0491	
S _{D1}	Antenna Load	154.00	0.6000	0.0000	286.9883	0.0325	0.0090	0.0294		
T _s	Mount Load	154.00	0.0500	0.0000	23.9157	0.0027	0.0008	0.5310		
I _e	Mount/Antenna Load	154.00	0.6500	0.0000	310.9039	0.0352	0.0098	0.0442		
Ω	Structure - Section 3	150.00	1.3390	0.0000	620.1437	0.0702	0.0201	0.5752		
C _s	Ladder/Line	147.00	0.0916	0.0000	41.3865	0.0047	0.0014	1.1850		
h (ft)	Mount/Antenna Load	140.00	0.2000	0.0000	85.1210	0.0096	0.0030	0.0810		
K _r	Ladder/Line	130.00	0.1416	0.0000	55.0356	0.0062	0.0021	0.1770		
W _a (ft)	Structure - Section 4	130.00	1.5860	0.0000	616.4300	0.0697	0.0238	0.1253		
W _o (ft)	Ladder/Line	117.50	0.0354	0.0000	12.1563	0.0014	0.0005	1.4036		
W (kips)	Antenna Load	115.00	6.0000	0.0000	2,006.8093	0.2270	0.0900	0.0314		
W ₁ (kips)	Structure - Section 5	110.00	1.8640	0.0000	590.4076	0.0668	0.0280	5.3100		
W ₂ (kips)	Ladder/Line	107.50	0.1998	0.0000	61.5277	0.0070	0.0030	1.6496		
f ₁ (Hertz)	Ladder/Line	90.00	0.2664	0.0000	65.9905	0.0075	0.0040	0.1768		
T (sec)	Structure - Section 6	90.00	1.9410	0.0000	480.8090	0.0544	0.0291	0.2958		
k _e	Ladder/Line	70.00	0.2664	0.0000	48.5042	0.0055	0.0040	1.7178		
V _s (kips)	Structure - Section 7	70.00	2.4630	0.0000	448.4453	0.0507	0.0369	0.2358		
B	Seismic Design Category	Ladder/Line	55.00	0.1332	0.0000	18.0488	0.0020	0.0020	2.1798	
		Antenna Load	50.00	0.4300	0.0000	51.8450	0.0059	0.0064	0.1179	
		Mount Load	50.00	0.0500	0.0000	6.0285	0.0007	0.0008	0.3806	
		Mount/Antenna Load	50.00	0.4800	0.0000	57.8735	0.0065	0.0072	0.3060	
		Structure - Section 8	50.00	3.1350	0.0000	377.9861	0.0428	0.0470	0.4442	
		Ladder/Line	45.00	0.1432	0.0000	15.1750	0.0017	0.0021	0.4248	
		Ladder/Line	30.00	0.2864	0.0000	18.4691	0.0021	0.0043	2.7745	
		Structure - Section 9	30.00	3.2270	0.0000	208.1002	0.0235	0.0484	0.1268	
		Ladder/Line	10.00	0.2864	0.0000	4.8081	0.0005	0.0043	0.2535	
									0.2535	

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Description	h _i (ft.)	w _i (kips)	W ₂ (kips)	Vertical Distribution of Seismic Forces			
				$\frac{w_i h_i^2}{\sum w_i h_i^2}$	F_{sx} or E_{sx} (kips)	E_{sx} (kips)	$1.2 D + 1.0 E_v$ or $0.9 D + 1.0 E_v$ (kips)
Structure - Section 10	10.00	3.5430	0.0000	59.4800	0.0067	0.0531	4.3047
Σ		33.20	2.0379	8,804.23	1.00	0.50	40.34
							29.38

Leg Connection Details

Bottom Elevation (ft)	Top Elevation (ft)	Solid Dimensions	Top Splice				Bottom Splice/Base							
			Bolt Qty.	Bolt Dia. (in)	Bolt Circle (in)	Plate Thickness (in)	Plate Dia. (in)	Bolt Qty.	Bolt Dia. (in)	Bolt Circle (in)	Plate Thickness (in)	Plate Dia. (in)		
180	195	1.75 S.R.								4	0.75	5.50	0.75	7.50
160	180	2.0 S.R.	4	0.75	5.50	0.75	7.50			4	0.75	5.50	0.75	7.50
140	160	2.25 S.R.	4	0.75	5.50	1.00	7.50			4	0.75	5.50	1.00	7.50
120	140	2.5 S.R.	4	0.75	5.50	1.00	7.50			6	1.00	7.25	1.00	9.75
100	120	2.75 S.R.	6	1.00	7.25	1.25	9.75			6	1.00	7.25	1.00	9.75
80	100	2.75 S.R.	6	1.00	7.25	1.25	9.75			6	1.00	7.25	1.25	9.75
60	80	3.0 S.R.	6	1.00	7.25	1.25	9.75			6	1.00	7.25	1.25	9.75
40	60	3.5 S.R.	6	1.00	7.25	1.50	9.75			6	1.00	7.25	1.25	9.75
20	40	3.5 S.R.	6	1.00	7.25	1.50	9.75			6	1.00	7.25	1.50	9.75
0	20	3.5 S.R.	6	1.00	7.25	1.50	9.75			6	1.00	7.25	1.50	9.75
										6	1.00	8.00	1.50	10.50

Diagonal Bracing Connection Details

Bottom Elevation (ft)	Top Elevation (ft)	Angle Shape	Bolt Qty.	Bolt Dia. (in)	Bolt End Distance (in)	Bolt Spacing (in)	Gage Distance From Heel (in)	Gusset Plate Thickness (in)
180	195	L 2 X 2 X 1/8	1	0.625	1.625		1.125	0.375
160	180	L 2 X 2 X 1/8	1	0.625	1.625		1.125	0.375
140	160	L 2 X 2 X 1/8	1	0.625	1.625		1.125	0.375
120	140	L 2 X 2 X 1/8	1	0.625	1.625		1.125	0.375
100	120	L 2 X 2 X 1/8	1	0.625	1.625		1.125	0.375
80	100	L 2 X 2 X 1/8	1	0.625	1.625		1.125	0.375
60	80	L 2 X 2 X 3/16	1	0.625	1.625		1.125	0.375
40	60	L 2 1/2 X 2 1/2 X 3/16	1	0.750	1.625		1.375	0.500
20	40	L 2 1/2 X 2 1/2 X 3/16	1	0.750	1.625		1.375	0.500
0	20	L 3 X 3 X 3/16	1	0.750	1.625		1.750	0.500

MAT FOUNDATION DESIGN BY SABRE INDUSTRIES

195' S3R Series SD MURPHY TOWER SERVICE LLC Council Bluffs, IA (533238) 2023-10-19 DO

Overall Loads:			
Factored Moment (ft-kips)	3365.12		
Factored Axial (kips)	84.18		
Factored Shear (kips)	31.35		
Individual Leg Loads:			Tower eccentric from mat (ft)= 1.5
Factored Uplift (kips)	194.00		
Factored Download (kips)	237.00		
Factored Shear (kips)	19.00		
Width of Tower (ft)	17.25	Allowable Bearing Pressure (ksf)	1.30
Ultimate Bearing Pressure	2.60	Safety Factor	2.00
Bearing Φ_s	0.75		
Bearing Design Strength (ksf)	1.95	Max. Factored Net Bearing Pressure (ksf)	1.61
Water Table Below Grade (ft)	999		
Width of Mat (ft)	25.5	Minimum Mat Width (ft)	22.08
Thickness of Mat (ft)	1.5		
Depth to Bottom of Slab (ft)	7		
Bolt Circle Diameter (in)	8		
Effective Anchor Bolt Embedment	41.625	Minimum Pier Diameter (ft)	2.00
Diameter of Pier (ft)	2.5	Equivalent Square b (ft)	2.22
Ht. of Pier Above Ground (ft)	0.5		
Ht. of Pier Below Ground (ft)	5.5		
Quantity of Bars in Mat	48		
Bar Diameter in Mat (in)	0.625		
Area of Bars in Mat (in ²)	14.73		
Spacing of Bars in Mat (in)	6.37	Recommended Spacing (in)	6 to 12
Quantity of Bars Pier	12		
Bar Diameter in Pier (in)	0.875		
Tie Bar Diameter in Pier (in)	0.5		
Spacing of Ties (in)	4		
Area of Bars in Pier (in ²)	7.22	Minimum Pier A_s (in ²)	3.53
Spacing of Bars in Pier (in)	5.73	Recommended Spacing (in)	5 to 12
f'_c (ksi)	4.5		
f_y (ksi)	60		
Unit Wt. of Soil (kcf)	0.11		
Unit Wt. of Concrete (kcf)	0.15		
Volume of Concrete (yd ³)	39.40		

MAT FOUNDATION DESIGN BY SABRE INDUSTRIES (CONTINUED)

Two-Way Shear:

Average d (in)	14.375		
ϕv_c (ksi)	0.201	v_u (ksi)	0.107
$\phi v_c = \phi(2 + 4/\beta_c)f'_c{}^{1/2}$	0.302		
$\phi v_c = \phi(\alpha_s d/b_o + 2)f'_c{}^{1/2}$	0.277		
$\phi v_c = \phi 4f'_c{}^{1/2}$	0.201		
Shear perimeter, b_o (in)	163.85		
β_c	1		

Stability:

Overturning Design Strength (ft-k)	6479.1	Factored Overturning Moment (ft-k)	3600.2
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One-Way Shear:

ϕV_c (kips)	442.6	V_u (kips)	162.9
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Pier Design:

Design Tensile Strength (kips)	389.7	T_u (kips)	194.0
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Shear:

ϕ	0.75		
V_c (kips)	43.6		
V_s (kips)	141.4	$V_{s,max}$ (kips)	386.4
ϕV_n (kips)	138.7	V_u (kips)	19.0
Maximum Spacing (in)	12.00	(Only if Shear Ties are Required)	
Actual Hook Development (in)	13.75	Req'd Hook Development l_{dh} (in) - Tension	10.96
		Req'd Hook Development l_{dc} (in) - Compression	11.81

Anchor Bolt Pull-Out:

$N_{ua} / \phi N_n$	0.61	$V_{ua} / \phi V_n$	0.13
Pier Rebar Development Length (in)	33.68	Required Length of Development (in)	23.48

Flexure in Slab:

ϕM_n (ft-kips)	927.6	M_u (ft-kips)	853.7
a (in)	0.75		
Steel Ratio	0.00335		
β_1	0.825		
Maximum Steel Ratio (ρ_t)	0.0197		
Minimum Steel Ratio	0.0018		

Condition	1 is OK, 0 Fails
Minimum Mat Width	1
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Two-Way Shear	1
Overturning	1
Anchor Bolt Pull-Out	1
Flexure	1
Steel Ratio	1
Interaction Diagram	1
One-Way Shear	1
Hook Development	1
Minimum Mat Depth	1
Anchor Bolt Punching Shear	1

DRILLED STRAIGHT PIER DESIGN BY SABRE INDUSTRIES

195' S3R Series SD MURPHY TOWER SERVICE LLC Council Bluffs, IA (533238) 2023-10-19 DO

Factored Uplift (kips)	194		
Factored Download (kips)	237		
Factored Shear (kips)	19		
Ultimate Bearing Pressure	4.6		
Bearing ϕ_s	0.75		
Bearing Design Strength (ksf)	3.45		
Water Table Below Grade (ft)	999		
Bolt Circle Diameter (in)	8		
Effective Anchor Bolt Embedment	41.625		
Pier Diameter (ft)	2.5	Minimum Pier Diameter (ft)	2.00
Ht. Above Ground (ft)	0.5		
Pier Length Below Ground (ft)	45		
Quantity of Bars	10		
Bar Diameter (in)	1.128		
Area of Bars (in ²)	9.99	Minimum Area of Steel (in ²)	3.53
Spacing of Bars (in)	6.76		
Tie Bar Diameter (in)	0.5		
Spacing of Ties (in)	12		
f'_c (ksi)	4.5		
f_y (ksi)	60		
Unit Wt. of Concrete (kcf)	0.15		
Volume of Concrete (yd ³)	8.27		

Ignore bottom length in download? Length to ignore download (ft) 0

Depth at Bottom of Layer (ft)	Ult. Skin Friction (ksf)	(Ult. Skin Friction)*(Uplift Factor)	γ (kcf)
3.5	0.00	0.00	0.11
7	0.50	0.50	0.11
10	0.80	0.80	0.11
15	0.80	0.80	0.11
20	1.00	1.00	0.11
25	1.00	1.00	0.11
30	1.10	1.10	0.11
38	1.10	1.10	0.11
48	1.10	1.10	0.11
50	1.20	1.20	0.11

DRILLED STRAIGHT PIER DESIGN BY SABRE INDUSTRIES (CONTINUED)

Download:

Φ_s , Download Friction	0.75		
Q_f , Skin Friction (kips)	315.3	W_s (kips)	24.3
Q_b , End Bearing Strength (kips)	22.6	W_c (kips)	33.5
Download Design Strength (kips)	253.4	Factored Net Download (kips)	248.0

Uplift (skin friction):

Φ_s , Uplift (friction)	0.75		
Q_f , Skin Friction (kips)	315.3		
W_c (kips)	33.5		
W_w (kips)	0.0		
Uplift Design Strength (kips)	266.7	Factored Uplift (kips)	194.0

Uplift (cone):

Φ_s , Uplift (cone)	0.75		
$W_{s,cone}$ (kips)	4004.0		
$W_{w,cone}$ (kips)	0.0		
W_c (kips)	33.5		
$W_{w,cyl}$ (kips)	0.0		
Uplift Design Strength (kips)	3033.1	Factored Uplift (kips)	194.0

Tension:

Design Tensile Strength (kips)	539.6	T_u (kips)	194.0
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Shear:

ϕ	0.75		
V_c (kips)	43.6		
V_s (kips)	47.1	$V_{s,max}$ (kips)	386.4
ϕV_n (kips)	68.0	V_u (kips)	19.0

Anchor Bolt Pull-Out:

$N_{ua} / \phi N_n$	0.61	$V_{ua} / \phi V_n$	0.13
Rebar Development Length (in)	33.77	Required Length of Development (in)	30.27

Condition	1 is OK, 0 Fails
Download	1
Uplift	1
Area of Steel	1
Shear	1
Anchor Bolt Pull-Out	1
Interaction Diagram	1



**UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
ANTENNA STRUCTURE REGISTRATION**



OWNER: MIDAMERICAN ENERGY CO

FCC Registration Number (FRN):

ATTN: TELECOMS DEPT MIDAMERICAN ENERGY CO PO BOX 657 666 GRAND AVE DES MOINES, IA 50309	Antenna Structure Registration Number <p align="center">1020795</p>						
	Issue Date <p align="center">06/04/1997</p>						
Location of Antenna Structure 2 MI NW OF HWY 6 & I-80 COUNCIL BLUFFS, IA 51503 County: POTTAWATTAMIE	Ground Elevation (AMSL) <p align="right">375.2 meters</p>						
	Overall Height Above Ground (AGL) <p align="right">60.9 meters</p>						
<table border="0"> <tr> <td align="center">Latitude</td> <td align="center">Longitude</td> <td align="center">NAD83</td> </tr> <tr> <td align="center">41- 17- 47.0 N</td> <td align="center">095- 48- 07.0 W</td> <td></td> </tr> </table>	Latitude	Longitude	NAD83	41- 17- 47.0 N	095- 48- 07.0 W		Overall Height Above Mean Sea Level (AMSL) <p align="right">436.1 meters</p>
Latitude	Longitude	NAD83					
41- 17- 47.0 N	095- 48- 07.0 W						
Center of Array Coordinates <p align="center">N/A</p>	Type of Structure <p align="center">TOWER</p> <p align="center">Free standing or Guyed Structure used for Communications Purposes</p>						
Painting and Lighting Requirements: FCC Paragraphs None							
Conditions:							

This registration is effective upon completion of the described antenna structure and notification to the Commission. **YOU MUST NOTIFY THE COMMISSION WITHIN 24 HOURS OF COMPLETION OF CONSTRUCTION OR CANCELLATION OF YOUR PROJECT, please file FCC Form 854.** To file electronically, connect to the antenna structure registration system by pointing your web browser to <http://wireless.fcc.gov/antenna>. Electronic filing is recommended. You may also file manually by submitting a paper copy of FCC Form 854. Use purpose code "NT" for notification of completion of construction; use purpose code "CA" to cancel your registration.

The Antenna Structure Registration is not an authorization to construct radio facilities or transmit radio signals. It is necessary that all radio equipment on this structure be covered by a valid FCC license or construction permit.

You must immediately provide a copy of this Registration to all tenant licensees and permittees sited on the structure described on this Registration (although not required, you may want to use Certified Mail to obtain proof of receipt), and display your Registration Number at the site. See reverse for important information about the Commission's Antenna Structure Registration rules.

You must comply with all applicable FCC obstruction marking and lighting requirements, as set forth in Part 17 of the Commission's Rules (47 C.F.R. Part 17). These rules include, but are not limited to:

Posting the Registration Number: The Antenna Structure Registration Number must be displayed in a conspicuous place so that it is readily visible near the base of the antenna structure. Materials used to display the Registration Number must be weather-resistant and of sufficient size to be easily seen at the base of the antenna structure. Exceptions exist for certain historic structures. See 47 C.F.R. 17.4(g)-(h).

Inspecting lights and equipment: The obstruction lighting must be observed at least every 24 hours in order to detect any outages or malfunctions. Lighting equipment, indicators, and associated devices must be inspected at least once every three months.

Reporting outages and malfunctions: When any top steady-burning light or a flashing light (in any position) burns out or malfunctions, the outage must be reported to the nearest FAA Flight Service Station, unless corrected within 30 minutes. The FAA must also be notified when the light is restored. The owner must also maintain a log of these outages and malfunctions.

Maintaining assigned painting: The antenna structure must be repainted as often as necessary to maintain good visibility.

Complying with environmental rules: If you certified that grant of this registration would not have a significant environmental impact, you must nevertheless maintain all pertinent records and be ready to provide documentation supporting this certification and compliance with the rules, in the event that such information is requested by the Commission pursuant to 47 C.F.R. 1.1307(d).

Updating information: The owner must notify the FCC of proposed modifications to this structure; of any change in ownership; or, within 30 days of dismantlement of the structure.

You can find additional information at [\[insert link\]](#) or by calling (877) 480-3201 (TTY 717-338-2824).

Registration Number: 1020795
Issue Date: 06/04/1997

OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES

It is to be expressly understood that the issuance of the below specifications is in no way to be considered as precluding additional or modified markings or lighting as may hereafter be required under the provisions of Section 303(q) of the Communications Act of 1934, as amended.

None NO PAINT LIGHT REQUIRED

1020795

Registration 1020795[Map Registration](#)

Registration Detail

Reg Number	1020795	Status	Constructed
File Number	A0024816	Constructed	01/01/1968
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	41-17-47.0 N 095-48-07.0 W	Address	2 MI NW OF HWY 6 & I-80
City, State	COUNCIL BLUFFS , IA		
Zip	51503	County	POTTAWATTAMIE
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	375.2	Overall Height Above Ground (AGL)	60.9
Overall Height Above Mean Sea Level	436.1	Overall Height Above Ground w/o Appurtenances	60.9

Painting and Lighting Specifications

None

FAA Notification

FAA Study	FAA Issue Date
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Owner & Contact Information

FRN	Owner Entity Type
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Owner

MIDAMERICAN ENERGY CO
 Attention To: TELECOMS DEPT
 666 GRAND AVE
 P.O. Box 657
 DES MOINES , IA 50309

P: (515)242-4366
 F:
 E:

Contact

P:
 F:
 E:

Last Action Status

Status	Constructed	Received	05/12/1997
Purpose	New	Entered	05/13/1997
Mode	Mail In (Manual)		

Related Applications

05/12/1997	A0024816 - New (NE)
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Comments

Comments

None

History

Date

Event

None

Pleadings

Pleading Type

Filer Name

Description

Date Entered

None

Automated Letters

None

CLOSE WINDOW



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

Aeronautical Study No.
 2023-ACE-5974-OE

Issued Date: 08/29/2023

Telecom Department
 MidAmerican Energy
 4124 NW Urbandale Dr
 Urbandale, IA 50322

**** 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 COUNCIL BLUFFS TOWER NEW
 Location: Council Bluffs, IA
 Latitude: 41-17-48.25N NAD 83
 Longitude: 95-48-06.29W
 Heights: 1216 feet site elevation (SE)
 210 feet above ground level (AGL)
 1426 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:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, a med-dual system-Chapters 4,8(M-Dual),&15.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Air Missions (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

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)

This determination expires on 03/01/2025 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 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, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, 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 includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

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 (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2023-ACE-5974-OE.

Signature Control No: 596951045-597908986
Andrew Hollie
Specialist

(DNE)

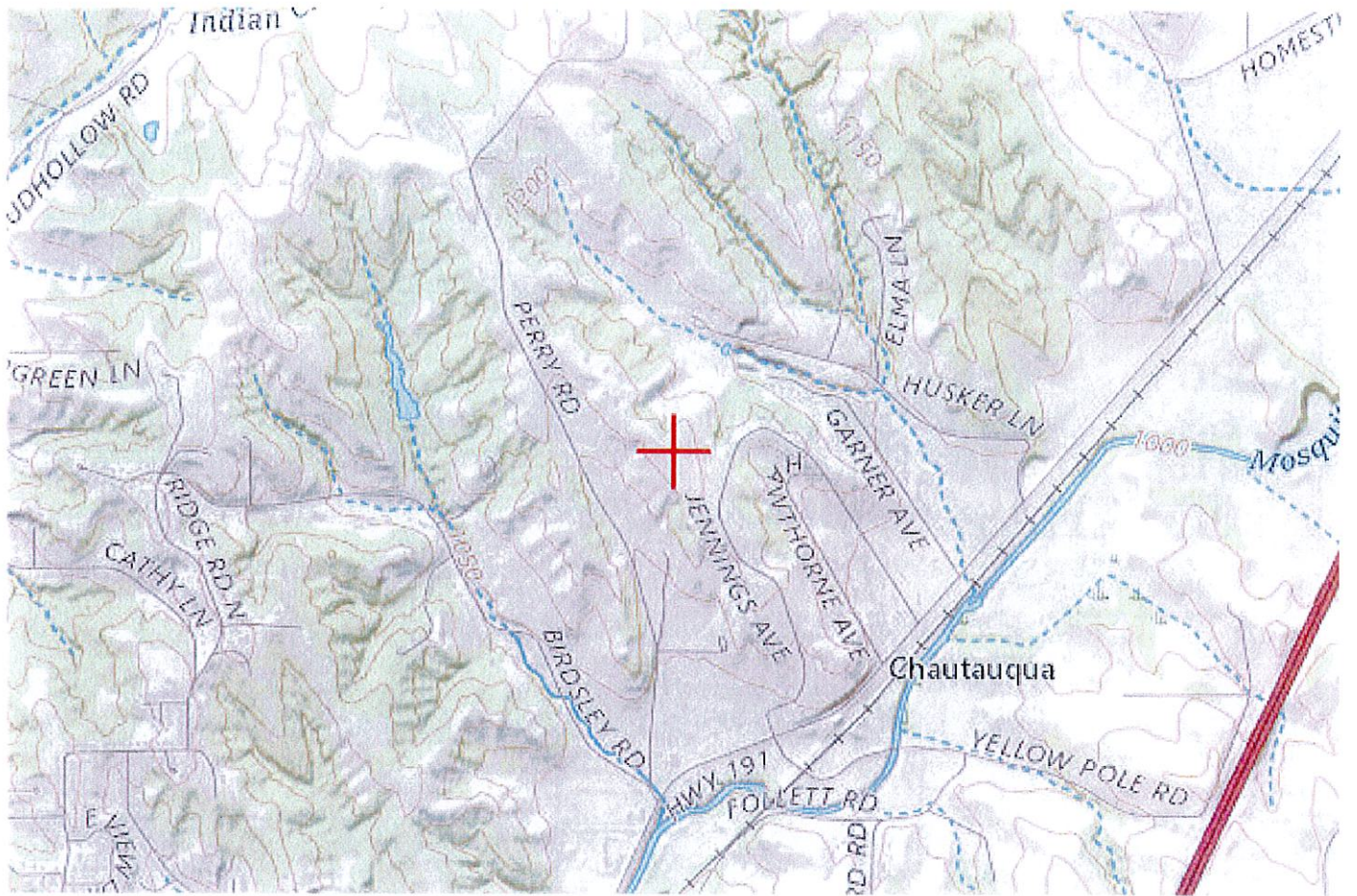
Attachment(s)
Case Description
Frequency Data
Map(s)

cc: FCC

COUNCIL BLUFFS TOWER NEW

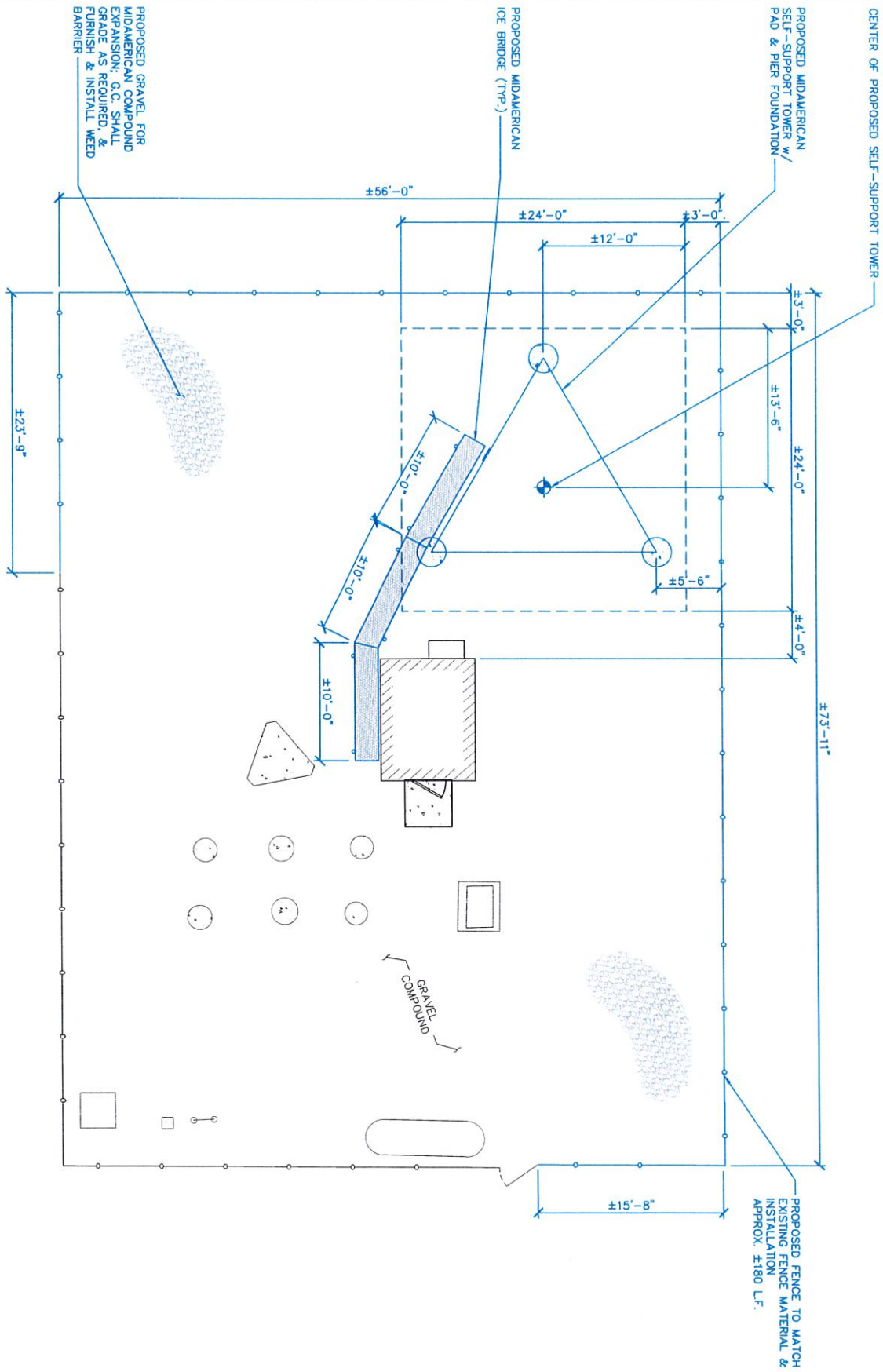
Frequency Data for ASN 2023-ACE-5974-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
6	7	GHz	55	dBW
10	11.7	GHz	55	dBW





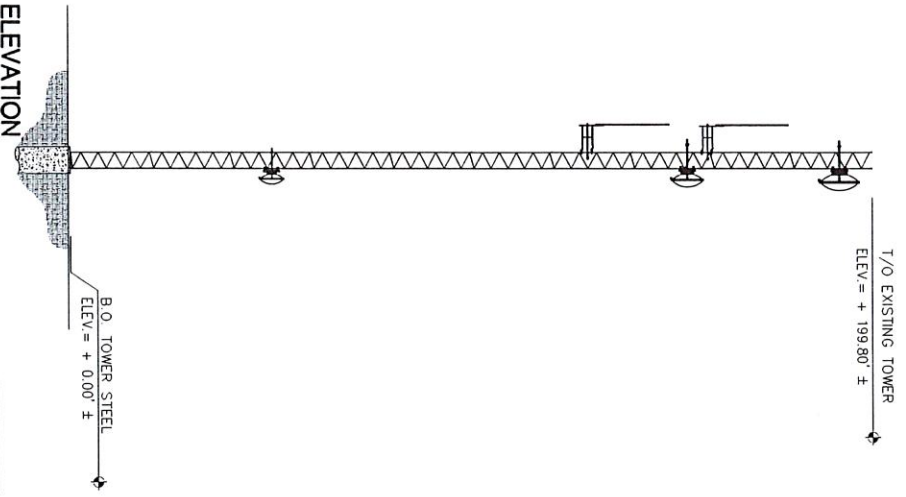
1 COMPOUND PLAN - PROPOSED
SCALE: 1/8" = 1'-0"



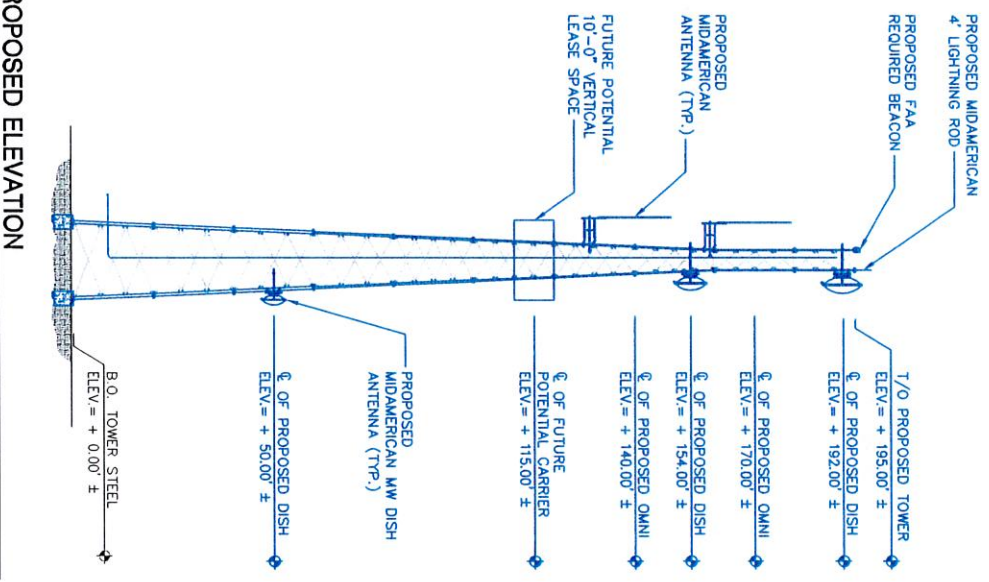
1 SHEET NUMBER C-12	SHEET TITLE COMPOUND PLAN - PROPOSED	MIDAMERICAN - COUNCIL BLUFFS 1474 JENNINGS AVE. COUNCIL BLUFFS, IA 51503 POTTAWATTAMIE COUNTY DROP & SWAP - EXISTING GUYED TOWER		A 08/04/23 INTERNAL REVIEW BMW B 08/11/23 2D 50% CLIENT REVIEW BCG															
		PROJ # 22-00-04-10	DWG BY: BMW	CHKD BY: JMD				<table border="1"> <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> </table>											

EXISTING TOWER NOTE
 EXISTING GUY TOWER, GUY WIRES, FOUNDATION, AND APPURTENANCES TO REMAIN UNTIL NEW SELF-SUPPORT TOWER IS ERRECTED & OPERATIONAL, PROTECT DURING CONSTRUCTION




1 EXISTING ELEVATION
 SCALE: 1"=30'



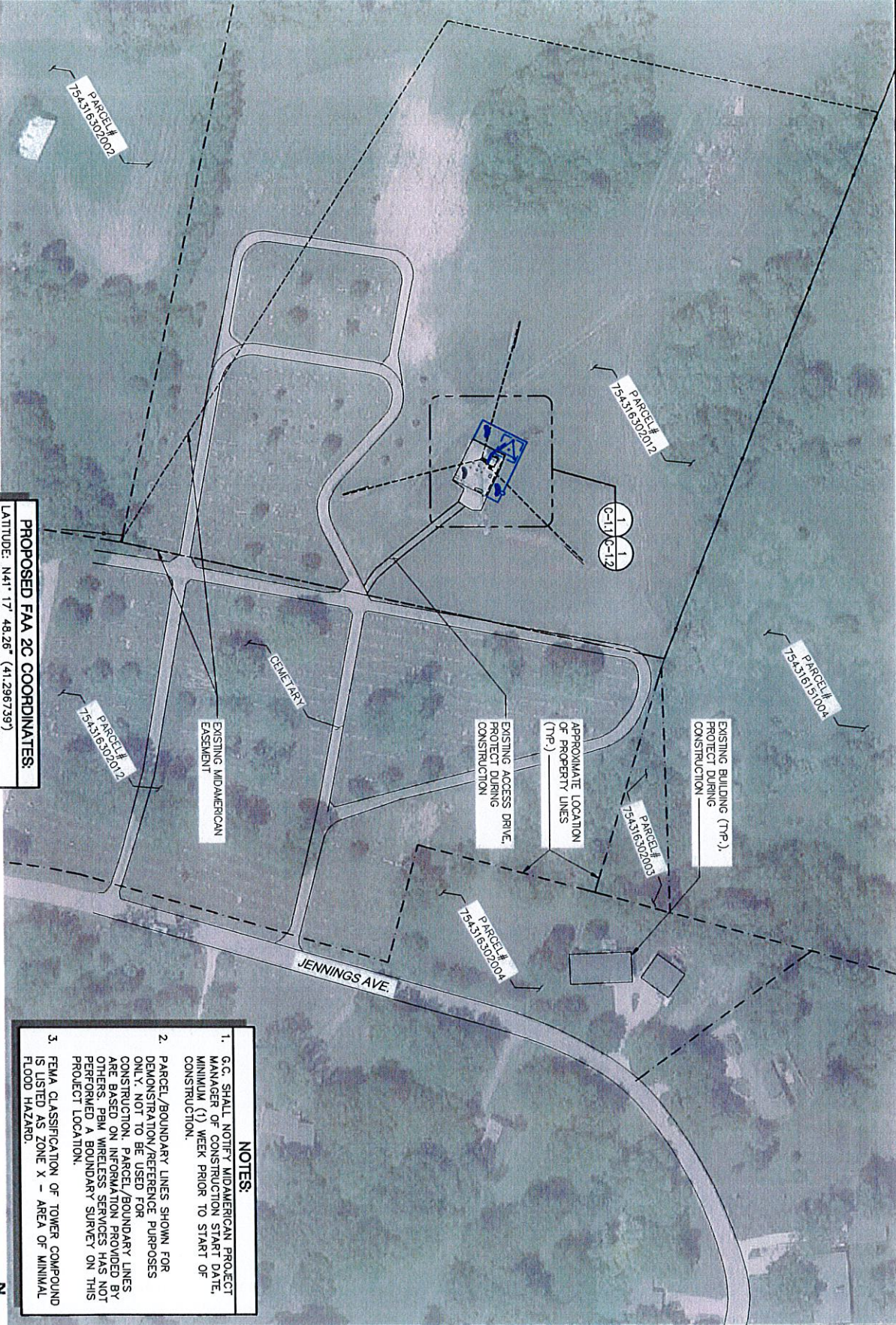
2 PROPOSED ELEVATION
 SCALE: 1"=30'



- NOTES:**
- ELEVATION IS FOR REFERENCE PURPOSE ONLY.
 - CONTRACTOR SHALL PERFORM WORK DONE TO OR ON STRUCTURE IN ACCORDANCE WITH PROVIDED STRUCTURAL ANALYSIS SEPARATE FROM PBM WIRELESS DRAWINGS.
 - FINAL CONFIGURATION SHALL BE COMPLETED w/ MIDAMERICAN PRIOR TO START OF CONSTRUCTION.
 - GROUND LEVEL EQUIPMENT NOT SHOWN FOR CLARITY.

SHEET NUMBER C-30	SHEET TITLE TOWER ELEVATION	MIDAMERICAN - COUNCIL BLUFFS 1474 JENNINGS AVE. COUNCIL BLUFFS, IA 51503 POTTAWATTAMIE COUNTY DROP & SWAP - EXISTING GUYED TOWER		A 08/04/23 INTERNAL REVIEW BMW			
		PROJ # 22-00-04-10	DWG BY: BMW	CHKD BY: JMD				B 08/11/23 2D 50% CLIENT REVIEW BCG

PROPOSED FAA 2C COORDINATES:
 LATITUDE: N41° 17' 48.26" (-41.296739)
 LONGITUDE: W95° 48' 6.33" (-95.801758)



- NOTES:**
1. G.C. SHALL NOTIFY MIDAMERICAN PROJECT MANAGER OF CONSTRUCTION START DATE, MINIMUM (1) WEEK PRIOR TO START OF CONSTRUCTION.
 2. PARCEL/BOUNDARY LINES SHOWN FOR DEMONSTRATION/REFERENCE PURPOSES ONLY. NOT TO BE USED FOR CONSTRUCTION. PARCEL/BOUNDARY LINES ARE BASED ON INFORMATION PROVIDED BY OTHERS. PBM WIRELESS SERVICES HAS NOT PERFORMED A BOUNDARY SURVEY ON THIS PROJECT LOCATION.
 3. FEMA CLASSIFICATION OF TOWER COMPOUND IS LISTED AS ZONE X - AREA OF MINIMAL FLOOD HAZARD.

SHEET NUMBER
C-10

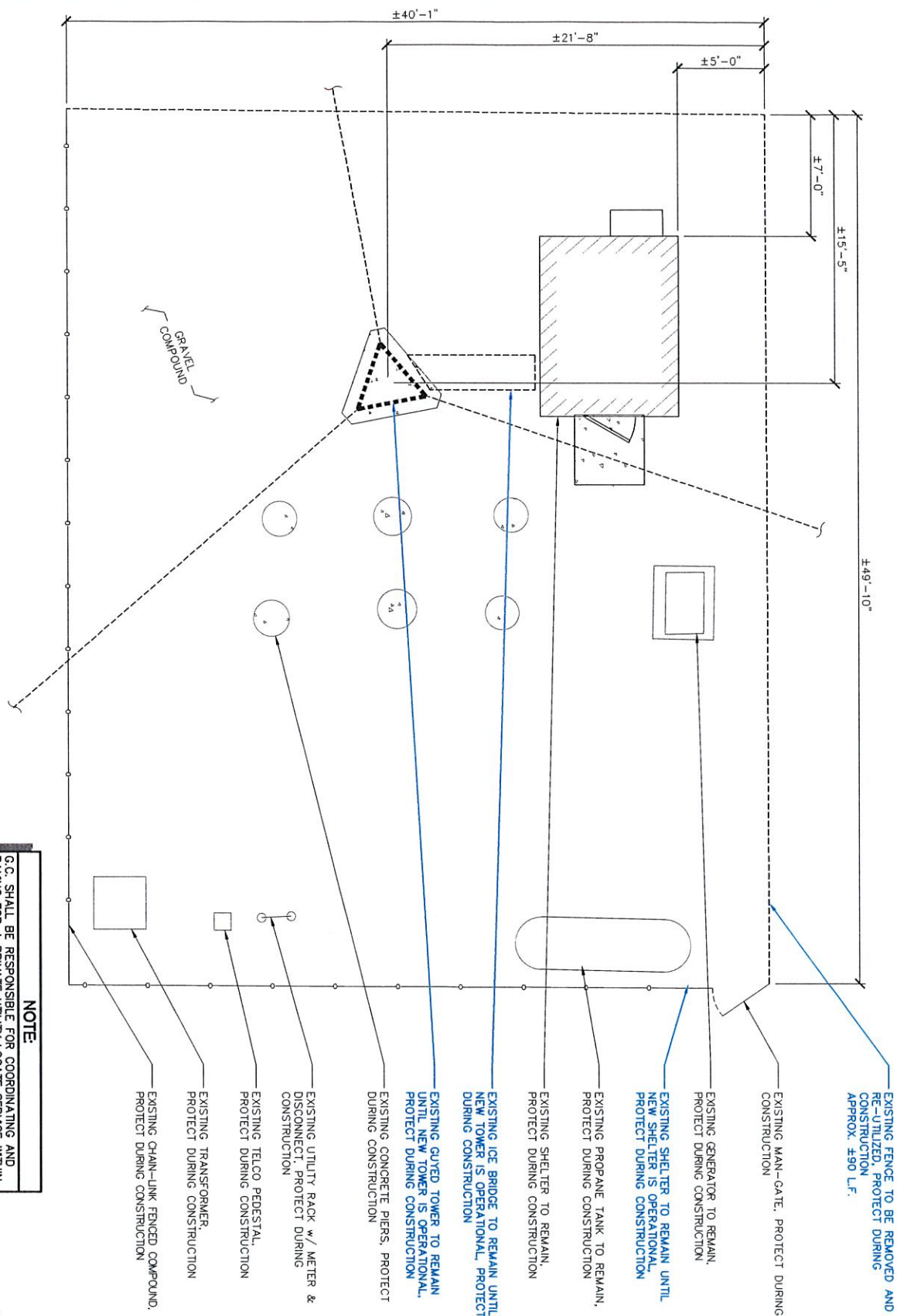
MIDAMERICAN - COUNCIL BLUFFS
 1474 JENNINGS AVE. COUNCIL BLUFFS, IA 51503
 POTTAWATTAMIE COUNTY
 DROP & SWAP - EXISTING GUYED TOWER

PROJ # 22-00-04-10 | DWG BY:BMW | CHKD BY:JMD

A	08/04/23	INTERNAL REVIEW	BMW
B	08/11/23	2D 50% CLIENT REVIEW	BCG



1 COMPOUND PLAN - DEMO
SCALE: 3/8" = 1'-0"



NOTE:
G.C. SHALL BE RESPONSIBLE FOR COORDINATING AND PAYING FOR A PRIVATE UTILITY LOCATE SERVICE WITHIN COMPOUND PRIOR TO START OF CONSTRUCTION.



SHEET TITLE
COMPOUND PLAN - DEMO
SHEET NUMBER
C-11

MIDAMERICAN - COUNCIL BLUFFS
1474 JENNINGS AVE. COUNCIL BLUFFS, IA 51503
POTTAWATTAMIE COUNTY
DROP & SWAP - EXISTING GUYED TOWER
PROJ # 22-00-04-10 DWG BY:BMW CHKD BY:JMD

A	08/04/23	INTERNAL REVIEW	BMW
B	08/11/23	50% CLIENT REVIEW	BCG



Pam Kalstrup

From: Sam Arkfeld
Sent: Thursday, October 26, 2023 1:28 PM
To: Rolynn Ramirez; Pam Kalstrup
Subject: Re: Mid American Tower Drop and Swap @ 1474 Jennings Avenue, Council Bluffs IA - Zoning and Building Permit Inquiry

Thank you for including me in the discussion. I have talked with my technician and he agrees that this should not create any interference.

Thanks

Sam Arkfeld 78-43

Captain –Communications Center

From: Rolynn Ramirez <rramirez@pbmws.com>
Sent: Thursday, October 26, 2023 12:54 PM
To: Pam Kalstrup <pam.kalstrup@pottcounty-ia.gov>
Cc: Sam Arkfeld <SArkfeld@sheriff.pottcounty-ia.gov>
Subject: RE: Mid American Tower Drop and Swap @ 1474 Jennings Avenue, Council Bluffs IA - Zoning and Building Permit Inquiry

You don't often get email from rramirez@pbmws.com. [Learn why this is important](#)

WARNING External Message: Verify actual sender address. Hover over links to check before clicking. Take extra caution with attachments.

Thank you, Pam.

Sam, MidAmerican is only replacing the tower, they are not replacing any of their equipment so if the existing equipment is not interfering with you now, when it put on the new tower, it shouldn't cause anything new to arise.

But please let me know if you need anything else from me.

Thank you,

Rolynn Ramirez
PBM Wireless Services
317-945-3788
rramirez@pbmws.com