PLANNING AND ZONING COMMISSION
TENTATIVE AGENDA

Wednesday, April 3, 2017

4:00 PM

Public Meeting Room - Story County Administration (900 6th Street) – Nevada, Iowa*

THIS MEETING IS OPEN TO THE PUBLIC PURSUANT TO CHAPTER 21 IOWA CODE.

1. CALL TO ORDER
2. ROLL CALL/QUORUM DETERMINED
3. APPROVAL OF AGENDA
4. APPROVAL OF MINUTES

   Documents:

   MARCH 2017 MINUTES.PDF

5. PUBLIC COMMENT

   This is the time for members of the public to offer comments concerning matters not scheduled to be heard before the Planning and Zoning Commission.

6. PUBLIC HEARINGS

   6.I. Discussion And Consideration Of REZ04-17 Thomason Rezoning Request; Jerry Moore

   Documents:

   REZ03-17 THOMASONREZONING STAFF REPORT PANDZ.PDF
   APPLICATION.PDF
   REVISED SITE PLAN.PDF
   BUSINESS DESCRIPTION FOR ZONING.PDF
   JENNIFERS RESPONSE TO COUNTY STAFF REVIEW COMMENTS.PDF
   JENNIFERS RESPONSE TO COUNTY STAFF REVIEW COMMENTS P2.PDF
   SUPPORT FROM ZEARING MAYOR AND CITY COUNCIL.PDF

   6.II. Discussion And Consideration Of CUP04-17 Alliant Energy Tower; Amelia Schoeneman

   Documents:

   STAFF REPORT.PDF
   SITE PLAN.PDF
   TOWER COMPOUND LAYOUT.PDF
   TOWER DESIGN SPECIFICATIONS.PDF
   FENCING STANDARD.PDF
   ANTI CLIMBING DOOR MODEL.PDF
   PLAT OF SURVEY TO BE REVISED.PDF
   SITE CONTEXT MAP 2017 03 21.PDF
   FAA DETERMINATION AND LIGHTING.PDF
   CITY OF AMES NO CONFLICT LETTER.PDF
   COVERAGE MAP.PDF
   LOCATIONS OF OTHER TOWERS.PDF

   6.III. Discussion And Consideration Of CUP03-17 And VAR02-17; Iowa Statewide Interoperable Communications System (ISICS) Tower - Emily Zandt

   Documents:

   ISICS STAFF REPORT.PDF
   IOWA INTEROPERABILITY INFRASTRUCTURE OVERVIEW.PDF

ISICS_STORY_COVERAGE MAP AND SEARCH RING.PDF
ISICS_STORY_MOTOROLA ENGINEER LETTER.PDF
ISICS STORY SURVEY CONSTRUCTION DRAWINGS.PDF
ISICS P25 VALMONT ZERO FALL ZONE LETTER.PDF
ISICS_STORY_FAA_DETERMINATION OF NO HAZARD_10.24.16.PDF
ISICS_STORY_CITY OF AMES AIRPORT APPROVAL.PDF
ISICS_STORY_FAA RE TOWER LIGHTING.PDF

7. Discussion Of 2017 Work Program Items

7.I. Review Of Fernald Survey Results And Possible Course Of Action; Amelia Schoeneman And Emily Zandt

7.II. Construction/Demolition Landfill Siting Evaluation Update; Amelia Schoeneman

8. COMMENTS
   Staff
   Commission

9. ADJOURNMENT

*Story County strives to ensure that its programs and activities do not discriminate on the basis of race, color, national origin, sex, age or disability. Persons requiring assistance, auxiliary aids or services, or accommodation because of a disability may contact the county's ADA coordinator at (515)382-7204.

**For further information on these cases, contact the Story County Planning and Development Department at PZWeb@storycounty.com or by phone at (515) 382-7245. Case Files, including exact property locations, may be inspected in the Story County Planning and Development Department located in the Story County Administration Building, 900 6th Street, Nevada, Iowa.

Staff Report

Planning and Zoning Commission

Date of Meeting:
April 5, 2017

Case Number - REZ04-17

Rezoning – Story County Zoning Map amendment from the A-2 Agribusiness District and A-1 Agricultural District to the CLI Commercial Light Industrial District. No change to the Cornerstone to Capstone (C2C) Map is necessary. The property is designated Urban Expansion Area and is located adjacent to the City of Zearing.

APPLICANT:
Jennifer Thomason
20046 270th Street
Hubbard, Iowa 50122

STAFF PROJECT MANAGER: Jerry L. Moore, Planning & Development Director

SUMMARY:
The applicant acquired the subject property at 70197 130th Street and proposes to use the existing building and property for fuel sales, convenience store, restaurant, Jeep vehicle and part sales, camper and RV repair, and sales of beef, chicken and pork. The existing building is located within the A-2 Agribusiness District. To conduct the proposed uses on the subject property the applicant is requesting approval of the rezoning from A-2 Agribusiness and A-1 Agricultural District to CLI Commercial Light Industrial District.

Property Information
70197 130th Street, Section 16 Lincoln Township

Parcel Identification Number
0416300385

Parcel size
4.3 acres

Current Zoning
A-2 Agribusiness District (includes existing building location) and A-1 Agricultural District

Statement of Intent. The A-2 Agribusiness District is intended and designed to provide for those activities strongly interrelated with agricultural uses and must therefore be located in agricultural areas. It may be necessary to locate such uses on land scoring 267-300 points based on the Land Evaluation and Site Assessment (LESA) System, although this shall be avoided where possible. It is also intended that, to the degree possible, all A-2 Agribusiness Districts shall be entirely surrounded by the A-1 Agricultural District.

Statement of Intent.

The A-1 Agricultural District in part is intended and designed to accommodate land uses compatible with agriculture and to protect agricultural land from encroachment of urban land uses.

Proposed Zoning
CLI-Commercial Light Industrial

Statement of Intent.
This district is intended to accommodate the full range of retail commercial services and products, wholesaling and warehousing, as well as light industrial, laboratory, manufacturing, fabricating and institutional activities in industrial locations. The intended uses are generally characterized by a minimum of obnoxious characteristics which might adversely affect surrounding development.

Current C2C Plan Designation
Urban Expansion Area

The Urban Expansion Area designation reflects those areas identified by certain communities as future growth areas. Development proposed in these areas should be encouraged to be annexed into the neighboring city in order for an urban level of service to be provided. Proposed land use and regulations should comply with the city's plans and standards as appropriate.
Story County and all the communities share similar concerns about issues and impacts from development that occurs in areas surrounding the cities, such as:

Overlapping regulations of different local jurisdictions;
Inconsistences among different land use strategies; and
Impacts of development on rural/agricultural activities.

Based on the C2C Plan, the County is to consider and address the following principles:

1. Development in the Urban Expansion Area occurs in accordance with applicable City's future land use plans and goals.
2. Encourage annexation when development is proposed.
3. Where annexation is not appropriate at the time of development proposal, coordinate a cooperative review/approval between Story County and the City according to the following standards:
   a. Development occurs at an urban density/scale using city development standards where applicable
   b. Use conditional rezoning agreements and annexation agreements to ensure development is built so as to facilitate a seamless transition into the City when the area is annexed
4. Review design and development standards to ensure conflicts between proposed development and agricultural and natural resources are minimized.
5. When development is located adjacent to agricultural uses provide adequate buffers to minimize conflicts.
6. Encourage development to take access off existing paved roads.
7. Mitigate and manage stormwater runoff, soil erosion, and wastewater discharge according to IDNR and Story County standards.

Based on communication with City officials, the City is considering annexing the subject property, however have not begun that process. While Planning and Development staff communicated the C2C Plan principles with the City officials, to date the City has raised no specific interest in applying any City development regulations to the subject property.

Cities within Two Miles of the Subject Property
City of Zearing

Items submitted with the Rezoning Application Include the Following:

1. Application
2. Site plan sketch (included revised site plan sketch and parking dimensions)
3. Written narrative of the proposed use of the building and land.
4. Responses to County staff review comments.

Utilities and Services
City of Zearing Water
Story County Sheriff
Alliant Energy Electric – Currently have LP tank service. (Applicant was working with Alliant Energy to install natural gas service.)
Zearing Fire Department
Story County Ambulance Service

Property is not located within a drainage district

Background – Requested Rezoning

According to Story County records, the applicant (Jennifer Thomason) acquired the subject property on December 2, 2016. The applicant plans to use the existing building for fuel sales, convenience store, restaurant, Jeep vehicle and part sales, camper and RV repair, and sales of processed beef, chicken and pork.

The applicant learned about the conflict with the current zoning of the property and their planned uses after submitting a liquor license for action to the Story County Board of Supervisors.

The property was rezoned to A-2 Agribusiness District from the A-1 Agriculture District June 14, 1983 by the Reece Brothers for an office and farm store for petroleum product sales. According to the Story County Assessor's records, the building was constructed in 1983 and contains approximately 7344 sq. ft. The applicant communicated to Planning and Development staff that the previous property owners used the building and property for fuel sales, convenience store and restaurant. There are no Planning and Development Department records approving the change of use of this property and these uses are not permitted in the A-2 Agribusiness District.

The southeast corner of the subject property is also the northwest corner of the City of Zearing's corporate limits. The adjacent land surrounding the subject property is zoned A-1 Agricultural District. The two parcels located at the northeast and northwest corners of the intersection of HWY 65 and 130th Street are zoned CLI-Commercial Light Industrial District. This CLI District is located approximately 580 feet west of the subject property. The zoning of the closest parcel located inside the City of Zearing is split zoned; Light Industrial District along the north ½ of the parcel adjacent to the street and Residential Single Family on the south half of the property. The current land use of the parcel however is in agricultural row crops. The western edge of the property contains mature trees.

The grade of the subject property is higher in the north portion of the property and relatively level where the building, fuel pumps and parking is located. East of the building there is an approximate 1.8 acre grassy area and the grade drops from the north area to the south and southeast. There is a grove of trees on the northwest area of the property.

The site plan sketch submitted with the rezoning application shows the restaurant on the southeast side of the interior space of the building, the convenience store on the southwest side, garage for repairing Jeeps for sale on the north side of the building, and a parts storage area on second level on the northwest side of the building. The customer entrances to the convenience store and restaurant are located on the south side of the building and an overhead garage door is located on the east side of the building. Used Jeeps for sale are shown on the southwest side of the property. According to the applicant, this vehicle display area will be graveled. Customer and employee parking is primarily shown on the east and north sides of the building. There are two separate gravel accesses extending into the subject property. The parking area and drive is partially gravel and dirt and the drive extends around the building. The fuel pump areas are paved. The applicant initially planned to construct a Jeep course as shown on the east side of the parking on the east side

of the building. This required the submittal of a Conditional Use Permit and a Variance Application as a 20 acre site is required for courses. The purpose of the Jeep course was for Jeep owners to drive their Jeeps over various obstacles at low speed to challenge them and their vehicles. The applicant submitted a Conditional Use Permit and Variance applications for the Jeep course concurrently with the Rezoning application, however after review and input from County staff and others about concerns regarding the Jeep course and its proximity to the other proposed businesses, the Conditional Use Permit and Variance application were withdrawn by the applicant. The septic system is located on the east side of the building. The septic system was designed to accommodate the permitted use from 1983.

Planned hours of operation for the convenience store (JJ's Station) are 6:30 AM-11PM Monday-Friday and the restaurant (Mammy's Cafe) are 6:30 AM-8 PM Monday-Saturday & Sunday 12PM-8PM. Planned hours of operation for the Jeep sales and parts (Just Jeeps) and camper and RV repair services are 9AM–6PM Tuesday-Saturday & Sunday by appointment. Estimated number of daily customers to Mammy's Cafe are 12 at lunch plus 8 carry out meals and 12 for supper. JJ's Station is estimated to have 106 customers in 24 hour period (pumps operational 24/7), six customers for Just Jeeps and three request from customers for camper service.

Current Surrounding Land Use

The subject property is located in somewhat of a transitional area of the County with potential for change, on a County street. The subject property is currently adjacent to agricultural properties in row crops, a previous school football field, and in close proximity to the City of Zearing. Its also relatively close to commercial uses located inside the City and near an agricultural business located at the intersection of HWY 65 and 130th Street. The size and use of the adjacent parcels are as follows:

Direction	Parcel Size (acres)	Use of Property/Property Owner
North/west	30.55	Agriculture – Agnes Cerka
East	6	Football field – Colo-Nesco Community School District (not currently used as football is played in Colo)
South	35.56	Branstad Family Iowa Farm
	2.13	Trees – Blattel-Britton

Closest property and business located within the City of Zearing:

Southeast	7	Agriculture - Reed Enterprises
	2.8	Commercial – Reed Enterprises – Trucking Company (over 300 feet from the subject property)

The 2.8 acre commercial property located on the northwest corner of the intersection is Johnson Sales and Service; a farm machinery repair business. The property is located over 800 feet from the subject property.

The closest dwelling is located within the City of Zearing and the property is located approximately 740 feet to the southeast of the subject property.

Traffic

Traffic Levels on 130th Street according to the Iowa Department of Transportation records – Annual Average Daily Traffic amounts are identified below. 130th Street is a paved County street. An asphalt overlay project is planned for the street by the Story County Engineering and Secondary Roads Department this summer and will extend from the Story/Marshall County border to the west limits of the City of Zearing's corporate limits (adjacent to the subject property).

Year	Traffic
2015	610
2011	650
2007	670

Based on the above information, annual average daily traffic levels decreased on 130th Street for the eight year period by 60 vehicles. According to the applicant, approximately 3-4 fulltime employees are anticipated including 9-10 part-time employees. The extra part-time employees would likely work during peak times, evenings and weekends.

Population Information for City of Zearing

Information below is from the State Data Center, a unit of the State Library of Iowa.

Year	2015	2014	2013	2012	2011	2010
Pop.	537	542	540	541	558	554

Based on the above information, the City of Zearing has gradually lost population overall from the five year time frame of 17 people. This represents an approximate 3% loss in population.

Analysis

Applicable Regulations

According to Section 92.06(2) Standards for Approval, all petitions to rezone shall satisfy the following standards for such requested action to be approved:

1. **The proposed rezoning shall conform to the Story County Development Plan (*Cornerstone to Capstone – C2C)***

Applicant Comment –

After reviewing the C2C plan, its our understanding the future plans for our area would be to expand the town of Zearing to the edge of HWY 65. This could potentially lead to annexing our property and/or changing our zoning to include commercial use. We understand this to mean our request is right in alignment with our request for rezoning.

Staff Comment –

With the designation of the subject property as Urban Expansion Area, the County is to coordinate development requests with the City of Zearing. The County is to coordinate the future planning of the subject property with the City of Zearing based on the City's comprehensive plan, adhering to any plans to annex the property and any City policies and interest in requiring City development standards be applied to the property. To date, while annexation of the subject property is being considered by the City, the City is not currently taking action to annex the property or requiring and applying City development standards to the property.

The subject property started as a commercial agricultural business prior to being changed to commercial uses that are not permitted in the A-2 Agribusiness District.

The following are applicable excerpts are from the C2C Plan that relate to the rezoning request.

Input from citizens at the public open houses.

Weakness and Threats

Governance, Leadership and Learning Environments
Lack of Services in small communities
Need for more community cooperation
Getting people involved

Economic Prosperity
Small business can't afford Ames or Story County
Lack of economic diversification
Small town businesses struggling
Local regulations more of a threat to development than federal strings
Small businesses growing
Commerce too concentrated in Ames (little towns need it too)
Growth shouldn't be only goal, other goals should be maintenance and improvement of existing facilities
Small towns have little to no businesses and less tax base

Growth – Oriented and Sustainable Infrastructure
Need to attract new businesses

Strength and Opportunities

Natural Amenities
Camping and recreational areas
Zearing Park

Governance, Leadership and Learning Environments
Public has opportunity to be engaged at many levels, transparency
Communities have a good idea of where they want to go

Economic Prosperity
Small town survival education and economy
Enlarged Dakins Lake

Growth – Oriented and Sustainable Infrastructure
Hwy 65 Corridor
More companies moving in

Quality of Life Highlights
Indicate changes you think would improve the quality of life in Story County
Expand retail shopping options 42%
(643 citizens responded)

How would you describe the availability of places to shop or dine in Story County?
Adequate 43%
Lacking 41%
(531 citizens responded)

How would you direct County civic leaders and planners with regard to land use policies and regulations?
Be more restrictive; allow less flexibility for where and how land may be used and developed. The highest number of citizens supported this statement at 41%.

Economic Prosperity Chapter 6
Goal 1 – Cooperate regionally to focus on common goals and allocate resources accordingly to maximize successful business start-up, retention, expansion and recruitment efforts.
Objective – Promote a sustainable, strong, diverse and healthy economy.
Strategies –
Foster the startup and development of new businesses of all sizes
Foster county wide communication and strengthen collaborative efforts.

Goal 2 – Create a healthy and sustainable regional economy by the retention, expansion and recruitment of business.
Objective – Develop and maintain a roster of businesses in Story County that will help the County sustain economic cycles.
Strategy – Continue to work with regional partners and organizations to recruit companies from target clusters identified in the Battelle Report on Iowa Economic Development.

2. **The proposed rezoning shall conform to the Statement of Intent for the proposed district and district requirements**.

Applicant comment –
We are requesting the rezoning to commercial light industrial district. We understand this to accommodate our businesses to include a small restaurant, convenience store, gas station, and used car sales. The dirt track as we are aware is not covered under the list below. Thus the reasoning for requesting conditional use permit with the variance. Per section 86.10 of the Land Development Regulations. A. "All uses involving retailing, commercial services and products, professional services to the general public, wholesaling and warehousing." Therefore we believe the proposed rezoning request will conform to the intended use of our property and the district requirements

Staff Comment –
The statement of Intent for the Commercial Light Industrial District indicates the district is intended to accommodate the full range of retail commercial services and products, wholesaling and warehousing, as well as light industrial, laboratory, manufacturing, fabricating and institutional activities in industrial locations. The intended uses of the building and property are generally characterized by a minimum level of obnoxious characteristics which likely will minimally affect surrounding property.

The proposed uses for the building would meet the requirements of the CLI District. The uses with the exception of the actual dispensing of fuel for vehicles and vehicles displayed for sale would primarily occur inside the existing building. No building expansion is currently planned. The fuel pumps are located on the south and west sides of the building. The proposed businesses will increase traffic to the property and area, however the increase will partially offset the reduction of vehicles on 130th Street that occurred over the eight year reporting period. There are two existing accesses and drives extending into the property. The greatest number of traffic to the property will likely be generated during peak times, during the morning, early afternoon and evening. Except during peak operational times the number of employees will be minimal. 130th Street is paved and designed to handle the proposed traffic levels. The scheduled asphalt overlaying this summer of the street will further assist future customers in gaining access to the subject property from the east.

3. The proposed rezoning shall be compatible with surrounding land uses and development patterns.

Applicant comment –
Since our plan is to continue using the property the same way it has been used for the past 30 years, regardless of whether or not the land had been zoned properly for it, we think history has proven it is compatible with the surrounding land use. Refer to the C2C and answer to question #1 for development plans.

Staff Comment –
Impact of the proposed building uses of the property is anticipated to be minimal as the adjacent land is agricultural ground in row crops and an adjacent unused football field. The closest

businesses are located several hundred feet away at the intersection and to the east within the City of Zearing.

4. **The proposed rezoning shall protect environmental resources. Rezoning of parcels containing more than fifty (50) percent of the gross acreage as lands identified with areas designated Natural Resource Areas on the Story County Development Plan shall not be approved unless such requested action results in a district designation more restrictive than the current designation, the R-C Residential Conservation Design (Overlay) District is applied to the property, or conditions protecting the identified areas are attached to the rezoning request. (Ordinance No. 184)**

Staff Comment –
There are no natural resources designated on the subject property from the C2C Plan.

5. **In areas where the Petition to Rezone requests a change from A-1 District or A-2 District to another district, lands scoring 267 or above for total LESA score, as determined by a Land Evaluation Site Assessment as adopted for Story County, shall not be approved.**

Staff Comment –
Planning and Development staff calculated the LESA score for the property and the score was below the threshold with the following numbers: Site Assessment of 133 and Land Evaluation and Site Assessment of 210.

Commentary
The following comments are part of the official record of the proposed Rezoning request. If necessary, conditions of approval may be formulated based on these comments:

Comments
A Conceptual Review meeting for the proposed Rezoning request and Conditional Use Permit was held on Thursday, February 16, 2017. After conceptual review, the complete application submittal was also forwarded to the members of the Interagency Review Team. Some of the County staff review comments were as follows:

Planning and Development Department
Conceptual Review
1. Conceptual Review is the first step in consideration of a Rezoning application submittal. Rezoning submittal involves further review by County staff, review and recommendation by the Story County Planning and Zoning Commission and action by the Story County Board of Supervisors. Planning staff will communicate with City of Zearing about the rezoning request as the City is within close proximity to the property.
2. The property is currently zoned A-2 Agribusiness District. Uses in the district are to be interrelated with agricultural uses and must be located in agricultural areas. The property was rezoned to A-2 from A-1 District June 14, 1983 by Reece Brothers for an office and farm store for petroleum product sales.

3. Items planned for the property include, fuel sales, convenience store, restaurant, processing/selling beef, chicken & pork products, Jeep sales, Jeep parts sales, camper repair services, camping supplies, and dirt track for Jeeps. All items except dirt track would be permitted uses in the Commercial Light Industrial District if the rezoning is approved. The dirt track or course could be permitted with the granting of a Conditional Use Permit by the Story County Board of Adjustment after a recommendation from the Planning and Zoning Commission and if located in an A-1 District or CLI District. A 20 acre minimum site is required.
4. Corner Stone to Capstone (C2C Plan) identified the property as an Urban Expansion Area. The Plan indicates development of these areas is to occur in accordance with applicable City's (City of Zearing) future land use plans and goals, annexation is encouraged, if annexation not appropriate we are to coordinate the review in accordance with the City's development standards where applicable, use conditional rezoning agreements and annexation agreements to assure development is built to City's standards where applicable. City can defer to County's standards for site improvements.
5. If the rezoning is approved a more detailed site plan sketch may be needed. Comments from sketch drawing: Only two customer parking spaces are shown beyond parking at the pumps. One space needs to be ADA accessible with a sign. Explain Used Jeep Car Display on south side of property. Garbage dumpsters are required to be screened. Allow adequate separation distance from Jeep vehicle display and fuel sales. Any building addition or other site improvements planned for the property?
6. Give thought to your future business needs for the building and property. Do you need to increase the zoning boundary request?
7. Are the adjacent property owners interested in participating in the request to rezone a portion or all of their property simultaneous with your rezoning request? The properties located on the northwest and northeast corners of the intersection are zoned CLI-Commercial Light Industrial District.
8. The deadline for a Rezoning submittal is March 20, 2017 for the April 5, 2017 Story County Planning and Zoning Commission meeting. The first consideration of this item would tentatively be addressed by the Story County Board of Supervisors at their April 18, 2017 meeting. State law requires three separate considerations of an ordinance (Zoning Map) change request.

Review of Rezoning application and materials

1. Did you contact the adjacent property owners to see if they were interested in joining your rezoning application to request rezoning of a portion or all of their property? If so, what were their responses.
2. Just so I am clear, are you requesting to rezone the entire parcel from A-2 Agribusiness District to the CLI Commercial Light Industrial District?
3. If the rezoning is approved, when do you intend to start operating your business?
4. Who owns the camper and vehicle located on the property?
5. The Cornerstone to Capstone (C2C) Plan designates the property as Urban Expansion Area. According to the principals identified in the Plan, development is to occur in accordance to the City of Zearing's future land use plan. Annexation is to be encouraged and where not appropriate development is to occur at an urban scale using the city's development standards where applicable and use conditional rezoning agreements to encourage a seamless transition when property is annexed. This information from the C2C Plan will be communicated to the city staff.
6. Where is the closest gas station, convenience store and restaurant from this property?
7. Any proposed building, site grading and or other site improvements including a future Jeep course beyond the current site conditions should involve the submittal of a revised site plan

and/or written signature from an architect and/or engineer that the proposed improvements will meet Iowa Stormwater Management Manual and SUDAS erosion control requirements.
8. How many participants and vehicles are planned for the Jeep Course each day and/or for future special events planned for your property?
9. How many Jeeps do you intend to have on-site to sell each week?
10. Is anything planned to separate the building and the proposed convenience store and restaurant use from the Jeep Course such as barriers and/or other devices? How many feet setback would the proposed course be from adjacent properties and the front property line?
11. A sign permit would be required for any external or wall sign for your business.
12. Do you have any plans to separate the existing LP tanks from the users of the Jeep Course?
13. Additional questions/comments may follow.

Environmental Health Department

This site will definitely need a wastewater review. At a minimum, they will have to add a grease trap (outside tank). The septic was originally designed for "office facility for maximum 10 employees and 20 patrons daily".

It is important to provide a good estimate of water use for your proposed business so that the proper size of your septic system can be determined. IAC Chapter 69 "Private Sewage Disposal Systems" Appendix A "Estimates of Nonhousehold Domestic Sewage Flow Rates" can be used to arrive at the water use figures. This can be found on page 31 of: https://www.legis.iowa.gov/docs/ACO/chapter/567.69.pdf . The more difficult part of this calculation is determining the customer volume for your business. In addition, restaurants require grease interceptors to prevent the grease from getting into your lateral field and causing irreversible damage. A grease interceptor is necessary, as it provides more protection than the small under-sink grease traps that are almost always too small for the volume of fats, oils, and grease, and does not buffer the temperature variations.

Response based on applicants proposed customer numbers

The Thomason's are proposing a new business for the existing building site. The proposal is for a 27-seat restaurant and three employees. There will also be a convenience store, gas station, and repair shop. There will be 9-10 additional employees for the convenience shop and repair shop, of which 3-4 will be full time employees.

Water use:

Restaurant has 27 seats x 40 gal/day = 1080 gallons
3 employees x 13 gal/day = 39 gallons
4 full time office (shop) employees x 18 gal/day = 72 gallons
6 part time office (shop) employees x 9 gal/day = 54 gallons
Gas station # ?? of cars served x 13 gal/day =??
Total water use projected to be 1,245 gallons per day plus the convenience store and gas station customers who use the facilities.

Existing facilities:

Permit #789 was issued for treatment of 250 gallons wastewater per day. The system consists of a 750 gallon septic tank, and about 100' of lateral.

Without doing a site review, the type and size of a system cannot be determined. The septic tank size shall be two times the estimated daily sewage flow (you will need at least a 2,500 gallon septic tank). Assuming the site can accommodate laterals, and loading rate is .5 gallons per square foot per day, you would need approximately 900 feet of 3' laterals. Other options that offer a smaller footprint include mounds and at-grades which are both pressurized systems requiring a pump.

You want to protect the secondary system (laterals) from fats oil and grease. Talk to any pumper! A grease interceptor provides protection, sink traps do not. Sink traps would not be considered to be on a separate building sewer; if they are not maintained regularly, they flow to the septic tank and cause a great deal of damage or failure.

Environmental Health Department conditions for staff report:

1. Submit an application for an onsite wastewater site review and permit.
2. Finalize water use projection figures, and submit with the aforementioned application. System design is based on the planned full capacity.
3. Install/upgrade the onsite wastewater system as per the specifications of the permit prior to business start-up.

Engineering Department

1. The two accesses have been there for a long time and they will work OK.
2. The main concern with this one is to make sure that there is enough parking on site to accommodate the events (This comment was based on the Jeep course). We do not want cars parked on the shoulder of the highway.

Emergency Management Agency

The location of the LP tanks in relation to the course presents a risk if you have a vehicle go off the track and crash into the tanks. (These comments were based on the proposed Jeep course.)

Assessors Department

The property, with the new improvements, will be reviewed and revalued for the 01/01/2018 assessment to reflect market value.

Comments from the General Public

Notification letters were mailed to surrounding property owners within ¼ mile of the property regarding the rezoning and subdivision request on March 17, 2017. A copy of the public notice was also emailed to the City of Zearing. A total of 37 written responses were emailed to the Planning and Development Department in support of the requested rezoning. They were from citizens residing inside and outside the City of Zearing. A separate letter was also received in support of the rezoning request from the City of Zearing City Council and Mayor on March 14, 2017. Planning and Development staff and a Board of Supervisor member also met with the applicant and a council member from the City of Zearing on March 17, 2017. An email was received on April 2, 2017 from a citizen from the City of Zearing who supports the rezoning request. One phone call was received from a person who owned property and a dwelling who didn't currently reside in the area however had questions about the request.

A publication regarding the rezoning request was published in the three newspapers adopted by the Board of Supervisors on March 23, 2017 for the Planning and Zoning Commission meeting and on March 30, 2017 for the Board of Supervisors action on April 11, 2017.

Analysis

Points to consider in evaluating the proposed rezoning request are as follows:

1. The subject property was previously legally used for a commercial agricultural business involving office, farm store and petroleum sales.
2. The subject property is located within the Urban Expansion Area of the City of Zearing. Due to the proximity of the property to the City, the City has a vested interest in the review and consideration of the Rezoning request. The City of Zearing is considering annexing the property in the near future, however, no action to annex is currently occurring. City Officials support the applicant's request to rezone the property for the requested uses. Numerous letters were also sent to the Planning and Development Department in support of the rezoning.
3. While considered a spot zoning primarily benefiting the applicant, impact to adjacent properties will likely be minimal as the property is surrounded by agricultural properties and an unused football field.
4. In addition to the proximity of the subject property to the City of Zearing, the proximity of the HWY 65 and 130th Street intersection will also likely be beneficial to the applicant's business. Also, in the near feature its likely the subject property and other land owners to the west may find annexation into the City advantageous primarily for commercial uses benefiting motorist and the citizens of the City.
5. The proposed uses of the subject property will likely be beneficial to citizens in the City and to participants using Dakins Lake.
6. The planned 130th Street overlay project will assist customers to access the subject property.

Staff Recommendation

Rezoning Request

Based on field observation of the property and adjacent properties, review and consideration of the documents submitted with the application, discussions with the applicant regarding the rezoning request and City of Zearing officials, and the information identified in this staff report, Planning and Development staff recommends approval of the Story County Zoning Map amendment from the A-2 Agribusiness District and A-1 Agricultural District to the CLI Commercial Light Industrial District with the conditions identified below.

1. The applicant shall mark the customer and employee parking and access isle areas as required in Story County Land Development Regulations in Chapter 88.08 to demonstrate meeting requirements. The minimum number of ADA compliant handicapped parking spaces with access aisle and handicapped parking signs shall be provided nearest to the building entrance. These items shall be inspected by Planning and Development staff prior to operating the business.

2. If additional dirt and gravel is planned to be added to the property for parking or other site improvements, a statement that the improvement meets the Iowa Stormwater Management Manual and SUDAS for erosion control shall be provided to the Planning and Development Department prior to proceeding with the improvement.
3. If more than 10 customer and employee parking spaces are provided, the applicant shall install trees at a rate of one tree for each five parking spaces at the perimeter of the parking area. The trees shall be installed within 60 days of approval of the rezoning request.
4. The applicant shall submit an application for an onsite wastewater site review and permit. Finalize water use projection figures, and submit with the aforementioned application. System design is based on the planned full capacity. Install/upgrade the onsite wastewater system as per the specifications of the permit prior to business start-up.

Planning and Development staff recommends the Planning and Zoning Commission support alternative #2.

Alternatives

The Planning and Zoning Commission may consider the following alternatives on the rezoning map amendment. These alternatives are:

1. The Story County Planning and Zoning Commission recommends approval of the requested Zoning amendment to the Story County Board of Supervisors, as submitted and requested by the applicant as put forth in case REZ 04-17.
2. **The Story County Planning and Zoning Commission recommends approval of the requested Zoning amendment with the conditions to the Story County Board of Supervisors, as put forth in case REZ 04-17.**
3. The Story County Planning and Zoning Commission recommends denial of the requested Zoning amendment to the Story County Board of Supervisors, as submitted and requested by the applicant and as put forth in case REZ 04-17.
4. The Story County Planning and Zoning Commission remands the requested Zoning amendment, as put forth in case REZ 04-17, and directs the applicant to address specific areas for additional information, review and/or modifications, and requests staff to place the requested Zoning amendment on the May 3, 2017 Planning and Zoning Commission Agenda.

REZ04-17

Story County Planning and Development
900 6th Street, Nevada, Iowa 50201
(515) 382-7245 — PZWeb@storycounty.com — www.storycounty.com

AMENDMENTS

Applicant

If the Applicant is not the Property Owner, please attach consent and authority of the Property Owner for you to apply on his/her behalf.

(Last Name) Thomason (First Name) Jennifer + Josh

(Address) 70197 130th street (City) Leaving (State) IA (Zip) 50278

(Phone) 641-487-7540 (Email) jen@justjeeps-station.com
402-599-0106 (cell)

(Property Address) 70197 130th St, Leaving, IA 50278 (Parcel ID Numbers) 04-16-300-385

☐ **Code of Ordinances (Text)**

Section: _____

- ☐ **Filing Fee: $325**
- ☐ **Digital copy of all materials**
- ☐ **Attend conceptual review meeting**
- ☐ **Proposed text language showing red-lines & strikeouts of the proposed changes**
- ☐ **Written narrative explaining justification for proposed amendment and conformance to the standards for approval outlined in Section 92.07(2) of the Story County Code of Ordinances**

☐ **County Development Plan**

Current Designation: _____

Proposed Designation: _____

- ☐ **Filing Fee: $350**
- ☐ **Digital copy of all materials**
- ☐ **Attend conceptual review meeting**
- ☐ **Legal description of area**
- ☐ **Written narrative explaining existing and proposed plan designations, as well as justification for amendment**
- ☐ **Site Context Map showing the relationship of the amendment area to natural and human made features existing within one thousand (1,000) feet of the site**

☒ **Official Zoning Map (Rezoning)**

Current District: A-1 + A-2

Proposed District: C L I

- ☐ **Filing Fee: $350** (mailed)
- ☐ **Digital copy of all materials**
- ☒ **Attend conceptual review meeting**
- ☐ **Written narrative explaining justification for proposed amendment and conformance to the standards for approval in Section 92.06(2) of the Story County Code of Ordinances**
- ☐ **All submittal requirements as outlined in Section 92.06(3) of the Story County Code of Ordinances**

RECEIVED
FEB 23 2017
STORY CO. PLANNING & DEVELOPMENT

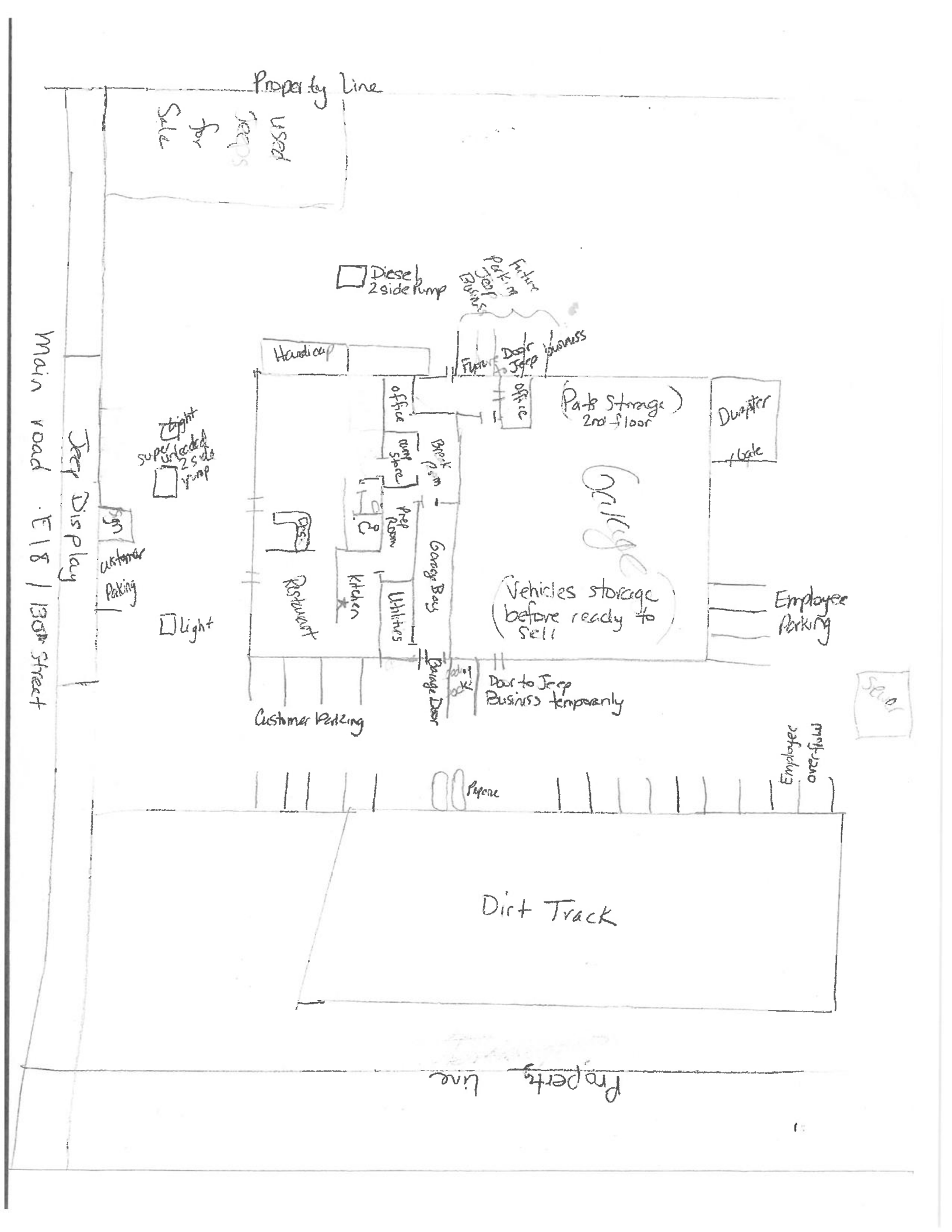
CERTIFICATION

I/we certify that the information and exhibits submitted are true and correct to the best of my knowledge and that in filing this application I am acting with the knowledge, consent and authority of the owners of the property. Pursuant to said authority, I hereby permit County officials to enter upon the property for the purpose of a site visit, and, if necessary, post a public notice sign on the property.

SIGNATURE Jennifer Thomason **DATE** 2/22/17

Submit Application Josh Thom 2/22/17

Date Received 2-23-17
Receipt No. 569024
Receipt Amount 350-


Property Line
Used Cars for Sale
Diesel 2 side pump
Future Parking for Jeep Business
Handicap
Door to Jeep business
office
office
(Parts Storage) 2nd floor
Dumpster + Gate
Light
super unleaded 2 side pump
Sign
customer Parking
Light
Rest room
Rest room
Prep Room
Kitchen
Garage Bays
Utilities
Vehicles storage before ready to Sell
Employee Parking
Garage Door
Door to Jeep Business temporarily
Customer Parking
Main road - E18 / 130th street
Jeep Display
Propane
Employee
Dirt Track
Property line

OUR BUSINESSES & SERVICES

Description of property intended for businesses per realtor (was we used to determine our businesses and services):

> *"Great multi-purpose building with 4.35 acres. Property has high visibility with highway traffic. This used to be a gas station with Cardtrol system, convenience store, and restaurant. Has a truck loading area and approximately 5,000 sq.ft. storage facility and plenty of land to expand." -listing description with MLS. See attached copy of MLS legal description.*

Why our businesses and why now?

After several recent family camping trips to Dakin's Lake Campground, it became apparent to us that the Zearing community and visitors aren't currently having their needs met in a number of ways. With the expansion of Dakin's Lake Campground in 2015, Story County has seen an additional 1,000+ visitors per month during camping season. These visitors need camping supplies, fueling that is RV accessible, convenience store access, emergency camper repairs (like flat tires), and restaurant services. We have heard from many members of the community that they are tired of driving out of town to dine. They would much prefer to put the money back into a business in their own community, someone local. As Jeep enthusiasts, we are finding that we are not alone in Iowa. In fact, the annual Jeep Show is held right here is Story County, attracting people from all over the Midwest. Offering a Jeep playground (dirt track), Jeep aftermarket & used parts, and restored Jeep sales, all feed in to one another and our other businesses on the premises. There are no other Jeep playgrounds in Iowa and currently Jeepers travel quite a distance to Tuttle Creek in Kansas. A Jeep experience like ours will put Story County on the map for outdoor enthusiasts far and wide. It is expected that the camper volume will increase based on our pull of Jeep enthusiasts that also enjoy camping.

Purpose:

To provide superior customer service in used JEEP sales, distribute JEEP and 4x4 after-market & used parts, provide gasoline, restaurant/food service, camping goods supplier, and convenience store services. We plan to serve the Zearing area, Dakin's Lake Park and Campground, and the many surrounding communities.

Description of Doing Business As:

1. **Just Jeeps** – Jeep Restoration business. The purchase, repair, and resale of Jeeps. Also to include the sale and installation of after-market JEEP and 4x4 parts resale. Will provide the only one of a kind "Switch and store" jeep tops. There will be an outdoor dirt track to be enjoyed (for a fee) by visitor's from both near and far. Business to be conducted at JJ's Station. Some minor repair services for RV's and travel trailers such as flat tire repair. Repairs may be performed at the campsite, when possible, or at the garage on our

property. We will not be offering garage repair type service at this time but may add that in the future.

A. Hours of Operation: 9am-6pm Tuesday-Saturday, Sunday by appointment.

B. Dirt track Hours of Operation: Daily from 4pm -dusk and by appointment.

2. **JJ's Station** – a convenience store offering snacks, automotive necessities, minor medical supplies, household supplies, and camping supplies including fishing and camper parts. Free compressed air will be located on the southeast side of the building.
    A. Hours of Operation: 630am-1100pm Monday-Friday.
3. **Mammy's Cafe** – a quaint,country-style restaurant offering breakfast, lunch and dinner meals, desserts, pastries and take out.
    A. Hours of Operation: 630am-800pm Monday-Saturday, Sunday 12pm-8pm.

Purpose:

To provide superior customer service in used JEEP sales, distribute JEEP and 4x4 after-market parts, the retail petroleum industry, restaurant/food service, camping goods supplier, and convenience store industry. We will be featuring many local "value added" products from the Iowa farming community including beef, pork, chicken products, and dairy products. We plan to serve the Zearing area, Dakin's Lake Park and Campground, and the many surrounding communities.

Jeep Playground

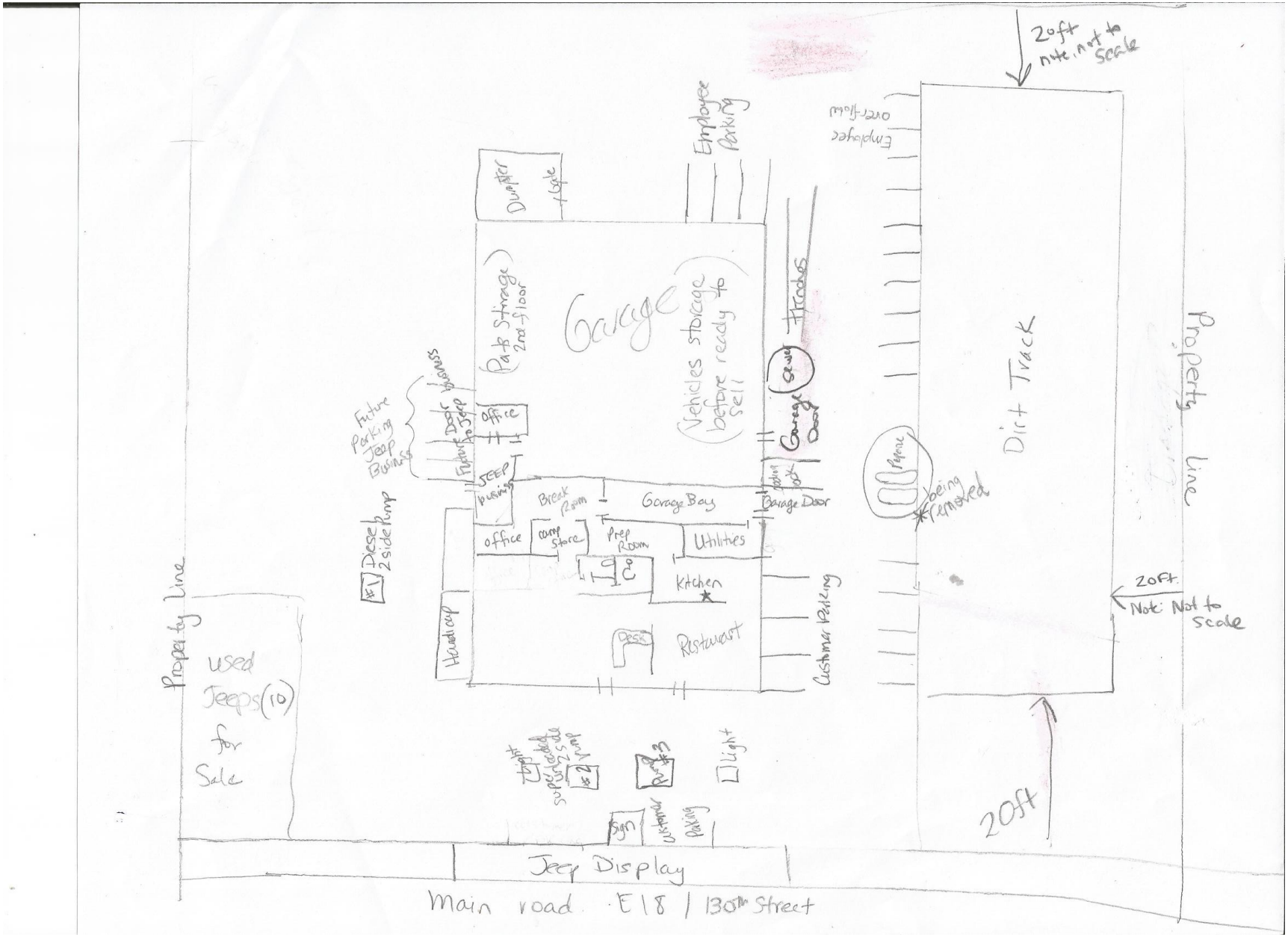
Each year, hundreds of Jeep lovers flock to Jeep shows to celebrate their common love of everything Jeep. The Jeep Club of Iowa holds this annual show at the fairgrounds in Nevada. This is a less than ideal situation for them because the track has to be disassembled each year. The Jeep Club has been seeking a more permanent location that could be accessed more than just one time per year. We'd like to extend that invitation to hosting their monthly meetings as well. We hope to partner with them, gleaning from their wisdom that can only be found through years of experience, in the building and maintain of our track.

In addition to the use by the Jeep Club of Iowa, there are other Jeep clubs located throughout Iowa that would be potentially use our track. We will be very selective in who we allow access and the track will be secured at all times so that no one enters without our permission or knowledge. We will have a fence, posted signs, and security camera surveillance. No one will be allowed access if they have been consuming drugs or alcohol. The track will not operate after dark or without supervision by an owner or manager.

The track itself will be made from a variety of products from logs to concrete conduit. This is a slow, crawling gear track and will produce minimal sound or exhaust. While there may be a few people observing vehicles navigating the track (with the exception would be the annual Jeep Show), this is not a spectator type event that would involve ticketed spectators.

To better explain the size of the track, it would be best to compare to a football field. The exact dimensions could vary slightly.

I've attached some images from the annual Jeep Show for examples of the obstacles that might be included on the "Jeep playground".


20ft not to scale
Employee overflow
Employee Parking
Dumpster
Gate
Garage
(Vehicles storage before ready to sell)
Parts Storage 2nd floor
Entrances
Garage Door
Garage Door
Paint Booth
Dirt Track
Property Line
Future Parking Jeep Business
Door Business
Future Jeep Business
Office
JEEP parking
Break Room
Garage Bay
Garage Door
Propane
being removed
Desk 2 side pump
office
Camp Store
Prep Room
Utilities
Kitchen
Restaurant
Desk
Handicap
Customer Parking
20ft
Note: Not to scale
Property Line
used Jeeps (10) for Sale
Light
Sign
Customer Parking
20ft
Jeep Display
Main road · E18 / 130th Street

Addressing the Questions regarding rezoning.

1. Did you contact the adjacent property owners to see if they were interested in joining your rezoning...
   A: While we would love to grow our business to include the surrounding properties, we do not have the means to purchase them at this time. Therefore, we have not spoken to the property owner to our north and west about purchasing the land. It would be premature to ask him to rezone his property in hopes that we may one day purchase their land. That would be like asking someone to remodel their home to suite your needs because you may one day ask them to sell it to you. While I understand the C2C plan, I don't believe we are in position to coerce area land owners to change their property zoning merely for our convenience at a possible later date. I hope you understand our position. As for Mr. Wildeboer, the property owner to our east, we have communicated with him through a city council member. He has expressed interest in leasing the land to us but, because he is not yet the owner of the land, we can make no arrangements at this time. As well, I don't believe it would be appropriate to address the school since they are planning to sell soon.
2. Yes, we would like to rezone the entire parcel to CL1. If, down the road we decided to expand the business on the property, it would be easier if already zoned accordingly. Please advise us on this issue if you see that this might not be in our best interest.
3. We would like to open our doors at JJ's Station and Mammy's Café as soon as the zoning is passed. We will be ready to open on April 19th pending the board approval. The track will open once it is completed, which we expect to be May or June. The used Jeep business is still being set up and may open in late April.
4. While we are having a difficult time understanding the relevance of the camper question, we want to be as amicable as possible. When we purchased the land, the camper became our property since it was left behind by the previous owner. With that said, we have been approached by the person who owns the trailer that the camper is on and he plans to come collect them both when it has warmed up a bit and before April 19th per our request. Without his permission, I cannot disclose his name. We own the Honda and the Jeep on the property.
5. We have spoken with the city at length regarding annexation and they have declined to annex our property at this time. If and when the city decided to entertain annexing our property, we would be happy to do so. They city is well aware of this. I can get a letter from the city stating as such if necessary.
6. The closest gas station and convenience store is located one mile away inside the city of Zearing, not visible from highway 65. The closest restaurant would be in Flatheads Bar & Grill in Saint Anthony, 14 miles away.
7. If required to do so, we will consult an architectural engineer prior to forming the dirt track. However, we are aware that no such requirements were placed on the annual Jeep Show and the construction of their track. I will plan to talk with Brandon Berguist on Monday to further research how to address this.

8. We are anticipating no more than 10 spectators (family or friends of those on the track) at any given time. There will not be an admission fee set up since this is not a spectator event. We will only allow 3 vehicles on the track at a time. We would expect no more than 30 visitors to the track per day, likely 2-4 per vehicle. In the future, we would like to host the annual Jeep Show at our location but giving projections for that would be premature at this time since we would still have to acquire the additional land first. We estimate that the annual Jeep Show currently sees 200-300 goers over a weekend.
9. We plan to average 10 Jeeps/vehicles for sale at a time.
10. The dirt track will be 20 feet from the main road/south) , 20 feet from the north field/property line, and 20 feet from the east/property line. There will be a fence surrounding the dirt track.
11. I plan to submit the sign permit on Monday.
12. We are planning to remove the LP tanks. We are scheduled to have the natural gas lines dug the first week of April and, once the gas is all hooked up, we will removed the LP tanks. IF all goes as planned, they will be removed prior to April 19th.
13. *Code 69.7(4) a. interceptors shall be provided for kitchen flows at restaurants ...from which grease can be expected to be discharged. B. Installation. Grease interceptors shall be installed on a separate building sewer serving kitchen flows into which the grease will be discharged. The discharge from the grease interceptor must flow to a properly designed septic tank or to a building sewer and then to a septic tank.*

    Using a flow rate estimator for our sink (20in.x18in.x12in. deep) we will drain grease down, we will need a grease trap that is 28 gpm for our sink (per the recommendation of the Plumbing and Drainage Institute guidelines). In addition, we will have an under counter commercial dishwasher with a 20-30 pound grease trap.

    Calculation for Sewer size needed...

    Seats in Restaurant 27 x 40 = 1080

    Employees 3 x 13 = 39

    Total: 1119 needed. Have: 750

    Please advise us of our options. I highly doubt we will be feeding at maximum seating capacity.

City of Zearing

105 W. Main Street - P.O. Box 235
Zearing, Iowa 50278
641-487-7477(phone)/641-487-7427(fax)

March 14, 2017

To Whom It May Concern:

We; the City Council, Mayor and citizens of Zearing, would like to express our whole-hearted support and 100% backing for JJ's Station. We are excited to support the Thomason's creation of three new businesses in our community. The City of Zearing is looking forward to these businesses opening to complement Dakins Lake. We the citizens of Zearing would like to be able to embrace growth in our town. The Thomason's want to enrich our community with their businesses and draw individuals to Zearing and Story County.

The City of Zearing approves JJ's Station, Mammy's Café and Just Jeeps. All three businesses would continue to receive approval from the City of Zearing in the event that the property at 70197 130th Street, would be annexed (whether now or in the future).

We are looking forward to working with Story County to help our community grow and flourish. Please contact me if you have any questions or require additional information.

Sincerely,

Edwina Formanek-Amundson

Edwina Formanek-Amundson

Mayor

City of Zearing

Staff Report

Story County
Planning and Zoning Commission

Date of Meeting:
April 5, 2017

Case Number CUP04-17
Alliant Energy Communication tower
Conditional Use Permit

APPLICANT: Dustin Kern, DK Land Services, REROW Contractor
642 10th Street, Suite 202, Marion, Iowa
On behalf of Alliant Energy

STAFF PROJECT MANAGER: Amelia Schoeneman, Planner

SUMMARY: The request is for a conditional use permit to allow Alliant Energy to construct a new communication tower east of Nevada. The tower will support two-way radio and real-time communications. It will replace an existing tower that is located on a property to the west of the proposed site, which cannot support the necessary communications technology. Alliant Energy will also allow Corn Belt Power Cooperative to co-locate on the tower. The proposed tower meets all standards of approval and supplemental standards required for the conditional use permit. Staff recommend the Planning and Zoning Commission recommend approval of the conditional use permit with conditions.

Property Information

PROPERTY OWNER

Current:

Marilyn L Lounsberry Trust (7/8)
Ray Lounsberry (1/8)

To be purchased by Alliant Energy.

GENERAL PROPERTY LOCATION

Section: 34 Township: 84 Range:22 SE SE, in unincorporated Story County

PARCEL IDENTIFICATION NUMBER(S)

07-34-400-455

CURRENT ZONING

A-1 Agricultural

CURRENT LAND USE

The current land use at the proposed site of communication tower is agricultural row crops. Alliant Energy will continue to allow the current property owner to farm the ground that is not occupied by the proposed communication tower compound. The subject property is surrounded by parcels that are currently in agricultural row crop production.

LAND USE FRAMEWORK MAP DESIGNATION

Agricultural Conservation Area

CITIES WITHIN TWO MILES

N/A

Background

The request is for a Conditional Use Permit to allow the construction of an Alliant Energy communication tower: a 365-foot tall, galvanized steel, lattice-type tower. The communication tower will provide critical communications including real-time information and two-way radio for Alliant Energy's crews and substations. It will also support advance metering infrastructure, restoration during outages, and the security and safety of crews and customers. The proposed tower will be located on the north side of 220th Avenue and approximately one mile to the east of the intersection of 220th Avenue and County Road S-27/650th Street.

The proposed tower will replace an existing, 350-foot tall Alliant Energy Communication Tower located on a property to the west of the proposed site. The existing tower was constructed in 1964 and is supported with guy-wires, as opposed to the self-supporting lattice design of the proposed tower. The existing tower was not able to pass a feasibility analysis on if it could physically support the necessary

technology—Alliant Energy concluded that a new tower was needed. The existing tower will be removed following the requirements in Chapter 90.10(4)(I): Removal of Abandoned Towers/Facilities.

The location of the proposed communication tower is based on the location of the existing tower. The closer the proposed tower is to the existing tower, the closer the radio coverages of the towers will be. The proposed tower will also include a 15' x 24' enclosure building for equipment storage, a 500-gallon LP tank, and a generator, all of which will be located inside of the tower's fenced compound. The compound is approximately 50' x 75' or 3,750 square feet. The building and generator will be moved from the site of the existing communication tower to the site of the proposed tower.

Alliant Energy previously divided the southeast quarter of the southeast quarter in section 34, township 84, range 22, through a plat of survey to create a separate parcel for the proposed tower site. However, the platting was completed prior to the determination that the communication tower required a conditional use permit. Planning and Development staff initially learned the proposed tower would only support Alliant Energy's communication needs. Non-commercial towers are reviewed by staff with action by the Board of Supervisors to approve the site development plan and zoning permit. During the review process for the proposal, staff learned that other companies, including Corn Belt Power Cooperative, would be allowed to co-locate on the proposed tower and a conditional use permit was also necessary. Stricter setbacks are required for communication towers as part of the conditional use permit. Alliant Energy is currently in the process of reconfiguring the parcel to ensure all setbacks are met. The new parcel will be 7.3-net acres and Alliant Energy will purchase the parcel from the current landowner. The revised drawing is included in the Planning and Zoning Commission's packet for review. Planning and Development staff have included in their recommendation that, as a condition of approval, the new plat of survey be recorded prior to the issuance of a zoning permit.

The following items were submitted by the applicant: a project narrative, separation distances between residential parcels and other towers, site context map, site plan including landscaping, tower engineering specifications, a copy of the FAA permit application and determination, City of Ames Municipal Airport No Conflict Confirmation, a propagation map, a construction outline, a statement on the co-location potential of the proposed tower, and a draft of the plat of survey for the parcel on which the tower will be located.

Analysis

A. Applicable Regulations: Chapter 90.04: Standards for Approval

The Planning and Zoning Commission shall review the proposed development for conformance to the following development criteria:

1. **Compatibility.** The proposed buildings or use shall be constructed, arranged and operated so as to be compatible with the character of the zoning district and immediate vicinity, and not to interfere with the development and use of adjacent property in accordance with the applicable district regulations. The proposed development shall not be unsightly, obnoxious, nor offensive in appearance to abutting or nearby properties.

Staff Comment: Communication towers and facilities are permitted as a conditional use in the A-1, Agricultural Zoning District, if a conditional use permit is granted. The properties adjacent to the proposed communication tower, including the area not occupied by the tower compound on the proposed site, are in agricultural row crops, will continue to be farmed, and are zoned A-1, Agricultural. The *Story County Cornerstone to Capstone (C2C) Plan* designates these adjacent parcels as agricultural conservation areas. The C2C plan does designate two parcels to the west of the site, one with an existing single-family dwelling, as future rural residential areas. However, the parcel without the single-family dwelling is the site of the existing tower. The new proposed site is also further from the existing single-family dwelling and thus more compatible with the rural residential designations of these parcels.

Applicant Comment: The proposed facilities do not interfere with the adjacent land uses of the proposed site and associated development. The owner of the adjacent lands will continue to farm all property, including property that will be owned by Alliant Energy.

2. **Transition.** The development shall provide for a suitable transition, and if necessary, buffer between the proposed buildings or use and surrounding properties.

   Staff Comment: The tower location meets all setbacks and separation distance requirements as per the supplemental standards for a conditional use permit for communication towers and facilities. The tower will be located 555' north of the right-of-way line on 220th Avenue. No separation distance is required from residential parcels or planned residential parcels as there are none adjacent to the tower site. However, if the separation distance requirement did apply, the site would meet the required distances from residential parcels. The parcel with the single-family dwelling is located 875' to the southwest of the tower location. The parcel designated by the C2C plan as rural residential that is the site of the existing tower is located approximately 775' to the west of the proposed site. Also per the supplemental standards, the applicant will be constructing an eight-foot (8) tall chain-link fence around the tower compound and landscape the south side of the compound facing the right-of-way of 220th Avenue with trees.

   Applicant Comment: The existing crop land within and outside of the proposed conditional use provides an adequate and necessary buffer to surrounding properties.

3. **Traffic.** The development shall provide for adequate ingress and egress, with particular attention to vehicular and pedestrian safety and convenience, traffic flow and control, and emergency access.

   Staff Comment: A new access from 220th Avenue to the tower compound site will be created in accordance with Story County Land Development Regulations Chapter 88.04: Access Requirements and approved by the Story County Engineer. The drive will be 555' in length from the right-of-way and end at the south side of the tower compound. The applicant has also provided a hammerhead or turnaround at the end of the drive to promote safe ingress and egress.

   The traffic impact of the tower is expected to be minimal. Once construction of the proposed tower is completed, Alliant Energy will conduct quarterly site inspections. Other visits may occur if issues develop or upgrades are needed. The overall traffic levels are not expected to increase

as the proposed tower will replace the existing tower on 220th Avenue to the west of the proposed site.

Applicant Comment: A new entrance will be constructed off 220th Avenue on the south edge that will meet or exceed all local design requirements and standards for ingress and egress. Additionally, the proposed tower will have a turnaround at the southerly edge of the structure for adequate maneuvering.

4. **Parking and Loading.** The development shall provide all off-street parking and loading areas as required by this Ordinance, and adequate service entrances and areas. Appropriate screening shall be provided around parking and service areas to minimize visual impacts, glare from headlights, noise, fumes or other detrimental impacts.

   Staff Comment: During the construction of the communication tower, parking will take place on the subject property. No parking or equipment storage will take place in the right of way.

   Applicant Comment: Once constructed, the tower will receive minimal traffic and therefore any additional parking or loading is not necessary.

5. **Signs and Lighting.** Permitted signage shall be in accordance with the applicable district regulations and shall be compatible with the immediate vicinity. Exterior lighting, if provided, shall be with consideration given to glare, traffic safety and compatibility with property in the immediate vicinity.

   Staff Comment: The applicant has not proposed any signage for the site.

   As required per the supplemental standards, towers shall not be artificially lighted unless required by the FAA. The lighting on the proposed tower is required as part of the FAA's determination of no hazard to air navigation and will comply with the United States Federal Aviation Administration (FAA) Advisory 70/7460-1 L Change 1, Obstruction Marking and Lighting, a med-dual system –Chapters 4,8 (M-Dual), & 12. The flash beacon lighting will be positioned at the top of the communication tower. There is one obstruction light positioned at 264' and two mid-level strobe lights positioned at 175'. During the day, the lighting will be medium intensity, flashing white and, during the night, there will be red sidelights. The FAA advisory specifies that this combination causes fewer environmental concerns than a white, flashing light system used during the night.

   Applicant Comment: The lighting and signage on the proposed tower will not have a negative effect on adjacent properties.

6. **Environmental Protection.** The development shall be planned and operated in such a manner that will safeguard environmental and visual resources. The development shall not generate excessive noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds.

   Staff Comment: No excessive noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds, are anticipated. The applicant has provided a statement and construction plan that all erosion

control and stormwater requirements listed in the Story County Land Development Regulations Chapter 88.05 will be met, including a statement to be included on the site plan. Alliant Energy has also provided a site development plan that includes erosion control measures in compliance with the Story County Land Development Regulations Chapter 88.05(4). The site plan also includes a statement from an engineer that best management practices for stormwater control following Iowa Stormwater Management Manual and Iowa Statewide Urban Design and Specifications are not necessary as there will be negligible impact on the natural hydrology of the site and no point source discharges are anticipated.

Applicant Comment: The proposed tower is not anticipated generate any excessive noise, vibration, dust, smoke, fumes, odor, glare, or groundwater pollution.

If the Commission concludes that all the above development criteria will be met, it must recommend approval of the application unless it concludes that, if completed as proposed, there is a strong probability the development will:

1. **not adequately safeguard the health, safety and general welfare of persons residing or working in adjoining or surrounding property.**

   Staff Comment:

   The tower will be built in compliance with the required setbacks from the right-of-way and adjacent property lines and meet the FAA lighting specifications.

2. **impair an adequate supply (including quality) of light and air to surrounding properties.**

   Staff Comment:

   The proposed communication tower will be a lattice type tower and will have little to no impact on the supply of light and air to surrounding properties. The closest dwelling is located approximately 875’ to the southwest of the tower and is closer to the existing tower. The land directly surrounding the tower is in agricultural row crop production. The existing tower will be removed after the proposed tower is constructed.

3. **unduly increase congestion in the roads, or the hazard from fire, flood, or similar dangers.**

   Staff Comment:

   Following the construction of the proposed tower, there will be very little traffic to and from the tower. Again, traffic is not anticipated to increase above current levels as the proposed tower will replace an existing tower to the west of the proposed site on the same street. The applicant will be required to obtain a new access permit and an E911 address for the proposed tower.

4. **diminish or impair established property values on adjoining or surrounding property.**

   Staff Comment:

The Story County Assessor's Office raised no concerns with this item from the review of the requested Conditional Use Permit application. A 350-foot tall Alliant Energy communication tower of a guyed-wire design has been located in the vicinity since 1964—no further impacts on property values are anticipated.

5. **not be in accord with the intent, purpose and spirit of the Land Development Regulations or County Cornerstone to Capstone (C2C) Plan.**

   Staff Comment:

   The C2C plan is oriented toward preserving the county's rural character and high value agricultural land. The communication tower will be located on agricultural land and will occupy a relatively small imprint on the parcel. Approximately 12,785 square feet or four-percent of the 7.3 net-acre (317,988 square-foot) parcel will be occupied by the tower compound, drive, and hammerhead. The remaining 305,203 square-feet will continue to be farmed by the current property owner.

B. Burden of Persuasion.

1. **The burden of persuasion as to whether the development, if completed as proposed, will comply with the requirements of this Chapter is at all times on the applicant.**

2. **The burden of presenting evidence to the Planning and Zoning Commission sufficient enough for it to conclude that the application does not comply with the requirements of this Chapter is upon the person or persons recommending such a conclusion, unless the information presented by the applicant warrants such a conclusion.**

D. When indicated in Table 90-1, Table of Conditional Uses, a conditional use shall be subject to the supplemental standards listed below, in addition to the standards for approval set forth in Section 90.04 and development impacts specified in Section 90.05 of this chapter.

4. **Communication Towers and Facilities. Communication towers/facilities existing and/or approved prior to the date of adoption of these standards may continue to be used; however, proposed modifications must be reviewed by the Director and, depending on the nature of the proposed modifications, may be subject to review and approval by the Board of Adjustment. In addition, any proposed modifications to approved and/or existing towers/facilities on towers constructed prior to April 20, 2001, for co-location must submit an application for zoning permit consistent with the requirements of Section 92.09, Required Permits.**

   A. Co-Location. Prior to applying for a conditional use permit for construction of a new tower/facility, the applicant shall exhaust all alternatives for co-location on existing towers/facilities. As such, the applicant shall submit evidence demonstrating the following:

   Staff Comment: A statement that collocation was not feasible was provided by the applicant.

The applicant explained that the existing tower was obsolete in its design and was not able to pass a feasibility analysis on if it could physically support the necessary technology, hence the need for the new tower. Additionally, a new tower had to be located as close to the old tower site as possible to maintain the radio frequency coverage, limiting co-location options.

Applicant Comment: Alliant Energy sharing agreements with other peer utilities such as Corn Belt Power Cooperative, allow them to utilize our towers and for us to utilize theirs. Corn Belt Power is on the Alliant Nevada Tower. Corn Belt Power Cooperative, headquartered in Humboldt, Iowa, is a generation and transmission (G&T) electric cooperative owned by its member systems. Corn Belt Power provides electricity to nine-member distribution electric cooperatives and one municipal electric cooperative (NIMECA) that serve farm members, rural residences, small towns and commercial and industrial members in 41 counties in northern Iowa. Corn Belt Power was formed in 1947.

Although Alliant does not actively market leasing space on our towers, we do consider leasing space to tenants on a case by case basis. We fully recognize the need to limit the number of towers in an area and therefore will provide space if structurally and sound, economically feasible, and it does not interfere with our operation.

B. Separation from Planned and/or Existing Residential Properties. All proposed towers/facilities shall be separated from neighboring properties either planned or utilized for residential purposes as established herein. The minimum separation distance shall be measured from the center of the foundation of the proposed tower/facility to the nearest portion of a property line of a neighboring tax parcel used or planned for residential purposes. For the purposes of this section, a property shall be considered to be used for a residential purpose, regardless of assessment type, if a dwelling or mobile home exists on the property. A property shall be considered to be planned for residential purposes if it has the County Development Plan (CDP) designation of Rural Residential Area or a residential designation as defined as an approved fringe area plan; if it is within two miles of a city boundary, and that city has established a residential land use classification for the property; or if a property is zoned Agricultural/Residential (A-R), Residential (R-1), Residential (R-2), or Residential Mobile Home (RMH).

(1) For towers/facilities of self-supporting monopole or lattice-type construction, the minimum separation distance shall be 300 feet or 150 percent of the height of the tower, whichever is greater.

Staff Comment: No residential parcels or planned residential parcels are adjacent to the tower site and thus the requirement is not applicable. The separation distance of the proposed tower from residential properties, if the requirement was applicable, would be 547.5 feet. The closest residential parcel is 875’ feet from the tower site. The planned residential parcel near the proposed tower, designated as rural residential by the C2C plan, is approximately 775’ feet from the tower site.

(2) For guyed towers/facilities the minimum separation distance shall be 300 feet or 150 percent of the height of the tower, whichever is greater, plus 100 percent of the length of the longest supporting guy wire.

Staff Comment: Not Applicable.

C. Height. The applicant must demonstrate the proposed height of the tower/facility is the minimum necessary to accommodate the proposal's requirements, as documented by a qualified engineer.

Comment from Alliant Energy Telecommunications Engineer: Both our current two-way radio (used for field dispatch) and a new proposed wireless meter-reading (AMI) system will be located on this tower. Coverage studies from the radio vendor specify that we must be at the top of the tower to obtain the coverage necessary for reliable dispatch of field crews. Likewise, our AMI vendor has indicated that we need to be at the top of the tower to reach the required quantity of customer electric and gas meters.

D. Required Setbacks. The center foundation of all towers/facilities are required to be set back from any public right-of-way in accordance with the following:

(1) For towers of monopole and lattice-type construction, a distance equal to 150 percent the height of the tower or 200 feet, whichever is greater; and for towers of guyed-type construction, a distance equal to 150 percent the height of the tower plus the length of guyed wire or 200 feet, whichever is greater.

Staff Comment: The tower is a lattice design and the height is 365', requiring a 547.5-foot setback from the right-of-way. The submitted site plan shows that the tower will be set back 555' from the right-of-way, meeting the requirements.

(2) From any adjoining property zoned or planned residential or existing residential use, the distance of 300 feet or 150 percent of the height of the tower/facility for towers of lattice or monopole construction type; and 300 or 150 percent of the height of the tower/facility plus 100 percent of the length of the longest supporting guy wire for towers of guyed type construction as measured the center foundation of the tower/facility to the nearest property line.

Staff Comment: Not applicable.

(3) From other property lines, a distance equal to at least 50 percent of the height of the tower/facility.

Staff Comment: The tower is a lattice design and the height is 365', requiring a 182.5-foot setback from adjacent properties. The submitted site plan shows that the tower will be set back 186' from both side property lines and 187.1 feet from the rear property line meeting the requirements.

(4) Guys and accessory buildings must satisfy the minimum zoning district setback requirements for accessory structures within the lease area.

Staff Comment: There are no guys. The accessory structure meets the minimum zoning district

setbacks. The A-1 Agricultural Zoning District requires a 50-foot front setback from the right-of-way, 10-foot side setbacks, and a two-foot (2) rear setback for accessory structures. The equipment enclosure building is 11.5' x 16'. It is located within the tower compound, which is setback 555' from the right of way, 186' from the side property lines, and 187.1' from the rear property line.

E. Fencing and Screening.

(1) Security Fencing. Towers/facilities shall be enclosed by fencing not less than six feet in height and shall be equipped with appropriate anti-climbing devices.

Staff Comment: The applicant submitted the Alliant Energy fencing standard that will be used for the project. The fence will be eight-feet (8) in height and made of a chain link material. Regarding anti-climbing measures and devices, the fence will have barbed wire at the top. Climbing pegs will be removed from the bottom 20 feet of the tower. Alliant Energy will also install an approximately 10-foot tall anti-climbing door over the climbing ladder.

(2) Screening. The lowest six feet of the tower/facility shall be visually screened by trees, large shrubs, solid walls, buildings, solid fencing, and/or any combination thereof, from all public right-of-ways and adjoining zoned, planned, and/or existing residential land uses.

Staff Comment: On the south side of the compound, facing the right-of-way, Alliant Energy will plant 10 trees, including five (5) viburnum and five (5) dogwoods. The trees will span the full 50-foot width of the compound.

F. Aesthetics. Towers/facilities shall meet the following general requirements.

(1) Color. Towers/facilities shall maintain a galvanized steel finish. If required to be painted by the FAA, such required colored schemes must be submitted to the Board of Adjustment. All mandated FAA requirements must be provided in writing to the Board of Adjustment prior to any action on applications.

Staff Comment: The tower design manual submitted by the applicant specifies that it will be finished in galvanized steel.

(1) Lighting. Towers/facilities, including antennas, shall not be artificially lighted unless required by the FAA or applicable authority. Unless required as the only option by the FAA, strobe lighting is not permitted. If lighting is required, lighting alternatives and design chosen must cause the least disturbance to the surrounding views. All mandated FAA requirements must be provided in writing to the Board of Adjustment prior to any action on applications.

Staff Comment: The applicant submitted the FAA determination of no hazard to air navigation. The lighting proposed for the tower is a requirement of this determination. It is in accordance with FAA Advisory circular 70/7460-1 L Change 1, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8 (MDual), & 12, which includes medium intensity, flashing white lighting during the daytime and red sidelights during the night. The FAA advisory specifies that this

combination causes fewer environmental concerns than a white, flashing light system used during the night.

(2) Signs. No signs shall be allowed on any tower/facility, other than safety or warning signs. If any signage is required consistent with this standard, such signage must comply with the requirements of Section 89.02, Signs.

Staff Comment: The applicant has noted the sign requirement and has not proposed any signage for the site.

G. Compliance with Other Regulations. The proposed tower/facility must comply with all other applicable local, State or Federal regulations.

Staff Comment:

In addition to the FAA determination of no hazard to air navigation, the applicant submitted a no conflict letter from the City of Ames regarding the finding that the municipal airport will have no conflicts with the proposed tower.

H. Obstruction of View. The proposed tower/facility will not unreasonably interfere with the view from any publicly owned or managed areas or major view corridors.

Staff Comment:

While the tower is at a high point on the site, there are no adjacent publically owned areas. All adjacent parcels are in agricultural use. 220th Avenue is a gravel, secondary road and not part of a major view corridor. The tower will be located 555' north of the right-of-way of 220th Avenue.

I. Submittal Requirements. In addition to the submittal requirements defined for conditional use permit applications, all applications for towers/facilities must submit the following information (as applicable). All plans shall be drawn at a scale of one inch equals 50 feet.

(1) A scaled site plan clearly indicating the location, type and height of the proposed tower/facility, existing land uses, adjacent land uses, zoning, County Development Plan designations of the site and for all properties within 500 feet.
(2) Legal description of the parent parcel and leased parcel (if applicable).
(3) The separation distance between the proposed tower/facility and nearest planned and/or existing residential property.
(4) The separation distance from other existing and approved towers. The applicant shall also identify the type of construction of the existing towers and owner/operators of such facilities.
(5) A landscape plan showing specific landscape materials, existing and those proposed, identifying type and size of materials.
(6) Written statements from other applicable jurisdictions such as the FAA regarding coloring and potential lighting requirements. In addition, a copy of the FAA's response to the submitted "Notice of Proposed Construction or Alteration" must be submitted.

(7) A statement by the applicant as to whether construction of the tower/facility will accommodate co-location of additional antennas for future users and documentation regarding the standards for co-located established in the Ordinance.
(8) Identification of all other tower/facility sites owned and/or operated by the applicant within Story County.
(9) Elevations showing all facades, indicating exterior materials and color of the tower/facility on the proposed site.
(10) Copy of the signed lease agreement with the property owner.

Staff Comment: The applicant provided all applicable information as required by the submittal requirements. Alliant Energy is currently in the process of reconfiguring the parcel where the proposed tower will be located to ensure all setbacks are met. Planning and Development staff have included in their recommendation that, as a condition of approval, the new plat of survey be recorded prior to the issuance of a zoning permit.

Commentary

The following comments are part of the official record of the proposed **Alliant Energy Communication tower CUP04-17**. If necessary, conditions of approval may be formulated based off these comments.

Comments from the Interagency Review Team
Conceptual review was completed on June 30, 2016. At the conceptual review meeting, staff learned the proposed tower would only support Alliant Energy's communication needs. Non-commercial towers are reviewed by staff with action by the Board of Supervisors to approve the site development plan and zoning permit. During the review process for the proposal, staff learned that other companies would be allowed to co-locate on the proposed tower, including Corn Belt Power Cooperative, and a conditional use permit was necessary. The conditional use permit application was routed for Interagency Review on March 22, 2016. The following were relevant comments documented by the Interagency Review Team:

Planning and Development:
1. Please provide an explanation of why this site was chosen for the proposed tower. Please also include an explanation for why the existing tower cannot be used to support the proposed equipment.
2. An E911 address is required. You can apply for the address through our office.
3. Please note that no signs shall be allowed on any tower/facility, other than safety or warning signs (see Chapter 90.10(4)(F) Signs.).
4. Please note the Removal of Abandoned Towers/Facilities regulation found in Chapter 90.10(4)(I).

Story County Engineer Department
1. A driveway permit will need to be approved for the location of the new access.

Comments from the General Public
Public notification letters were mailed to surrounding property owners within ¼ mile of the site on March 28, 2017 regarding the Conditional Use Permit application.

No comments have been received as of the completion of this report.

Conditions of Approval

Chapter 90.05: Recommendations on Applications

Staff Recommendation:
Based on review of the site, application materials, and the information and analysis in this staff report, Planning and Development staff recommend approval of the Conditional Use Permit application CUP04-17 as put forth in case CUP04-17 with the condition (Alternative 2) that:

1) ***That a plat of survey be recorded for the reconfiguration of the existing parcel into the 7.3-net acre parcel prior to the issuance of a zoning permit.***

Alternatives

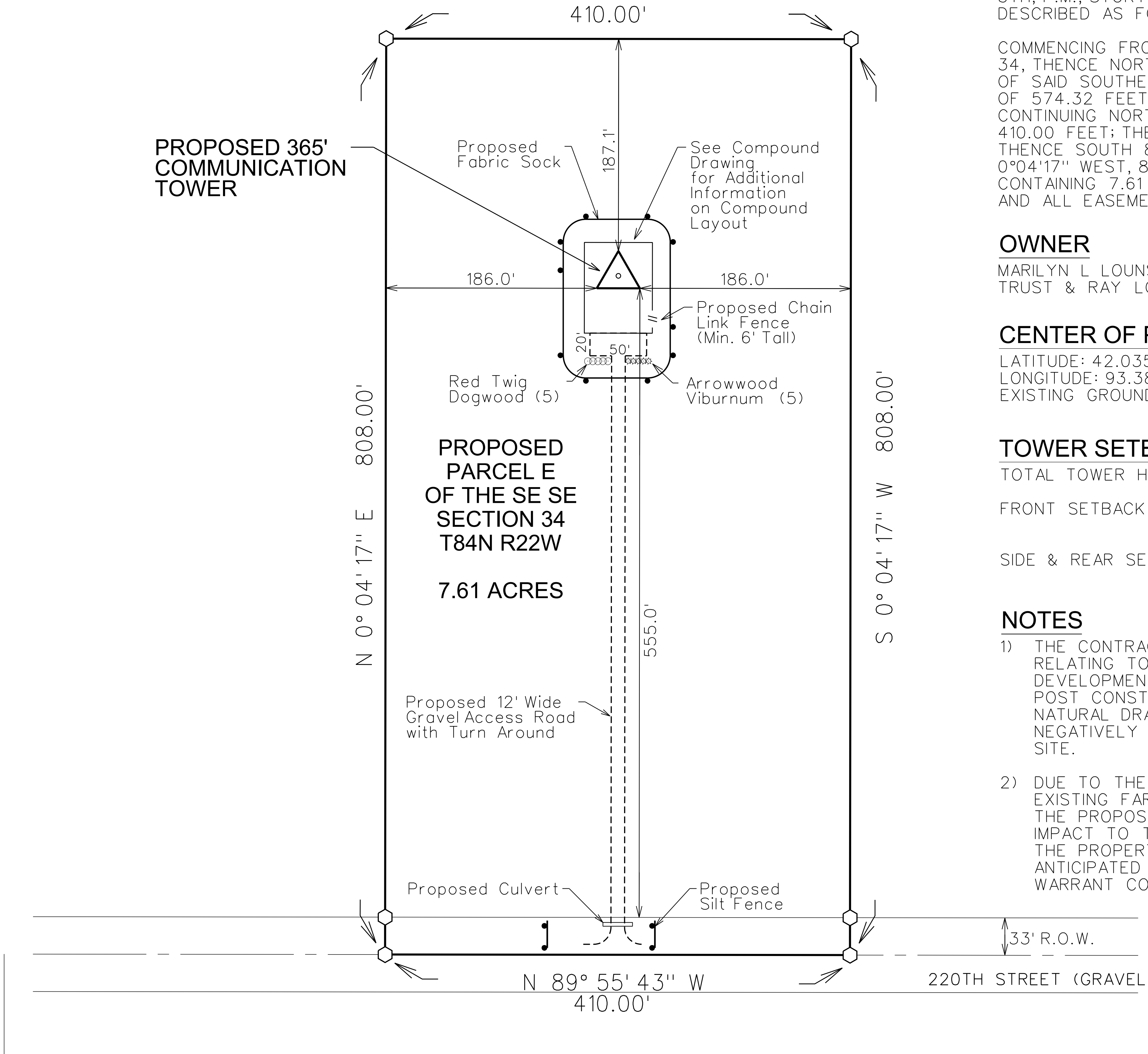
The Story County Planning and Zoning Commission may consider the following alternatives:

1) The Story County Planning and Zoning Commission recommends approval of the Conditional Use Permit for the Alliant Energy Communication tower as put forth in case CUP04-17, as submitted, to the Story County Board of Adjustment, and directs staff to place the case on the Board of Adjustment agenda.

2) **The Story County Planning and Zoning Commission recommends approval of the Conditional Use Permit for the Alliant Energy Communication tower as put forth in case CUP04-17, with conditions, to the Story County Board of Adjustment, and directs staff to place the case on the Board of Adjustment agenda:**

3) The Story County Planning and Zoning Commission recommends denial of the Conditional Use Permit for the Alliant Energy Communication tower as put forth in case CUP04-17, as submitted, to the Story County Board of Adjustment, and directs staff to place the case on the Board of Adjustment agenda.

4) The Story County Planning and Zoning Commission remands the Conditional Use Permit for the Alliant Energy Communication tower as put forth in case CUP04-17, back to the applicant for further review and/or modifications, and directs staff to place this item on the May 3, 2017 Story County Planning and Zoning Commission agenda.



TOWER PROPERTY DESCRIPTION

PARCEL E OF THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 34, TOWNSHIP 84 NORTH, RANGE 22 WEST OF THE 5TH, P.M., STORY COUNTY, IOWA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING FROM THE SOUTHEAST CORNER OF SAID SECTION 34, THENCE NORTH 89°55'43" WEST ALONG THE SOUTH LINE OF SAID SOUTHEAST 1/4 OF THE SOUTHEAST 1/4, A DISTANCE OF 574.32 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING NORTH 89°55'43" WEST ALONG SAID SOUTH LINE, 410.00 FEET; THENCE NORTH 0°04'17" EAST, 808.00 FEET; THENCE SOUTH 89°55'43" EAST, 410.00 FEET; THENCE SOUTH 0°04'17" WEST, 808.00 FEET TO THE POINT OF BEGINNING CONTAINING 7.61 ACRES MORE OR LESS AND SUBJECT TO ANY AND ALL EASEMENTS APPARENT OR OF RECORD.

OWNER

MARILYN L LOUNSBERRY
TRUST & RAY LOUNSBERRY

CENTER OF PROPOSED TOWER

LATITUDE: 42.0359947° N
LONGITUDE: 93.389216° W
EXISTING GROUND ELEV= 1012.0' (NAVD88)

TOWER SETBACKS

TOTAL TOWER HEIGHT - 365'

FRONT SETBACK - 150% OF TOWER HEIGHT TO FACE OF TOWER = 547.5' MINIMUM FROM R.O.W.

SIDE & REAR SETBACK - 50% OF TOWER HEIGHT TO FACE OF TOWER = 182.5' MINIMUM

NOTES

1) THE CONTRACTOR SHALL FOLLOW S.U.D.A.S. BEST PRACTICES RELATING TO EROSION CONTROL AND STORY COUNTY'S LAND DEVELOPMENT REGULATIONS CHAPTER 88.05 FOR THIS SITE. POST CONSTRUCTION DRAINAGE OF THE SITE SHALL MAINTAIN NATURAL DRAINAGE AS MUCH AS PRACTICAL AND NOT NEGATIVELY AFFECT THE EXISTING NATURAL DRAINAGE OF THE SITE.

2) DUE TO THE NATURE OF THE PROJECT, LOCATION WITHIN THE EXISTING FARM FIELD AND THE MINIMAL INTENDED IMPACT OF THE PROPOSED IMPROVEMENTS, THERE WILL BE NEGLIGIBLE IMPACT TO THE EXISTING DRAINAGE PATTERN/RUNOFF FROM THE PROPERTY. NO POINT SOURCE DISCHARGES ARE ANTICIPATED WITH THESE IMPROVEMENTS THAT WOULD WARRANT CONSTRUCTION OF A DETENTION BASIN.

MARK	REVISION	DATE	BY
3	REVISED PER COUNTY COMMENTS	4/03/17	SDB
2	TOWER SCREENING	3/27/17	EJM
1	REVISED SITE LAYOUT	3/20/17	EJM

Engineer: | Checked By: MLS | Scale: 1"= 200'
Technician: RLC | Date: 12/07/2016 | Field Bk: | Pg:
Project No: 1161113 | Sheet 1 of 1

ALLIANT ENERGY - PROSED TOWER LOCATION NEVADA
SITE PLAN
STORY COUNTY, IA

SNYDER & ASSOCIATES, INC.
1751 MADISON AVENUE
COUNCIL BLUFFS, IA 51503
712-322-3202 | www.snyder-associates.com

Project No: 1161113
Sheet 1 of 1

Compound Layout

N

6ft. 0in.

8ft. 0in.

35ft. 0in.

6ft. 0in.

12'x10'

HV AC

11.5' x 16' shelter

500 Gallon LP Tank

9ft. 6in. Pad

3ft. 6in.

102"L x 42.5"W x 59.6"H Kohler Generator

8ft. 6in.

12ft. 0in.

5ft. 0in.

10ft. 0in.

Utility Field Structure

Compound Fence is aprox 50' x 75'

Rack Indicator Legend:

Existing | Future | New | Removed

No	DATE	REVISION	BY	APVD
1	3/23/17	Removed Page 1 & Lat/Lon	RG	

ALLIANT ENERGY

TITLE		
50197-02-01 Nevada Tower Site Plan.vsd		
DATE	PAGE	DRAWN BY
11/12/10	1 OF 1	ME McCune
DRAWING NO		
50277-02-01		

EHRESMANN ENGINEERING INC.

4400 West 31st St – Yankton, SD 57078
Phone: (605) 665-7532 Fax: (605) 665-9780
http://www.ehresmannengineering.com
E-Mail: e.heine@ehresmannengineering.com

New 350' Ehresmann Self Supporting Tower

Designed per TIA-222-G

Site: Nevada, IA

(Lat/Long: 42-02-09N 93-23-39W)

Ehresmann Engineering, Inc. Project
J.O. #98360-17

Prepared For:

Interstate Power & Light Co. (Alliant Energy)
1031 Iowa Street, Ste. 5007
Dubuque, IA 52001

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

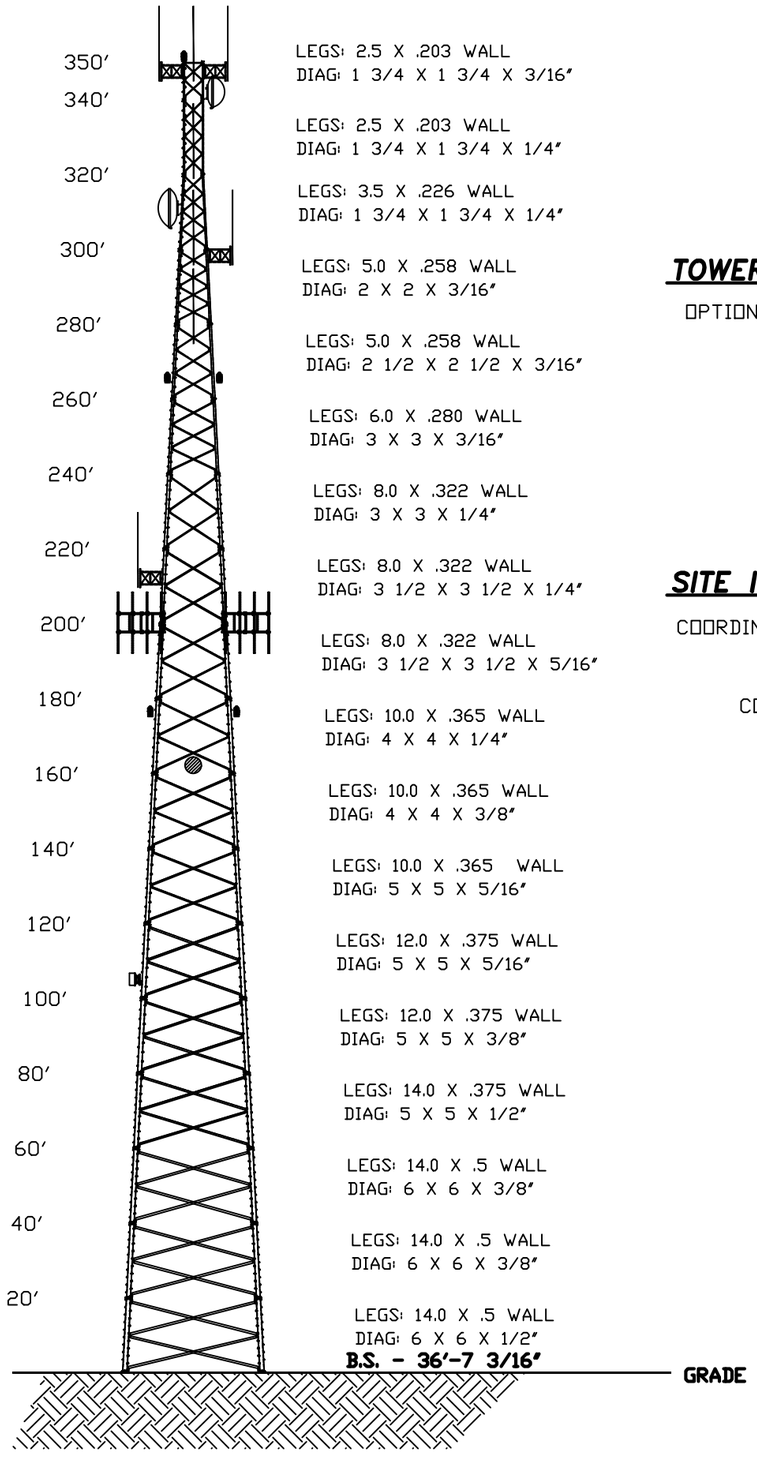
Eric Heine 1/19/17

(signature) (date)

Eric Heine
License Number 21066

My license renewal date is December 31, 2017

Pages or sheets covered by this seal:
Dwg # 98360-C1, E01, E02



EHRESMANN ENGINEERING, INC.
CONSULTING ENGINEERS
4400 WEST 31ST STREET
YANKTON, SD 57078
(605) 665-7532
(605) 665-9780

TOWER DESIGN LOADS:

OPTION #1 - PROPOSED TOWER WITH
- PROPOSED ANTENNAS
- ANALYSIS PER TIA-222-G
- 90 MPH WIND & NO ICE
- 40 MPH WIND & 3/4″ ICE
- 60 MPH WIND & NO ICE (SERVICE)
- STRUCTURAL CLASS III
- EXPOSURE CATEGORY C
- TOPOGRAHIC CATEGORY 1

SITE INFORMATION:

COORDINATES: LATITUDE: 42° 02′ 09″ N
LONGITUDE: 93° 23′ 39″ W

COUNTY: STORY COUNTY, IA

DESGIN LOADING:

ELEV.	ITEM	RAD.	AZ.	LINE
350′	FLASH BEACON LIGHTING	——	——	1/2″ SO CORD
347′	(3) EEI 6′ SIDEARMS	——	——	——
347′	(2) DB810KE-XT	——	——	(2) LDF7-50A
347′	DS8A10F36U-D	——	——	LDF6-50A
341′	ANDREW 8′ (PAR8-59-PXA)	YES	——	EW52
321′	6′ EEI SIDEARM	——	——	——
321′	DS8A10F36U-D	——	——	LDF6-50A
310′	ANDREW 10′ (PAR10-59-PXA)	YES	——	EW52
298′	(2) 6′ EEI SIDEARMS	——	——	——
298′	DB809KE-SY	——	——	LDF6-50A
298′	DB809KE-SY	——	——	LDF5-50A
277′	6′ EEI SIDEARM	——	——	——
277′	DB809KE-SY	——	——	LDF7-50A
264′	OBSTRUCTION LIGHTS	——	——	1/2″ SO CORD
212′	6′ EEI SIDEARM	——	——	——
212′	20′ 8 BAY DI-POLE	——	——	LDF5-50A
200′	14′ EEI T-FRAMES	——	——	——
200′	(9) 8′ X 1′ X 6″ PANELS	——	——	(9) LDF7-50A
200′	(9) 1′ X 1′ X 6″ TMAS	——	——	——
175′	(2) MID-LEVEL STROBES	——	——	——
161.2′	ANDREW 4′ DISH	YES	——	LDF5-50A
160′	P3F-52 (3′ DISH)	YES	——	LDF4.5-50
105′	3′ HP DISH	——	——	EWP90
88′	OBSTRUCTION LIGHTS	——	——	1/2″ SO CORD
85′	LCOM 2425HG (3′ DISH)	YES	——	LDF5-50A

ANCHOR BOLT DATA (PER LEG):

(14x) 1 1/2″ø ASTM F1554 GRADE 105 KSI
X 10′-0″ LG ON A 20″ø BOLT CIRCLE

BASE PLATE DATA (PER LEG):

26″ø, 2″ THICK, ROUND
ASTM A572 50 KSI
(14x) 3/8″ THICK X 5 1/2″ TALL GUSSETS
ASTM A572 50 KSI

NOTES:

1. TOWER DESIGNED ACCORDING TO TIA-222-G.
2. ANTENNA LOADS FROM MANUFACTURING SPECIFICATIONS AND ANDREWS BULLETIN 1015F.
3. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISION OF THE AMERICAN WELDING SOCIETY, A.W.S. D 1.1.
4. ALL TOWER MEMBERS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO ASTM A123.
5. ALL BOLTS SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATION FOR ZINC COATING OF IRON AND STEEL HARDWARE, ASTM A153.
6. BOLTS
   A. BOLTS IN TENSION ASTM A325
   B. STEP BOLTS ASTM A307
7. ALL ITEMS MUST BE INVENTORIED AT THE TIME OF DELIVERY TO THE JOB SITE/STORAGE FACILITY. ANY SHORTAGES REPORTED AFTER THIS DELIVERY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR/OWNER

   ANY PROBLEMS THAT OCCUR WITH SCHEDULING, TRANSPORTATION, DELIVERY, FOUNDATION INSTALLATION, ERECTION OR ANY ITEMS FURNISHED BY EEI MUST BE REPORTED IMMEDIATELY TO ALLOW EEI TIME TO TAKE CORRECTIVE MEASURES. EEI WILL MAKE EVERY EFFORT TO REPAIR/REPLACE NECESSARY ITEMS IN AN EXPEDITED MANNER AND/OR WILL PURSUE CORRECTIVE MEASURES IN THE MOST ECONOMICAL WAY POSSIBLE AT OUR DISCRETION. HOWEVER, UNDER NO CIRCUMSTANCES WILL EEI PAY FOR OR BE RESPONSIBLE FOR ANY DOWN TIME OR EXPENSES INCURRED DUE TO DOWN TIME.
8. TOWER LEGS SHALL BE 50 KSI. ALL OTHER STEEL SHALL BE ASTM A36 MINIMUM.

SITE: NEVADA, IA

350′ EHRESMANN SELF SUPPORTING TOWER

EHRESMANN ENGINEERING, INC.
CONSULTING ENGINEERS
4400 WEST 31st. STREET
YANKTON, SD 57078
(605) 665-7532
(605) 665-9780

DATE: 01/17/17
BY: TR
CHECKED:

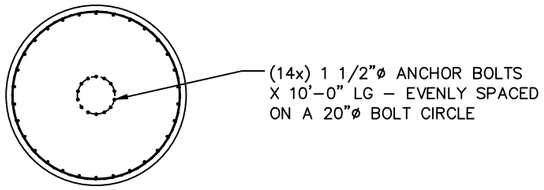
J.O. 98360 | DWG # 98360-C1 | SHT C1 OF

CONCRETE REQUIRED (1) CAISSON
75.4 CU YDS

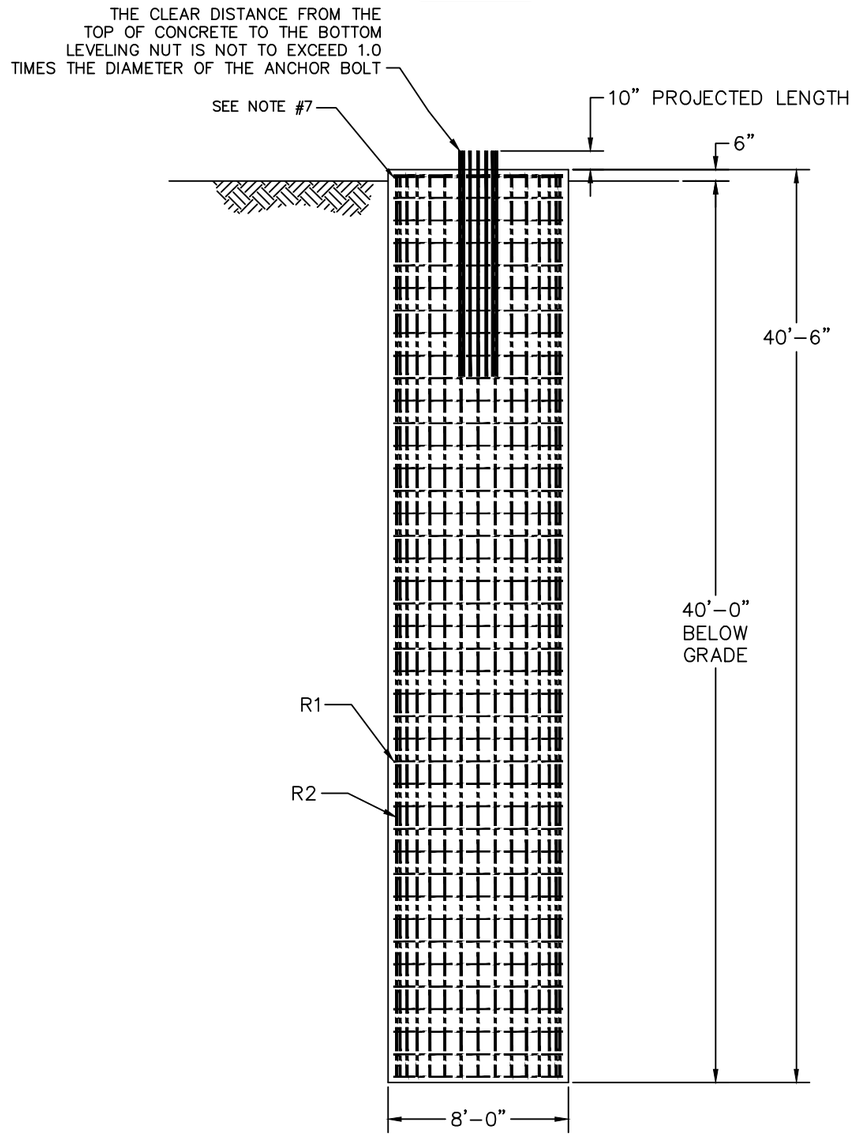
TOTAL CONCRETE REQUIRED
226.2 CU YDS

DESIGN REACTIONS

MAX. UPLIFT = 521.077 KIPS
SHEAR = 75.139 KIPS
MAX COMPRESSION = 651.651 KIPS



PLAN VIEW



ELEVATION VIEW

BILL OF MATERIALS (PER CAISSON)

ITEM	QTY	GRADE	DESCRIPTION	SIZE
R1	42	40 KSI	#5 BARS	4" HOOKS 6" MIN. LAP (STAGGERED) 7'-6"
R2	30	60 KSI	#10 BARS VERTICAL APPROX. 9 1/8" CTC	40'-0"
*	14	105 KSI	1 1/2"ø X 10'-0" LG	10'-0"

* SUPPLIED BY EEI, ALL OTHER MATERIAL TO BE SUPPLIED BY THE CONTRACTOR.

QUANTITIES ABOVE ARE FOR (1) CAISSON (3) ARE REQUIRED.

NOTES:

1.) CONCRETE SHALL ATTAIN ULTIMATE COMPRESSION STRENGTH OF 4,500 PSI AT 28 DAYS
2.) REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE SPECIFICATIONS.
3.) 3" MINIMUM CONCRETE COVER ON ALL REINFORCING STEEL.
4.) BASE OF EXCAVATION SHALL BE CLEAN AND FREE OF ALL DEBRIS.
5.) CASING MAY BE REQUIRED TO ALLOW INSTALLATION OF FOUNDATION.
6.) DESIGN BASED ON SOILS REPORT BY TERRACON CONSULTANTS, INC.; DATED DECEMBER 22, 2016; PROJECT NO. AB165026-01. CONTRACTOR TO REVIEW SOILS REPORT FOR POSSIBLE SPECIAL INSTRUCTIONS BY GEOTECHNICAL ENGINEERS.
7.) LATERAL REINFORCEMENT, CONSISTING OF TWO (2) HORIZONTAL TIES SHALL BE DISTRIBUTED WITHIN 5" OF THE TOP OF THE COLUMN PER ACI 318, SEC. 7.10.5.7.
8.) ACI STANDARDS APPLY TO BENDING REINFORCING STEEL. (ACI 318-LATEST EDITION SECTION 7.2)
9.) EXPOSED EDGES OF FOUNDATION TO BE CHAMFERED 1" X 45°.
10.) IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL PRACTICES AND PROCEDURES UTILIZED DURING WORK REQUIRED ON THE FOUNDATION DO NOT ENDANGER THE SAFETY OF ANY PERSONNEL NOR THE STRUCTURAL INTEGRITY OF THE FOUNDATION.
11.) THESE DRAWINGS INDICATE THE MAJOR OPERATIONS TO BE PERFORMED, BUT DO NOT SHOW EVERY FIELD CONDITION THAT MAY BE ENCOUNTERED. THEREFORE, PRIOR TO BEGINNING WORK THE CONTRACTOR SHOULD SURVEY THE JOB THOROUGHLY TO ELIMINATE ANY FIELD PROBLEMS.
12.) PURCHASER SHALL VERIFY THE INSTALLATION IS IN CONFORMANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
13.) USE STEEL TEMPLATES PROVIDED BY EEI FOR PROPER ANCHOR BOLT PLACEMENT.
14.) REFERENCE EEI "TERMS AND CONDITIONS RELATED TO SALES" AND "ANCHOR ROD TIGHTENING" SHEETS FOR ADDITIONAL NOTES.

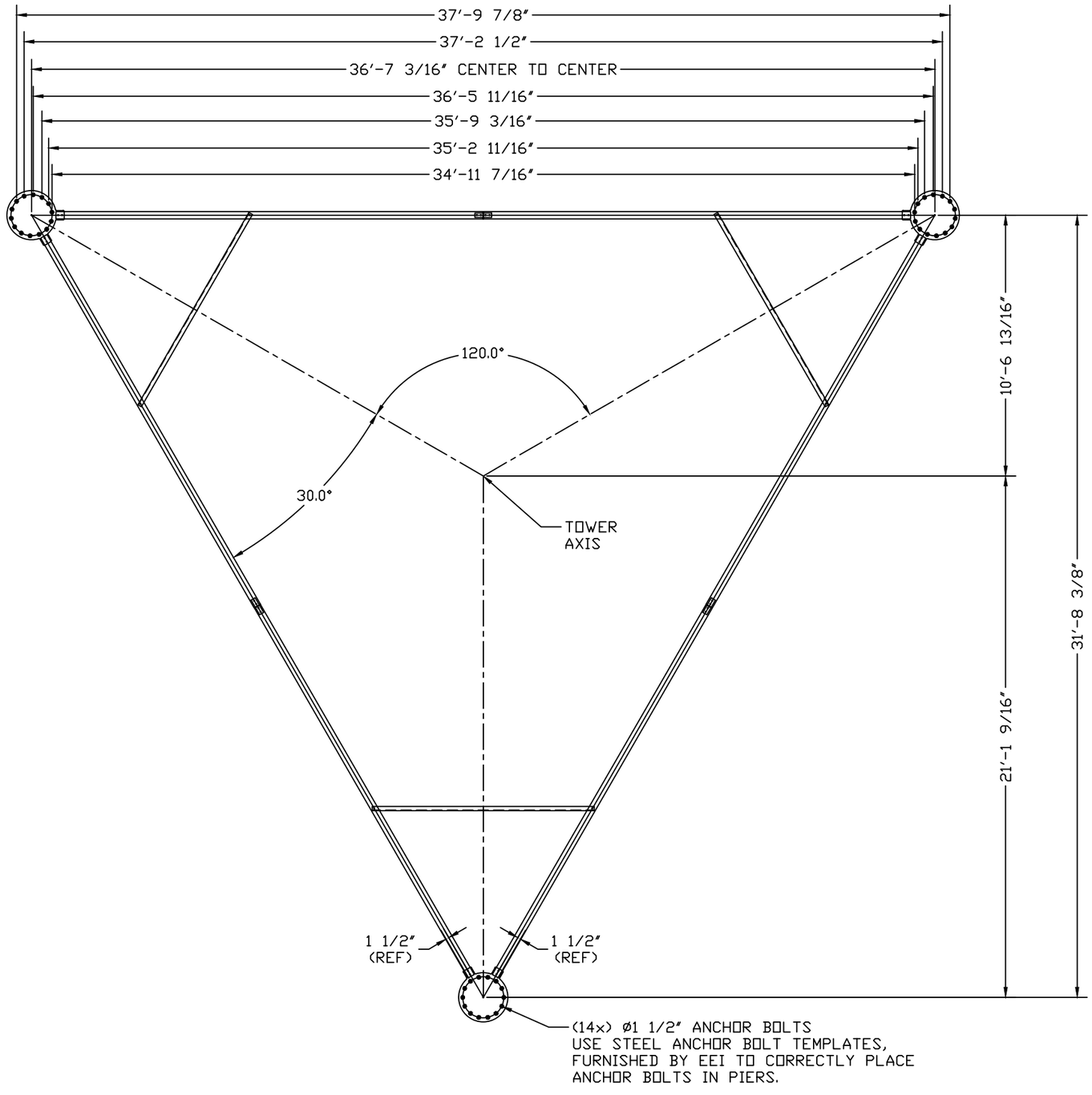
SITE: NEVADA, IA

PIER FOOTING FOUNDATION
350' EEI SSTA

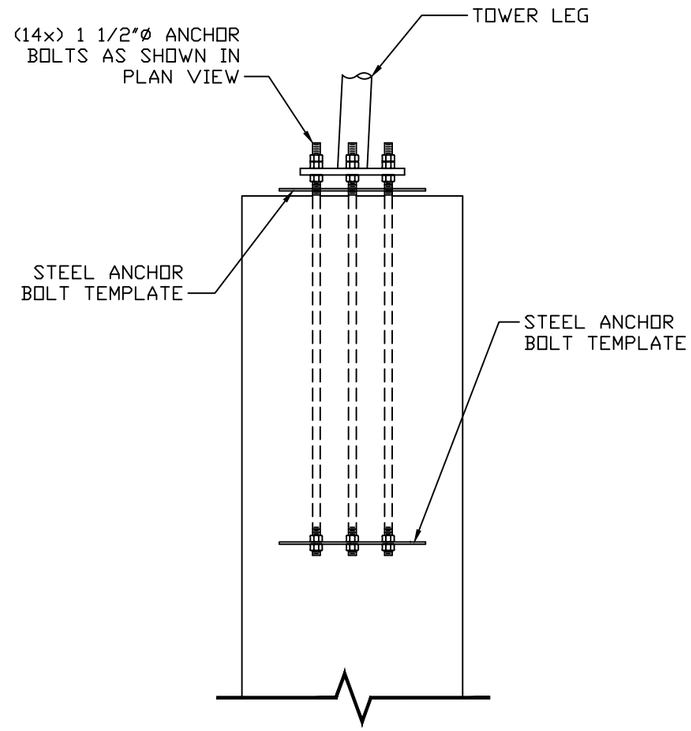
EHRESMANN ENGINEERING, INC.
CONSULTING ENGINEERS
4400 WEST 31st. STREET
YANKTON, SD 57078
(605) 665-7532
(605) 665-9780

DATE: 01/17/17
BY: TR
CHECKED:

J.O. 98360 | DWG # 98360E01 | SHT E01 OF



TYPICAL PLAN VIEW ANCHOR BOLTS



NOTES:

1.) SET ANCHOR BOLTS IN TEMPLATE AND EMBED IN FRESH CONCRETE.
2.) AFTER CONCRETE HAS SET REMOVE TOP TEMPLATE.
3.) SET TOWER IN PLACE USING LEVELING NUTS TO PLUMB TOWER.

SITE: NEVADA, IA

FOUNDATION AND TEMPLATES

EHRESMANN ENGINEERING, INC.
CONSULTING ENGINEERS
4400 WEST 31st. STREET
YANKTON, SD 57078
(605) 665-7532
(605) 665-9780

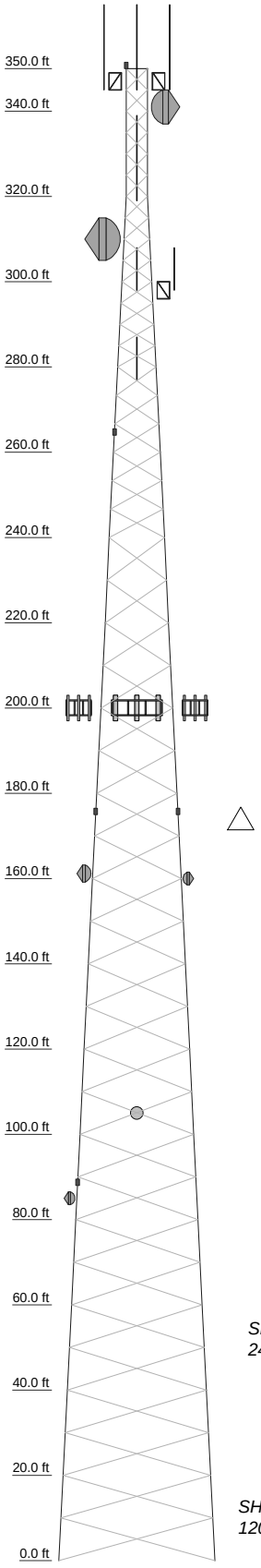
DATE: 01/17/17

BY: TR

CHECKED:

J.O. 98360 | DWG # 98360E02 | SHT E02 OF

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18
Legs		P2.5x.203		P3.5x.226		P5x.258		P6x.28		P8x.322		P10x.365		P12x.375		P14x.375		P14x.5	
Leg Grade		A572-50																	
Diagonals	L6x6x1/2		L6x6x3/8		L5x5x1/2		L5x5x3/8		L5x5x5/16		L4x4x3/8		L4x4x1/4		L3x3x1/4		L3x3x3/16		L2x2x3/16		L1 3/4x1 3/4x1/4		A
Diagonal Grade		A36																	
Top Girts		N.A.																	A
Face Width (ft)	34.625		32.6563		30.6823		28.7135		26.7396		24.7656		22.7969		20.828		18.854		16.8854		14.9115		12.9375		10.9688		9		7.026		5.052
# Panels @ (ft)		24 @ 10																	6 @ 6.66667		14 @ 5	
Weight (lb)	14507.6		11827.2		11468.1		10480.6		8242.9		7223.4		6373.9		5945.3		4798.8		3949.9		3453.2		3136.3		2444.7		1880.9		1804.0		1243.7		969.5		465.3	100205.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	350	Obtruction Lights	264
DB810KE-XT	347	20' 8 Bay Di-Pole	212
6' EEI SIDEARM	347	6' EEI SIDEARM	212
DB810KE-XT	347	(3) 8' X 1' X 6" PANEL	200
6' EEI SIDEARM	347	(3) 1' x 1' x 6" TMA	200
DS8A10F36U-D	347	(3) 1' x 1' x 6" TMA	200
6' EEI SIDEARM	347	(3) 1' x 1' x 6" TMA	200
Andrew 8' w/Radome (PAR8-59-PXA)	341	(3) 14' EEI T-FRAMES SS	200
6' EEI SIDEARM	321	(3) 8' X 1' X 6" PANEL	200
DS8A10F36U-D	321	(3) 8' X 1' X 6" PANEL	200
Andrew 10' w/Radome (PAR10-59-PXA)	310	Mid-Level Strobe	175
		Mid-Level Strobe	175
DB809KE-SY	298	Andrew 4' w/Radome	161.2
6' EEI SIDEARM	298	P3F-52 (3' Dish w/Rad)	160
DB809KE-SY	298	3' HP Dish	105
6' EEI SIDEARM	298	Obtruction Lights	88
DB809KE-SY	277	LCOM 2425HG (3' Dish w/Rad)	85
6' EEI SIDEARM	277		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x3/16	C	L3 1/2x3 1/2x1/4
B	L2 1/2x2 1/2x3/16	D	L3 1/2x3 1/2x5/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Story County, Iowa.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 90 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 73.5%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 651651 lb
SHEAR: 75139 lb

UPLIFT: -521077 lb
SHEAR: 60649 lb

AXIAL
340757 lb

SHEAR
24459 lb

MOMENT
4210802 lb-ft

TORQUE 2967 lb-ft
40 mph WIND - 0.7500 in ICE

AXIAL
136669 lb

SHEAR
120277 lb

MOMENT
19210564 lb-ft

TORQUE 9149 lb-ft
REACTIONS - 90 mph WIND

Ehresmann Engineering, Inc.
4400 W. 31st Street
Yankton, SD
Phone: (605) 665-7532
FAX: (605) 665-9780

Job:	***NEVADA, IA***	***98360-16***	
Project:	***350' EEI SSTA SELF SUPPORTING TOWER***		
Client:	ALLIANT - RICHARD GRACE	Drawn by: EJH	App'd:
Code:	TIA-222-G	Date: 01/06/17	Scale: NTS
Path:	X:\EEI JOBS\9836 - Nevada, IA\98360- NEVADA, IA - 350' EEI SSTA.eri		Dwg No. E-1

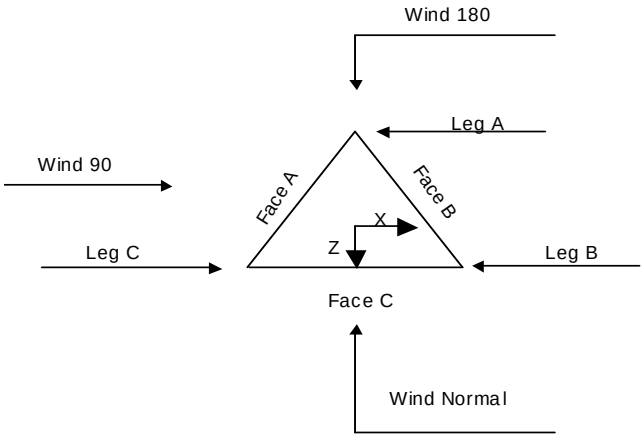
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 350.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.05 ft at the top and 36.60 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Story County, Iowa.
Basic wind speed of 90 mph.
Structure Class III.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
√ Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	350.00-340.00			5.05	1	10.00
T2	340.00-320.00			5.05	1	20.00
T3	320.00-300.00			5.05	1	20.00
T4	300.00-280.00			7.03	1	20.00
T5	280.00-260.00			9.00	1	20.00
T6	260.00-240.00			10.97	1	20.00
T7	240.00-220.00			12.94	1	20.00
T8	220.00-200.00			14.91	1	20.00
T9	200.00-180.00			16.89	1	20.00
T10	180.00-160.00			18.85	1	20.00
T11	160.00-140.00			20.83	1	20.00
T12	140.00-120.00			22.80	1	20.00
T13	120.00-100.00			24.77	1	20.00
T14	100.00-80.00			26.74	1	20.00
T15	80.00-60.00			28.71	1	20.00
T16	60.00-40.00			30.68	1	20.00
T17	40.00-20.00			32.66	1	20.00
T18	20.00-0.00			34.63	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	350.00-340.00	5.00	X Brace	No	No	0.0000	0.0000
T2	340.00-320.00	5.00	X Brace	No	No	0.0000	0.0000
T3	320.00-300.00	5.00	X Brace	No	No	0.0000	0.0000
T4	300.00-280.00	5.00	X Brace	No	No	0.0000	0.0000
T5	280.00-260.00	6.67	X Brace	No	No	0.0000	0.0000
T6	260.00-240.00	6.67	X Brace	No	No	0.0000	0.0000
T7	240.00-220.00	10.00	X Brace	No	No	0.0000	0.0000
T8	220.00-200.00	10.00	X Brace	No	No	0.0000	0.0000
T9	200.00-180.00	10.00	X Brace	No	No	0.0000	0.0000
T10	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T11	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T12	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T13	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T14	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T15	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T16	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T17	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T18	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 350.00-340.00	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 340.00-320.00	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T3 320.00-300.00	Pipe	P3.5x.226	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T4 300.00-280.00	Pipe	P5x.258	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 280.00-260.00	Pipe	P5x.258	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 260.00-240.00	Pipe	P6x.28	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 240.00-220.00	Pipe	P8x.322	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T8 220.00-200.00	Pipe	P8x.322	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 200.00-180.00	Pipe	P8x.322	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T10 180.00-160.00	Pipe	P10x.365	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T11 160.00-140.00	Pipe	P10x.365	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T12 140.00-120.00	Pipe	P10x.365	A572-50 (50 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T13 120.00-100.00	Pipe	P12x.375	A572-50 (50 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T14 100.00-80.00	Pipe	P12x.375	A572-50 (50 ksi)	Equal Angle	L5x5x3/8	A36 (36 ksi)
T15 80.00-60.00	Pipe	P14x.375	A572-50 (50 ksi)	Equal Angle	L5x5x1/2	A36 (36 ksi)
T16 60.00-40.00	Pipe	P14x.5	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T17 40.00-20.00	Pipe	P14x.5	A572-50	Equal Angle	L6x6x3/8	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T18 20.00-0.00	Pipe	P14x.5	(50 ksi) A572-50 (50 ksi)	Equal Angle	L6x6x1/2	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 350.00-340.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 350.00-340.00	1.32	0.2500	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T2 340.00-320.00	2.22	0.2500	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T3 320.00-300.00	2.22	0.2500	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T4 300.00-280.00	5.00	0.3750	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T5 280.00-260.00	4.00	0.3750	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T6 260.00-240.00	4.00	0.3750	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T7 240.00-220.00	3.00	0.3750	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T8 220.00-200.00	3.00	0.3750	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T9 200.00-180.00	3.00	0.3750	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T10 180.00-160.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T11 160.00-140.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T12 140.00-120.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T13 120.00-100.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T14 100.00-80.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T15 80.00-60.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T16 60.00-40.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T17 40.00-20.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000
T18 20.00-0.00	3.00	0.5000	A36 (36 ksi)	1.01	1	1.1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 350.00-340.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 340.00-320.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 320.00-300.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 300.00-280.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 280.00-260.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 260.00-240.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 240.00-220.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 220.00-200.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 200.00-180.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 180.00-160.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 160.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T12 140.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T13 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T14 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T15 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T16 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T17 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T18 20.00-0.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 350.00-340.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 340.00-320.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 320.00-300.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 300.00-280.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 280.00-260.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 260.00-240.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 240.00-220.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 220.00-200.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 200.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 350.00-340.00	Flange	0.7500 A325N	0	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 340.00-320.00	Flange	1.0000 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 320.00-300.00	Flange	1.0000 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T4 300.00-280.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 280.00-260.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 260.00-240.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 240.00-220.00	Flange	1.1250 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 220.00-200.00	Flange	1.1250 A325N	9	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 200.00-180.00	Flange	1.1250 A325N	9	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 180.00-160.00	Flange	1.2500 A325N	9	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 160.00-140.00	Flange	1.2500 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 140.00-120.00	Flange	1.2500 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 120.00-100.00	Flange	1.2500 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 100.00-80.00	Flange	1.2500 A325N	12	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 80.00-60.00	Flange	1.2500 A325N	12	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T16 60.00-40.00	Flange	1.2500 A325N	12	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T17 40.00-20.00	Flange	1.2500 A325N	12	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T18 20.00-0.00	Flange	1.2500 A325N	12	1.1250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2" SO Cord	A	No	Ar (CaAa)	350.00 - 8.00	1	1	0.6300	0.6300		0.40
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	347.00 - 8.00	2	2	1.0200 1.9800	1.9800		0.82
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	347.00 - 8.00	1	1	1.5500	1.5500		0.66
EW52	A	No	Ar (CaAa)	341.00 - 8.00	1	1	1.7426	1.7426		0.59
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	321.00 - 8.00	1	1	1.5500	1.5500		0.66
EW52	C	No	Ar (CaAa)	310.00 - 8.00	1	1	1.7426	1.7426		0.59
LDF6-50A (1-1/4 FOAM)	C	No	Ar (CaAa)	298.00 - 8.00	1	1	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	298.00 - 8.00	1	1	1.9100 1.0900	1.0900		0.33
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	277.00 - 8.00	1	1	1.9800	1.9800		0.82
1/2" SO Cord	A	No	Ar (CaAa)	264.00 - 8.00	1	1	0.6300	0.6300		0.40
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	212.00 - 8.00	1	1	1.9100 1.0900	1.0900		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	200.00 - 8.00	9	5	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	161.20 - 8.00	1	1	1.9100 1.0900	1.0900		0.33
LDF4.5-50 (5/8 FOAM)	A	No	Ar (CaAa)	160.00 - 8.00	1	1	2.1300 0.8700	0.8700		0.15
EWP90	A	No	Ar (CaAa)	105.00 - 8.00	1	1	0.9869	0.9869		0.32
1/2" SO Cord	A	No	Ar (CaAa)	88.00 - 8.00	1	1	0.6300	0.6300		0.40
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	85.00 - 8.00	1	1	1.0900	1.0900		0.33

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Climbing Ladder	A	No	CaAa (In Face)	350.00 - 0.00	1	No Ice	0.29	7.90
						1/2" Ice	0.55	10.60
						1" Ice	0.81	13.30

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	350.00-340.00	A	0.000	0.000	4.789	0.000	88.21
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.772	0.000	11.48
T2	340.00-320.00	A	0.000	0.000	13.800	0.000	191.66
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.920	0.000	32.80
T3	320.00-300.00	A	0.000	0.000	16.745	0.000	204.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	9.663	0.000	38.70
T4	300.00-280.00	A	0.000	0.000	18.707	0.000	210.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.195	0.000	56.48
T5	280.00-260.00	A	0.000	0.000	19.177	0.000	212.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	17.871	0.000	71.74
T6	260.00-240.00	A	0.000	0.000	20.185	0.000	218.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	18.465	0.000	74.20
T7	240.00-220.00	A	0.000	0.000	20.185	0.000	218.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	18.465	0.000	74.20
T8	220.00-200.00	A	0.000	0.000	21.493	0.000	222.76
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	18.465	0.000	74.20
T9	200.00-180.00	A	0.000	0.000	22.365	0.000	225.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	54.105	0.000	221.80
T10	180.00-160.00	A	0.000	0.000	22.365	0.000	225.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	54.236	0.000	222.20
T11	160.00-140.00	A	0.000	0.000	24.105	0.000	228.40

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T12	140.00-120.00	A	0.000	0.000	24.105	0.000	228.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T13	120.00-100.00	A	0.000	0.000	24.599	0.000	230.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T14	100.00-80.00	A	0.000	0.000	27.128	0.000	239.65
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T15	80.00-60.00	A	0.000	0.000	29.519	0.000	249.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T16	60.00-40.00	A	0.000	0.000	29.519	0.000	249.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T17	40.00-20.00	A	0.000	0.000	29.519	0.000	249.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	56.285	0.000	228.40
T18	20.00-0.00	A	0.000	0.000	20.031	0.000	212.84
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	33.771	0.000	137.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	350.00-340.00	A	2.371	0.000	0.000	25.654	0.000	394.60
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	10.342	0.000	146.22
T2	340.00-320.00	A	2.360	0.000	0.000	67.147	0.000	1092.55
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	29.476	0.000	415.56
T3	320.00-300.00	A	2.346	0.000	0.000	78.673	0.000	1309.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.808	0.000	535.53
T4	300.00-280.00	A	2.330	0.000	0.000	88.613	0.000	1479.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	53.250	0.000	863.61
T5	280.00-260.00	A	2.314	0.000	0.000	91.361	0.000	1520.50
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	65.476	0.000	1098.71
T6	260.00-240.00	A	2.296	0.000	0.000	99.162	0.000	1643.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.122	0.000	1125.62
T7	240.00-220.00	A	2.277	0.000	0.000	98.507	0.000	1624.81
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	66.760	0.000	1112.83
T8	220.00-200.00	A	2.256	0.000	0.000	104.520	0.000	1719.90
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	66.370	0.000	1099.08
T9	200.00-180.00	A	2.234	0.000	0.000	108.139	0.000	1772.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	127.438	0.000	2611.65
T10	180.00-160.00	A	2.209	0.000	0.000	107.190	0.000	1745.66
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		0.000	0.000	127.467	0.000	2595.24
T11	160.00-140.00	A	2.182	0.000	0.000	116.601	0.000	1882.16
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	137.009	0.000	2734.76
T12	140.00-120.00	A	2.151	0.000	0.000	115.287	0.000	1845.63
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	136.092	0.000	2696.59
T13	120.00-100.00	A	2.115	0.000	0.000	116.385	0.000	1845.78
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	135.038	0.000	2653.06
T14	100.00-80.00	A	2.073	0.000	0.000	128.699	0.000	2016.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	133.795	0.000	2602.20
T15	80.00-60.00	A	2.021	0.000	0.000	139.485	0.000	2151.78
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	132.275	0.000	2540.62
T16	60.00-40.00	A	1.955	0.000	0.000	135.846	0.000	2053.70
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	130.298	0.000	2461.70
T17	40.00-20.00	A	1.857	0.000	0.000	130.551	0.000	1915.26
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	127.423	0.000	2349.18
T18	20.00-0.00	A	1.664	0.000	0.000	81.266	0.000	1128.40
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	73.032	0.000	1280.36

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	1/2" SO Cord	340.00 - 350.00	0.6000	0.4333
T1	2	Climbing Ladder	340.00 - 350.00	1.0000	1.0000
T1	3	LDF7-50A (1-5/8 FOAM)	340.00 - 347.00	0.6000	0.4333
T1	4	LDF6-50A (1-1/4 FOAM)	340.00 - 347.00	0.6000	0.4333
T1	5	EW52	340.00 - 341.00	0.6000	0.4333
T2	1	1/2" SO Cord	320.00 - 340.00	0.6000	0.4899
T2	2	Climbing Ladder	320.00 - 340.00	1.0000	1.0000
T2	3	LDF7-50A (1-5/8 FOAM)	320.00 - 340.00	0.6000	0.4899
T2	4	LDF6-50A (1-1/4 FOAM)	320.00 - 340.00	0.6000	0.4899
T2	5	EW52	320.00 - 340.00	0.6000	0.4899
T2	6	LDF6-50A (1-1/4 FOAM)	320.00 - 321.00	0.6000	0.4899
T3	1	1/2" SO Cord	300.00 - 320.00	0.6000	0.5239
T3	2	Climbing Ladder	300.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	3	LDF7-50A (1-5/8 FOAM)	320.00 300.00 -	0.6000	0.5239
T3	4	LDF6-50A (1-1/4 FOAM)	320.00 300.00 -	0.6000	0.5239
T3	5	EW52	320.00 300.00 -	0.6000	0.5239
T3	6	LDF6-50A (1-1/4 FOAM)	320.00 300.00 -	0.6000	0.5239
T3	7	EW52	320.00 300.00 -	0.6000	0.5239
T4	1	1/2" SO Cord	310.00 280.00 -	0.6000	0.5454
T4	2	Climbing Ladder	300.00 280.00 -	1.0000	1.0000
T4	3	LDF7-50A (1-5/8 FOAM)	300.00 280.00 -	0.6000	0.5454
T4	4	LDF6-50A (1-1/4 FOAM)	300.00 280.00 -	0.6000	0.5454
T4	5	EW52	300.00 280.00 -	0.6000	0.5454
T4	6	LDF6-50A (1-1/4 FOAM)	300.00 280.00 -	0.6000	0.5454
T4	7	EW52	300.00 280.00 -	0.6000	0.5454
T4	8	LDF6-50A (1-1/4 FOAM)	300.00 280.00 -	0.6000	0.5454
T4	9	LDF5-50A (7/8 FOAM)	298.00 280.00 -	0.6000	0.5454
T5	1	1/2" SO Cord	298.00 260.00 -	0.6000	0.6000
T5	2	Climbing Ladder	280.00 260.00 -	1.0000	1.0000
T5	3	LDF7-50A (1-5/8 FOAM)	280.00 260.00 -	0.6000	0.6000
T5	4	LDF6-50A (1-1/4 FOAM)	280.00 260.00 -	0.6000	0.6000
T5	5	EW52	280.00 260.00 -	0.6000	0.6000
T5	6	LDF6-50A (1-1/4 FOAM)	280.00 260.00 -	0.6000	0.6000
T5	7	EW52	280.00 260.00 -	0.6000	0.6000
T5	8	LDF6-50A (1-1/4 FOAM)	280.00 260.00 -	0.6000	0.6000
T5	9	LDF5-50A (7/8 FOAM)	280.00 260.00 -	0.6000	0.6000
T5	10	LDF7-50A (1-5/8 FOAM)	280.00 260.00 -	0.6000	0.6000
T5	11	1/2" SO Cord	277.00 260.00 -	0.6000	0.6000
T6	1	1/2" SO Cord	264.00 240.00 -	0.6000	0.6000
T6	2	Climbing Ladder	260.00 240.00 -	1.0000	1.0000
T6	3	LDF7-50A (1-5/8 FOAM)	260.00 240.00 -	0.6000	0.6000
T6	4	LDF6-50A (1-1/4 FOAM)	260.00 240.00 -	0.6000	0.6000
T6	5	EW52	260.00 240.00 -	0.6000	0.6000
T6	6	LDF6-50A (1-1/4 FOAM)	260.00 240.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	7	EW52	240.00 - 260.00	0.6000	0.6000
T6	8	LDF6-50A (1-1/4 FOAM)	240.00 - 260.00	0.6000	0.6000
T6	9	LDF5-50A (7/8 FOAM)	240.00 - 260.00	0.6000	0.6000
T6	10	LDF7-50A (1-5/8 FOAM)	240.00 - 260.00	0.6000	0.6000
T6	11	1/2" SO Cord	240.00 - 260.00	0.6000	0.6000
T7	1	1/2" SO Cord	220.00 - 240.00	0.6000	0.6000
T7	2	Climbing Ladder	220.00 - 240.00	1.0000	1.0000
T7	3	LDF7-50A (1-5/8 FOAM)	220.00 - 240.00	0.6000	0.6000
T7	4	LDF6-50A (1-1/4 FOAM)	220.00 - 240.00	0.6000	0.6000
T7	5	EW52	220.00 - 240.00	0.6000	0.6000
T7	6	LDF6-50A (1-1/4 FOAM)	220.00 - 240.00	0.6000	0.6000
T7	7	EW52	220.00 - 240.00	0.6000	0.6000
T7	8	LDF6-50A (1-1/4 FOAM)	220.00 - 240.00	0.6000	0.6000
T7	9	LDF5-50A (7/8 FOAM)	220.00 - 240.00	0.6000	0.6000
T7	10	LDF7-50A (1-5/8 FOAM)	220.00 - 240.00	0.6000	0.6000
T7	11	1/2" SO Cord	220.00 - 240.00	0.6000	0.6000
T8	1	1/2" SO Cord	200.00 - 220.00	0.6000	0.6000
T8	2	Climbing Ladder	200.00 - 220.00	1.0000	1.0000
T8	3	LDF7-50A (1-5/8 FOAM)	200.00 - 220.00	0.6000	0.6000
T8	4	LDF6-50A (1-1/4 FOAM)	200.00 - 220.00	0.6000	0.6000
T8	5	EW52	200.00 - 220.00	0.6000	0.6000
T8	6	LDF6-50A (1-1/4 FOAM)	200.00 - 220.00	0.6000	0.6000
T8	7	EW52	200.00 - 220.00	0.6000	0.6000
T8	8	LDF6-50A (1-1/4 FOAM)	200.00 - 220.00	0.6000	0.6000
T8	9	LDF5-50A (7/8 FOAM)	200.00 - 220.00	0.6000	0.6000
T8	10	LDF7-50A (1-5/8 FOAM)	200.00 - 220.00	0.6000	0.6000
T8	11	1/2" SO Cord	200.00 - 220.00	0.6000	0.6000
T8	12	LDF5-50A (7/8 FOAM)	200.00 - 212.00	0.6000	0.6000
T9	1	1/2" SO Cord	180.00 - 200.00	0.6000	0.6000
T9	2	Climbing Ladder	180.00 - 200.00	1.0000	1.0000
T9	3	LDF7-50A (1-5/8 FOAM)	180.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	4	LDF6-50A (1-1/4 FOAM)	180.00 - 200.00	0.6000	0.6000
T9	5	EW52	180.00 - 200.00	0.6000	0.6000
T9	6	LDF6-50A (1-1/4 FOAM)	180.00 - 200.00	0.6000	0.6000
T9	7	EW52	180.00 - 200.00	0.6000	0.6000
T9	8	LDF6-50A (1-1/4 FOAM)	180.00 - 200.00	0.6000	0.6000
T9	9	LDF5-50A (7/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T9	10	LDF7-50A (1-5/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T9	11	1/2" SO Cord	180.00 - 200.00	0.6000	0.6000
T9	12	LDF5-50A (7/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T9	13	LDF7-50A (1-5/8 FOAM)	180.00 - 200.00	0.6000	0.6000
T10	1	1/2" SO Cord	160.00 - 180.00	0.6000	0.6000
T10	2	Climbing Ladder	160.00 - 180.00	1.0000	1.0000
T10	3	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	4	LDF6-50A (1-1/4 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	5	EW52	160.00 - 180.00	0.6000	0.6000
T10	6	LDF6-50A (1-1/4 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	7	EW52	160.00 - 180.00	0.6000	0.6000
T10	8	LDF6-50A (1-1/4 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	9	LDF5-50A (7/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	10	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	11	1/2" SO Cord	160.00 - 180.00	0.6000	0.6000
T10	12	LDF5-50A (7/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	13	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T10	14	LDF5-50A (7/8 FOAM)	160.00 - 161.20	0.6000	0.6000
T11	1	1/2" SO Cord	140.00 - 160.00	0.6000	0.6000
T11	2	Climbing Ladder	140.00 - 160.00	1.0000	1.0000
T11	3	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	4	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	5	EW52	140.00 - 160.00	0.6000	0.6000
T11	6	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	7	EW52	140.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	8	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	9	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	10	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	11	1/2" SO Cord	140.00 - 160.00	0.6000	0.6000
T11	12	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	13	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	14	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T11	15	LDF4.5-50 (5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T12	1	1/2" SO Cord	120.00 - 140.00	0.6000	0.6000
T12	2	Climbing Ladder	120.00 - 140.00	1.0000	1.0000
T12	3	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	4	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	5	EW52	120.00 - 140.00	0.6000	0.6000
T12	6	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	7	EW52	120.00 - 140.00	0.6000	0.6000
T12	8	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	9	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	10	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	11	1/2" SO Cord	120.00 - 140.00	0.6000	0.6000
T12	12	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	13	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	14	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T12	15	LDF4.5-50 (5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T13	1	1/2" SO Cord	100.00 - 120.00	0.6000	0.6000
T13	2	Climbing Ladder	100.00 - 120.00	1.0000	1.0000
T13	3	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	4	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	5	EW52	100.00 - 120.00	0.6000	0.6000
T13	6	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	7	EW52	100.00 - 120.00	0.6000	0.6000
T13	8	LDF6-50A (1-1/4 FOAM)	100.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			120.00		
T13	9	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	10	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	11	1/2" SO Cord	100.00 - 120.00	0.6000	0.6000
T13	12	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	13	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	14	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	15	LDF4.5-50 (5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T13	16	EWP90	100.00 - 105.00	0.6000	0.6000
T14	1	1/2" SO Cord	80.00 - 100.00	0.6000	0.6000
T14	2	Climbing Ladder	80.00 - 100.00	1.0000	1.0000
T14	3	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	4	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	5	EW52	80.00 - 100.00	0.6000	0.6000
T14	6	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	7	EW52	80.00 - 100.00	0.6000	0.6000
T14	8	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	9	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	10	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	11	1/2" SO Cord	80.00 - 100.00	0.6000	0.6000
T14	12	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	13	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	14	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	15	LDF4.5-50 (5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T14	16	EWP90	80.00 - 100.00	0.6000	0.6000
T14	17	1/2" SO Cord	80.00 - 88.00	0.6000	0.6000
T14	18	LDF5-50A (7/8 FOAM)	80.00 - 85.00	0.6000	0.6000
T15	1	1/2" SO Cord	60.00 - 80.00	0.6000	0.6000
T15	2	Climbing Ladder	60.00 - 80.00	1.0000	1.0000
T15	3	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	4	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	5	EW52	60.00 - 80.00	0.6000	0.6000
T15	6	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	7	EW52	60.00 - 80.00	0.6000	0.6000
T15	8	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	9	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	10	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	11	1/2" SO Cord	60.00 - 80.00	0.6000	0.6000
T15	12	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	13	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	14	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	15	LDF4.5-50 (5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T15	16	EWP90	60.00 - 80.00	0.6000	0.6000
T15	17	1/2" SO Cord	60.00 - 80.00	0.6000	0.6000
T15	18	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T16	1	1/2" SO Cord	40.00 - 60.00	0.6000	0.6000
T16	2	Climbing Ladder	40.00 - 60.00	1.0000	1.0000
T16	3	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	4	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	5	EW52	40.00 - 60.00	0.6000	0.6000
T16	6	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	7	EW52	40.00 - 60.00	0.6000	0.6000
T16	8	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	9	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T16	10	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	11	1/2" SO Cord	40.00 - 60.00	0.6000	0.6000
T16	12	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	13	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	14	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	15	LDF4.5-50 (5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T16	16	EWP90	40.00 - 60.00	0.6000	0.6000
T16	17	1/2" SO Cord	40.00 - 60.00	0.6000	0.6000
T16	18	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T17	1	1/2" SO Cord	20.00 - 40.00	0.6000	0.6000
T17	2	Climbing Ladder	20.00 - 40.00	1.0000	1.0000
T17	3	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	4	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	5	EW52	20.00 - 40.00	0.6000	0.6000
T17	6	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	7	EW52	20.00 - 40.00	0.6000	0.6000
T17	8	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	9	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	10	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	11	1/2" SO Cord	20.00 - 40.00	0.6000	0.6000
T17	12	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	13	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	14	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	15	LDF4.5-50 (5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T17	16	EWP90	20.00 - 40.00	0.6000	0.6000
T17	17	1/2" SO Cord	20.00 - 40.00	0.6000	0.6000
T17	18	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T18	1	1/2" SO Cord	8.00 - 20.00	0.6000	0.6000
T18	2	Climbing Ladder	0.00 - 20.00	1.0000	1.0000
T18	3	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	4	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	5	EW52	8.00 - 20.00	0.6000	0.6000
T18	6	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	7	EW52	8.00 - 20.00	0.6000	0.6000
T18	8	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	9	LDF5-50A (7/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	10	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	11	1/2" SO Cord	8.00 - 20.00	0.6000	0.6000
T18	12	LDF5-50A (7/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	13	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	14	LDF5-50A (7/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	15	LDF4.5-50 (5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T18	16	EWP90	8.00 - 20.00	0.6000	0.6000
T18	17	1/2" SO Cord	8.00 - 20.00	0.6000	0.6000
T18	18	LDF5-50A (7/8 FOAM)	8.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Flash Beacon Lighting	C	From Leg	0.00	0.0000	350.00	No Ice	2.70	2.70	50.00
			0.00			1/2" Ice	3.10	3.10	70.00
			0.00			1" Ice	3.50	3.50	90.00
DB810KE-XT	B	From Leg	6.00	0.0000	347.00	No Ice	4.35	4.35	36.00
			0.00			1/2" Ice	5.83	5.83	67.41
			8.00			1" Ice	7.33	7.33	108.13
6' EEI SIDEARM	B	From Leg	3.00	0.0000	347.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
DB810KE-XT	C	From Leg	6.00	0.0000	347.00	No Ice	4.35	4.35	36.00
			0.00			1/2" Ice	5.83	5.83	67.41
			8.00			1" Ice	7.33	7.33	108.13
6' EEI SIDEARM	C	From Leg	3.00	0.0000	347.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
DS8A10F36U-D	A	From Leg	6.00	0.0000	347.00	No Ice	4.35	4.35	38.00
			0.00			1/2" Ice	5.83	5.83	69.41
			8.00			1" Ice	7.33	7.33	110.13
6' EEI SIDEARM	A	From Leg	3.00	0.0000	347.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
DS8A10F36U-D	A	From Leg	6.00	0.0000	321.00	No Ice	4.35	4.35	38.00
			0.00			1/2" Ice	5.83	5.83	69.41
			8.00			1" Ice	7.33	7.33	110.13
6' EEI SIDEARM	A	From Leg	3.00	0.0000	321.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
DB809KE-SY	A	From Leg	6.00	0.0000	298.00	No Ice	3.66	3.66	30.00
			0.00			1/2" Ice	4.91	4.91	56.49
			5.00			1" Ice	6.18	6.18	90.89
6' EEI SIDEARM	A	From Leg	3.00	0.0000	298.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
DB809KE-SY	B	From Leg	6.00	0.0000	298.00	No Ice	3.66	3.66	30.00
			0.00			1/2" Ice	4.91	4.91	56.49
			5.00			1" Ice	6.18	6.18	90.89
6' EEI SIDEARM	B	From Leg	3.00	0.0000	298.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
DB809KE-SY	A	From Leg	6.00	0.0000	277.00	No Ice	3.66	3.66	30.00
			0.00			1/2" Ice	4.91	4.91	56.49
			5.00			1" Ice	6.18	6.18	90.89
6' EEI SIDEARM	A	From Leg	3.00	0.0000	277.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
20' 8 Bay Di-Pole	A	From Leg	6.00	0.0000	212.00	No Ice	4.00	4.00	55.00
			0.00			1/2" Ice	6.00	6.00	100.00
			10.00			1" Ice	8.00	8.00	145.00
6' EEI SIDEARM	A	From Leg	3.00	0.0000	212.00	No Ice	8.30	8.30	315.00
			0.00			1/2" Ice	10.70	10.70	350.00
			0.00			1" Ice	13.10	13.10	385.00
(3) 14' EEI T-FRAMES SS	C	None		0.0000	200.00	No Ice	15.00	15.00	1750.00
						1/2" Ice	26.80	26.80	2000.00
						1" Ice	38.60	38.60	2250.00
(3) 8' X 1' X 6" PANEL	A	From Leg	3.00	0.0000	200.00	No Ice	11.47	6.80	50.00
			0.00			1/2" Ice	12.08	7.38	112.06
			0.00			1" Ice	12.71	7.98	181.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(3) 8' X 1' X 6" PANEL	B	From Leg	3.00	0.0000	200.00	No Ice	11.47	6.80	50.00
			0.00			1/2" Ice	12.08	7.38	112.06
			0.00			1" Ice	12.71	7.98	181.70
(3) 8' X 1' X 6" PANEL	C	From Leg	3.00	0.0000	200.00	No Ice	11.47	6.80	50.00
			0.00			1/2" Ice	12.08	7.38	112.06
			0.00			1" Ice	12.71	7.98	181.70
(3) 1' x 1' x 6" TMA	A	From Leg	3.00	0.0000	200.00	No Ice	1.20	0.60	10.00
			0.00			1/2" Ice	1.34	0.70	20.34
			0.00			1" Ice	1.48	0.81	32.81
(3) 1' x 1' x 6" TMA	B	From Leg	3.00	0.0000	200.00	No Ice	1.20	0.60	10.00
			0.00			1/2" Ice	1.34	0.70	20.34
			0.00			1" Ice	1.48	0.81	32.81
(3) 1' x 1' x 6" TMA	C	From Leg	3.00	0.0000	200.00	No Ice	1.20	0.60	10.00
			0.00			1/2" Ice	1.34	0.70	20.34
			0.00			1" Ice	1.48	0.81	32.81
Obtruction Lights	C	From Leg	0.00	0.0000	264.00	No Ice	2.70	2.70	50.00
			0.00			1/2" Ice	3.10	3.10	70.00
			0.00			1" Ice	3.50	3.50	90.00
Obtruction Lights	C	From Leg	0.00	0.0000	88.00	No Ice	2.70	2.70	50.00
			0.00			1/2" Ice	3.10	3.10	70.00
			0.00			1" Ice	3.50	3.50	90.00
Mid-Level Strobe	B	From Leg	0.00	0.0000	175.00	No Ice	2.70	2.70	50.00
			0.00			1/2" Ice	3.10	3.10	70.00
			0.00			1" Ice	3.50	3.50	90.00
Mid-Level Strobe	C	From Leg	0.00	0.0000	175.00	No Ice	2.70	2.70	50.00
			0.00			1/2" Ice	3.10	3.10	70.00
			0.00			1" Ice	3.50	3.50	90.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
Andrew 8' w/Radome (PAR8-59-PXA)	B	Paraboloid w/Radome	From Leg	1.00	Worst		341.00	8.00	No Ice	50.27	522.00
				0.00					1/2" Ice	51.32	785.00
				0.00					1" Ice	52.37	1049.00
Andrew 10' w/Radome (PAR10-59-PXA)	C	Paraboloid w/Radome	From Leg	1.00	Worst		310.00	10.00	No Ice	78.54	622.00
				0.00					1/2" Ice	79.85	1032.00
				0.00					1" Ice	81.17	1442.00
Andrew 4' w/Radome	C	Paraboloid w/Radome	From Leg	0.50	Worst		161.20	4.00	No Ice	12.57	140.00
				0.00					1/2" Ice	13.10	282.00
				0.00					1" Ice	13.62	424.00
P3F-52 (3' Dish w/Rad)	B	Paraboloid w/Radome	From Leg	0.50	Worst		160.00	3.00	No Ice	7.10	90.00
				0.00					1/2" Ice	7.46	128.31
				0.00					1" Ice	7.83	166.62
3' HP Dish	A	Paraboloid w/Shroud (HP)	From Leg	0.50	Worst		105.00	3.00	No Ice	7.07	350.00
				0.00					1/2" Ice	7.47	388.35
				0.00					1" Ice	7.86	426.69
LCOM 2425HG	C	Paraboloid	From	0.50	Worst		85.00	3.00	No Ice	7.10	90.00

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
(3' Dish w/Rad)		w/Radome	Leg	0.00					1/2" Ice	7.46	128.31
				0.00					1" Ice	7.83	166.62

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	42551.54					
Bracing Weight	54812.86					
Total Member Self-Weight	97364.40			-10790.51	1357.55	
Gusset Weight	2840.78					
Total Weight	113891.07			-10790.51	1357.55	
Wind 0 deg - No Ice		0.00	-75172.98	-11952684.04	1357.55	-5307.84
Wind 30 deg - No Ice		34837.77	-60340.79	-9712656.05	-5600017.13	-5695.58
Wind 60 deg - No Ice		58753.81	-33921.53	-5488974.49	-9487135.44	-4557.20
Wind 90 deg - No Ice		69675.54	0.00	-10790.51	-11201391.81	-2197.71
Wind 120 deg - No Ice		65101.71	37586.49	5960156.26	-10340625.62	750.64
Wind 150 deg - No Ice		34837.77	60340.79	9691075.03	-5600017.13	3497.87
Wind 180 deg - No Ice		0.00	67843.06	10945577.46	1357.55	5307.84
Wind 210 deg - No Ice		-34837.77	60340.79	9691075.03	5602732.23	5695.58
Wind 240 deg - No Ice		-65101.71	37586.49	5960156.26	10343340.72	4557.20
Wind 270 deg - No Ice		-69675.54	0.00	-10790.51	11204106.91	2197.71
Wind 300 deg - No Ice		-58753.81	-33921.53	-5488974.49	9489850.54	-750.64
Wind 330 deg - No Ice		-34837.77	-60340.79	-9712656.05	5602732.23	-3497.87
Member Ice	135074.54					
Gusset Ice	3652.89					
Total Weight Ice	317979.14			-13665.47	8796.95	
Wind 0 deg - Ice		0.00	-24459.57	-4145853.50	8796.95	-623.70
Wind 30 deg - Ice		11820.43	-20473.58	-3500333.90	-2004232.01	-1997.67
Wind 60 deg - Ice		20237.23	-11683.97	-2009006.08	-3447234.35	-2836.37
Wind 90 deg - Ice		23640.85	0.00	-13665.47	-4017260.96	-2915.06
Wind 120 deg - Ice		21182.61	12229.78	2052428.54	-3569782.85	-2212.66
Wind 150 deg - Ice		11820.43	20473.58	3473002.95	-2004232.01	-917.39
Wind 180 deg - Ice		0.00	23367.95	3977015.73	8796.95	623.70
Wind 210 deg - Ice		-11820.43	20473.58	3473002.95	2021825.90	1997.67
Wind 240 deg - Ice		-21182.61	12229.78	2052428.54	3587376.75	2836.37
Wind 270 deg - Ice		-23640.85	0.00	-13665.47	4034854.86	2915.06
Wind 300 deg - Ice		-20237.23	-11683.97	-2009006.08	3464828.25	2212.66
Wind 330 deg - Ice		-11820.43	-20473.58	-3500333.90	2021825.90	917.39
Total Weight	113891.07			-10790.51	1357.55	
Wind 0 deg - Service		0.00	-29052.36	-4626015.06	1357.55	-2051.34
Wind 30 deg - Service		13463.87	-23320.11	-3760303.76	-2163424.94	-2201.19
Wind 60 deg - Service		22706.79	-13109.77	-2127963.06	-3665692.88	-1761.23
Wind 90 deg - Service		26927.74	0.00	-10790.51	-4328207.42	-849.36
Wind 120 deg - Service		25160.08	14526.18	2296821.77	-3995544.16	290.10
Wind 150 deg - Service		13463.87	23320.11	3738722.74	-2163424.94	1351.83
Wind 180 deg - Service		0.00	26219.54	4223554.60	1357.55	2051.34
Wind 210 deg - Service		-13463.87	23320.11	3738722.74	2166140.04	2201.19
Wind 240 deg - Service		-25160.08	14526.18	2296821.77	3998259.26	1761.23
Wind 270 deg - Service		-26927.74	0.00	-10790.51	4330922.52	849.36
Wind 300 deg - Service		-22706.79	-13109.77	-2127963.06	3668407.98	-290.10
Wind 330 deg - Service		-13463.87	-23320.11	-3760303.76	2166140.04	-1351.83

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	350 - 340	Leg	Max Tension	15	3185.37	-246.78	-197.25
			Max. Compression	10	-4983.38	-181.35	-103.36
			Max. Mx	8	-519.24	521.08	-2.92
			Max. My	4	-533.92	-284.88	-713.64
			Max. Vy	18	-772.04	266.51	-266.83
			Max. Vx	4	-1077.69	-212.07	358.07
		Diagonal	Max Tension	6	1818.27	0.00	0.00
			Max. Compression	18	-1879.00	0.00	0.00
			Max. Mx	34	362.69	20.74	-0.02
			Max. My	18	-1513.38	3.20	1.67
			Max. Vy	34	-27.23	20.74	-0.02
			Max. Vx	18	0.50	0.00	0.00
		Top Girt	Max Tension	3	68.52	0.00	0.00
			Max. Compression	22	-101.18	0.00	0.00
			Max. Mx	26	-62.27	-53.68	0.00
			Max. My	18	-55.28	0.00	-0.00
			Max. Vy	26	-42.50	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T2	340 - 320	Leg	Max Tension	7	29436.46	-162.94	300.53
			Max. Compression	2	-32915.68	7.14	317.85
			Max. Mx	18	-9848.91	303.64	109.87
			Max. My	3	3547.54	-96.58	363.86
			Max. Vy	20	-552.80	261.40	11.16
			Max. Vx	10	416.52	-187.82	-315.41
		Diagonal	Max Tension	14	4175.19	0.00	0.00
			Max. Compression	2	-4429.93	0.00	0.00
			Max. Mx	31	556.27	32.76	0.81
			Max. My	6	-3822.54	-0.37	-13.74
			Max. Vy	31	-31.57	32.76	0.81
			Max. Vx	6	-3.91	0.00	0.00
T3	320 - 300	Leg	Max Tension	23	55148.97	-115.96	35.73
			Max. Compression	18	-61643.45	364.48	-5.29
			Max. Mx	18	-61643.45	364.48	-5.29
			Max. My	24	-1222.74	-24.07	518.20
			Max. Vy	6	-1140.11	-257.85	10.64
			Max. Vx	12	-2209.92	19.35	229.50
		Diagonal	Max Tension	20	4336.39	0.00	0.00
			Max. Compression	10	-4474.48	0.00	0.00
			Max. Mx	35	708.68	37.19	4.23
			Max. My	24	-3252.84	-10.67	-11.13
			Max. Vy	33	39.00	35.96	5.02
			Max. Vx	24	3.38	0.00	0.00
T4	300 - 280	Leg	Max Tension	7	83465.47	-436.39	-24.11
			Max. Compression	2	-93296.78	662.48	7.56
			Max. Mx	10	-93250.36	683.83	115.37
			Max. My	8	-3458.99	-24.91	818.83
			Max. Vy	14	253.66	-579.12	83.50
			Max. Vx	2	369.75	-310.34	-544.73
		Diagonal	Max Tension	20	4416.06	0.00	0.00
			Max. Compression	20	-4483.94	0.00	0.00
			Max. Mx	29	738.25	52.77	-6.92
			Max. My	27	-86.77	51.55	-7.86
			Max. Vy	29	50.53	52.77	-6.92
			Max. Vx	27	-2.90	0.00	0.00
T5	280 - 260	Leg	Max Tension	7	109034.29	-485.90	-25.61
			Max. Compression	2	-122486.60	705.55	21.25
			Max. Mx	2	-122486.60	705.55	21.25
			Max. My	8	-3558.50	-24.93	818.83
			Max. Vy	14	-212.04	-675.91	-4.73
			Max. Vx	8	354.26	-24.93	818.83
		Diagonal	Max Tension	16	5016.95	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	16	-5170.39	0.00	0.00
			Max. Mx	29	932.74	94.54	-12.34
			Max. My	31	42.72	80.50	13.86
			Max. Vy	29	71.15	94.54	-12.34
			Max. Vx	31	4.12	0.00	0.00
T6	260 - 240	Leg	Max Tension	7	134837.73	-631.56	0.14
			Max. Compression	2	-152349.82	1274.01	8.77
			Max. Mx	2	-152349.82	1274.01	8.77
			Max. My	24	-5031.97	-1.38	1152.28
			Max. Vy	19	-188.78	1269.45	-4.56
			Max. Vx	24	-176.83	-1.38	1152.28
		Diagonal	Max Tension	16	5557.43	0.00	0.00
			Max. Compression	16	-5680.28	0.00	0.00
			Max. Mx	29	933.29	139.50	18.01
			Max. My	31	134.01	122.36	19.68
			Max. Vy	29	94.30	139.50	18.01
			Max. Vx	31	5.18	0.00	0.00
T7	240 - 220	Leg	Max Tension	7	157738.90	-1302.66	-13.81
			Max. Compression	2	-179446.94	1819.75	4.91
			Max. Mx	10	-178987.65	1827.98	64.30
			Max. My	4	-6167.16	-56.37	-1699.42
			Max. Vy	19	-223.04	1817.87	-69.96
			Max. Vx	4	220.59	-56.38	-1699.42
		Diagonal	Max Tension	16	6824.47	0.00	0.00
			Max. Compression	16	-7000.78	0.00	0.00
			Max. Mx	29	1176.71	212.02	29.15
			Max. My	31	98.35	181.26	30.83
			Max. Vy	29	115.21	212.01	-28.68
			Max. Vx	31	6.72	0.00	0.00
T8	220 - 200	Leg	Max Tension	7	182830.32	-1330.10	97.82
			Max. Compression	2	-210036.13	1853.73	4.12
			Max. Mx	2	-210036.13	1853.73	4.12
			Max. My	8	-8295.14	-92.34	2050.41
			Max. Vy	14	300.17	-1360.63	2.42
			Max. Vx	8	-574.91	-92.34	2050.41
		Diagonal	Max Tension	16	7876.07	0.00	0.00
			Max. Compression	16	-8098.96	0.00	0.00
			Max. Mx	29	1249.08	292.41	39.02
			Max. My	31	179.62	253.81	40.82
			Max. Vy	29	145.57	292.41	39.02
			Max. Vx	31	8.12	0.00	0.00
T9	200 - 180	Leg	Max Tension	7	211511.61	-1242.69	8.18
			Max. Compression	2	-245892.06	1860.66	-3.03
			Max. Mx	2	-245892.06	1860.66	-3.03
			Max. My	8	-10659.53	-90.11	2040.75
			Max. Vy	6	-1440.75	-1620.71	-8.90
			Max. Vx	24	1235.49	52.25	861.83
		Diagonal	Max Tension	16	10086.37	0.00	0.00
			Max. Compression	16	-10307.03	0.00	0.00
			Max. Mx	29	1584.84	373.16	48.13
			Max. My	31	240.37	331.03	50.02
			Max. Vy	29	171.50	373.15	-47.27
			Max. Vx	31	9.19	0.00	0.00
T10	180 - 160	Leg	Max Tension	7	242039.43	-2234.88	-24.55
			Max. Compression	2	-282790.08	3360.69	55.65
			Max. Mx	2	-282790.08	3360.69	55.65
			Max. My	24	-12814.65	44.11	3007.32
			Max. Vy	11	-442.14	3342.98	-5.63
			Max. Vx	24	-540.07	44.11	3007.32
		Diagonal	Max Tension	16	11052.87	0.00	0.00
			Max. Compression	16	-11325.76	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	29	1662.14	454.71	57.62
			Max. My	31	320.67	409.98	60.19
			Max. Vy	37	195.16	454.70	-57.64
			Max. Vx	31	10.24	0.00	0.00
T11	160 - 140	Leg	Max Tension	7	273846.96	-2018.18	-9.16
			Max. Compression	2	-322091.82	2824.74	4.51
			Max. Mx	2	-301582.01	3360.69	55.66
			Max. My	24	-13465.62	44.11	3007.32
			Max. Vy	10	346.07	3358.98	-6.44
			Max. Vx	24	271.17	44.11	3007.32
		Diagonal	Max Tension	16	12590.08	0.00	0.00
			Max. Compression	16	-12797.59	0.00	0.00
			Max. Mx	37	1764.44	604.19	-74.78
			Max. My	35	440.24	550.04	-77.64
			Max. Vy	37	240.69	604.19	-74.78
			Max. Vx	35	-12.30	0.00	0.00
T12	140 - 120	Leg	Max Tension	7	306336.53	-2142.14	1.69
			Max. Compression	2	-362534.81	2898.13	-0.09
			Max. Mx	2	-362534.81	2898.13	-0.09
			Max. My	4	-18071.34	27.27	-2573.05
			Max. Vy	3	-283.43	2885.65	-0.16
			Max. Vx	16	-234.20	-91.38	2531.82
		Diagonal	Max Tension	16	13887.20	0.00	0.00
			Max. Compression	16	-14168.99	0.00	0.00
			Max. Mx	37	1817.53	787.95	-96.06
			Max. My	35	651.88	722.52	-99.03
			Max. Vy	37	293.13	787.95	-96.06
			Max. Vx	35	-14.68	0.00	0.00
T13	120 - 100	Leg	Max Tension	7	339565.37	-3290.56	45.35
			Max. Compression	2	-404994.05	4602.04	2.74
			Max. Mx	18	-404015.66	4614.45	-56.77
			Max. My	20	-22058.57	89.59	-3993.36
			Max. Vy	18	-411.44	4614.45	-56.77
			Max. Vx	20	414.81	89.59	-3993.36
		Diagonal	Max Tension	16	15272.20	0.00	0.00
			Max. Compression	16	-15623.78	0.00	0.00
			Max. Mx	37	1867.95	891.14	-108.15
			Max. My	35	716.50	824.63	-111.08
			Max. Vy	37	311.92	891.14	-108.15
			Max. Vx	35	-15.45	0.00	0.00
T14	100 - 80	Leg	Max Tension	7	373762.58	-2825.08	-12.20
			Max. Compression	2	-448938.87	5694.82	69.03
			Max. Mx	2	-448938.87	5694.82	69.03
			Max. My	24	-24677.67	159.89	4493.19
			Max. Vy	10	-572.48	5689.91	-48.21
			Max. Vx	12	408.30	159.87	-4489.00
		Diagonal	Max Tension	16	16822.23	0.00	0.00
			Max. Compression	16	-17208.68	0.00	0.00
			Max. Mx	37	1942.56	1074.99	128.70
			Max. My	35	842.41	1000.99	-131.95
			Max. Vy	37	353.16	1074.99	128.70
			Max. Vx	35	-17.28	0.00	0.00
T15	80 - 60	Leg	Max Tension	23	408242.06	-3958.68	-12.10
			Max. Compression	2	-494911.65	3586.98	-8.67
			Max. Mx	2	-470883.60	5694.82	69.03
			Max. My	4	-28103.38	-173.31	-4547.36
			Max. Vy	10	403.68	5689.91	-48.21
			Max. Vx	20	-322.75	-164.97	-4536.96
		Diagonal	Max Tension	16	18825.43	0.00	0.00
			Max. Compression	16	-19056.16	0.00	0.00
			Max. Mx	37	1827.71	1355.07	-160.84

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	35	1104.82	1269.71	-163.16
			Max. Vy	37	419.67	1355.07	-160.84
			Max. Vx	35	-20.22	0.00	0.00
T16	60 - 40	Leg	Max Tension	23	443239.99	-4159.10	-2.59
			Max. Compression	2	-542356.84	4288.69	-2.19
			Max. Mx	2	-541377.88	4526.43	-1.65
			Max. My	4	-33620.18	38.54	-4169.98
			Max. Vy	33	375.57	-3574.34	-2.84
			Max. Vx	4	286.88	38.54	-4169.98
		Diagonal	Max Tension	16	20064.78	0.00	0.00
			Max. Compression	16	-20416.64	0.00	0.00
			Max. Mx	37	2028.08	1537.87	-181.04
			Max. My	35	-1369.84	1523.61	-183.67
			Max. Vy	37	453.24	1537.87	-181.04
			Max. Vx	35	-21.64	0.00	0.00
T17	40 - 20	Leg	Max Tension	23	478563.63	-3564.07	-3.05
			Max. Compression	2	-590638.73	7941.59	27.20
			Max. Mx	37	15469.30	-19531.50	-8.15
			Max. My	24	-38606.67	543.32	4400.67
			Max. Vy	33	2739.14	-19526.20	-3.11
			Max. Vx	13	226.44	414.06	-4396.71
		Diagonal	Max Tension	16	21178.00	0.00	0.00
			Max. Compression	16	-21777.37	0.00	0.00
			Max. Mx	37	1049.46	1588.76	-192.25
			Max. My	35	476.01	1498.51	-194.51
			Max. Vy	37	460.23	1581.68	-172.83
			Max. Vx	35	-21.88	0.00	0.00
T18	20 - 0	Leg	Max Tension	23	513044.51	-3860.40	-4.47
			Max. Compression	2	-639796.38	-0.00	-0.45
			Max. Mx	27	-247165.84	26887.20	-4.69
			Max. My	4	-43309.87	-666.57	-7773.70
			Max. Vy	33	-4520.64	-19526.19	-3.11
			Max. Vx	4	-946.78	-666.57	-7773.70
		Diagonal	Max Tension	16	23238.56	0.00	0.00
			Max. Compression	16	-23765.83	0.00	0.00
			Max. Mx	37	-5657.62	2170.71	-289.36
			Max. My	36	-7898.29	2049.81	-293.24
			Max. Vy	37	530.68	2170.71	-289.36
			Max. Vx	36	-28.15	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	651077.82	65002.88	-37669.11
	Max. H_x	18	651077.82	65002.88	-37669.11
	Max. H_z	5	-457451.81	-44028.51	30723.26
	Min. Vert	7	-521010.78	-52466.37	30422.13
	Min. H_x	7	-521010.78	-52466.37	30422.13
	Min. H_z	18	651077.82	65002.88	-37669.11
Leg B	Max. Vert	10	650989.27	-65067.29	-37554.40
	Max. H_x	23	-521077.12	52535.23	30305.27
	Max. H_z	25	-457518.07	44144.95	30519.27
	Min. Vert	23	-521077.12	52535.23	30305.27
	Min. H_x	10	650989.27	-65067.29	-37554.40
	Min. H_z	10	650989.27	-65067.29	-37554.40

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg A	Max. Vert	2	651651.49	-131.54	75138.85
	Max. H_x	21	34476.55	8743.26	3544.20
	Max. H_z	2	651651.49	-131.54	75138.85
	Min. Vert	15	-520581.64	135.63	-60640.51
	Min. H_x	9	34476.63	-8744.63	3544.22
	Min. H_z	15	-520581.64	135.63	-60640.51

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	113891.07	0.00	0.00	-10789.84	1357.86	0.02
1.2 Dead+1.6 Wind 0 deg - No Ice	136669.29	0.00	-120276.77	-19210564.24	1608.64	-8465.31
0.9 Dead+1.6 Wind 0 deg - No Ice	102501.97	0.00	-120276.78	-19184369.50	1208.47	-8472.55
1.2 Dead+1.6 Wind 30 deg - No Ice	136669.29	55740.43	-96545.26	-15610122.91	-9003393.95	-9148.76
0.9 Dead+1.6 Wind 30 deg - No Ice	102501.97	55740.43	-96545.26	-15588089.64	-8992961.36	-9143.21
1.2 Dead+1.6 Wind 60 deg - No Ice	136669.29	94006.10	-54274.45	-8820126.83	-15252665.53	-7416.55
0.9 Dead+1.6 Wind 60 deg - No Ice	102501.97	94006.10	-54274.45	-8806218.63	-15234668.39	-7384.67
1.2 Dead+1.6 Wind 90 deg - No Ice	136669.29	111480.86	-0.00	-13097.24	-18008338.77	-3699.01
0.9 Dead+1.6 Wind 90 deg - No Ice	102501.97	111480.86	-0.00	-9803.83	-17987089.10	-3649.31
1.2 Dead+1.6 Wind 120 deg - No Ice	136669.29	104162.74	60138.38	9585691.71	-16623910.77	1041.14
0.9 Dead+1.6 Wind 120 deg - No Ice	102501.97	104162.75	60138.39	9577522.23	-16604473.71	1081.85
1.2 Dead+1.6 Wind 150 deg - No Ice	136669.29	55740.43	96545.26	15584042.81	-9003332.06	5516.17
0.9 Dead+1.6 Wind 150 deg - No Ice	102501.97	55740.43	96545.26	15568572.09	-8992915.68	5533.50
1.2 Dead+1.6 Wind 180 deg - No Ice	136669.29	0.00	108548.89	17601078.30	1618.78	8468.63
0.9 Dead+1.6 Wind 180 deg - No Ice	102501.97	0.00	108548.89	17583117.28	1216.33	8474.69
1.2 Dead+1.6 Wind 210 deg - No Ice	136669.29	-55740.43	96545.26	15584047.19	9006568.76	9148.87
0.9 Dead+1.6 Wind 210 deg - No Ice	102501.97	-55740.43	96545.26	15568575.05	8995347.53	9143.30
1.2 Dead+1.6 Wind 240 deg - No Ice	136669.29	-104162.74	60138.38	9585700.16	16627146.55	7424.21
0.9 Dead+1.6 Wind 240 deg - No Ice	102501.97	-104162.75	60138.39	9577528.93	16606905.11	7390.73
1.2 Dead+1.6 Wind 270 deg - No Ice	136669.29	-111480.86	-0.00	-13093.49	18011574.57	3698.85
0.9 Dead+1.6 Wind 270 deg - No Ice	102501.97	-111480.86	-0.00	-9801.03	17989520.73	3649.20
1.2 Dead+1.6 Wind 300 deg - No Ice	136669.29	-94006.10	-54274.45	-8820125.77	15255897.35	-1052.08
0.9 Dead+1.6 Wind 300 deg - No Ice	102501.97	-94006.10	-54274.45	-8806217.98	15237096.98	-1090.03

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.6 Wind 330 deg - No Ice	136669.29	-55740.43	-96545.26	-15610123.80	9006619.84	-5516.09
0.9 Dead+1.6 Wind 330 deg - No Ice	102501.97	-55740.43	-96545.26	-15588090.86	8995385.64	-5533.45
1.2 Dead+1.0 Ice+1.0 Temp	340757.30	0.00	0.00	-15842.22	9037.69	0.21
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	340757.30	0.00	-24459.50	-4210791.65	9136.61	-629.08
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	340757.30	11820.39	-20473.52	-3555771.18	-2034368.96	-2027.40
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	340757.30	20237.18	-11683.94	-2041916.43	-3499294.34	-2883.09
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	340757.30	23640.78	-0.00	-16326.39	-4077871.83	-2966.84
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	340757.30	21182.55	12229.75	2080914.44	-3623385.41	-2256.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	340757.30	11820.39	20473.52	3523135.31	-2034366.16	-938.36
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	340757.30	0.00	23367.88	4034870.79	9137.08	628.71
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	340757.30	-11820.39	20473.52	3523135.78	2052640.25	2027.41
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	340757.30	-21182.55	12229.75	2080915.11	3641659.44	2885.22
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	340757.30	-23640.78	-0.00	-16325.53	4096145.46	2966.84
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	340757.30	-20237.18	-11683.94	-2041915.74	3517567.63	2254.39
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	340757.30	-11820.39	-20473.52	-3555770.81	2052641.96	938.36
Dead+Wind 0 deg - Service	113891.07	0.00	-29052.36	-4644430.97	1350.35	-2046.61
Dead+Wind 30 deg - Service	113891.07	13463.87	-23320.11	-3775383.07	-2172098.26	-2208.19
Dead+Wind 60 deg - Service	113891.07	22706.79	-13109.77	-2136534.57	-3680412.64	-1785.99
Dead+Wind 90 deg - Service	113891.07	26927.74	-0.00	-10872.23	-4345540.20	-886.81
Dead+Wind 120 deg - Service	113891.07	25160.08	14526.18	2305915.29	-4011433.95	257.81
Dead+Wind 150 deg - Service	113891.07	13463.87	23320.11	3753653.51	-2172089.99	1335.91
Dead+Wind 180 deg - Service	113891.07	0.00	26219.54	4240466.87	1351.14	2045.78
Dead+Wind 210 deg - Service	113891.07	-13463.87	23320.11	3753652.28	2174792.11	2208.18
Dead+Wind 240 deg - Service	113891.07	-25160.08	14526.18	2305914.37	4014133.72	1788.80
Dead+Wind 270 deg - Service	113891.07	-26927.74	-0.00	-10871.53	4348238.51	886.80
Dead+Wind 300 deg - Service	113891.07	-22706.79	-13109.77	-2136532.74	3683111.11	-259.79
Dead+Wind 330 deg - Service	113891.07	-13463.87	-23320.11	-3775381.07	2174798.37	-1335.88

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-113891.07	0.00	-0.00	113891.07	-0.00	0.000%
2	0.00	-136669.29	-120276.77	-0.00	136669.29	120276.77	0.000%
3	0.00	-102501.97	-120276.77	-0.00	102501.97	120276.78	0.000%
4	55740.43	-136669.29	-96545.26	-55740.43	136669.29	96545.26	0.000%
5	55740.43	-102501.97	-96545.26	-55740.43	102501.97	96545.26	0.000%
6	94006.10	-136669.29	-54274.45	-94006.10	136669.29	54274.45	0.000%
7	94006.10	-102501.97	-54274.45	-94006.10	102501.97	54274.45	0.000%
8	111480.86	-136669.29	0.00	-111480.86	136669.29	0.00	0.000%
9	111480.86	-102501.97	0.00	-111480.86	102501.97	0.00	0.000%
10	104162.74	-136669.29	60138.38	-104162.74	136669.29	-60138.38	0.000%
11	104162.74	-102501.97	60138.38	-104162.75	102501.97	-60138.39	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
12	55740.43	-136669.29	96545.26	-55740.43	136669.29	-96545.26	0.000%
13	55740.43	-102501.97	96545.26	-55740.43	102501.97	-96545.26	0.000%
14	0.00	-136669.29	108548.89	-0.00	136669.29	-108548.89	0.000%
15	0.00	-102501.97	108548.89	-0.00	102501.97	-108548.89	0.000%
16	-55740.43	-136669.29	96545.26	55740.43	136669.29	-96545.26	0.000%
17	-55740.43	-102501.97	96545.26	55740.43	102501.97	-96545.26	0.000%
18	-104162.74	-136669.29	60138.38	104162.74	136669.29	-60138.38	0.000%
19	-104162.74	-102501.97	60138.38	104162.75	102501.97	-60138.39	0.000%
20	-111480.86	-136669.29	0.00	111480.86	136669.29	0.00	0.000%
21	-111480.86	-102501.97	0.00	111480.86	102501.97	0.00	0.000%
22	-94006.10	-136669.29	-54274.45	94006.10	136669.29	54274.45	0.000%
23	-94006.10	-102501.97	-54274.45	94006.10	102501.97	54274.45	0.000%
24	-55740.43	-136669.29	-96545.26	55740.43	136669.29	96545.26	0.000%
25	-55740.43	-102501.97	-96545.26	55740.43	102501.97	96545.26	0.000%
26	0.00	-340757.36	0.00	-0.00	340757.30	-0.00	0.000%
27	0.00	-340757.36	-24459.57	-0.00	340757.30	24459.50	0.000%
28	11820.43	-340757.36	-20473.58	-11820.39	340757.30	20473.52	0.000%
29	20237.23	-340757.36	-11683.97	-20237.18	340757.30	11683.94	0.000%
30	23640.85	-340757.36	0.00	-23640.78	340757.30	0.00	0.000%
31	21182.61	-340757.36	12229.78	-21182.55	340757.30	-12229.75	0.000%
32	11820.43	-340757.36	20473.58	-11820.39	340757.30	-20473.52	0.000%
33	0.00	-340757.36	23367.95	-0.00	340757.30	-23367.88	0.000%
34	-11820.43	-340757.36	20473.58	11820.39	340757.30	-20473.52	0.000%
35	-21182.61	-340757.36	12229.78	21182.55	340757.30	-12229.75	0.000%
36	-23640.85	-340757.36	0.00	23640.78	340757.30	0.00	0.000%
37	-20237.23	-340757.36	-11683.97	20237.18	340757.30	11683.94	0.000%
38	-11820.43	-340757.36	-20473.58	11820.39	340757.30	20473.52	0.000%
39	0.00	-113891.07	-29052.36	-0.00	113891.07	29052.36	0.000%
40	13463.87	-113891.07	-23320.11	-13463.87	113891.07	23320.11	0.000%
41	22706.79	-113891.07	-13109.77	-22706.79	113891.07	13109.77	0.000%
42	26927.74	-113891.07	-0.00	-26927.74	113891.07	0.00	0.000%
43	25160.08	-113891.07	14526.18	-25160.08	113891.07	-14526.18	0.000%
44	13463.87	-113891.07	23320.11	-13463.87	113891.07	-23320.11	0.000%
45	0.00	-113891.07	26219.54	-0.00	113891.07	-26219.54	0.000%
46	-13463.87	-113891.07	23320.11	13463.87	113891.07	-23320.11	0.000%
47	-25160.08	-113891.07	14526.18	25160.08	113891.07	-14526.18	0.000%
48	-26927.74	-113891.07	-0.00	26927.74	113891.07	0.00	0.000%
49	-22706.79	-113891.07	-13109.77	22706.79	113891.07	13109.77	0.000%
50	-13463.87	-113891.07	-23320.11	13463.87	113891.07	23320.11	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000054
5	Yes	4	0.00000001	0.00000051
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000047
9	Yes	4	0.00000001	0.00000046
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000035

13	Yes	4	0.00000001	0.00000039
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000053
17	Yes	4	0.00000001	0.00000050
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000047
21	Yes	4	0.00000001	0.00000046
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000035
25	Yes	4	0.00000001	0.00000039
26	Yes	4	0.00000001	0.00000534
27	Yes	4	0.00000001	0.00001197
28	Yes	4	0.00000001	0.00001196
29	Yes	4	0.00000001	0.00001198
30	Yes	4	0.00000001	0.00001191
31	Yes	4	0.00000001	0.00001188
32	Yes	4	0.00000001	0.00001183
33	Yes	4	0.00000001	0.00001186
34	Yes	4	0.00000001	0.00001182
35	Yes	4	0.00000001	0.00001185
36	Yes	4	0.00000001	0.00001187
37	Yes	4	0.00000001	0.00001194
38	Yes	4	0.00000001	0.00001194
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	350 - 340	12.333	39	0.4108	0.0244
T2	340 - 320	11.475	39	0.4085	0.0236
T3	320 - 300	9.814	39	0.3705	0.0095
T4	300 - 280	8.345	39	0.3219	0.0073
T5	280 - 260	7.046	39	0.2855	0.0039
T6	260 - 240	5.912	39	0.2443	0.0033
T7	240 - 220	4.934	39	0.2108	0.0026
T8	220 - 200	4.079	39	0.1879	0.0024
T9	200 - 180	3.322	39	0.1642	0.0019
T10	180 - 160	2.663	39	0.1396	0.0015
T11	160 - 140	2.087	39	0.1219	0.0012
T12	140 - 120	1.591	39	0.1034	0.0010
T13	120 - 100	1.172	39	0.0843	0.0008
T14	100 - 80	0.822	39	0.0683	0.0007
T15	80 - 60	0.541	39	0.0518	0.0005
T16	60 - 40	0.330	39	0.0363	0.0004

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T17	40 - 20	0.170	39	0.0245	0.0002
T18	20 - 0	0.056	39	0.0124	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Flash Beacon Lighting	39	12.333	0.4108	0.0244	208059
347.00	DB810KE-XT	39	12.075	0.4110	0.0246	208059
341.00	Andrew 8' w/Radome	39	11.561	0.4093	0.0240	108950
321.00	DS8A10F36U-D	39	9.893	0.3730	0.0096	20032
310.00	Andrew 10' w/Radome	39	9.055	0.3453	0.0086	23819
298.00	DB809KE-SY	39	8.208	0.3178	0.0069	31479
277.00	DB809KE-SY	39	6.865	0.2797	0.0038	28450
264.00	Obtruction Lights	39	6.125	0.2525	0.0034	29258
212.00	20' 8 Bay Di-Pole	39	3.764	0.1789	0.0022	49610
200.00	(3) 14' EEI T-FRAMES SS	39	3.322	0.1642	0.0019	46237
175.00	Mid-Level Strobe	39	2.511	0.1347	0.0014	61135
161.20	Andrew 4' w/Radome	39	2.119	0.1229	0.0012	58685
160.00	P3F-52	39	2.087	0.1219	0.0012	58638
105.00	3' HP Dish	39	0.904	0.0722	0.0007	71826
88.00	Obtruction Lights	39	0.645	0.0585	0.0006	65823
85.00	LCOM 2425HG	39	0.605	0.0560	0.0006	64407

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	350 - 340	50.908	2	1.6933	0.1010
T2	340 - 320	47.360	2	1.6842	0.0978
T3	320 - 300	40.501	2	1.5268	0.0394
T4	300 - 280	34.449	2	1.3264	0.0303
T5	280 - 260	29.095	2	1.1763	0.0162
T6	260 - 240	24.419	2	1.0074	0.0135
T7	240 - 220	20.386	2	0.8699	0.0110
T8	220 - 200	16.856	2	0.7754	0.0099
T9	200 - 180	13.730	2	0.6780	0.0078
T10	180 - 160	11.008	2	0.5768	0.0061
T11	160 - 140	8.627	2	0.5038	0.0048
T12	140 - 120	6.580	2	0.4273	0.0041
T13	120 - 100	4.848	2	0.3483	0.0035
T14	100 - 80	3.402	2	0.2822	0.0029
T15	80 - 60	2.239	2	0.2140	0.0022
T16	60 - 40	1.367	2	0.1502	0.0016
T17	40 - 20	0.706	2	0.1013	0.0010
T18	20 - 0	0.234	2	0.0514	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Flash Beacon Lighting	2	50.908	1.6933	0.1010	62326
347.00	DB810KE-XT	2	49.842	1.6938	0.1020	62326
341.00	Andrew 8' w/Radome	2	47.714	1.6871	0.0993	31820
321.00	DS8A10F36U-D	2	40.827	1.5371	0.0398	4982
310.00	Andrew 10' w/Radome	2	37.373	1.4221	0.0358	5827
298.00	DB809KE-SY	2	33.885	1.3097	0.0286	7638
277.00	DB809KE-SY	2	28.350	1.1523	0.0156	6936
264.00	Obtruction Lights	2	25.300	1.0409	0.0140	7139
212.00	20' 8 Bay Di-Pole	2	15.557	0.7382	0.0092	12061
200.00	(3) 14' EEI T-FRAMES SS	2	13.730	0.6780	0.0078	11256
175.00	Mid-Level Strobe	2	10.382	0.5565	0.0058	14843
161.20	Andrew 4' w/Radome	2	8.761	0.5080	0.0048	14208
160.00	P3F-52	2	8.627	0.5038	0.0048	14195
105.00	3' HP Dish	2	3.737	0.2984	0.0030	17398
88.00	Obtruction Lights	2	2.668	0.2417	0.0025	15934
85.00	LCOM 2425HG	2	2.501	0.2313	0.0023	15588

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	350	Diagonal	A325N	0.6250	1	1818.27	6855.47	0.265 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	68.52	6855.47	0.010 ✔	1	Member Block Shear
T2	340	Leg	A325N	1.0000	3	2832.31	53014.40	0.053 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4175.19	9140.63	0.457 ✔	1	Member Block Shear
T3	320	Leg	A325N	1.0000	3	12131.60	53014.40	0.229 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4336.39	9140.63	0.474 ✔	1	Member Block Shear
T4	300	Leg	A325N	1.0000	6	10372.30	53014.40	0.196 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	4416.06	8124.61	0.544 ✔	1	Member Block Shear
T5	280	Leg	A325N	1.0000	6	15184.40	53014.40	0.286 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	5016.95	10163.70	0.494 ✔	1	Member Block Shear
T6	260	Leg	A325N	1.0000	6	19623.70	53014.40	0.370 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	5557.43	11183.20	0.497 ✔	1	Member Block Shear
T7	240	Leg	A325N	1.1250	6	24179.40	67096.30	0.360 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	6824.47	14910.90	0.458 ✔	1	Member Block Shear
T8	220	Leg	A325N	1.1250	9	18908.80	67096.30	0.282 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8098.96	17892.40	0.453 ✔	1	Bolt Shear
T9	200	Leg	A325N	1.1250	9	21871.50	67096.30	0.326 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.7500	1	10307.00	17892.40	0.576 ✔	1	Bolt Shear
T10	180	Leg	A325N	1.2500	9	25207.00	82835.00	0.304 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	11052.90	17962.50	0.615 ✔	1	Member Block Shear
T11	160	Leg	A325N	1.2500	12	21480.50	82835.00	0.259 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	12797.60	24353.50	0.525 ✔	1	Bolt Shear
T12	140	Leg	A325N	1.2500	12	24169.10	82835.00	0.292 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	14169.00	24353.50	0.582 ✔	1	Bolt Shear
T13	120	Leg	A325N	1.2500	12	26913.30	82835.00	0.325 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	15623.80	24353.50	0.642 ✔	1	Bolt Shear
T14	100	Leg	A325N	1.2500	12	29718.80	82835.00	0.359 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	17208.70	31808.60	0.541 ✔	1	Bolt Shear
T15	80	Leg	A325N	1.2500	12	32584.10	82835.00	0.393 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	19056.20	31808.60	0.599 ✔	1	Bolt Shear
T16	60	Leg	A325N	1.2500	12	35489.00	82835.00	0.428 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	20416.60	31808.60	0.642 ✔	1	Bolt Shear
T17	40	Leg	A325N	1.2500	12	38406.80	82835.00	0.464 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	21777.40	31808.60	0.685 ✔	1	Bolt Shear
T18	20	Leg	A325N	1.2500	12	41345.10	82835.00	0.499 ✔	1	Bolt Tension
		Diagonal	A325N	1.1250	1	23765.80	40257.80	0.590 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	P2.5x.203	10.00	5.00	63.3 K=1.00	1.7040	-4983.38	57192.30	0.087 [1] ✔
T2	340 - 320	P2.5x.203	20.00	5.00	63.3 K=1.00	1.7040	-32915.70	57192.30	0.576 [1] ✔
T3	320 - 300	P3.5x.226	20.03	5.01	45.0 K=1.00	2.6795	-61643.50	104013.00	0.593 [1] ✔
T4	300 - 280	P5x.258	20.03	5.01	32.0 K=1.00	4.2999	-93296.80	179533.00	0.520 [1] ✔
T5	280 - 260	P5x.258	20.03	6.68	42.7 K=1.00	4.2999	-122487.00	169374.00	0.723 [1] ✔
T6	260 - 240	P6x.28	20.03	6.68	35.7 K=1.00	5.5813	-152350.00	228832.00	0.666 [1] ✔
T7	240 - 220	P8x.322	20.03	10.02	40.9	8.3993	-179447.00	334425.00	0.537 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔
T8	220 - 200	P8x.322	20.03	10.02	40.9 K=1.00	8.3993	-210036.00	334425.00	0.628 [1] ✔
T9	200 - 180	P8x.322	20.03	10.02	40.9 K=1.00	8.3993	-245892.00	334426.00	0.735 [1] ✔
T10	180 - 160	P10x.365	20.03	10.02	32.7 K=1.00	11.9083	-282790.00	495535.00	0.571 [1] ✔
T11	160 - 140	P10x.365	20.03	10.02	32.7 K=1.00	11.9083	-322092.00	495536.00	0.650 [1] ✔
T12	140 - 120	P10x.365	20.03	10.02	32.7 K=1.00	11.9083	-362535.00	495536.00	0.732 [1] ✔
T13	120 - 100	P12x.375	20.03	10.02	27.5 K=1.00	14.5790	-404994.00	620863.00	0.652 [1] ✔
T14	100 - 80	P12x.375	20.03	10.02	27.5 K=1.00	14.5790	-448939.00	620863.00	0.723 [1] ✔
T15	80 - 60	P14x.375	20.03	10.02	24.9 K=1.00	16.0516	-494912.00	690202.00	0.717 [1] ✔
T16	60 - 40	P14x.5	20.03	10.02	25.2 K=1.00	21.2057	-542357.00	911080.00	0.595 [1] ✔
T17	40 - 20	P14x.5	20.03	10.02	25.2 K=1.00	21.2057	-590639.00	911081.00	0.648 [1] ✔
T18	20 - 0	P14x.5	20.03	10.02	25.2 K=1.00	21.2057	-639796.00	911080.00	0.702 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L1 3/4x1 3/4x3/16	7.11	3.24	114.9 K=1.02	0.6211	-1879.00	10043.80	0.187 [1] ✔
T2	340 - 320	L1 3/4x1 3/4x1/4	7.11	3.24	115.4 K=1.01	0.8125	-4429.93	13056.50	0.339 [1] ✔
T3	320 - 300	L1 3/4x1 3/4x1/4	8.42	4.01	141.1 K=1.00	0.8125	-4346.15	9223.88	0.471 [1] ✔
T4	300 - 280	L2x2x3/16	10.08	4.75	144.6 K=1.00	0.7150	-4456.69	7719.91	0.577 [1] ✔
T5	280 - 260	L2 1/2x2 1/2x3/16	12.56	6.03	146.2 K=1.00	0.9020	-5170.39	9528.14	0.543 [1] ✔
T6	260 - 240	L3x3x3/16	14.26	6.84	137.7 K=1.00	1.0900	-5680.28	12987.20	0.437 [1] ✔
T7	240 - 220	L3x3x1/4	17.55	8.47	171.7 K=1.00	1.4400	-7000.78	11034.30	0.634 [1] ✔
T8	220 - 200	L3 1/2x3 1/2x1/4	19.20	9.30	160.9 K=1.00	1.6900	-8098.96	14754.20	0.549 [1] ✔
T9	200 - 180	L3 1/2x3 1/2x5/16	20.91	10.16	176.7 K=1.00	2.0900	-10307.00	15124.40	0.681 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	180 - 160	L4x4x1/4	22.66	10.92	164.8 K=1.00	1.9400	-11325.80	16132.90	0.702 [1] ✔
T11	160 - 140	L4x4x3/8	24.45	11.81	179.9 K=1.00	2.8600	-12797.60	19961.60	0.641 [1] ✔
T12	140 - 120	L5x5x5/16	26.25	12.72	153.6 K=1.00	3.0300	-14169.00	29022.10	0.488 [1] ✔
T13	120 - 100	L5x5x5/16	28.09	13.55	163.6 K=1.00	3.0300	-15623.80	25572.90	0.611 [1] ✔
T14	100 - 80	L5x5x3/8	29.94	14.46	175.3 K=1.00	3.6100	-17208.70	26546.30	0.648 [1] ✔
T15	80 - 60	L5x5x1/2	31.80	15.34	187.2 K=1.00	4.7500	-19056.20	30605.80	0.623 [1] ✔
T16	60 - 40	L6x6x3/8	33.68	16.28	164.2 K=1.00	4.3600	-20416.60	36544.30	0.559 [1] ✔
T17	40 - 20	L6x6x3/8	35.57	17.22	173.7 K=1.00	4.3600	-21777.40	32648.20	0.667 [1] ✔
T18	20 - 0	L6x6x1/2	37.47	18.15	184.6 K=1.00	5.7500	-23765.80	38110.20	0.624 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L1 3/4x1 3/4x3/16	5.05	4.52	158.0 K=1.00	0.6211	-101.18	5623.90	0.018 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	P2.5x.203	10.00	5.00	63.3	1.7040	3185.37	76682.30	0.042 [1] ✔
T2	340 - 320	P2.5x.203	20.00	5.00	63.3	1.7040	29436.50	76682.30	0.384 [1] ✔
T3	320 - 300	P3.5x.226	20.03	5.01	45.0	2.6795	55149.00	120579.00	0.457 [1] ✔
T4	300 - 280	P5x.258	20.03	5.01	32.0	4.2999	83465.50	193494.00	0.431 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	280 - 260	P5x.258	20.03	6.68	42.7	4.2999	109034.00	193494.00	0.564 [1]
T6	260 - 240	P6x.28	20.03	6.68	35.7	5.5813	134838.00	251161.00	0.537 [1]
T7	240 - 220	P8x.322	20.03	10.02	40.9	8.3993	157739.00	377967.00	0.417 [1]
T8	220 - 200	P8x.322	20.03	10.02	40.9	8.3993	182830.00	377967.00	0.484 [1]
T9	200 - 180	P8x.322	20.03	10.02	40.9	8.3993	211512.00	377967.00	0.560 [1]
T10	180 - 160	P10x.365	20.03	10.02	32.7	11.9083	242039.00	535873.00	0.452 [1]
T11	160 - 140	P10x.365	20.03	10.02	32.7	11.9083	273847.00	535873.00	0.511 [1]
T12	140 - 120	P10x.365	20.03	10.02	32.7	11.9083	306337.00	535873.00	0.572 [1]
T13	120 - 100	P12x.375	20.03	10.02	27.5	14.5790	339565.00	656053.00	0.518 [1]
T14	100 - 80	P12x.375	20.03	10.02	27.5	14.5790	373763.00	656053.00	0.570 [1]
T15	80 - 60	P14x.375	20.03	10.02	24.9	16.0516	408242.00	722321.00	0.565 [1]
T16	60 - 40	P14x.5	20.03	10.02	25.2	21.2057	443240.00	954259.00	0.464 [1]
T17	40 - 20	P14x.5	20.03	10.02	25.2	21.2057	478564.00	954259.00	0.502 [1]
T18	20 - 0	P14x.5	20.03	10.02	25.2	21.2057	513045.00	954259.00	0.538 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L1 3/4x1 3/4x3/16	7.11	3.24	75.7	0.3604	1818.27	15675.30	0.116 [1]
T2	340 - 320	L1 3/4x1 3/4x1/4	7.11	3.24	76.8	0.4688	4175.19	20390.60	0.205 [1]
T3	320 - 300	L1 3/4x1 3/4x1/4	8.03	3.82	90.0	0.4688	4336.39	20390.60	0.213 [1]
T4	300 - 280	L2x2x3/16	9.66	4.54	91.5	0.4132	4416.06	17974.30	0.246 [1]
T5	280 - 260	L2 1/2x2 1/2x3/16	12.56	6.03	95.6	0.5535	5016.95	24075.20	0.208 [1]
T6	260 - 240	L3x3x3/16	14.26	6.84	89.5	0.6945	5557.43	30208.70	0.184 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	240 - 220	L3x3x1/4	17.55	8.47	111.4	0.9159	6824.47	39843.30	0.171 [1] ✔
T8	220 - 200	L3 1/2x3 1/2x1/4	19.20	9.30	104.3	1.1034	7876.07	47999.50	0.164 [1] ✔
T9	200 - 180	L3 1/2x3 1/2x5/16	20.91	10.16	114.7	1.3624	10086.40	59265.40	0.170 [1] ✔
T10	180 - 160	L4x4x1/4	22.66	10.92	106.6	1.2675	11052.90	55136.30	0.200 [1] ✔
T11	160 - 140	L4x4x3/8	24.45	11.81	117.1	1.8637	12590.10	81073.10	0.155 [1] ✔
T12	140 - 120	L5x5x5/16	26.25	12.72	98.7	2.0381	13887.20	88658.40	0.157 [1] ✔
T13	120 - 100	L5x5x5/16	28.09	13.55	105.0	2.0381	15272.20	88658.40	0.172 [1] ✔
T14	100 - 80	L5x5x3/8	29.94	14.46	112.8	2.3911	16822.20	104013.00	0.162 [1] ✔
T15	80 - 60	L5x5x1/2	31.80	15.34	121.1	3.1406	18825.40	136617.00	0.138 [1] ✔
T16	60 - 40	L6x6x3/8	33.68	16.28	105.2	2.9536	20064.80	128481.00	0.156 [1] ✔
T17	40 - 20	L6x6x3/8	35.57	17.22	111.3	2.9536	21178.00	128481.00	0.165 [1] ✔
T18	20 - 0	L6x6x1/2	37.47	18.15	118.6	3.8438	23238.60	167203.00	0.139 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L1 3/4x1 3/4x3/16	5.05	4.52	107.6	0.3604	68.52	15675.30	0.004 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	350 - 340	Leg	P2.5x.203	2	-4983.38	57192.30	8.7	Pass
		Diagonal	L1 3/4x1 3/4x3/16	7	-1879.00	10043.80	18.7	Pass
		Top Girt	L1 3/4x1 3/4x3/16	6	-101.18	5623.90	1.8	Pass
T2	340 - 320	Leg	P2.5x.203	21	-32915.70	57192.30	57.6	Pass
		Diagonal	L1 3/4x1 3/4x1/4	25	-4429.93	13056.50	33.9	Pass
T3	320 - 300	Leg	P3.5x.226	46	-61643.50	104013.00	59.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	L1 3/4x1 3/4x1/4	50	-4346.15	9223.88	47.1	Pass
T4	300 - 280	Leg	P5x.258	75	-93296.80	179533.00	52.0	Pass
		Diagonal	L2x2x3/16	76	-4456.69	7719.91	57.7	Pass
T5	280 - 260	Leg	P5x.258	102	-122487.00	169374.00	72.3	Pass
		Diagonal	L2 1/2x2 1/2x3/16	108	-5170.39	9528.14	54.3	Pass
T6	260 - 240	Leg	P6x.28	123	-152350.00	228832.00	66.6	Pass
		Diagonal	L3x3x3/16	129	-5680.28	12987.20	43.7	Pass
T7	240 - 220	Leg	P8x.322	144	-179447.00	334425.00	53.7	Pass
		Diagonal	L3x3x1/4	150	-7000.78	11034.30	63.4	Pass
T8	220 - 200	Leg	P8x.322	159	-210036.00	334425.00	62.8	Pass
		Diagonal	L3 1/2x3 1/2x1/4	165	-8098.96	14754.20	54.9	Pass
T9	200 - 180	Leg	P8x.322	174	-245892.00	334426.00	73.5	Pass
		Diagonal	L3 1/2x3 1/2x5/16	180	-10307.00	15124.40	68.1	Pass
T10	180 - 160	Leg	P10x.365	189	-282790.00	495535.00	57.1	Pass
		Diagonal	L4x4x1/4	195	-11325.80	16132.90	70.2	Pass
T11	160 - 140	Leg	P10x.365	204	-322092.00	495536.00	65.0	Pass
		Diagonal	L4x4x3/8	210	-12797.60	19961.60	64.1	Pass
T12	140 - 120	Leg	P10x.365	219	-362535.00	495536.00	73.2	Pass
		Diagonal	L5x5x5/16	225	-14169.00	29022.10	48.8	Pass
T13	120 - 100	Leg	P12x.375	234	-404994.00	620863.00	65.2	Pass
		Diagonal	L5x5x5/16	240	-15623.80	25572.90	61.1	Pass
T14	100 - 80	Leg	P12x.375	249	-448939.00	620863.00	72.3	Pass
		Diagonal	L5x5x3/8	255	-17208.70	26546.30	64.8	Pass
T15	80 - 60	Leg	P14x.375	264	-494912.00	690202.00	71.7	Pass
		Diagonal	L5x5x1/2	270	-19056.20	30605.80	62.3	Pass
T16	60 - 40	Leg	P14x.5	279	-542357.00	911080.00	59.5	Pass
		Diagonal	L6x6x3/8	285	-20416.60	36544.30	55.9	Pass
T17	40 - 20	Leg	P14x.5	294	-590639.00	911081.00	64.8	Pass
		Diagonal	L6x6x3/8	300	-21777.40	32648.20	66.7	Pass
T18	20 - 0	Leg	P14x.5	309	-639796.00	911080.00	70.2	Pass
		Diagonal	L6x6x1/2	315	-23765.80	38110.20	62.4	Pass
							Summary	
						Leg (T9)	73.5	Pass
						Diagonal (T10)	70.2	Pass
						Top Girt (T1)	1.8	Pass
						Bolt Checks	68.5	Pass
						RATING =	**73.5**	**Pass**

**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

SUBSTATION FENCE WITH BARBED WIRE

TABLE OF CONTENTS

**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

---

1. **SCOPE**
This specification defines the requirements for a chain link fence to be furnished and installed at the location(s) specified on Attachment A( ).

2. **USE OF EQUIVALENTS**
When equivalent equipment to the specified equipment is allowed, the manufacturer shall provide documentation regarding the design and operation of the proposed equivalent equipment with the review drawings to enable the company to determine the suitability of the substitute.

3. **CODES AND STANDARDS**
Chain link fence furnished under this specification shall meet the requirements of the latest revision of the following standards, unless stated otherwise in this specification. If any of the requirements of this specification are in conflict with these standards, the manufacturer shall notify the company.

   a. American Society for Testing and Materials (ASTM) No. A123, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

   b. American Society for Testing and Materials (ASTM) No. A491, Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.

   c. American Society for Testing and Materials (ASTM) No. A525, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.

   d. American Society for Testing and Materials (ASTM) No. A585, Specification for Aluminum-Coated Steel Barbed Wire.

   e. American Society for Testing and Materials (ASTM) No. A824, Specification for Metallic-Coated Steel Marcelled Tension Wire for Use with Chain-Link Fence.

   f. American Society for Testing and Materials (ASTM) No. F626, Standard Specification for Fence Fittings.

   g. American Society for Testing and Materials (ASTM) No. F900, Standard Specification for Industrial and Commercial Swing Gates.

   h. American Society for Testing and Materials (ASTM) No. F1043, Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.

   i. American Society for Testing and Materials (ASTM) No. F1083, Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

4. **DRAWINGS AND SUPPLEMENTS**
The substation fence layout drawing(s) will accompany the Bid Quotation and/or the Purchase Order/Purchase Order Release.

5. **GENERAL**
The chain link fence is to include fence fabric, line posts, gate and terminal posts, top rails, gates, barbed wire extension arms, barbed wire, and associated hardware, such as fittings, latches, etc., and footings all as specified.

**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

6. **STOCK STATUS**
None.

7. **LOCATION**
The chain link fence shall be erected at the location as indicated on Attachment A() and/or the Purchase Order/Purchase Order Release.

8. **SCHEDULE**
The approximate installation dates shall be stated on the Attachment A() and/or the Purchase Order. The exact date of the installation to be determined by the Alliant Energy Construction Coordinator and the successful bidder.

9. **DESIGN AND MATERIALS**

a. **Fence and Gate Fabric**
The fabric shall be 9 gauge wire woven in a 2 inch diamond mesh, aluminum coated by the hot-dip process before weaving into the fabric, with a minimum of 0.4 ounces of aluminum per square foot of surface area. The selvage at the top and bottom to be twisted and barbed. The overall fabric height shall be 96 inches, manufactured in accordance with ASTM A-491. The steel wire and coating shall conform to ASTM A-817.

b. **Barbed Wire**
The barbed wire, Type I, shall be formed of two strands of No. 12-1/2 gauge steel wires and include 14 gauge steel barbs in a 4 point pattern on 5 inch centers. The coating on the 12-1/2 gauge wires shall be a minimum 0.30 ounces of aluminum per square foot of wire surface per ASTM A-585. The coating on the 14 gauge wires shall be a minimum 0.25 ounces of aluminum per square foot of wire surface per ASTM A-585. The typical installation will consist of three parallel strands of barbed wire on angled barb arms. Attachment A() will indicate when barbed wire is not required.

c. **Tension Wire**
The tension wire shall be 7 gauge Type I marcelled carbon steel, conforming to ASTM A-824. The coating shall be 0.40 ounces of aluminum per square foot of wire surface.

d. **Line Posts**
The line post shall be roll formed “C” section steel, 2.25 x 1.70 inch, 2.70 lbs. per foot or round post 2 IPS (2.375 inch OD) Type II at 3.12 lbs. per foot, conforming to the requirements of ASTM F-1043. The coating to be either 4.0 ounces per square foot of galfan (zinc) alloy per ASTM A-525, or 2.0 ounces per square foot of zinc, hot-dip galvanized per ASTM A-123. The line posts shall be of sufficient length to be driven to a minimum depth of 4 feet. The first line post from a terminal or gatepost shall be of sufficient length to be embedded in concrete per Figure 3. Line posts shall be evenly spaced on maximum 10-foot centers.

e. **Terminal Posts**
The terminal posts shall be round post, 2-1/2 IPS (2.875 inch OD) Type II at 4.64 lbs. per foot conforming to ASTM F-1043. The coating to be either 4.0 ounces per square foot of galfan (zinc) alloy per ASTM A-525, or 2.0 ounces per square foot of zinc, hot-dip galvanized per ASTM A-123. The terminal posts shall be of sufficient length to be embedded in concrete per Figure 3, Fence Foundation Drawing.

**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

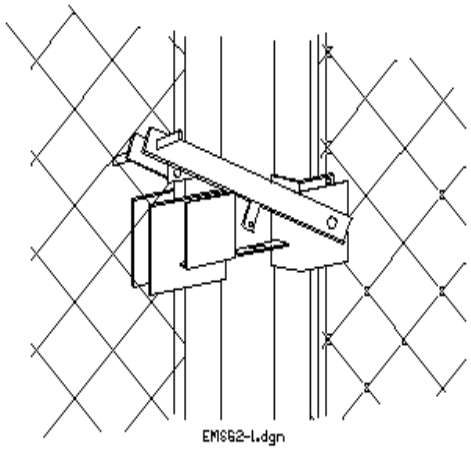
FENCE, SUBSTATION, WITH BARBED WIRE

f. **Swing Gate Posts**
The swing gateposts shall be round post, 3-1/2 IPS (4 inch OD) Type II at 6.56 lbs. per foot, for gates up to 26-foot opening, conforming to ASTM F-1043. The coating to be either 4.0 ounces per square foot of galfan (zinc) alloy per ASTM A-525, or 2.0 ounces per square foot of zinc, hot-dip galvanized per ASTM A-123. The swing gateposts shall be of sufficient length to be embedded in concrete per Figure 3, Fence Foundation Drawing. Positioning of the gateposts is critical, as the completed gate installation shall have no more than a 4 inch opening between the gates.

g. **Gate Hinges**
Gate hinges shall be of the Bull Dog style with three installed on each gate. The upper hinge to be placed at the top of the gate frame to support the gate, the bottom hinge to be placed above the lower gate frame member, and the third hinge centered. The hinges shall not twist or turn under the full swing of the gate. The hinge shall be designed to provide a maximum opening between the gatepost and the frame of the gate of 3".

h. **Gate Frames**
Gate frames and bracing shall be constructed of 1-1/2 IPS (1.90 inch OD) Type I or Type II galvanized round steel pipe and conform to ASTM F900, 2.72 lbs. per ft. per ASTM F1083 or 2.28 lbs. per ft., per ASTM F1043. The pipe frame shall be welded at each corner and brace member. The welds shall be painted with zinc-based paint. The standard gate frames are 8 ft. high by 10 ft. long and require a horizontal and vertical brace. The end members of the gate frames shall be extended one foot above the top horizontal member to which 3 strands of barbed wire, uniformly spaced, shall be attached. Each frame shall have 3/8-inch diameter adjustable truss rods. Gates shall have a double drive industrial latch. PL152, per Figure 1, and drop bar type hold backs per Figure 2. The gate fabric shall be the same type as used in the fence construction. The fabric shall be attached securely to the gate frame at intervals not exceeding 14 inches.

FIGURE 1 DOUBLE DRIVE INDUSTRIAL LATCH



**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

i. **Wicket Gate**
A 3 ft. wide by 6 ft. high wicket gate (also called step through gate) shall be placed in the main vehicular gate, located 1.5 feet above the bottom and at the latch end of the enclosing gate. The frame shall consist of 1-1/2 IPS (1.9 inch OD) Type I or Type II galvanized round steel pipe, 2.72 lbs. per ft., per ASTM F1083 or 2.28 lbs. per ft., per ASTM F1043. The pipe frame shall be welded and the welds painted with zinc-based paint. The wicket gate shall be supported on three pin type hinges with the center hinge mounted upside down. The wicket gate latch shall be a PLW-152.

j. **Capacitor Bank Fence**
The capacitor bank fence, when required, will be constructed in accordance with this specification with these exceptions: 1) Fence height is 6 foot, no barbed wire is required; 2) Terminal and gate post are 2-1/2" IPS; 3) One 4 foot wide personnel gate with latch similar to wicket gate.

k. **Fence Panels**
The fence panel is to be constructed in accordance with paragraph 9.f and 9.h with these exceptions: 1) Two Bull Dog type hinges will be installed on both sides of the gate frame positioned as on the swing gates; 2) The gate latch will not be required. The location and width of the fence panel(s) will be indicated on Attachment A. The use of fence panels will be permitted when access to an area of the substation is not needed on a regular basis and can not be obtained from the entrance gate.

l. **Extension Arm**
The barbed wire extension arms, fabricated and galvanized per ASTM F626, shall extend at a 45° angle such that the upper barbed wire is located approximately one foot outside of the fence line. The arm shall be fitted with clips or other means for attaching three strands of barbed wire. The arm shall support a 250 lb. vertical load per ASTM F626. The 3 barb 45° extension arms shall also be provided for the corner posts.

m. **Top and Brace Rail and Truss Rod**
Rails shall be 1-1/4 IPS (1.66 inch OD) Type II galvanized round steel pipe, 1.40 lbs. per ft., per ASTM F1043, Group IC with Type B external zinc coating and Type B or D internal zinc coating. The top rail shall be not less than 18 feet and shall be swedged for connecting lengths into a continuous run. The top rail shall pass through intermediate post tops and be securely fastened to terminal posts. The top rail in its final state should lie in a level plane between terminal posts. Brace rails shall be located at gate and terminal posts only, extending to the first line post, midway between the top rail and ground. Truss rod, attaching brace and post, shall be 3/8-inch minimum diameter, fabricated and galvanized per ASTM F626.

n. **Fabric Ties**

1) Fabric shall be connected to:

   a) Line posts with 6 gauge wire ties every 14 inches.

   b) Top rails with 9 gauge wire ties every 24 inches.

   c) Terminal, corner, and gate posts by 1/4 x 3/4 inch galvanized tension bars tied to the post every 14 inches with 12 gauge by 7/8-inch wide galvanized steel bands and 5/16 inch diameter bolts and nuts.

2) Ties, clips, tension bars and steel bands fabricated and installed per ASTM F626.

**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

o. **Fittings**
All fittings shall be steel fabricated and hot-dip zinc-coated per ASTM F626.

p. **Material Certification**
A Mill Certificate SHALL be provided on the galvanized and aluminized components.

10. **INSTALLATION**

a. Installation shall meet the requirements of ASTM F567.

b. When required, post foundations shall be constructed per Fig. 3, Fence Foundation Drawing. If the crushed rock is installed prior to fence installation, excavated material shall be prevented from contaminating the crushed rock and after the concrete has set, crushed rock shall be spread over the foundation and tamped in place.

c. Driven line posts shall be driven to a depth of 4 feet.

d. The fence fabric shall be installed so that as far as practical, there is no opening between the bottom of the fence fabric and the crushed rock. The maximum opening allowed between the bottom of the fence fabric and the crushed rock is 1 inch. The top of the fence shall be a straight line between terminals (i.e., "airline between terminals").

e. A tension wire shall be installed and attached as close to the bottom of the fabric as possible, be taut and free of sag.

f. Terminate the barb wire on all corner brackets

g. The fence, including corners and gates, shall be placed in the location as staked by the Company surveyors and in accordance with the drawings. Any discrepancy between the survey stakes and the drawings should be brought immediately to the attention of the Construction Coordinator.

h. All excess fence materials shall be removed from the site at the completion of the installation.

11. **MISCELLANEOUS**

a. Specification inquiries shall be directed to the technical contact as shown on Attachment A(), purchasing and account inquiries shall be directed to the contact person indicated on the Request For Quote or Purchase Order, and installation and construction inquiries shall be directed to the Construction Coordinator.

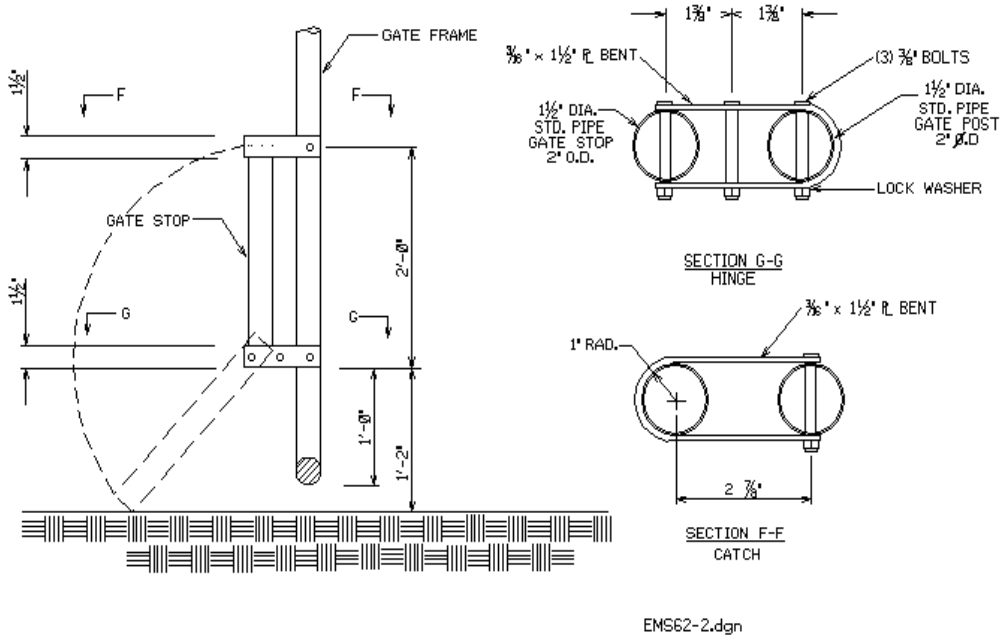
b. Fence found not in compliance with this specification will be rejected and credited, replaced or brought into full compliance at the supplier's expense.

**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

FIGURE 2 - GATE WING DETAIL

The standard design is for the gates to swing into the substation in which case the gate wing would be installed on the outside of each gate. Should the gates need to swing to the outside of the substation, the gate wing would be installed on the inside of each gate.

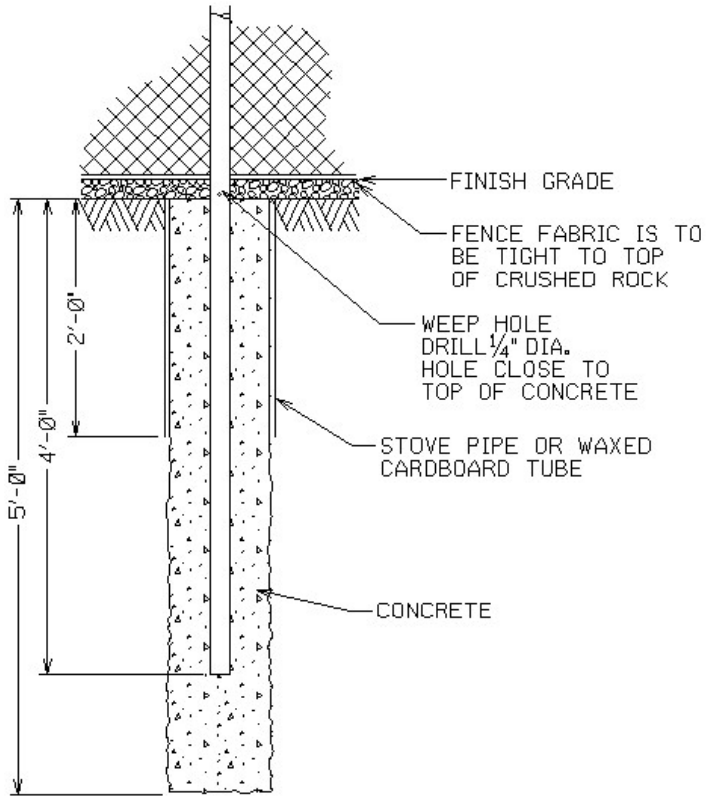


**ELECTRICAL EQUIPMENT
AND MATERIAL SPECIFICATION**

FENCE, SUBSTATION, WITH BARBED WIRE

FIGURE 3 - FENCE FOUNDATION DRAWING

All corner, gate, and first line post each side of a terminal post shall have 12" dia. foundations. The top 24 inches shall be formed using a stovepipe or waxed cardboard Sonotube.

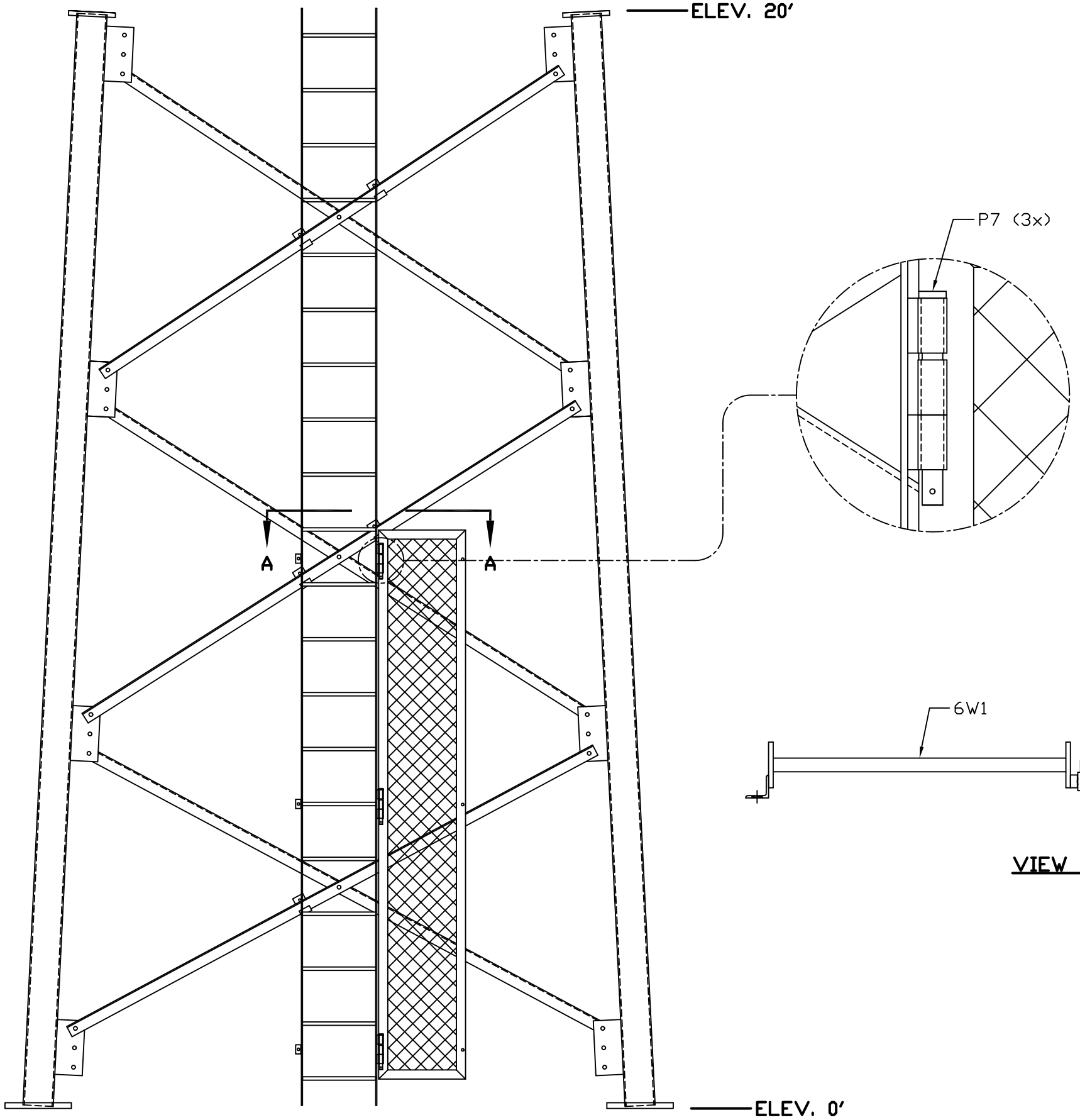


FDND2Ø

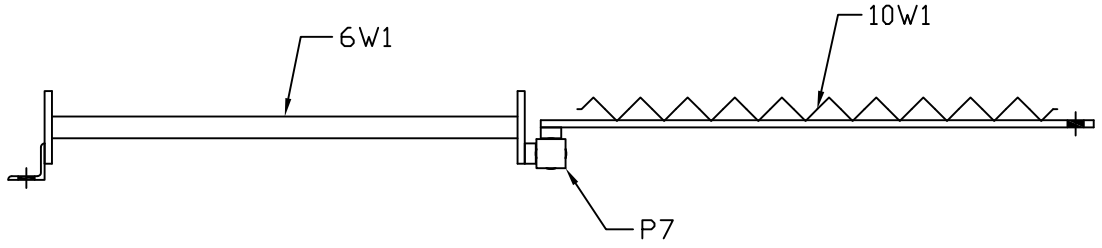
(END)

MATERIAL LIST				
MK#	ITEM	QTY	DESCRIPTION	WT#
6W1		1	LADDER WELDMENT W/ ANTI-CLIMB	129
10W1		1	ANTI-CLIMB DOOR WELDMENT	64
P7		3	3/4" SOLID ROUND PIN WELDMENT	4
		3	1/8" COTTER PIN	--

BLACK IRON WT = 197#
GALVANIZED WT = 211#



ELEVATION VIEW



VIEW A-A

NOTES:

1. INSTALL AS SHOWN. USE ITEM P7 TO ATTACH DOOR TO LADDER.
2. ALL STEEL SHALL BE ASTM A36 MINIMUM.
3. FABRICATED STEEL SHALL BE HOT DIP GALVANIZED PER ASTM A123.
4. HARDWARE SHALL BE A325 OR APPROVED EQUAL.
5. ALL NUTS SHALL BE TIGHTENED TO A TIGHT CONDITION TO BE DETERMINED BY THE TURN-OF-THE-NUT METHOD AS OUTLINED IN THE ASIC MANUAL OF STEEL CONSTRUCTION.
6. REFERENCE EEI "TERMS & CONDITIONS RELATED TO SALES" SHEET FOR ADDITIONAL NOTES.

SITE: DUBOIS, WY

INSTALLATION DETAILS FOR ANTI-CLIMB DEVICE

EHRESMANN ENGINEERING, INC.
CONSULTING ENGINEERS
4400 WEST 31st. STREET
YANKTON, SD 57078
(605) 665-7532
(605) 665-9780

DATE: 05/18/01

BY: TSP

CHECKED:

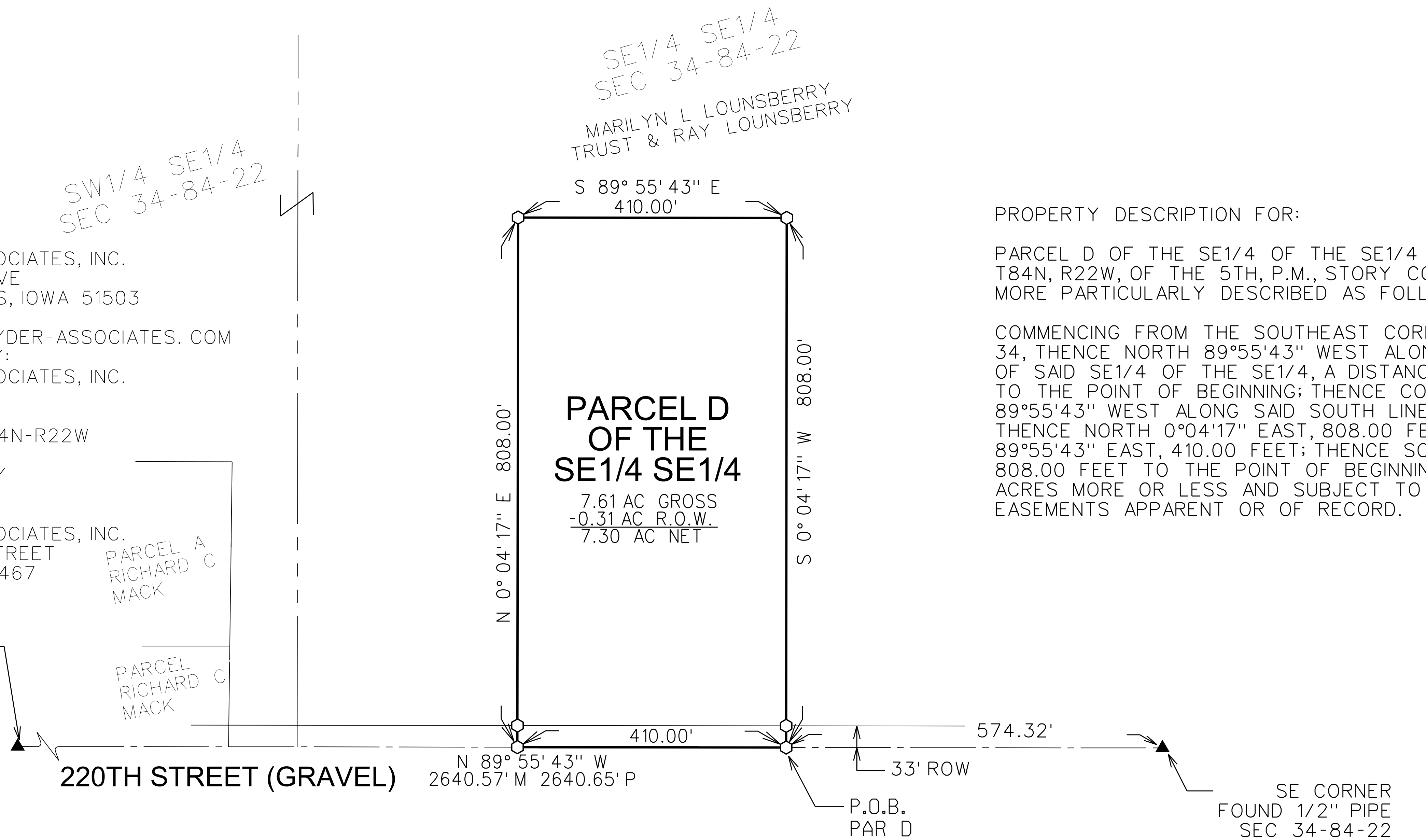
J.O. **49260** | DWG # 49260E8 | SHT 8 OF

CORRECTED PLAT OF SURVEY
PARCEL D OF THE SE1/4 SE1/4 OF SEC 34-84-22

THE PURPOSE OF THIS SURVEY IS TO CORRECT AND REPLACE THE SURVEY PREVIOUSLY RECORDED IN INSTRUMENT NUMBER 2017-00000546.

INDEX LEGEND

SURVEYOR'S NAME:
MIKE SCHULTE
SNYDER & ASSOCIATES, INC.
1751 MADISON AVE
COUNCIL BLUFFS, IOWA 51503
712-322-3202
MLSCHULTE@SNYDER-ASSOCIATES. COM
SERVICE PROVIDED BY:
SNYDER & ASSOCIATES, INC.
SURVEY LOCATED:
SE 1/4 SE1/4
SECTION 34-T84N-R22W
REQUESTED BY:
ALLIANT ENERGY
RETURN TO:
MIKE SCHULTE
SNYDER & ASSOCIATES, INC.
2003 390TH STREET
WESTSIDE, IA 51467



PROPERTY DESCRIPTION FOR:

PARCEL D OF THE SE1/4 OF THE SE1/4 OF SECTION 34, T84N, R22W, OF THE 5TH, P.M., STORY COUNTY, IOWA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING FROM THE SOUTHEAST CORNER OF SAID SECTION 34, THENCE NORTH 89°55'43" WEST ALONG THE SOUTH LINE OF SAID SE1/4 OF THE SE1/4, A DISTANCE OF 574.32 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING NORTH 89°55'43" WEST ALONG SAID SOUTH LINE, 410.00 FEET; THENCE NORTH 0°04'17" EAST, 808.00 FEET; THENCE SOUTH 89°55'43" EAST, 410.00 FEET; THENCE SOUTH 0°04'17" WEST, 808.00 FEET TO THE POINT OF BEGINNING CONTAINING 7.61 ACRES MORE OR LESS AND SUBJECT TO ANY AND ALL EASEMENTS APPARENT OR OF RECORD.

LEGEND

Survey	Found	Set
Section Corner	▲	△
1/2" Rebar, Yellow Plastic Cap #17979	●	
1/2" Rebar, Yellow Plastic Cap #17979 (Unless Otherwise Noted)		⬡
ROW Marker	■	□
ROW Rail	H	H
Calculated Point	+	
Platted Distance	P	
Measured Bearing & Distance	M	
Recorded As	R	
Deed Distance	D	
Calculated Distance	C	
Centerline		
Section Line		
1/4 Section Line		
1/4 1/4 Section Line		
Easement Line		

DATE OF SURVEY

MARCH 20, 2017

BASIS OF BEARING

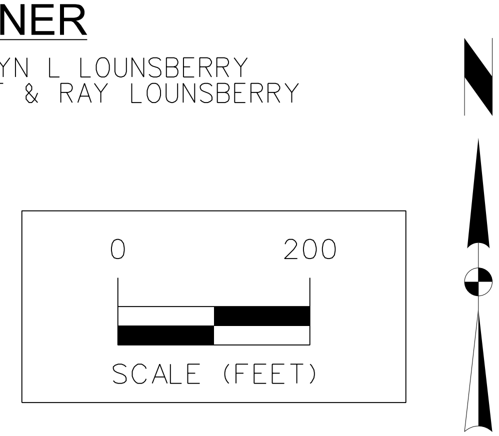
IARCS ZONE 8
IARTN DERIVED
US SURVEY FEET
P.O.B.
N:7650334.65
E:18589031.23

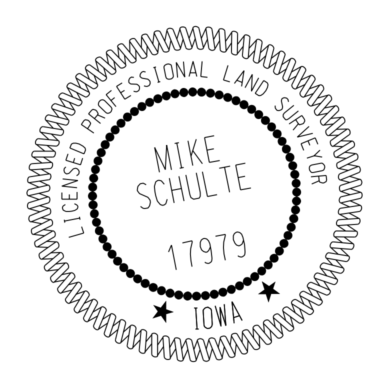
SURVEY REQUESTED BY

ALLIANT ENERGY

OWNER

MARILYN L LOUNSBERRY
TRUST & RAY LOUNSBERRY





I hereby certify that this land surveying document was prepared and the related survey work was performed by me or under my direct personal supervision and that I am a duly licensed Professional Land Surveyor under the laws of the State of Iowa.

Mike Schulte, PLS Date

License Number 17979

My License Renewal Date is December 31, 2017

Pages or sheets covered by this seal:
1 of 1

MARK	REVISION	DATE	BY
1	PARCEL DIMENSIONS CHANGED	03/21/17	SLG

Date: | Field Bk: | Pg: | Scale: 1" = 200'
Technician: MLS | Checked By: MLS | Sheet 1 of 1
Project No: 116.1113

PARCEL D OF THE SE1/4 SE1/4 OF SEC 34-84-22
STORY COUNTY IOWA
CORRECTED PLAT OF SURVEY

SNYDER & ASSOCIATES, INC.
1751 MADISON AVE
COUNCIL BLUFFS, IOWA 51503
712-322-3202 | ww.snyder-associates.com

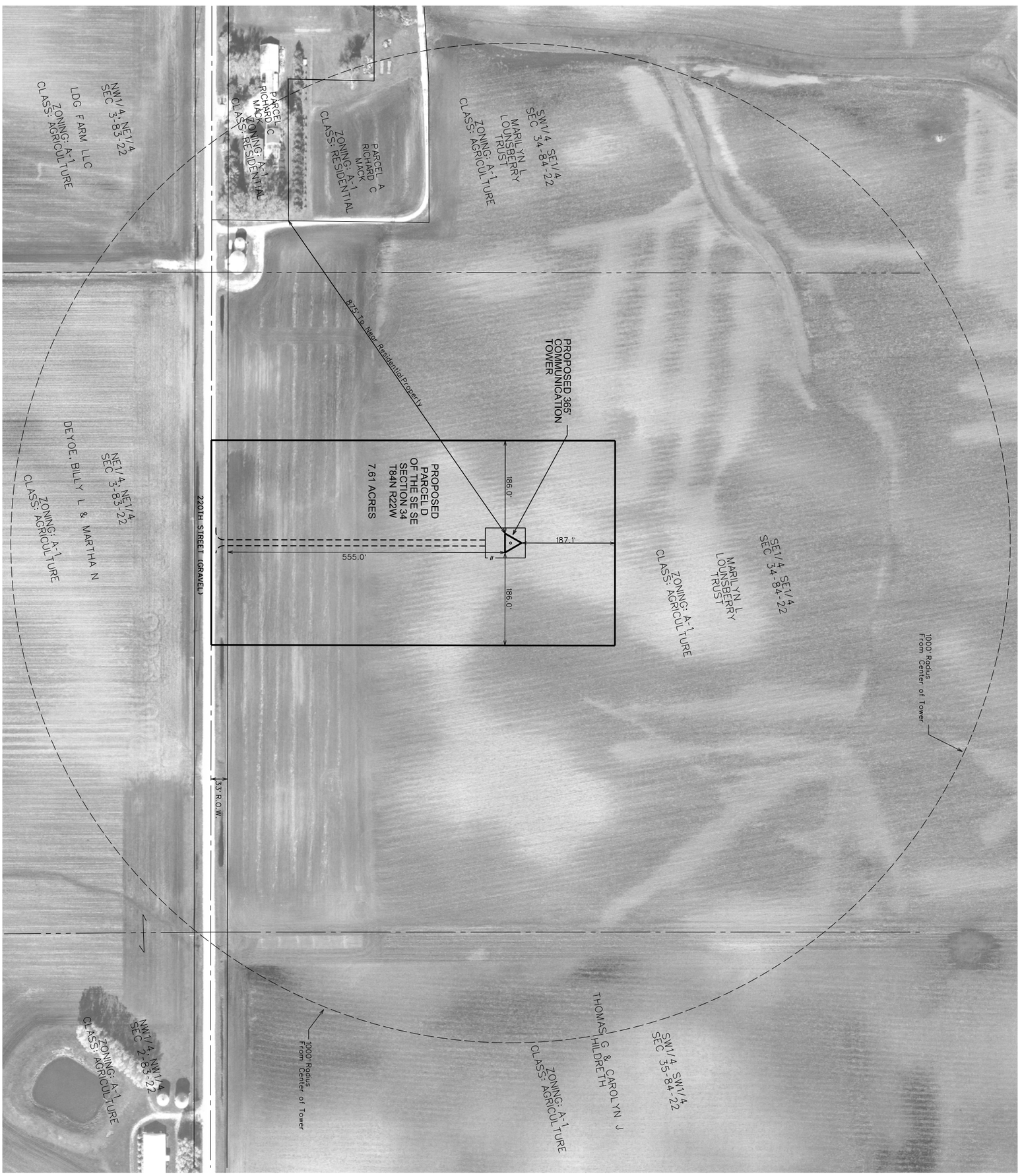
Project No: 116.1113
Sheet 1 of 1

EJM
N:\2016_Projects\116.1113\Cadd\1161113SiteContextMap.dgn

3/21/2017
12:04:15 PM

Snyder
1:200

Y:\pen\gate.tbl
Y:\print_drivers\Black_Gray\V8iBWHalfWeight1PDF.pltcfg



SCALE (FEET)
0
200

Sheet 1 of 1

Project No: 1161113

ALLIANT ENERGY - PROSED TOWER LOCATION NEVADA

SITE CONTEXT MAP

STORY COUNTY, IA

SNYDER & ASSOCIATES, INC.
1751 MADISON AVENUE
COUNCIL BLUFFS, IA 51503
712-322-3202 | www.snyder-associates.com

MARK	REVISION	DATE	BY
1	REVISED SITE LAYOUT	3/20/17	EJM

Engineer:	Checked By: MLS	Scale:	1"= 200'
Technician: RLC	Date: 12/07/2016	Field Bk:	Pg:
Project No: 1161113		Sheet	1 of 1

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

Aeronautical Study No.
2016-ACE-5031-OE
Prior Study No.
2016-ACE-4176-OE

Issued Date: 12/23/2016

John Einck
AlliantEnergy
1000 Main St; Suite 769
Dubuque, IA 52001-4723

**** 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:	Tower Nevada
Location:	Nevada, IA
Latitude:	42-02-08.14N NAD 83
Longitude:	93-23-21.30W
Heights:	1010 feet site elevation (SE)
	365 feet above ground level (AGL)
	1375 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 L Change 1, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

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 Airmen (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)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

This determination expires on 06/23/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (310) 725-6591. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2016-ACE-5031-OE.

Signature Control No: 311922495-313501819 (DNE)
Tameria Burch
Technician

Attachment(s)
Frequency Data

cc: FCC

Frequency Data for ASN 2016-ACE-5031-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
851	866	MHz	500	W
952.6812	952.6812	MHz	38	dBm
6182	6213	MHz	68	dBm
10830	10840	MHz	55	dBm

CITY OF
ames

Smart Choice

January 30, 2017

Snyder & Associates, Inc.
Mike Schulte
712-322-3202 Office
515-669-1019 Mobile
mlschulte@snyder-associates.com

RE: Airport No Conflict Confirmation.

Dear Mr. Schulte:

The City of Ames has reviewed your request for the permitting and construction of a 350' tower located in the SE1/4 of the SE1/4 of Section 34, T84N, R22W, of the 5th P.M., of Story County, Iowa. The Ames Municipal Airport will have no issue with this tower.

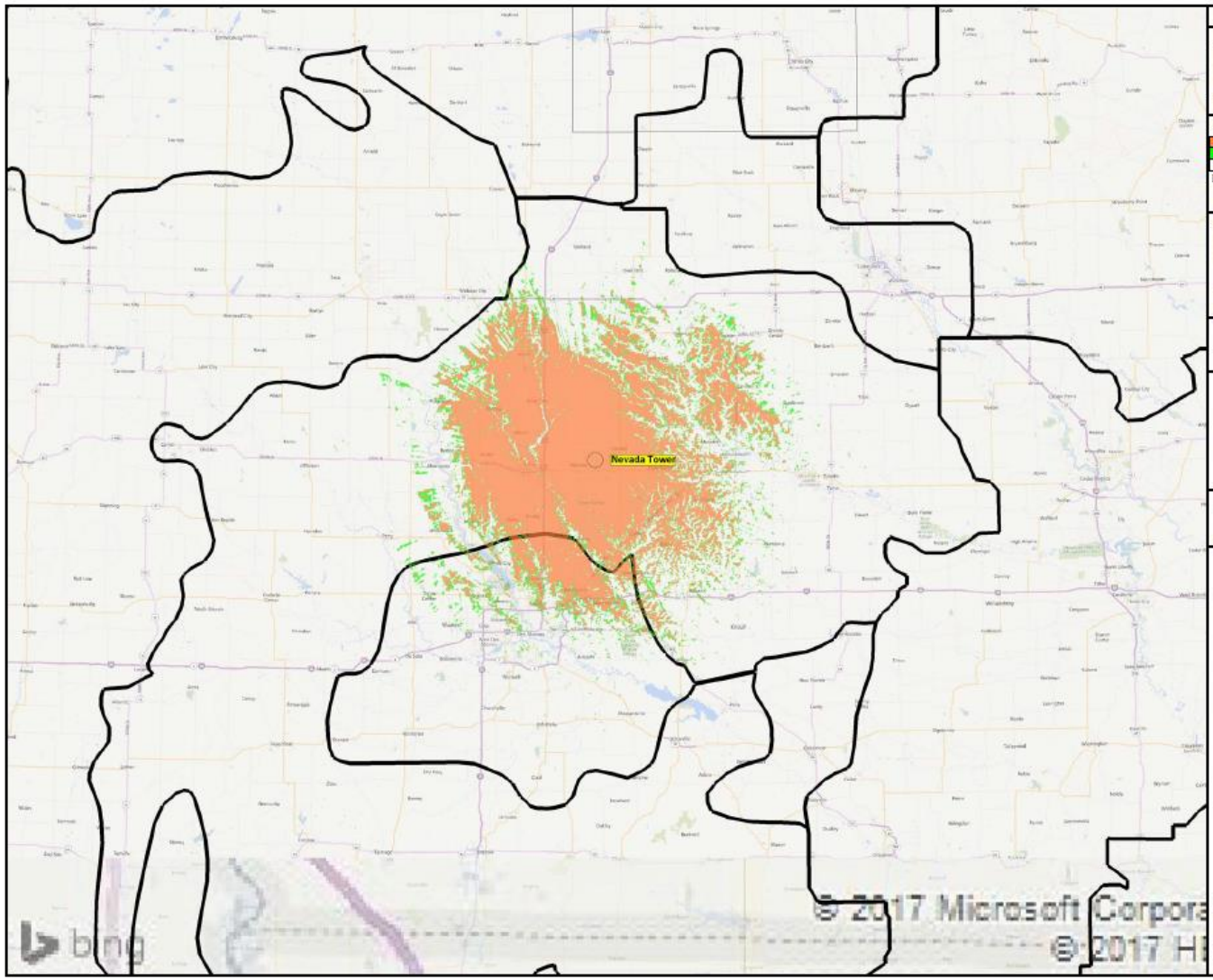
Sincerely,

Damion Pregitzer, P.E. PTOE
Traffic Engineer/Airport Manager

Public Works
Traffic

515.239.5160 *main*
515.509.5189 *cell*
515.239.5404 *fax*

515 Clark Ave. P.O. Box 811
Ames, IA 50010
www.CityofAmes.org



EDXI® SignalPro®: P50-00952A_Alliant_R1_YZEDX_Jun3015

Prop. model 2: Anderson-2D v1.00
Time: 50.0% Loc.: 50.0%
Prediction Confidence Margin: 10.8dB
Climate: Continental Temperate
Land use (clutter): EDX .GCV format
Atmospheric Abs.: none
K Factor: 1.333

Mobile Talk In (Rx Antenna with Multicoupler)

>=	-108.8 dBmW	Duplexer
	-111.9 to -108.8 dBmW	Multicoupler Mobile Talk In
<	-111.9 dBmW	800 MHz DMR T3

Display threshold level: -111.9 dBmW
RX Antenna - Type: ISOTROPIC
Height: 6.6 ft AGL Gain: 1.00 dBd

Notes

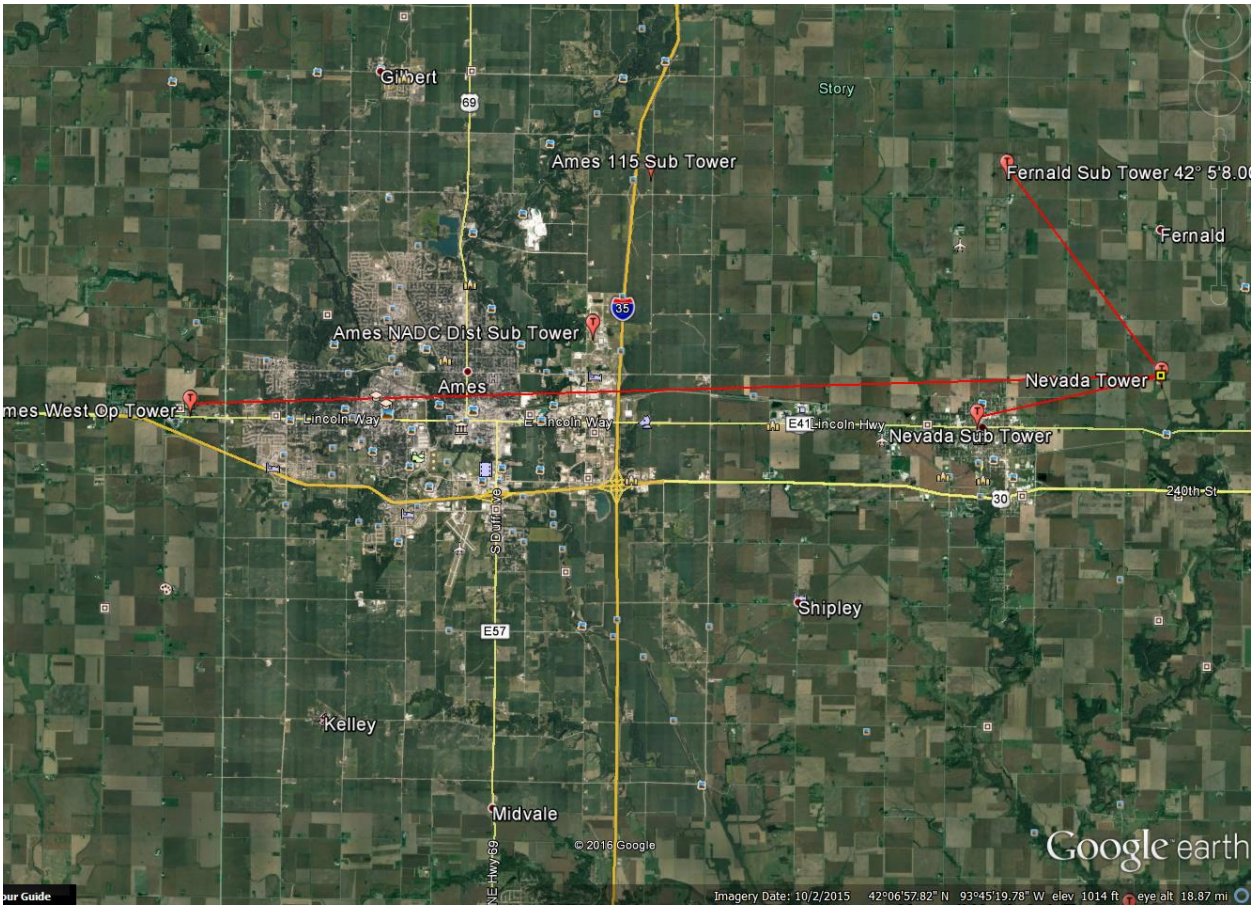
DAQ 3.0.
Region 6A
Mobile Antenna Gain: 3 dB (derated to 2 dB).

These plots are for planning and illustrative purposes only and do not imply any guaranteed level of system performance.

MILES
-5 0 20

tait communications

P50-00952A Alliant Energy
Iowa, Wisconsin
800 MHz DMR Fri Feb 17 15:45:57 2017


Gilbert
69
Story
Ames 115 Sub Tower
Fernald Sub Tower 42° 5'8.0
Fernald
35
Ames NADC Dist Sub Tower
Ames
Nevada Tower
mes West Op Tower
Lincoln Way
E Lincoln Way
E41 Lincoln Hwy
Nevada Sub Tower
30
240th St
Shipley
E57
Kelley
Midvale
© 2016 Google
Google earth
Imagery Date: 10/2/2015 42°06'57.82" N 93°45'19.78" W elev 1014 ft eye alt 18.87 mi

Staff Report

Story County
Planning and Zoning Commission

Date of Meeting:
April 5, 2017

Case Number CUP03-17
Iowa Statewide Interoperable Communications System (ISICS) Tower - Conditional Use Permit

Case Number VAR02-17
Request for 313 foot variance to the required right-of-way setback for the tower ***(This item requires action by the Board of Adjustment only.)***

APPLICANT: Joe Coyle, Pyramid Network Services, LLC
444 E. 74th Terrace, Kansas City, MO 64131
On behalf of the Iowa Statewide Interoperable Communications System (ISICS) Board and the State of Iowa Communications Network

STAFF PROJECT MANAGER: Emily Zandt, Planner

SUMMARY: This request is for a conditional use permit to allow the construction of a new 395' lattice tower for the Iowa Statewide Interoperable Communication System (ISICS), which will give first responders the ability to communicate with each other on one single band in order to efficiently mobilize during times of emergency or disaster. There is an additional request to decrease the minimum setback requirement from the public right-of-way by 313'. Staff recommends the Planning and Zoning Commission recommend approval of the conditional use permit contingent on the Board of Adjustment approval of a compromise to allow the setback from the north edge of the US Highway 30 frontage road equal to or greater than 100% of the height of the tower.

Property Information

PROPERTY OWNER

State of Iowa Department of Transportation (IDOT)

GENERAL PROPERTY LOCATION

Section: 08 Township: 83 Range: 23, in unincorporated Story County
57073 US Highway 30, Ames, Iowa

PARCEL IDENTIFICATION NUMBER(S)

10-08-300-305

CURRENT ZONING

A-1 Agricultural

CURRENT LAND USE

The proposed site of the ISCIS tower is an existing Iowa Department of Transportation (IDOT) maintenance and storage facility site. This is a 19.43 net acre site located on the north side of the US Highway 30 Frontage Road, east of the Interstate 35 and US Highway 30 interchange. The property is surrounded on the north and east sides by land in agricultural row crops and is adjacent neighbors to two churches to the west. The IDOT will retain ownership of the proposed tower site and there will not be a lease agreement as it is a state owned property.

The IDOT uses this property for truck maintenance, equipment storage, and office space. There is an existing 180' communications tower located in the center of the property, approximately 290' from the north side of the frontage road that is used for IDOT internal communication. This tower meets Story County's Land Development requirements and will be removed once the proposed ISICS tower is completed. The existing tower has a small (10' x 14') equipment building located in the northeast corner of the base. There are four propane tanks immediately south of the existing tower used for heating the IDOT buildings.

LAND USE FRAMEWORK MAP DESIGNATION

Ames Urban Fringe Plan: Rural Urban Transition Area – Agricultural/Long-term Industrial Reserve

CITIES WITHIN TWO MILES

City of Ames

Background

The request is for a Conditional Use Permit to allow the construction of a 395-foot tall, galvanized steel, lattice type tower. Pyramid Network Services, LC is working on behalf of Motorola, the company contracting with the State of Iowa to design and establish the Iowa State Interoperable Communication System (ISICS). This is a federally mandated statewide project to upgrade the State of Iowa's Emergency Management System, improving the communications network to cover at least 95% of the population in

the state. The improved system will give first responders the ability to communicate with each other on one single band in order to efficiently mobilize during times of emergency or disaster. More information and a map of the tower sites statewide can be found in the attached supplemental materials.

The proposed communications system includes 84 towers to be installed statewide. All 84 towers will be sited on state owned property, such as property owned by the Iowa Department of Transportation (DOT), Iowa Department of Corrections (DOC), or the Iowa Department of Natural Resources (DNR). This IDOT property was chosen in Story County because of its proximity to the City of Ames and the ability for connection via microwave transmissions with the Mitchellville site to the southeast and the Woodward site to the southwest. See search ring maps for area considered for proposed tower. There will be no formal lease agreement to locate the tower on the IDOT property because it is state-owned.

The proposed location of the proposed 395' lattice tower is directly to the east of an existing 180' lattice tower and northeast of the four (4) existing propane tanks already on the IDOT site. The applicant indicated that this site was chosen based on its proximity to the existing tower and equipment building and the electrical source with the goal of reusing the infrastructure for cost savings. The existing tower is planned to be removed following the construction of the proposed ISCIS tower.

The Annual Average Daily traffic counts for US Highway 30 as presented by the IDOT increased approximately 12% between 2007 and 2015 from 12,800 vehicle trips to 16,600 vehicle trips, respectively. Following this trend, the estimated 2019 Annual Average Daily Traffic Counts will likely be approximately 18,700 vehicle trips.

A representative from Pyramid Network Services, LLC first contacted the Story County Planning and Development Department on May 11, 2016 to discuss the project and learn about the county's requirements.

Variance request as submitted by the Applicant:

> *This request for a Variance to be granted stems from the necessary location on the parcel of the proposed ISICS emergency communications tower. The Variance that is sought is with regard to the tower setback requirement from the right-of-way (see Chapter 90.10 (4)(D)(1)). The proposed 395' lattice tower requires a separation distance per the Code from the public right-of-way of 150 percent of the height of the tower or 593 feet. The distance from the tower center to Sand Hill Trail to the South is approximately 280 feet and the distance from the tower center to Highway 30 to the South is approximately 380 feet. Therefore Motorola and the State of Iowa would respectfully request that the setback to be varied by approximately 313 feet.*

Staff Comment: Based on the site plan submitted, the actual variance requested is 274.58 feet rather than 313 feet.

The following items were submitted by the applicant: a project narrative, description of overall statewide project, property owner consent, site context map, site plan, legal descriptions, separation distances between residential parcels and other towers, tower engineering specifications, zero fall zone letter, copy of the FAA permit application and determination, City of Ames Municipal Airport statement of no issues, Environmental and Historical reviews, and a statement on the co-location potential of the proposed tower and search ring information.

Conditional Use Permit Analysis

A. Applicable Regulations: Chapter 90.04: Standards for Approval

The Planning and Zoning Commission shall review the proposed development for conformance to the following development criteria:

1. **Compatibility.** The proposed buildings or use shall be constructed, arranged and operated so as to be compatible with the character of the zoning district and immediate vicinity, and not to interfere with the development and use of adjacent property in accordance with the applicable district regulations. The proposed development shall not be unsightly, obnoxious, nor offensive in appearance to abutting or nearby properties.

   Applicant Comment: *The proposed tower is situated on a large 18.5 acre parcel, next to a 180 foot tall existing tower. The parcel has been used by IDOT as a maintenance and storage yard since the 1960's. The IDOT property is abutted on two sides with large acreages of farmland. To the South, the tower is set back approximately 300' from the four lane Highway 30 with more farmland and commercially zoned properties to the South including a 120' monopole tower. The proposed tower will not interfere with any future development and use of adjacent property. Compared to other structures that have been approved in the County such as wind turbines, or even large water tanks, the lattice tower that can both be seen through and has no motion, can be considered less obtrusive.*

   Staff Comment: Communication towers and facilities are permitted as a conditional use in the A-1, Agricultural Zoning District, if a conditional use permit is granted. The closest residence is approximately 1/3 of a mile to the east of the IDOT property. The remainder of the IDOT property will continue to be used as it is currently. The IDOT property is designated as Agricultural/Long-term Industrial reserve on the Ames Urban Fringe Plan (AUFP) Land Use Framework Map. There are currently no plans for the IDOT to construct additional buildings on this site. Given the location of the property near to I-35 and US Highway 30 and the potential for future growth and change, and given the proximity of the existing populated uses and heavy volume of motorists on adjacent and nearby roads, towers are not uncharacteristic for the area. In 2014, Pyramid Network Services submitted an application for a Conditional Use Permit for a 160-foot monopole, which is currently located south and east of the proposed tower site on the south side of US Highway 30. This monopole tower meets Story County Land Development Requirements. The wind turbines in the area also meet the required setbacks indicated for the Wind Energy Conversion Systems (WECS) as outlined in the Story County Land Development Regulations Conditional Use Permit Supplemental Standards. However, the proposed location for the tower on the IDOT property does not meet the required setback of 150% of the tower height from the right-of-way. The applicant applied for a 313' variance to this setback requirement. All other setback requirements have been met.

2. **Transition.** The development shall provide for a suitable transition, and if necessary, buffer between the proposed buildings or use and surrounding properties.

Applicant Comment: *The existing buildings on the site, as well as the existing trees help to buffer the tower site from adjacent properties.*

Staff Comment: The IDOT site contains buildings to the west and north of the proposed tower site. There are trees on the east side of the property near the proposed tower site, as well as north of the frontage road to the south. Per the supplemental standards, the applicant will be constructing an eight-foot (8) tall mesh fence around the tower compound. No additional landscaping will be necessary. If the tower is placed on the north side of the building to the north to increase the setback distance from the right-of-way, the building would further buffer the base of the tower from the right-of-way.

3. **Traffic.** The development shall provide for adequate ingress and egress, with particular attention to vehicular and pedestrian safety and convenience, traffic flow and control, and emergency access.

   Applicant Comment: *Access is off of the frontage road that runs parallel to Highway 30, Sand Hill Trail, and there is a paved drive that leads directly to the tower for ease of access in case of emergency. The site is not staffed and preventive maintenance approximately once per month will not materially increase traffic to the IDOT property.*

   Staff Comment: The IDOT currently uses the existing access off of the Highway 30 frontage road for large trucks and other equipment. It is likely that only IDOT employees and tower maintenance workers will visit this site. Traffic to the tower will be limited to upkeep and maintenance and will not be staffed. No new access points will be created.

4. **Parking and Loading.** The development shall provide all off-street parking and loading areas as required by this Ordinance, and adequate service entrances and areas. Appropriate screening shall be provided around parking and service areas to minimize visual impacts, glare from headlights, noise, fumes or other detrimental impacts.

   Applicant Comment: *There is a large parking lot on site to accommodate construction activities and maintenance visits.*

   Staff Comment: All parking of construction equipment and materials will be located within the IDOT property in the existing parking area. Maintenance vehicles will be parked within the private property, out of the right-of-way.

5. **Signs and Lighting.** Permitted signage shall be in accordance with the applicable district regulations and shall be compatible with the immediate vicinity. Exterior lighting, if provided, shall be with consideration given to glare, traffic safety and compatibility with property in the immediate vicinity.

   Applicant Comment: *The only additional lighting will be two red lights on the tower; FAA is not requiring a strobing light. Signage on site will be limited to FCC requirements. The lighting will be provided by the tower manufacturer and the specifications have been requested by the*

applicant. The tower will be fitted with dual red medium intensity lighting. The lights will be flashing day and night.

Staff Comment: Planning and Development staff will require lighting specifications, which must meet county and FAA requirements, prior to the issuance of the preliminary zoning permit.

6. **Environmental Protection.** The development shall be planned and operated in such a manner that will safeguard environmental and visual resources. The development shall not generate excessive noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds.

   Applicant Comment: *The tower facility will not produce any type of nuisance conditions. The only noise will be that of a commercial air conditioning unit to cool the shelter. The proposed emergency generator will only run if there is a power outage. Environmental due diligence has been performed which includes a 185 page Phase I Environmental Assessment that has been provided to the County in soft copy for review.*

   Staff Comment: The environmental impact of the proposed tower is expected to be minimal. The footprint of the concrete base will be 5,548 square feet. Any trees removed from the site due to the construction of the tower shall be replaced near the base of the tower. Prior to the issuance of a Zoning Permit, Story County Planning and Development will require the submittal of a statement indicating the incorporation of the Iowa Storm Water Management Manual Best Practices and erosion and sediment control practices that meet or exceed the Iowa Statewide Urban Design Specifications (SUDAS).

B. If the Commission concludes that all the above development criteria will be met, it must recommend approval of the application unless it concludes that, if completed as proposed, there is a strong probability the development will:

1. not adequately safeguard the health, safety and general welfare of persons residing or working in adjoining or surrounding property.

Applicant Comment: *The proposed facility will be designed and constructed to meet all applicable governmental and industry safety standards. Specifically, the tower site will comply with all FCC, FAA, as well as local and state building codes, rules and regulations regarding construction requirements and technical standards. Compliance with these regulations and standards ensures the public's health and safety will not be adversely impacted. In fact, the entire reason for the installation of the new tower is to enhance the public's health and safety by the ISICS network being utilized by first responders in times of emergency or disaster.*

Staff Comment: The proposed tower will not meet the required setback from the Highway 30 right-of-way. This is a concern based on the traffic numbers along both the frontage road as well as Highway 30. The Annual Average Daily traffic counts for US Highway 30 as presented by the IDOT increased approximately 12% between 2007 and 2015 from 12,800 vehicle trips to 16,600

vehicle trips, respectively. Following this trend, the estimated 2019 Annual Average Daily Traffic Counts will likely be approximately 18,700 vehicle trips.

In addition to the IDOT maintenance vehicles traveling to, from, and within the property of the proposed tower, there are two large churches to the directly west of the proposed tower site that use the Hwy 30 frontage road for access. Crossroad Baptist church has 300+ active members, with an average of 270 members attending weekly. Cornerstone Church has approximately 2,000 active members.

2. **impair an adequate supply (including quality) of light and air to surrounding properties.**

   Applicant Comment: *There will be no dangerous materials handled, stored, discharged or discarded; and no noise will be generated, other than the sound generated by a standard commercial air conditioning unit. The facility will not generate any vibrations, smoke or particulate matter, toxic or noxious matter, odorous matter, fire or explosive hazards, glare, heat, liquid or solid waste or radioactive materials.*

   Staff Comment: The proposed communication tower will be a lattice type tower and will have little to no impact on the supply of light and air to surrounding properties. The closest dwelling is located approximately 1/3 of a mile to the west of the proposed tower site.

3. **unduly increase congestion in the roads, or the hazard from fire, flood, or similar dangers.**

   Applicant Comment: *There will be no traffic, no heat or other noxious dangers produced by the tower equipment.*

   Staff Comment: Following the construction of the proposed tower, there will be very little traffic to and from the tower. Any additional traffic to the site will be limited to tower maintenance vehicles.

4. **diminish or impair established property values on adjoining or surrounding property.**

   Applicant Comment: *Telecommunications towers have been found to not affect property values of surrounding properties. A recent article on this issue can be found here: http://www.beneschlaw.com/Files/Publication/8db35df2-9682-4972-9499-80c23822114d/Presentation/PublicationAttachment/0c5087ff-e21f-4ed9-ab8f-834d23a29325/Probate%20and%20Property%20May%202016.pdf*

   Staff Comment: The Story County Assessor's Office raised no concerns with this item from the review of the requested Conditional Use Permit application. No negative impacts on property values are anticipated.

5. **not be in accord with the intent, purpose and spirit of the Land Development Regulations or County Cornerstone to Capstone (C2C) Plan.**

Applicant Comment: *The Land Use Framework Map (Ames Urban Fringe Plan) indicates that the future use of the area surrounding the tower site is Agricultural/Long-term Industrial Reserve. This would indicate that the presence of the tower will not inhibit future development as shown in the C2C Comprehensive Plan*.

Staff Comment: The Ames Urban Fringe Plan Land Use Framework Map designates this area as Agricultural/Long-term Industrial Reserve. This designation "supports the long term planning objective of accommodating future demand for industrial growth". The proposed tower will not likely impact the surrounding agricultural uses and will not take any land out of row crop production. The tower is not anticipated to inhibit any future industrial growth. With the exception of the proposed location not meeting the required setbacks, the need for towers are typical of a growing and changing area.

C. Burden of Persuasion.

1. **The burden of persuasion as to whether the development, if completed as proposed, will comply with the requirements of this Chapter is at all times on the applicant.**
2. **The burden of presenting evidence to the Planning and Zoning Commission sufficient enough for it to conclude that the application does not comply with the requirements of this Chapter is upon the person or persons recommending such a conclusion, unless the information presented by the applicant warrants such a conclusion.**

D. When indicated in Table 90-1, Table of Conditional Uses, a conditional use shall be subject to the supplemental standards listed below, in addition to the standards for approval set forth in Section 90.04 and development impacts specified in Section 90.05 of this chapter.

4. **Communication Towers and Facilities. Communication towers/facilities existing and/or approved prior to the date of adoption of these standards may continue to be used; however, proposed modifications must be reviewed by the Director and, depending on the nature of the proposed modifications, may be subject to review and approval by the Board of Adjustment. In addition, any proposed modifications to approved and/or existing towers/facilities on towers constructed prior to April 20, 2001, for co-location must submit an application for zoning permit consistent with the requirements of Section 92.09, Required Permits.**

A. Co-Location. Prior to applying for a conditional use permit for construction of a new tower/facility, the applicant shall exhaust all alternatives for co-location on existing towers/facilities.

Applicant Comment: *There are no collocation opportunities within the Search Ring that will accommodate the amount of planned equipment at the required heights. No existing towers within the Search Ring can be modified and extended by approximately 200 to 300 feet at a reasonable cost to support the planned equipment. The planned four (4) microwave dishes and two (2) antennas have much more weight and wind sail area than a typical wireless antenna array. Please see attached letter from Motorola RF Engineer Greg VanHyfte. No*

interference to other equipment will be caused by the planned equipment. Additionally, all of the ISICS network towers must be owned by the State of Iowa and placed on publicly owned properties.

Staff Comment: The applicant provided a statement that co-location is not possible for the proposed equipment and use as well as information on nearby existing towers. None of the nearby towers meet the height required for the proposed ISICS equipment. Additionally, all proposed ISICS towers statewide will be located on properties owned by the State of Iowa to reduce the cost of the overall project.

B. Separation from Planned and/or Existing Residential Properties. All proposed towers/facilities shall be separated from neighboring properties either planned or utilized for residential purposes as established herein. The minimum separation distance shall be measured from the center of the foundation of the proposed tower/facility to the nearest portion of a property line of a neighboring tax parcel used or planned for residential purposes. For the purposes of this section, a property shall be considered to be used for a residential purpose, regardless of assessment type, if a dwelling or mobile home exists on the property. A property shall be considered to be planned for residential purposes if it has the County Development Plan (CDP) designation of Rural Residential Area or a residential designation as defined as an approved fringe area plan; if it is within two miles of a city boundary, and that city has established a residential land use classification for the property; or if a property is zoned Agricultural/Residential (A-R), Residential (R-1), Residential (R-2), or Residential Mobile Home (RMH).

(1) For towers/facilities of self-supporting monopole or lattice-type construction, the minimum separation distance shall be 300 feet or 150 percent of the height of the tower, whichever is greater.

Applicant Comment: *The proposed 395' lattice tower requires a separation distance of 150 percent of the height of the tower or 593 feet. The nearest property being used for a residential purpose is PID 10-08-300-405 with the address 57507 US HIGHWAY 30, Ames which is located east of the proposed tower site. The western property line of the parcel that has an existing dwelling is approximately 900 feet from the center of the proposed tower. There do not appear to be any planned residential properties in closer proximity.*

Staff Comment: Not applicable. The closest residential property is over 900 feet to the east of the proposed tower site. The Ames Urban Fringe Land Use Framework map designates this area as Agricultural/Long-term Industrial Reserve. There are no residential developments currently planned for this area. Agricultural Land use and uses related permitted in the A-1 Agricultural District will continue until the area transitions to industrial land use as identified in the Ames Urban Fringe Plan (AUFP).

(2) For guyed towers/facilities the minimum separation distance shall be 300 feet or 150 percent of the height of the tower, whichever is greater, plus 100 percent of the length of the longest supporting guy wire.

Applicant Comment: *Not applicable. The proposed tower is a self-supporting lattice tower with no guy wires.*

Staff Comment: Not applicable.

C. Height. The applicant must demonstrate the proposed height of the tower/facility is the minimum necessary to accommodate the proposal's requirements, as documented by a qualified engineer.

Applicant Comment: *Please refer to the attached letter from Motorola RF Engineer Greg VanHyfte which states that the proposed height of 395' is the minimum height necessary to meet the network functionality objectives.*

D. Required Setbacks. The center foundation of all towers/facilities are required to be set back from any public right-of-way in accordance with the following:

(1) For towers of monopole and lattice-type construction, a distance equal to 150 percent the height of the tower or 200 feet, whichever is greater; and for towers of guyed-type construction, a distance equal to 150 percent the height of the tower plus the length of guyed wire or 200 feet, whichever is greater.

Applicant Comment: *The proposed 395' lattice tower requires a separation distance from the public right-of-way of 150 percent of the height of the tower or 593 feet. The distance from the tower center to Sand Hill Trail to the South is approximately 280 feet and the distance from the tower center to Highway 30 to the South is approximately 380 feet. The required separation is not met and will therefore be addressed with a request for a Variance – please see attached BOA Variance application for discussion.*

Staff Comment: The required side and rear setbacks will be met by the proposed tower. There is sufficient space on the IDOT site (19.43 acres) to meet all of the setback requirements, including 150% of the height of the tower from the right-of way. However, the proposed location of the tower does not meet these setback requirements.

(2) From any adjoining property zoned or planned residential or existing residential use, the distance of 300 feet or 150 percent of the height of the tower/facility for towers of lattice or monopole construction type; and 300 or 150 percent of the height of the tower/facility plus 100 percent of the length of the longest supporting guy wire for towers of guyed type construction as measured the center foundation of the tower/facility to the nearest property line.

Applicant Comment: *The proposed 395' lattice tower requires a separation distance of 150 percent of the height of the tower or 593 feet. The nearest property being used for a residential purpose is PID 10-08-300-405 with the address 57507 US HIGHWAY 30, Ames which is located east of the proposed tower site. The western property line of the parcel that has an existing dwelling is approximately 900 feet East of the center of the proposed tower. There do not appear to be any planned residential properties in closer proximity.*

Staff Comment: Not applicable. The closest residential property is over 900 feet to the east of the proposed tower site. The Ames Urban Fringe Land Use Framework map designates this area as Agricultural/Long-term Industrial Reserve. There are no residential developments currently planned for the area.

(3) From other property lines, a distance equal to at least 50 percent of the height of the tower/facility.

Applicant Comment: *Please see attached Survey showing the following measurements to the other property lines. The center of the tower is 434.86 feet from the property line to the West and 899.99 feet from the property line to the North.*

Staff Comment: The required side and rear setbacks will be met by the proposed tower.

(4) Guys and accessory buildings must satisfy the minimum zoning district setback requirements for accessory structures within the lease area.

Applicant Comment: *There are no guys. The existing equipment shelter is within the lease area and must be within 8 feet of the tower as that is the maximum length for the ice bridge used to support the coax cabling running from the shelter to the tower (See Page 505 of construction drawings for ice bridge details stating "8'-0" MAX.)*

Staff Comment: Not applicable. If the equipment building is relocated on the property, it is likely to meet setbacks on the 19-acre parcel.

E. Fencing and Screening.

(1) Security Fencing. Towers/facilities shall be enclosed by fencing not less than six feet in height and shall be equipped with appropriate anti-climbing devices.

Applicant Comment: *Chain link fencing eight feet high is proposed. The tower will have anti-climbing devices.*

Staff Comment: Per the supplemental standards, the applicant will be constructing an eight-foot (8) tall mesh fence around the tower compound. Anti-climbing devices are also planned.

(2) Screening. The lowest six feet of the tower/facility shall be visually screened by trees, large shrubs, solid walls, buildings, solid fencing, and/or any combination thereof, from all public right-of-ways and adjoining zoned, planned, and/or existing residential land uses.

Applicant Comment: *The site already benefits from existing screening consisting of many mature trees along the South property line facing the right-of-ways and along the East property line.*

Staff Comment: The IDOT site contains buildings to the west and north of the proposed tower site. There are trees on the east side of the property near the proposed tower site, as well as along the north side of the frontage road to the south.

F. Aesthetics. Towers/facilities shall meet the following general requirements.

(1) Color. Towers/facilities shall maintain a galvanized steel finish. If required to be painted by the FAA, such required colored schemes must be submitted to the Board of Adjustment. All mandated FAA requirements must be provided in writing to the Board of Adjustment prior to any action on applications.

Applicant Comment: The tower will be constructed of galvanized steel. It will not be painted. The FAA Determination of No Hazard letter is attached to this application.

Staff Comment: The tower design manual submitted by the applicant specifies that it will be finished in galvanized steel.

(2) Lighting. Towers/facilities, including antennas, shall not be artificially lighted unless required by the FAA or applicable authority. Unless required as the only option by the FAA, strobe lighting is not permitted. If lighting is required, lighting alternatives and design chosen must cause the least disturbance to the surrounding views. All mandated FAA requirements must be provided in writing to the Board of Adjustment prior to any action on applications.

Applicant Comment: *The FAA Determination of No Hazard letter is attached to this application. Also attached is an FAA structure details page that indicates the tower should be fitted with dual red medium intensity lighting for migratory bird safety and aircraft safety.*

Staff Comment: Lighting specifications shall be submitted to Story County Planning and Development prior to the issuance of a zoning permit and will be required to meet county and FAA requirements.

(3) Signs. No signs shall be allowed on any tower/facility, other than safety or warning signs. If any signage is required consistent with this standard, such signage must comply with the requirements of Section 89.02, Signs.

Applicant Comment: *Only safety or warning signs as required by the FCC will be posted on the fencing and will comply with the FCC mandates and policies.*

Staff Comment: The applicant has not proposed any additional signage.

G. Compliance with Other Regulations. The proposed tower/facility must comply with all other applicable local, State or Federal regulations.

Applicant Comment: *The tower will comply with all applicable operating and design standards.*

Staff Comment: In addition to the FAA determination of no hazard to air navigation, the applicant submitted a statement from the City of Ames regarding the finding that the municipal airport will have no issues with the proposed tower. However, the proposed tower will not meet setback requirements from the right-of-way at the proposed location.

H. Obstruction of View. The proposed tower/facility will not unreasonably interfere with the view from any publicly owned or managed areas or major view corridors.

Applicant Comment: *The proposed setbacks from Highway 30 should mitigate interference with views. According to Story County Planning and Zoning, the project lies within the IDOT Highway 30 Corridor Study Area and will be reviewed by IDOT. Since IDOT is aware of the project, the Applicant does not foresee any opposition from IDOT.*

Staff Comment: The proposed tower will be visible from Highway 30, Interstate 35, Lincoln Highway, and other local roads. However, it is not anticipated to be an issue for publicly owned or managed areas or major view corridors. The view when entering or exiting the IDOT site will not likely be obstructed.

I. Submittal Requirements. In addition to the submittal requirements defined for conditional use permit applications, all applications for towers/facilities must submit the following information (as applicable). All plans shall be drawn at a scale of one inch equals 50 feet.

(1) A scaled site plan clearly indicating the location, type and height of the proposed tower/facility, existing land uses, adjacent land uses, zoning, County Development Plan designations of the site and for all properties within 500 feet.
(2) Legal description of the parent parcel and leased parcel (if applicable).
(3) The separation distance between the proposed tower/facility and nearest planned and/or existing residential property.

(4) The separation distance from other existing and approved towers. The applicant shall also identify the type of construction of the existing towers and owner/operators of such facilities.
(5) A landscape plan showing specific landscape materials, existing and those proposed, identifying type and size of materials.
(6) Written statements from other applicable jurisdictions such as the FAA regarding coloring and potential lighting requirements. In addition, a copy of the FAA's response to the submitted "Notice of Proposed Construction or Alteration" must be submitted.
(7) A statement by the applicant as to whether construction of the tower/facility will accommodate co-location of additional antennas for future users and documentation regarding the standards for co-located established in the Ordinance.
(8) Identification of all other tower/facility sites owned and/or operated by the applicant within Story County.
(9) Elevations showing all facades, indicating exterior materials and color of the tower/facility on the proposed site.
(10) Copy of the signed lease agreement with the property owner.

Staff Comment: The applicant has submitted all applicable information as required by the submittal requirements.

Variance Analysis

1. Legal Principles
According to Section 92.03(4) of the Story County Land Development Regulations, in deciding whether to grant a variance request, the Board of Adjustment shall consider all the following legal principles. **All legal principles shall be satisfied in order for the Board of Adjustment to grant a variance.**

Additionally, Section 92.03 (2) states that special conditions shall include but are not limited to a property owner who can show that his/her property was acquired in good faith and where by reason of exceptional topographical conditions or other extraordinary or exceptional situations the strict application of the terms of the Ordinance actually prohibits the use of the property in a manner reasonably similar to that of other property in the district.

Findings of Fact

A. Finding of unnecessary hardship

1. The land in question cannot yield a reasonable return if used only for a purpose allowed in that zone;

Applicant Comment: *The tower is allowed as a Conditional Use in the zone.*

Staff Comment: The existing IDOT site has been used for maintenance and equipment storage for many years. This will likely continue to be used for this use primarily due to the proximity to US Highway 30 and I-35. Communications Towers are allowed through

Conditional Use Permits in the A-1 Agricultural District. Additionally, there is an existing 180' tower on the property. This tower meets all setback requirements of the Story County Land Development Regulations. There are plans to remove this tower once the new ISCIS tower is completed.

2. **The plight of the owner is due to unique circumstances and not to general conditions in the neighborhood which may reflect the unreasonableness of the Ordinance itself; and**

   Applicant Comment: *First, the ISICS program uses State-owned properties for the network infrastructure so there is a lack of alternative sites to consider from the beginning. The ISICS tower sites across the State on IDOT properties where existing IDOT communication towers are located, all have been designed adjacent to the existing towers. There are several reasons for this but one illustrated at the instant site is that the Story County IDOT site will be utilizing the existing the existing underground utilities that are already in place for the existing tower, as well as using the existing equipment shelter to house the new ground equipment needed to operate the new tower antennas. This keeps costs down and causes less of a burden on Iowa taxpayers. Aesthetically, if the old tower is not coming down, two towers next to each other is less obtrusive, and even if the existing IDOT tower will be replaced by the new ISICS tower, placing the tower in nearly the same footprint keeps the view of a tall structure more consistent with what residents are accustomed to seeing. Also, at the instant site, the design of the tower compound nearer the entrance allows use of existing the paved drive and paved parking lot to allow a technician to quickly and easily access the site in case of emergency. If IDOT chooses in the future to expand their out buildings or equipment or other storage, it would likely be to the east and north of the existing maintenance buildings, not nearer to the frontage of the parcel where the tower will be placed.*

   Staff Comment: There are no unique circumstances that prohibit the proposed ISICS tower from meeting all requirements of the Story County Land Development Regulations. The existing tower, which it to be removed, meets the county zoning requirements. The property contains 19-acres and there is ample space to construct the proposed tower on site and meet all setbacks. These requirements were communicated to the applicant early in their meeting with county staff.

3. **The use to be authorized by the variance will not alter the essential character of the locality.**

   Applicant Comment: *The character of the locality will not be altered since there is a similar use already existing on the property.*

Staff Comment: While the proposed tower is planned to the east of the existing IDOT tower, it is over twice the height and the width of the base will also be greater. While the tower will be noticed by properties and from public roads, tower are common for growing and changing areas.

B. Granting the variance will not be contrary to the public interest; and

Applicant Comment: *Many municipalities have gotten away from setbacks in excess of 100 percent of tower height as technology has advanced, especially when discussing non-guyed towers. The construction standards have been constantly improved to make towers safer. Please see the attached Zero Fall Zone Letter that was prepared by an engineer with Valmont, the tower manufacturer. This letter is offered to be persuasive to show that towers will collapse upon themselves and thus the setback from the right-of-way as currently designed is sufficient. This tower design protects the public interest in the unlikely event of failure by not falling over and protects the surrounding property interests since the only property damaged would be the IDOT property.*

Staff Comment: Story County Land Development Regulations require a setback from the public right-of-way of at least 150% of the height of the tower. Zoning Regulations have been adopted by Story County to ensure the health, safety, and welfare of the general public. This is a large (19.34 acre) parcel, with ample space to site a tower and meet all setback requirements for the safety and welfare of the public. The frontage road and US Highway 30 are heavily traveled and any proposed tower not meeting the County requirements are a concern.

C. The spirit and intent of the Story County Development Plan and Story County Land Development Regulations are protected.

Applicant Comment: *The tower as proposed meets the required setbacks in three of the four directions. The project will be reviewed by IDOT to ensure it meets the Highway 30 corridor standards. The tower is set back from Highway 30 a reasonable amount (nearly 100 percent of tower height) and the Development Plans for the surrounding properties will be protected. It is likely the IDOT property will continue to operate as such into the future, so the presence of a tower will not inhibit any future development of the site or adjacent properties.*

Staff Comment: Planning and Development staff have concerns about the tower not meeting the required setback from the right-of-way. The frontage road and US Highway 30 are heavily traveled. Our position is that any additional time and cost associated with extending the electrical lines or relocating the existing equipment building to a location on

the 19-acre property that would meet County setback requirements is well worth the effort to protect the safety and welfare of adjacent property uses and motorists on the frontage road and US Highway 30.

Comments

The following comments are part of the official record of the proposed **ISCIS Tower CUP03-17 and VAR02-17**. If necessary, conditions of approval may be formulated based off these comments.

A Conceptual Review meeting for the proposed Conditional Use Permit request was held on Thursday, March 2, 2017. After conceptual review, the complete application submittal was also forwarded to the members of the Interagency Review Team. Some of the County staff review comments were as follows:

Comments from the Interagency Review Team
The following were relevant comments documented by the Interagency Review Team:

Planning and Development:

1. Can the proposed tower location be moved further to the north so that the proposed tower is setback a distance 100% of the tower height?
2. What is the length of the Ice Bridge in the drawing? It appears to be greater than 8' in length.
3. Please provide a clarification on the agreement for using IDOT property. The written narrative indicates there will not be a lease agreement, however the drawings shows a leased area. We would request a copy of any agreement that is in place between the State Departments.
4. What is the use of the existing tower on the IDOT site? What is the future plan for this tower?
5. Does the IDOT currently have plans to add to their buildings on this site?
6. Are you proposing site improvements or grading within the access/utility easement? It appears some of this area is paved and some is gravel or green space.
7. Provide lighting specifications and a written summary of the proposed lighting for the tower. What will the lighting be during the day and at night?
8. Will a lightning rod or antenna be placed on top of the tower? If so, what will be the overall height of the structure?
9. Will the gates on the security fence be locked at all times?
10. If the conditional use permit is approved by the Board of Adjustment, what is the proposed project timeline for the tower?

Follow-up Questions:

1. Since the existing tower will be removed, is it possible for the equipment building be relocated to allow a setback from the north edge of the frontage road of at least 100% of the height of the proposed tower? Even at a setback of 100% of the tower height, there is still a risk that equipment may be separated from the tower upon impact.
2. If the building cannot be relocated, could the cables planned for the Ice Bridge be run underground from the tower to the existing building allowing the tower to be setback from the north edge frontage road at least 100% of the height of the proposed tower?

3. Please verify the height requirements for the antennas, as there appears to be some discrepancies between A-1 Tower Elevation and A-2 Antenna Schedule on C-201. Could the tower height be reduced to the required height of the top antenna?
4. Is it possible that the elevations of the antennas could be lowered to reduce the overall tower height, and still achieve the communication need objectives of the project?

Environmental Heath:

1. The location of the septic system and the plugged well must be identified on a site plan. When located, the septic laterals shall be cordoned off to keep construction traffic off.

Comments from the General Public
Public notification letters were mailed to surrounding property owners within ¼ mile of the site on March 28, 2017 regarding the Conditional Use Permit application and Variance application.

A representative from the Ames Chamber of Commerce contact Planning and Development Staff with questions about the impact of this tower on the East Industrial Annexation Area. There is no impact anticipated.

Additional Comments
The applicant provided examples of other jurisdictions that waived setback requirements or issued a variance to setback requirements. The applicant provided a court case, which an Attorney with the Story County Attorney's office found to be not applicable or relevant to Story County.

Planning and Development staff reached out to Tony Gustafson, Iowa Department of Transportation, Assistant District 1 Engineer, to inquire if there were any concerns regarding the US Highway 30 Corridor Study Area. Mr. Gustafson indicated he has no concerns with the proposed tower in relationship to the Corridor Study Area. It appears that the reconfiguration of the accesses will be to the east of the proposed tower site.

Points to Consider for Conditional Use Permit Request

1. Communications towers and facilities are permitted as a conditional use in the A-1 Agricultural Zoning District, if a conditional use permit is granted.
2. The Ames Urban Fringe Plan Land Use Framework Map identifies this area as Agricultural/Long-term Industrial Reserve. The proposed tower will not likely impact the surrounding agricultural uses and will not take any land out of row crop production. The tower is not anticipated to inhibit any future industrial growth.
3. Existing buildings and plantings on the IDOT maintenance site will provide a sufficient buffer between adjacent properties and the public right-of-way.
4. Access for the tower will be through the existing IDOT drive off of the Highway 30 frontage road. Little increase in traffic is anticipated and will likely be limited to tower maintenance vehicles approximately once per month.
5. All tower construction equipment and materials as well as tower maintenance vehicles will be parked within the IDOT property and outside of the right-of-way.

6. Signs, lighting, and environmental protection measures will meet Story County Land Development Regulations and FAA requirements.

Points to Consider for Variance Request

1. The safety and welfare of adjacent property owners/users and the volume of motorists using the frontage road and US Highway 30 is a priority identified in the Story County Land Development Regulations.
2. The State IDOT property contains over 19 acres and there is ample space to place the proposed tower and components at a location that meets all setback requirements and also allows the IDOT to adequately utilize their land and buildings on the property.
3. The county zoning ordinance does not allow for a Zero Fall Zone letter from an Engineer as an exception to meeting the setback requirements, which emphasizes the importance of the setback requirements. Additionally, the Zero Fall Zone letter appears to identify only cx a wind event. Other events could occur such as a tornado, fire, ice storm, vehicle collision, or other events.
4. With the proposed project, the existing IDOT tower is planned to be removed and the small communication equipment shelter building and electrical wiring and components could be relocated on the site to accommodate the proposed tower as planned.
5. Based on the most recent Highway 30 Corridor Study plans provided to the County by IDOT, the frontage road will remain to the south of the IDOT property.
6. The benefit of any additional time and/or possible expense to research a new location on the subject property to meet the required setbacks or the proposed compromise will be improved safety of adjacent property owners and motorists.

Based on these points, Planning and Development Staff supports a compromise that meets the intent of the County Zoning Ordinance, which offers protection to adjacent property owners and motorists on the frontage road and US Highway 30, to construct the proposed tower a distance of 100% of its height from the north edge of the frontage road. In the event a tower failure occurs, the tower would then likely remain on the IDOT property and miss the frontage road. With this compromise, the spirit and intent of the Story County Land Development Regulations will be met and the safety and welfare of citizens will be protected.

Recommendation to Planning and Zoning Commission

Planning and Development Staff recommends approval of the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower based on a site review, the information provided in this staff report, and material provided by the applicant as put forth in case CUP03-17, with the setback compromise proposed (Alternative 2). This approval is contingent upon the Board of Adjustment's support of a compromise to a setback from the north edge of the frontage road equal to or greater than 100% of the height of the tower.

Alternatives for Planning and Zoning Commission

The Story County Planning and Zoning Commission may consider the following alternatives:

1) The Story County Planning and Zoning Commission recommends approval of the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17, as submitted, to the Story County Board of Adjustment, and directs staff to place the case on the Board of Adjustment agenda.

2) **The Story County Planning and Zoning Commission recommends approval of the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17 with the setback compromise proposed by staff, to the Story County Board of Adjustment, and directs staff to place the case on the Board of Adjustment agenda. This approval is contingent upon the Board of Adjustment's support of a compromise to a setback from the north edge of the frontage road equal to or greater than 100% of the height of the tower.**

3) The Story County Planning and Zoning Commission recommends denial of the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17, as submitted, to the Story County Board of Adjustment, and directs staff to place the case on the Board of Adjustment agenda.

4) The Story County Planning and Zoning Commission remands the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17, back to the applicant for further review and/or modifications, and directs staff to place this item on the May 3, 2017 Story County Planning and Zoning Commission agenda.

Recommendation to Board of Adjustment

Planning and Development Staff recommend approval of the Variance Request VAR02-17 with the proposed compromise that the setback of the tower from the north edge of the US Highway 30 frontage equal to or greater than 100% of the height of the tower.

Planning and Development Staff recommend approval of Conditional Use Permit CUP03-17 for the proposed Iowa Statewide Interoperable Communication System (ISICS) Tower contingent on the Variance Compromise indicated above.

FOR BOARD OF ADJUSTMENT ACTION ONLY

Variance Request Alternatives

The Story County Board of Adjustment may consider the following alternatives for the **Variance Request**:

1) The Story County Board of Adjustment approves the variance request as submitted in case VAR02-17.

2) **The Story County Board of Adjustment approves the variance request with the compromise proposed by staff to allow a setback of at least 100% of the height of the proposed ISICS tower from the north edge of the US Highway 30 frontage road.**

3) The Story County Board of Adjustment denies the variance request as submitted in case VAR02-17.

4) The Story County Board of Adjustment remands the variance request as submitted in case VAR02-17, back to the applicant for further review and/or modifications, and directs staff to place this item on the May 17, 2017 Board of Adjustment meeting agenda.

Conditional Use Permit Request Alternatives

The Story County Board of Adjustment may consider the following alternatives for the **Conditional Use Permit Request:**

1) **The Story County Board of Adjustment approves the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17, with the compromise proposed by staff to allow a setback equal to or greater than 100% of the height of the proposed ISICS tower from the north edge of the US Highway 30 frontage road.**

2) The Story County Board of Adjustment approves the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17, with conditions.

3) The Story County Board of Adjustment denies the Conditional Use Permit for the Iowa Statewide Interoperable Communication System (ISICS) Tower as put forth in case CUP03-17, as submitted.

4) The story County Board of Adjustment remands the Conditional Use Permit application as put forth in CUP03-17 to the applicant for further review and/or modifications, and directs staff to place this item on the May 17, 2017 Board of Adjustment meeting agenda.

PYRAMID Network Services, LLC

Telecommunications Construction Services And Consulting

March 17, 2017 ***VIA FEDEX***

Mr. Jerry Moore
Planning and Development Director
Story County Iowa
900 Sixth Street
Nevada, IA 50201

RE: Applications for Conditional Use Permit and Variance

Dear Jerry,

Please find enclosed application materials and two checks for the required fees for a proposed tower facility on the IDOT property located at 57073 US Highway 30, Ames, IA 50010. In addition to the required documents, I have also included several documents to provide some further background regarding the need for the State of Iowa to complete the build out of the Iowa State Interoperable Communication System (ISICS). I will also send soft copies via email of all of the documentation as required by the Code.

BACKGROUND NARRATIVE

As you are aware, my company is working on behalf of Motorola whom is the vendor that will build out the P25 system for the State of Iowa. The statewide project is called the Iowa Statewide Interoperable Communications System, or ISICS. Each new facility is part of a state-wide project by the State of Iowa to upgrade its Emergency Management System, improving the statewide platform and covering at least 95% of the population as federally mandated under the P25 project. The project includes a minimum of 84 wireless communication tower sites across the state and each is required to be built in order to make the statewide platform work. Each new facility will be built on State of Iowa owned land, where the facility will be owned by the State of Iowa, and used by the State of Iowa to upgrade EMS Communications. The Story site is an integral site due to the large population in the Ames area; it will connect via microwave transmissions with the Mitchellville site to the southeast and the Woodward site to the southwest. You will see the web of sites on the map I have provided that will provide first responders with the ability to communicate with each other on one single band in order to efficiently mobilize during times of emergency or disaster.

Please review the documents I have provided and let me know if there are questions that the County has prior to the public hearings and I will do my best to track down the additional information.

Best Regards,

Joe Coyle
jcoyle@pyramidns.com
(816) 560-5035

Terry E. Branstad
Governor
Kim Reynolds
Lt. Governor

Department of Public Safety

Roxann M. Ryan
Commissioner

May 2, 2016

Re: Interoperable Communications

Dear Friends,

I am writing to you to make you aware of advances that we are making in interoperable communications in Iowa, and to let you know that your clients may be contacted by someone from the Department of Public Safety or from Motorola Solutions, Inc., regarding radio towers.

We are in the process of building the primary infrastructure for a statewide interoperability platform Local agencies will have the option to join the statewide platform, at no cost, but there is no requirement to join.

The statewide platform is called the Iowa Statewide Interoperable Communications System, or ISICS, and it includes 84 tower sites across the state. The statewide platform provides baseline coverage across the state, covering at least 95% of the population. Local agencies can plug into this statewide platform, develop a completely separate radio communication system, or build an enhanced system at the local level and plug into the statewide system. Local officials make the decision about what is best for their locality. The statewide system provides one option, but a locality is not required to plug into the statewide platform. Regardless of the participation of localities, however, the baseline structure is required to be built in order to make the statewide platform work.

Some background about the ISICS: Among the states, Iowa is bringing up the rear in implementing interoperable communications. After the terrorist attacks of September 11, 2001, the FCC set requirements for emergency communications among law enforcement, fire, EMS and other emergency responders. Although we were late to the table, Iowa has not been fined or shut down, and we have now navigated a way to a comprehensive plan to build a statewide interoperability platform. Under that plan, we anticipate that the primary elements of the statewide platform will be completed within two years, making it possible for more than 95% of the population of Iowa to access a 700mhz radio system, with no user fees. Attached is a fact sheet that sets out more of the details about the system, which will allow all levels of government to leverage their resources most effectively. I cannot emphasize how important it is to get this baseline system built, and I am very pleased that our statewide infrastructure can be built at a significantly lower cost than most other states have paid. Your law enforcement/emergency responder clients are likely to know about this system, and may already have some plans in place to enhance your local coverage, which can benefit your own locality and, if you plug into the statewide platform, you can benefit the rest of the state at no cost.

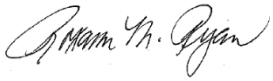
Here is where you come in: As we build the statewide platform, we may need to upgrade some of the current tower infrastructure, or build new tower infrastructure. These towers are the backbone of the radio system, and in order to make communication possible, they need to be structurally sound and in many cases, very tall. This may have some zoning implications. You or your clients may be contacted by someone from the Department of Public Safety or from Motorola Solutions about the process for obtaining zoning waivers or zoning approval for this public infrastructure. I would respectfully ask that you work with them to make this happen as expeditiously as possible. We are facing FCC deadlines again, and the physical infrastructure is an essential piece of our interoperability implementation plan.

The overall plan is in place for building the statewide platform. The build requires upgrades and construction of some new towers. Some of the build may require modifications or adjustments of zoning laws, based on the communication needs in a particular area. If your zoning laws may be implicated, we will include a separate attachment that requests information about possible zoning issues, and seeks information about the zoning process in your jurisdiction, so that we are able to take appropriate actions to comply with local ordinances during the course of the build.

Our in-house attorney (Barbara Edmondson) and the Attorney General's office have developed model language for Memoranda of Agreement, and have examined some of the zoning issues that may be implicated by the infrastructure build. If you have questions, Barb can be a valuable first-call resource. Her direct line is 515-725-6188. Of course, you can call me with any questions or concerns, too.

Thank you for your assistance.

Very truly yours,



Roxann M. Ryan

5 February 2016

To whom it may concern:

The Iowa Statewide Interoperable Communications System (ISICS) Board has engaged the Iowa communications Network (ICN) in the project management efforts for the implementation of the statewide system. The Department of Administrative Services (DAS) awarded Motorola RFP1013005265. The agencies contributing to this RFP include DAS, Department of Public Safety (DPS), Department of Transportation (DOT), Department of Natural Resources (DNR), and Department of Corrections (DOC).

Motorola is dispatching teams and their subcontractors throughout the state of Iowa to look at existing and green-field (new) tower site locations. The project team has made efforts to notify the primary contacts for these structures, but due to leases and other unknown variables, some individuals may have been over looked.

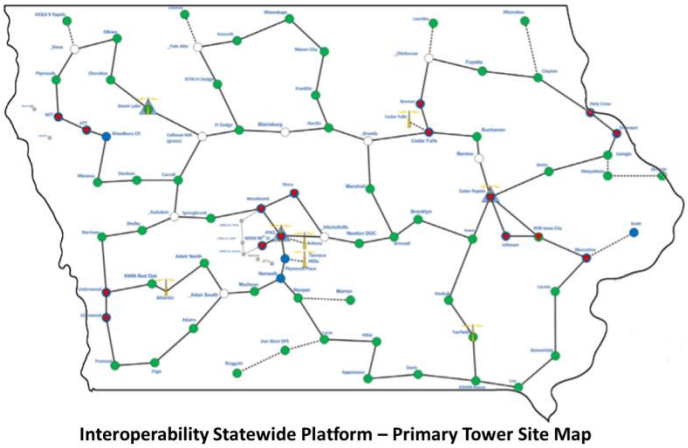
I am providing this letter to those whom we authorized to work on this project. Due to the sensitivity and the importance of the locations, I understand that there will be individuals who have questions. If you have questions, concerns, or want to report an issue, please do not hesitate to contact me by phone or email.

† *Stephen J. Rodriquez* CPM, PMP®
State of Iowa ISICS Project Manager | ICN Project Manager
Oran Pape Building | 215 East 14th Street | Des Moines, IA 50319 |
Office: 515-725-4757| Email: stephen.rodriquez@iowa.gov

Iowa Interoperability Infrastructure Plan

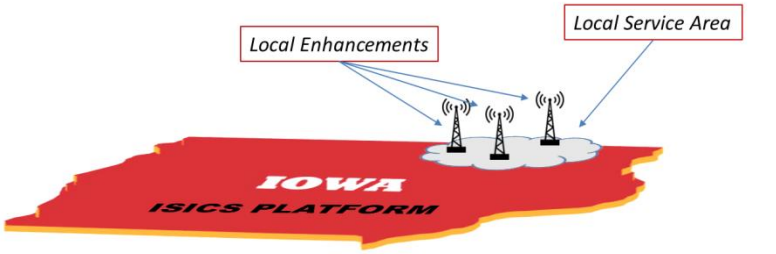
History of Iowa Interoperability

- Current technology is Very High Frequency (VHF), circa 1930s analog technology, and much of the infrastructure is circa 1970s.
- Current radio coverage is 75% and FCC requires 95% coverage by 2018.
- Current licensing for 700mhz will end in 2018 without an upgrade.
- Cost of the system is $58 million (including 10 years of maintenance costs). Other states have spent far more (Indiana $82 million, Wyoming $100 million, Minnesota $300 million).



Interoperability Statewide Platform – Primary Tower Site Map

Milestones for completion of the statewide platform:
12/31/2016: 1/3 population served
12/31/2017: 2/3 population served
12/13/2018: 96% population served



How to join ISICS

01. To apply, send a letter of intent addressed to the chair of the Iowa Statewide Interoperable Communications System Board (ISICSB) from a governing body.

02. ISICSB chair provides letter of intent to user group committee for review.

03. Upon approval by the user group committee, the application is presented to ISICSB members for final approval.

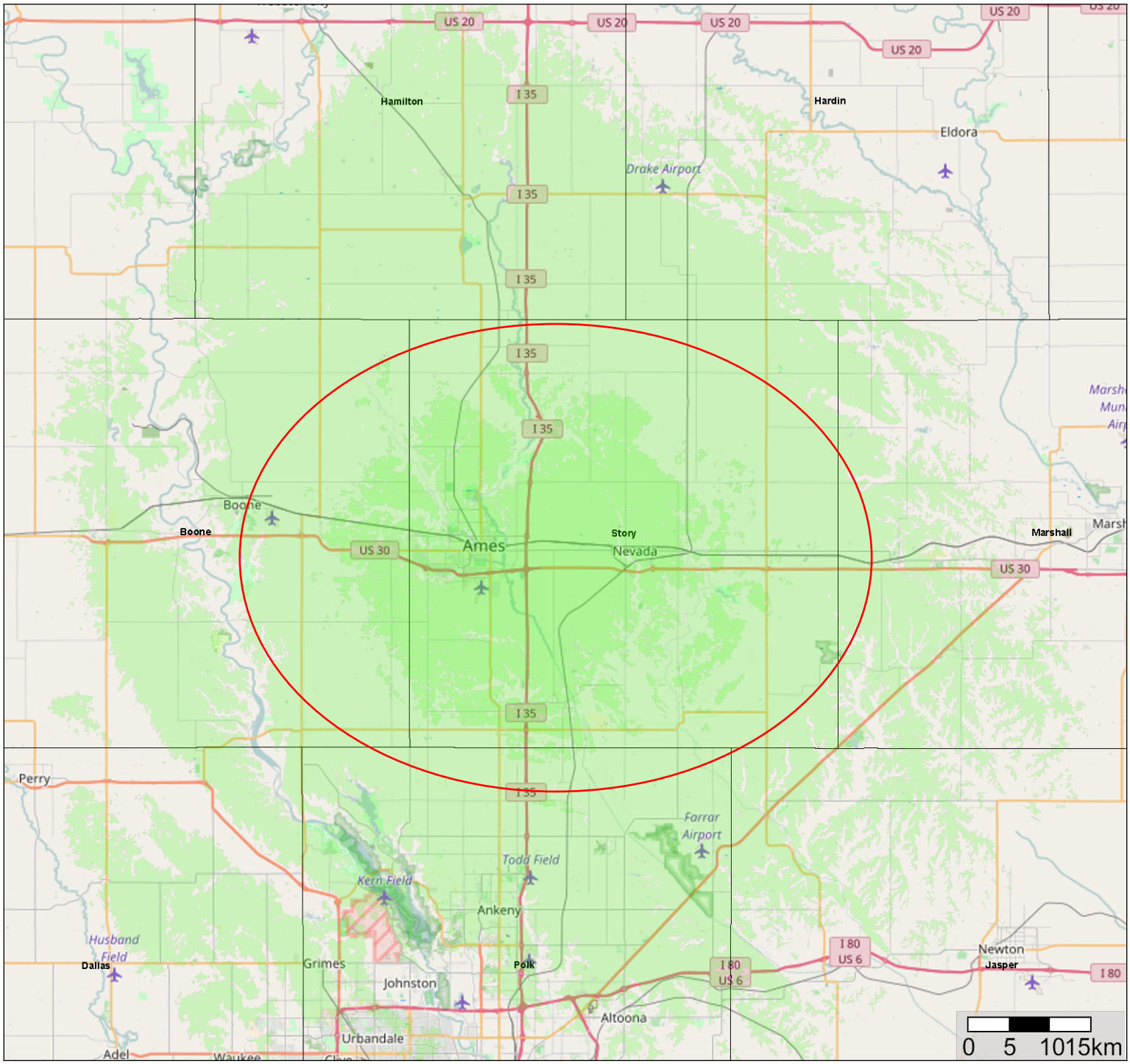
04. ISICSB members vote on approving entity to join system based on committee results.

ISICS Goals

- Statewide platform for operability and interoperability
  - Day to day usage
  - Establishes multiple statewide interoperability channels for small to larger scale operations
- Operate in 700Mhz public safety spectrum
  - Dedicated spectrum
- Open source, open standard, P25 Compliant
  - Non-proprietary solution allows user to select radio vendor
- Statewide 95% mobile coverage
  - Portable coverage can be increased based on local need

MOTOROLA

ISICS P25 Phase 2 TDMA - Story County Only



Scale 1 : 675000

Legend

- 95% Area Round_Trip APX Portable In-Building
- 95% Area Round_Trip APX Mobile
- Search Ring

Solution: Iowa

Workspace: IA_3-1-2017

Design: Story Only

Job ID: 9259381053.1.Story Only

System version: 20170308, N/A, 2.00.4

Printed: 3/15/2017

Motorola Solutions, Inc.

March 16, 2017

RE: Iowa Statewide Interoperable Communications System (Story County Site Location)

To whom this may concern:

The Story Antenna Tower to be located at 42-0-35.02N, 93-33-32.76W (Ames, Iowa) will be used for the State of Iowa Communications Interoperable (ISICS) Network and is part of the overall statewide network currently under construction. The Iowa State Patrol and other public safety first responders will use this new network for mission critical communications during emergency situations.

The tower height for this location has been determined by the microwave network connectivity required for communications to the neighboring tower structures of the overall statewide network and Land Mobile Radio RF Coverage into Story County. Per contract the microwave network is to provide >99.9999% reliability to first responders linking this location to its neighbors and to locations/users across the state. This site in the network will provide >95% on-street mobile RF coverage to Story County with overlap into the adjacent counties. I also provides >95% in-building portable RF coverage to the cities of Ames and Nevada, Iowa.

A new tower is required due to the weight and wind loading requirements and heights required to install the communications network equipment (microwave dishes and Land Mobile Radio RF antennas). The State of Iowa contract also requires the communications vendor to use 'State owned" locations for the ISICS network. Iowa Department of Public Safety policy also requires all personnel with access to any of the ISCIS Network properties and structures (vendors, contractors, installers, technicians, etc.) to be cleared via security background checks. This new tower structure is to be constructed at an existing Iowa Department of Transportation facility in Ames, Iowa.

No existing tower sites in the area have the available space, or are able to support the wind/weight load of the new communications network equipment.

Initial Equipment to be installed on new tower:
Qty 2 - 6' Side Arms with Qty 2 - SC412 Antennas (21' long, 79lbs each) mounted at 374ft
Receive Tower Top Pre-Amp mounted at 375ft
6' Microwave dish and radome (198lbs) at 375ft [main link to Mitchellville MW repeater location]
Microwave Dish Ice Shield at 343ft
4' Microwave dish and radome (77lbs) at 340ft [diversity link to Mitchellville MW repeater location]
Microwave Dish Ice Shield at 294ft
6' Microwave dish and radome (198lbs) at 290ft [main link to Woodward Dept Public Safety location]
Microwave Dish Ice Shield at 263ft
4' Microwave dish and radome (77lbs) at 260ft [diversity link to Woodward Dept Public Safety location]

Any Future Microwave Dishes, Ice Shields or Antennas required for system expansion/growth
Any addition of equipment to support the First Responder Network Authority (FirstNet) build-out

6165 NW 86th Street ▪ Johnston, IA 50131 ▪ Phone: 847-875-2785 ▪ g.vanhyfte@motorolasolutions.com

Please feel free to give me a call with any questions.

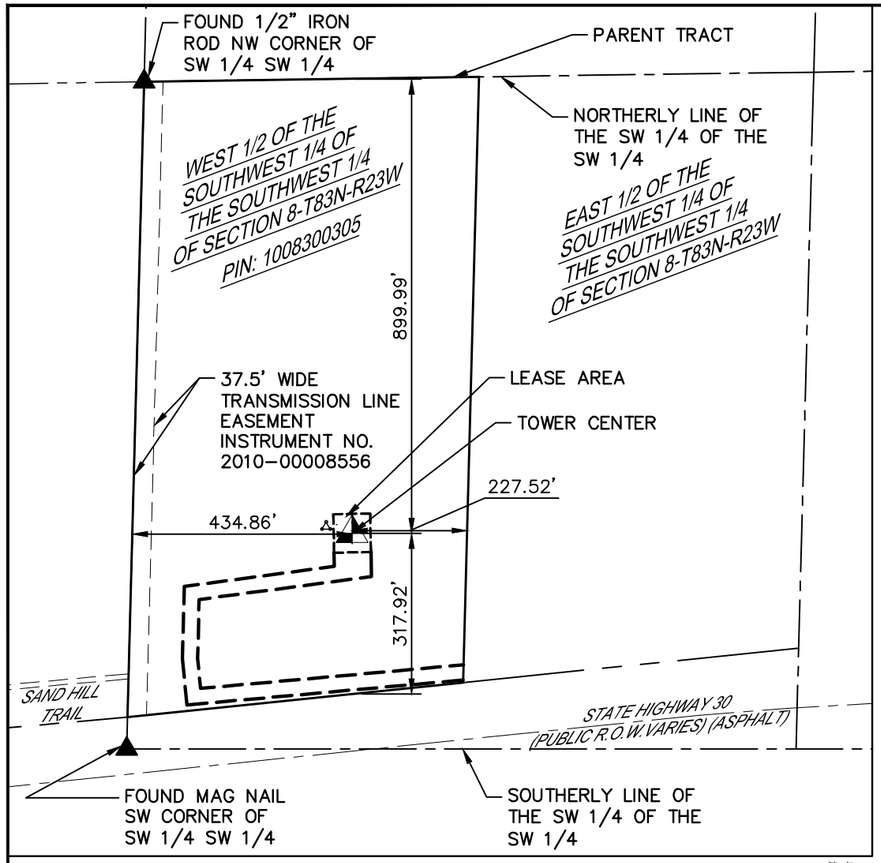
Sincerely,

Gregory VanHyfte
Senior Solutions Architect / Engineering Lead State Iowa Project (ISICS)
Motorola Solutions Inc.

A.A.S.E.E.T. Hamilton Technical College – Davenport, IA - August, 1986
Motorola/Motorola Solutions – September, 1986 to Present (30+ yrs Land Mobile Radio Systems)
Motorola Solutions – Member of the Staff Engineering Council
Comp TIA Network+ IT Certified
Amateur Radio Extra Class – N9GV

Attachments:
Microwave Path – Story County location to Mitchellville location
Microwave Path – Story County location to Woodward DPS location
Land Mobile Coverage Map – Story County 95% Mobile / Portable In-Building

6165 NW 86th Street ▪ Johnston, IA 50131 ▪ Phone: 847-875-2785 ▪ g.vanhyfte@motorolasolutions.com



PARENT PARCEL

SCALE: 1"=300'

SECTION 8, TOWNSHIP 83 NORTH, RANGE 23 WEST
STORY COUNTY, IOWA

VICINITY MAP

SCALE: NONE

DESCRIPTION OF PARENT PARCEL

(PER WARRANTY DEED RECORDED IN THE STORY COUNTY RECORDERS' OFFICE IN BOOK 97, PAGE 627.)

ALL THAT PART OF THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 8, TOWNSHIP 83 NORTH, RANGE 23 WEST OF THE 5TH P.M., STORY COUNTY, IOWA, THAT LIES NORTHERLY OF PRIMARY ROAD NO. U.S. 30, CONTAINING 18.5 ACRES, MORE OR LESS..

PIN: 1008300305

SCHEDULE "B" - SECTION II ITEMS

INGRESS AND EGRESS EASEMENT TO THE CITY OF AMES, IOWA, A MUNICIPAL CORPORATION

INSTRUMENT NUMBER 2010-00008556

TOWER INFORMATION	
TOWER TYPE	HEIGHT
SELF-SUPPORT	395.0'

BOUNDARY LEGEND

▲	FOUND SECTION CORNER (AS NOTED)
●	FOUND IRON PIN (AS NOTED)
O	SET 5/8" IRON ROD W/XXX CAP #XXXX
XX.XX' (R)	RECORDED DISTANCE
XX.XX'	MEASURED DISTANCE

SURVEYOR'S NOTES

BEARINGS ARE BASED ON THE IOWA STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD83) FROM GPS EQUIPMENT USING THE IOWA REALTIME NETWORK.

SITE BENCHMARK:

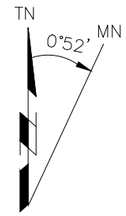
BM SOUTHWEST CORNER OF CONCRETE SLAB NEAR EXISTING TOWER

-ELEVATION=940.53' (NAVD 88)

SITE SURVEY

PROPERTY OWNERS: STATE OF IOWA D.O.T

TN=TRUE NORTH
MN=MAGNETIC NORTH
(MAGNETIC DECLINATION TAKEN FROM NATIONAL GEODETIC SURVEY WEB SITE FOR THIS AREA, 04/19/2016) CHANGING BY 5' W/YEAR (PLUS OR MINUS 22'.)



GEOGRAPHIC COORDINATES

LATITUDE:	42°00'35.02"	NAD83
LONGITUDE:	93°33'32.76"	NAD83
SITE ELEVATION:	940 FEET	NAVD88

UTILITY NOTE

THE LOCATIONS OF UTILITY MAINS, STRUCTURES, AND SERVICE CONNECTIONS PLOTTED ON THIS DRAWING ARE APPROXIMATE ONLY AND WERE OBTAINED FROM RECORDS MADE AVAILABLE TO SURVEYOR THERE MAY BE OTHER EXISTING UTILITY MAINS, STRUCTURES, AND SERVICE CONNECTIONS NOT KNOWN TO SURVEYOR AND NOT SHOWN ON THIS DRAWING.

GENERAL NOTES

THIS PARCEL IS ZONED A-1, AGRICULTURAL; STORY COUNTY, IOWA JURISDICTION.

SETBACKS: FRONT = 50'; REAR = 40'; SIDE = 10'. TOWERS 150% OF HEIGHT FROM ALL PROPERTY LINES.

ACCORDING TO THE FLOOD INSURANCE RATE MAPCOMMUNITY-PANEL NUMBER 19169C0168E, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY AND WITH AN EFFECTIVE DATE OF FEBRUARY 20, 2008, THIS SITE DOES NOT APPEARS TO BE LOCATED IN ZONE "X" (AREAS OF MINIMAL FLOOD HAZARD), TO THE BEST OF MY KNOWLEDGE AND BELIEF. THE SURVEYOR UTILIZED THE ABOVE REFERENCED FLOODPLAIN PANEL FOR THIS DETERMINATION; FURTHERMORE, THE SURVEYOR DOES NOT CERTIFY THAT REVISED FLOODPLAIN INFORMATION HAS NOT BEEN PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY OR SOME OTHER SOURCE.

A FULL BOUNDARY SURVEY WAS NOT PERFORMED ON THE PARENT PARCEL SHOWN ON THIS SHEET. ONLY MONUMENTS SHOWN AS "FOUND" WERE USED TO DESCRIBE THE EASEMENTS AND LEASE AREA.

THIS SURVEY WAS PREPARED WITH THE AID OF A TITLE COMMITMENT, PREPARED BY IOWA TITLE COMPANY, AS INVOICE NUMBER S116469024397, WITH AN EFFECTIVE DATE OF APRIL 15, 2016, WHICH SHOWS DEEDS, CHAIN OF TITLE, AND EASEMENTS OF RECORD OF DESCRIBED PARENT PARCEL.

ONLY THESE COPIES OF THIS DOCUMENT SIGNED AND DATED IN CONTRASTING INK COLOR ARE TO BE CONSIDERED CERTIFIED OFFICIAL COPIES PER IOWA ADMINISTRATION CODE 193C-6.1(5)

I HEREBY CERTIFY THAT THIS LAND SURVEYING DOCUMENT WAS PREPARED AND THE RELATED SURVEY WORK WAS PERFORMED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE: _____

NAME: _____

DATE: _____ LICENSE NUMBER: _____

MY LICENSE RENEWAL DATE IS: DECEMBER 31, 2016

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL: C-1.1, C-1.2, C-1.3, C-1.4

PYRAMID Network Services, LLC
MOTOROLA SOLUTIONS
PBM Wireless Services
Think outside the triangle.

PROJECT NO: 16-02-01
DRAWN BY: JAP
CHECKED BY: JMD

NO	DATE	
0	04/29/2016	90% REVIEW

STORY

SITE #85

57073 U.S. HIGHWAY 30
AMES, IA 50010
STORY COUNTY

SELF-SUPPORT TOWER

SHEET TITLE
SITE SURVEY

SHEET NUMBER
C-1.1

37.5' WIDE TRANSMISSION LINE EASEMENT INSTRUMENT NO. 2010-00008556

GENERAL LEGEND

- TOWER CENTERLINE
- UTILITY POLE
- TELEPHONE PEDESTAL
- GUARD POST/ BOLLARD
- EXISTING STRUCTURE
- OE — ELECTRIC – OVERHEAD
- CHAINLINK FENCE
- BM — BENCH MARK
- TELEPHONE PEDESTAL
- DECIDUOUS TREE
- CONIFEROUS TREE

ASPHALT

CONCRETE

ASPHALT

GRAVEL

EXISTING TOWER

EXISTING BUILDING

TOWER CENTER

LEASE AREA

EXISTING BUILDING (TYP.)

EXISTING A/C UNIT

FENCED COMPOUND

BM

ASPHALT

EXISTING PROPANE TANKS

940

ASPHALT

945

ACCESS/UTILITY EASEMENT

940

GRASS

940

SAND HILL TRAIL

STATE HIGHWAY 30
(PUBLIC R.O.W. VARIES) (ASPHALT)

P.O.C.
FOUND MAG NAIL
SW CORNER OF
SW 1/4 SW 1/4

WEST 1/2 OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 8-T83N-R23W

PIN: 1008300305

N

SITE PLAN

SCALE: 1" = 60'

PYRAMID Network Services, LLC

MOTOROLA SOLUTIONS

ISICS

PBM Wireless Services
Think outside the triangle.

PROJECT NO: 16-02-01

DRAWN BY: JAP

CHECKED BY: JMD

0	04/29/2016	90% REVIEW

STORY

SITE #85

57073 U.S. HIGHWAY 30
AMES, IA 50010
STORY COUNTY

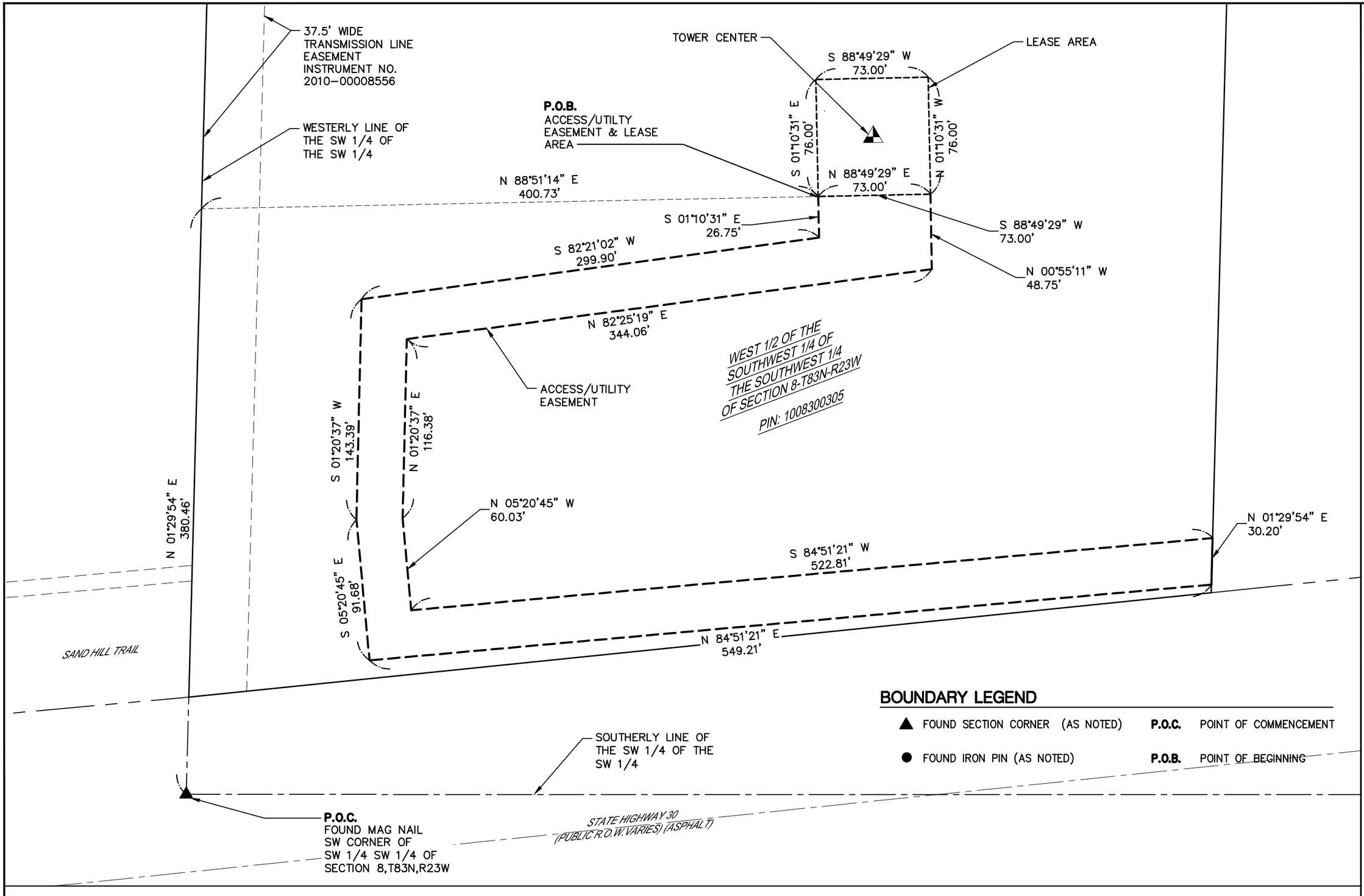
SELF-SUPPORT TOWER

SHEET TITLE

SITE PLAN

SHEET NUMBER

C-1.2



BOUNDARY LEGEND

- ▲ FOUND SECTION CORNER (AS NOTED)
- ● FOUND IRON PIN (AS NOTED)
- **P.O.C.** POINT OF COMMENCEMENT
- **P.O.B.** POINT OF BEGINNING

LEASE AREA & EASEMENTS

SCALE: 1" = 60'

N

PYRAMID Network Services, LLC

MOTOROLA SOLUTIONS

ISICS

PBM Wireless Services

Think outside the triangle.

PROJECT NO: 16-02-01

DRAWN BY: JAP

CHECKED BY: JMD

0	04/29/2016	90% REVIEW

STORY

SITE #85

57073 U.S. HIGHWAY 30
AMES, IA 50010
STORY COUNTY

SELF-SUPPORT TOWER

SHEET TITLE
LEASE AREA & EASEMENTS

SHEET NUMBER
C-1.3

DESCRIPTION OF LEASE AREA

A PARCEL OF LAND, BEING A PART OF AND LYING ENTIRELY WITHIN THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER, OF SECTION 8, TOWNSHIP 83 NORTH, RANGE 23 WEST OF THE 5TH P.M., STORY COUNTY, IOWA, AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND MAG NAIL BEING THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER SOUTHWEST QUARTER OF SAID SECTION 8;

THENCE ALONG AND UPON THE WEST LINE OF THE SOUTHWEST QUARTER, OF SAID SECTION 8, NORTH 01°29'54" EAST, A DISTANCE OF 380.46 FEET TO A POINT;

THENCE LEAVING SAID WEST LINE NORTH 88°51'14" EAST, A DISTANCE OF 400.73 FEET TO THE **POINT-OF-BEGINNING**;

THENCE NORTH 88°49'29" EAST, A DISTANCE OF 73.00 FEET;

THENCE NORTH 01°10'31" WEST, A DISTANCE OF 76.00 FEET;

THENCE SOUTH 88°49'29" WEST, A DISTANCE OF 73.00 FEET;

THENCE SOUTH 01°10'31" EAST, A DISTANCE OF 76.00 FEET, TO THE **POINT OF BEGINNING**;

CONTAINING 5,548 SQUARE FEET (0.13 ACRES) MORE OR LESS.

DESCRIPTION OF ACCESS/UTILITY EASEMENT

A 30 FOOT WIDE PARCEL OF LAND, BEING A PART OF AND LYING ENTIRELY WITHIN THE SOUTHWEST QUARTER OF THE FRACTIONAL SOUTHWEST QUARTER, OF SECTION 8, TOWNSHIP 83 NORTH, RANGE 23 WEST OF THE 5TH P.M., STORY COUNTY, IOWA, AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND MAG NAIL BEING THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER SOUTHWEST QUARTER, OF SAID SECTION 8;

THENCE ALONG AND UPON THE WEST LINE OF THE SOUTHWEST QUARTER, OF SAID SECTION 8, NORTH 01°29'54" EAST, A DISTANCE OF 380.46 FEET TO A POINT;

THENCE LEAVING SAID WEST LINE NORTH 88°51'14" EAST, A DISTANCE OF 400.73 FEET TO THE **POINT-OF-BEGINNING**;

THENCE SOUTH 01°10'31" EAST, A DISTANCE OF 26.75 FEET;

THENCE SOUTH 82°21'02" WEST, A DISTANCE OF 299.90 FEET;

THENCE SOUTH 01°20'37" WEST, A DISTANCE OF 143.39 FEET;

THENCE SOUTH 05°20'45" EAST, A DISTANCE OF 91.68 FEET;

THENCE NORTH 84°51'21" EAST, A DISTANCE OF 549.21 FEET TO A POINT ON THE EASTERLY PROPERTY LINE ALSO BEING THE NORTHERLY R.O.W LINE OF HIGHWAY 30;

THENCE ALONG AND UPON SAID EASTERLY PROPERTY LINE ALSO BEING THE NORTHERLY R.O.W LINE OF HIGHWAY 30, NORTH 01°29'54" EAST, A DISTANCE OF 30.20 FEET;

THENCE LEAVING SAID EASTERLY PROPERTY LINE ALSO BEING THE NORTHERLY R.O.W LINE OF HIGHWAY 30, SOUTH 84°51'21" WEST, A DISTANCE OF 522.81';

THENCE NORTH 05°20'45" WEST, A DISTANCE OF 60.03 FEET;

THENCE NORTH 01°20'37" EAST, A DISTANCE OF 116.38 FEET;

THENCE NORTH 82°25'19" EAST, A DISTANCE OF 344.06 FEET;

THENCE NORTH 00°55'11" WEST, A DISTANCE OF 48.75 FEET;

THENCE SOUTH 88°49'29" WEST, A DISTANCE OF 73.00 FEET, TO THE **POINT OF BEGINNING**;

CONTAINING 34,607 SQUARE FEET (0.79 ACRES), MORE OR LESS.

PYRAMID Network Services, LLC

MOTOROLA SOLUTIONS

ISICS

PBM Wireless Services

Think outside the triangle.

PROJECT NO: 16-02-01

DRAWN BY: JAP

CHECKED BY: JMD

0	04/29/2016	90% REVIEW

STORY

SITE #85

57073 U.S. HIGHWAY 30
AMES, IA 50010
STORY COUNTY

SELF-SUPPORT TOWER

SHEET TITLE

DESCRIPTIONS

SHEET NUMBER

C-1.4

IOWA STATEWIDE INTEROPERABLE COMMUNICATIONS SYSTEM
ISICS

MOTOROLA SOLUTIONS

Pyramid Network Services, LLC

C&S COMPANIES

CONTRACT DRAWINGS FOR THE CONSTRUCTION OF

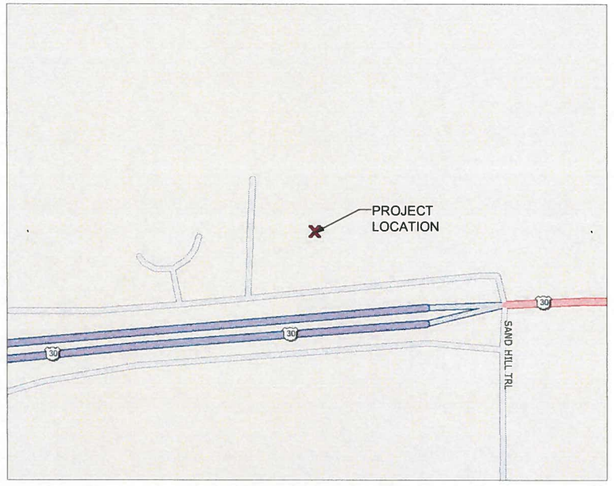
IOWA ISICS P25 UPGRADE PROJECT

SITE NAME: STORY - SITE #85

57073 US HIGHWAY 30
AMES, IA 50010

C&S PROJECT: D60.002.012

SEPTEMBER 2016



LOCATION MAP

DIRECTIONS TO SITE: (FROM DES MOINES INTERNATIONAL AIRPORT)
TRAVEL ON I-235 NORTH TOWARDS I-35 NORTH. FOLLOW I-35 NORTH TO US30 EXIT. TURN RIGHT ONTO US30 AND FOLLOW TO YOUR FIRST LEFT TOWARDS SITE ON RIGHT.

VICINITY MAP

PROJECT INFORMATION

LANDOWNER NAME:	IOWA DEPARTMENT OF TRANSPORTATION
SITE NAME:	STORY - SITE #85
SITE ADDRESS:	57073 US HIGHWAY 30 AMES, IA 50010
PARCEL #:	8-T83N-R23W
LATITUDE:	42° 00' 35.02"
LONGITUDE:	93° 33' 32.76"
GROUND ELEVATION:	940' NAVD88
ZONING JURISDICTION:	STORY COUNTY
ZONING CLASSIFICATION:	A-1 AGRICULTURAL
COUNTY:	STORY
TYPE OF SITE:	EXISTING COMMUNICATION FACILITY
TOWER HEIGHT:	395'-0"± AGL
RAD CENTER:	254.5'±, 284.52'±, 350'±, 380'±, AND 354'±
CONSTRUCTION TYPE:	NONCOMBUSTIBLE, IB \ USE GROUP B - OCCUPANCY
GOVERNING CODE:	IOWA BUILDING CODE 2010
DESCRIPTION OF WORK:	INSTALL FOUR (4) EQUIPMENT RACKS AND NEW 200A PANEL IN EXISTING SHELTER. INSTALL FOUR (4) MICROWAVE DISHES, AND THREE (3) ANTENNAS ON EXISTING TOWER. INSTALL A GENERATOR AND FUEL TANK ON AN INSTALLED CONCRETE PAD.

PROJECT DIRECTORY

PROJECT MANAGER:	MOTOROLA SOLUTIONS
CONTACT:	NICK PUTMAN
PHONE:	(847) 344-5827
CIVIL ENGINEERING FIRM:	C&S ENGINEERS INC. 499 COL. EILEEN COLLINS BLVD SYRACUSE, NY 13212
CONTACT:	ERIC N. KENNA P.E.
PHONE:	(315) 455-2000
POWER COMPANY:	MID AMERICAN ENERGY
PHONE:	(888) 427-5632
TELEPHONE COMPANY:	CENTURY LINK
PHONE:	(515) 276-5639

GENERAL NOTES

- DO NOT SCALE DRAWINGS
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
- THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS IS NOT REQUIRED. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED. NO GRADING WILL BE REQUIRED FOR THIS SITE.

STATEMENT THAT COMPLIANCE WITH THE ENERGY CODE IS NOT REQUIRED

- SCOPE OF WORK DOES NOT INVOLVE MODIFICATIONS OF EXTERIOR, MODIFICATIONS TO EXTERIOR ENVELOPE OF BUILDING, HVAC SYSTEMS OR ELECTRICAL LIGHTING.

DRAWING LIST

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
23032
IOWA

811 Know what's below. Call before you dig.

NOTE:
48 HOURS PRIOR TO DIGGING, CONTRACTOR TO NOTIFY ALL UTILITY COMPANIES TO LOCATE ALL UNDERGROUND UTILITIES.

G-001

Oct 10, 2016 - 8:38am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\General\D60002012_G-001.dwg

EXISTING FEATURES	LEGEND	PROPOSED FEATURES
	UTILITY POLE	
	TREES, SHRUBS, BUSHES	
	UTILITY POLE GUY WIRE	
	FENCE	
	SILT FENCE	
	BUILDING LINE	
	GROUND LINE	
	UNDERGROUND ELECTRIC	
	UNDERGROUND TELEPHONE	
	DETAIL	### DETAIL NUMBER / ## SHEET NUMBER

1.1. SUMMARY OF WORK.

THE WORK SHALL CONSIST OF, BUT NOT BE LIMITED TO, THE INSTALLATION OF COMMUNICATION SITES, TOWER, ANTENNAS AND LINES, GROUNDING, ELECTRICAL WORK, ETC., ASSOCIATED WITH THE MOTOROLA SOLUTIONS EQUIPMENT AS INDICATED ON DRAWINGS AND AS SPECIFIED HEREIN. CONTRACTOR SHALL SUPPLY ALL MATERIALS/EQUIPMENT REQUIRED AND ALL LABOR, EQUIPMENT, TOOLS, UTILITIES, MINOR HARDWARE/MATERIALS, TRANSPORTATION AND FACILITIES NECESSARY FOR PROPER EXECUTION AND COMPLETION OF SERVICES AND INSTALL WORK. WHETHER TEMPORARY OR PERMANENT. CONTRACTOR SHALL BE OBLIGATED TO PERFORM ALL THE WORK OUTLINED IN THESE DRAWINGS IN ACCORDANCE WITH THE CONTRACT AGREEMENT, FEDERAL REGULATIONS, STATE REQUIREMENTS, LOCAL CODES, COMMERCIAL/INDUSTRY STANDARDS, DETAILED SCOPE OF WORK AND THE DOCUMENTS IDENTIFIED BELOW. IN CASE OF A CONFLICT BETWEEN THE ABOVE LISTED DOCUMENTS REGARDING STANDARDS OF WORK. THE MORE STRINGENT CRITERIA SHALL APPLY. ANY ADDITIONAL COSTS OR DELAYS RESULTING FROM CORRECTION OF THE WORK TO COMPLY WITH THE ABOVE REQUIREMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

1.2. SITE VISIT.

CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH THE SCOPE OF WORK REQUIRED PER THE DRAWINGS AND ALL LOCAL CONDITIONS JURISDICTIONAL REQUIREMENTS AND LAWS AND REGULATIONS THAT MAY AFFECT THE PRICE, PROGRESS AND PERFORMANCE OF WORK, INCLUDING ANY COSTS ASSOCIATED WITH IT. THE CONTRACTOR SHALL ALSO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND NOTIFY THE MOTOROLA SOLUTIONS REPRESENTATIVE OF ANY DISCREPANCIES OR INTERFERENCES WHICH AFFECT THE WORK OF THIS CONTRACT.

1.3. STANDARDS AND CODES. (LATEST EDITION)

A. AMERICAN NATIONAL STANDARDS INSTITUTE:
- ANSI Z359 REQUIREMENTS FOR PERSONAL FALL ARREST SYSTEM, SUBSYSTEMS AND COMPONENTS.
- ANSI Z87.1 OCCUPATIONAL AND EDUCATIONAL EYE AND FACE PROJECTION.
- ANSI Z89.1 PROTECTIVE HEADWEAR FOR INDUSTRIAL WORKERS - REQUIREMENTS.
- ANSI/IEEE C95.1 SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO RADIO FREQUENCY ENERGY.
- ANSI/TLA/EIA STANDARD 222: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

B. AMERICAN CONCRETE INSTITUTE:
- ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
- ACI 305 "HOT WEATHER CONCRETING ".
- ACI 306 "COLD WEATHER CONCRETING".
- ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
- ACI 311 "RECOMMENDED PRACTICE FOR CONCRETE INSPECTION".
- ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
- ACI 613 "RECOMMENDED PRACTICE FOR SELECTING PROPORTIONS FOR CONCRETE".
- ACI 614 "RECOMMENDED PRACTICE FOR MEASURING, MIXING AND PLACING CONCRETE".

C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION:
- AISC MANUAL OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION: LATEST EDITION.

D. AMERICAN SOCIETY FOR TESTING AND MATERIALS:
- ASTM A615 "SPECIFICATION FOR DEFORMED AND PLAIN BILLET STEEL BARS FOR CONCRETE REINFORCEMENT".
- ASTM C33 "SPECIFICATION FOR CONCRETE AGGREGATES".
- ASTM C39-77 "SPECIFICATION FOR TEST FOR COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMEN".
- ASTM C94-80 "SPECIFICATION FOR READY-MIX CONCRETE".
- ASTM C150 "SPECIFICATION FOR PORTLAND CEMENT".
- ASTM C172 "SAMPLING FRESH CONCRETE".
- ASTM C143 "SLUMP OF PORTLAND CEMENT CONCRETE".
- ASTM D698-91 "TEST METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT".
- ASTM 1556-64 "DENSITY OF SOIL IN PLACE BY THE SAND-CONE METHOD".

- ASTM 1557 "TEST FOR MOISTURE-UNIT WEIGHT RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES USING 10-LB HAMMER AND 18-IN DROP". (PROCEDURE C)
- ASTM D2922 "DENSITY OF SOIL AND SOIL AGGREGATE IN PLACE BY NUCLEAR METHODS SHALLOW DEPTH".

E. AMERICAN WELDING SOCIETY:
- AWS D12.1 "RECOMMENDED PRACTICES FOR WELDING REINFORCING STEEL, METAL, INSERTS AND CONNECTIONS IN REINFORCED CONCRETE CONSTRUCTION".

F. CONCRETE REINFORCING STEEL INSTITUTE:
- "MANUAL OF STANDARD PRACTICE".

G. FEDERAL AVIATION ADMINISTRATION:
- DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR, AC 70/7460-1L: OBSTRUCTION MARKING AND LIGHTING.
- DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR, 150-5345-43, FAA/DOD SPECIFICATION L-856: HIGH INTENSITY OBSTRUCTION LIGHTING SYSTEMS.

H. FEDERAL COMMUNICATIONS COMMISSION:
- FEDERAL COMMUNICATIONS COMMISSION-RULES AND REGULATIONS PART 17: CONSTRUCTION, MARKING AND LIGHTING OF ANTENNA STRUCTURES.

I. STRUCTURAL STEEL PAINTING COUNCIL:
- SSPC-SP-1-63: SPECIFICATION FOR PAINTING STEEL STRUCTURES.

J. MOTOROLA SOLUTIONS STANDARDS AND GUIDELINES FOR COMMUNICATION SITES. (R56) REV.2005 OR SUBSEQUENT EDITIONS

K. MOTOROLA SOLUTIONS CIVIL WORKS BID SPECIFICATIONS.

L. NATIONAL FIRE PROTECTION ASSOCIATION:
- NFPA 1 FIRE PREVENTION CODE
- NFPA 70 NATIONAL ELECTRICAL CODE
- NFPA 101 LIFE SAFETY CODE
- NFPA 111 STANDARD ON STORED ELECTRICAL ENERGY, EMERGENCY AND STANDBY POWER SYSTEMS
- NFPA 780 STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS

M. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:
- OSHA 1926
- OSHA DIRECTIVES CPL 2-1.29-INTERIM INSPECTION PROCEDURES DURING COMMUNICATION TOWER CONSTRUCTION ACTIVITIES.

N. STANDARD BUILDING CODE:
- SBCC SECTION 1607 EARTHQUAKE LOADS, ASCE-7 MAP BE USED IN DETERMINING COEFFICIENT VALUES FOR A, AND AV.

O. ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING:

1. BUILDING CODE
2. UNIFORM BUILDING CODE
3. BUILDING OFFICIALS AND CODE
4. UNIFORM MECHANICAL CODE
5. ANSI/TIA/EIA-222-F
6. UNIFORM PLUMBING CODE
7. NATIONAL ELECTRIC CODE
8. LOCAL BUILDING CODE
9. CITY/COUNTY/TOWNSHIP ORDINANCES
10. UNIFORM FIRE CODE STANDARDS
11. STATE ENERGY CODE
12. STATE VENTILATION AND INDOOR
13. AIR QUALITY CODE
14. MECHANICAL CODE/NFPA

1.4 NOTICE TO PROCEED.

WHEN THE SITE IS AVAILABLE FOR CONSTRUCTION START, MOTOROLA SOLUTIONS SHALL ISSUE A NOTICE TO PROCEED TO THE CONTRACTOR, UPON RECEIPT OF THE NOTICE TO PROCEED. THE CONTRACTOR SHALL SUBMIT TO MOTOROLA SOLUTIONS A SCHEDULE REFLECTING THE WORK PLAN. THE CONTRACTOR SHALL ADVISE THE MOTOROLA SOLUTIONS REPRESENTATIVE IMMEDIATELY OF ANY SCHEDULE CHANGES. THE CONTRACTOR SHALL ADJUST HIS WORK, AS REQUIRED, TO COORDINATE WITH THE MOTOROLA SOLUTIONS EQUIPMENT INSTALLATION TEAM IF THE SCHEDULES OVERLAP.

1.5. MOTOROLA SOLUTIONS REPRESENTATIVE.

MOTOROLA SOLUTIONS SHALL DESIGNATE A REPRESENTATIVE. THIS PERSON IS THE ONLY CONTACT POINT AUTHORIZED TO MAKE ANY CHANGES TO THE CONTRACT PROVISIONS OR THE PLANS AND SPECIFICATIONS. ANY CHANGES MADE BY THE CONTRACTOR WITHOUT THE MOTOROLA SOLUTIONS REPRESENTATIVE'S PRIOR APPROVAL ARE AT THE CONTRACTOR'S COST, RESPONSIBILITY AND RISK.

1.6. CONTRACTORS FIELD REPRESENTATIVE.

CONTRACTOR SHALL ASSIGN A FIELD REPRESENTATIVE WHO IS FAMILIAR WITH THESE SPECIFICATIONS AND WILL REPRESENT THE CONTRACTOR AND HAVE THE AUTHORITY TO ACT FOR THE CONTRACTOR AND SUPERVISE ALL CONSTRUCTION ACTIVITIES. THE FIELD REPRESENTATIVE SHALL BE AVAILABLE WHEN CONSTRUCTION ACTIVITIES BEGIN. THE FIELD REPRESENTATIVE SHALL BE THE PRIMARY POINT OF CONTACT FOR MOTOROLA SOLUTIONS DURING THE CONSTRUCTION PHASE OF THE WORK.

1.7. PROJECT MEETINGS.

THE CONTRACTOR SHALL CONDUCT THE INITIAL (PRE-CONSTRUCTION) MEETING (INCLUDING ALL SUB-CONTRACTORS) WITH THE MOTOROLA SOLUTIONS REPRESENTATIVE WITHIN TWO WEEKS FOLLOWING AWARD OF THE CONTRACT. SUBSEQUENTLY, THE CONTRACTOR SHALL PROVIDE PROGRESS SCHEDULE UPDATES TO MOTOROLA SOLUTIONS ON A WEEKLY BASIS. THE CONTRACTOR MAY BE REQUIRED TO ATTEND WEEKLY STATUS MEETINGS.

1.8. MATERIALS.

CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AS REQUIRED FOR COMPLETE SYSTEMS INCLUDING: ALL PARTS OBVIOUSLY OR REASONABLY INCIDENTAL TO A COMPLETE INSTALLATION, WHETHER SPECIFICALLY INDICATED OR NOT. ALL SYSTEMS SHALL BE COMPLETELY ASSEMBLED, TESTED, ADJUSTED AND DEMONSTRATED TO BE READY FOR OPERATION PRIOR TO MOTOROLA SOLUTIONS ACCEPTANCE.

MATERIALS AND WORKMANSHIP SHALL BE THE BEST OF THEIR RESPECTIVE KINDS (AS DEFINED BY INDUSTRY STANDARDS), FREE OF DEFECTS AND ALL MATERIALS SHALL BE NEW AND UNUSED IN ALL CASES, UNLESS OTHERWISE SPECIFIED, WHERE THE NAME OF A CONCERN OR MANUFACTURER IS MENTIONED ON DRAWINGS OR IN SPECIFICATIONS IN REFERENCE TO A REQUIRED SERVICE OR PRODUCT, AND NO QUALIFICATIONS OR SPECIFICATION OF SUCH IS INCLUDED, THEN THE MATERIAL SPECIFICATIONS, DETAILS OF MANUFACTURER, FINISH, ETC., SHALL BE IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICE, DIRECTION OR SPECIFICATIONS. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS AND EQUIPMENT NOT SHOWN IN THE BILL OF MATERIALS AS OWNER FURNISHED, AND ALL LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.

1.9 VERIFICATION OF EXISTING CONDITIONS.

BEFORE STARTING ANY OPERATION, THE CONTRACTOR SHALL EXAMINE EXISTING WORK, OR WORK PERFORMED BY OTHERS, TO WHICH ITS WORK IS TO ADJOIN OR BE APPLIED, AND SHALL REPORT TO THE MOTOROLA SOLUTIONS PROJECT MANAGER ANY CONDITIONS THAT WILL PREVENT SATISFACTORY ACCOMPLISHMENT OF HIS WORK IN ACCORDANCE WITH THE PROJECT SCHEDULE & MILESTONES PRIOR TO COMMENCING AND EXCAVATION OR GRADING. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF ALL SURVEY DATA AS INDICATED IN THE PLANS AND SPECIFICATIONS AND/OR AS PROVIDED BY MOTOROLA SOLUTIONS. SHOULD THE CONTRACTOR DISCOVER ANY INACCURACIES, ERRORS, OR OMISSIONS IN THE SURVEY DATA, HE SHALL IMMEDIATELY NOTIFY THE MOTOROLA SOLUTIONS REPRESENTATIVE IN ORDER THAT PROPER ADJUSTMENTS CAN BE ANTICIPATED AND ORDERED. FAILURE TO NOTIFY THE MOTOROLA SOLUTIONS REPRESENTATIVE OF DEFICIENCIES, ERRORS OR FAULTS PRIOR TO COMMENCEMENT OF WORK SHALL CONSTITUTE ACCEPTANCE THEREOF AND WAIVER OF ANY CLAIMS OF UNSUITABILITY, ERRORS, OMISSIONS OR INACCURACIES.

THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK. THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PRESERVING ALL ESTABLISHED SURVEY CONTROL POINTS. IF THE CONTRACTOR OR ANY OF HIS SUB-CONTRACTORS MOVE OR DESTROY ANY SURVEY CONTROL POINTS. THE COST INCURRED BY THE LAND OWNER OR MOTOROLA SOLUTIONS TO REESTABLISH THEN WILL BE BORNE BY THE CONTRACTOR.

A1 GENERAL NOTES AND LEGEND
NOT TO SCALE

A3 GENERAL NOTES
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
23527
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	J. OSWALD
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

GENERAL NOTES AND LEGEND

G-002

Oct 10, 2016 - 8:39am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story Construction\Sheet Files\General\D60002012_G-002.dwg

1.10. PERMITS.

THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE CONTRACTOR SHALL MEET ALL OF THE REGULATORY REQUIREMENTS OF THE JURISDICTION GOVERNING CONSTRUCTION. SUCH AS TOWER CONSTRUCTION, EQUIPMENT BLDG/GENERATOR CONSTRUCTION AND FINAL SITE CONSTRUCTION.

1.11. SITE INSPECTION BY MOTOROLA SOLUTIONS (SYSTEM OWNER) NAME

THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY, ARRANGING WITH MOTOROLA SOLUTIONS, AN INSPECTION PRIOR TO COVERING UP ALL WORK THAT WILL BE COVERED IN FINISHED CONDITION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MANAGE THE SEQUENCE OF WORK AND REQUEST THE INSPECTIONS IN A TIMELY MANNER. THE CONTRACTOR SHALL NOT REQUEST AN INSPECTION UNLESS ALL OF THE RELATED WORK HAS BEEN COMPLETED. WORK SHALL NOT PROCEED TO THE NEXT STEP UNTIL THE PREVIOUS STEP HAS BEEN INSPECTED AND APPROVED BY THE LOCAL INSPECTORS AND THE MOTOROLA SOLUTIONS REPRESENTATIVE. THE PRESENCE OF THE OWNER OR MOTOROLA SOLUTIONS REPRESENTATIVE ON THE JOB SITE IN NO WAY RELIEVES THE CONTRACTOR OF THE ASSOCIATED RESPONSIBILITIES OF THE JOB. ANY WORK, WHICH DOES NOT MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS WILL BE CORRECTED OR REMOVED SOLELY AT THE CONTRACTOR'S EXPENSE.

THE FOLLOWING INFORMATION IS INCLUDED AS A GUIDE TO THE CONTRACTOR TO ASSIST IN DETERMINING THE TYPE AND FREQUENCY OF INSPECTIONS, SUCH AS TOWER CONSTRUCTION, EQUIPMENT BLDG/GENERATOR CONSTRUCTION AND FINAL SITE CONSTRUCTION INSPECTION. THE LISTED INSPECTIONS REPRESENT THOSE REQUIRED FOR SMALL OR SIMPLE PROJECTS. LARGE OR COMPLEX PROJECTS MAY REQUIRE ADDITIONAL INSPECTIONS DEPENDING ON THE SEQUENCE OF WORK.

-FOUNDATIONS EXCAVATION AND REBAR: TO BE MADE AFTER TRENCHES ARE EXCAVATED AND FORMS ERECTED. REINFORCEMENT PLACED, COMPACTION TESTED, SOIL TREATED, VAPOR BARRIER PLACED, AND ESSENTIALLY READY FOR CONCRETE PLACEMENT.
-GROUNDING: TO BE MADE AFTER THE BELOW GROUND CADWELD CONNECTIONS HAVE BEEN COMPLETED, PRIOR TO COVERING UP THE TRENCHES.
-ELECTRICAL WORK WITHIN WALLS: TO BE MADE, AFTER THE ROOF, FRAMING, FIREBLOCKING AND BRACING IS IN PLACE PRIOR TO THE INSTALLATION OF INSULATION OR WALL/CEILING MEMBRANES.

AS A GENERAL RULE, THE CONTRACTOR SHALL PROVIDE ADVANCE NOTICE TO MOTOROLA SOLUTIONS FOR INSPECTION OF ALL WORK PRIOR TO CONCEALMENT. THE CONTRACTOR HAS RESPONSIBILITIES RELATIVE TO ALL TYPES OF INSPECTIONS AND IS RESPONSIBLE FOR CONTACTING ALL OF THE INSPECTING ENTITIES TO DETERMINE HIS RESPONSIBILITIES. ALL OF THESE INSPECTING ENTITIES HAVE UNIQUE AND SEPARATE RESPONSIBILITIES. ONE INSPECTION FROM AN ENTITY WILL NOT SUBSTITUTE FOR AN INSPECTION FROM ANOTHER ENTITY.

1.12. SAFETY.

THE CONTRACTOR, HIS EMPLOYEES, ANY SUB-CONTRACTORS, VENDORS, THEIR RESPECTIVE EMPLOYEES AND CONTRACTOR'S VISITORS SHALL COMPLY WITH ALL SAFETY STANDARDS, ACCIDENT PREVENTION REGULATIONS AND ENVIRONMENTAL REGULATIONS PROMULGATED BY STATE AND/OR FEDERAL GOVERMENTS TO AVOID THE RISK OF BODILY HARM TO ANY PERSONS AND THE RISK OF DAMAGE TO ANY PROPERTY, EQUIPMENT OR MATERIAL SUCH PARTIES SHALL ALSO COMPLY WITH ANY SAFETY PROGRAMS AND/OR RULES PROMULGATED BY OWNER AND/OR MOTOROLA SOLUTIONS. CONTRACTOR SHALL SUBMIT COPY OF COMPANY SAFETY MANUAL FOR REVIEW AND APPROVAL BY MOTOROLA SOLUTIONS PRIOR TO CONSTRUCTION START.

1.13. ELECTRO MAGNETIC EMISSIONS.

THE CONTRACTOR SHALL ACKNOWLEDGE ALL OR PORTIONS OF THE WORK THAT MAY INVOLVE POSSIBLE EXPOSURE OF CONTRACTOR, SUB-CONTRACTORS, AND THEIR RESPECTIVE EMPLOYEES, AGENTS, INVITEES, LICENSEES AND OTHER VISITORS TO THE JOBSITE AND/OR MOTOROLA SOLUTIONS PREMISES TO ELECTRO-MAGNETIC ENERGY ("EME") WHILE PERFORMING WORK UNDER THIS CONTRACT, ESPECIALLY IF WORK IS PERFORMED ON EXISTING ANTENNA TOWERS OR BUILDING TOPS WHERE ANTENNAS ARE LOCATED. THE CONTRACTOR REPRESENTS THAT CONTRACTOR, SUBCONTRACTORS, AND ALL OF THEIR RESPECTIVE EMPLOYEES, AGENTS, INVITEES, LICENSEES, AND OTHER AUTHORIZED REPRESENTATIVES WHO ARE PERFORMING SERVICES UNDER THIS AGREEMENT WILL COMPLY WITH ALL ANSI AND ANY OTHER APPLICABLE EME STANDARDS, RULES OR REGULATIONS, INCLUDING, BUT NOT LIMITED TO THOSE RULES OR REGULATIONS IMPOSED OR SUGGESTED BY MOTOROLA SOLUTIONS, IF ANY.

THE CONTRACTOR SHALL ADHERE TO ALL OSHA RULES, REGULATIONS AND ADOPTED POLICIES. ALL CONTRACTOR PERSONNEL SHALL HAVE UNDERGONE ELECTRO-MAGNETIC ENERGY ("EME") TRAINING FOR PERSONNEL WORKING IN THE VICINITY OF ACTIVE ANTENNAS. AS SUCH IT IS RECOMMENDED THAT RF MONITORS BE USED BY THE TOWER PERSONNEL TO MONITOR EXPOSURE LEVELS. IF EME LEVELS AT THE SITE EXCEED THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS. THE CONTRACTOR SHALL COORDINATE WITH THE INDIVIDUALS RESPONSIBLE FOR USE OF THE TRANSMITTER TO MAKE SURE THAT THE EQUIPMENT IS DEACTIVATED BEFORE WORK CAN BE RESUMED. WITHOUT CAUSING A SERIOUS DISRUPTION OF THE SERVICE.

1.14. SITE CLEANUP.

THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, VEGETATION, AND RUBBISH, AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. WHENEVER THE WORK-SITE IS LEFT UNATTENDED. THE CONTRACTOR SHALL SECURE THE OPENING WITH WARNING TAPE OR OTHER ADEQUATE MEANS TO DISCOURAGE TRESPASSING. THE PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE AT THE CONCLUSION OF SITE WORK.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LANDSCAPING, GRADING AND SEEDING OF THE DISTURBED SOIL, THE CONTRACTOR SHALL USE LOCAL GRASS SEED TO STABILIZE SOIL AND SHALL COVER DISTURBED AREAS WITH HAY MULCH TO REDUCE RUNOFF OF SEDIMENT TO DOWNSTREAM AREAS. THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION. ALL SLOPES AND DISTURBED AREAS NOT RECEIVING AGGREGATE SURFACING ARE TO BE PREPARED AND BROADCAST SEEDED AND FERTILIZED FOR EROSION PROTECTION. SEEDING FOR AREAS DISTURBED SHALL BE ESTABLISHED SEASONALLY AS REQUIRED BY LOCAL CODES.

THE CONTRACTOR SHALL EXERCISE ALL CARE TO AVOID DAMAGE OR INTERRUPTION OF EXISTING UNDERGROUND OR OVERHEAD ELECTRIC SERVICES, UNDERGROUND GROUNDING AND FUEL LINES, EQUIPMENT AND BUILDING ON THE SITE, PLUS OFF SITE SERVICES, BURIED OR OVERHEAD, SURROUNDING THE EXISTING OR EXPANDED COMPOUND. ANY PROPERTY DAMAGE CAUSED BY THE CONTRACTOR OR HIS OPERATIONS SHALL BE CORRECTED AND/OR RESTORED TO THE SATISFACTION OF THE PROPERTY OWNER(S) AND MOTOROLA SOLUTIONS AT NO ADDITIONAL COST TO THE PROPERTY OWNER OR MOTOROLA SOLUTIONS.

1.15. FACILITY STARTUP & COMMISSIONING.

THE CONTRACTOR AND/OR SUB-CONTRACTORS SHALL DEMONSTRATE TO MOTOROLA SOLUTIONS THAT ALL SYSTEMS AND SUB-SYSTEMS INSTALLED UNDER THIS CONTRACT, OPERATE PROPERLY PRIOR TO THE FINAL ACCEPTANCE INSPECTION. ALL OPERATIONS AND MAINTENANCE MANUALS SHALL BE PROVIDED AT THIS TIME.

1.16. AS-BUILT DRAWINGS.

THE CONTRACTOR SHALL KEEP UP-TO-DATE MARKED-UP PRINTS OF THE PROJECT DRAWINGS. UPON COMPLETION OF WORK AT THE SITE, THE CONTRACTOR SHALL REVIEW THE COMPLETED AS-BUILT DRAWINGS, AND ASCERTAIN THAT ALL DATA FURNISHED ON THE DRAWINGS IS ACCURATE AND TRULY REPRESENTS THE WORK AS ACTUALLY INSTALLED. MARKINGS INDICATING CHANGES TO THE DRAWINGS SHALL BE RED OR GREEN AND CLEARLY VISIBLE. FIVE (5) SETS OF "AS-BUILTS" DRAWINGS SHALL BE FURNISHED TO THE MOTOROLA SOLUTIONS REPRESENTATIVE AT THE COMPLETION OF THE PROJECT. THESE DRAWINGS SHALL ALSO SHOW THE FOLLOWING (IF APPLICABLE).

-MODIFICATIONS TO SITE LAYOUT.
-MODIFICATIONS TO THE ANTENNA SYSTEMS.
-GROUNDING SYSTEM LAYOUT.
-UNDERGROUND FUEL LINE RUN.
-UNDERGROUND TELCO CABLE RUN.
-UNDERGROUND ELECTRICAL RUN.

WHERE THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING THE SITE EQUIPMENT (SHELTER, ISOLATION TRANSFORMER, GENERATOR, ETC.) THAT REQUIRES PERIODIC MAINTENANCE, THE CONTRACTOR SHALL INCLUDE ALL OPERATION AND MAINTENANCE MANUALS AND ALL AS-BUILT DRAWINGS WHICH FULLY DESCRIBE THE ACTUAL INSTALLED EQUIPMENT.

1.17. TEST PROCEDURES AND RESULTS.

THE CONTRACTOR IS REQUIRED TO SUBMIT THE RESULTS OF ALL TESTS REQUIRED BY THE PROJECT SPECIFICATIONS AND DRAWINGS THAT FALL WITHIN HIS SCOPE OF WORK TO THE MOTOROLA SOLUTIONS REPRESENTATIVE WITHIN FIVE (5) DAYS OF THE TEST. THE CONTRACTOR IS REQUIRED TO SUBMIT TEST PROCEDURES NINETY (90) DAYS PRIOR TO THE TESTS BEING CONDUCTED. AT A MINIMUM, THE FOLLOWING TEST RESULTS SHALL BE INCLUDED, BUT NOT LIMITED TO:

-CONCRETE COMPRESSION TEST (PER ACI & R56) FOR ALL CONCRETE WORK.
-FREQUENCY DOMAIN REFLECTOMETER (FDR)/SWEEP TEST FOR ANTENNA AND TRANSMISSION LINE INSTALLATION WORK.
-FUEL LINE LEAKAGE TEST FOR FUEL. TANK AND PIPING INSTALLATION WORK.
-GROUNDING RESISTANCE TEST FOR GROUNDING WORK.
-SLUMP TEST FOR CONCRETE WORK.
-SOIL/BACKFILL COMPRESSION TESTING.
-ANY OTHER TEST THAT MAY BE JURISDICTIONALLY OR OTHERWISE REQUIRED.
-UPS SYSTEM START-UP
-GENERATOR SYSTEM START-UP

1.18. CONTRACT CLOSEOUT.

THE MOTOROLA SOLUTIONS REPRESENTATIVE WILL PROVIDE A CERTIFICATE OF COMPLETION AND APPROVE FINAL PAYMENT WHEN ALL PUNCH-LIST ITEMS HAVE BEEN CORRECTED AND ALL SYSTEMS ARE ACCEPTABLE.

1.19. WARRANTY.

ALL WORK PERFORMED BY THE CONTRACTOR IN COMPLETING THE SCOPE IDENTIFIED ON THE DRAWINGS SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR BASED ON AGREED FLOW DOWN CLAUSE. THIS GUARANTEE SHALL COVER ALL MATERIALS, EQUIPMENT OR WORKMANSHIP WHICH IN THE OPINION OF MOTOROLA SOLUTIONS IS RENDERED DEFECTIVE OR INFERIOR OR NOT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT DURING THE GUARANTEE PERIOD. IF, WITHIN THE GUARANTEE PERIOD, REPAIRS OR CHANGES ARE REQUIRED TO CORRECT THE GUARANTEE WORK, THEN UPON RECEIPT OF NOTICE, THE CONTRACTOR SHALL PROMPTLY AND WITHOUT EXPENSE TO MOTOROLA SOLUTIONS OR PROPERTY OWNER, PROCEED TO:

-PLACE IN SATISFACTORY CONDITION ALL OF SUCH GUARANTEED WORK AND CORRECT ALL DEFECTS THEREIN.
-MAKE GOOD ALL DAMAGES TO THE STRUCTURE OR SITE OR EQUIPMENT OR CONTENTS THEREOF, WHICH. IN THE OPINION OF MOTOROLA SOLUTIONS, IS THE RESULT OF THE USE OF MATERIALS, EQUIPMENT, OR WORKMANSHIP WHICH ARE INFERIOR, DEFECTIVE, OR NOT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT:
-MAKE GOOD ANY WORK, MATERIALS OR EQUIPMENT, AND ADJACENT STRUCTURES DISTURBED IN FULFILLING THE GUARANTEE.

A1 GENERAL NOTES
NOT TO SCALE

A3 GENERAL NOTES
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D TRIMBLE
23367
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
		REVISIONS
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	.
CHECKED BY:	E.N. KENNA, P.E.

GENERAL NOTES

G-003

Oct 10, 2016 - 8:39am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Code\Story\Construction\Sheet Files\General\D60002012_G-003.dwg

GENERAL NOTES

1. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
2. DO NOT CHANGE SIZE NOR SPACING OF STRUCTURAL ELEMENTS.
3. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
4. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
5. BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
6. DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
7. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR EXISTING CONDITIONS SHALL BE REPORTED TO THE MOTOROLA SOLUTIONS REPRESENTATIVE OR OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE APPROVAL.
8. EACH CONTRACTOR SHALL COOPERATE WITH MOTOROLA SOLUTIONS AND/OR OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
9. CONTRACTOR TO FOLLOW ALL STATE, LOCAL AND NATIONAL CODES AS APPLICABLE.

DESIGN DATA

LIVE LOADS: PER STATE, LOCAL AND NATIONAL CODES AS APPLICABLE
WIND LOADS: PER STATE, LOCAL AND NATIONAL CODES AS APPLICABLE
ICE LOADS: 1/2" RADIAL ON ALL COMPONENTS & CABLE
SNOW LOAD: PER STATE, LOCAL AND NATIONAL CODES AS APPLICABLE
SEISMIC LOADS: PER STATE, LOCAL AND NATIONAL CODES AS APPLICABLE

ANTENNA SUPPORT BRACKET NOTES

1. DESIGN RESPONSIBILITY OF ANTENNA MOUNTING BRACKETS AND POLES AND ALL COMPONENTS THERE OF AND ATTACHMENT THERE TO SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER. MFR. SHALL PROVIDE TO THE ENGINEER FOR APPROVAL, DRAWINGS DETAILING ALL COMPONENTS OF THE ASSEMBLY, INCLUDING CONNECTIONS, DESIGN LOADS, AND ALL OTHER PERTINENT DATA. ALL SUBMISSIONS SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE THE WORK IS BEING PERFORMED.
2. BRACKETS SHALL BE DESIGNED TO SUPPORT CURRENT AND FUTURE ANTENNAS AND COAXIAL CABLES SYSTEMS AS SPECIFIED.

STRUTURAL STEEL NOTES

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS". ALL W-SHAPES SHALL BE ASTM A992. ALL STEEL PIPE SHALL BE ASTM A53 GRADE B. ALL RECTANGULAR HOLLOW STRUCTURAL STEEL SHALL BE ASTM A500. ALL OTHER STEEL SHALL BE ASTM A-36.
2. ALL INTERIOR STRUCTURAL STEEL USED SHALL BE WHEN DELIVERED, FINISHED WITH ONE COAT FABRICATOR'S NON-LEAD, RED OXIDE PRIMER. PRIMING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE PRIMED AREAS SHALL BE REPAIRED BY FIELD TOUCHUP PRIOR TO COMPLETION OF THE WORK.
3. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH SPECIFICATION ASTM A123 UNLESS OTHERWISE NOTED. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE GALVANIZED AREAS SHALL BE REPAIRED BY FIELD TOUCH UP PRIOR TO COMPLETION OF THE WORK USING ZRC COLD GALVANIZING COMPOUND OR APPROVED EQUAL.
4. DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
5. CONNECTIONS:
   A. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
   B. BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS (3/4" DIA) AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
   C. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
   D. CONNECTION DESIGN BY FABRICATOR WILL BE SUBJECT TO REVIEW AND APPROVAL BY ENGINEER.
   E. AT ALL BOLTED CONNECTIONS, PROVIDE A NUT AND A WASHER CONFORMING TO ASTM F436. PROVIDE A WASHER MATCHING THE BOLT SIZE UNDER ALL BOLT HEADS AND NUTS THAT WILL BE TURNED IN TIGHTENING THE CONNECTION. TIGHTEN TO AISC "SNUG TIGHT" CRITERIA
6. STRUCTURAL STEEL GRATING SHALL BE 1 1/2" X 3/16" GALVANIZED STEEL BAR GRATING (IKG BORDEN TYPE-WB OR EQUAL) ATTACHED @ 1'-6" O.C. WITH GRATING CLAMPS, UNLESS OTHERWISE NOTED.
7. NEW STRUCTURAL STEEL LOCATED WITHIN A BUILDING OR ENCLOSURE SHALL BE FIRERATED PER LOCAL CODE.

CONCRETE NOTES

1. DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING APPLICABLE CODES: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"; ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
2. MIX DESIGN SHALL BE APPROVED BY THE MOTOROLA SOLUTIONS REPRESENTATIVE PRIOR TO PLACING CONCRETE.
3. CONCRETE SHALL BE NORMAL WEIGHT. 6% AIR ENTRAINED (±1.5%) WITH A MAXIMUM 4" SLUMP, AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI UNLESS OTHERWISE NOTED.
4. MAXIMUM AGGREGATE SIZE SHALL BE 1".
5. THE FOLLOWING MATERIALS SHALL BE USED:

	PORTLAND CEMENT:	ASTM C 150, TYPE 1
	REINFORCEMENT:	ASTM A 615, GRADE 60
	NORMAL WEIGHT AGGREGATE:	ASTM C 33
WATER:	DRINKABLE	
	ADMIXTURES:	NON-CHLORIDE CONTAINING

6. REINFORCING DETAILS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 315.
7. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
8. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   -CONCRETE CAST AGAINST EARTH.....3 IN.
   -CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF .....1 1/2 IN.
   -CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS .....1 1/2 IN.
9. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
10. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURES WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE.
11. CURING COMPOUNDS SHALL CONFORM TO ASTM C-309.
12. ADMIXTURES SHALL CONFORM TO THE APPROPRIATE ASTM STANDARD AS REFERENCED IN ACI-301.
13. DO NOT WELD OR TACKWELD REINFORCING STEEL.
14. ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, GROUNDS AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT.
15. LOCATE ADDITIONAL CONSTRUCTION JOINTS REQUIRED TO FACILITATE CONSTRUCTION AS ACCEPTABLE TO ENGINEER. PLACE REINFORCEMENT CONTINUOUSLY THROUGH JOINT.
16. REINFORCEMENT SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED.
17. PLACE CONCRETE IN A UNIFORM MANNER TO PREVENT THE FORMATION OF COLD JOINTS AND OTHER PLANES OF WEAKNESS. VIBRATE THE CONCRETE TO FULLY EMBED REINFORCING. DO NOT USE VIBRATORS TO TRANSPORT CONCRETE THROUGH CHUTES OR FORMWORK.
18. DO NOT PLACE CONCRETE IN WATER, ICE, OR ON FROZEN GROUND.
19. DO NOT ALLOW CONCRETE SUBBASE TO FREEZE DURING CONCRETE CURING AND SETTING PERIOD, OR FOR A MINIMUM OF 14 DAYS AFTER PLACEMENT.
20. FOR COLD-WEATHER AND HOT-WEATHER CONCRETE PLACEMENT, CONFORM TO APPLICABLE ACI CODES AND RECOMMENDATIONS, IN EITHER CASE, MATERIALS CONTAINING CHLORIDE, CALCIUM, SALTS, ETC SHALL NOT BE USED. PROTECT FRESH CONCRETE FROM WEATHER FOR 7 DAYS MINIMUM.

EXCAVATIONS/FOUNDATION

6. FOUNDATION EXCAVATION SHALL BE HAND-TRIMMED TO REMOVE LOOSE MATERIALS.
7. DO NOT PLACE FOOTINGS IN WATER OR ON FROZEN GROUND.
8. SOIL BEARING SURFACES, PREVIOUSLY ACCEPTED BY GEOTECHNICAL ENGINEER, WHICH ARE ALLOWED TO BECOME SATURATED, FROZEN OR DISTURBED SHALL BE REWORKED TO SATISFACTION OF GEOTECHNICAL ENGINEER.
9. DO NOT ALLOW GROUND BENEATH FOOTINGS TO FREEZE. PROVIDE DEWATERING AS REQUIRED.
10. ALL STRUCTURAL BACKFILL AND SUBBASE UNDER SLABS SHALL BE SELECT STRUCTURAL FILL MEETING THE GRADATION AND SOUNDNESS REQUIREMENTS IN ACCORDANCE WITH THE FOLLOWING GRADATION:
    A. GRADATION: THE MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

SEIVE SIZE	PERCENT PASSING BY WEIGHT
2 INCH	100
1/4 INCH	30 TO 65
NO. 200	0 TO 10

    B. MATERIALS SHALL BE SUBSTANTIALLY FREE OF SHALE OR OTHER SOFT, POOR DURABILITY PARTICLES. IF TESTING IS ELECTED BY MOTOROLA SOLUTIONS, MATERIAL WITH A MAGNESIUM SULFATE SOUNDNESS LOSS EXCEEDING 30% WILL BE REJECTED.
11. COMPACT TO 95% MODIFIED PROCTOR DENSITY PER ASTM D1557, UNLESS NOTED OTHERWISE.
12. SUBGRADE BELOW FOUNDATIONS SHALL BE REVIEWED AND ACCEPTED BY GEOTECHNICAL ENGINEER BEFORE CONCRETE SLAB PLACEMENT
13. ALL LOOSE AND/OR ORGANIC MATERIAL SHALL BE REMOVED PRIOR TO PREPARATION OF THE AREA FOR PLACEMENT OF STRUCTURAL BACKFILL
14. EXCAVATE ALL TOPSOIL TO STABLE SUBGRADE AND RE-COMPACT USING A PLATE TAMPER. ANY SOFT AREAS SHALL BE OVER EXCAVATED TO STABLE MATERIAL AND BACKFILLED WITH MATERIALS AND COMPACTION REQUIREMENTS SHOWN ON THE DRAWINGS.
15. PLACEMENT AND COMPACTION OF STRUCTURAL BACKFILL AND SUBBASE SHALL BE DONE IN 8" LIFTS.

SITE WORK NOTES

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
2. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE SITE COMPOUND AND OTHER SITE IMPROVEMENT AREAS.
5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
6. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE SITE IMPROVEMENTS, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
8. REMOVE ALL DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO PLACING FILLS.
9. CONTRACTOR SHALL COORDINATE THE CONSTRUCTION SCHEDULE WITH PROPERTY OWNER SO AS TO AVOID INTERRUPTIONS TO PROPERTY OWNER'S OPERATIONS.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING SITE VEHICLE TRAFFIC AS TO NOT ALLOW VEHICLES LEAVING THE SITE TO TRACK MUD ONTO PUBLIC STREETS. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING PUBLIC STREETS DUE TO MUDDY VEHICLES LEAVING THE SITE.

A1 GENERAL NOTES
NOT TO SCALE

A3 GENERAL NOTES
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
23827
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

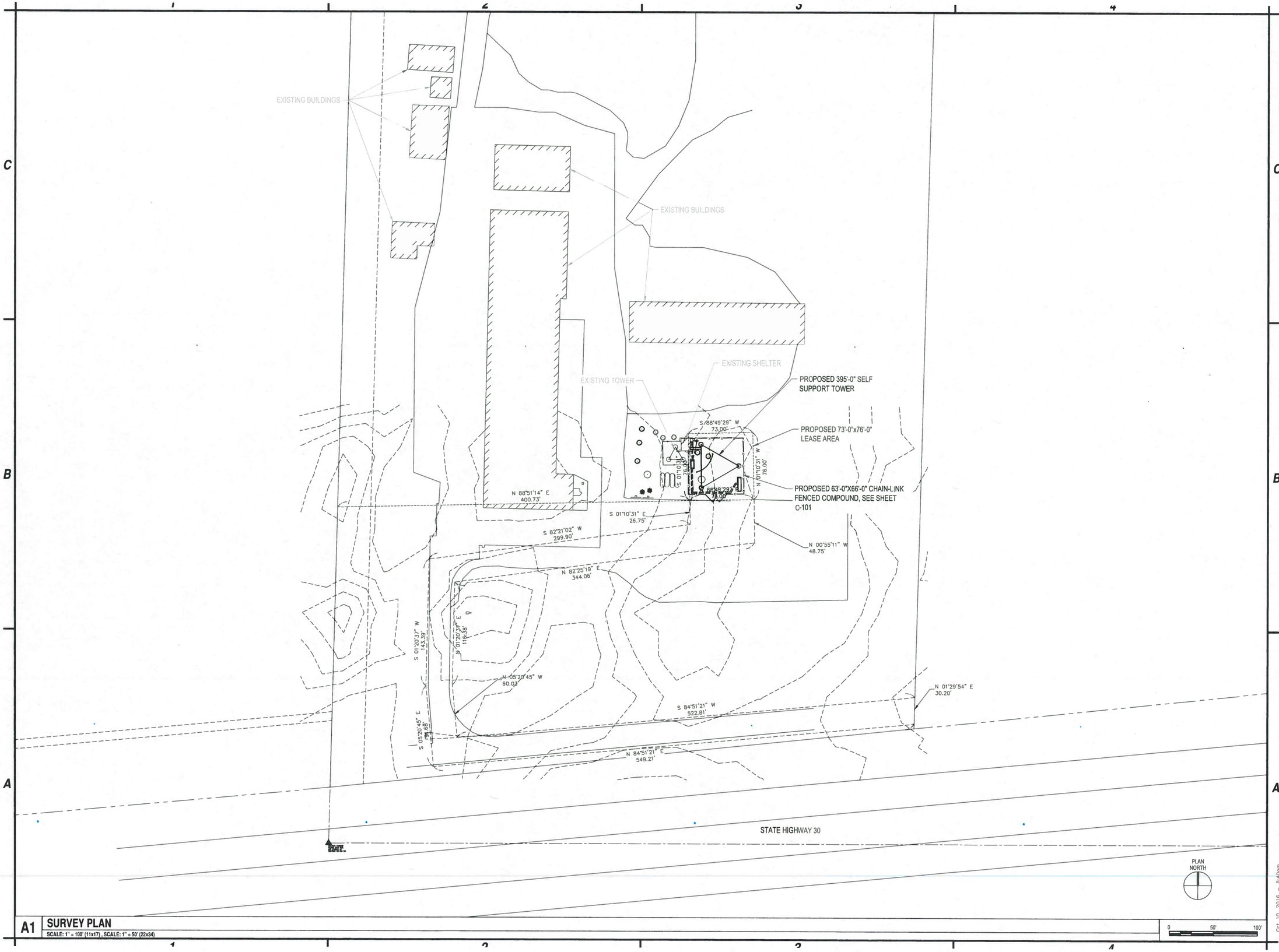
REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

GENERAL NOTES

G-004

Oct. 10, 2016 - 8:39am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cost\Story\Construction\Sheet Files\General\D60002012_G-004.dwg



A1 SURVEY PLAN

SCALE: 1" = 100' (11x17), SCALE: 1" = 50' (22x34)

C&S COMPANIES

C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
28337
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	-
CHECKED BY:	E.N. KENNA, P.E.

SURVEY PLAN

SP-100

Oct 10, 2016 - 8:40am
F:\Projects\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Civil\D60002012_SP-100.dwg

PLAN NORTH

A1 **OVERALL SITE PLAN**
SCALE: 1" = 160' (11x17) , SCALE: 1" = 80' (22x34)

0 80' 160'

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
25027
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

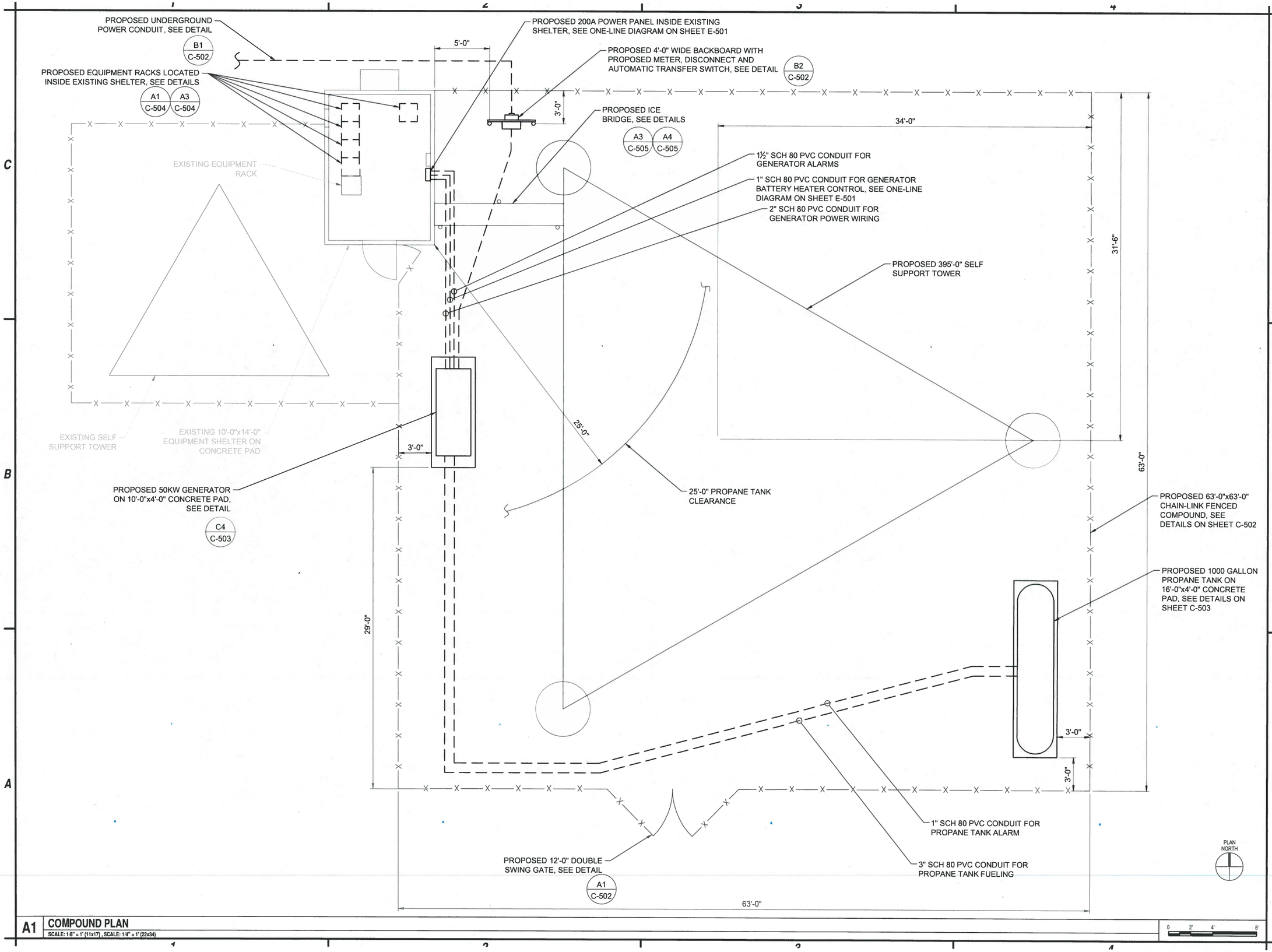
MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	-
CHECKED BY:	E.N. KENNA, P.E.

OVERALL SITE PLAN

C-100



A1 COMPOUND PLAN
SCALE: 1/8" = 1' (11x17) , SCALE: 1/4" = 1' (22x34)

0 2' 4' 8'

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
29327
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

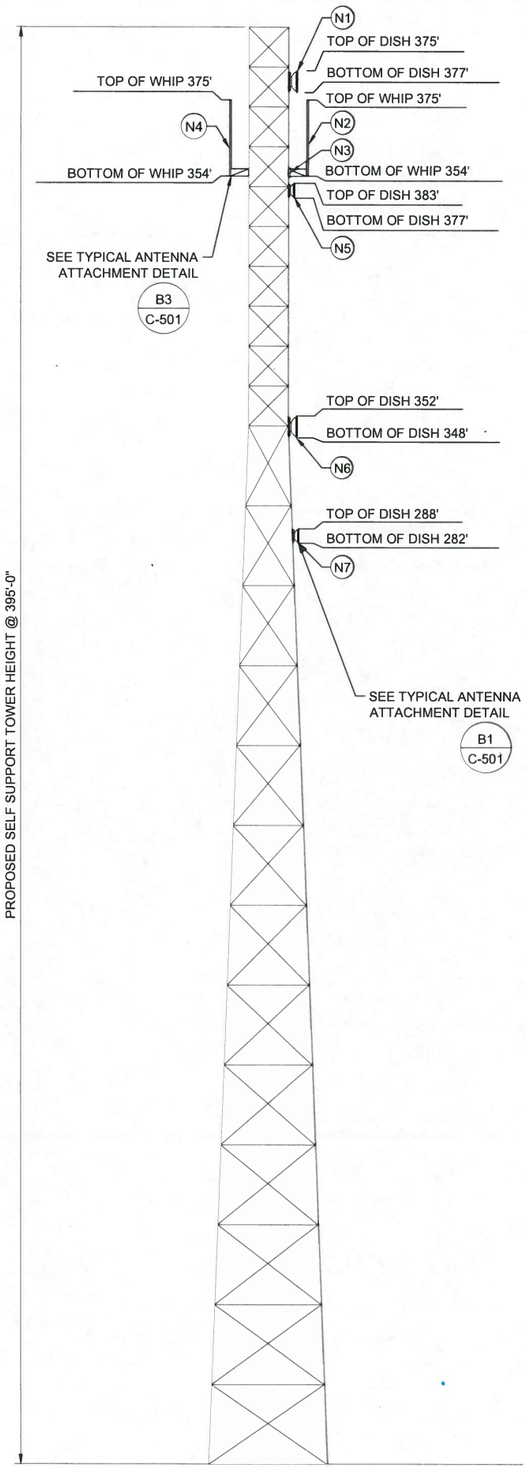
REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	-
CHECKED BY:	E.N. KENNA, P.E.

COMPOUND PLAN

C-101

Oct. 10, 2016 - 8:40am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Codd\Story\Construction\Sheet Files\Civil\D60002012_C-101.dwg



NOTE:
EXISTING ANTENNA LOADING IS NOT SHOWN PENDING RECEIPT OF TOWER INVENTORY. PROPOSED ANTENNA LOADING TO BE ADJUSTED AS REQUIRED UPON RECEIPT.

A1 TOWER ELEVATION
NOT TO SCALE

ANTENNA / APPERTUNACE LOCATION CHART

SITE COORDINATES: N42° 0' 35.60" W93° 33' 33.90"			ANTENNA INFORMATION							FEEDLINE INFORMATION				
ANTENNA ID	MANUFACTURER	MODEL	TYPE	LENGTH	BOTTOM ELEV	RAD CENTER	TOP ELEV	AZIMUTH	QTY	TYPE	MANUFACTURER	MODEL	SIZE	QTY.
N1	RFS	SB6-W60	MW	6'	377'	380'-0"± A.G.L.	383'	153.13°	1	COAX	COMMSCOPE	CNT-400	.405"	1
N2	SINCLAIR	SC412-HF2LDF	RX	20.9'	354'	364.6'± A.G.L.	375'	N/A	1	COAX	-	-	.5"	1
N3	-	428E831O1T	TTA	N/A	N/A	355'-0"± A.G.L.	N/A	N/A	1	-	-	-	.5"	1
N4	SINCLAIR	SC412-HF2LDF	TX	20.9'	354'	364.6'± A.G.L.	375'	N/A	1	COAX	-	-	.875"	1
N5	RFS	SB4-W60	MW	4'	348'	350'-0"± A.G.L.	352'	153.13°	1	COAX	COMMSCOPE	CNT-400	.405"	1
N6	RFS	SB6-W60	MW	6'	282'	285'-0"± A.G.L.	288'	245.09°	1	COAX	COMMSCOPE	CNT-400	.405"	1
N7	RFS	SB4-W60	MW	4'	253'	255'-0"± A.G.L.	257'	245.09°	1	COAX	COMMSCOPE	CNT-400	.405"	1

A2 ANTENNA SCHEDULE
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D TRUMBLE
21327
IOWA

ISICS
Pyramid Network Services, LLC
MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

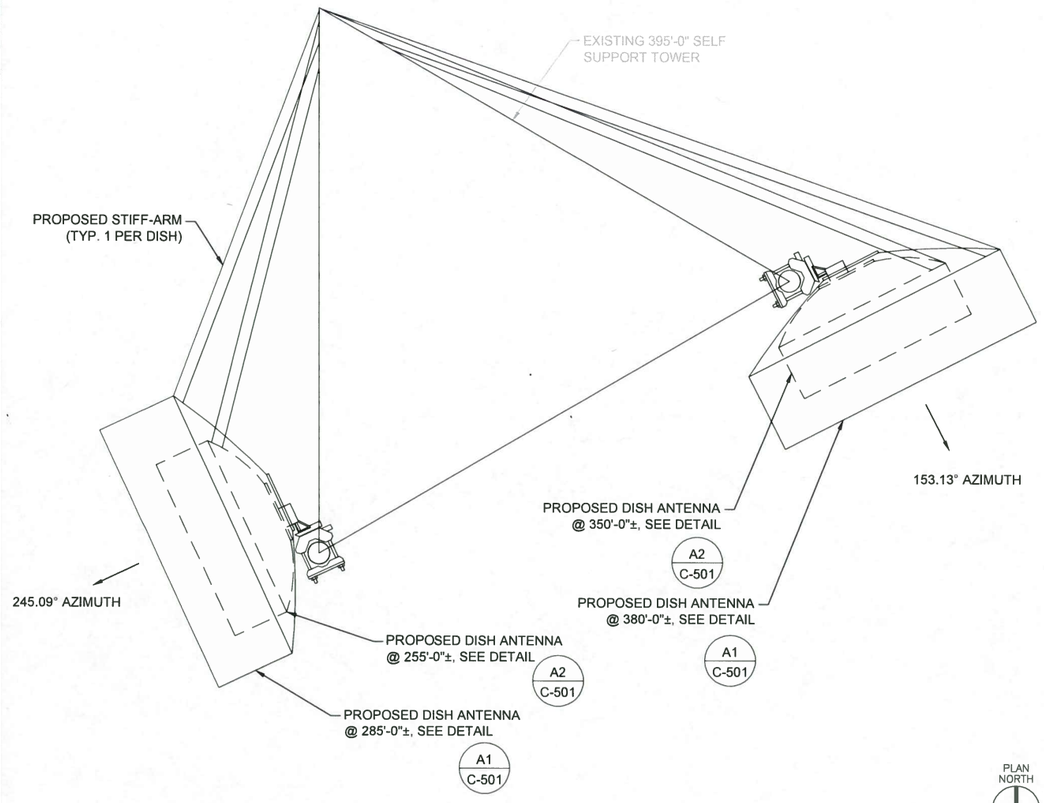
REVISIONS

PROJECT NO: D60.002.012
DATE: SEPTEMBER 2016
DRAWN BY: M. BUCKINGHAM
DESIGNED BY: -
CHECKED BY: E.N. KENNA, P.E.

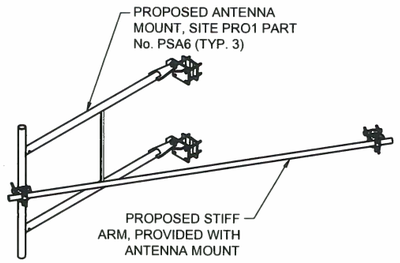
TOWER ELEVATION AND ANTENNA INFORMATION

C-201

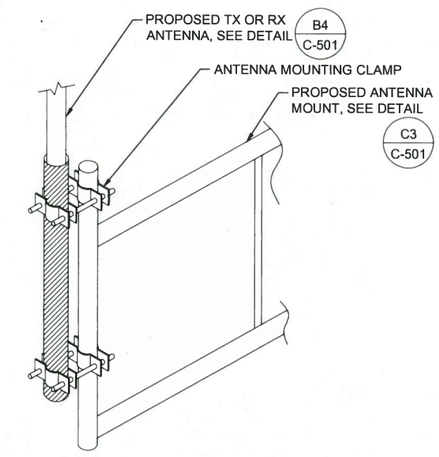
Oct. 10, 2016 - 8:41am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Civil\D60002012_C-201.dwg



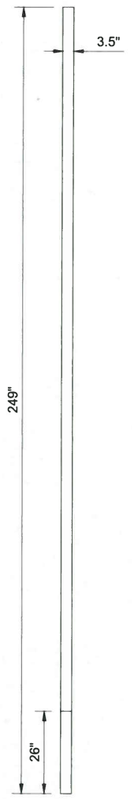
B1 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE



C3 ANTENNA MOUNT DETAIL
NOT TO SCALE

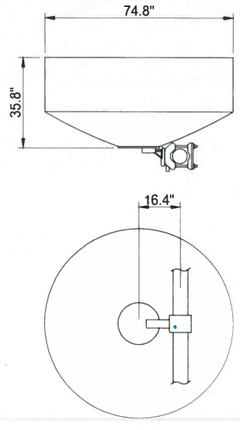


B3 ANTENNA ATTACHMENT DETAIL
NOT TO SCALE



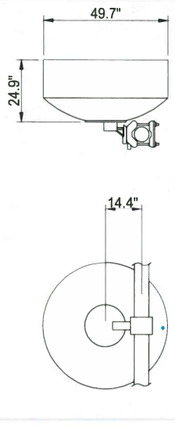
900MHz ANTENNA
MFG. SINCLAIR
MODEL: SC412-HF2LDF

B4 ANTENNA DETAIL
NOT TO SCALE



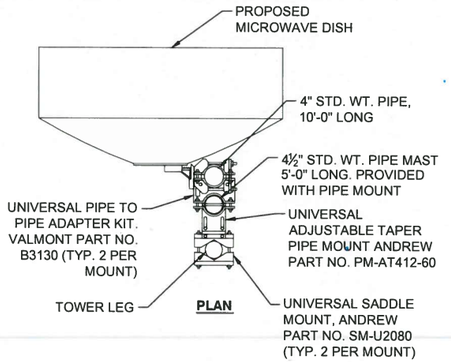
MANUFACTURER: RFS
MODEL: SB6-W60

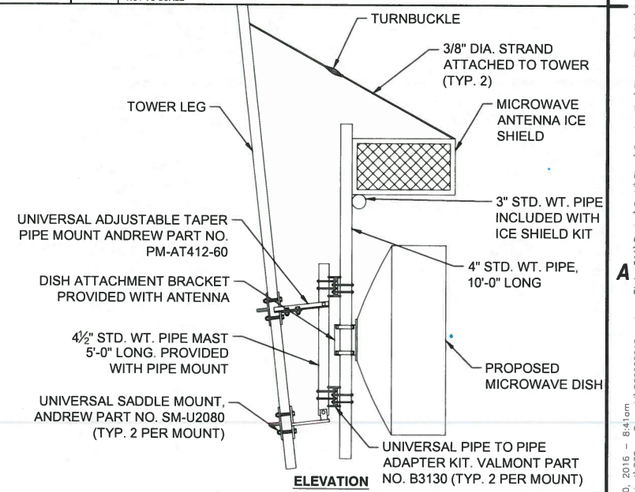
A1 ANTENNA DETAIL
NOT TO SCALE



MANUFACTURER: RFS
MODEL: SB4-W60

A2 ANTENNA DETAIL
NOT TO SCALE





A3 DISH ATTACHMENT DETAIL
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
23367
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

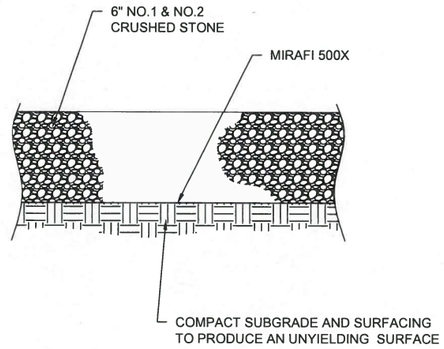
MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

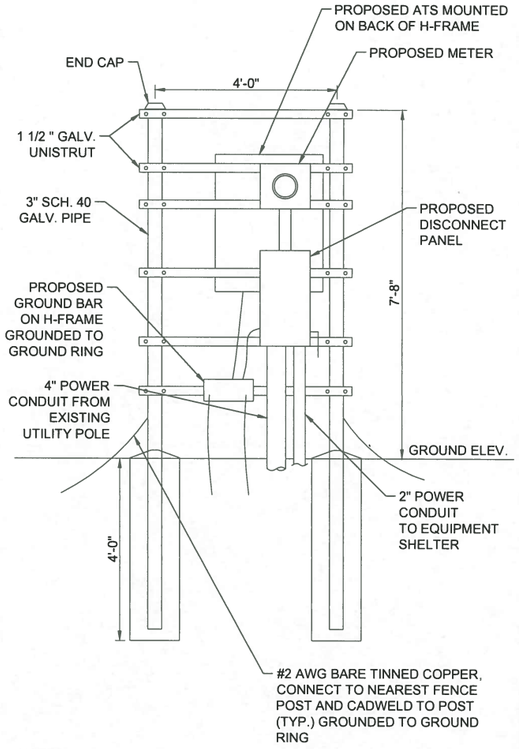
ANTENNA DETAILS

C-501



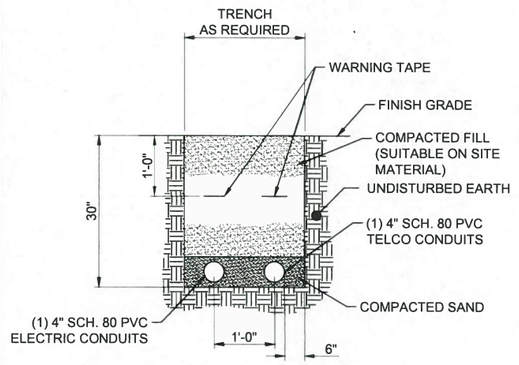
NOTE:
1. EXTEND 1'-0" BEYOND FENCE UNLESS NOTED OTHERWISE.

C1 STONE YARD DETAIL
NOT TO SCALE



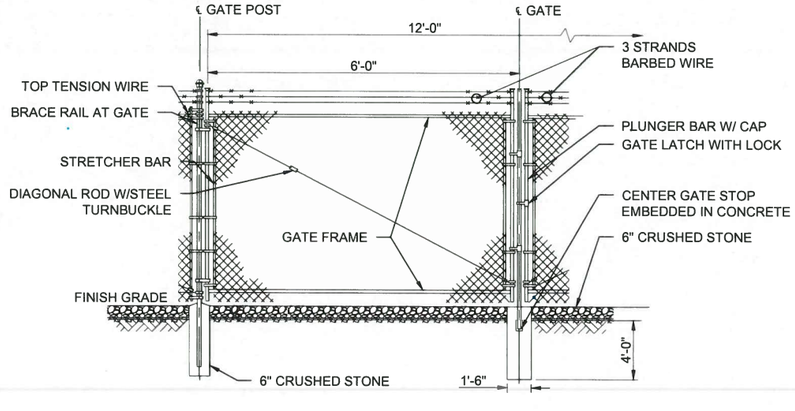
NOTES:
1). ALL WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE AND THE LOCAL BUILDING CODES. ALL COMPONENTS SHALL BE U.L. APPROVED.
2). ALL COMPONENTS TO BE AS SPECIFIED OR EQUIVALENT.

B2 H-FRAME DETAIL
NOT TO SCALE

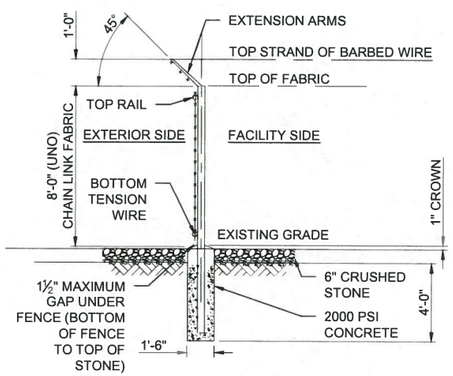


NOTE:
1. NUMBER AND SIZE OF CONDUITS MAY VARY, SEE ONE-LINE DIAGRAM.

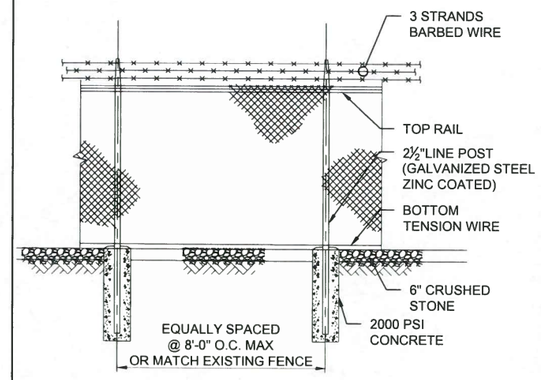
B1 ELECTRIC/TELCO TRENCH DETAIL
NOT TO SCALE



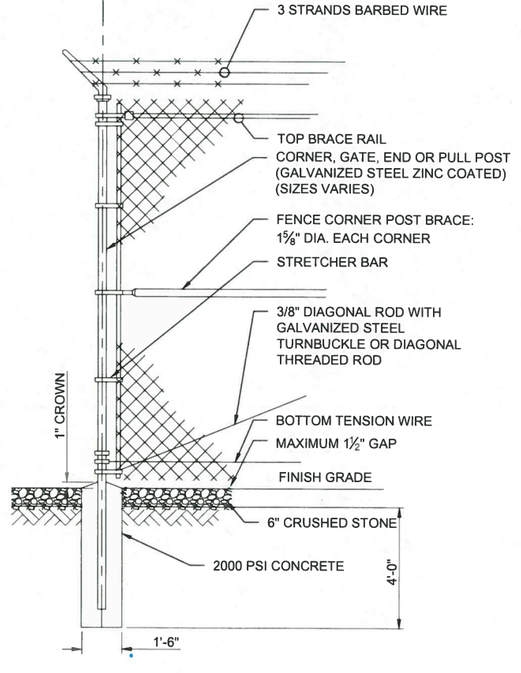
A1 WOVEN WIRE DOUBLE SWING GATE DETAIL
NOT TO SCALE



C3 WOVEN WIRE FENCE DETAIL
NOT TO SCALE



C4 WOVEN WIRE FENCE DETAIL
NOT TO SCALE



A3 WOVEN WIRE CORNER, GATE, END OR PULL POST DETAIL
NOT TO SCALE

(INSTALL FENCING PER ASTM F-567, SWING GATES PER ASTM F- 900)

1. GATE POST: 4" DIA. SCHEDULE 40 PER ASTM-F 1083, GALVANIZED STEEL ZINC COATED.
2. CORNER AND TERMINAL OR PULL POST: 3" DIA. SCHEDULE 40 PER ASTM-F 1083, GALVANIZED STEEL ZINC COATED.
3. LINE POST: 2½" DIA. SCHEDULE 40 PIPE PER ASTM-F 1083, GALVANIZED STEEL ZINC COATED.
4. GATE FRAME: 1½" DIA. SCHEDULE 40 PIPE PER ASTM-F 1083, GALVANIZED STEEL ZINC COATED.
5. TOP RAIL AND BRACE RAIL: 1½" DIA. SCHEDULE 40 PIPE PER ASTM-F 1083, GALVANIZED STEEL ZINC COATED.
6. FABRIC: 9 GA. CORE WIRE SIZE 2" MESH, CONFORMING TO ASTM-A392.
7. TIE WIRE: MINIMUM 9 GA. GALVANIZED STEEL AT POSTS AND RAILS A SINGLE WRAP OF FABRIC TIE AND AT TENSION WIRE BY HOG RINGS SPACED MAXIMUM 24" INTERVALS.
8. TENSION WIRE: 6 GA. MIN. GALVANIZED STEEL, SHOULD BE CONTINUOUS.
9. BARBED WIRE DOUBLE STRAND 12-½" O.D. TWISTED WIRE TO MATCH EXISTING WITH FABRIC 14 GA., 4 PT. BARBS SPACED ON APPROXIMATELY 5" CENTERS.
10. GATE LATCH: 1-⅜" O.D. PLUNGER ROD WITH MUSHROOM TYPE CATCH AND LOCK, KEYED ALIKE FOR ALL SITES.
11. LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLIED IF REQUIRED.
12. HEIGHT = 8' VERTICAL (UNLESS NOTED OTHERWISE) OR MATCH EXISTING FENCE (IF APPLICABLE) AND 1' BARBED WIRE VERTICAL DIMENSION.
13. MAXIMUM 1½" GAP UNDER FENCE.
14. ALL OPEN POSTS REQUIRE CAPS.

A4 TYPICAL WOVEN WIRE FENCING NOTES
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
28327
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

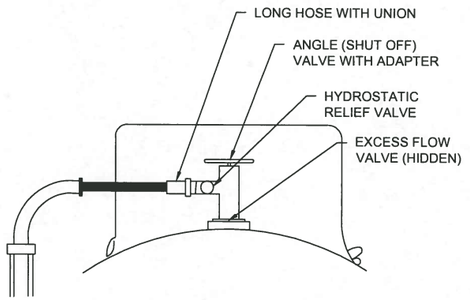
MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

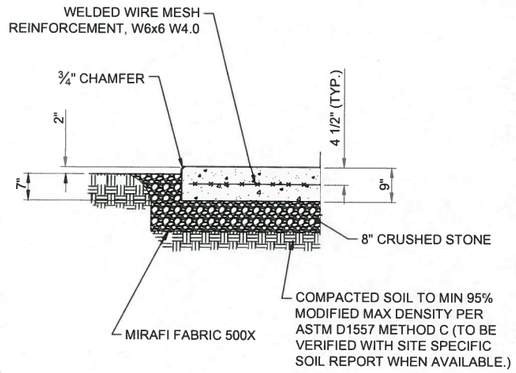
DETAILS

C-502

Oct. 10, 2016 - 8:42am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Civil\D60002012_C-502.dwg



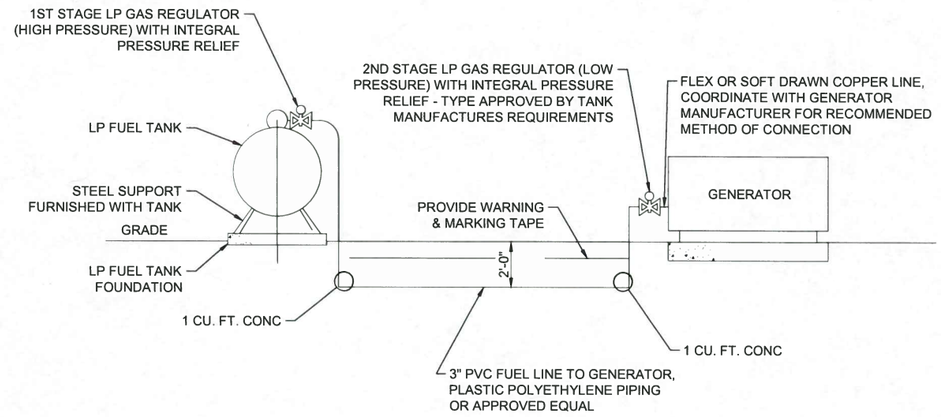
C3 PROPANE TANK VALVE ATTACHMENT DETAIL
NOT TO SCALE



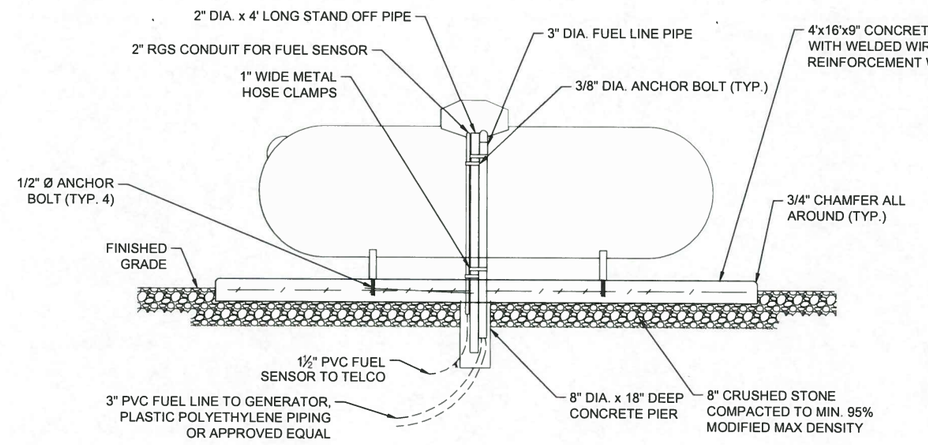
C4 SLAB ON GRADE DETAIL
NOT TO SCALE

C1 NOT USED
NOT TO SCALE

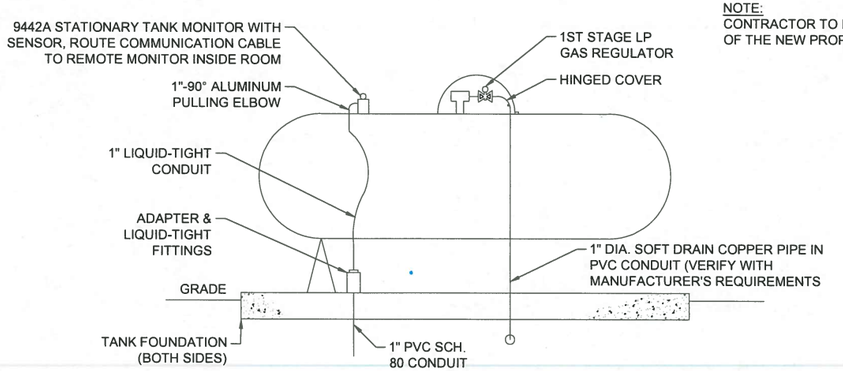
C2 NOT USED
NOT TO SCALE



B1 PROPANE TANK ELEVATION
NOT TO SCALE

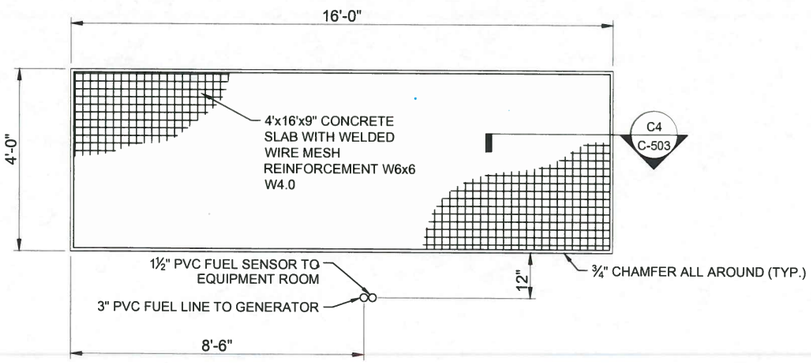


B3 PROPANE TANK ELEVATION
NOT TO SCALE



NOTE:
CONTRACTOR TO PROVIDE INITIAL FILL OF THE NEW PROPANE TANK

A1 PROPANE TANK PLAN
NOT TO SCALE



A3 PROPANE TANK PLAN
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. KENNA
27327
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2 *	10-03-16	REVISIONS
1	9-14-16	REVISIONS

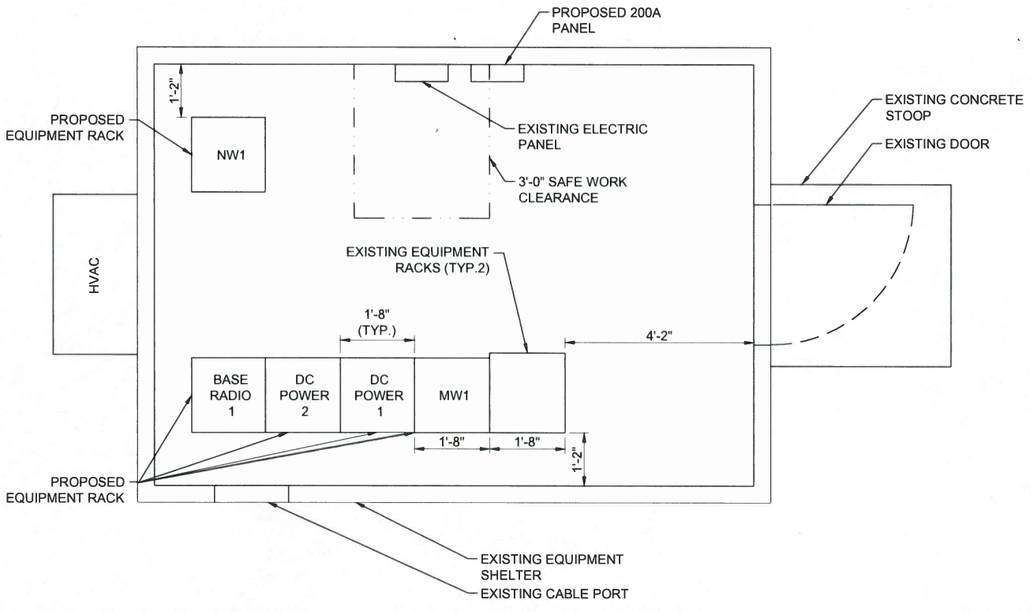
REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

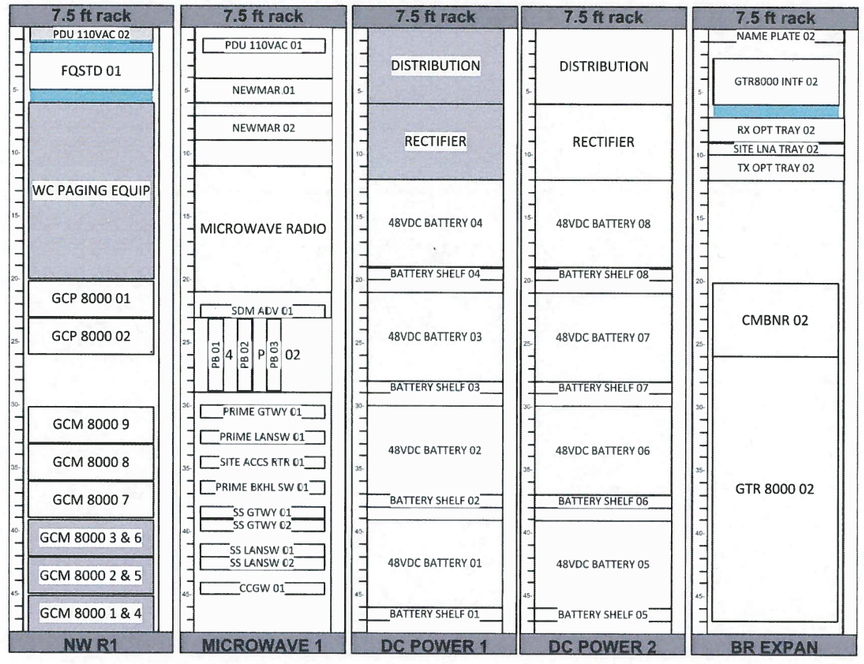
PROPANE TANK FOUNDATION DETAILS

C-503

Oct. 10, 2016 - 8:42pm
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Civil\D60002012_C-503.dwg



A1 **EQUIPMENT SHELTER PLAN**
NOT TO SCALE



A3 **MW REPEATER RACK DIAGRAM**
NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
28321
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

REVISIONS

PROJECT NO: D60.002.012
DATE: SEPTEMBER 2016
DRAWN BY: M. BUCKINGHAM
DESIGNED BY:
CHECKED BY: E.N. KENNA, P.E.

EQUIPMENT SHELTER PLAN AND RACK DIAGRAM

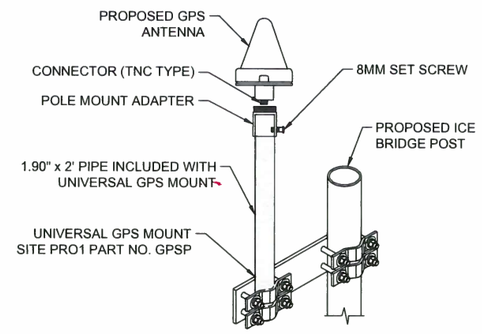
C-504

Oct. 10, 2016 - 8:42am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Civil\D60002012_C-504.dwg

C1 NOT USED
NOT TO SCALE

B1 NOTT USED
NOT TO SCALE

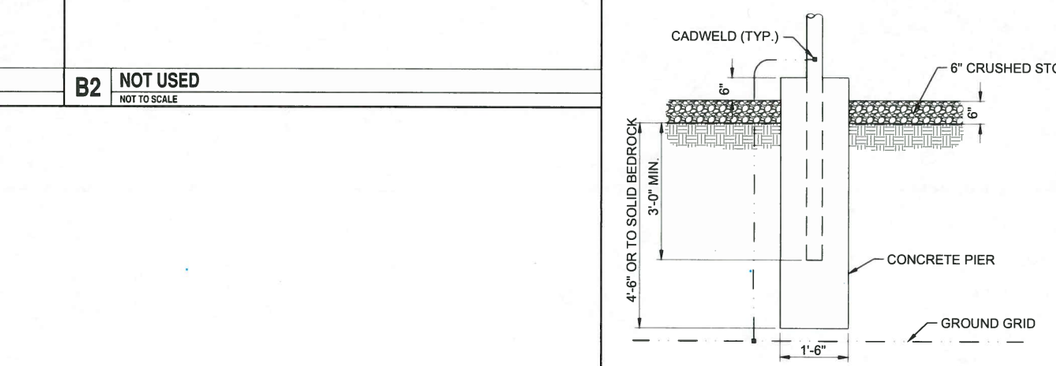
A1 NOT USED
NOT TO SCALE



NOTES:
1. PROVIDE COAXIAL CABLE TO EQUIPMENT.
2. MOUNT GPS ANTENNA TO PROPOSED ICE BRIDGE POST.

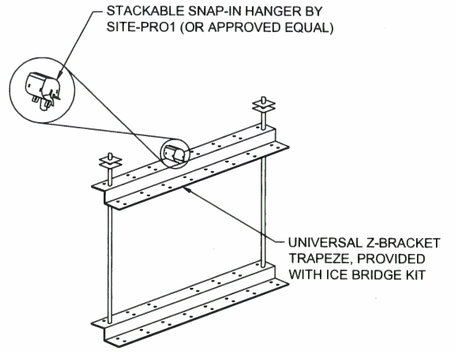
C2 GPS ANTENNA DETAIL
NOT TO SCALE

B2 NOT USED
NOT TO SCALE

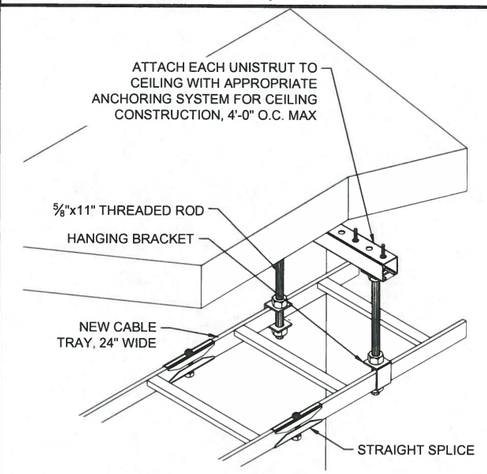


NOTES:
1. USE SITE PRO 1 PARTS OR APPROVED EQUAL.
2. SUPPORT POSTS SHALL BE STAGGERED ON BOTH SIDES OF ICE BRIDGE SPACED NO MORE THAN 8'-0" BETWEEN POSTS.
3. ANY SPLICES OR CANTILEVERED SECTIONS OF THE ICE BRIDGE SHALL BE LOCATED WITHIN 2'-0" OF A SUPPORT POST.

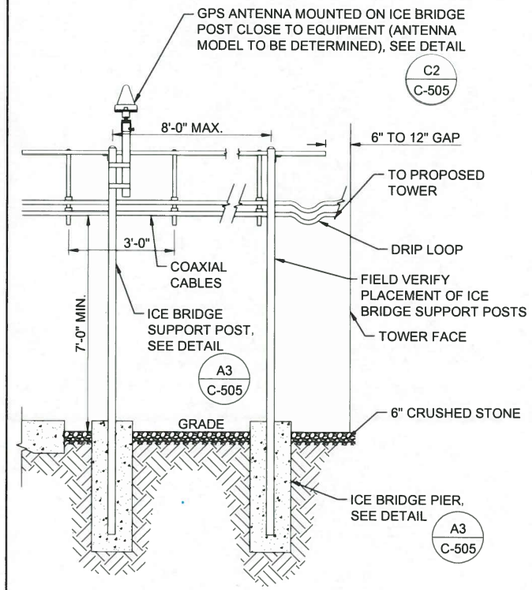
A3 ICE BRIDGE PIER DETAIL
NTS



C3 TRAPEZE KIT DETAIL
NTS



C4 CABLE LADDER DETAIL
NOT TO SCALE



A4 ICE SHIELD - ICE BRIDGE ELEVATION
NTS

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
26727
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

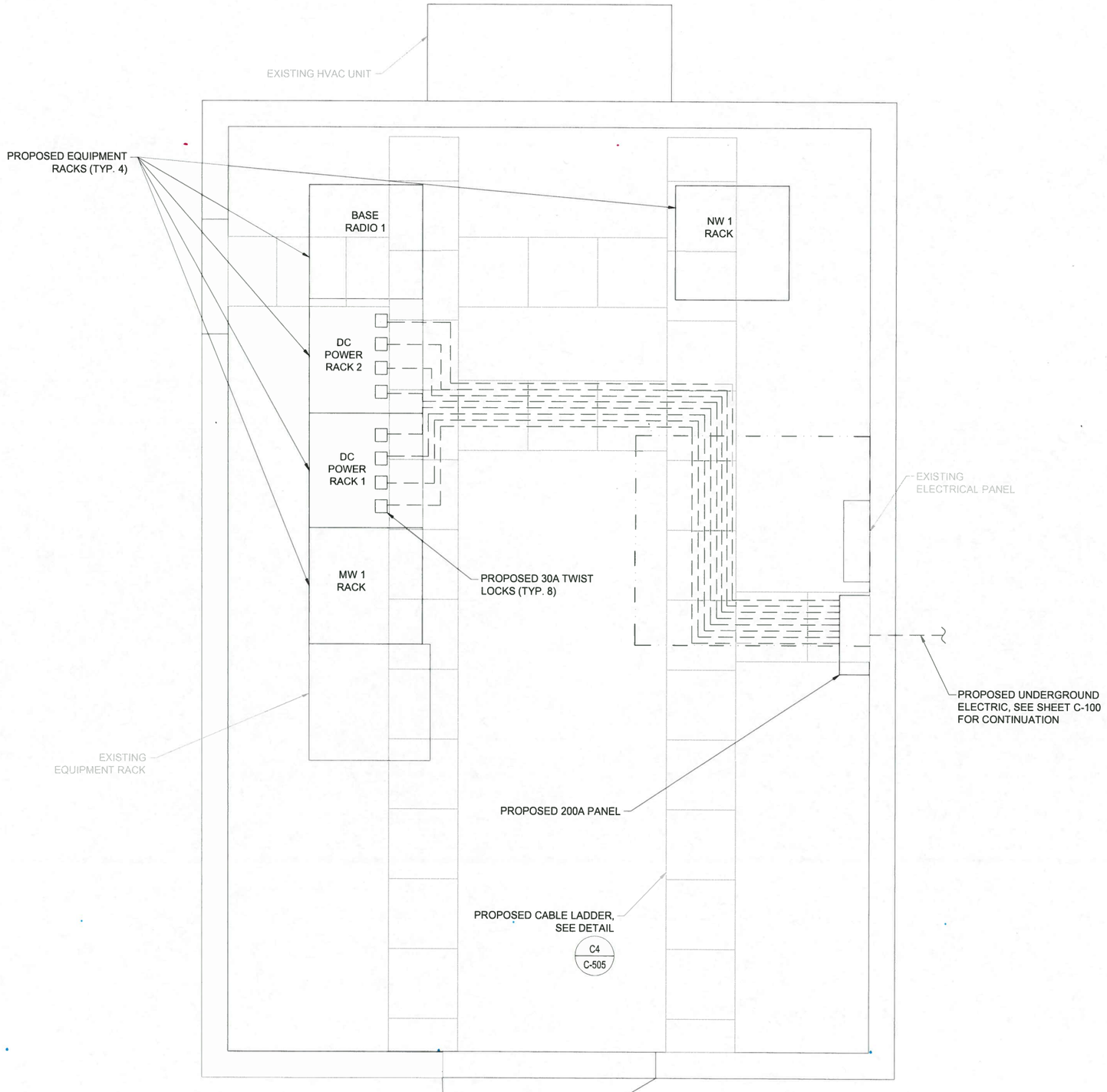
MARK	DATE	DESCRIPTION
		REVISIONS
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

ICE BRIDGE DETAILS

C-505

Oct 10, 2016 - 8:43am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Civil\D60002012_C-505.dwg



A1 **EQUIPMENT POWER PLAN**
SCALE: 1" = 10'-0" (22x34) 1" = 20'-0" (11x17)

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
23827
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

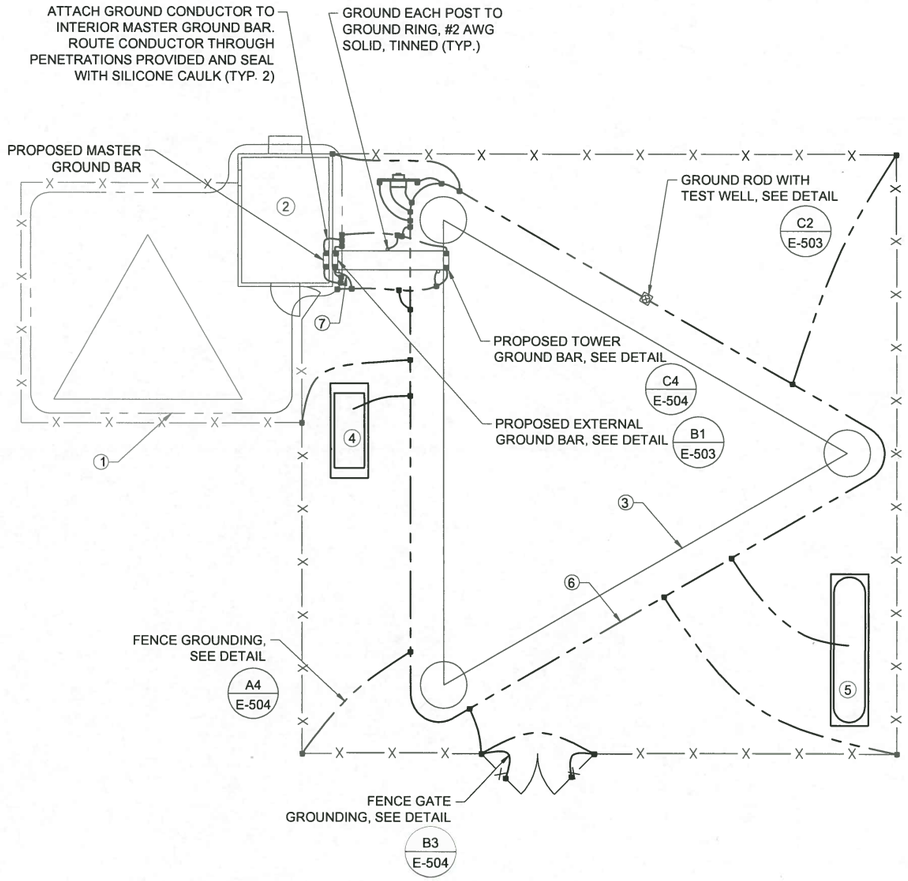
REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	-
CHECKED BY:	E.N. KENNA

EQUIPMENT POWER PLAN

E-101

Oct 10, 2016 – 8:43am
F:\Projects\D60 – Pyramid\D60002012 – Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Electrical\D60002012_E-101.DWG



PLAN NORTH

CODED DRAWING NOTES:

1. EXISTING TOWER GROUND RING (FIELD VERIFIY LOCATION)
2. EXISTING SHELTER
3. PROPOSED TOWER
4. PROPOSED GENERATOR ON CONCRETE PAD
5. PROPOSED PROPANE TANK ON CONCRETE PAD
6. PROPOSED TOWER GROUND RING
7. BOND EACH SECTION AND SUPPORT POST OF ICE BRIDGE

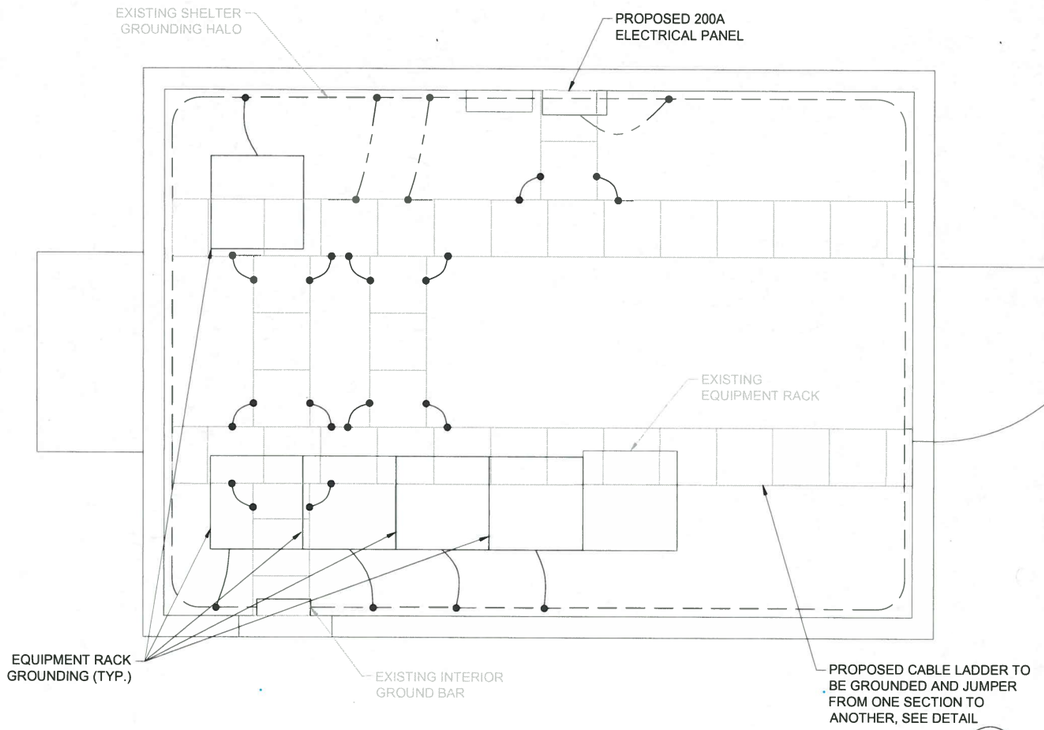
LEGEND:

- ⊗ 5/8"x8'-0" COPPER CLAD GROUND ROD
- ⊗ ⅝"x8'-0" COPPER CLAD GROUND ROD WITH ACCESS TEST WELL
- ■ EXOTHERMIC WELD CONNECTION
- ● COMPRESSION CONNECTION
- Ⓜ METER SOCKET BY CONTRACTOR METER BY UTILITY COMPANY
- ——— GROUNDING WIRE, #2 BCC U.N.O.
- # CODED DRAWING NOTE
- MGB MGB - MASTER GROUND BAR
- EGB EGB - EXTERNAL GROUND BAR
- TGB TGB - TOWER GROUND BAR

ABBREVIATIONS:

AWG	AMERICAN WIRE GAUGE
BCC	BARE COPPER CABLE
EGB	EXTERNAL GROUND BAR
IPGB	INTERIOR PERIMETER GROUND BUS
MGB	MASTER GROUND BAR
TGB	TOWER GROUND BAR

A1 GROUNDING PLAN
NOT TO SCALE



PLAN NORTH

A3 GROUNDING NOTES
SCALE: NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
25321
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

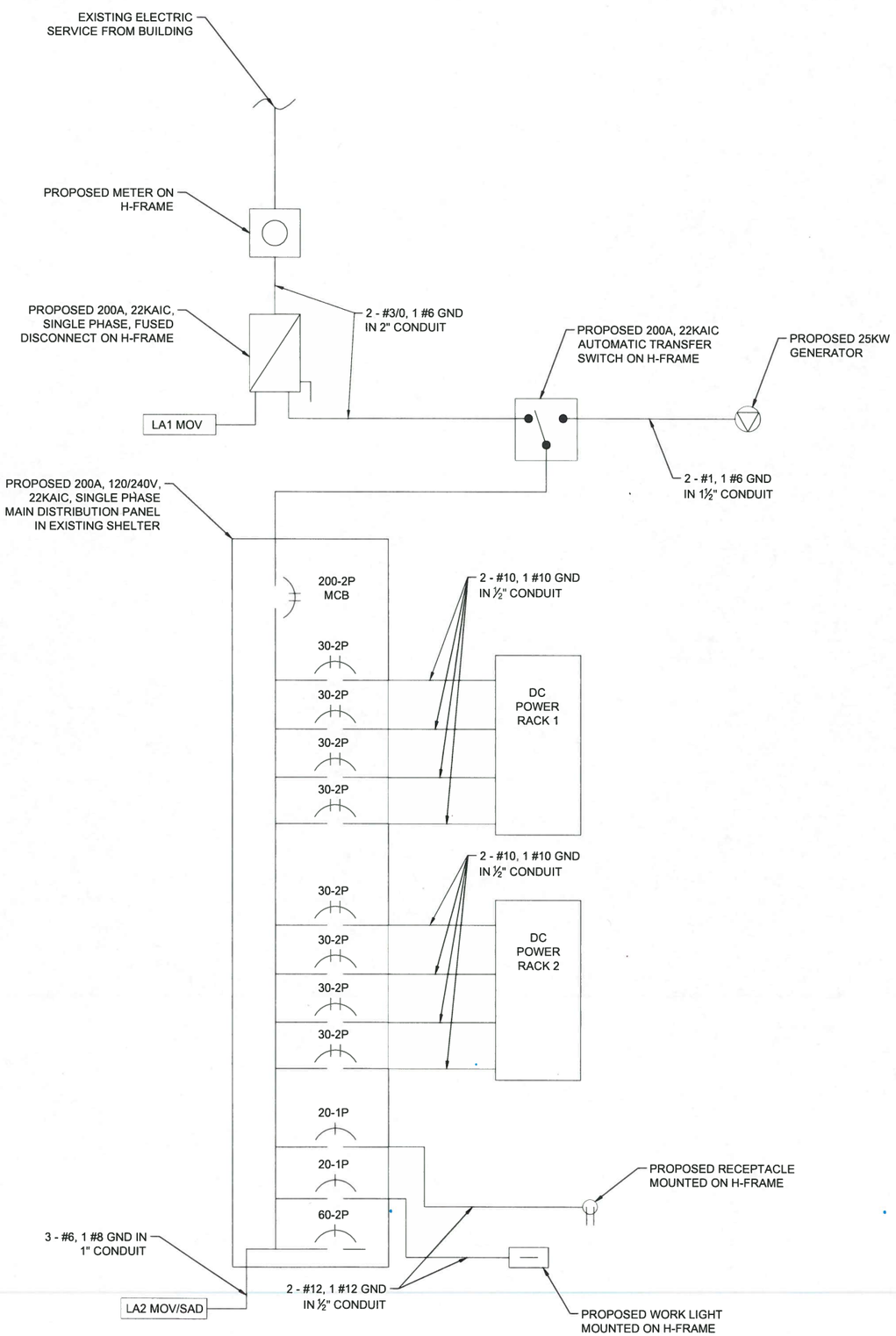
REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	-
CHECKED BY:	E.N. KENNA

GROUNDING PLANS

E-102

Oct 10, 2016 – 8:44am
F:\Project\D60 – Pyramid\D60002012 – Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Electrical\D60002012_E-102.DWG



A1 **ELECTRICAL ONE-LINE DIAGRAM**
SCALE: NOT TO SCALE

PANEL SCHEDULE

200 AMPS	MAIN BREAKER	NA AMPS	INSTALLATION	NEMA 1	
120/240 VOLTS	LUGS	200 AMPS	LOCATION	Existing Interior Shelter Wall	
1 PHASE	GND. BAR	x	PANEL FEEDER	Existing Building Service	
3 WIRE			CONNECTED		KVA
30 POLE SPACES	RMS. SYMMETRICAL AMPS		DEMAND		KVA

NOTES:

DESCRIPTION	WIRE	CON	CB. AMPS	LOAD kVA	DEM KVA	CIR #	CIR #	DEM kVA	LOAD kVA	CB. AMPS	WIRE	CON	DESCRIPTION
DC Power Rack Ckt. 1	2-10		30-2			1	2			30-2	2-10		DC Power Rack Ckt. 3
DC Power Rack Ckt. 1	2-10		30-2			3	4			30-2	2-10		DC Power Rack Ckt. 3
DC Power Rack Ckt. 2	2-10		30-2			5	6			30-2	2-10		DC Power Rack Ckt. 4
DC Power Rack Ckt. 2	2-10		30-2			7	8			30-2	2-10		DC Power Rack Ckt. 4
DC Power Rack Ckt. 5	2-10		30-2			9	10			30-2	2-10		DC Power Rack Ckt. 7
DC Power Rack Ckt. 5	2-10		30-2			11	12			30-2	2-10		DC Power Rack Ckt. 7
DC Power Rack Ckt. 6	2-10		30-2			13	14			30-2	2-10		DC Power Rack Ckt. 8
DC Power Rack Ckt. 6	2-10		30-2			15	16			30-2	2-10		DC Power Rack Ckt. 8
LA 2 MOV/SAD	3-6		60-2			17	18			20-1	3-12		H-Frame Outlet
LA 2 MOV/SAD	3-6		60-2			19	20			20-1	3-12		H-Frame Light
Spare						21	22						Spare
Spare						23	24						Spare
Spare						25	26						Spare
Spare						27	28						Spare
Spare						29	30						Spare

A3 **PROPOSED SCHEDULE**
SCALE: NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
20221
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

REVISIONS

PROJECT NO: D60.002.012
DATE: SEPTEMBER 2016
DRAWN BY: M. BUCKINGHAM
DESIGNED BY: -
CHECKED BY: E.N. KENNA

ONE-LINE DIAGRAM AND PANEL SCHEDULE

E-501

Oct. 10, 2016 - 8:44am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Electrical\D60002012_E-501.dwg

1. ALL GROUNDING CABLE IN CONCRETE OR THROUGH WALL SHALL BE IN 3/4" PVC CONDUIT. NO METALLIC CONDUIT SHALL BE USED FOR GROUNDING CONDUCTOR SLEEVES.

2. GROUND ALL EXPOSED METALLIC OBJECTS ON MULTI-TENANT METER/TELCO CENTER USING A TWO-HOLE NEMA DRILLED CONNECTOR SUCH AS THOMAS & BETTS #32207 OR APPROVED EQUAL.

3. THE CONTRACTOR SHALL NOTIFY THE MOTOROLA REPRESENTATIVE WHEN THE GROUND RING IS INSTALLED SO THAT THE REPRESENTATIVE CAN INSPECT GROUND RING BEFORE IT IS CONCEALED.

4. ALL EXTERIOR GROUNDING CONDUCTORS INCLUDING GROUND RING SHALL BE #2 AWG SOLID BARE TINNED COPPER. MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. THE RADIUS OF ANY BEND SHALL NOT BE LESS THAN 8" AND THE INCLUSIVE ANGLE OF ANY BEND SHALL NOT EXCEED 90°. GROUNDING CONDUCTORS SHALL BE ROUTED DOWNWARD TOWARD THE BURIED GROUND RING.

5. ALL BELOW GROUND EXTERNAL CONNECTIONS SHALL BE EXOTHERMICALLY WELDED OR MECHANICALLY ADHERED BY A 12 TON COMPRESSION CONNECTION. ALL EXOTHERMIC WELDS TO BURIED GROUND RING SHALL BE THE PARALLEL-TYPE. EXCEPT FOR THE GROUND RODS WHICH ARE TEE-TYPE EXOTHERMIC WELDS. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY EXOTHERMIC WELDING. USE SPRAY GALVANIZED SUCH AS HOLUB LECTROSOL #15-501.

6. WHERE MECHANICAL CONNECTORS (TWO-HOLE OR CLAMP) ARE USED, APPLY A LIBERAL PROTECTIVE COATING OF A CONDUCTIVE ANTI-OXIDE COMPOUND ON ALL CONNECTORS. PROVIDE LOCK WASHERS ON ALL MECHANICAL CONNECTOR. USE STAINLESS STEEL HARDWARE THROUGHOUT. THOROUGHLY REMOVE ALL PAINT AND CLEAN ALL DIRT FROM SURFACES REQUIRING GROUND CONNECTORS, REPAINT TO MATCH EXISTING AFTER CONNECTION IS MADE TO MAINTAIN CORROSION RESISTANCE. ALL GROUND CONNECTIONS SHALL BE APPROVED FOR THE TYPES OF METALS BEING ATTACHED TO.

7. THE CONTRACTOR SHALL COORDINATE AS REQUIRED TO HAVE A UTILITY COMPANY REPRESENTATIVE AT THE SITE TO DISCONNECT THE UTILITY NEUTRAL FROM GROUNDING SYSTEM DURING FINAL INSPECTION SO THAT REQUIRED TESTING ON THE GROUND SYSTEM CAN BE PERFORMED. THE CONTRACTOR SHALL PROVIDE NOTICE TO THE MOTOROLA REPRESENTATIVE 2 (TWO) DAYS PRIOR TO FINAL TESTING. IF THE CONTRACTOR FAILS TO MAKE UTILITY COMPANY REPRESENTATIVE AVAILABLE DURING THE FINAL TESTING, THE CONTRACTOR SHALL PAY THE COST FOR AN INDEPENDENT GROUNDING CONSULTANT TO PERFORM THE GROUND RESISTANCE TEST, GROUNDING CONSULTANT SHALL BE SELECTED BY THE MOTOROLA REPRESENTATIVE. IF THE UTILITY COMPANY REPRESENTATIVE FAILS TO APPEAR DUE TO NO FAULT OF THE CONTRACTOR, NO PENALTY SHALL APPLY.

8. A RESISTANCE TO GROUND OF 10 (TEN) OHMS OR LESS IS REQUIRED FOR ALL MOTOROLA SITES. THE CONTRACTOR SHOULD RETAIN TESTER AT HIS OWN EXPENSE. IN ADDITION, A THIRD PARTY SHOULD BE HIRED TO OBTAIN MEGGER AND SWEEP RESULTS ON ALL SITES INCLUSIVE OF WHAT RESULTS THE CONTRACTOR SUBMITS. TO INSURE PROPER QUALITY CONTROL ON ALL SITES. SCHEDULE FINAL MEGGER TEST SUCH THAT THE MOTOROLA REPRESENTATIVE CAN BE PRESENT FOR FIELD VERIFICATION. REFER TO THE MOTOROLA MASTER SPECIFICATION FOR MEGGER TESTING PROCEDURES. IF THE FINAL GROUNDING RESISTANCE MEASUREMENT EXCEEDS 10 (TEN) OHMS. THE CONTRACTOR SHALL NOTIFY THE MOTOROLA REPRESENTATIVE.

9. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL.

10. THE GROUND WIRES SHALL BE RUN STRAIGHT FOR MINIMUM INDUCTANCE AND VOLTAGE DROP. SINCE CABLE BENDS INCREASE INDUCTANCE. THE MINIMUM REQUIRED BENDING RADIUS IS 8 INCHES WHEN BENDS ARE UNAVOIDABLE. ALL METAL WORK WITHIN 10 FEET OF THE GROUND RING SHALL BE DIRECTLY BONDED TO THE THIS GROUND SYSTEM, WITHOUT USING SERIES OR DAISY CHAIN CONNECTION ARRANGEMENTS.

11. PAINT, ENAMEL LACQUER AND OTHER ELECTRICALLY NON-CONDUCTIVE COATINGS SHALL BE REMOVED FROM THREADS AND SURFACE AREAS WHERE CONNECTIONS ARE MADE TO ENSURE GOOD ELECTRICAL CONTINUITY.

12. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL NOT BE MADE UNLESS THE CONDUCTORS ARE SEPARATED BY A SUITABLE MATERIAL THAT IS A PART OF THE ATTACHMENT DEVICE. ONLY ATTACHMENT DEVICES LISTED AND APPROVED FOR USE WITH THE SPECIFIC DISSIMILAR METALS MAY BE USED FOR THIS PURPOSE.

13. ALL BELOW GRADE GROUND SYSTEM CONDUCTORS SHALL BE A MINIMUM DEPTH OF 30" (OR 6" BELOW FROST LINE, WHICHEVER IS GREATER).

A1 GENERAL GROUNDING NOTES
SCALE: NOT TO SCALE

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.

6. EACH END OF EVERY POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA.

7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).

8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#12 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#12 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.

13. ALL POWER CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

15. ELECTRICAL METALLIC TUBING (EMT) SHALL BE USED FOR ALL INDOOR LOCATIONS.

16. RIGID GALVANIZED STEEL CONDUIT (RGS) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

17. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.

20. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

21. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

22. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS

23. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

24. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

25. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

26. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

A3 GENERAL ELECTRICAL NOTES
SCALE: NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. KRIMMEL
2007
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

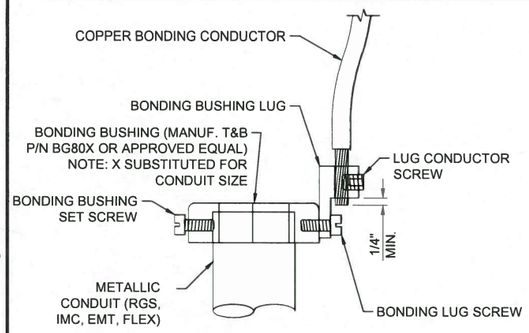
MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS
		REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	-
CHECKED BY:	E.N. KENNA

GROUNDING AND ELECTRICAL NOTES

E-502

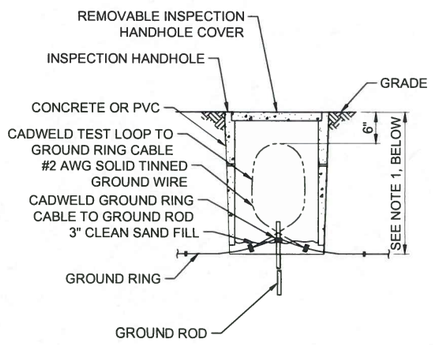
Oct. 10, 2016 - 8:44am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Electrical\D60002012_E-502.dwg



NOTES:
1. MOUNT BONDING BUSHING ONTO CONDUIT.
2. TIGHTEN BOND BUSHING SET SCREW.
3. INSERT COPPER CONDUCTOR INTO LUG.
4. TIGHTEN LUG CONDUCTOR SCREW.
5. TIGHTEN BONDING LUG SCREW.

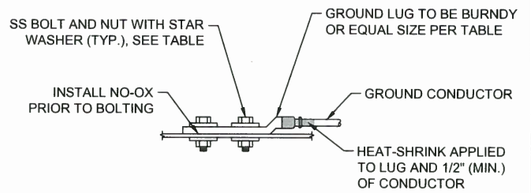
* BONDING BUSHING, SET SCREW, LUG, LUG SCREW, COND. LUG SCREW, SHOWN AS COMPLETE UNIT.

C1 CONDUIT BOND / GROUND BUSHING
NOT TO SCALE



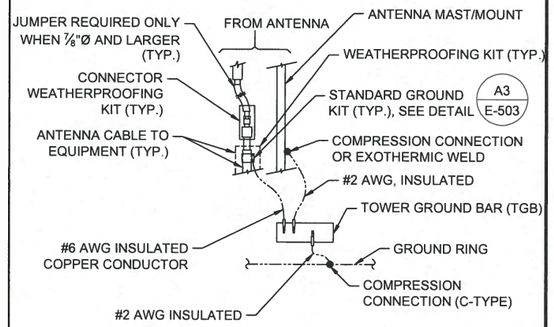
NOTES:
1. ALL BELOW GRADE CONDUCTORS SHALL BE A MINIMUM OF 4'-6".
2. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 8" IN WIDTH/DIAMETER.

C2 TEST WELL DETAIL
SCALE: NOT TO SCALE



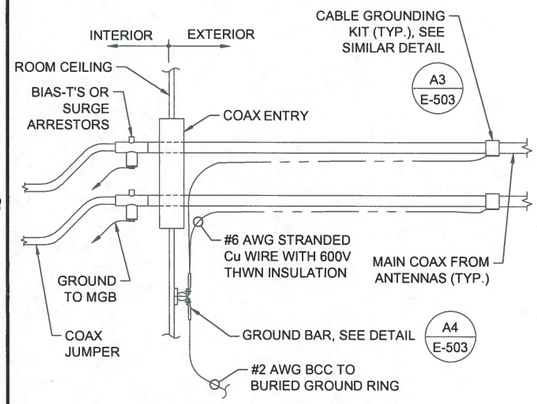
WIRE SIZE	LUG #	BOLT DIA.
#6	YGA6-2TC38E2G1	3/8"
#2	YGA2C-2TC38	3/8"
#2 SOLID	YGA2C-2TC38	3/8"
#2/0	YGA26-2N	1/2"
#4/0	YGA28-2N	1/2"

C3 TWO HOLE LUG GROUND CONNECTION
SCALE: NOT TO SCALE

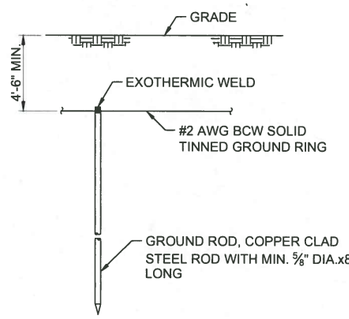


NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWNWARD.

C4 GROUNDING BAR CONNECTION
SCALE: NOT TO SCALE

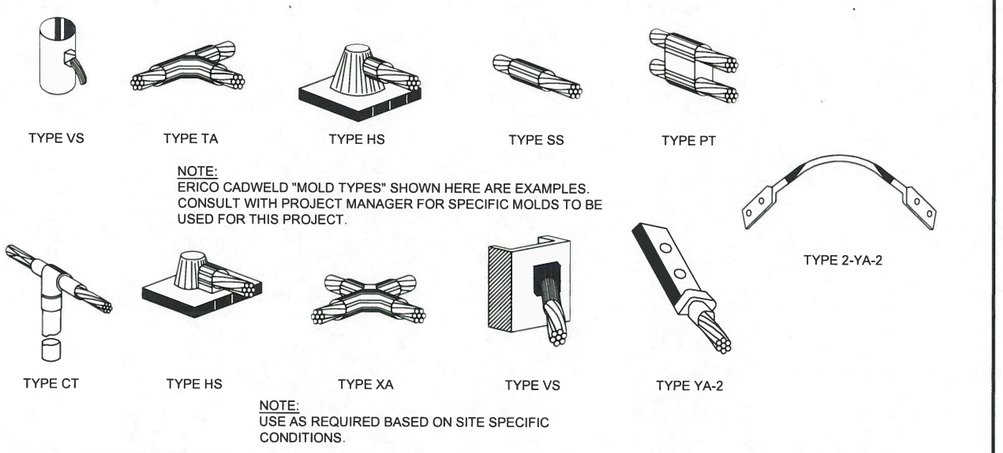


B1 EXTERIOR ANTENNA CABLE GROUND AT COAX ENTRY
SCALE: NOT TO SCALE



NOTE:
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.

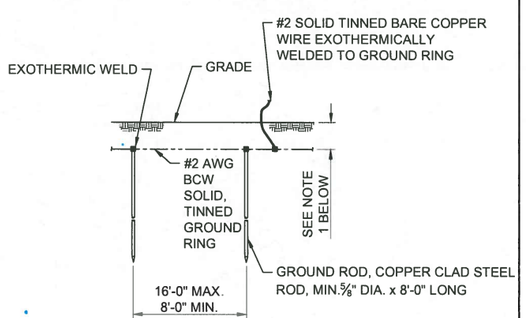
B2 GROUND ROD DETAIL
SCALE: NOT TO SCALE



NOTE:
ERICO CADWELD "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.

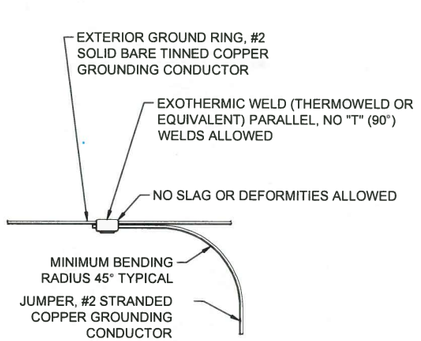
NOTE:
USE AS REQUIRED BASED ON SITE SPECIFIC CONDITIONS.

B3 EXOTHERMIC WELD DETAILS
SCALE: NOT TO SCALE

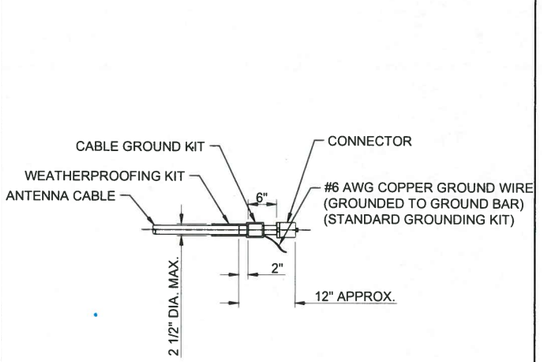


NOTES:
1. ALL BELOW GRADE GROUNDING SYSTEM CONDUCTORS SHALL BE A MINIMUM DEPTH OF 4'-6"
2. GROUND ROD SHALL BE DRIVEN VERTICALLY, NO TO EXCEED 45 DEGREES FROM VERTICAL.
3. SPACING BETWEEN GROUND RODS 10' MIN. TO 20' MAX.

A1 GROUND RING DETAIL
SCALE: NOT TO SCALE

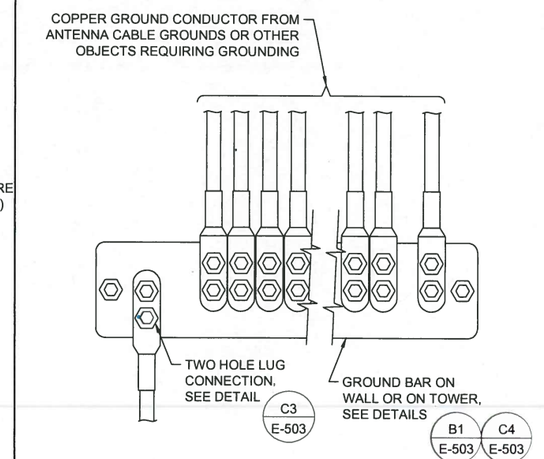


A2 TYPICAL GROUNDING CONNECTION DETAIL
SCALE: NOT TO SCALE



NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

A3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



A4 INSTALLATION OF CONDUCTOR TO GROUNDING BAR
SCALE: NOT TO SCALE

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TIMBLE
23327
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

GROUNDING DETAILS

E-503

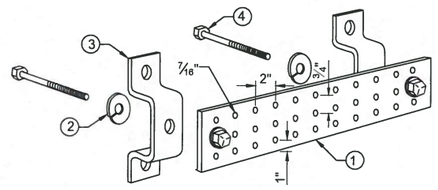
Oct 10, 2016 - 8:44am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadet\Story\Construction\Sheet Files\Electrical\D60002012_E-503.dwg

C1 NOT USED
NOT TO SCALE

C2 NOT USED
SCALE: NOT TO SCALE

C3 NOT USED
NTS

C4 TOWER GROUND BAR DETAIL
NTS

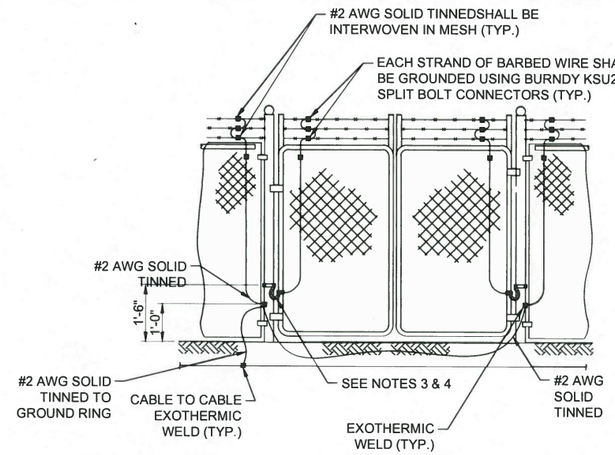


LEGEND:
1- COPPER GROUND BAR, ¼" x 4" x 20" (MIN.), NEWTON INSTRUMENT CO., CAT. NO. B-6142. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2- ⅝" STAINLESS STEEL LOCKWASHERS
3- STAINLESS STEEL MOUNTING BRACKET
4- STAINLESS STEEL BOLTS

B1 NOT USED
SCALE: NOT TO SCALE

B2 NOT USED
SCALE: NOT TO SCALE

B3 GATE GROUNDING DETAIL
NOT TO SCALE



NOTES:
1. THE #2 AWG SOLID TINNED, FROM THE GROUND RING SHALL BE EXOTHERMICALLY WELDED TO THE POST ABOVE GRADE.

2. BOND EACH HORIZONTAL POLE/BRACE TO EACH OTHER AND TO EACH VERTICAL POLE BONDED TO THE EXTERIOR GROUND RING.

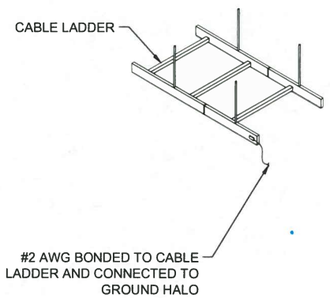
3. GATE JUMPER SHALL BE #2/0 AWG WELDING CABLE OR FLEXIBLE COPPER BRAID BURNDY TYPE B WITH SLEEVES ON EACH END DESIGNED FOR EXOTHERMIC WELDING.

4. GATE JUMPER SHALL BE INSTALLED SO THAT IT WILL NOT BE SUBJECTED TO DAMAGING STRAIN WHEN GATE IS FULLY OPEN IN EITHER DIRECTION.

5. GROUND RING TO BE A MINIMUM DEPTH OF 36".

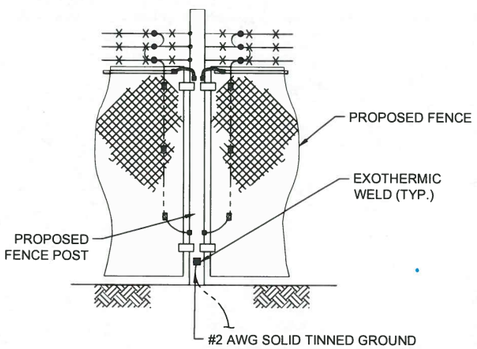
A1 NOT USED
SCALE: NOT TO SCALE

A2 CABLE LADDER GROUNDING DETAIL
NTS



A3 NOT USED
NTS

A4 FENCE GROUNDING DETAIL
NOT TO SCALE



NOTE:
DO NOT ALLOW DOWN CONDUCTOR TO MAKE CONTACT WITH BARB WIRE OR FENCE FABRIC.

C&S COMPANIES
C&S Engineers, Inc.
20445 Emerald Parkway, Suite 100
Cleveland, Ohio 44135
Phone: 216-619-5449
Fax: 216-619-5453
www.cscos.com

LICENSED PROFESSIONAL ENGINEER
JOHN D. TRIMBLE
24927
IOWA

ISICS

Pyramid Network Services, LLC

MOTOROLA SOLUTIONS

IOWA ISICS P25 UPGRADE PROJECT
SITE NAME: STORY - SITE #85
57073 US HIGHWAY 30
AMES, IA 50010

MARK	DATE	DESCRIPTION
2	10-03-16	REVISIONS
1	9-14-16	REVISIONS

REVISIONS

PROJECT NO:	D60.002.012
DATE:	SEPTEMBER 2016
DRAWN BY:	M. BUCKINGHAM
DESIGNED BY:	
CHECKED BY:	E.N. KENNA, P.E.

GROUNDING DETAILS

E-504

Oct. 10, 2016 - 8:45am
F:\Project\D60 - Pyramid\D60002012 - Iowa State 911\Design\Cadd\Story\Construction\Sheet Files\Electrical\D60002012_E-504.dwg

valmont
STRUCTURES

May 5, 2016

Motorola Solutions

Attn: Mr. Rich Mulligan
SUBJECT: State of Iowa Project

Thank you for your inquiry concerning tower design codes and practices as they relate to your requested tower designs.

Valmont Structures has been designing and building guyed and self-supporting towers and monopoles since the early 1950's. During this time, we have sold thousands of towers ranging in height form as little as 50' high to in excess of 1400'. These towers were individually engineered to accommodate the loading requirements imparted by the design wind speed, ice considerations, antenna loading, and other factors dictated by the national code requirements existing at the time the tower was built.

The present National Tower code, the TIA-222-G, represents the latest refinement of specific minimum requirements for tower engineers and manufacturers to follow to help assure that the tower structure and its foundation are designed to meet the most realistic conditions for local weather while assuring that the tower is designed to stringent factors of safety.

The TIA-222-G code incorporates an escalating wind factor based on tower height. If 90 MPH 3 second gust is the basic design wind speed at the 10 meter height, then per the specification, this speed is then increased in stages up the tower. "Meeting the code" implies that the design will have all of the code requirements for safety factors intact at the wind speed specified. Thus, the ultimate survival speed would be considerably higher.

We are aware of only a very few documented instances of a self supporting tower or monopole failure. Self supporting towers and monopoles can be designed such that the most common mode of failure is in the upper middle region of the tower, with the upper portion of the tower remaining connected and "bending and bowing over" against the base of the tower or pole. The fact that the wind is normally greater on the upper portion of the structure contributes to the likelihood of this type of failure.

This particular Tower has a theoretical failure at the tower midpoint or above. The predicted mode of wind induced failure would be a buckling of the tower legs above the tower midpoint with the top sections of the tower folding over on to the intact base sections. This would then affect a "zero fall zone" at ground level.

Communications Division, Valmont Industries, Inc.
1545 Pidco Drive Plymouth, Indiana 46563-4005 USA
574-936-4221 Fax 574-936-6796 www.valmont.com

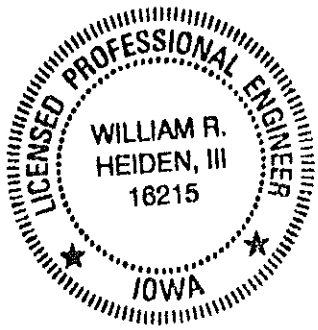
valmont
STRUCTURES

As Manager of Engineering of the company and a registered P.E. in 48 states, I oversee all engineering and application of our towers. Valmont Structures is an AISC approved shop. All Valmont Structures welders are AWS. Our total design, engineer and build process has been quality audited by our customers including public utilities, telephone companies, government agencies, and of course AISC.

We trust the above and the attached will be helpful to you. If you should need anything else, please let us know at your convenience.

Sincerely,

William R. Heiden III
Manager of Engineering
Ext. #5243



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.

Signature: _____

Name: (typed or printed) _____

Date 5/03/16 (Month, day, year) Lic. No. 16215

*My License expires December 31, 2017

Federal Aviation Administration

« OE/AAA

Dual Red - Medium Intensity Lighting for aircraft and migratory birds

Archive Search Results Form 7460-1 for ASN 2016-ACE-2328-OE

Overview

Study (ASN):	2016-ACE-2328-OE	**Received Date:**	05/17/2016
Prior Study:		**Entered Date:**	05/17/2016
Status:	Determined	**Completion Date:**	10/24/2016
Letters:	Determination	**Expiration Date:**	04/24/2018
Supplemental Form 7460-2:	Please login to add a Supplemental Form 7460-2.	**Map:**	View Map

Sponsor Information

Sponsor:	State of Iowa - ISICSB
Attention Of:	C/O Pyramid Network Services - Attn James Reek
Address:	6519 Towpath Road
Address2:	
City:	East Syracuse
State:	NY
Postal Code:	13057
Country:	US
Phone:	515-727-1665
Fax:	315-445-0653

Sponsor's Representative Information

Representative:	AdGen Telecom Group, Inc.
Attention Of:	Mehran Nazari
Address:	752 Walker Road, Suite H
Address2:	
City:	Great Falls
State:	VA
Postal Code:	22066
Country:	US
Phone:	703-757-6757 701
Fax:	

Construction Info

Notice Of:	CONSTR
Duration:	PERM (Months: 0 Days: 0)
Work Schedule:	06/10/2016 to 06/24/2016
Date Built:	

Structure Summary

Structure Type:	Antenna Tower
Structure Name:	Story - Site #85
FCC Number:	

Structure Details

Latitude (NAD 83):	42° 00' 35.02" N
Longitude (NAD 83):	93° 33' 32.76" W
Horizontal Datum:	NAD 83
Survey Accuracy:	2C
Marking/Lighting:	Dual-red and medium intensity
Other Description:	
Current Marking/Lighting:	N/A Proposed Structure
Current Marking/Lighting Other Description:	
Name:	
City:	Ames
State:	IA
Nearest County:	Story
Nearest Airport:	AMW
Distance to Structure:	18227.51 feet
On Airport:	No
Direction to Structure:	69.22°
Description of Location:	57073 US Highway 30 Ames, IA 50010
Description of Proposal:	1) A new self supporting structure with overall height of 399' AGL 2) Request dual red medium lighting with red flashing light for migratory bird protection.

Height and Elevation

	Proposed	DNE	DET
Site Elevation:	940		
Structure Height:	399	213	**399**
Total Height (AMSL):	1339	1153	**1339**

Frequencies

Low Freq	High Freq	Unit	ERP	Unit
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W

Previous Back to Search Result Next

Joe Coyle

From: Damion Pregitzer <dpregitzer@city.ames.ia.us>
Sent: Tuesday, March 14, 2017 3:57 PM
To: Joe Coyle
Cc: 'Jerry L. Moore'; 'Emily E. Zandt'
Subject: Re: ISICS / Story / FAA - Deter No Hazard Attached

Hi Joe,

I read through the FAA No Hazard determination. Therefore, I do not have any requirements from the City of Ames standpoint.

Thanks!

Damion Pregitzer, P.E. PTOE
Traffic Engineer

515.239.5160 *main*| 515.509.5189 *cell*| 515.239.5404 *fax*
dpregitzer@city.ames.ia.us | City Hall, 515 Clark Avenue | Ames, IA 50010
www.CityofAmes.org | **~ Caring People ~ Quality Programs ~ Exceptional Service ~**

-----"Joe Coyle" <jcoyle@pyramidnetworkservices.com> wrote: -----
To: <dpregitzer@city.ames.ia.us>
From: "Joe Coyle" <jcoyle@pyramidnetworkservices.com>
Date: 03/13/2017 09:40AM
Cc: "'Jerry L. Moore'" <JMoore@storycountyiowa.gov>, "'Emily E. Zandt'" <EZandt@storycountyiowa.gov>
Subject: ISICS / Story / FAA - Deter No Hazard Attached

Good morning Damion,

Attached is the FAA Determination of No Hazard for the proposed State of Iowa ISICS emergency communication system tower near I-35 and Highway 30 in Ames. As part of our Conditional Use Permit application with Story County, they would like you to confirm in writing that you have reviewed the tower height and location and that the City approves of the tower. A reply to this email should meet the County's requirement.

I have copied the County Planning representatives on this email as well.

Thank you for your help.

Joe Coyle
Project Manager

Pyramid Network Services, LLC

(816) 560-5035 (M)

jcoyle@pyramidns.com

[attachment "ISICS_Story_FAA_Determination of No Hazard_10.24.16.pdf" removed by Damion Pregitzer/COA]

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

Aeronautical Study No.
2016-ACE-2328-OE

Issued Date: 10/24/2016

C/O Pyramid Network Services - Attn James Reek
State of Iowa - ISICSB
6519 Towpath Road
East Syracuse, NY 13057

**** 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 Story - Site #85
Location:	Ames, IA
Latitude:	42-00-35.02N NAD 83
Longitude:	93-33-32.76W
Heights:	940 feet site elevation (SE)
	399 feet above ground level (AGL)
	1339 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 1, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

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

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

See attachment for additional condition(s) or information.

This determination expires on 04/24/2018 unless:

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

6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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

This determination is subject to review if an interested party files a petition that is received by the FAA on or before November 23, 2016. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Policy & Regulation, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on December 03, 2016 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

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 Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

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 Vee Stewart, at (816) 329-2508. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2016-ACE-2328-OE.

Signature Control No: 292343371-308176487 (DNH)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Frequency Data
Map(s)

cc: FCC

Abbreviations:
AGL, Above Ground Level
AMSL, Above Mean Sea Level
CAT, Category
CFR, Code of Federal Regulations
IFR, Instrument Flight Rules
MDA, Minimum Descent Altitude
NM, Nautical Mile
RWY, Runway
S-31, Straight-in Runway 31
TERPS, Terminal Instrument Procedures
VFR, Visual Flight Rules
VHF, Very High Frequency
VOR, VHF Omnidirectional Radio Range System

The proposed structure would be located approximately 3 NM east of the Airport Reference Point for the Ames Municipal Airport (AMW), Ames, IA. It is identified as exceeding the obstruction standards of 14 CFR Part 77 as follows as applied to AMW:

Section 77.17(a)(2): A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet:

It would exceed by up to 184 feet.

Section 77.17(a)(3): A height that increases a minimum instrument flight altitude within a terminal area (TERPS criteria):

It would increase the VOR RWY 31 S-31 MDA from 1500 feet AMSL to 1600 feet AMSL.

For Plan on File, Change 21 Circling, it would increase the VOR RWY 31 Circling MDA CAT C from 1500 feet AMSL to 1640 feet AMSL.

The proposal was circularized on August 29, 2016, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. No letters of objection were received as a result of the circularization.

Aeronautical study disclosed that the proposed structure would have an adverse effect on the VOR RWY 31 S-31 MDA and the Circling MDA as described above; however, no information was received to indicate that this change would affect a significant number of aircraft operations. The proposed structure would have no effect on any other existing or proposed arrival, departure, or en route IFR operation or procedure.

Study for possible VFR effect disclosed that the proposed structure would have no significant effect on any existing or proposed arrival or departure VFR operations or procedures. It would not conflict with airspace required to conduct normal VFR traffic pattern operations at AMW or any other known public use or military

airport. At 399 feet AGL the proposed structure would not have a substantial adverse effect on VFR en route flight operations.

The proposed structure would be appropriately obstruction marked/lighted to make it more conspicuous to airmen should circumnavigation be necessary.

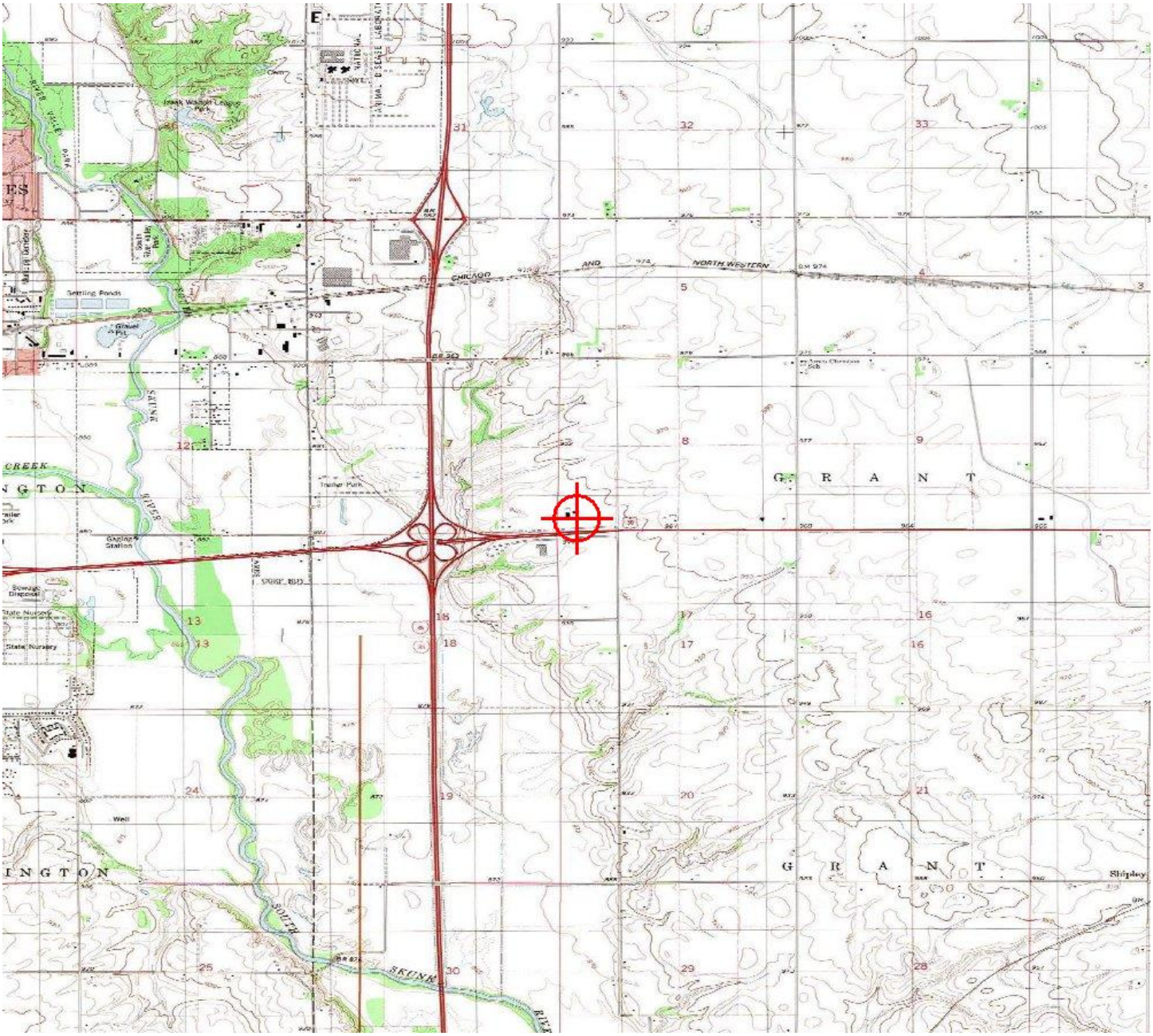
The cumulative impact of the proposed structure, when combined with other proposed structures, is not considered to be significant. Study did not disclose any significant adverse effect on existing or proposed public-use or military airport or navigational facilities, nor would the proposal affect the capacity of any known existing or planned public-use or military airport.

Therefore, it is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

Frequency Data for ASN 2016-ACE-2328-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W

TOPO Map for ASN 2016-ACE-2328-OE



Sectional Map for ASN 2016-ACE-2328-OE