



PLANNING COMMISSION MEETING AGENDA  
REGULAR MEETING  
TUESDAY SEPTEMBER 17, 2019

**7:30 PM Regular Meeting**

1. Call to Order
2. Roll Call
3. Election of Chairman and Vice Chairman Due to Change in Membership
4. Approval of Minutes:
  - a. July 16, 2019 Planning Commission Meeting
  - b. August 20, 2019 Planning Commission Meeting
  - c. September 3, 2019 City Council Meeting Minutes (For Information Only)
5. **(CONTINUED FROM AUGUST 20, 2019 MEETING) PUBLIC HEARING:** Anita Volkenant (Applicant/Owner) requests that the City consider the following actions for the property located at 5835 Drake Drive, Independence, MN (PID No. 26-118-24-43-0006):
  - a. An amendment to the existing interim use permit previously granted on the property.
6. **PUBLIC HEARING:** R. Michael and Margaret King (Applicants/Owners) request that the City consider the following actions for the property located at 2365 County Road 92 N., Independence, MN (PID No. 20-118-24-11-0002):
  - a. A variance and minor subdivision to allow the creation of a rural view lot. The property is an original quarter, quarter section with the exception of a small piece of property that was taken by Wright Hennepin Electric for their substation. The variance would allow the subdivision of property for a rural view lot that is less than 40 acres.
7. **PUBLIC HEARING:** AT&T (Applicant) requests that the City consider the following action for the property located at 3310 County Line Road, Independence, MN (PID No. 07-118-24-33-0004):
  - a. A conditional use permit to allow the colocation of new cellular antennas on the existing wireless tower located on the subject property.

- b. A variance to allow a second accessory structure on the property and the reduction of the requisite 40-foot rear yard setback.
- 8. **PUBLIC HEARING:** A proposed text amendment to the City of Independence Ordinances as follows:
  - a. Chapter 5, Section 530.01, Subd. 3 Accessory Uses – Considering an amendment to the maximum height of an accessory structure. The City will discuss increasing the permitted height of detached accessory structures.
- 9. Open/Misc.
- 10. Adjourn.

MINUTES OF A REGULAR MEETING OF THE  
INDEPENDENCE PLANNING COMMISSION  
TUESDAY, AUGUST 20, 2019 – 7:30 P.M.

1. CALL TO ORDER

Pursuant to due call and notice thereof, a regular meeting of the Independence Planning Commission was called to order by Gardner at 7:30 p.m.

3. ROLL CALL

PRESENT: Commissioners Palmquist, Gardner and Volkenant  
STAFF: City Administrator Kaltsas, Administrative Assistant Horner  
ABSENT: Commissioners Palmquist and Dumas  
VISITORS: Lynda Franklin, Nate Sleck, Scott Ficek, Laura Dwyer, Corey Oeffling, Tyler Stevenson, Curtis Marks, Michael Sharratt,

4. APPROVAL OF MINUTES:

- a. July 16, 2019 Planning Commission Meeting
- b. July 30, 2019 City Council Meeting Minutes (For Information Only)

**No quorum for minutes available. Moved to next meeting.**

7. **PUBLIC HEARING:** Laura Dwyer (Applicant/Owner) requests that the City consider the following action for the properties located at 5215 and 5175 Sunset La. (PID No. 01-118-24-31-0002 and 01-118-24-42-0028) in Independence, MN:

- a. A Minor Subdivision to consider a lot line rearrangement for the properties located 5215 and 5175 Sunset Ln. The lot line rearrangement would allow for a portion of the property currently attached to 5175 Sunset Ln. to be combined with 5215 Sunset Ln.

Kaltsas said the applicant is seeking a minor subdivision to allow a lot line rearrangement that would allow the property located at 5215 Sunset Lane to capture a “strip” of land directly adjacent and currently belonging to the property located at 5175 Sunset Lane. The 30-foot-wide piece of property appears to have been attached to the 5175 Sunset property to provide access to the western portion of the property along the lakeshore. There is an existing low area between the house on 5175 Sunset Lane and the lake frontage which can restrict access to the shoreline in wet years. The subject 30-foot-wide strip of land has historically been maintained by the owners of 5215 Sunset Lane. The two property owners have worked out an agreement that would allow the property to be combined with 5215 Sunset Lane. In exchange for the sale of the property, the owners of 5215 Sunset Lane would grant an access easement back to the owners of 5175 Sunset Lane.

5215 Sunset Lane is considered a legal non-conforming lot by the City. The minimum lot size for sewered properties located in the Shoreland Overlay district is one acre. In addition, the property located at 5215 Sunset Lane received a side yard and front yard setback variance in 2017 to allow the expansion of the existing home. Should the City approve the minor subdivision, the existing home would come into conformance with the requisite side yard setback. The 5175 Sunset Lane property is a legal property. Staff has reviewed the request and offers the following information for consideration by the Planning Commission:

1. The lot line rearrangement does not appear to impact either property or create any additional non-conformities.
2. The side yard setback of the existing home on the 5215 Sunset Lane property would be conforming in the after condition.
3. Both properties are connected to City sewer.
4. The minor subdivision would clean up both properties and align with the historical use and maintenance of the properties.

Staff is seeking a recommendation from the Planning Commission for the requested minor subdivision to allow a lot line rearrangement with the following findings and conditions:

1. The proposed minor subdivision to allow a lot line rearrangement request meets all applicable conditions and restrictions stated Chapter V, Sections 500 and 510, Planning and Land Use Regulations and Zoning, in the City of Independence Zoning Ordinance.
2. The Applicant shall pay for all costs associated with the City's review of the requested minor subdivision.
3. The Applicant shall record the subdivision and City Council Resolution with the county within six (6) months of approval.

Palmquist asked if this would only benefit the 5175 easement that runs with the land. Kaltsas said that was correct.

#### **Public Hearing Open**

**Motion by Palmquist to close the Public Hearing, second by Volkenant.**

#### **Public Hearing Closed**

Gardner confirmed there no comments received by neighboring properties.

**Motion by Volkenant to approve a Minor Subdivision to consider a lot line rearrangement for the properties located at 5215 and 5175 Sunset Ln. The lot line rearrangement would allow for a portion of the property currently attached to 5175 Sunset Ln. to be combined with 5215 Sunset Ln. (PID No. 01-118-24-31-0002 and 01-118-24-42-0028) in Independence, MN; second by Palmquist. Ayes: Gardner, Palmquist and Volkenant. Nays: None. Absent: Thompson and Dumas. Abstain. None. Motion Approved.**

8. **PUBLIC HEARING:** Sharratt Design & Company (Applicant) and Curt Marks (Owner) request that the City consider the following action for the property identified by (PID No. 28-118-24-14-0006) and located at 7220 Turner in Independence, MN:

- a. A Conditional Use Permit and Variance to allow an accessory dwelling, an accessory structure larger than 5,000 SF and taller than the principal structure.

Kaltsas said the property owner currently has an existing home with large barn and indoor riding arena on the subject



property. The City granted a conditional use permit in 2018 to allow use of the property for a commercial riding stable. The property owner is now interested in constructing a new detached accessory structure on the property that is larger than 5,000 SF, is taller than the principle residence and houses an accessory dwelling unit.

The owner would like to construct a new detached accessory structure for personal use as a multipurpose recreation building. The proposed building would be a multi-story building comprised of approximately 6,000 SF on the first floor and 3,000 SF on the second floor. The building would have a garage, game room, accessory dwelling unit, office, kitchen and other similar and associated recreation space. All accessory structures greater than 5,000 SF require a conditional use permit. In addition to the limitation on building size, the City regulates the maximum height of detached accessory structures. The maximum height of a detached accessory structure shall not exceed the height of the principle structure. The property owner currently has an existing home with large barn and indoor riding arena on the subject property. The City granted a conditional use permit in 2018 to allow use of the property for a commercial riding stable. The property owner is now interested in constructing a new detached accessory structure on the property that is larger than 5,000 SF, is taller than the principle residence and houses an accessory dwelling unit.

The existing home on the property is two story home with a mean height of 24 feet (total height of 28). The applicant would like the City to permit the detached accessory building to have a mean height of 28 feet (total height of 36 feet). In order for the applicant to construct a building higher than that which is permitted, the City will need to consider a 4-foot variance.

520.21. Standards for granting variances. Subdivision 1. The City Council may grant a variance from the terms of this zoning code, including restrictions placed on nonconformities, in cases where:

- 1) the variance is in harmony with the general purposes and intent of this zoning code;
- 2) the variance is consistent with the comprehensive plan;
- 3) the applicant establishes that there are practical difficulties in complying with the zoning code (Amended, Ord. 2011-08)

Subd. 2. An applicant for a variance must demonstrate that there are practical difficulties in complying with the zoning code.

For such purposes, “practical difficulties” means:

- (a) The property owner proposes to use the property in a reasonable manner not permitted by the zoning code;
- (b) the plight of the property owner is due to circumstances unique to the property not created by the landowner;
- (c) the variance, if granted, will not alter the essential character of the locality.

Economic considerations alone do not constitute practical difficulties. Practical difficulties include, but are not limited to, inadequate access to direct sunlight for solar energy systems. (Amended, Ord. 2011-08) 26 Subd. 3. The City Council shall not grant a variance to permit a use that is not allowed under the zoning code based on the zoning classification of the affected property. (Amended, Ord. 2011-08) 520.23. Conditions and restrictions. The board of adjustments may recommend, and the City Council may impose conditions on a variance. Conditions must be directly related to and must bear a rough proportionality to the impact created by the variance. (Amended, Ord. 2011-08)

Consideration of the criteria for granting a variance:

- a. The applicant is proposing to use the property in a manner consistent with the Agriculture Zoning

District. The City is currently working on revising the ordinance to provide a method for permitting detached accessory structures that exceed the height of the home.

- b. The effect of the requested variance will be somewhat mitigated as a result of the size of the property as well as its relationship to surrounding properties.
- c. The character of the surrounding area is agriculture. The proposed detached accessory building is generally, in keeping with the City's comprehensive plan.

The applicant would also like to utilize a portion of the detached accessory structure for an accessory dwelling unit. The City allows accessory dwelling units as a conditional use in the Agriculture zoning district. The intent of the ordinance was to allow for "mother-in-law" type units to be located within the principle structure or within a detached accessory building. In order to allow an accessory dwelling unit, the property owner will need to demonstrate that they meet all applicable criteria for granting a conditional use permit. The City has criteria broadly relating to Conditional Use Permits and then more focused criteria relating specifically to accessory dwelling units. An accessory dwelling unit must meet the following criteria:

Subd. 2. "Accessory Dwelling Unit." A secondary dwelling unit that is:

- (a) Physically attached to or within a single-family dwelling unit or within a detached accessory building that has a principal structure on the parcel; and the applicant is proposing to locate an accessory dwelling unit within the proposed detached accessory building.
- (b) Subordinate in size to the single-family dwelling unit; and the proposed accessory dwelling unit would be subordinate in size to the single-family dwelling unit as only a portion of the proposed detached accessory building would be used as an accessory dwelling unit.
- (c) Fully separated from the single-family dwelling unit by means of a wall or floor, with or without a door; and the proposed accessory dwelling unit would be separated from the single-family home.
- (d) Architecturally compatible with the principal structure (using materials, finishes, style and colors similar to the principal structure); and the proposed accessory structure would have an architectural character that is consistent with the agricultural use of the property.
- (e) The lesser of 33% of the above ground living area of the principal structure or 1,200 square feet, and no less than 400 square feet; and the principal structure has approximately 4,500 square feet of above ground space not including the basement or garage. 33% of 4,500 square feet equals 1,485 square feet. The applicant is proposing to construct approximately 1,150 square feet of accessory dwelling unit. The proposed layout of the bedrooms, bathroom and kitchen is somewhat unique due to the multi-purpose use of the detached accessory structure. The City will need to consider the proposed layout and determine if it meets the intent of the accessory dwelling unit ordinance. Historically, the City looked to establish a clear separation or distinction between the ADU and the remaining finished or unfinished space in the detached accessory structure.
- (f) Not in excess of the maximum square footage for accessory structures as permitted in this code; and there is no maximum accessory structure size for properties zoned AG-Agriculture and larger than 10 acres in overall size.
- (g) Has permanent provisions for cooking, living and sanitation; and the proposed accessory dwelling unit has permanent provisions for cooking; living and sanitation.
- (h) Has no more than 2 bedrooms; and the proposed accessory dwelling unit has one bedroom.

- (i) Limited to relatives of the homesteaded owner occupants or the homesteaded owners of the principal structure. The total number of individuals that reside in both the principal dwelling unit and accessory dwelling unit may not exceed the number that is allowed by the building code; and the applicant is proposing that the accessory dwelling unit be occupied solely by family members.
- (j) Uses the existing on-site septic system or an approved holding tank; and the applicant will likely need to increase the size of the existing on site-septic system to accommodate the additional bedroom. The City will need to evaluate the proposed structure in more detail should the City grant approval of the ADU.
- (k) Respectful of the future subdivision of the property and the primary and secondary septic sites. The City may require a sketch of the proposed future subdivision of a property; and the subject property cannot be further subdivided at this time due to the zoning and permitted land use.
- (l) In compliance with the adopted building code relating to all aspects of the dwelling unit. The proposed detached accessory dwelling unit will need to meet all applicable building codes. On lots less than 2.5 acres, the accessory dwelling unit must be attached to the principal dwelling unit or located/constructed within an existing detached accessory structure that meets all criteria of this section. The existing on-site septic system will be required to be inspected by the City to ensure compliance with all applicable standards. Any system that does not meet all applicable standards shall be brought into compliance as a part of the approval of the accessory dwelling unit.

The criteria for granting a conditional use permit are clearly delineated in the City's Zoning Ordinance (Section 520.11 subd. 1, a-i) as follows:

- 1. The conditional use will not adversely affect the health, safety, morals and general welfare of occupants of surrounding lands.
- 2. The proposed use will not have a detrimental effect on the use and enjoyment of other property in the immediate vicinity for the proposes already permitted or on the normal and orderly development and improvement of surrounding vacant property for uses predominant in the area.
- 3. Existing roads and proposed access roads will be adequate to accommodate anticipated traffic.
- 4. Sufficient off-street parking and loading space will be provided to serve the proposed use.
- 5. The proposed conditional use can be adequately serviced by public utilities or on-site sewage treatment, and sufficient area of suitable soils for on-site sewage treatment is available to protect the city form pollution hazards.
- 6. The proposal includes adequate provision for protection of natural drainage systems, natural topography, tree growth, water courses, wetlands, historic sites and similar ecological and environmental features.
- 7. The proposal includes adequate measures to prevent or control offensive odor, fumes, dust, noise, or vibration so that none of these will constitute a nuisance.
- 8. The proposed condition use is consistent with the comprehensive plan of the City of Independence.
- 9. The proposed use will not stimulate growth incompatible with prevailing density standards.

The City should consider the following issues/points during their review of the requested actions:

The City is considering amending the ordinance to provide a mechanism for allowing accessory structures that are taller than the principle structure. The property owner is proposing to develop a structure that appears to be designed to have an agricultural theme utilizing materials and colors that will be compatible with character of the area. The property owner has noted that they intend to construct a new principle structure on the property in the near future. The new principle structure will be larger than the existing home on the property and establish a better sense of proportionality between the structures on the property. The location of the proposed structure and its relationship to surrounding properties will help to mitigate the potential impact of the taller and larger detached accessory structure. In addition, there is a larger stand of existing trees that would further screen the proposed structure from surrounding properties.

The proposed accessory dwelling unit does not appear to meet the historic interpretation of the ADU ordinance. The City will need to consider how the proposed bedroom and kitchen relate to the remaining space within the detached accessory structure. There could be a concern relating to the structure being misunderstood as a second residential home as a result of the size, interior space and more traditional garage space. Typically, the City has reviewed ADU's that are fully delineated within a detached accessory structure and therefore clearly subordinate to the use of the detached accessory structure. Staff is seeking direction from the Planning Commission relating to the proposed detached accessory structure. For context and discussion, the City would allow a finished detached accessory structure with similar features to that which is proposed without the full kitchen and bedrooms. Bathrooms, recreation space, bar, etc. would all be permitted without a conditional use. The City has typically distinguished an accessory dwelling unit from an accessory structure by whether or not there are bedrooms and or a kitchen stove/oven.

Staff is seeking a recommendation from the Planning Commission pertaining to the request for a conditional use permit and variance with the following findings and conditions:

- a) The proposed conditional use permit and variance request meets all applicable conditions and restrictions stated in Chapter V, Section 510, Zoning, in the City of Independence Zoning Ordinance.
- b) The conditional use permit will include the following conditions:
  - 1. The conditional use permit will be reviewed annually by the City to ensure conformance with the conditions set forth in the resolution.
  - 2. The existing accessory structure cannot be expanded or enlarged without the review and approval of the City. Any expansion will require an amendment to the conditional use permit and possibly a variance following all applicable procedures.
  - 3. The accessory dwelling unit is limited to relatives of the homesteaded owner occupants or the homesteaded owners of the principal structure. The total number of individuals that reside in both the principal dwelling unit and accessory dwelling unit may not exceed the number that is allowed by the building code.
- c) The 4-foot variance will allow the detached accessory building to have a maximum height of 28 feet as measured in accordance with City standards.
- d) The Owner will be required to meet all applicable standards relating to the on-site septic system for the proposed detached accessory structure.
- e) The applicant shall pay for all costs associated with the review and recording of the resolution.

Kaltsas noted a few public comments were submitted that were concerned with the size and interior space appearing to be more like a second home on the property. There was some concern this would be used in the future for a commercial business.

Gardner asked about the elevation difference of the roofs. The primary residence is one-story. Marks stated he spoke with several neighboring residents and they were fine with the building. He said there would be no parties and only family entertaining at the location.

Palmquist asked Kaltsas if there was a concern of the historical interpretation related to the riding stable. Kaltsas said it was not a concern. He said this application is for a new space and it would be hard to define what is the accessory dwelling unit versus the recreational space as there is no separation. Other properties that are defined have a door as a barrier separating the sides and creating the distinction. Kaltsas said there could be a baseline mechanism to be able to check against in future inspections with the CUP. Volkenant asked about proposed changes regarding height requirements. Kaltsas said language is being constructed looking at having a design committee review applications based on unique criteria.

### **Public Hearing Open**

Marks said he spoke with the neighbors and would have them write letters of support if needed.

**Motion by Palmquist to close the Public Hearing, second by Volkenant.**

### **Public Hearing Closed**

**Motion by Palmquist to approve a Conditional Use Permit and Variance to allow an accessory dwelling structure larger than 5,000 SF and taller than the principal structure with the addition of no commercial events to be allowed and applicant (Curt Marks) will provide an exhibit to the CUP box for the property identified by (PID No. 28-118-24-14-0006) and located at 7220 Turner in Independence, MN;; second by Volkenant. Ayes: Gardner, Palmquist and Volkenant. Nays: None. Absent: Thompson and Dumas. Abstain. None. Motion Approved.**

9. **PUBLIC HEARING:** Gregory Hamman (Applicant/Owner) requests that the City consider the following action for the property identified by (PID No. 16-118-24-33-0002) and located at 2460 CSAH 92 N in Independence, MN:

- a. A variance to allow an accessory structure to exceed the height of the principle structure.

Kaltsas said the applicant would like to construct a detached accessory structure on the property. There is currently an existing home located on the property. The City regulates the total square footage permitted for detached accessory structures using a formula. The formula allows a property owner to construct an accessory building which does not exceed 2% of the upland square footage of the property. In this particular case the City has determined that the upland portion of the property is 2.71 acres. Based on this determination, the total allowable square footage for a detached accessory structure is 2,361 (2.71 acres -118,048 sf \* .02 = 2,361).

The applicant is proposing to construct a 2,000 square foot detached accessory structure which is less than the maximum size permitted. In addition to the limitation on building size, the City regulates the maximum height of detached accessory structures. The maximum height of an accessory structure shall not exceed the height of the principle structure. The height of an accessory structure shall not exceed the height of the principle structure. The height of the principle and accessory structure shall be measured in accordance with the definition provided in this ordinance, Section 510.05, Subdivision 10.

The existing home on the property is a rambler with a mean height of 16 feet. The applicant would like the City to permit the detached accessory building to have a mean height of 19 feet. In order for the applicant to construct a building higher than that which is permitted, the City will need to consider a 3-foot variance. The applicant is proposing to locate the building to the east of the principle structure. The elevation of the proposed accessory building is approximately 2 feet lower than the elevation of the principle home. The applicant has noted that the

proposed detached accessory structure would be located in a manner that would limit its visibility in relation to the existing home on the property. The proposed accessory structure is proposed to meet applicable building setbacks (15-foot side yard, 40-foot rear yard setback). The applicant has noted in his narrative that the proposed detached accessory structure would have an 8/12 roof pitch versus a lower pitch. It was noted that the steeper pitch will provide a nicer aesthetic appearance.

There are several factors to consider relating to granting a variance. The City's ordinance has established criteria for consideration in granting a variance.

520.21. Standards for granting variances. Subdivision 1. The City Council may grant a variance from the terms of this zoning code, including restrictions placed on nonconformities, in cases where:

- 1) the variance is in harmony with the general purposes and intent of this zoning code;
- 2) the variance is consistent with the comprehensive plan; and
- 3) the applicant establishes that there are practical difficulties in complying with the zoning code (Amended, Ord. 2011-08)

Subd. 2. An applicant for a variance must demonstrate that there are practical difficulties in complying with the zoning code. For such purposes, "practical difficulties" means:

- (a) The property owner proposes to use the property in a reasonable manner not permitted by the zoning code;
- (b) the plight of the property owner is due to circumstances unique to the property not created by the landowner;
- (c) the variance, if granted, will not alter the essential character of the locality.

Economic considerations alone do not constitute practical difficulties. Practical difficulties include, but are not limited to, inadequate access to direct sunlight for solar energy systems. (Amended, Ord. 2011-08)

Subd. 3. The City Council shall not grant a variance to permit a use that is not allowed under the zoning code based on the zoning classification of the affected property. (Amended, Ord. 2011-08)

520.23. Conditions and restrictions. The board of adjustments may recommend, and the City Council may impose conditions on a variance. Conditions must be directly related to and must bear a rough proportionality to the impact created by the variance. (Amended, Ord. 2011-08)

Consideration of the criteria for granting a variance:

- a. The applicant is proposing to use the property in a manner consistent with the Rural Residential District. The City is currently working on revising the ordinance to provide a method for permitting detached accessory structures that exceed the height of the home.
- b. The effect of the requested variance will be somewhat mitigated as a result of the size of the property as well as its relationship to surrounding properties. The character of the surrounding area is agriculture. The proposed detached accessory building is generally in keeping with the City's comprehensive plan.

The Planning Commission will need to determine if the requested variance meets the requirements for granting a variance.

Staff is seeking a recommendation from the Planning Commission for the requested Variance with the following findings and conditions:

1. The proposed Variance request meets all applicable conditions and restrictions stated in Chapter V, Section 520.19, Procedures on variances, in the City of Independence Zoning Ordinance.

2. The 3-foot variance will allow the detached accessory building to have a maximum height of 19 feet as measured in accordance with City standards.
3. The proposed building cannot be used for a commercial business or storage.
4. The Applicant shall pay for all costs associated with the City's review of the requested variance.
5. Any future improvements made to this property will need to be in compliance with all applicable standards relating to the Rural Residential and Shoreland Overlay zoning districts.

Palmquist clarified the three-foot variance is the only request. Kaltsas stated that was correct.

#### **Public Hearing Open**

Nathan Sleek stated he is a neighbor at 2485 CSAH 92N and he has no problem with this request.

**Motion by Palmquist to close the Public Hearing, second by Volkenant.**

#### **Public Hearing Closed**

**Motion by Palmquist to approve a variance to allow an accessory structure to exceed the height of the principle structure for the property identified by (PID No. 16-118-24-33-0002) and located at 2460 CSAH 92 N in Independence, MN; second by Volkenant. Ayes: Gardner, Palmquist and Volkenant. Nays: None. Absent: Thompson and Dumas. Abstain. None. Motion Approved.**

10. **(TO BE CONTINUED TO SEPTEMBER 17, 2019) PUBLIC HEARING:** Anita Volkenant (Applicant/Owner) requests that the City consider the following actions for the property located at 5835 Drake Drive, Independence, MN (PID No. 26-118-24-43-0006):

- a. An amendment to the existing interim use permit previously granted on the property.

Kaltsas noted that there would not be a quorum for voting due to Volkenant likely needing to recuse herself and asked Volkenant if she was going to recuse herself and if she was in agreement that this item would be continued to the September meeting. Volkenant agreed and recused herself from the discussion.

**Motion by Palmquist to continue Volkenant hearing at the September 17, 2019 meeting.**

6. Open/Misc.
5. Adjourn.

**Motion by Palmquist, second by Volkenant to adjourn at 8:35 p.m.**

Respectfully Submitted,  
Trish Gronstal/ Recording Secretary

MINUTES OF A REGULAR MEETING OF THE  
INDEPENDENCE CITY COUNCIL  
TUESDAY, AUGUST 20, 2019 –6:30 P.M.

1. CALL TO ORDER.

Pursuant to due call and notice thereof, a regular meeting of the Independence City Council was called to order by Mayor Johnson at 6:30 p.m.

3. ROLL CALL

PRESENT: Mayor Johnson, Councilors Spencer, McCoy and Grotting

ABSENT: City Attorney Vose, Councilor Betts

STAFF: City Administrative Assistant Horner, City Administrator Kaltsas

VISITORS: Scott Ficek, Anita Volkenant, Laura Dwyer, Corey Oeffling, Tyler Stephenson, Curtis Marks, Michael Sharray, Nate Sleck

4. \*\*\*\*Consent Agenda\*\*\*\*

All items listed under Consent Agenda are considered to be routine by Council and will be acted on by one motion. There will be no separate discussion of these items. If discussion is desired, that item will be removed from the Consent Agenda and will be considered separately.

- a. Approval of City Council Minutes from the July 30, 2019 Regular City Council Meeting.
- b. Approval of City Council Minutes from the August 7, 2019 City Council Workshop.
- c. Approval of Accounts Payable; Checks Numbered 19039-19073.
- d. Approval of a Large Assembly Permit for Mama's Happy (7888 County Road 6) Fall Art Fair: September 12-14, 2019.
- e. Approval of a Medium Assembly Permit for Brian Gilbertson (7165 Turner Road) to Host a Hog Roast: September 21, 2019.
- f. **RESOLUTION NO. 19-0820-01** – Adopting the Proposed Assessment for the Lyndale Sanitary Sewer Improvements.

**Motion by Spencer, second by McCoy to approve the Consent Agenda. Ayes: Johnson, McCoy, Grotting and Spencer. Nays: None. Absent: Betts. MOTION DECLARED CARRIED.**

5. SET AGENDA – ANYONE NOT ON THE AGENDA CAN BE PLACED UNDER OPEN/MISC.

Kaltsas removed item 7 as Chief Kroells was unable to attend. His report will be made at the 09/03/19 meeting.

6. REPORTS OF BOARDS AND COMMITTEES BY COUNCIL AND STAFF

**Spencer attended the following meetings:**

- City Council Workshop
- City of Medina, LICA and Three Rivers Parks Districts members about the no-wake ordinance on Lake Independence.



**Grotting attended the following meetings:**

- City Council Workshop
- LMCC Quarterly meeting
- Three Night-to-Unite Events

**McCoy attended the following meetings:**

- City Council Workshop
- Three Night-to-Unite Events

**Betts attended the following meetings:**

**Johnson attended the following meetings:**

- Haven Homes Meeting
- Police Commission Meeting
- Senior Community Services Finance Committee Meeting
- Five Night-to-Unite Events
- City Council Workshop
- Eagle Scout Sam Lieberman's Ceremony
- North West Trails Snowmobile Event
- Maple Plain Library Historical Ice Cream Social
- Congressmen Phillip and Angie Craig meeting to discuss funding for Highway 12
- Orono Healthy Youth Meeting Caring for Kids
- West Hennepin Chamber of Commerce Meeting
- Highway 12 Safety Coalition Meeting
- Highway 55 Coalition Meeting
- West Hennepin Historical Society of Long Lake meeting
- Orono School Board Meeting
- City Council Workshop

**Horner attended the following meetings:**

- West Hennepin Chamber of Commerce Meeting
- City Council Workshop

**Kaltsas attended the following meetings:**

- Highway 12 Safety Coalition Meeting
- City Council Workshop

7. Director Gary Kroells, West Hennepin Public Safety:
  - a. Activity Report for the Month of July 2019. (rescheduled for 09/03/19 meeting)
8. **PUBLIC HEARING:** Consideration to authorize the issuance of revenue bonds for the benefit of PHS Founders Ridge, Inc.; approving the execution of the revenue obligations and related documents; and taking other actions with respect thereto.

**RESOLUTION NO. 19-0820-02** – Authorizing the issuance of revenue obligations for the benefit of PHS Founders Ridge, Inc.; execution of the revenue obligations and related documents; and taking other actions with respect thereto.

Kaltsas said the City has received a proposal to upgrade the existing sanitary sewer system that serves Ox Yoke and the two adjacent residential properties (Lyndale Sanitary Sewer System). The City has had a series of meetings with Ox Yoke and the City's current operator of the existing mound system that serves the restaurant to discuss issues that are causing the system to not work properly. The concentration of the discharge (CBOD and TSS) from the system is too high to be handled by the existing system. The City has been working with a company named Septic Check to design an upgrade to the existing system that can handle the discharge. Septic Check from Milaca has prepared an estimate for the upgrade to the system for \$50,500 with an additional \$2,500-\$5,000 cost to upgrade the existing lift station control panels. The upgrade to the control panels will provide Septic Check with the ability to remotely monitor the system. The City believes that the proposed system provides the most cost effective and sustainable solution to address the sanitary sewer needs for this area moving forward.

Kaltsas said Staff has discussed the proposed update with Ox Yoke based on direction previously provided by the City Council relating to funding for the project. Currently, the owner is asking the City to assess a portion of the update costs to the Ox Yoke property. The City had initially discussed assessing 50% of the project cost to the property. The owner is asking for additional consideration to assess 70% of the project cost or \$35,000 to the property. The remaining balance (~\$15,000) will be paid up front by the property owner. In exchange for the additional assessment amount, the City would reduce the assessment period to 5 years.

Council provided direction to staff to move forward with an assessment of \$35,000 over five years. The City has prepared a detailed breakdown of the proposed assessment role for the property. The owner of Ox Yoke has agreed to waive any objection to the special assessment. This waiver agreement allows the City to proceed with adopting the assessment without any further hearings or discussion. If approved, the sanitary sewer system upgrades will likely commence in September 2019. The City will contract with Septic Check to design, install and regularly monitor the entire system. Independence staff will no longer maintain and or monitor the system. The cost of monitoring the system will continue to be charged to the users of the system via regular quarterly sewer charges.

#### **Public Hearing Open**

No comments.

**Motion by Spencer to close the Public Hearing, second by Grotting. Ayes: Johnson, McCoy, Grotting and Spencer. Nays: None. Absent: Betts. MOTION DECLARED CARRIED.**

#### **Public Hearing Closed**

Kaltsas said this was a good opportunity for the City to obtain some funds through this conduit financing. He noted the City would receive about \$45,000 as payment for issuing the note. That amount is ½ of 1% of 9M. This is a tax-exempt obligation and there is no liability to the City. Kaltsas said the City has done a couple of these notes in the past and it is relatively low administrative costs to the City.

**Motion by Spencer, second by McCoy to approve RESOLUTION NO. 19-0820-02 – Authorizing the issuance of revenue obligations for the benefit of PHS Founders Ridge, Inc.; execution of the revenue obligations and related documents; and taking other actions with respect thereto. Ayes: Johnson, McCoy, Grotting and Spencer. Nays: None. Absent: Betts. MOTION DECLARED CARRIED.**

9. Consider Approval of an Amendment to the Tri-City Agreement Creating the Quad City Agreement to Allow Loretto to Connect to the City's Existing Sanitary Sewer Line.

a. **RESOLUTION NO. 19-0820-03** – Approving the Quad City Agreement.

Kaltsas said the City has been working on an amendment to the Tri-City Agreement (will now be called the Quad-City Agreement) in order to allow Loretto to connect to the City of Independence Force Main on County Road 19. The agreement has been revised and is now in a form to be considered for adoption by the City. There are several key points that should be noted:

The City has been working to understand the potential number of additional Independence units that could be connected to the system. The City has focused on lakeshore lots that have access to the sewer. Earlier this year the City determined that lakeshore lots that have the ability to connect to City sewer can be a minimum of 1 acre. Based on the conceptual subdivision of properties, (primarily along Independence Road) it was estimated that an additional 14-34 lots could be realized. The City also recognized that there are six properties on Windmill Dr. that are not connected City sewer. Staff has been working with Medina to increase the number of connections included in the Quad City Agreement. Medina has stated that they would allow an additional 26 connections on top of the 289 agreed to in the Tri-City Agreement for a total of 315 connections. The City has been working to determine how the Metropolitan Council will handle I&I after the Loretto connection. Independence and Loretto will metered by the Metropolitan Council before discharging into the force main sanitary sewer line that runs south along County Road 19 to the Medina lift station. Greenfield will not be metered by the Metropolitan Council. Independence will continue to receive meter readings from Greenfield and will be responsible for administering a proportionate share of any I&I surcharges. Similarly, Independence connects to Medinas gravity sanitary sewer line at Perkinsville Road. This connection point will not be metered by the Metropolitan Council and Independence will be subject to providing Medina with sewer flow readings and a proportionate share of any I&I surcharges. Many of the costs associated with maintenance and repairs to the shared system will now be reimbursed by the Metropolitan Council and can be seen in the cooperative agreements between the Metropolitan Council and the cities of Medina and Independence. There is a cap on the total amount that will be reimbursed and any costs exceeding the cap amount will be proportionately shared amongst the quad cities. The agreement has been modified to remove the reconstruction of the pipe under Sycamore Trail. The Metropolitan Council is including this replacement in their project. The Cities will continue to have a maximum daily flow that can be pumped into the system. Those daily flow numbers will reflect the increased number of units.

Johnson asked if Met Council is working with Greenfield and Kaltsas replied they are not. He said we would be the recipients not Greenfield and then the flow goes to Medina. McCoy asked if the meter would be upgrade. Kaltsas said Met Council is not going to upgrade the meter and Staff is fine with the readings we are getting through the meter at this point. We will be able to back charge I&I if that becomes an issue. Johnson noted this was a great value because it would be an improvement for Sycamore Lane. Kaltsas said the sewer fund would benefit from this too. Kaltsas said if Greenfield does not approve that it will be back to a tri-review again.

**Motion by Spencer, second by McCoy to RESOLUTION NO. 19-0820-03 – Approving the Quad City Agreement if the City received reimbursement for expenses. Ayes: Johnson, McCoy, Grotting and Spencer. Nays: None. Absent: Betts. MOTION DECLARED CARRIED.**

10. Open/Misc.

11. Adjourn.

**Motion by Spencer, second by McCoy and carried to adjourn the meeting at 7:22 p.m.**  
Respectfully Submitted,

Trish Gronstal/Recording Secretary

DRAFT

## City of Independence

### *Request for an Amendment to the Interim Use Permit for the Property located at 5835 Drake Drive*

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<i>To:</i>	Planning Commission
<i>From:</i>	Mark Kaltsas, City Planner
<i>Meeting Date:</i>	September 17, 2019
<i>Applicant:</i>	Anita Volkenant
<i>Owner:</i>	Anita Volkenant
<i>Location:</i>	5835 Drake Drive

#### ***Request:***

Anita Volkenant (Applicant/Owner) requests that the City consider the following actions for the property located at 5835 Drake Drive, Independence, MN (PID No. 26-118-24-43-0006):

- a. An amendment to the interim use permit allowing horticulture use of the subject property.

#### ***Property/Site Information:***

The property is located at 5835 Drake Drive which is on the south side of Drake Drive between County Road 83 and County Road 90. There is an existing home located on the property along with 5 detached permanent accessory structures and 2 detached temporary hoop houses. The property has the additional following characteristics.

Property Information: 5835 Drake Drive

Zoning: *Rural Residential*

Comprehensive Plan: *Rural Residential*

Acreage: 3.8 acres

5835 Drake Drive: Aerial View



**Discussion:**

The City granted an interim use permit (IUP) in April of 2019 to allow the continued use of horticulture on the subject property. The IUP was approved subject to a settlement and stipulation agreement which further detailed the conditions of the IUP approval. One of the conditions related to the two hoop houses located on the property. The agreement included the following provisions relating to the hoop houses on the property:

*There are currently two temporary hoop houses situated on the Property (the "Hoop Houses"). Volkenant and PVG agree that the Hoop Houses will be utilized for Horticultural Purposes, and the City consents to the continued use of the Hoop Houses on the Property for Horticultural Purposes. Volkenant and the City further agree as follows:*

- (i) Volkenant shall be allowed to maintain the temporary plastic covering on the 30X1 00 Hoop House year-round.*
- (ii) Between November 1 and December 1 of each calendar year, Volkenant shall be allowed to install the temporary plastic covering*

*on the 20X80 Hoop House that is currently situated on the Property;*

*(iii) Between July 1 and July 30 of each calendar year, Volkenant shall remove the temporary plastic covering from the 20X80 Hoop House that is currently situated on the Property; and*

*(iv) Volkenant shall not install any additional temporary hoop house structures on the Property without prior City review and approval.*

The current agreement requires the applicant to remove the temporary plastic covering from the 20 x 80 hoop house between the dates of July 1 and July 30. The applicant is now asking the City to consider allowing the temporary plastic covering to remain on the 20 X 80 hoop house year-round.

There are several key considerations relating to the proposed amendment to the interim use permit that should be noted and further considered by the City.

1. The City regulates the total square footage of detached accessory structures on a property. The subject property would allow for a total of 3,306 SF (165,315 SF x 2%). The applicant currently has the following detached accessory structures on the property totaling 3,457 SF:
  - a. Garage: 600 SF
  - b. Garage #1: 270 SF
  - c. Garage #2: 420 SF
  - d. Barn & Lean-to: 881 SF
  - e. Shed: 736 SF
  - f. Lean-to: 550 SF

In addition, the applicant has the following hoop houses totaling 4,600 SF:

- a. Hoop House #1: 3,000 SF (300' x 100')
- b. Hoop House #2: 1,600 SF (20' x 80')

The total square footage of detached accessory structures on the property is 8,057 SF. This total is more than twice the allowable square footage of 3,306 SF.

The square footage of detached accessory structure exceeds the allowable amount permitted on the property. All of the permanent detached buildings are existing and considered legal-non-conforming. The two hoop houses (greenhouses) on the property were constructed in the last 5 years without approval from the City. The applicant noted that they believe the structures to be temporary and considered agricultural buildings which would not require a building permit. The City does not differentiate between temporary and permanent structures in the zoning ordinance and the hoop houses are considered permanent accessory structures.



The City will need to find that it should permit more than double the allowable square footage on the property and the buildings are adequately mitigated so as to not take away from the reasonable use and enjoyment of the surrounding properties.

The City has criteria relating to interim use permits. One of the criteria of an interim use permit is that it meets the standards for granting a conditional use permit. The following criteria have been established for both an interim use permit and conditional use permit:

1. *The use is deemed temporary and the use conforms to the development and performance standards of the zoning regulations.*
2. *The date or event that will terminate the use can be identified with certainty.*
3. *Allowing the use will not impose additional costs on the public if it is necessary for the public to take the property in the future.*
4. *The user agrees to any conditions that the city council deems appropriate for allowing the use.*
5. *The use meets the standards set forth in subsection 520.11 governing conditional use permits.*

The criteria for granting a conditional use permit are clearly delineated in the City's Zoning Ordinance (Section 520.11 subd. 1, a-i) as follows:

1. *The conditional use will not adversely affect the health, safety, morals and general welfare of occupants of surrounding lands.*
2. *The proposed use will not have a detrimental effect on the use and enjoyment of other property in the immediate vicinity for the proposes already permitted or on the normal and orderly development and improvement of surrounding vacant property for uses predominant in the area.*
3. *Existing roads and proposed access roads will be adequate to accommodate anticipated traffic.*
4. *Sufficient off-street parking and loading space will be provided to serve the proposed use.*
5. *The proposed conditional use can be adequately serviced by public utilities or on-site sewage treatment, and sufficient area of suitable soils for on-site sewage treatment is available to protect the city form pollution hazards.*
6. *The proposal includes adequate provision for protection of natural drainage systems, natural topography, tree growth, water courses, wetlands, historic sites and similar ecological and environmental features.*
7. *The proposal includes adequate measures to prevent or control offensive odor, fumes, dust, noise, or vibration so that none of these will constitute a nuisance.*
8. *The proposed condition use is consistent with the comprehensive plan of the City of Independence.*
9. *The proposed use will not stimulate growth incompatible with prevailing density standards.*

The City will need to determine if the requested interim use permit amendment meets all of the aforementioned conditions and restrictions. Along with the initial IUP approval, the applicant did prepare a site plan which proposed screening of the property from Drake Drive. A copy of the site plan is attached to this report.



***Neighbor Comments:***

The City has not received any written comments prior to the time of this writing.

***Recommendation:***

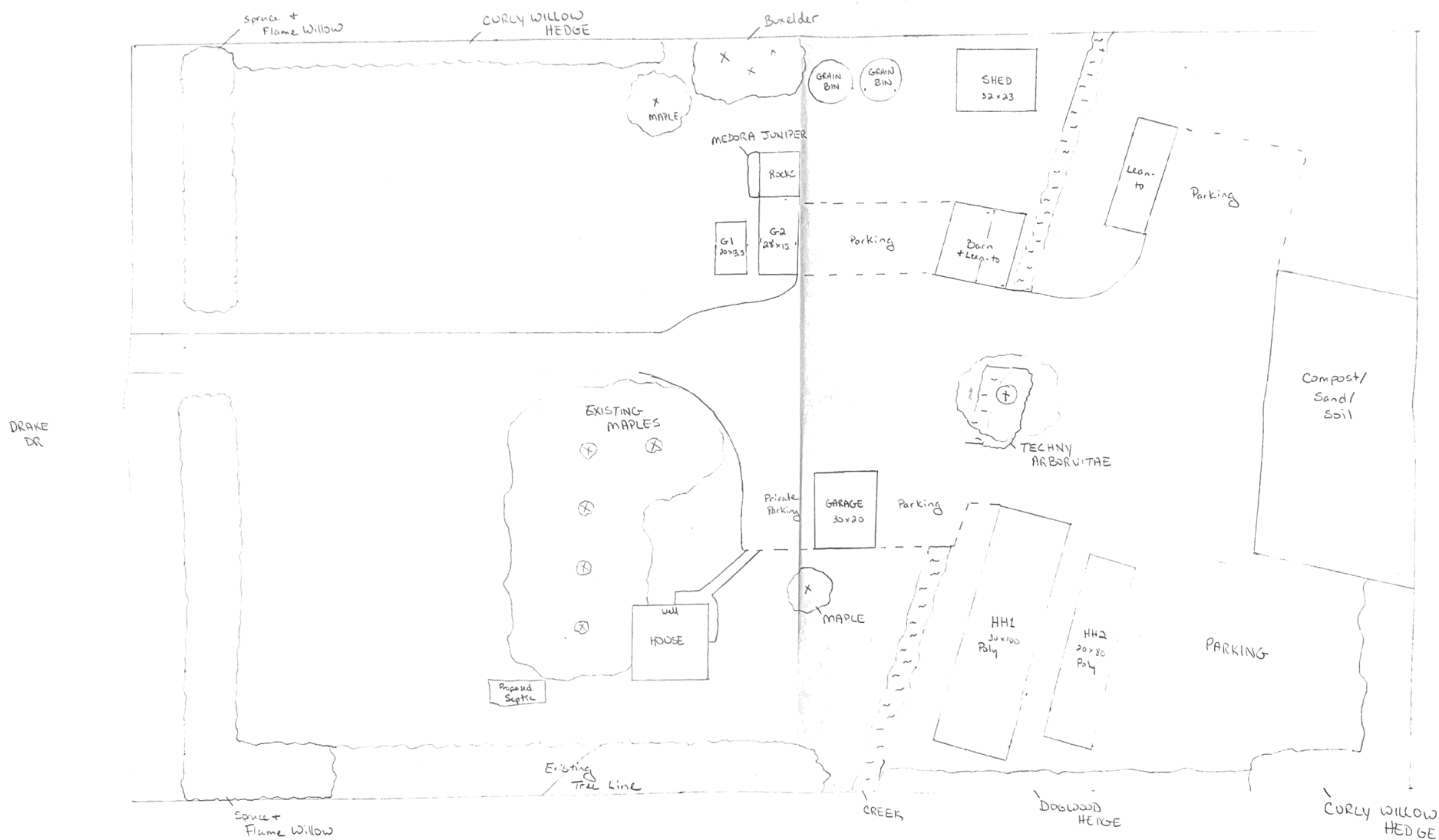
Staff is seeking a recommendation from the Planning Commission pertaining to the request for an amendment to the interim use permit with the following findings and conditions:

1. The proposed interim use permit request meets all applicable conditions and restrictions stated in Chapter V, Section 510, Zoning, in the City of Independence Zoning Ordinance.
2. The horticulture use of the property shall be subject to all conditions provided for and further detailed in the attached **Exhibit A** (Settlement and Stipulation Agreement) with the following amendment:
  - a. Volkenant shall be allowed to maintain the temporary plastic covering on the 30X1 00 Hoop House year-round.
  - b. Volkenant shall be allowed to maintain the temporary plastic covering on the 20 X 80 Hoop House year-round.
  - ~~b. Between November 1 and December 1 of each calendar year, Volkenant shall be allowed to install the temporary plastic covering on the 20X80 Hoop House that is currently situated on the Property;~~
  - ~~c. Between July 1 and July 30 of each calendar year, Volkenant shall remove the temporary plastic covering from the 20X80 Hoop House that is currently situated on the Property; and~~
3. The applicant shall pay for all costs associated with the City's review and processing of the requested amendment to the interim use permit.

***Attachments:*** Application  
Site Plan  
Exhibit A - Settlement and Stipulation Agreement

5835 DRAKE DR  
MAPLE PLAIN MN 55359

$\frac{1}{4}'' = 5.5'$



## SETTLEMENT AGREEMENT

This SETTLEMENT AGREEMENT (the "Agreement") is made this 30<sup>th</sup> day of November, 2018, by and between: (i) and Anita M. Volkenant ("Volkenant"); (ii) the City of Independence (the "City"); and (iii) with respect to Paragraph 5 below only, Robert Volkenant (the "1030 Property Owner"). Volkenant, the City and the 1030 Property Owner, were applicable, shall be referred to individually as a "Party" and collectively as the "Parties."

### RECITALS

WHEREAS, Volkenant resides at 5835 Drake Drive, Independence, Minnesota 55359 (the "Property"); and

WHEREAS, Volkenant is the owner of Pleasant View Gardens, Inc. ("PVG"), a seasonal horticultural based business; and

WHEREAS, Since 2015, Volkenant and PVG have continuously utilized the Property for purposes including horticultural purposes: The growing or production of fruits, vegetables, flowers, cultured sod and nursery stock, including ornamental plants and trees for the production of income ("Horticultural Purposes") as defined by Section 510.05, Subd. 42 of the applicable City Code (the "Code"); and

WHEREAS, Volkenant and PVG have made improvements to the Property in order to facilitate PVG's Horticultural Purposes including the erection of two (2) hoop house structures on the Property; and

WHEREAS, for several years, a dispute has existed between Volkenant, PVG and the City regarding Volkenant's past and present continuing use of the Property in connection with the seasonal operations of PVG, and the improvements to the Property; and

WHEREAS, as a result of recent settlement discussions, and in an effort to avoid costly and time consuming litigation, the Parties have agreed to fully and completely settle, compromise and resolve all claims, and potential claims, that the City has, or may have, against Volkenant relating in any way to Volkenant's past, present and future use of the Property, and Volkenant and PVG's improvements to the Property, in accordance with, and subject to, the terms and conditions set forth in this Agreement;

NOW, THEREFORE, in consideration of the foregoing recitals, the terms and conditions set forth below, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby stipulate and agree as follows:

### AGREEMENTS

1. Incorporation of Recitals: The Recitals set forth above are incorporated herein by reference and become part of this Agreement.

2. Effective Date: This Agreement shall be effective and binding upon the Parties upon final approval this Agreement by the City Council and the issuance of the agreed upon Interim Use Permit more fully described below (the "Effective Date").

3. Volkenant's Allowed Use of the Property: Without limiting Volkenant's personal use and enjoyment of the Property, Volkenant shall be allowed, for so long as she and her family members and heirs own the Property, to continue to use the Property in furtherance and continuation of PVG's horticultural based business and activities subject to receipt of an IUP pursuant to paragraph 4.

4. Interim Use Permit/Reservation of Rights: Upon execution of this Agreement, Volkenant and, as appropriate, PVG, shall promptly apply for an Interim Use Permit ("IUP") to be processed by the City in the normal course. Such IUP application shall propose or request terms consistent with those attached hereto as Exhibit A. The final terms of the IUP shall be established by the City Council. The IUP shall provide that it shall remain effective for so long as Volkenant and/or her family members and/or heirs own, possess and/or reside at the Property and may not be revoked so long as Volkenant and/or her family members and/or heirs own, possess and/or reside at the Property. In the event the IUP is denied or is not granted with terms which, in Volkenant's sole determination, are consistent with those attached hereto as Exhibit A, Volkenant may revoke this Agreement by giving written notice to the City within seven (7) days of the City Council's issuance of such IUP.

5. Additional Parking: The 1030 Property Owner is the fee owner of the 1030 Property. In furtherance of this Agreement and issuance of the IUP, the 1030 Property Owner hereby agrees to allow Volkenant and PVG to park PVG employee vehicles on the 1030 Property. The City hereby consents to the forgoing and agrees that Volkenant and PVG shall be allowed to park PVG employee vehicles on the 1030 Property without limiting, impairing, modifying, negating or otherwise invalidating the current Conditional Use Permit that is of public record and runs with the 1030 Property (the "CUP").

6. Existing Agricultural Buildings: The City acknowledges and acknowledges and agrees that with the exception of the permanent shed located closest to the home on the Property that was constructed in the 1970's, Volkenant claims that all of the other permanent agricultural buildings situated on the Property were constructed on the Property during the 1950's and the City possesses no contrary information. Because all of the permanent agricultural buildings were constructed and in agricultural use prior to the enactment of the current applicable City ordinance, said permanent agricultural buildings and the continued existence and use thereof, shall be allowed as non-conforming pursuant to City ordinance Sections 510.05, Subd. 83 and 515.07.

7. City's Release of Volkenant: The City hereby releases Volkenant and PVG, and their respective agents, employees, successors, assigns, heirs, estates and other representatives from any and all rights, remedies, claims, demands, causes of action, liability, liens, loss, damage, cost and expense which the City has, or claims to have, known or unknown, asserted or unasserted, arising in any manner from or relating to matters that are the subject of this

Agreement occurring prior to the Effective Date of this Agreement provided that an IUP is issued and this Agreement is not revoked by Volkenant in accordance with paragraph 4.

8. Agreement Contingent upon City Council Final Approval: The Parties understand and agree that this Agreement is expressly contingent upon, and subject to, final City Council approval. In the event that final City Council approval is not obtained, this Agreement shall be null and void and of no force or effect.

9. Attorneys' Fees, Costs and Expenses: The Parties hereby waive any claim against one another for attorneys' fees, costs, and expenses, it being the intent of the Parties that each Party shall bear its own attorneys' fees, costs and expenses.

10. Entire Agreement and Waiver: This Agreement contains the entire agreement of the Parties, and the terms of this Agreement are contractual and not mere recitals. The provisions of this Agreement may only be waived, modified, or amended by the written agreement of all Parties hereto.

11. Legal Counsel: The Parties to this Agreement hereby warrant and represent that they have consulted with, and received advice from, legal counsel of their choice with respect to this Agreement, and/or have had the opportunity to consult with legal counsel of their choice prior to executing this Agreement. Without limiting the generality of the foregoing, the Parties acknowledge that they have legal and business options available to them other than the execution and delivery of this Agreement, but have nevertheless decided to execute and deliver this Agreement, and have done so voluntarily and without duress.

12. Authority To Enter Into This Agreement: The undersigned hereby represent and warrant that they are of legal age and are under no legal or other disability to prevent them from executing this Agreement and have full and complete authority to execute this Agreement on behalf of the Parties hereto.

13. Severability: If any part of this Agreement shall be determined to be void and unenforceable, the remainder of this Agreement shall remain in full force and effect.

14. Duty to Cooperate: The Parties acknowledge and agree that each of them will execute any other documents reasonably necessary, and otherwise cooperate with one another, in the future performance of this Agreement, in order to effectuate the intent of this Agreement, and in connection with obtaining final City Council approval of this Agreement.

15. No Admission of Liability: The Parties agree and acknowledge that this settlement is a compromise of disputed claims and that each Party expressly denies any and all liability in response to the claims asserted by the other or any violation of any law, contractual obligation or other agreement existing between the Parties.

16. Governing Law: This Agreement shall be governed by, and construed in accordance with, the laws of the State of Minnesota. Any action to enforce the terms of this Agreement shall be brought in a court situated in the State of Minnesota.

17. Counterparts: This Agreement may be executed in one or more counterparts, including facsimile or electronic counterparts, each of which shall be deemed an original, and together which shall constitute one and the same document and shall be deemed effective for all purposes as though this Agreement was executed as a "blue ink" original.

IN THE WITNESS WHEREOF, the Parties hereto have executed this Agreement effective as of the date and year set forth below.

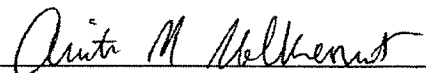
Dated: \_\_\_\_\_, 2018

CITY OF INDEPENDENCE

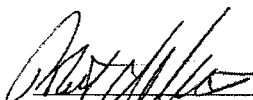
By: \_\_\_\_\_  
Its: \_\_\_\_\_

By: \_\_\_\_\_  
Its: \_\_\_\_\_

Dated: 12-6, 2018

  
Anita M. Volkenant

Dated: 12-6, 2018

  
Robert Volkenant, as to Paragraph 5 above only

16491306v1

## EXHIBIT A

- a. Consistent with applicable City Codes, PVG, Volkenant, her family members and heirs shall be allowed to continue to utilize the Property for Horticultural Purposes and related activities.
- b. In connection with Volkenant's and PVG's approved continuing use of the Property for Horticultural Purposes, Volkenant agrees not expand the current size of any of the existing permanent agricultural buildings that are currently situated on the Property without first complying with applicable City building code and ordinance procedures and requirements. Consistent with the requirements of applicable City building codes and ordinances, the City agrees that it will not unreasonably deny conforming requests by Volkenant.
- c. There are currently two temporary hoop houses situated on the Property (the "Hoop Houses"). Volkenant and PVG agree that the Hoop Houses will only be utilized for Horticultural Purposes, and the City consents to the continued use of the Hoop Houses on the Property for Horticultural Purposes. Volkenant and the City further agree as follows:
  - (i) Volkenant shall be allowed to maintain the temporary plastic covering on the 30X100 Hoop House year-round.
  - (ii) Between November 1 and December 1 of each calendar year, Volkenant shall be allowed to install the temporary plastic covering on the 20X80 Hoop House that is currently situated on the Property;
  - (iii) Between July 1 and July 30 of each calendar year, Volkenant shall remove the temporary plastic covering from the 20X80 Hoop House that is currently situated on the Property; and
  - (iv) Volkenant shall not install any additional temporary hoop house structures on the Property without prior City review and approval consistent with applicable City Codes and Ordinances.
- d. Between March and November of each calendar year, Volkenant shall be allowed to have PVG employees present on the Property in furtherance of PVG's horticultural related business activities. Primarily, the PVG employees will be present on the Property for the purpose of maintaining, protecting and watering the horticultural materials that are seasonally grown and maintained on the Property for the purpose of sale and the generation of income. Each of the foregoing PVG employees shall be allowed to park their personal vehicles on the Property while present at the Property. Excluding all of Volkenant's personal vehicles and vehicles owned by PVG, no more than six (6) PVG employee owned vehicles shall be parked on the Property at any one time. Volkenant agrees to make reasonable efforts to screen said vehicles from view from the public

roadway. The City further agrees that all other PVG employee vehicles shall be allowed to park, and will be parked, at the 1030 County Road 83 Independence, Minnesota property (the "1030 Property").

- e. Volkenant shall be entitled and allowed to park all vehicles and trailers that she or PVG own on the Property. When parked or not in use, Volkenant will make reasonable efforts to screen said vehicles and trailers from view from the public roadway.
- f. Volkenant shall be entitled and allowed to store materials (i.e. compost, dirt and mulch) on the Property at the general locations depicted on the schematic attached hereto. Volkenant further agrees to make reasonable efforts to add additional screening to further screen said materials from view from the public roadway.
- g. Volkenant agrees to add additional reasonable screening in the general areas of the Property as depicted in the schematic attached hereto.
- h. Volkenant shall be entitled and allowed to continue to maintain the pile of rock that is currently situated on the Property for personal use.
- i. The bobcat located at the Property and owned by Volkenant shall be stored in one of the permanent out-buildings situated on the Property when not in use.
- j. Notwithstanding the foregoing, nothing in this Agreement shall be construed to limit Volkenant's rights to her continued lawful and personal use, enjoyment, maintenance and upkeep of the Property and the permanent buildings situated on the Property without undue interference.
- k. All of the permanent agricultural buildings and the continued existence and use thereof that were constructed and in agricultural use prior to the enactment of the current applicable City ordinance, shall be allowed as non-conforming pursuant to City ordinance Sections 510.05, Subd. 83 and 515.07.



## City of Independence

### ***Request for a Variance and Minor Subdivision to Permit a Lot Line Rearrangement for the Property Located at 2365 County Road 92 N.***

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*To:* Planning Commission  
*From:* Mark Kaltsas, City Planner  
*Meeting Date:* September 17, 2019  
*Applicant/Owner:* R. Michael and Margaret King  
*Location:* 2365 County Road 92. N

#### ***Request:***

R. Michael and Margaret King (Applicants/Owners) request that the City consider the following actions for the property located at 2365 County Road 92 N., Independence, MN (PID No. 20-118-24-11-0002):

- a. A variance and minor subdivision to allow the creation of a rural view lot. The property is an original quarter, quarter section with the exception of a small piece of property that was taken by Wright Hennepin Electric for their substation. The variance would allow the subdivision of property for a rural view lot that is less than 40 acres.

#### ***Property/Site Information:***

The subject property is located south of Hwy. 12 on the west side of County Road 92 N. There is an existing home and an accessory building located on the property. The property has upland pasture, mature trees and wetlands. The property has the following site characteristics:

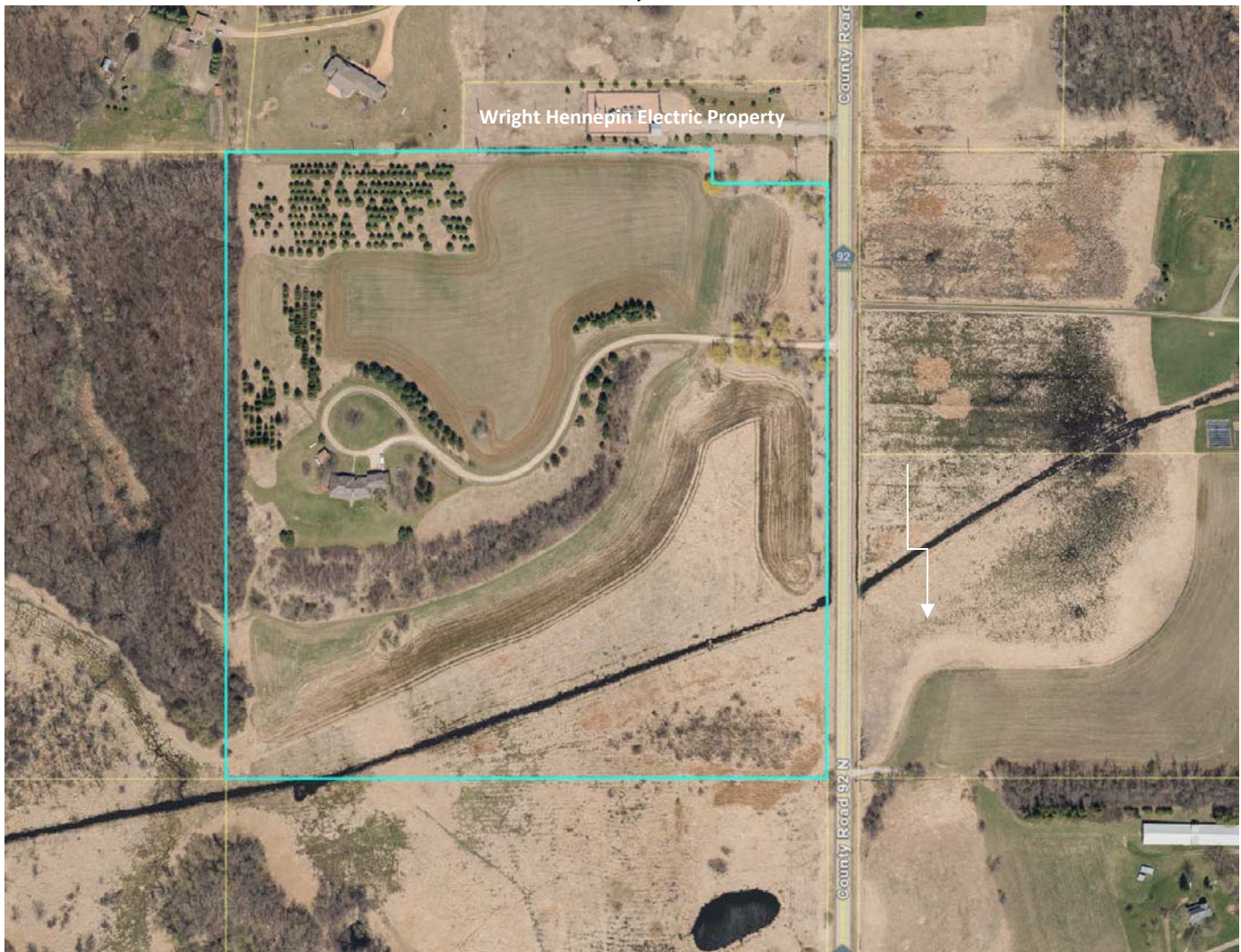
##### **Property Information: 2365 County Road 92 N.**

*Zoning: Agriculture*

*Comprehensive Plan: Agriculture*

*Acreage: (BEFORE) 38.95 acres*

*Acreage: (AFTER) 28.95 acres – Parcel 1  
10.00 acres –Parcel 2 (proposed)*



***Discussion:***

The applicants approached the City about the possibility of subdividing their property to create a rural view lot. The property is zoned Agriculture. The City does not allow the subdivision of property zoned Agriculture with the exception of lot line rearrangements and rural view lot splits. The overall property does not meet the minimum 40-acre requirement to realize a rural view lot subdivision; however, the property has not previously been subdivided for the purpose of creating any additional lots. The City has an additional provision that allows properties that were originally subdivided into a quarter-quarter section and not further subdivided to be deemed a 40-acre parcel for purposes of determining rural view lot eligibility. Wright Hennepin Electric has a substation located in the northeast corner of the property that appears to have taken a small piece of the original quarter-quarter section.

The applicant would like the City to consider granting a variance to allow the subdivision of property in the Agriculture zoning district that does not meet the minimum 40-acre lot size. The applicant is proposing to subdivide a 10-acre parcel from the overall property. The newly created lot would be located along the north property line. The newly subdivided property would be accessed via a private driveway easement that would provide access from County Road 92 N into the site on the existing driveway that serves the existing residence. Based on the information provided and a site visit, the proposed lot would appear to accommodate the development of a single-family home meeting all requisite requirements. The proposed property would have the following detail:

Min. Lot Size Required to Subdivide:	40 Acres
Existing Lot Size:	38.95 Acres (original quarter-quarter sect.)
Min. Lot Frontage Required:	300 Lineal Feet
Lot Frontage Proposed:	280 Lineal Feet
Min. Upland Acreage Required:	2.5 Acres
Upland Acreage Proposed:	8.32 Acres
Min. Lot Frontage to Lot Depth Required:	1:4
Min. Lot Frontage to Lot Depth Proposed:	1:4

The proposed Parcel 2 would meet all applicable criteria of the City's zoning ordinance with the exception of the minimum lot frontage (300 LF required/280 LF proposed). The applicant could meet the minimum lot frontage; however, the shape of the lot would become skewed rather than square. The overall width of the lot with the exception of the utility property is proposed to be 350 LF. The City can provide direction relating to whether or not the line should be adjusted to provide for the 300 LF of frontage.

The remainder property with the existing home and accessory structures would not be negatively impacted as a result of the proposed subdivision. The proposed property line for the new parcel would not create any non-conformities or reduced setbacks relating to the remainder property, the existing home or accessory buildings.

The City has standards for granting a variance which need to be considered prior to making a recommendation relating to the application. The standards established by the City require the applicant to demonstrate that the requested variance does not create a situation that is not in keeping with the character of the surrounding area. In addition, the applicant must demonstrate that the requested variance is unique to the subject property. The standards for granting a variance are as follows:

*520.21. Standards for granting variances. Subdivision 1. The City Council may grant a variance from the terms of this zoning code, including restrictions placed on nonconformities, in cases where: 1) the variance is in harmony with the general purposes and intent of this zoning code; 2) the variance is consistent with the comprehensive plan; and 3) the applicant establishes that there are practical difficulties in complying with the zoning code (Amended, Ord. 2011-08)*

*Subd. 2. An applicant for a variance must demonstrate that there are practical difficulties in complying with the zoning code. For such purposes, “practical difficulties” means:*

*(a) The property owner proposes to use the property in a reasonable manner not permitted by the zoning code;*

*(b) the plight of the property owner is due to circumstances unique to the property not created by the landowner;*

*(c) the variance, if granted, will not alter the essential character of the locality.*

*Economic considerations alone do not constitute practical difficulties. Practical difficulties include, but are not limited to, inadequate access to direct sunlight for solar energy systems. (Amended, Ord. 2011-08)*

*Subd. 3. The City Council shall not grant a variance to permit a use that is not allowed under the zoning code based on the zoning classification of the affected property. (Amended, Ord. 2011-08)*

*520.23. Conditions and restrictions. The board of adjustments may recommend and the City Council may impose conditions on a variance. Conditions must be directly related to and must bear a rough proportionality to the impact created by the variance. (Amended, Ord. 2011-08)*

Consideration of the standards for granting a variance:

- a. The applicants are proposing to use the property as residential which is consistent with the AG-Agriculture Zoning District.
- b. The properties created by the subdivision are similar in nature and character to the surrounding properties. There are existing properties located along County Road 92 N. that range between 5 and 40 acres plus.
- c. The character of the surrounding area is mixed residential/agricultural and guided for long term agriculture. The City’s current comprehensive plan guides this area for long term agriculture. The City will need to determine if the proposed subdivision is in keeping with the intent of the City’s comprehensive plan.



- d. The requested variance to allow the subdivision of the property must be found to be unique to this property. The City could find that because the parcel has not benefited from the subdivision of a rural view lot in the past, that it could consider this property to be an original quarter-quarter section. Due to the large area of the City and the number of properties, it is difficult to determine if this situation is wholly unique to this property but believes that there are very few properties impacted by a utility similar to this situation. . The City will need to determine if the unique characteristics of this property are distinctive and discernable from other conditions on similar properties.
- e. The property will be accessed via a private driveway easement utilizing the existing driveway from County Road 92 N.
- f. Proposed Parcel 2 will need to accommodate the requisite primary and secondary on-site septic system locations. The proposed subdivision does not currently provide for the requisite drainage and utility easements along all property lines. These easements would need to be provided to the City should the application be approved.
- g. The proposed Parcel 2 would be required to pay the City's park dedication fee. For this property, the park dedication fee amount is \$3,500.00. This fee will need to be paid prior to recording the subdivision.

Park dedication fee \$3,500 per lot up to 4.99 acres, plus \$750 per acre for each acre over 5.

10 acres = \$7,250

The Planning Commission will need to determine if the requested variance to allow the subdivision of the property meets the requirements for granting a variance.

***Planning Commission Recommendation:***

Staff is seeking a recommendation from the Planning Commission for the requested variance and minor subdivision with the following findings and conditions:

1. The proposed variance and minor subdivision request meet all applicable conditions and restrictions stated in Chapter V, Section 520.19, Procedures on variances, and Chapter V, Section 500, Subdivisions, in the City of Independence Zoning Ordinance.
2. The Applicant shall provide to the City verification that proposed Parcel 2 can accommodate a primary and secondary septic site.
3. The Applicant shall provide, execute and record the requisite drainage and utility easement with the county within six (6) months of approval.

4. The Applicant shall pay the park dedication fees in the amount of \$7,250 prior to the applicant receiving final approval to record the subdivision by the City.
5. The Applicant shall pay for all costs associated with the City's review of the requested variance and subdivision.
6. The Applicant shall record the subdivision and City Council Resolution with the county within six (6) months of approval.

**Attachments:**

- Application/Narrative
- Survey



## City of Independence

The Independence City Code was established to protect both current and future residents from the negative impacts of improper development and to ensure a positive future for the city. The land use application review is the mechanism that allows the city to examine proposed uses to ensure compatibility with the surrounding environment, natural or otherwise. It is important to understand that a proposed use may be acceptable in some circumstances, but unacceptable in others— all applications are reviewed on a case-by-case basis.

Minnesota State Statute 15.99 requires local governments to review an application within 15 days of its submission to determine if an application is complete and/ or if additional information is needed to adequately review the subject request. ***To ensure an expedited review, applicants shall schedule a pre-application meeting with the City Planner/ Administrator at least one week prior to submittal.*** Most applications have a review period of 60 days, with the City's ability to extend an additional 60 days if necessary due to insufficient information or schedule.

### ***Application for Planning Consideration Fee Statement***

The City of Independence has set forth a fee schedule for the year 2019 by City Ordinance. However, projects of large scope that include two or more requests will be required to provide a larger deposit than the resolution sets forth as set by the City Administrator. The fees collected for land use projects are collected as deposits. All invoices associated with each land employ application will be billed to the applicant within 30 days upon receipt by the City for each project. The City of Independence often utilizes consulting firms to assist in the review of projects. The consultant and City rates are noted on the current fee schedule. By signing this form, the applicant recognizes that he/ she is solely responsible for any and all fees associated with the land use application from the plan review stage to the construction monitoring stage through to the release of any financial guarantee for an approved project. If a project is denied by the City Council or withdrawn by the applicant, the fees associated for the project until such denial or withdrawal, remain the applicant's responsibility.

I UNDERSTAND THE FEE STATEMENT AND RESPONSIBILITIES ASSOCIATED WITH THIS LAND USE APPLICATION:

**Applicant Signature:** Margaret King

**Date:** August 13 2019

**Owner Signature (if different):** \_\_\_\_\_

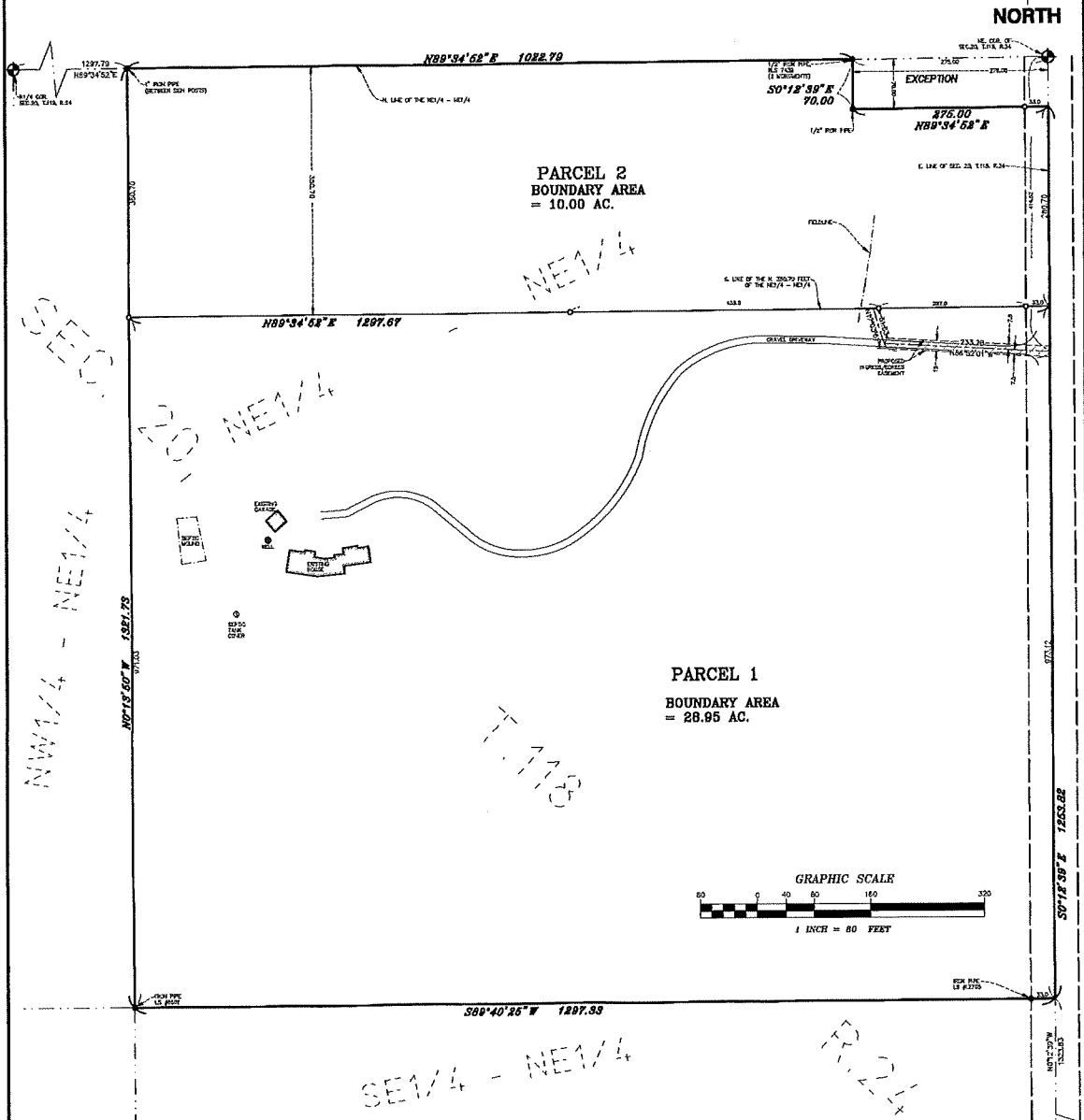
**Date:** \_\_\_\_\_



# CERTIFICATE OF SURVEY

~for~ PEGGY KING

~part of~ NE1/4 - NE1/4, SEC.20, T.118, R 24, Hennepin County, MN  
2365 County Road 92 N, Independence, MN



## PROPOSED PARCEL 1 DESCRIPTION

The Northeast Quarter of the Northeast Quarter of Section 20, Township 118, Range 24, Hennepin County, Minnesota, except the North 350.70 feet as measured perpendicular to the north line of said Northeast Quarter of the Northeast Quarter.

## PROPOSED PARCEL 2 DESCRIPTION

The North 350.70 feet of the Northeast Quarter of the Northeast Quarter of Section 20, Township 118, Range 24, Hennepin County, Minnesota as measured perpendicular to the north line of said Northeast Quarter of the Northeast Quarter, except the North 70 feet of the East 275 feet thereof.

## PROPOSED INGRESS/ EGRESS EASEMENT DESCRIPTION

Part of the Northeast Quarter of the Northeast Quarter of Section 20, Township 118, Range 24, Hennepin County, Minnesota, lying 7.5 feet on either side of a centerline described as follows:

Commencing at the northeast corner of said Section 20, thence South 0 degrees 12 minutes 39 seconds East, assumed bearing along the East line of said Section 20 a distance of 414.52 feet to the point of beginning of the centerline to be described; thence North 66 degrees 52 minutes 01 seconds West a distance of 233.26 feet; thence North 17 degrees 03 minutes 51 seconds West a distance of 51.53 feet to the south line of the North 350.70 feet of the Northeast Quarter of the Northeast Quarter of said Section 20 and there terminating. The width of said easement is assumed to terminate at said south line of the North 350.70 feet of the Northeast Quarter of the Northeast Quarter and said east line of Section 20.

## LEGEND

- DENOTES IRON MONUMENT FOUND AS LABELED
- DENOTES IRON MONUMENT SET, MARKED RLS# 45356/52705
- ⊕ DENOTES HENNEPIN COUNTY CAST IRON MONUMENT

## NOTES

- Field survey was completed by E.G. Rud and Sons, Inc. on 08/09/18.
- Bearings shown are on the Hennepin County Coordinate System NAD83 (86 Ad).
- This survey was prepared without the benefit of title work. Additional easements, restrictions and/or encumbrances may exist other than those shown hereon. Survey subject to revision upon receipt of a current title commitment or an attorney's title opinion.

**E.G. RUD & SONS, INC.**  
Professional Land Surveyors  
990 5th Avenue SE, Suite 2  
Hutchinson, MN 55350  
Tel. (820) 567-2025 Fax (320) 587-2595

DRAWN BY: SN	JOB NO: 180805	DATE: 08/13/18
CHECK BY: KHI	SCANNED: [ ]	
1		
2		
3		
NO. DATE	DESCRIPTION	BY

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

SAUEL N. NEMELA  
Date: 13AUG19 License No. 52705

1900955

## City of Independence

### ***Request for an Amendment to the Conditional Use Permit to Allow New Antennas on the Existing Telecommunications Tower, Site Plan Approval and a Variance to Permit More than One Accessory Building Per Telecommunications Tower Requirements***

---

*To:* Planning Commission  
*From:* Mark Kaltsas, City Planner  
*Meeting Date:* September 17, 2019  
*Applicant:* AT&T Wireless  
*Owner:* Delano United Methodist Church  
*Location:* 3310 County Line Road

#### ***Request:***

1. AT&T/SAC Wireless (Applicant) and Delano United Methodist Church (Owner) request that the City consider the following actions for the property located at 3310 County Line Road (PID No. 07-118-24-33-0004):
  - a. A Conditional Use Permit Amendment to allow collocation on the existing telecommunications tower.
  - b. A Variance to allow more than one accessory building per tower site and a reduced rear yard setback.
  - c. Site plan approval for the proposed site layout.

#### ***Property/Site Information:***

The property is located on the east side of County Line Road, just north of TH 12. The property is comprised of the existing church building and parking lot, open space and wetlands. The property has the following characteristics:

Property Information for 3310 County Line Road  
Zoning: *Agriculture*  
Comprehensive Plan: *Agriculture*  
Acreage: 6.89 Acres

3310 County Line Road



**Discussion:**

The applicant is seeking an amendment to the existing conditional use permit, site plan approval and variance to allow new antennas and to be located on the existing telecommunications tower and a new accessory structure to be located at the base of the tower. There is an existing Conditional Use Permit which was granted by the City in 2001 approving the site plan to allow the tower to be installed. In 2013, the City approved an amendment to allow Verizon Wireless to locate new antennas and accessory equipment building on the property. In 2014, the City granted approval to AT&T to allow the colocation and site plan for new antennas on the existing tower. AT&T did not install the antennas that were approved.

The applicant is again proposing to install new antennas on the existing tower as well as locate the associated equipment at the base of the tower. Given the proposed improvements, an amendment to the conditional use permit is required.

*520.09 Subd. 8. If a conditional use permit holder wishes to alter or extend the operation or to change the conditions of the permit, the city will evaluate the permit holder's compliance with the existing permit conditions. Any change involving structural alterations, enlargement, intensification of use, or similar change not specifically permitted by the conditional use permit issued requires an amended conditional use permit. An amended conditional use permit application must be administered in a manner similar to that required for a new conditional use permit.*

The City has criteria relating to the location (setbacks), site improvements and landscaping for new telecommunications tower development. In this case, the tower already has a conditional use permit. The location and setbacks for the existing tower were approved by the initial conditional use permit. There are several factors that should be considered relating to the site plan approval and variance:

1. The applicant is proposing to install new base equipment that is located within a fenced area at the base of the tower. The equipment would be located within a steel cabinet and the generator would be mounted to a pad on the ground, but otherwise not enclosed. The previous proposal (2014 and approved by the City) proposed to locate the equipment within a prefabricated equipment shelter similar to that used by Verizon on this site. Verizon Wireless has an approximate 300 SF equipment shelter which houses all of the requisite base equipment and a generator already on the property. Staff would like direction from the City relating to whether or not all of the proposed equipment and generator should be located in a prefabricated building similar to that Verizon already has on the property? In either case, the proposed cabinet is considered an accessory structure that would count as a second accessory structure on the property.
2. The applicant is proposing to remove some of the existing landscaping and add additional landscaping to the site. The location of the proposed equipment does not currently impact any of the surrounding properties. In the future, the subject property and adjacent property to the east could be redeveloped. It is recommended that an additional 4 Spruce trees be added to the north and east fence lines to further screen the proposed base equipment.
3. The City will need to grant a variance from the rear property line to allow the location of the equipment cabinet within the requisite 40 foot setback. The applicant is noting the proposed equipment cabinet would be located 9'-7" from the rear property line. The location of the existing



tower would likely not allow for any structure to meet the requisite setback. The City granted a similar variance in 2013 to allow the Verizon structure to be located within the requisite 40-foot setback.

4. The plans do not indicate that there will be any exterior lighting added to the site as a result of the proposed improvements. All lighting will need to comply with the City's lighting ordinance. The applicant will need to provide the City with lighting cut sheets indicating a cut-off type fixture along with verification that the proposed lighting does not spill over the existing property lines.
5. The plans do not label the height of the proposed fence. This should be noted on the plans. It appears that the proposed fence will tie into the existing fence already located on the property.
6. The plans do not show the existing gravel driveway. It is anticipated that access to the proposed equipment will be via the existing driveway access. This should be confirmed on the plans.
7. The proposed new antennas would be located below the height of the existing Verizon antennas. The Verizon antennas are located at a height of 181 feet. The proposed AT&T antennas would be located at a height of 172 feet.

The City can grant a variance if it determines that it meets the criteria for granting a variance as established by ordinance. The criteria for granting a variance are as follows:

*520.21. Standards for granting variances. Subdivision 1. The City Council may grant a variance from the terms of this zoning code, including restrictions placed on nonconformities, in cases where: 1) the variance is in harmony with the general purposes and intent of this zoning code; 2) the variance is consistent with the comprehensive plan; and 3) the applicant establishes that there are practical difficulties in complying with the zoning code (Amended, Ord. 2011-08)*

*Subd. 2. An applicant for a variance must demonstrate that there are practical difficulties in complying with the zoning code. For such purposes, "practical difficulties" means:*

- (a) The property owner proposes to use the property in a reasonable manner not permitted by the zoning code;*
- (b) the plight of the property owner is due to circumstances unique to the property not created by the landowner;*
- (c) the variance, if granted, will not alter the essential character of the locality.*

*Economic considerations alone do not constitute practical difficulties. Practical difficulties include, but are not limited to, inadequate access to direct sunlight for solar energy systems. (Amended, Ord. 2011-08)*

*Subd. 3. The City Council shall not grant a variance to permit a use that is not allowed under the zoning code based on the zoning classification of the affected property. (Amended, Ord. 2011-08)*

*520.23. Conditions and restrictions. The board of adjustments may recommend and the City Council may impose conditions on a variance. Conditions must be directly related to and must bear a rough proportionality to the impact created by the variance. (Amended, Ord. 2011-08)*

Any amendment to an existing CUP must meet the same requirements established for granting a new CUP. The criteria for granting a conditional use permit are clearly delineated in the City's Zoning Ordinance (Section 520.11 subd. 1, a-i) as follows:

- 1. The conditional use will not adversely affect the health, safety, morals and general welfare of occupants of surrounding lands.*
- 2. The proposed use will not have a detrimental effect on the use and enjoyment of other property in the immediate vicinity for the proposes already permitted or on the normal and orderly development and improvement of surrounding vacant property for uses predominant in the area.*
- 3. Existing roads and proposed access roads will be adequate to accommodate anticipated traffic.*
- 4. Sufficient off-street parking and loading space will be provided to serve the proposed use.*
- 5. The proposed conditional use can be adequately serviced by public utilities or on-site sewage treatment, and sufficient area of suitable soils for on-site sewage treatment is available to protect the city form pollution hazards.*
- 6. The proposal includes adequate provision for protection of natural drainage systems, natural topography, tree growth, water courses, wetlands, historic sites and similar ecological and environmental features.*
- 7. The proposal includes adequate measures to prevent or control offensive odor, fumes, dust, noise, or vibration so that none of these will constitute a nuisance.*
- 8. The proposed condition use is consistent with the comprehensive plan of the City of Independence.*
- 9. The proposed use will not stimulate growth incompatible with prevailing density standards.*

The existing tower has a conditional use permit. The new antennas will be located just below those approved for Verizon Wireless. The proposed equipment cabinet and generator are not consistent with the existing enclosed equipment shelter used by Verizon on this site. Enclosing the proposed ground equipment and generator inside of a building would be consistent with the plans approved for the Verizon Wireless equipment shelter. Landscaping will further mitigate the impacts of the proposed equipment shelter. It should be noted that the existing and adjacent properties to the south, east and north are guided for Urban Commercial by the City's 2030 Comprehensive Plan.

In the existing zoning district, telecommunication towers are permitted as a conditional use. Resulting traffic, noise, and other measureable impacts should not be incrementally amplified as a result of the proposed new antennas and associated base site improvements. The Planning Commission will need to determine if the requested amendment to the conditional use permit, site plan and variance meet all of the aforementioned conditions and restrictions.

***Neighbor Comments:***

The City has not received any written comments regarding the proposed amendment to the conditional use permit, site plan approval or variance.

***Recommendation:***

Staff is seeking a recommendation from the Planning Commission for the request for an amendment to the conditional use permit, site plan approval and variance. Should the Planning Commission make a recommendation to approve the requested actions, the following findings and conditions should be considered:

1. The proposed conditional use permit amendment, site plan review and variance meet all applicable conditions and restrictions stated Chapter V, Section 510, Zoning, in the City of Independence Zoning Ordinance.
2. The conditional use permit will be reviewed annually by the City to ensure conformance with the conditions set forth in the resolution.
3. This amendment approves nine (9) new antennas, site improvements (as indicated on the approved site plan, attached to this report as Exhibit B) and associated base equipment.
4. Prior to consideration by the City Council, the applicant shall provide the City with the following items:
  - a. Written information demonstrating the need for the tower at the proposed site in light of the existing and proposed wireless telecommunications network(s) to be operated by persons intending to place telecommunications facilities on the tower.
  - b. A copy of relevant portions of a lease signed by the applicant and property owner(s), requiring the applicant to remove the tower and associated telecommunications facilities upon cessation of operations on the leased site, or, if a lease does not yet exist, a written agreement to include such a provision in the lease to be signed.
  - c. A landscape plan with the requested landscaping indicated in the staff report.
  - d. A revised site plan showing the existing driveway and proposed access.

***Attachments:***

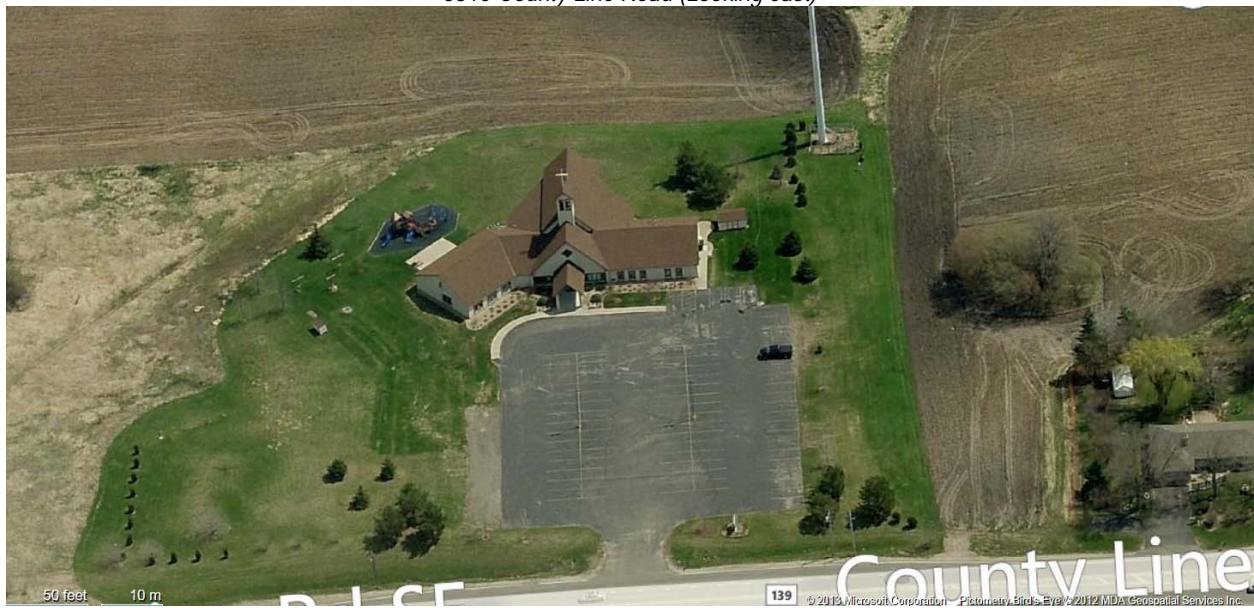
1. Application and Project Narrative
2. Proposed Plan Set

## Attachment

*3310 County Line Road (Looking north)*



*3310 County Line Road (Looking east)*







# PLANNING APPLICATION

Case No.

## Type of application

- ☐ Standard ☐ Staff Approval ☐ Plan Revision ☐ Amended ☐ Reapplication
- ☐ Rezoning ☐ Conditional Use Permit ☐ Variance ☐ Ordinance Amendment ☐ Subdivision
- ☐ Preliminary Development Plan ☐ Interim Use Permit ☐ Comprehensive Plan Amendment
- ☐ Final Development Plan ☐ Final Site & Building Plan ☐ Other \_\_\_\_\_

## Site Location— Additional addresses on back and legal description attached

Property address 3310 County Line Road SE PID 0711824330004

## Proposal -Full documentation must accompany application

AT+T to install additional antennas @ 172' center line. Add additional 6'x6' walk in cabinet on steel platform. Add generator on platform. Add fencing to surround new ground equipment

## Applicant

Name Curt Walter on behalf of AT+T Email Curtis.Walter@panderriordr.com

Address 2897 Lake Vista Dr NW Rochester, MN 55901

Phone 507-951-7151 Additional phone/contact \_\_\_\_\_

Printed Name Curt Walter Signature [Signature] for AT+T

## Owner Information (if different from applicant)

Name DECAUD UNITED METHODIST CHURCH Email www.DECANOUMC.COM

Address 3310 COUNTY LINE RD SE

Phone 763-772-3492 Additional phone/contact \_\_\_\_\_

Printed Name MARTIN D. HOWES Signature [Signature] Martin D. Howes

## Office Use Only

Date

Application Amount

Check #

Accepted By

Escrow Paid

Check #

Date Accepted by Planner

## City of Independence

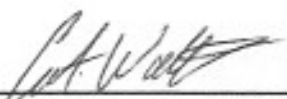
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### ***Application for Planning Consideration Fee Statement***

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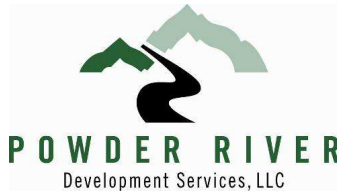
I UNDERSTAND THE FEE STATEMENT AND RESPONSIBILITIES ASSOCIATED WITH THIS LAND USE APPLICATION:

**Applicant Signature:**  Ex AT-T

**Date:** 5/7/19

**Owner Signature (if different):** Martin D. Howes CHURCH TRUSTEE CHAIR

**Date:** 5-8-19



**Powder River Development Services, LLC**  
2897 Lake Vista Drive NW  
Rochester, MN 55901  
(507) 951-7151 office  
(952) 314-4957 fax  
[www.powderriverdev.com](http://www.powderriverdev.com)  
[Curtis.walter@powderriverdev.com](mailto:Curtis.walter@powderriverdev.com)

July 25, 2019

City of Independence  
Attn: Mark Kaltsas  
1920 County Road 90  
Independence, MN 55359

Re: Planning Application for AT&T CUP and Variance.

Mark,

AT&T Mobility would like to collocate on an existing monopole located at 3310 County Line Road, SE. owned by Delano United Methodist Church (parcel #0711824330004). As per our discussions this installation will require a Conditional Use Permit.

We are requesting a Variance to allow a 2<sup>nd</sup> accessory structure to house AT&T's equipment. We also request a Variance from the 40' rear setback (9' 7" to equipment – 5' 5" to fence) to allow the proposed AT&T ground equipment to be located near the existing tower. The granting these Variances will be in harmony with the existing use of the property and existing tower.

This facility is needed to help with coverage and capacity in the area. Since more wireless usage is in the form of data and streaming, this facility is needed to help service in the homes and business of residents in this area. This project will provide consistent wireless phone and internet coverage for residents and emergency services in this area.

The proposed installation includes an additional antenna array on the existing monopole. We will also expand the existing compound fencing to the north to encompass a new 6' x 6' Walk-in Cabinet and external, self-contained generator. We will be planting new trees for additional screening.

Enclosed please find the following items:

- Planning Application sign by landowner and applicant;
- \$1,750 check for application fee;
- \$1,500 check for deposit fee;
- Copy of passing structural analysis;
- 1 Full set of construction drawings (letter size);
- 1 Full set of construction drawings (tabloid size);

This proposed installation should meet with the intent of the city ordinance, eliminate the need for an additional tower site and will have minimal effect on existing aesthetics. Please accept this information and application papers and place us on the next available agenda. Feel free to contact me for any additional information required.

Cordially,

*Curt Walter*

Curt Walter  
On behalf of AT&T Mobility

**On behalf of AT&T Mobility**

**Zoning Permit Proposal**

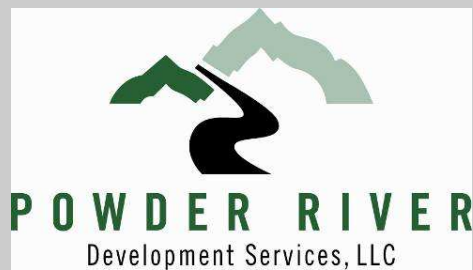
**for**

**City of Independence**

**Independence, Minnesota**

*Prepared by*

Curt Walter



July 24, 2019

**On behalf of AT&T Mobility**

**SITE PLAN**

**- TABLE OF CONTENTS -**

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- 1. OBJECTIVES AND BENEFITS**
- 2. SITE MAP**
- 3. SITE SKETCH**
- 4. ZONING MAP**
- 5. SITE SKETCH**

## **On behalf of AT&T Mobility**

### **City of Independence Independence, Minnesota**

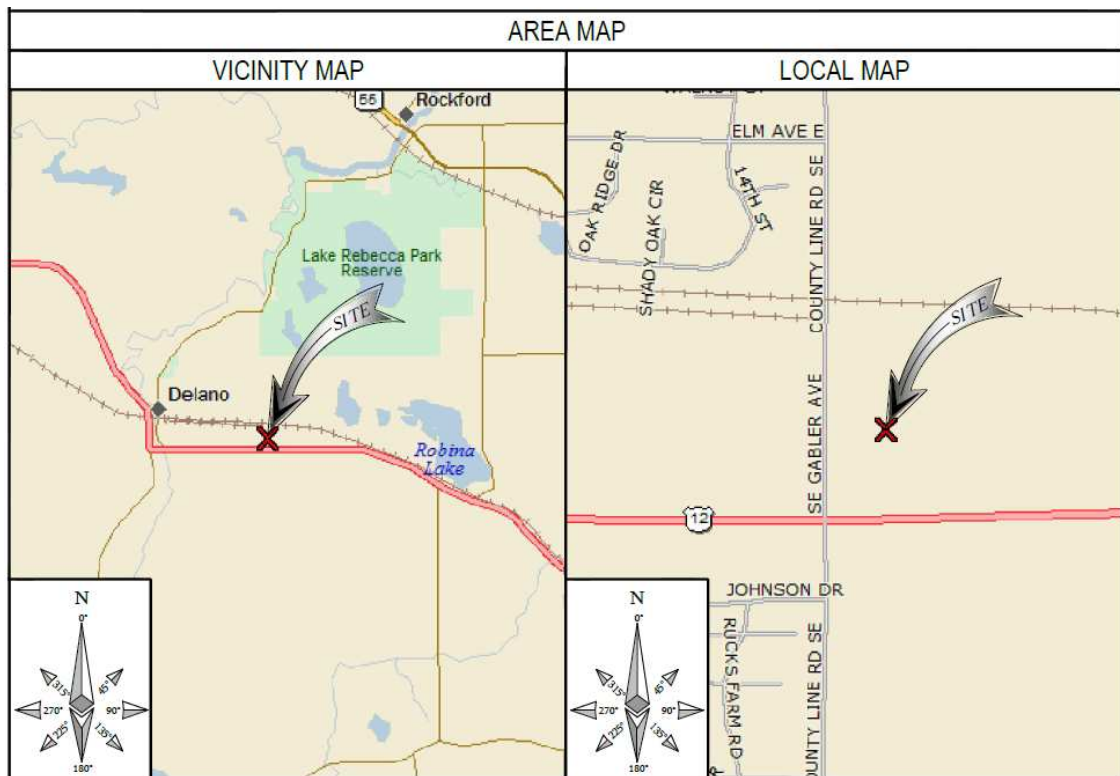
#### **OBJECTIVES:**

Improve AT&T wireless level of service in the Independence and Delano areas. This proposed cellular tower will enhance their already established network in Minnesota. This site will provide a clearer, stronger and more reliable signal for wireless residents in Independence and Delano and along Highway 12 and surrounding roads.

#### **BENEFITS TO THE COMMUNITY:**

- Improved cellular reception and expanded service area.
- Probable source of communications at time of natural disaster.
- Communications link for personal safety and roadside emergencies.
- Available for expansion into future technology with wireless communications industry & 911 interface capability.
- Site will be made available for collocation with other wireless carriers

## SITE MAP
















## ZONING MAP

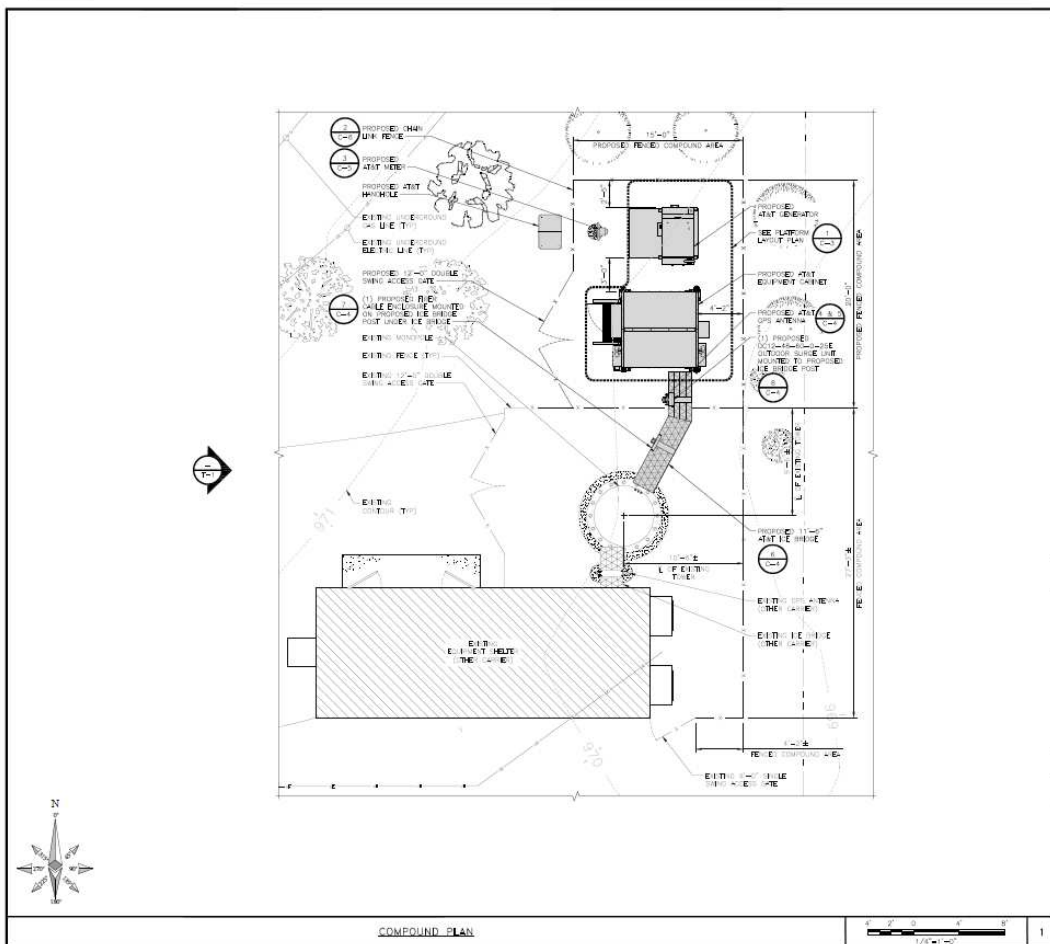
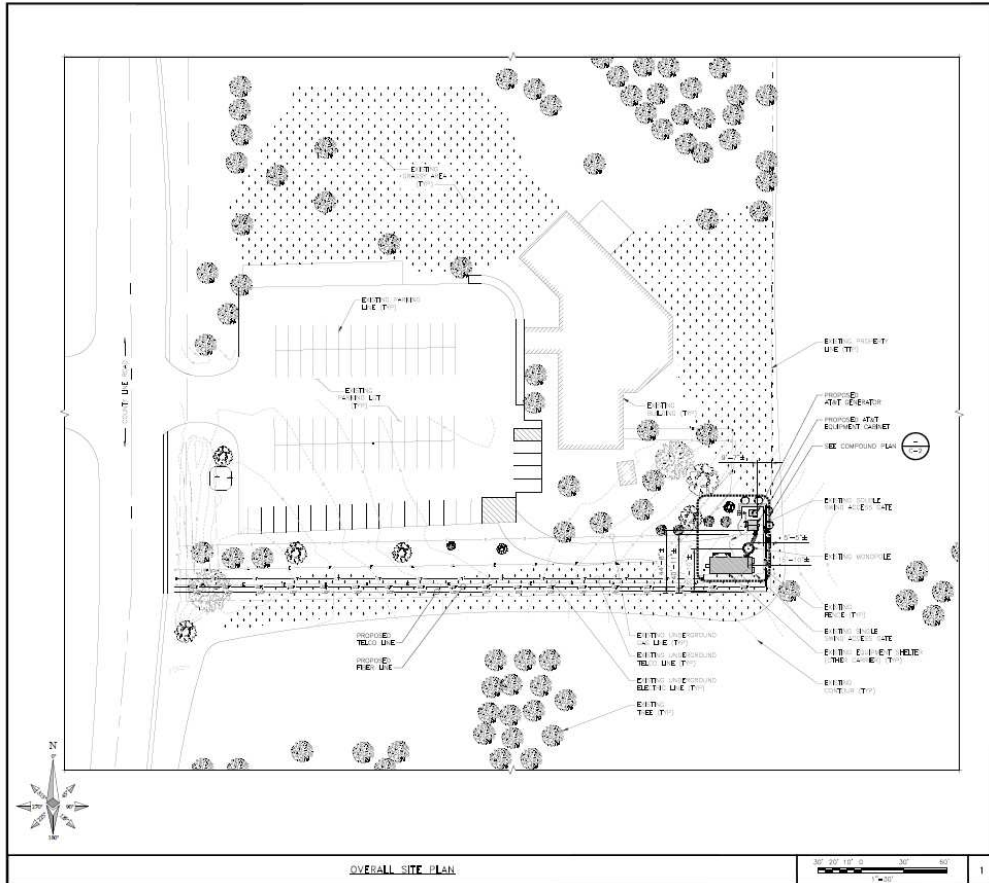


### ZONING DISTRICTS

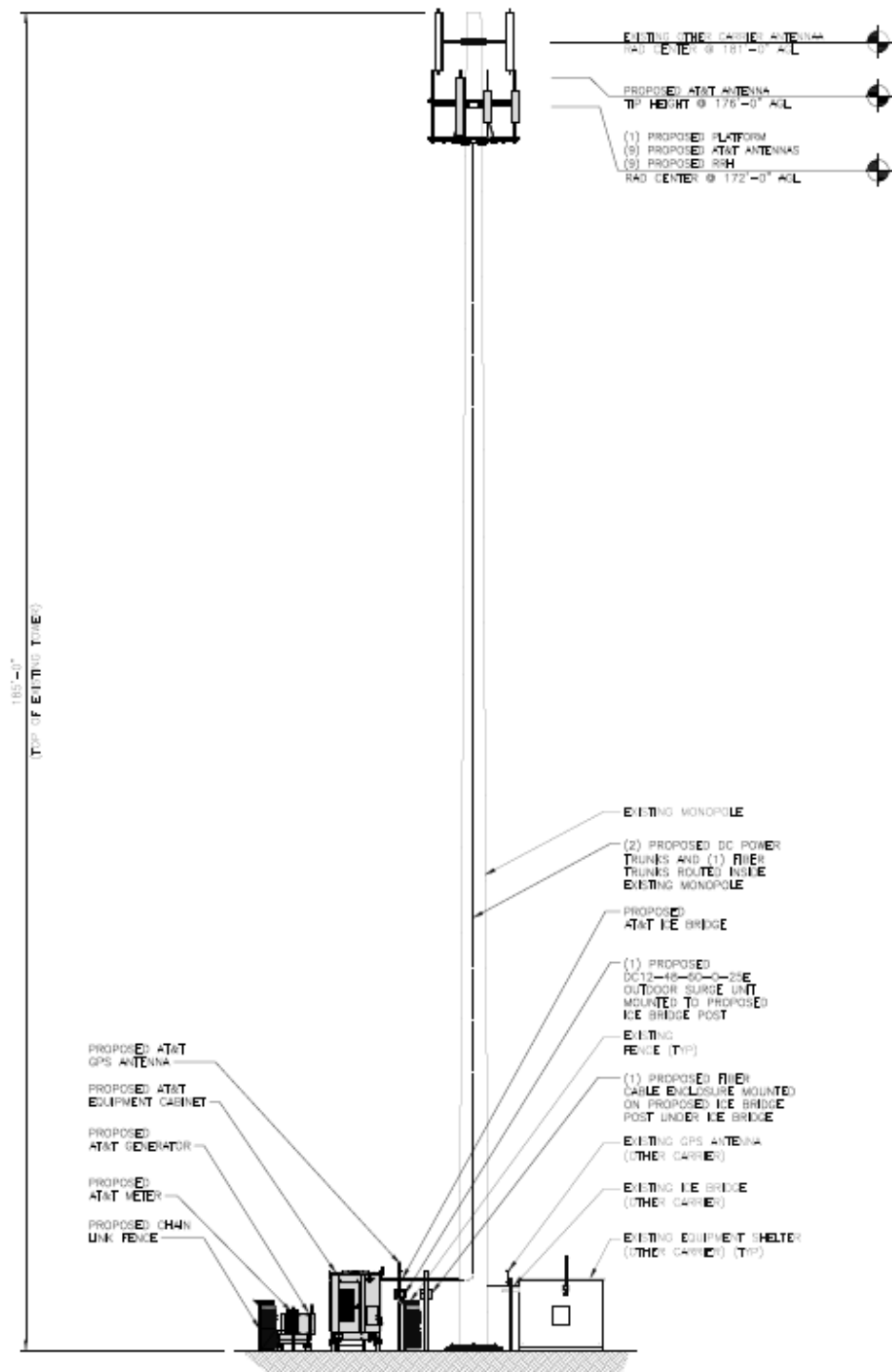
	<b>Agriculture</b>		<b>Railroad</b>
	<b>Commercial/Light Industrial</b>		<b>Waterway</b>
	<b>Rural Residential</b>		<b>Watershed</b>
	<b>Sewered Residential</b>		<b>Luce Line Trail</b>
	<b>Agriculture Preserve</b>		<b>MnDOT Section Line</b>
	<b>Conditional Use Permit</b>		



## SITE SKETCH



## SITE SKETCH



SITE PHOTO

PROJECT INFORMATION

SITE ADDRESS:

3310 COUNTY LINE ROAD SE  
DELANO, MN 55328

COUNTY

HENNEPIN

SITE NAME:

DELANO COUNTY LINE

AT&T SITE ID

MNL01123

FA NUMBER:

11571089

PACE NUMBER:

MRUMW004702  
MRUMW025729  
MRUMW025728

PTN NUMBER:

3511A0DSL0  
3511A0H5SG  
3511A0H5SH

USID NUMBER:

229192

LATITUDE (NAD 83):

45° 02' 14.198" N  
45.037277

LONGITUDE (NAD 83):

93° 45' 54.700" W  
-93.765194

GROUND ELEVATION:

970.1' AMSL

ZONING DISTRICT:

NA

TOWER OWNER:

DELANO UNITED METHODIST CHURCH  
3310 COUNTY LINE ROAD SE  
INDEPENDENCE, MN 55328

OWNER SITE NAME:

DELANO COUNTY LINE

OWNER SITE NUMBER:

NA

LANDLORD CONTACT:

MARTY HOWES  
(763) 258-6969  
HOWESMD@YAHOO.COM

GROUND OWNER:

GROUND OWNER

OCCUPANCY GROUP:

U

CONSTRUCTION TYPE:

I-B

AT&T PROJECT MANAGER:

PETER MCENERY  
(952) 258-9629  
PM753T@ATT.COM

B&V SITE ACQUISITION MANAGER:

KATE HUNTER  
(612) 206-7756  
HUNTERK@BV.COM

B&V CONSTRUCTION MANAGER:

MITCH LONNIE  
(952) 896-0880  
LONNEEM@OVERLANDCONTRACTING.COM

B&V LEAD ENGINEER:

CASEY TIJERINA  
(952) 896-0842  
TIJERINACL@BV.COM

AT&T  
MOBILITY  
PROJECT: NSB - WIC  
AT&T SITE ID: MNL01123  
FA#: 11571089  
PACE#: MRUMW004702  
PTN#: 3511A0DSL0

DELANO COUNTY LINE  
DELANO, MN 55328

AREA MAP

VICINITY MAP

LOCAL MAP

DRIVING DIRECTIONS

DIRECTIONS FROM AT&T OFFICE:  
GO STRAIGHT (SOUTH SOUTHWEST) ON SOUTHTOWN DR TURN RIGHT (WEST SOUTHWEST) ONTO W 80TH ST TURN RIGHT (NORTH) ONTO CR 17 KEEP RIGHT (NORTHWEST) ONTO I-494 RAMP TAKE EXIT 19B KEEP RIGHT (WEST NORTHWEST) ONTO US 12 RAMP KEEP RIGHT (WEST NORTHWEST) ONTO BELTLINE EXPY TURN RIGHT (NORTH) ONTO SE GABLER AVE ARRIVE 3310 COUNTY LINE ROAD SE, DELANO, MN 55328.

ENGINEERING

2012 INTERNATIONAL BUILDING CODE  
2017 NATIONAL ELECTRIC CODE  
2015 MINNESOTA BUILDING CODE  
TIA/EIA-222-G OR LATEST EDITION

REFERENCE MATERIALS

THESE LTE DRAWINGS ARE BASED ON AT&T RFDS DOCUMENT DATED 11/19/18.  
CONTRACTOR SHALL USE THE LATEST VERSION OF THE RFDS WITH THE CONSTRUCTION DRAWINGS PER THE SCOPE OF WORK.

DRAWING INDEX

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COVER

TITLE SHEET

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COMPOUND PLAN

C-3

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C-4

SITE DETAILS

C-5

SITE DETAILS

C-6

CHAINLINK FENCE DETAILS

C-7

SIGNAGE DETAILS

C-8

SPECIAL INSPECTIONS

C-9

CONCRETE WORK NOTES

C-10

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LEGEND AND ABBREVIATIONS

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GENERAL NOTES

LS-1

LANDSCAPE PLAN

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN MINNESOTA, CALL GOPHER STATE ONE CALL  
TOLL FREE: 1-800-252-1166 OR  
FAX A LOCATE: 1-800-236-4967  
MIN. STATUTE. REQUIRES MIN OF 48 HOURS NOTICE BEFORE YOU EXCAVATE.

-THESE PLANS CONFORM TO ALL OF THE REQUIREMENTS CALLED OUT IN THE JURISDICTION PLANNING AND ZONING FOR ANTENNAS AND SUPPORT STRUCTURES WHERE SITE IS LOCATED.  
-SUBCONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING CONDITIONS ON SITE. IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PERFORMING ANY WORK OR BE RESPONSIBLE FOR THE SAME

AT&T  
MOBILITY  
7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431

BLACK & VEATCH  
BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO:

129049.4004

DRAWN BY:

VPB

CHECKED BY:

JAT

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB - WIC

SHEET TITLE

TITLE SHEET

SHEET NUMBER

COVER

THIS DRAWING IS  
NOT A SITE SURVEY

THE PURPOSE OF THIS DRAWING IS  
TO SHOW HOW THE DEVELOPED SITE  
RELATES TO THE PARENT PARCEL  
AND ADJACENT PROPERTIES.

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SUITE 1200  
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PROJECT NO: 129049.4004

DRAWN BY: VPB

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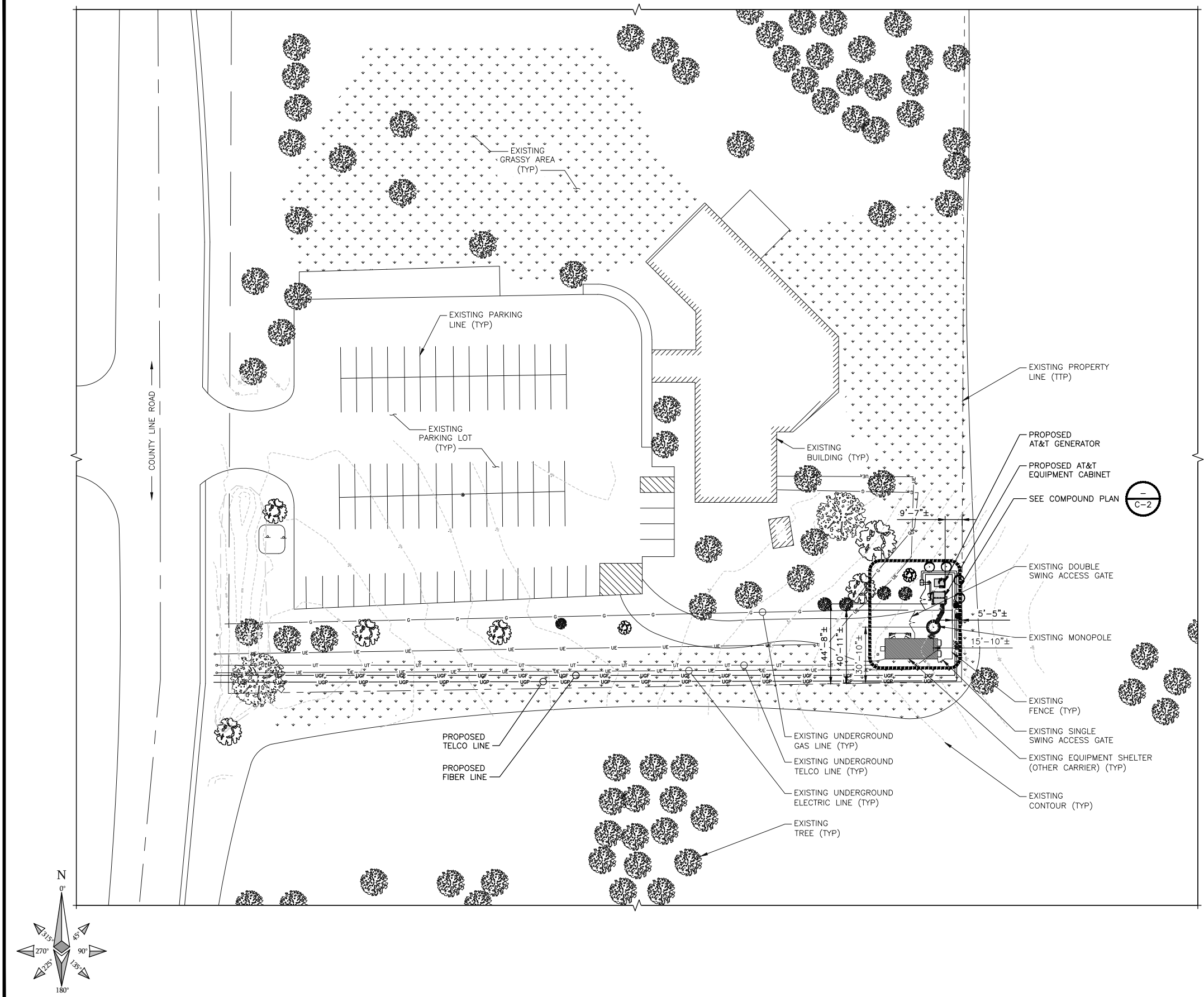
0	07/24/19	ISSUED FOR CONSTRUCTION
REV	DATE	DESCRIPTION

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NSB - WIC

SHEET TITLE  
**OVERALL SITE PLAN**

SHEET NUMBER  
**C-1**



OVERALL SITE PLAN

30' 20' 10' 0' 30' 60'  
1"=30'

1

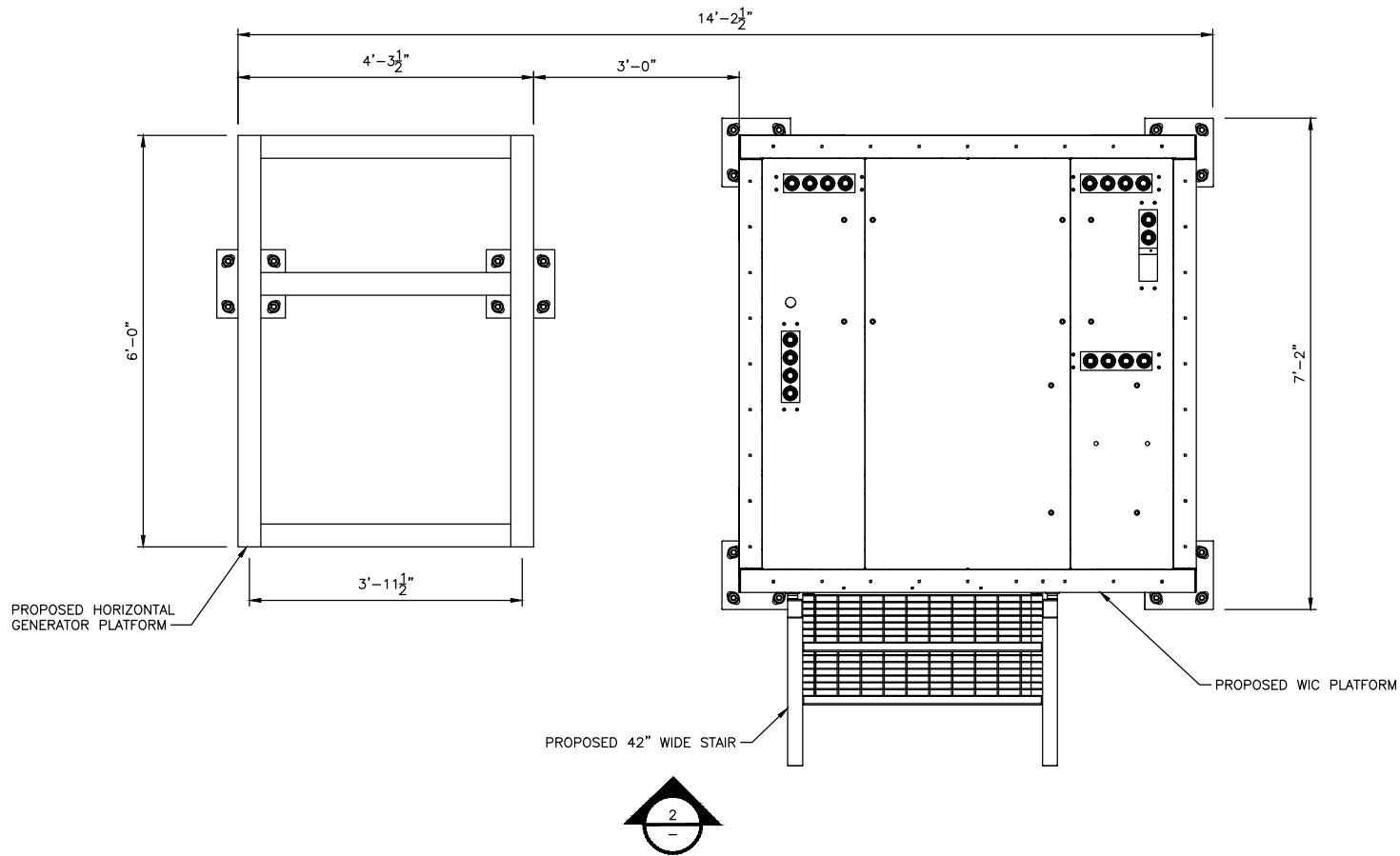
NOTES



AT&T TO VERIFY  
REQUIRED PLATFORM  
EQUIPMENT.

## LEGEND

**C-2**

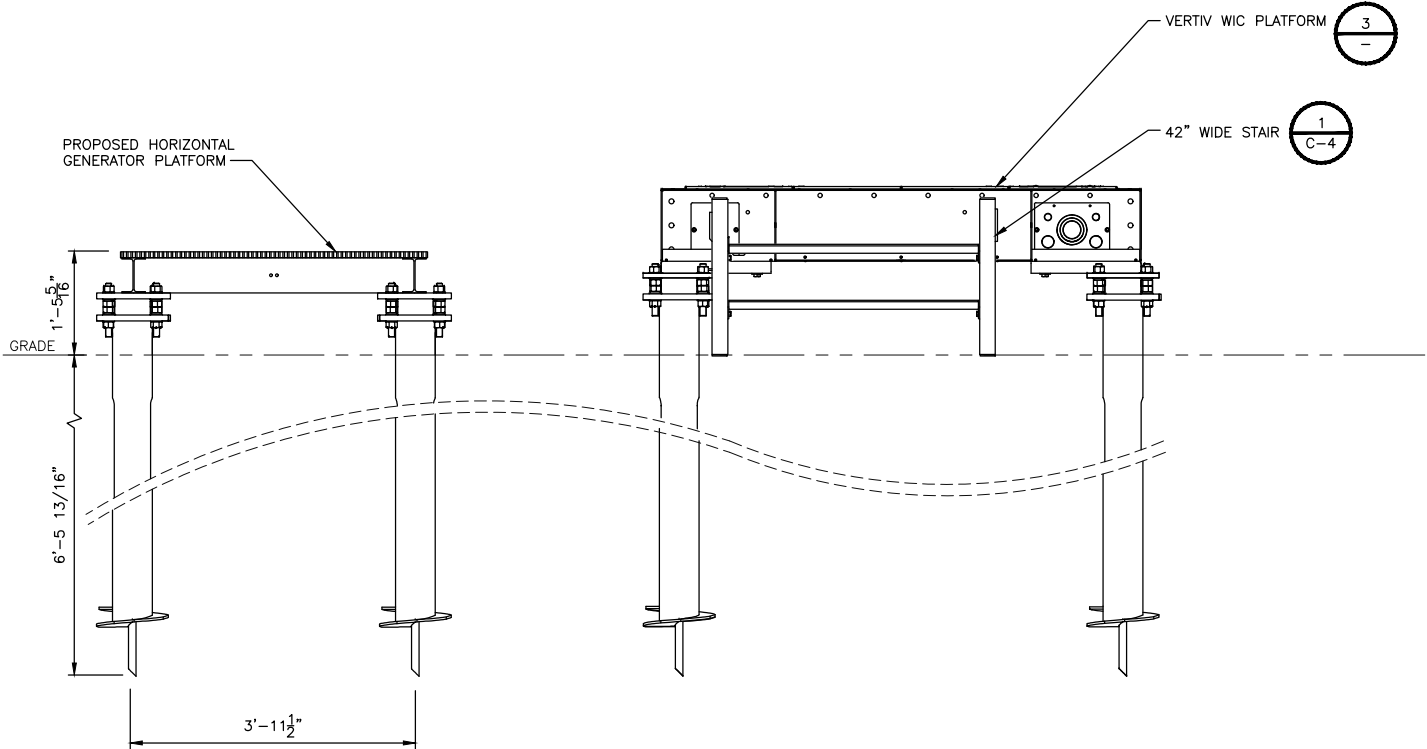


WIC PLATFORM LAYOUT PLAN

NO SCALE

1

NOTE:  
1. DRAWINGS ARE FOR GRAPHIC REPRESENTATION OF THE FINAL ASSEMBLY. CONTRACTOR MUST REFERENCE MANUFACTURERS DRAWINGS PRIOR TO CONSTRUCTION.

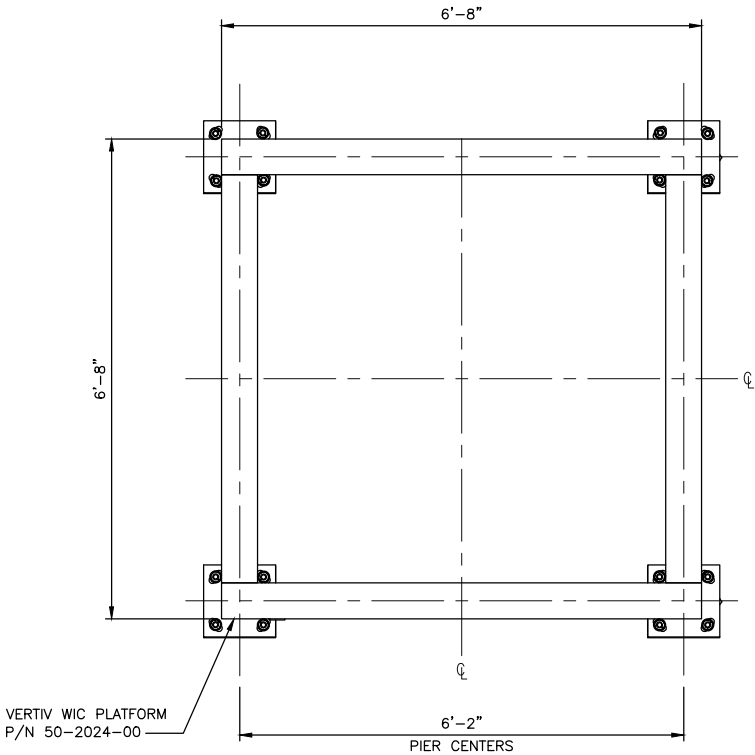


WIC PLATFORM ELEVATION

NO SCALE

2

NOTE:  
1. DRAWINGS ARE FOR GRAPHIC REPRESENTATION OF THE FINAL ASSEMBLY. CONTRACTOR MUST REFERENCE MANUFACTURERS DRAWINGS PRIOR TO CONSTRUCTION.  
2. PLATFORM SHOWN IS FOR THE VERTIV WALK-IN-CABINET P/N F2016017-P.FORM-FC (FULLY ASSEMBLED) OR F2016019-P.FORM-PC (BUILD ON SITE)



WIC PLATFORM PLAN

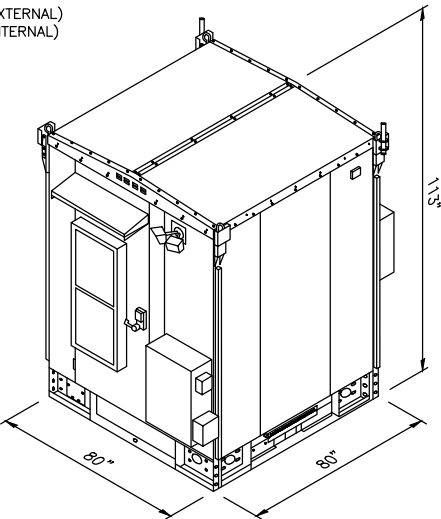
NO SCALE

3

VERTIV - XTE 801, 6'x6' WALK IN CABINET (WIC)

DIMENSIONS, HxWxD: 113.0"x80.0"x80.0" (EXTERNAL)  
105.0"x72.0"x72.0" (INTERNAL)

WEIGHT: ~4000 lbs (EMPTY)  
~7000 lbs (FULL)



WALK IN CABINET DETAIL

NO SCALE

4

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BLACK & VEATCH

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SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO: 129049.4004  
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CHECKED BY: JAT

REV	DATE	DESCRIPTION
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DELANO COUNTY LINE  
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NSB - WIC

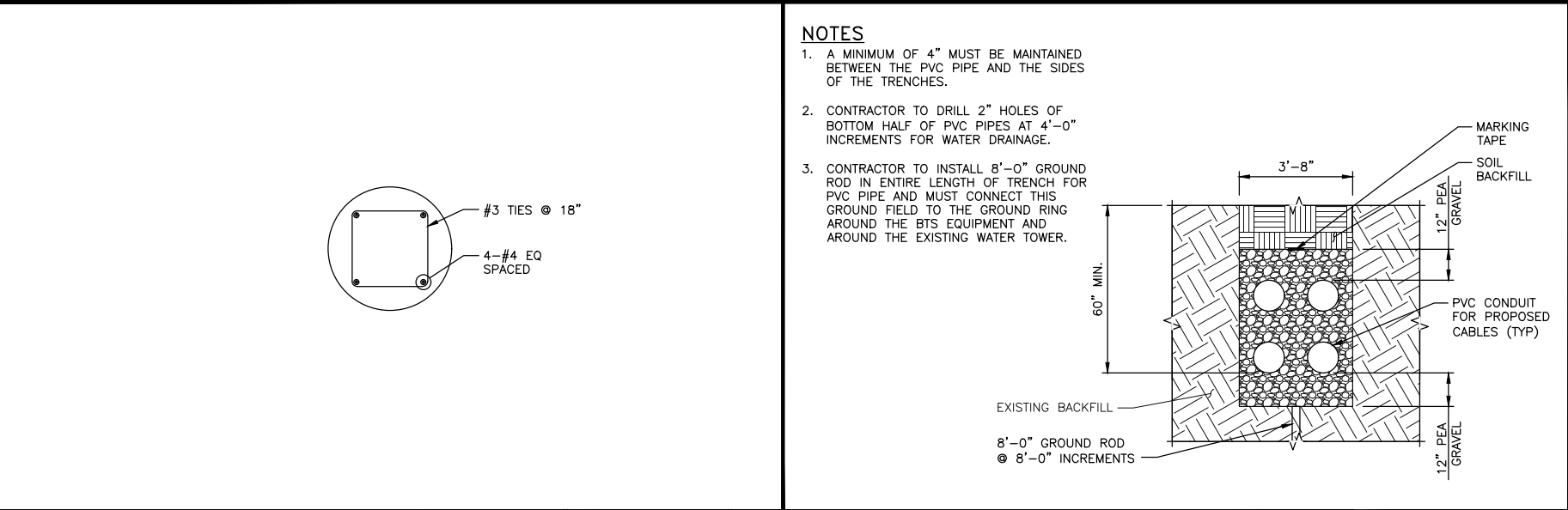
SHEET TITLE  
EMI - WIC  
PLATFORM  
W/GENERATOR

SHEET NUMBER

C-3







H-FRAME FOOTING

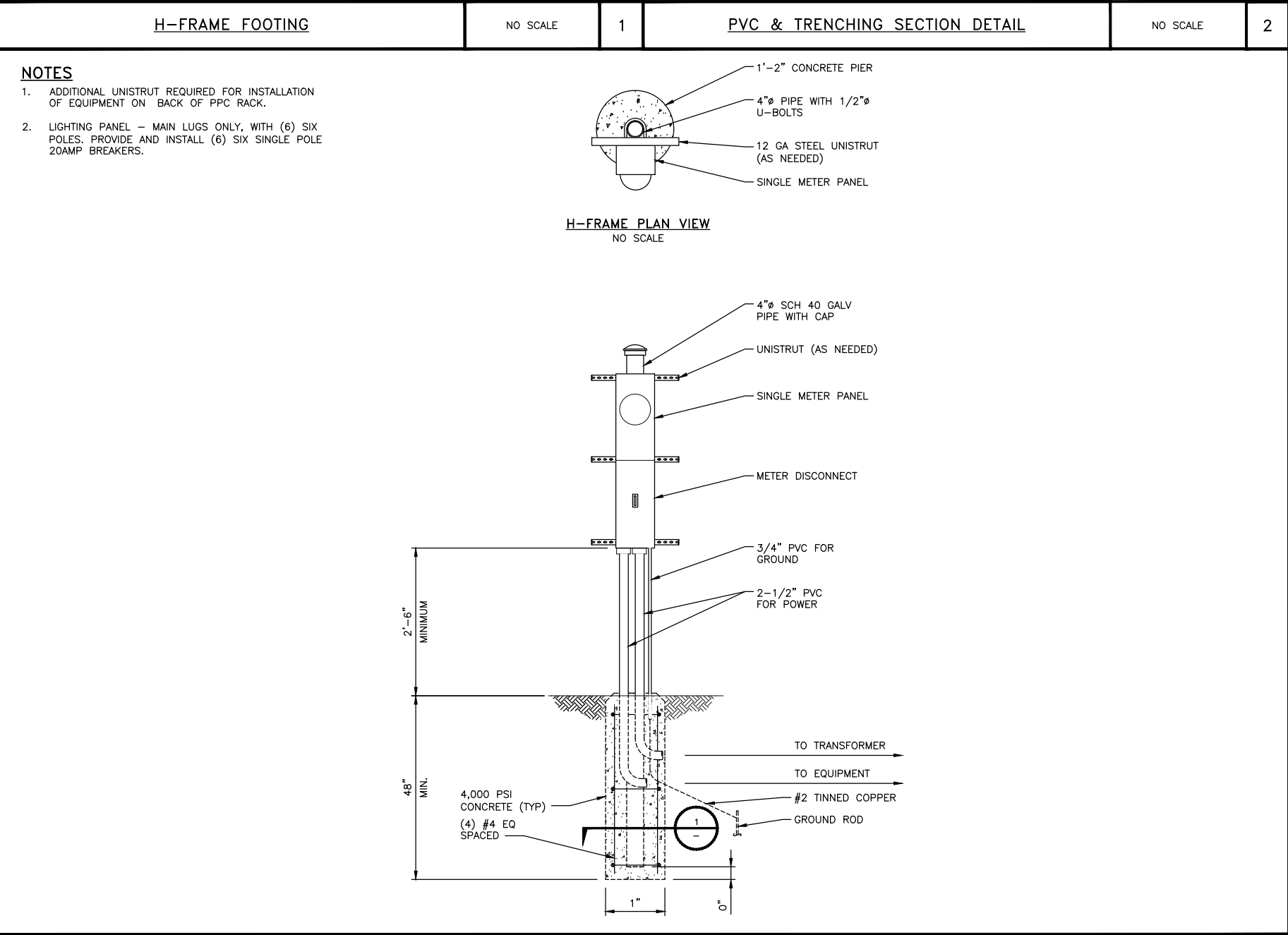
NO SCALE

1

PVC & TRENCHING SECTION DETAIL

NO SCALE

2



H-FRAME DETAIL

NO SCALE


3

NOT USED

4

AT&T  
MOBILITY

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3RD FLOOR  
BLOOMINGTON MN 55431



BLACK & VEATCH

BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO:

129049.4004

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DELANO COUNTY LINE  
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DELANO, MN 55328  
NSB - WIC

SHEET TITLE

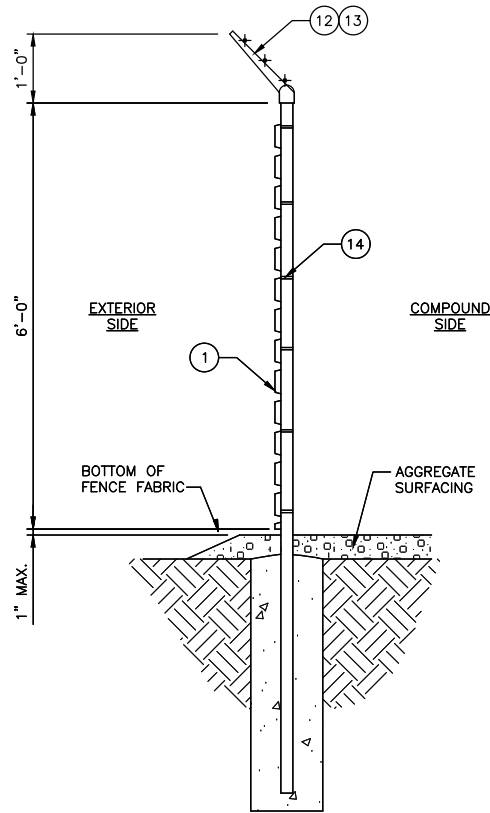
SITE DETAILS

SHEET NUMBER

C-5

58





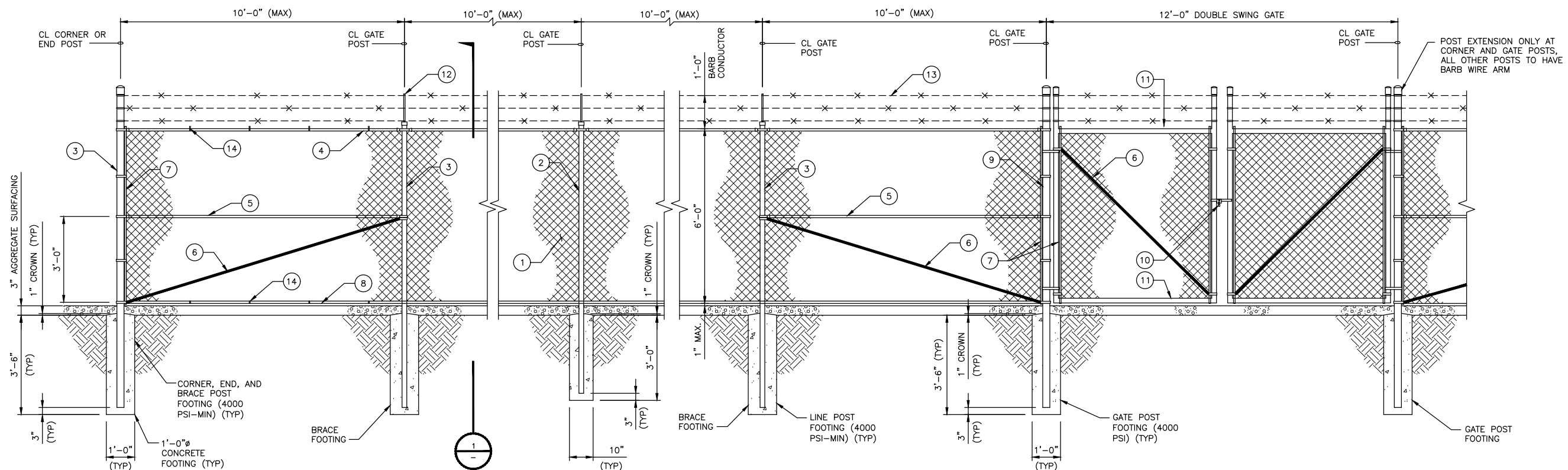
- ① CHAIN LINK RESIDENTIAL FABRIC: 11-1/2 GAUGE, 2-1/4" MESH; GALVANIZED ASTM-A392, CLASS 2; TWISTED SELVAGE ON TOP, KNUCKLED ON BOTTOM.
- ② LINE POSTS: 2-1/2" O.D. PIPE, 16 GAUGE (GALVANIZED) PER ASTM-F1083.
- ③ CORNER, END AND BRACE POSTS: 2-7/8" O.D. PIPE, SCHEDULE 40 (GALVANIZED).
- ④ TOP RAIL: 1-5/8" O.D. 17 GAUGE PIPE (GALVANIZED) PER ASTM-F1083.
- ⑤ BRACE RAIL: 1-5/8" O.D. 17 GAUGE PIPE (GALVANIZED).
- ⑥ DIAGONAL TRUSS ROD: 3/8" GALVANIZED ROD WITH TURNBUCKLE.
- ⑦ TENSION BAR: 3/16" X 3/4" GALVANIZED FLAT BAR.
- ⑧ BOTTOM TENSION WIRE: GALVANIZED OR ALUMINUM COATED COIL SPRING WIRE, 7 GAUGE.
- ⑨ GATE POSTS: 2-7/8" O.D. SCHEDULE 40 PIPE (GALVANIZED).
- ⑩ COMBINATION PADLOCK ACCORDING TO AT&T REQUIREMENTS.
- ⑪ GATE FRAMES: 1-7/8" O.D. SCHEDULE 40 PIPE (GALVANIZED).
- ⑫ BARBED WIRE SUPPORT ARM: SINGLE ARM TYPE (GALVANIZED). ARM SHALL BE INCLINED OUTWARD AT AN ANGLE OF 45 DEGREES.
- ⑬ BARBED WIRE: GALVANIZED, ASTM A121 CLASS 3; THREE 14 GAUGE MINIMUM STEEL WIRES WITH 4 POINT ROUND 14 GAUGE BARBS SPACED 4" APART.
- ⑭ FABRIC TIES: ALUMINUM BANDS OR WIRES. FABRIC SHALL BE ATTACHED TO THE TOP RAIL AND BOTTOM TENSION WIRE AT 24" CENTERS AND TO THE POSTS AT 15" CENTERS, ALL ON THE COMPOUND SIDE OF THE FENCE.
- ⑮ MISCELLANEOUS:
- A. RAIL COUPLINGS: SLEEVE TYPE, 6" LONG EXPANSION SPRING EVERY FIFTH COUPLING.
- B. POST TOPS: PRESSED STEEL, MALLEABLE IRON WITH PRESSED STEEL EXTENSION ARM, OR ONE-PIECE ALUMINUM CASTING; WITH HOLE FOR TOP, ALL DESIGNED TO FIT OVER THE OUTSIDE OF THE POSTS AND TO PREVENT ENTRY OF MOISTURE INTO TUBULAR POSTS.
- C. LATCHES SHALL BE FORKED TYPE AND SHALL BE ARRANGED FOR PADLOCKING WITH THE PADLOCK ACCESSIBLE FROM BOTH SIDES OF THE GATE.
- D. KEEPERS SHALL CONSIST OF MECHANICAL DEVICES FOR SECURING AND SUPPORTING THE FREE END OF THE GATES WHEN IN THE FULL OPEN POSITION. KEEPERS SHALL BE MOUNTED ON 2-7/8" O.D. PIPE POSTS FILLED WITH CONCRETE AND SET IN CONCRETE FOUNDATIONS.
- E. INSTALL FENCING PER ASTM-F567.
- F. INSTALL SWING GATES PER ASTM-F900.
- G. LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLETED IF REQUIRED.
- H. USE GALVANIZED HIG-RING WIRE TO MOUNT ALL SIGNS.
- I. ALL SIGNS MUST BE MOUNTED ON INSIDE OF FENCE.
- J. ALL POSTS SHALL HAVE "MUSHROOM" SLEEVE EMBEDDED IN CONCRETE.

CHAINLINK FENCE SECTION

NO SCALE

1

MATERIAL DESCRIPTION



CHAINLINK FENCE ELEVATION

NO SCALE

2

**AT&T  
MOBILITY**

7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431

**BLACK & VEATCH**

BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO: 129049.4004  
DRAWN BY: VPB  
CHECKED BY: JAT

REV	DATE	DESCRIPTION
0	07/24/19	ISSUED FOR CONSTRUCTION

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DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB - WIC

SHEET TITLE  
CHAINLINK FENCE  
DETAILS

SHEET NUMBER  
**C-6**

<div><div>NOTICE</div><div></div><div>Beyond This Point you are entering a controlled area where RF emissions may exceed the FCC General Population Exposure Limits.</div><div>Follow all posted signs and site guidelines for working in a RF environment.</div><div>Ref: 47CFR 1.1307(b)</div></div> <div><div>CAUTION</div><div></div><div>Beyond This Point you are entering a controlled area where RF emissions may exceed the FCC Occupational Exposure Limits.</div><div>Obey all posted signs and site guidelines for working in a RF environment.</div><div>Ref: 47CFR 1.1307(b)</div></div>		<div><div><div>023</div></div><div>ALERTING SIGN (FOR CELL SITE BATTERIES)</div></div> <div><div><div>201</div></div><div>ALERTING SIGN (FOR DIESEL FUEL)</div></div> <div><div><div>401</div></div><div>ALERTING SIGN (FOR PROPANE)</div></div>		<div>AT&amp;T MOBILITY</div> <div>7900 XERXES AVE S 3RD FLOOR BLOOMINGTON MN 55431</div> <div><div></div><div>BLACK &amp; VEATCH</div><div>BLACK &amp; VEATCH CORPORATION 7760 FRANCE AVENUE SOUTH SUITE 1200 BLOOMINGTON, MN 55435</div></div> <div><div>PROJECT NO: 129049.4004</div><div>DRAWN BY: VPB</div><div>CHECKED BY: JAT</div></div> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td>0</td><td>07/24/19</td><td>ISSUED FOR CONSTRUCTION</td></tr><tr><td>REV</td><td>DATE</td><td>DESCRIPTION</td></tr></table> <div>IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.</div> <div>DELANO COUNTY LINE MNL01123 3310 COUNTY LINE ROAD SE DELANO, MN 55328 NSB – WIC</div> <div>SHEET TITLE</div> <div>SIGNAGE DETAILS</div> <div>SHEET NUMBER</div> <div>C-7</div>																										0	07/24/19	ISSUED FOR CONSTRUCTION	REV	DATE	DESCRIPTION																																																																																																																
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REV	DATE	DESCRIPTION																																																																																																																																																	
<div>ALERTING SIGNS</div> <div><div><div>WARNING!</div><div>DANGER DO NOT TOUCH TOWER!</div><div>SERIOUS "RF" BURN HAZARD!</div><div>MAINTAIN AN ADEQUATE CLEARANCE BETWEEN TOWER SUPPORTS AND GUY WIRES</div><div>FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN A RADIO FREQUENCY ENVIRONMENT COULD RESULT IN SERIOUS INJURY. CONTACT CURRENT MAY EXCEED LIMITS PRESCRIBED IN ANSI/IEEE C95.1-1992 FOR CONTROLLED ENVIRONMENTS.</div><div></div></div><div><div>Property of AT&amp;T</div><div>Authorized Personnel Only</div><div>In case of emergency, or prior to performing maintenance on this site, call 800-638-2822 and reference cell site number FA# _____</div><div></div></div></div> <div><div>ALERTING SIGN</div><div>INFO SIGN #4</div></div> <div><div><div>INFORMATION</div><div>AT&amp;T Mobility operates telecommunications antennas at this location. Remain at least 3 feet away from any antenna and obey all posted signs.</div><div>Contact the owner(s) of the antenna(s) before working closer than 3 feet from the antenna.</div><div>Contact AT&amp;T Mobility at 800-638-2822 prior to performing any maintenance or repairs near AT&amp;T Mobility antennas.</div><div>This is Site# _____</div><div>Contact the management office if this door/hatch/gate is found unlocked.</div></div><div><div>INFORMACION</div><div>En esta propiedad se ubican antenas de telecomunicaciones operadas por AT&amp;T Mobility. Favor mantener una distancia de no menos de 3 pies y obedecer todos los avisos.</div><div>Comuníquese con el propietario o los propietarios de las antenas antes de trabajar o caminar a una distancia de menos de 3 pies de la antena.</div><div>Comuníquese con AT&amp;T Mobility 800-638-2822 antes de realizar cualquier mantenimiento o reparaciones cerca de la antena de AT&amp;T Mobility.</div><div>Esta es la estación base número _____</div><div>Favor comunicarse con la oficina de la administración del edificio si esta puerta o compuerta se encuentra sin candado.</div></div><div><div>STAY BACK 3 FEET FROM ANTENNA</div><div></div></div></div> <table><tr><th>Structure Type</th><th>INFO SIGN #1</th><th>INFO SIGN #2</th><th>INFO SIGN #3</th><th>INFO SIGN #4</th><th>Striping</th><th>NOTICE SIGN</th><th>CAUTION SIGN</th></tr><tr><td>Towers</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Monopole/Monopine/Monopalm</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td>climbing side of the Tower</td><td>On backside of Antennas</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td></td><td></td><td>At the height of the first climbing step, min. 9ft above ground</td></tr><tr><td>SCE Towers/ Towers with high voltage</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td>climbing side of the Tower</td><td>On backside of Antennas</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td></td><td></td><td>At the height of the first climbing step, min. 9ft above ground</td></tr><tr><td>Light Poles / Flag Poles</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td>on the pole, no less than 3ft below the Antenna and no less than 9ft above ground</td><td>On backside of Antennas</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td></td><td></td><td></td></tr><tr><td>Utility Wood Poles (JPA)</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td>on the pole, no less than 3ft below the Antenna and no less than 9ft above ground</td><td>On backside of Antennas</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td></td><td>If GP max value of MPE at antenna level is: 0-99%: Notice sign; over 99%: Caution sign at no less than 3ft below antenna and 9ft above ground</td><td></td></tr><tr><td>Microcells mounted on non-JPA poles</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td>on the pole, no less than 3ft below the Antenna and no less than 9ft above ground</td><td>On backside of Antennas</td><td>entrance gates, shelter doors OR on the outdoor cabinets</td><td></td><td>Notice or Caution sign at no less than 9ft above ground; only if the exposure exceeds 90% of the General Public exposure at 6ft above ground or at outside surface of adjacent buildings</td><td></td></tr><tr><td>Roof Tops</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>At all access points to the roof</td><td>X</td><td></td><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td>On Antennas</td><td>X</td><td></td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>Concealed Antennas</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td>antennas mounted facing outside the building</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td>antennas on support structure</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td>Roofview Graph:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Radiation area is within 3ft from antenna</td><td>X</td><td>adjacent to each antenna</td><td></td><td>X</td><td></td><td></td><td></td></tr><tr><td>Radiation area is beyond 3ft from antenna</td><td>X</td><td>adjacent to each antenna</td><td></td><td>X</td><td>diagonal, yellow striping as to Roofview graph</td><td>either Notice or Caution sign (based on Roofview results) at antennas/barrier</td><td></td></tr><tr><td>Church Steeples</td><td>Access to steeple</td><td>adjacent to antennas if antennas are concealed</td><td>On backside of Antennas</td><td>Access to steeple</td><td></td><td></td><td>Caution sign at the antennas</td></tr><tr><td>Water Stations</td><td>Access to ladder</td><td>adjacent to antennas if antennas are concealed</td><td>On backside of Antennas</td><td>Access to ladder</td><td></td><td></td><td>Caution sign beside Info sign #1, min. 9ft above ground</td></tr></table> <div>Notes for Rooftop sites: 1. Either NOTICE or CAUTION signs need to be posted at each sector as close as possible to: the outer edge of the striped off area or the outer antennas of the sector. 2. If Roofview shows: only blue = Notice Sign, blue and yellow = Caution Sign, only yellow = Caution Sign to be installed. 3. Should the required striping area interfere with any structures or equipment (A/C, vents, roof hatch, doors, other antennas, dishes, etc.), please notify AT&amp;T to modify the striping area, prior to starting the work</div>		Structure Type	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	Striping	NOTICE SIGN	CAUTION SIGN	Towers								Monopole/Monopine/Monopalm	entrance gates, shelter doors OR on the outdoor cabinets	climbing side of the Tower	On backside of Antennas	entrance gates, shelter doors OR on the outdoor cabinets			At the height of the first climbing step, min. 9ft above ground	SCE Towers/ Towers with high voltage	entrance gates, shelter doors OR on the outdoor cabinets	climbing side of the Tower	On backside of Antennas	entrance gates, shelter doors OR on the outdoor cabinets			At the height of the first climbing step, min. 9ft above ground	Light Poles / Flag Poles	entrance gates, shelter doors OR on the outdoor cabinets	on the pole, no less than 3ft below the Antenna and no less than 9ft above ground	On backside of Antennas	entrance gates, shelter doors OR on the outdoor cabinets				Utility Wood Poles (JPA)	entrance gates, shelter doors OR on the outdoor cabinets	on the pole, no less than 3ft below the Antenna and no less than 9ft above ground	On backside of Antennas	entrance gates, shelter doors OR on the outdoor cabinets		If GP max value of MPE at antenna level is: 0-99%: Notice sign; over 99%: Caution sign at no less than 3ft below antenna and 9ft above ground		Microcells mounted on non-JPA poles	entrance gates, shelter doors OR on the outdoor cabinets	on the pole, no less than 3ft below the Antenna and no less than 9ft above ground	On backside of Antennas	entrance gates, shelter doors OR on the outdoor cabinets		Notice or Caution sign at no less than 9ft above ground; only if the exposure exceeds 90% of the General Public exposure at 6ft above ground or at outside surface of adjacent buildings		Roof Tops								At all access points to the roof	X			X				On Antennas	X		X	X				Concealed Antennas	X	X		X				antennas mounted facing outside the building	X	X		X				antennas on support structure	X	X		X				Roofview Graph:								Radiation area is within 3ft from antenna	X	adjacent to each antenna		X				Radiation area is beyond 3ft from antenna	X	adjacent to each antenna		X	diagonal, yellow striping as to Roofview graph	either Notice or Caution sign (based on Roofview results) at antennas/barrier		Church Steeples	Access to steeple	adjacent to antennas if antennas are concealed	On backside of Antennas	Access to steeple			Caution sign at the antennas	Water Stations	Access to ladder	adjacent to antennas if antennas are concealed	On backside of Antennas	Access to ladder			Caution sign beside Info sign #1, min. 9ft above ground	<div>INFO SIGN #1</div> <div>INFO SIGN #2</div> <div>INFO SIGN #3</div> <div>SIGNAGE GUIDELINES CHART</div>	
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LIST OF SPECIAL INSPECTIONS	
	LIST OF ITEMS REQUIRING SPECIAL INSPECTIONS
	<div><div></div><div>INSPECTION OF REINFORCING STEEL, INCLUDING PRE-STRESSING TENDONS, AND PLACEMENT PER SECTION 1910.4 OF THE IBC.</div></div> <div><div></div><div>INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS PER SECTION 1909.1 OF THE IBC.</div></div> <div><div></div><div>AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATED SPECIMENS FOR STRENGTH TEXT, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE PER SECTION 1910.10 OF THE IBC.</div></div> <div><div></div><div>INSPECTIONS OF SOILS PER TABLE 1705.6 OF THE IBC.</div></div>

TABLE 1704.3					
VERIFICATION AND INSPECTION		CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:					
a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	—	X	ACI 360, SEC. A3.3, APPLICABLE ASTM MATERIAL STANDARDS	—	
b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	—	X	—	—	
2. INSPECTION OF HIGH-STRENGTH BOLTING:					
a. SNUG-TIGHT JOINTS	—	X	ACI 360, SEC. A3.3, APPLICABLE ASTM MATERIAL STANDARDS	1704.3.3	
b. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCHMARKING, TWIST-OFF BOLT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION.	—	X			
c. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCHMARKING OR CALIBRATED WRENCH METHODS OF INSTALLATION.	X	—			
3. MATERIAL VERIFICATION OF STRUCTURAL STEEL AND COLD-FORMED STEEL DECK:					
a. FOR STRUCTURAL STEEL, IDENTIFICATION MARKINGS TO CONFORM TO AISC 360.	—	X	ACI 360, SEC. M5.5		
b. FOR OTHER STEEL, IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	—	X	APPLICABLE ASTM MATERIAL STANDARDS		
c. MANUFACTURER'S CERTIFIED TEST REPORTS.	—	X			
4. MATERIAL VERIFICATION OF WELD FILLER MATERIALS:					
a. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.	—	X	AISC 360, SEC. A3.5 AND APPLICABLE AWS A5 DOCUMENTS	—	
b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	—	X	—	—	
5. INSPECTION OF WELDING:					
a. STRUCTURAL STEEL AND COLD-FORMED STEEL DECK:					
1. COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS.	X	—	AWS D1.1	1704.3.1	
2. MULTIPASS FILLET WELDS.	X	—			
3. SINGLE-PASS FILLET WELDS > 5/16".	X	—			
4. PLUG AND SLOT WELDS.	X	—			
5. SINGLE-PASS FILLET WELDS ≤ 5/16".	—	X			
6. FLOOR AND DECK WELDS.	—	X	AWS D1.3		
b. REINFORCING STEEL:					
1. VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.	—	X	AWS D1.4 ACI 318: SEC. 3.5.2	—	
2. REINFORCING STEEL RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL STRUCTURAL WALLS OF CONCRETE AND SHEAR REINFORCEMENT.	X	—			
3. SHEAR REINFORCEMENT.	X	—			
4. OTHER REINFORCING STEEL.	—	X			
6. INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE:					
a. DETAILS SUCH AS BRACING AND STIFFENING.	—	X	—	1704.3.2	
b. MEMBER LOCATIONS.	—	X			
c. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.	—	X			

TABLE 1704.7			
REQUIRED VERIFICATION AND INSPECTION OF SOILS			
VERIFICATION AND INSPECTION TASK		CONTINUOUS DURING TASK LISTED	PERIODIC DURING TASK LISTED
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		—	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		—	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.		—	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.		X	—
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		—	X

TABLE 1705.3					
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION					
VERIFICATION AND INSPECTION		CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRE-STRESSING TENDONS, AND PLACEMENT		—	X	ACI 318: 3.5, 7.1–7.7	1910.4
2. INSPECTION OF REINFORCING STEEL WELDING ON ACCORDANCE WITH TABLE 1704.3, ITEM 5b.		—	—	AWS D1.4 ACI 318: 3.5.2	—
3. INSPECTION OF BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED WHERE STRENGTH DESIGN IS USED.		—	—	ACI 318: 8.1.3, 21.2.8	1908.5, 1909.1
4. INSPECTION OF ANCHORS INSTALLED IN HARDED CONCRETE.		—	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1909.1
5. VERIFYING USE OF REQUIRED DESIGN MIX.		—	X	ACI 318: Ch 4, 5.2–5.4	1904.2, 1910.2, 1910.3
6. AT THE TIME FRESH CONCRETE IS STAMPED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.		X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.10
7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.		X	—	ACI 318: 5.9, 5.10	1910.6, 1910.7, 1910.8
8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		X	—	ACI 318: 5.9, 5.10	1910.9
9. INSPECTION OF PRE-STRESSED CONCRETE: a. APPLICATION OF PRE-STRESSING FORCES. b. GROUTING OF BONDED PRE-STRESSING TENDONS IN THE SEISMIC-FORCE RESISTING SYSTEM.		— —	— —	ACI 318: 18.20 ACI 318: 18.18.4	—
10. ERECTION OF PRECAST CONCRETE MEMBERS.		—	—	ACI 318: Ch. 16	—
11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLAB.		—	X	ACI 318: 6.2	—
12. INSPECT FRAMEWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		—	X	ACI 318: 6.1.1	—

TABLE 1705.6			
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION			
VERIFICATION AND INSPECTION		CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		—	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		—	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.		—	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.		X	—
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		—	X

AT&T  
MOBILITY

7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431



BLACK & VEATCH

BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO:		129049.4004
DRAWN BY:		VPB
CHECKED BY:		JAT
0	07/24/19	ISSUED FOR CONSTRUCTION
REV	DATE	DESCRIPTION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB – WIC

SHEET TITLE

SPECIAL INSPECTIONS

SHEET NUMBER

C-8

PART 1 – GENERAL

- 1.1 SCOPE:
- A.

FORM WORK, REINFORCING STEEL, ACCESSORIES, CAST-IN PLACE CONCRETE, FINISHING, CURING AND TESTING FOR STRUCTURAL CONCRETE FOUNDATIONS.
- 1.2 REFERENCES:
- A.

ACI (AMERICAN CONCRETE INSTITUTE)

1.

ACI 301 SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS.

2.

ACI 304 RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE.

3.

ACI 305 RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING.

4.

ACI 306 RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING.

5.

ACI 308 STANDARD PRACTICE FOR CURING CONCRETING.

6.

ACI 309 STANDARD PRACTICE FOR CONSOLIDATION OF CONCRETE.

7.

ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

8.

ACI 347 RECOMMENDED PRACTICE FOR CONCRETE FORMWORK DRILL PIERS.

B.

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS). THE APPLICABLE STANDARDS OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS ARE LISTED IN THE ACI STANDARDS AND ARE A PART OF THIS SPECIFICATION.

PART 2 – PRODUCTS

- 2.1 REINFORCING MATERIALS:
- A.

REINFORCING BARS: ASTM A615, GRADE 60, PROPOSED DEFORMED BILLET–STEEL BARS, PLAIN FINISH.
- B.

FURNISH CHAIRS, BOLSTERS, BAR SUPPORTS, SPACERS AS REQUIRED FOR SUPPORT OF REINFORCING STEEL AND WIRE FABRIC.
- 2.2 CONCRETE MATERIALS:
- A.

PORTLAND CEMENT SHALL BE TYPE II, CONFORMING TO ASTM C–150.
- B.

AGGREGATE SHALL CONFORM TO ASTM C–33.

1.

FINE AGGREGATE SHALL BE UNIFORMLY GRADED, CLEAN SHARP, WASHED NATURAL, OR CRUSHED SAND, FREE FROM ORGANIC IMPURITIES.

2.

COARSE AGGREGATE SHALL BE NATURAL WASHED GRAVEL OR WASHED CRUSHED ROCK HAVING HARD, STRONG, DURABLE PIECES, FREE FROM ADHERENT COATINGS.

3.

MAXIMUM SIZE OF COARSE AGGREGATE SHALL BE 3/4 INCH IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM C–33 GRADATION SIZE NO. 67.

C.

WATER USED IN CONCRETE MIX SHALL BE POTABLE, CLEAN, AND FREE FROM OILS, ACIDS, SALTS, CHLORIDES, ALKALI, SUGAR, VEGETABLE, OR OTHER INJURIOUS SUBSTANCES.

D.

THE CONCRETE SHALL CONTAIN AN AIR–ENTRAINING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C–260 AND ACI 212. 1R AND A WATER– REDUCING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C–494 AND ACI 212. 1R. ADMIXTURES SHALL BE PURCHASED AND BATCHED IN LIQUID SOLUTION. THE USE OF CALCIUM CHLORIDE OR AN ADMIXTURE CONTAINING CALCIUM CHLORIDE IS PROHIBITED. ADMIXTURES SHALL BE OF THE SAME MANUFACTURER TO ASSURE COMPATIBILITY. ACCEPTABLE MANUFACTURERS ARE:

1.

W.R. GRACE

2.

SIKA CORP.

3.

MASTER BUILDERS

4.

EUCLID CHEMICAL CO.

5.

APPROVED EQUAL

E.

CURING COMPOUND SHALL CONFORM TO ASTM C309, TYPE I, ID, CLASS A AND B AND ASTM C171 AS APPLICABLE.

2.3 CONCRETE MIX:

A.

PROPORTION CONCRETE MIX IN ACCORDANCE WITH REQUIREMENTS OF ACI 301. THE STRENGTH OF CONCRETE SHALL BE AS INDICATED ON THE DRAWINGS. WHERE STRENGTH IS NOT CLEARLY INDICATED, CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI.

B.

THE CONCRETE MIX SHALL BE DESIGNED FOR A MAXIMUM SLUMP OF THREE INCHES (PLUS OR MINUS 1–INCH) AT THE POINT OF DISCHARGE. MIXES OF THE STIFFEST CONSISTENCY THAT CAN BE EFFICIENTLY PLACED SHALL BE USED.

C.

ALL CONCRETE SHALL BE TO SIX PERCENT (6%) AIR ENTRAINED (PLUS OR MINUS 1%).

D.

ALL STRUCTURAL CONCRETE SHALL CONTAIN A WATER–REDUCING AGENT.
- PART 3 – EXECUTION
- 3.1 GENERAL:

A.

CONSTRUCT AND ERECT THE FORM WORK IN ACCORDANCE WITH ACI 301 AND ACI 347.

B.

COLD–WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 306.

C.

HOT–WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 305.

3.2 INSERTS, EMBEDDED COMPONENTS AND OPENINGS:

A.

CONTRACTOR SHALL CHECK ALL CIVIL, ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS FOR OPENINGS, SLEEVES, ANCHOR BOLTS, INSERTS AND OTHER ITEMS TO BE BUILT INTO THE CONCRETE WORK.

B.

COORDINATE THE WORK OF OTHER SECTION IN FORMING AND SETTING OPENINGS. RECESSES, SLOTS, CHASES, ANCHORS, INSERTS AND OTHER ITEMS TO BE EMBEDDED.
- C.

EMBEDDED ITEMS SHALL BE SET ACCURATELY IN LOCATION, ALIGNMENT, ELEVATION AND PLUMBNESS. LOCATE AND MEASURE FROM ESTABLISHED SURVEYED REFERENCE BENCHMARKS.

D.

EMBEDDED ITEMS SHALL BE ANCHORED INTO PLACE IN A MANNER TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT AND CONSOLIDATION. COMPONENTS FORMING A PART OF A COMPLETE ASSEMBLY SHALL BE ALIGNED BEFORE ANCHORING INTO PLACE. PROVIDE TEMPORARY BRACING, ANCHORAGE, AND TEMPLATES AS REQUIRED TO MAINTAIN THE SETTING AND ALIGNMENT.

3.3 REINFORCEMENT PLACEMENT:

A.

PLACE REINFORCEMENT ACCORDING TO CHECKED AND RELEASED DRAWINGS AND IN ACCORDANCE WITH ACI 301 AND ACI 318.

B.

ACCURATELY POSITION, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT FROM FORM WORK CONSTRUCTION OR CONCRETE PLACEMENT AND CONSOLIDATION. SUPPORT REINFORCING ON METAL CHAIRS, RUNNERS, BOLSTERS, SPACERS AND HANGERS.

C.

SPLICES OF REINFORCING BARS SHALL BE CLASS B UNLESS SHOWN OTHERWISE ON THE DRAWINGS. SPLICES SHALL BE STAGGERED. FULL DEVELOPMENT LENGTH SHALL BE PROVIDED ACROSS JOINTS.

D.

LOCATE REINFORCING TO PROVIDE CONCRETE COVER AND SPACING SHOWN ON THE DRAWINGS. MINIMUM COVER SHALL BE AS REQUIRED BY ACI 318.

E.

WELDING OF AND TO ANY REINFORCING MATERIALS INCLUDING TACK WELDING OF CROSSING BARS IS STRICTLY PROHIBITED.
- 3.4 CONCRETE PLACEMENT:

A.

PRIOR TO PLACING CONCRETE, THE FORMS AND REINFORCEMENT SHALL BE THOROUGHLY INSPECTED; ALL TEMPORARY BRACING, TIES AND CLEATS REMOVED; ALL OPENINGS FOR UTILITIES PROPERLY BOXED; ALL FORMS PROPERLY SECURED IN THERE CORRECT POSITION AND MADE TIGHT. ALL REINFORCEMENT AND EMBEDDED ITEMS SHALL BE SECURED IN THEIR PROPER LOCATIONS. ALL OLD AND DRY CONCRETE AND DIRT SHALL BE CLEANED OFF AND ALL STANDING WATER AND OTHER FOREIGN MATERIAL REMOVED.

B.

PLACING CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301 AND ACI 304 AND SHALL BE CARRIED OUT AT SUCH A RATE THAT THE CONCRETE PREVIOUSLY PLACED IS STILL PLASTIC AND INTEGRATED WITH THE FRESHLY PLACED CONCRETE. CONCRETING ONCE STARTED, SHALL BE CARRIED ON AS A CONTINUOUS OPERATION UNTIL THE SECTION IS COMPLETED. NO COLD JOINTS SHALL BE ALLOWED.

C.

ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED AND COMPACTED BY VIBRATION SPACING, RODDING, OR FORKING DURING THE OPERATION OF PLACING AND DEPOSITING IN ACCORDANCE WITH ACI 309. THE CONCRETE SHALL BE THOROUGHLY WORKED AROUND REINFORCEMENT, EMBEDDED ITEMS, AND INTO THE CORNER OF THE FORMS SO AS TO ELIMINATE ALL AIR AND STONE POCKETS.
- 3.5 FINISHING:

A.

FINISHING OF THE FLOOR SLABS SHALL BE IN ACCORDANCE WITH ACI 302.1 SECTION 7.2 WITH A MINIMUM OF THREE TROWELINGS. THE SLAB FINISH TOLERANCE AS MEASURED IN ACCORDANCE WITH ASTM E 1155 SHALL HAVE AN OVERALL TEST NUMBER FOR FLATNESS, FF= 20 AND FOR LEVEL, FL=15. THE MINIMUM LOCAL NUMBER FOR FLATNESS, FF= 15 AND FOR LEVEL, FL=10.

B.

SURFACE OF FLOOR SLAB SHALL RECEIVE TWO COATS OF CLEAR SEALER/HARDENER.

C.

ABOVE GRADE WALL SURFACES SHALL HAVE A SMOOTH FORM FINISH AS DEFINED IN CHAPTER 10 OF ACI 301.
- 3.6 CURING:

A.

FRESHLY DEPOSITED CONCRETE SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT AND COLD TEMPERATURES AND SHALL BE MAINTAINED WITH MINIMUM MOISTURE LOSS AT A RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD OF TIME NECESSARY FOR THE HYDRATION OF THE CEMENT AND PROPER HARDENING OF THE CONCRETE.

B.

CONCRETE SHALL BE KEPT CONTINUOUSLY MOIST AT LEAST OVERNIGHT, IMMEDIATELY FOLLOWING THE INITIAL CURING. BEFORE THE CONCRETE HAS DRIED, ADDITIONAL CURING SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING MATERIALS OR METHODS:

1.

PONDING OR CONTINUOUS SPRINKLING.

2.

ABSORPTIVE MAT OR FABRIC KEPT CONTINUOUSLY WET.

3.

NON–ABSORPTIVE FILM (POLYETHYLENE) OVER PREVIOUSLY SPRINKLED SURFACE.

4.

SAND OR OTHER COVERING KEPT CONTINUOUSLY WET.

5.

CONTINUOUS STEAM (NOT EXCEEDING 150° F) OR VAPOR MIST BATH.

6.

SPRAYED–ON CURING COMPOUND APPLIED IN TWO COATS, SPRAYED IN PERPENDICULAR DIRECTION.

C.

THE FINAL CURING SHALL CONTINUE UNTIL THE CUMULATIVE NUMBER OF DAYS OR FRACTION THEREOF, NOT NECESSARILY CONSECUTIVE, DURING WHICH TEMPERATURE OF THE AIR IN CONTACT WITH CONCRETE IS ABOVE 50° F HAS TOTALED SEVEN (7) DAYS. CONCRETE SHALL NOT BE PERMITTED TO FREEZE DURING THE CURING PERIOD. RAPID DRYING AT THE END OF THE CURING PERIOD SHALL BE PREVENTED.

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PROJECT NO:	129049.4004
DRAWN BY:	VPB
CHECKED BY:	JAT

0	07/24/19	ISSUED FOR CONSTRUCTION
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DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB – WIC

SHEET TITLE  
CONCRETE WORK  
NOTES

SHEET NUMBER

C-9

CONCRETE WORK NOTES

62

PART 1 – GENERAL

CLEARING, GRUBBING, STRIPPING, EROSION CONTROL, SURVEY, LAYOUT, SUBGRADE PREPARATION AND FINISH GRADING AS REQUIRED TO COMPLETE THE PROPOSED WORK SHOWN IN THESE PLANS.

1.1 REFERENCES:

- A. DOT (STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION–CURRENT EDITION).
- B. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS).
- C. OSHA (OCCUPATION SAFETY AND HEALTH ADMINISTRATION).

1.2 INSPECTION AND TESTING:

- A. FIELD TESTING OF EARTHWORK COMPACTION AND CONCRETE CYLINDERS SHALL BE PERFORMED BY CONTRACTORS INDEPENDENT TESTING LAB. THIS WORK TO BE COORDINATED BY THE CONTRACTOR.
- B. ALL WORK SHALL BE INSPECTED AND RELEASED BY THE GENERAL CONTRACTOR WHO SHALL CARRY OUT THE GENERAL INSPECTION OF THE WORK WITH SPECIFIC CONCERN TO PROPER PERFORMANCE OF THE WORK AS SPECIFIED AND/OR CALLED FOR ON THE DRAWINGS. IT IS THE CONTRACTOR’S RESPONSIBILITY TO REQUEST TIMELY INSPECTIONS PRIOR TO PROCEEDING WITH FURTHER WORK THAT WOULD MAKE PARTS OF WORK INACCESSIBLE OR DIFFICULT TO INSPECT.

1.3 SITE MAINTENANCE AND PROTECTION:

- A. PROVIDE ALL NECESSARY JOB SITE MAINTENANCE FROM COMMENCEMENT OF WORK UNTIL COMPLETION OF THE SUBCONTRACT.
- B. AVOID DAMAGE TO THE SITE AND TO EXISTING FACILITIES, STRUCTURES, TREES, AND SHRUBS DESIGNATED TO REMAIN. TAKE PROTECTIVE MEASURES TO PREVENT EXISTING FACILITIES THAT ARE NOT DESIGNATED FOR REMOVAL FROM BEING DAMAGED BY THE WORK.
- C. KEEP SITE FREE OF ALL PONDING WATER.
- D. PROVIDE EROSION CONTROL MEASURES IN ACCORDANCE WITH STATE DOT AND EPA REQUIREMENTS.
- E. PROVIDE AND MAINTAIN ALL TEMPORARY FENCING, BARRICADES, WARNING SIGNALS AND SIMILAR DEVICES NECESSARY TO PROTECT AGAINST THEFT FROM PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION. REMOVE ALL SUCH DEVICES UPON COMPLETION OF THE WORK.
- F. EXISTING UTILITIES: DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY THE OWNER OR OTHERS, EXCEPT WHEN PERMITTED IN WRITING BY THE ENGINEER AND THEN ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.
  - 1. PROVIDE A MINIMUM 48–HOUR NOTICE TO THE ENGINEER AND RECEIVE WRITTEN NOTICE TO PROCEED BEFORE INTERRUPTING ANY UTILITY SERVICE.

PART 2 – PRODUCTS

- 2.1 SUITABLE BACKFILL: ASTM D2321 (CLASS I, II, III OR IV) FREE FROM FROZEN LUMPS, REFUSE, STONES OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
- 2.2 NON–POROUS GRANULAR EMBANKMENT AND BACKFILL: ASTM D2321 (CLASS III, IVA OR IVB) COARSE AGGREGATE. FREE FROM FROZEN LUMPS, REFUSE, STONES OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
- 2.3 POROUS GRANULAR EMBANKMENT AND BACKFILL: ASTM D2321 (CLASS IA, IB OR II) COARSE AGGREGATE FREE FROM FROZEN LUMPS, REFUSE, STONES OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
- 2.4 SELECT STRUCTURAL FILL: GRANULAR FILL MATERIAL MEETING THE REQUIREMENTS OF ASTM E850–95. FOR USE AROUND AND UNDER STRUCTURES WHERE STRUCTURAL FILL MATERIAL ARE REQUIRED.
- 2.5 GRANULAR BEDDING AND TRENCH BACKFILL: WELL–GRADED SAND MEETING THE GRADATION REQUIREMENTS OF ASTM D2487 (SE OR SW–SM).
- 2.6 COARSE AGGREGATE FOR ACCESS ROAD SUBBASE COURSE SHALL CONFORM TO ASTM D2940.
- 2.7 UNSUITABLE MATERIAL: HIGH AND MODERATELY PLASTIC SILTS AND CLAYS (LL>45). MATERIAL CONTAINING REFUSE, FROZEN LUMPS, DEMOLISHED BITUMINOUS MATERIAL, VEGETATIVE MATTER, WOOD, STONES IN EXCESS OF 3 INCHES IN ANY DIMENSION, AND DEBRIS AS DETERMINED BY THE CONSTRUCTION MANAGER. TYPICALLY THESE WILL BE SOILS CLASSIFIED BY ASTM AS: PT, MH, CH, OH, ML, AND OL.
- 2.8 GEOTEXTILE FABRIC: MIRAFI 500X OR ENGINEER APPROVED EQUAL.
- 2.9 PLASTIC MARKING TAPE: SHALL BE ACID AND ALKALI RESISTANT POLYETHYLENE FILM SPECIFICALLY MANUFACTURED FOR MARKING AND LOCATING UNDERGROUND UTILITIES. 6 INCHES WIDE WITH A MINIMUM THICKNESS OF 0.004 INCH. TAPE SHALL HAVE MINIMUM STRENGTH OF 1500 PSI IN BOTH DIRECTIONS AND MANUFACTURED WITH INTEGRAL CONDUCTORS, FOIL BACKING OR OTHER MEANS TO ENABLE DETECTION BY A METAL DETECTOR WHEN BURIED UP TO 3 FEET DEEP. THE METALLIC CORE OF THE TAPE SHALL BE ENCASED IN A PROTECTIVE JACKET OR PROVIDED WITH OTHER MEANS TO PROTECT IT FROM CORROSION. TAPE COLOR SHALL BE RED FOR ELECTRIC UTILITIES AND ORANGE FOR TELECOMMUNICATION UTILITIES.

PART 3 – EXECUTION

3.1 GENERAL:

- A. BEFORE STARTING GENERAL SITE PREPARATION ACTIVITIES, INSTALL EROSION AND SEDIMENT CONTROL MEASURES. THE WORK AREA SHALL BE CONSTRUCTED AND MAINTAINED IN SUCH CONDITION THAT IN THE EVENT OF RAIN THE SITE WILL BE DRAINED AT ANY TIME.
- B. BEFORE ALL SURVEY, LAYOUT, STAKING, AND MARKING, ESTABLISH AND MAINTAIN ALL LINES, GRADES, ELEVATIONS AND BENCHMARKS NEEDED FOR EXECUTION OF THE WORK.
- C. CLEAR AND GRUB THE AREA WITHIN THE LIMITS OF THE SITE. REMOVE TREES, BRUSH, STUMPS, RUBBISH AND OTHER DEBRIS AND VEGETATION RESTING ON OR PROTRUDING THROUGH THE SURFACE OF THE SITE AREA TO BE CLEARED.
  - 1. REMOVE THE FOLLOWING MATERIALS TO A DEPTH OF NO LESS THAN 12 INCHES BELOW THE ORIGINAL GROUND SURFACE: ROOTS, STUMPS, AND OTHER DEBRIS, BRUSH, AND REFUSE EMBEDDED IN OR PROTRUDING THROUGH THE GROUND SURFACE, RAKE, DISK OR PLOW THE AREA TO A DEPTH OF NO LESS THAN 6 INCHES, AND REMOVE TO A DEPTH OF 12 INCHES ALL ROOTS AND OTHER DEBRIS THEREBY EXPOSED.
  - 2. REMOVE TOPSOIL MATERIAL COMPLETELY FROM THE SURFACE UNTIL THE SOIL NO LONGER MEETS THE DEFINITION OF TOPSOIL. AVOID MIXING TOPSOIL WITH SUBSOIL OR OTHER UNDESIRABLE MATERIALS.
  - 3. EXCEPT WHERE EXCAVATION TO GREATER DEPTH IS INDICATED, FILL DEPRESSIONS RESULTING FROM CLEARING, GRUBBING AND DEMOLITION WORK COMPLETELY WITH SUITABLE FILL.
- A. REMOVE FROM THE SITE AND DISPOSE IN AN AUTHORIZED LANDFILL ALL DEBRIS RESULTING FROM CLEARING AND GRUBBING OPERATIONS. BURNING WILL NOT BE PERMITTED.

- B. PRIOR TO EXCAVATING, THOROUGHLY EXAMINE THE AREA TO BE EXCAVATED AND/OR TRENCHED TO VERIFY THE LOCATIONS OF FEATURES INDICATED ON THE DRAWINGS AND TO ASCERTAIN THE EXISTENCE AND LOCATION OF ANY STRUCTURE, UNDERGROUND STRUCTURE, OR OTHER ITEM NOT SHOWN THAT MIGHT INTERFERE WITH THE PROPOSED CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER OF ANY OBSTRUCTIONS THAT WILL PREVENT ACCOMPLISHMENT OF THE WORK AS INDICATED ON THE DRAWINGS.
- C. SEPARATE AND STOCK PILE ALL EXCAVATED MATERIALS SUITABLE FOR BACKFILL. ALL EXCESS EXCAVATED AND UNSUITABLE MATERIALS SHALL BE DISPOSED OF OFF–SITE IN A LEGAL MANNER.

3.2 BACKFILL:

- A. AS SOON AS PRACTICAL, AFTER COMPLETING CONSTRUCTION OF THE RELATED STRUCTURE, INCLUDING EXPIRATION OF THE SPECIFIED MINIMUM CURING PERIOD FOR CAST–IN–PLACE CONCRETE, BACKFILL THE EXCAVATION WITH APPROVED MATERIAL TO RESTORE THE REQUIRED FINISHED GRADE.
  - 1. PRIOR TO PLACING BACKFILL AROUND STRUCTURES, ALL FORMS SHALL BE REMOVED AND THE EXCAVATION CLEANED OF ALL TRASH, DEBRIS, AND UNSUITABLE MATERIALS.
  - 2. BACKFILL BY PLACING AND COMPACTING SUITABLE BACKFILL MATERIAL OR SELECT GRANULAR BACKFILL MATERIAL WHEN REQUIRED IN UNIFORM HORIZONTAL LAYERS OF NO GREATER THAN 8–INCHES LOOSE THICKNESS AND COMPACTED. WHERE HAND OPERATED COMPACTORS ARE USED, THE FILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 4 INCHES IN LOOSE DEPTH AND COMPACTED.
  - 3. WHENEVER THE DENSITY TESTING INDICATES THAT THE CONTRACTOR HAS NOT OBTAINED THE SPECIFIED DENSITY, THE SUCCEEDING LAYER SHALL NOT BE PLACED UNTIL THE SPECIFICATION REQUIREMENTS ARE MET UNLESS OTHERWISE AUTHORIZED BY THE GEOTECHNICAL ENGINEER. THE CONTRACTOR SHALL TAKE WHATEVER APPROPRIATE ACTION IS NECESSARY, SUCH AS DISKING AND DRYING, ADDING WATER, OR INCREASING THE COMPACTIVE EFFORT TO MEET THE MINIMUM COMPACTION REQUIREMENTS.
- B. THOROUGHLY COMPACT EACH LAYER OF BACKFILL TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.3 TRENCH EXCAVATION:

- A. UTILITY TRENCHES SHALL BE EXCAVATED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE GENERAL CONTRACTOR. PROVIDE SHORING, SHEETING AND BRACING AS REQUIRED TO PREVENT CAVING OR SLOUGHING OF THE TRENCH WALLS.
- B. EXTEND THE TRENCH WIDTH A MINIMUM OF 6 INCHES BEYOND THE OUTSIDE EDGE OF THE OUTERMOST CONDUIT.
- C. WHEN SOFT YIELDING, OR OTHERWISE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, BACKFILL AT THE REQUIRED TRENCH TO A DEPTH OF NO LESS THAN 12 INCHES BELOW THE REQUIRED ELEVATION AND BACKFILL WITH GRANULAR BEDDING MATERIAL.

3.4 TRENCH BACKFILL:

- A. PROVIDE GRANULAR BEDDING MATERIAL IN ACCORDANCE WITH THE DRAWINGS AND THE UTILITY REQUIREMENTS.
- B. NOTIFY THE GENERAL CONTRACTOR 24 HOURS IN ADVANCE OF BACKFILLING.
- C. CONDUCT UTILITY CHECK TESTS BEFORE BACKFILLING. BACKFILL AND COMPACT TRENCH BEFORE ACCEPTANCE TESTING.
- D. PLACE GRANULAR TRENCH BACKFILL UNIFORMLY ON BOTH SIDES OF THE CONDUITS IN 6–INCH UNCOMPACTED LIFTS UNTIL 12 INCHES OVER THE CONDUITS. SOLIDLY RAM AND TAMP BACKFILL INTO SPACE AROUND CONDUITS.
- E. PROTECT CONDUIT FROM LATERAL MOVEMENT, IMPACT DAMAGE, OR UNBALANCED LOADING.
- F. ABOVE THE CONDUIT EMBEDMENT ZONE, PLACE AND COMPACT SATISFACTORY BACKFILL MATERIAL IN 8–INCH MAXIMUM LOOSE THICKNESS LIFTS TO RESTORE THE REQUIRED FINISHED SURFACE GRADE.
- G. COMPACT FINAL TRENCH BACKFILL TO A DENSITY EQUAL TO OR GREATER THAN THAT OF THE EXISTING UNDISTURBED MATERIAL IMMEDIATELY ADJACENT TO THE TRENCH BUT NO LESS THAN A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.5 AGGREGATE ACCESS ROAD:

- A. CLEAR, GRUB, STRIP AND EXCAVATE FOR THE ACCESS ROAD TO THE LINES AND GRADES INDICATED ON THE DRAWINGS. SCARIFY TO A DEPTH OF 6 INCHES AND PROOF–ROLL. ALL HOLES, RUTS, SOFT PLACES AND OTHER DEFECTS SHALL BE CORRECTED.
- B. THE ENTIRE SUBGRADE SHALL BE COMPACTED TO NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE MODIFIED PROCTOR TEST, ASTM D 1557.
- C. AFTER PREPARATION OF THE SUBGRADE IS COMPLETE THE GEOTEXTILE FABRIC (MIRAFI 500X) SHALL BE INSTALLED TO THE LIMITS INDICATED ON THE DRAWINGS BY ROLLING THE FABRIC OUT LONGITUDINALLY ALONG THE ROADWAY. THE FABRIC SHALL NOT BE DRAGGED ACROSS THE SUBGRADE. PLACE THE ENTIRE ROLL IN A SINGLE OPERATION, ROLLING OUT AS SMOOTHLY AS POSSIBLE.
  - 1. OVERLAPS PARALLEL TO THE ROADWAY WILL BE PERMITTED AT THE CENTERLINE AND AT LOCATIONS BEYOND THE ROADWAY SURFACE WIDTH (I.E. WITHIN THE SHOULDER WIDTH) ONLY. NO LONGITUDINAL OVERLAPS SHALL BE LOCATED BETWEEN THE CENTERLINE AND THE SHOULDER. PARALLEL OVERLAPS SHALL BE A MINIMUM OF 3 FEET WIDE.
  - 2. TRANSVERSE (PERPENDICULAR TO THE ROADWAY) OVERLAPS AT THE END OF A ROLL SHALL OVERLAP IN THE DIRECTION OF THE AGGREGATE PLACEMENT (PREVIOUS ROLL ON TOP) AND SHALL HAVE A MINIMUM LENGTH OF 3 FEET.
  - 3. ALL OVERLAPS SHALL BE PINNED WITH STAPLES OR NAILS A MINIMUM OF 10 INCHES LONG TO INSURE POSITIONING DURING PLACEMENT OF AGGREGATE. PIN LONGITUDINAL SEAMS AT 25 FOOT CENTERS AND TRANSVERSE SEAMS EVERY 5 FEET.
- D. THE AGGREGATE BASE AND SURFACE COURSES SHALL BE CONSTRUCTED IN LAYERS NOT MORE THAN 4 INCH (COMPACTED) THICKNESS. AGGREGATE TO BE PLACED ON GEOTEXTILE FABRIC SHALL BE END–DUMPED ON THE FABRIC FROM THE FREE END OF THE FABRIC OR OVER PREVIOUSLY PLACED AGGREGATE. THE FIRST LIFT SHALL BE BLADED DOWN TO A THICKNESS OF 8 INCHES PRIOR TO COMPACTION. AT NO TIME SHALL EQUIPMENT, EITHER TRANSPORTING THE AGGREGATE OR GRADING THE AGGREGATE, BE PERMITTED ON THE ROADWAY WITH LESS THAN 4 INCHES OF MATERIAL COVERING THE FABRIC.
- E. THE AGGREGATE SHALL BE IMMEDIATELY COMPACTED TO NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE MODIFIED PROCTOR TEST, ASTM D 1557 WITH A TAMPING ROLLER, OR WITH A PNEUMATIC–TIRED ROLLER, OR WITH A VIBRATORY MACHINE OR ANY COMBINATION OF THE ABOVE. THE TOP LAYER SHALL BE GIVEN A FINAL ROLLING WITH A THREE–WHEEL OR TANDEM ROLLER.

3.6 FINISH GRADING:

- A. PERFORM ALL GRADING TO PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURES AND SMOOTH, EVEN SURFACE DRAINAGE OF THE ENTIRE AREA WITHIN THE LIMITS OF CONSTRUCTION. GRADING SHALL BE COMPATIBLE WITH ALL SURROUNDING TOPOGRAPHY AND STRUCTURES.
- B. UTILIZE SATISFACTORY FILL MATERIAL RESULTING FROM THE EXCAVATION WORK IN THE CONSTRUCTION OF FILLS, EMBANKMENTS AND FOR REPLACEMENT OF REMOVED UNSUITABLE MATERIALS.

- C. ACHIEVE FINISHED GRADE BY PLACING A MINIMUM OF 4 INCHES OF 1/2” – 3/4” CRUSHED STONE ON TOP SOIL STABILIZER FABRIC.
- D. REPAIR ALL ACCESS ROADS AND SURROUNDING AREAS USED DURING THE COURSE OF THIS WORK TO THEIR ORIGINAL CONDITION.

3.7 ASPHALT PAVING ROAD:

- MINNESOTA:
  - A. SECTION 2321 – MN/DOT ROAD–MIXED BITUMINOUS SURFACE.
  - B. SECTION 2360 – MN/DOT PLANT MIXED ASPHALT PAVEMENT.

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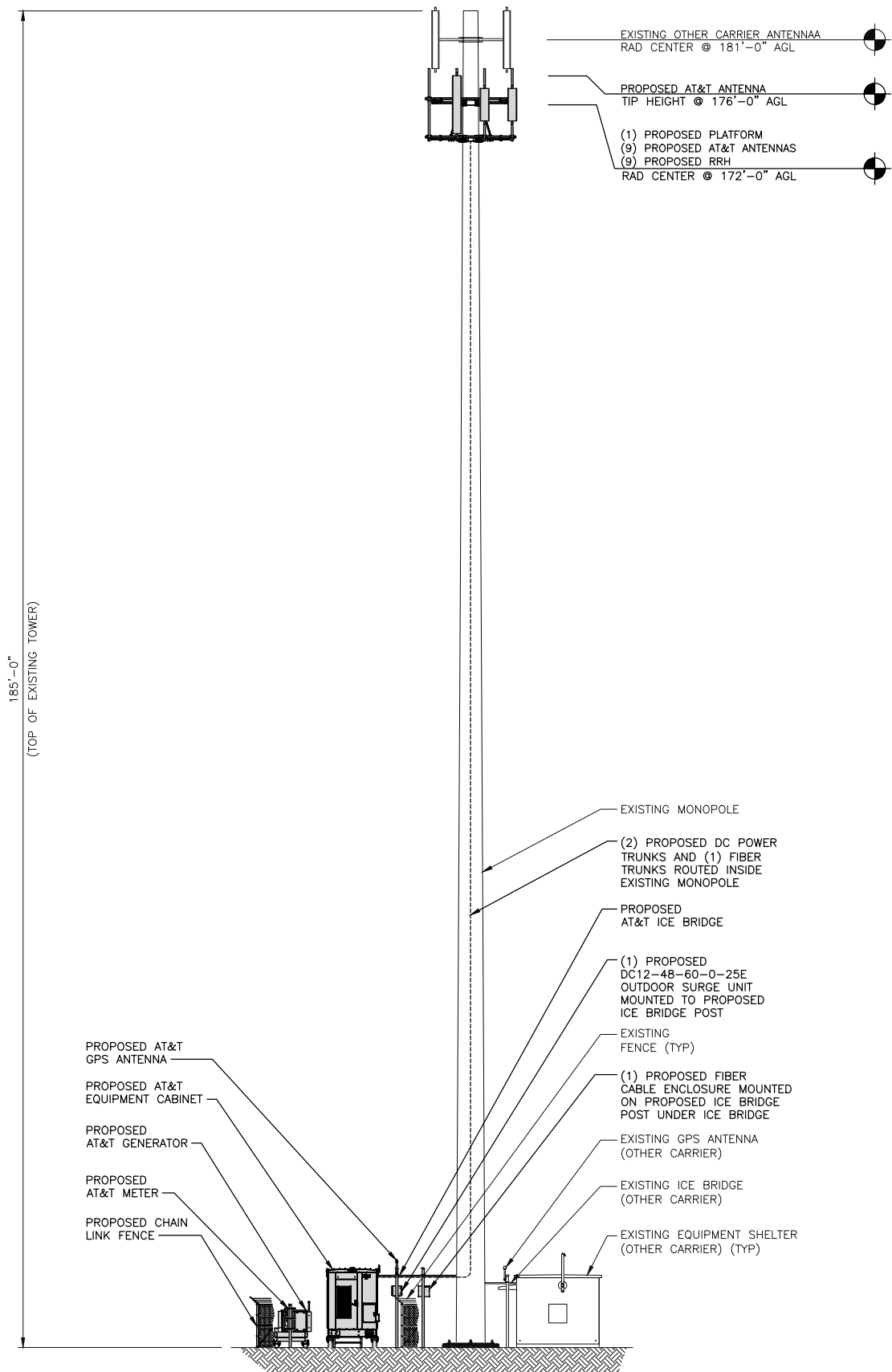
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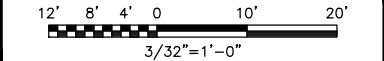
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SITE WORK AND  
DRAINAGE NOTES

SHEET NUMBER

C-10



PROPOSED TOWER WEST ELEVATION



1

STRUCTURAL NOTE

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE.

THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

PROPOSED-TOWER:  
INSTALL (1) SABRE C10855721C MONOPOLE PLATFORM (OR ENGINEER APPROVED EQUAL)  
INSTALL (3) KMW EPBQ-654L8H8-L2 ANTENNAS  
INSTALL (6) KMW ET-X-UW-70-17-IR-AT ANTENNAS  
INSTALL (9) LTE RRH UNITS  
INSTALL (2) RAYCAP DC6-48-60-18-8C-EV SURGE UNITS  
INSTALL (2) DC POWER TRUNK  
INSTALL (1) FIBER TRUNK

PROPOSED-PLATFORM:  
INSTALL (1) VERTIV XTE 801 CABINET, W/EQUIPMENT (NEQ200060)  
INSTALL (1) GPS KIT  
INSTALL (1) POLAR POWER GENERATOR WITH PLATFORM

PROPOSED-SITE:  
INSTALL (1) ROSENBERGER FB-15-ABOX FIBER ENCLOSURE  
INSTALL (1) RAYCAP DC12-48-60-0-25E OUTDOOR SURGE  
INSTALL APPROXIMATELY 11'-6" OF ICE BRIDGE

AT&T TO VERIFY  
REQUIRED PLATFORM  
EQUIPMENT.

PROJECT DESCRIPTION

- FENCE NOT ENTIRELY SHOWN FOR CLARITY.
- WHEN STACKING CABLES 3 OR MORE DEEP, USE STACKABLE SNAP-INS, TALLEY PART NUMBER SSH-158-3 (OR ENGINEER APPROVED EQUAL)

NOTES

A MOUNT ANALYSIS WAS NOT PERFORMED AS A PART OF THE SCOPE OF WORK INCLUDED IN THESE CONSTRUCTION DRAWINGS.

MOUNT ANALYSIS NOTE

THE PROPOSED TOWER IS BEING DESIGNED BY OTHERS TO CARRY THE PROPOSED AND FUTURE ANTENNAS, CABLES, AND EQUIPMENT. THESE DRAWINGS HAVE BEEN CREATED BASED ON THE ASSUMPTION THAT THE TOWER HAS SUFFICIENT CAPACITY TO SUPPORT THE PROPOSED AND FUTURE LOADS.

IF REQUIRED, THE PROPOSED TOWER SHALL INCLUDE FAA LIGHTING PER THE REQUIREMENTS INDICATED BY AT&T AND THE FAA. THE TOP LIGHT SHALL BE INSTALLED SUCH THAT THE BASE OF THE LIGHT IS A MINIMUM OF 1'-0" ABOVE THE TOP OF THE HIGHEST ANTENNA AND/OR TOWER STEEL. LIGHTNING ROD TO BE INSTALLED BY OTHERS.

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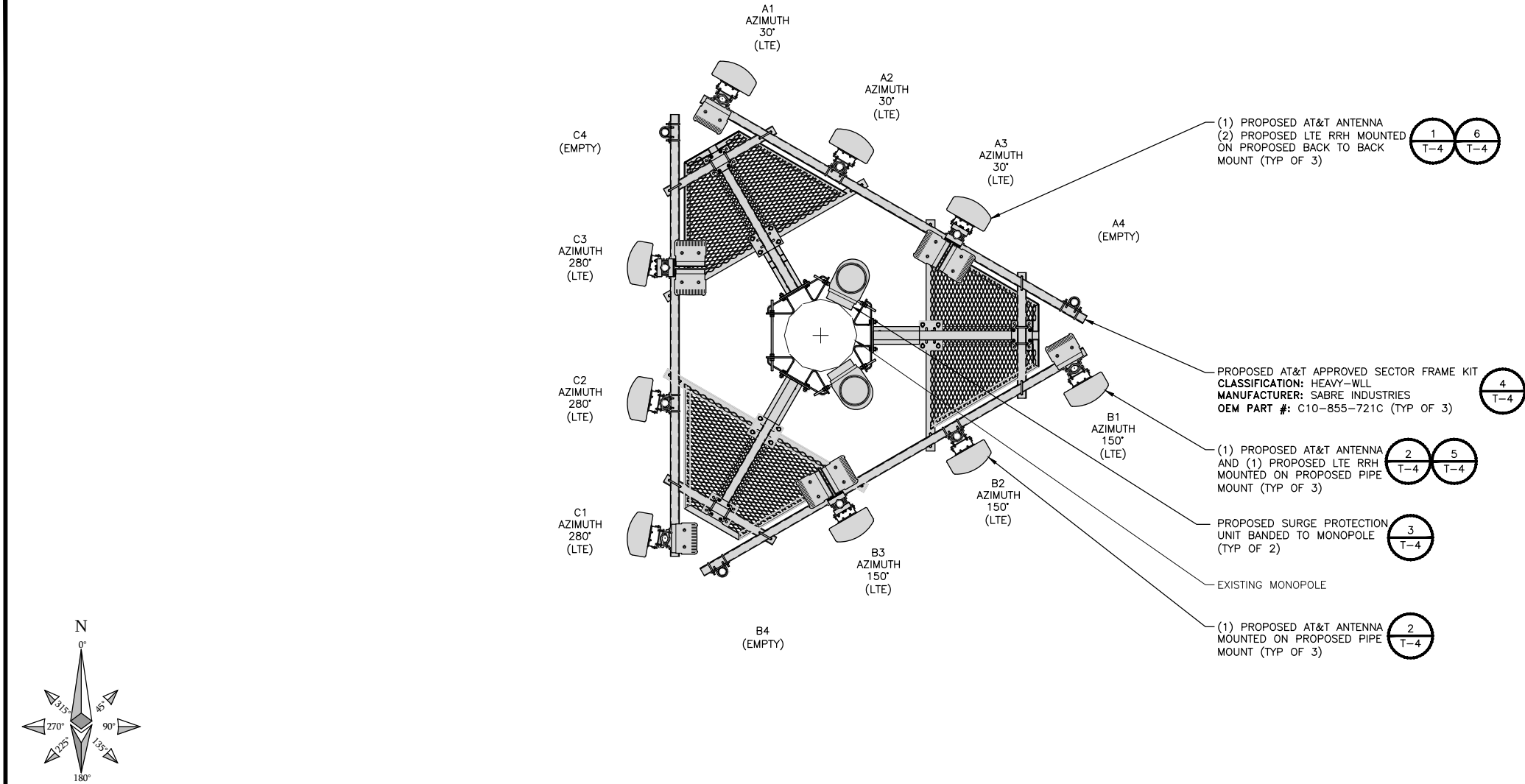
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SHEET TITLE

TOWER ELEVATION

SHEET NUMBER

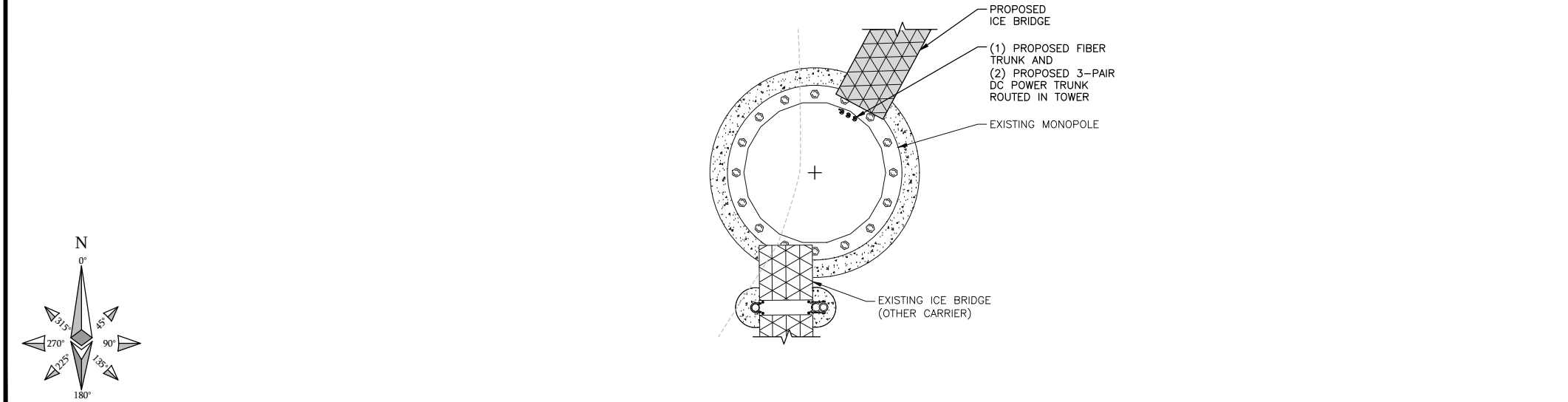
T-1



ANTENNA LAYOUT PLAN

12" 6" 0 1' 2' 3' 4' 5' 1/2"=1'-0"

1



COAX ROUTING DIAGRAM

12" 6" 0 1' 2' 3' 4' 5' 6' 7' 3/8"=1'-0"

2

A MOUNT ANALYSIS WAS NOT PERFORMED AS A PART OF THE SCOPE OF WORK INCLUDED IN THESE CONSTRUCTION DRAWINGS.

MOUNT ANALYSIS NOTE

1. RAYCAP DC6-48-60-18-8C-EV SURGE SUPPRESSOR WILL ROUTE POWER AND FIBER TO EACH SECTORS TOWER MOUNTED RRHS.

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0	07/24/19	ISSUED FOR CONSTRUCTION
REV	DATE	DESCRIPTION

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DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB - WIC

SHEET TITLE

ANTENNA  
CONFIGURATION

SHEET NUMBER

T-2

NOTES

FINAL ANTENNA AND TRANSMISSION EQUIPMENT REQUIREMENTS (VERIFY WITH LATEST RFDS)												
SECTOR	RAD CENTER	POSITION	ANTENNA TILT		AZIMUTH	ANTENNA MODEL	TECHNOLOGY	RRH / TMA	SURGE & DISTRIBUTION			
			MECH	ELEC					MODEL	CABLE (QTY) TYPES		
A	172'	1			30°	KMW ET-X-UW-70-13-70-17-iR-AT	LTE	RRH	(2) RAYCAP DC6-48-60-18-8C-EV	(2) 3-PAIR DC POWER (1) 18-PAIR FIBER		
		2			30°	KMW ET-X-UW-70-13-70-17-iR-AT	LTE					
		3			30°	KMW EPBQ-654L8H8-L2	LTE	RRH RRH				
		4										
B	172'	1			150°	KMW ET-X-UW-70-13-70-17-iR-AT	LTE	RRH				
		2			150°	KMW ET-X-UW-70-13-70-17-iR-AT	LTE					
		3			150°	KMW EPBQ-654L8H8-L2	LTE	RRH RRH				
		4										
C	172'	1			280°	KMW ET-X-UW-70-13-70-17-iR-AT	LTE	RRH				
		2			280°	KMW ET-X-UW-70-13-70-17-iR-AT	LTE					
		3			280°	KMW EPBQ-654L8H8-L2	LTE	RRH RRH				
		4										

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

NOTES

AT&T  
MOBILITY

7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431



BLACK & VEATCH

BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO: 129049.4004

DRAWN BY: VPB

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DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB – WIC

SHEET TITLE  
ANTENNA AND RRH  
REQUIREMENTS

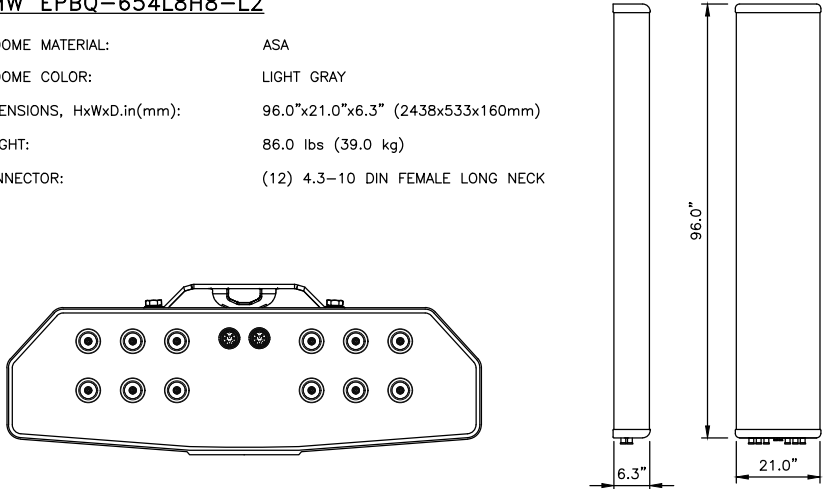
SHEET NUMBER

T-3



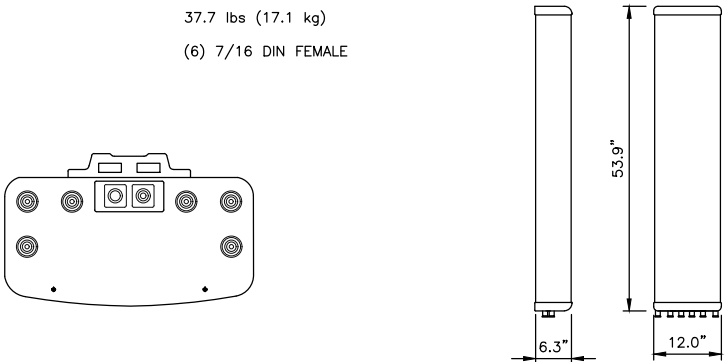
KMW EPBQ-654L8H8-L2

RADOME MATERIAL: ASA  
RADOME COLOR: LIGHT GRAY  
DIMENSIONS, HxWxD.in(mm): 96.0"x21.0"x6.3" (2438x533x160mm)  
WEIGHT: 86.0 lbs (39.0 kg)  
CONNECTOR: (12) 4.3-10 DIN FEMALE LONG NECK



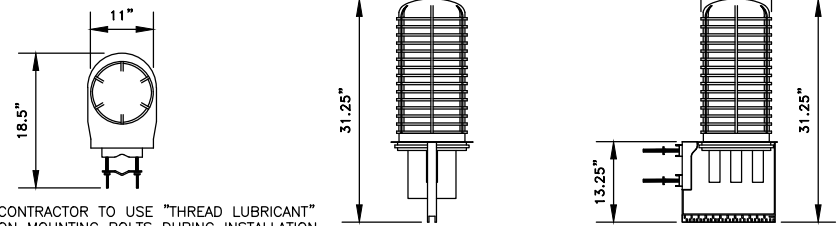
ET-X-UW-70-13-70-17-IR-AT

RADOME MATERIAL: ASA  
RADOME COLOR: LIGHT GRAY  
DIMENSIONS, HxWxD.in(mm): 53.9"x12.0"x6.3" (1368x305x160mm)  
WEIGHT: 37.7 lbs (17.1 kg)  
CONNECTOR: (6) 7/16 DIN FEMALE



RAYCAP DC6-48-60-18-8C-EV

DIMENSIONS, DxH: 280x794mm (11"x31.25")  
NOMINAL OPERATING VOLTAGE: 48 VDC  
NOMINAL DISCHARGE CURRENT: 20 kA 8/20µs  
MAXIMUM DISCHARGE CURRENT: 60 kA 8/20µs  
MAXIMUM CONTINUOUS OPERATING VOLTAGE: 75 VDC  
VOLTAGE PROTECTION RATING: 400 V  
WIND LOADING: 150 MPH SUSTAINED (105.7 lbs)  
195 MPH GUST (213.6 lbs)  
TOTAL WEIGHT: 32.8 lbs



CONTRACTOR TO USE "THREAD LUBRICANT" ON MOUNTING BOLTS DURING INSTALLATION

ANTENNA SPECIFICATIONS

NO SCALE

1

ANTENNA SPECIFICATIONS

NO SCALE

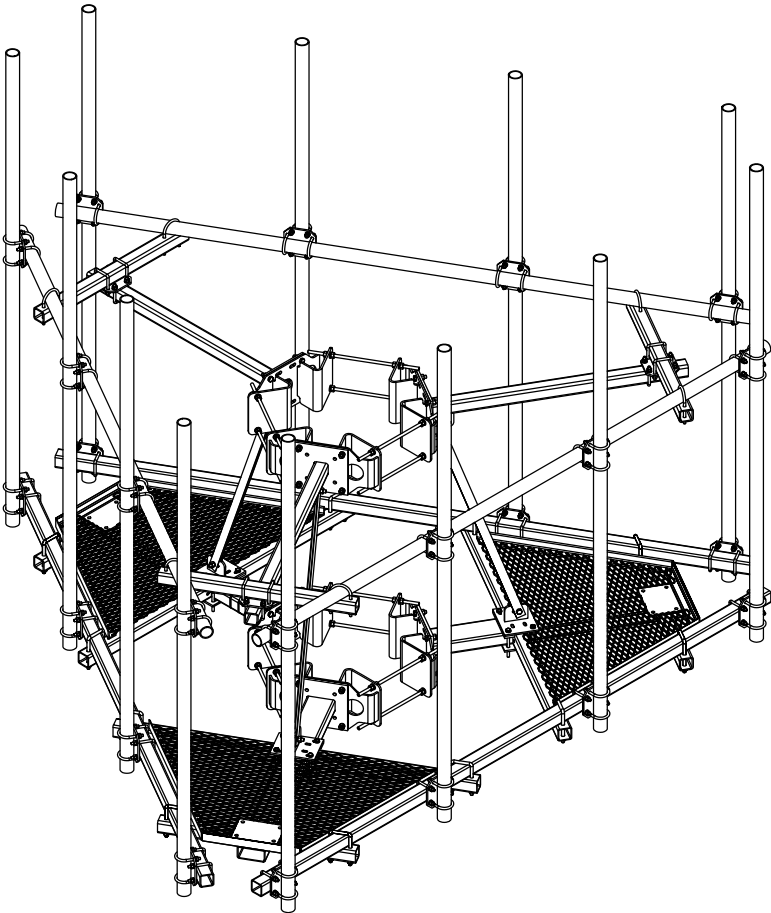
2

DC SURGE SUPPRESSOR DETAIL

NO SCALE

3

MANUFACTURER PART NO.	DESCRIPTION	WEIGHT (lbs)
SABRE C10-855-721C	12'-0" HD TENSION PLATFORM W/(12) 2-7/8" O.D. x 10'-0" MTG PIPES	2959



NOTES

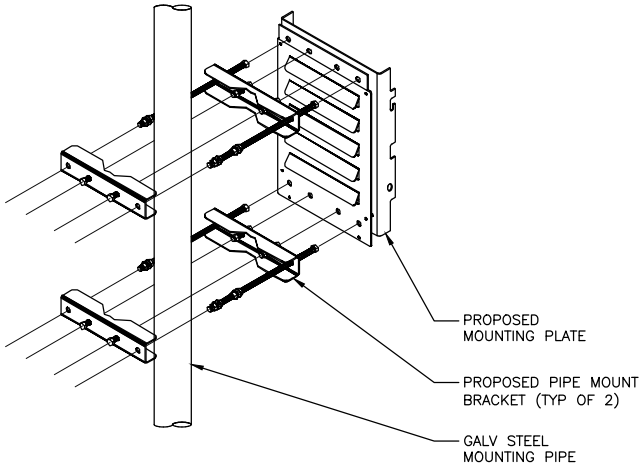
1. THIS DETAIL IS INCLUDED FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL REFER TO MANUFACTURER DETAILS FOR SPECIFIC PART ORDERING AND INSTALLATION.

SABRE 12'-0" HD M.O.V.E. PLATFORM

NO SCALE

4

NOTE:  
ANTENNA NOT SHOWN FOR CLARITY

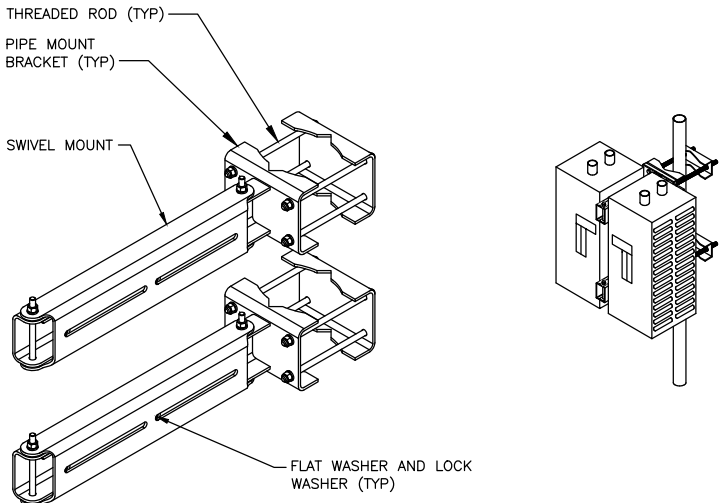


RRH MOUNTING PLATE DETAIL

NO SCALE

5

ROSENBERGER D218RRUDSM



DUAL RRH MOUNTING DETAIL

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

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7900 XERXES AVE S  
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BLACK & VEATCH

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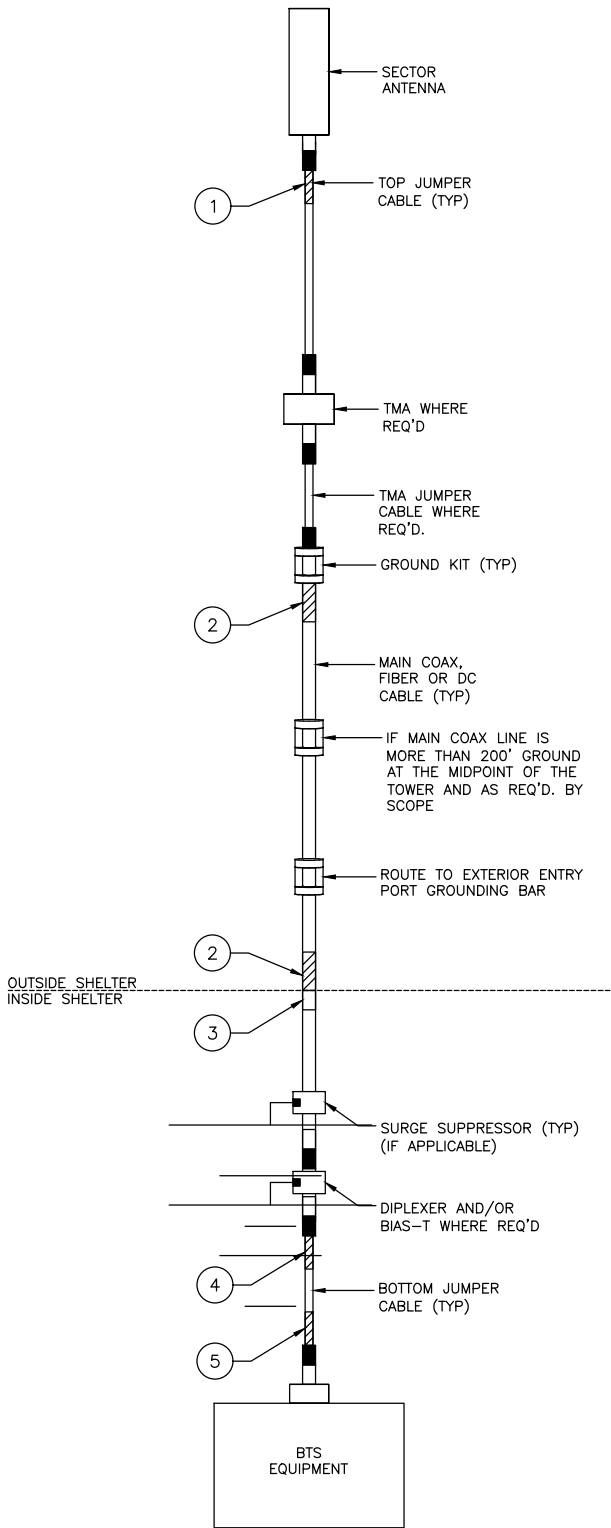
DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB - WIC

SHEET TITLE  
TOWER EQUIPMENT  
DETAILS

SHEET NUMBER

T-4

AT&T Coax and Jumper Color Code Chart for MNP						
AT&T Main Line Coax and Jumper Color Code Chart for MNP						
Sector	Technology	Frequency	TX / RX	Sector Color/ Main Line	Freq Color	
Alpha (X)	GSM	850	TXM / RXM	1 Red	1 Orange	Any line that has main line coax will be marked with sector color first and frequency second (typically GSM/UMTS).
Alpha (X)	GSM	850	TXD / RXD	3 Red	1 Orange	
Alpha (X)	GSM	1900	TXM / RXM	1 Red	1 Violet	
Alpha (X)	GSM	1900	TXD / RXD	3 Red	1 Violet	
Alpha (X)	UMTS	850	TXM / RXM	2 Red	1 Orange	
Alpha (X)	UMTS	850	TXD / RXD	4 Red	1 Orange	
Alpha (X)	UMTS	1900	TXM / RXM	2 Red	1 Violet	
Alpha (X)	UMTS	1900	RXD / RXD	4 Red	1 Violet	
AT&T LTE/UMTS RRH at top of tower Jumper Color Code Chart for MNP						
Sector	Technology	Frequency	TX / RX	Freq Color	Sector Color	
Alpha (X)	LTE	700 B/C	TXM / RXM	1 Green	2 Red	Color coding of jumpers that have RRHs on top of tower will have the frequency color first then the sector color. Color coding for LTE/UMTS with RRHs on top of tower will only happen on coax from LTE RRH to antenna. Power and fiber lines will be color coded with alternating gray/white (add a stripe for multiple runs) from ground to distro box (DC-6/FC-12) then tagged with written tags to RRH. If DC-2s are in line then you tag all breakout points appropriately.
Alpha (X)	LTE	700 B/C	TXD / RXD	2 Green	2 Red	
Alpha (X)	LTE	700 D/E	TXM / RXM	3 Green	2 Red	
Alpha (X)	LTE	700 D/E	TXD / RXD	4 Green	2 Red	
Alpha (X)	LTE	850	TXM / RXM	3 Orange	2 Red	
Alpha (X)	LTE	850	TXD / RXD	4 Orange	2 Red	
Alpha (X)	UMTS	850	TXM / RXM	1 Orange	2 Red	
Alpha (X)	UMTS	850	RXD / RXD	2 Orange	2 Red	
Alpha (X)	LTE	1900 PCS	TXM / TXM	1 Violet	2 Red	
Alpha (X)	LTE	1900 PCS	TXD / TXD	2 Violet	2 Red	
Alpha (X)	LTE	1900 PCS	RXM / RXM	3 Violet	2 Red	
Alpha (X)	LTE	1900 PCS	RXD / RXD	4 Violet	2 Red	
Alpha (X)	UMTS	1900	TXM / RXM	1 Violet	3 Red	
Alpha (X)	UMTS	1900	RXD / RXD	2 Violet	3 Red	
Alpha (X)	LTE	2100 AWS	TXM / TXM	1 Gray	2 Red	
Alpha (X)	LTE	2100 AWS	TXD / TXD	2 Gray	2 Red	
Alpha (X)	LTE	2100 AWS	RXM / RXM	3 Gray	2 Red	
Alpha (X)	LTE	2100 AWS	RXD / RXD	4 Gray	2 Red	
Alpha (X)	LTE	2300 WCS	TXM / RXM	1 Yellow	2 Red	
Alpha (X)	LTE	2300 WCS	TXD / RXD	2 Yellow	2 Red	
Alpha (X)	LTE	2300 WCS	TXM / RXM	3 Yellow	2 Red	
Alpha (X)	LTE	2300 WCS	TXD / RXD	4 Yellow	2 Red	
AT&T Main Line Coax and Jumper Color Code Chart for MNP						
Sector	Technology	Frequency	TX / RX	Sector Color/ Main Line	Freq Color	
Beta (Y)	GSM	850	TXM / RXM	1 White	1 Orange	Any line that has main line coax will be marked with sector color first and frequency second (typically GSM/UMTS).
Beta (Y)	GSM	850	TXD / RXD	3 White	1 Orange	
Beta (Y)	GSM	1900	TXM / RXM	1 White	1 Violet	
Beta (Y)	GSM	1900	TXD / RXD	3 White	1 Violet	
Beta (Y)	UMTS	850	TXM / RXM	2 White	1 Orange	
Beta (Y)	UMTS	850	TXD / RXD	4 White	1 Orange	
Beta (Y)	UMTS	1900	TXM / RXM	2 White	1 Violet	
Beta (Y)	UMTS	1900	RXD / RXD	4 White	1 Violet	
AT&T LTE/UMTS RRH at top of tower Jumper Color Code Chart for MNP						
Sector	Technology	Frequency	TX / RX	Freq Color	Sector Color	
Beta (Y)	LTE	700 B/C	TXM / RXM	1 Green	2 White	Color coding of jumpers that have RRHs on top of tower will have the frequency color first then the sector color. Color coding for LTE/UMTS with RRHs on top of tower will only happen on coax from LTE RRH to antenna. Power and fiber lines will be color coded with alternating gray/white (add a stripe for multiple runs) from ground to distro box (DC-6/FC-12) then tagged with written tags to RRH. If DC-2s are in line then you tag all breakout points appropriately.
Beta (Y)	LTE	700 B/C	TXD / RXD	2 Green	2 White	
Beta (Y)	LTE	700 D/E	TXM / RXM	3 Green	2 White	
Beta (Y)	LTE	700 D/E	TXD / RXD	4 Green	2 White	
Beta (Y)	LTE	850	TXM / RXM	3 Orange	2 White	
Beta (Y)	LTE	850	TXD / RXD	4 Orange	2 White	
Beta (Y)	UMTS	850	TXM / RXM	1 Orange	2 White	
Beta (Y)	UMTS	850	RXD / RXD	2 Orange	2 White	
Beta (Y)	LTE	1900 PCS	TXM / TXM	1 Violet	2 White	
Beta (Y)	LTE	1900 PCS	TXD / TXD	2 Violet	2 White	
Beta (Y)	LTE	1900 PCS	RXM / RXM	3 Violet	2 White	
Beta (Y)	LTE	1900 PCS	RXD / RXD	4 Violet	2 White	
Beta (Y)	UMTS	1900	TXM / RXM	1 Violet	3 White	
Beta (Y)	UMTS	1900	RXD / RXD	1 Violet	4 White	
Beta (Y)	LTE	2100 AWS	TXM / TXM	1 Gray	2 White	
Beta (Y)	LTE	2100 AWS	TXD / TXD	2 Gray	2 White	
Beta (Y)	LTE	2100 AWS	RXM / RXM	3 Gray	2 White	
Beta (Y)	LTE	2100 AWS	RXD / RXD	4 Gray	2 White	
Beta (Y)	LTE	2300 WCS	TXM / RXM	1 Yellow	2 White	
Beta (Y)	LTE	2300 WCS	TXD / RXD	2 Yellow	2 White	
Beta (Y)	LTE	2300 WCS	TXM / RXM	3 Yellow	2 White	
Beta (Y)	LTE	2300 WCS	TXD / RXD	4 Yellow	2 White	
AT&T Main Line Coax and Jumper Color Code Chart for MNP						
Sector	Technology	Frequency	TX / RX	Sector Color/ Main Line	Freq Color	
Gamma (Z)	GSM	850	TXM / RXM	1 Blue	1 Orange	Any line that has main line coax will be marked with sector color first and frequency second (typically GSM/UMTS).
Gamma (Z)	GSM	850	TXD / RXD	3 Blue	1 Orange	
Gamma (Z)	GSM	1900	TXM / RXM	1 Blue	1 Violet	
Gamma (Z)	GSM	1900	TXD / RXD	3 Blue	1 Violet	
Gamma (Z)	UMTS	850	TXM / RXM	2 Blue	1 Orange	
Gamma (Z)	UMTS	850	TXD / RXD	4 Blue	1 Orange	
Gamma (Z)	UMTS	1900	TXM / RXM	2 Blue	1 Violet	
Gamma (Z)	UMTS	1900	RXD / RXD	4 Blue	1 Violet	
AT&T LTE/UMTS RRH at top of tower Jumper Color Code Chart for MNP						
Sector	Technology	Frequency	TX / RX	Freq Color	Sector Color	
Gamma (Z)	LTE	700 B/C	TXM / RXM	1 Green	2 Blue	Color coding of jumpers that have RRHs on top of tower will have the frequency color first then the sector color. Color coding for LTE/UMTS with RRHs on top of tower will only happen on coax from LTE RRH to antenna. Power and fiber lines will be color coded with alternating gray/white (add a stripe for multiple runs) from ground to distro box (DC-6/FC-12) then tagged with written tags to RRH. If DC-2s are in line then you tag all breakout points appropriately.
Gamma (Z)	LTE	700 B/C	TXD / RXD	2 Green	2 Blue	
Gamma (Z)	LTE	700 D/E	TXM / RXM	3 Green	2 Blue	
Gamma (Z)	LTE	700 D/E	TXD / RXD	4 Green	2 Blue	
Gamma (Z)	LTE	850	TXM / RXM	3 Orange	2 Blue	
Gamma (Z)	LTE	850	TXD / RXD	4 Orange	2 Blue	
Gamma (Z)	UMTS	850	TXM / RXM	1 Orange	2 Blue	
Gamma (Z)	UMTS	850	RXD / RXD	2 Orange	2 Blue	
Gamma (Z)	LTE	1900 PCS	TXM / TXM	1 Violet	2 Blue	
Gamma (Z)	LTE	1900 PCS	TXD / TXD	2 Violet	2 Blue	
Gamma (Z)	LTE	1900 PCS	RXM / RXM	3 Violet	2 Blue	
Gamma (Z)	LTE	1900 PCS	RXD / RXD	4 Violet	2 Blue	
Gamma (Z)	UMTS	1900	TXM / RXM	1 Violet	3 Blue	
Gamma (Z)	UMTS	1900	RXD / RXD	1 Violet	4 Blue	
Gamma (Z)	LTE	2100 AWS	TXM / TXM	1 Gray	2 Blue	
Gamma (Z)	LTE	2100 AWS	TXD / TXD	2 Gray	2 Blue	
Gamma (Z)	LTE	2100 AWS	RXM / RXM	3 Gray	2 Blue	
Gamma (Z)	LTE	2100 AWS	RXD / RXD	4 Gray	2 Blue	
Gamma (Z)	LTE	2300 WCS	TXM / RXM	1 Yellow	2 Blue	
Gamma (Z)	LTE	2300 WCS	TXD / RXD	2 Yellow	2 Blue	
Gamma (Z)	LTE	2300 WCS	TXM / RXM	3 Yellow	2 Blue	
Gamma (Z)	LTE	2300 WCS	TXD / RXD	4 Yellow	2 Blue	



1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES—RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M–35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

#### CABLE COLOR CODING & IDENTIFICATION NOTES

ALL RF AND DC CABLE SHALL BE MARKED AS PER CABLE MARKING LOCATIONS TABLE BELOW:

CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

#### AT&T MOBILITY

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NSB – WIC

SHEET TITLE  
COAX COLOR CODING

SHEET NUMBER

T-5

CABLE COLOR CHART

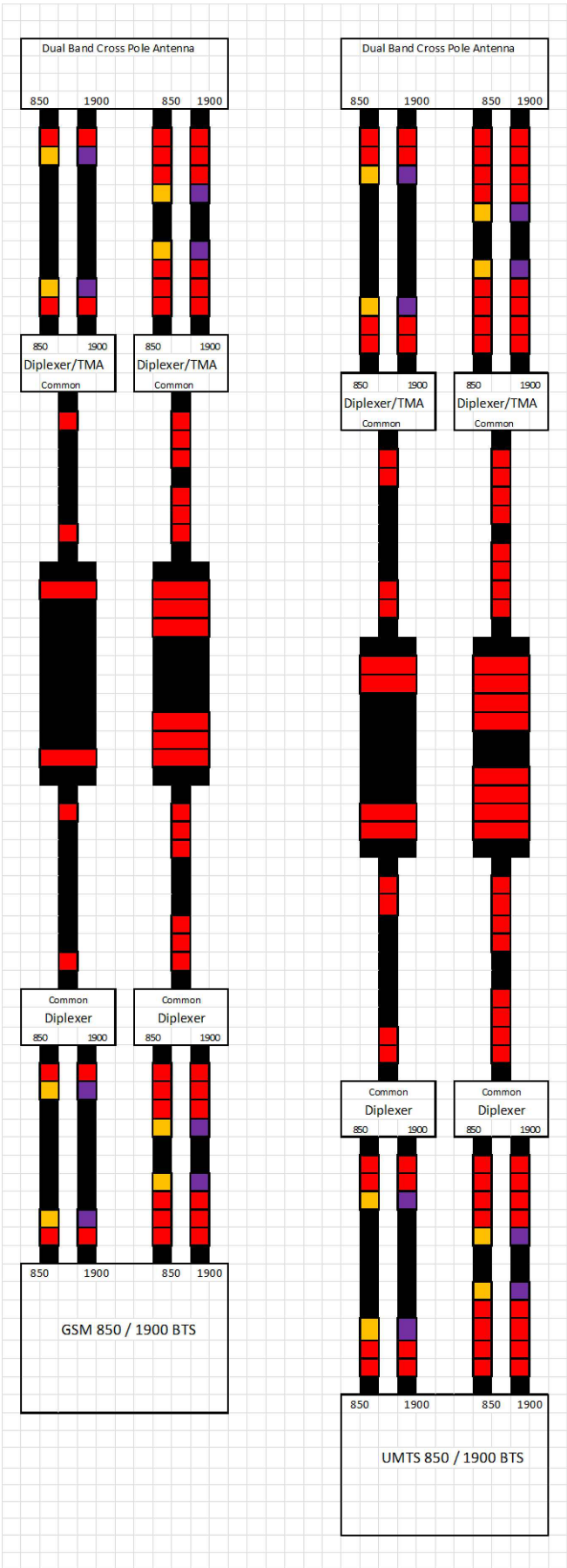
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CABLE MARKING LOCATIONS DIAGRAM

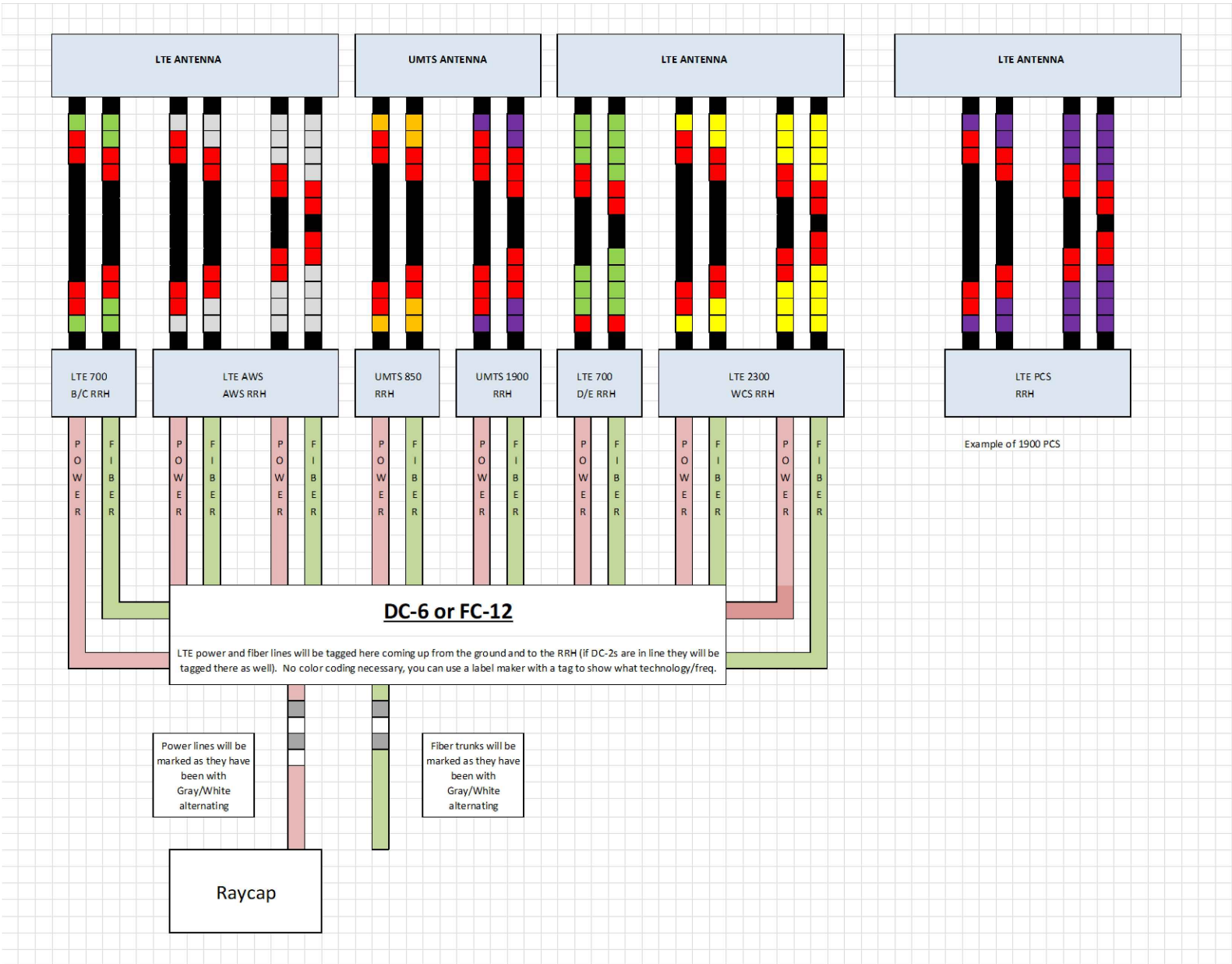
2

CABLE MARKING LOCATIONS TABLE

3



ALPHA SECTOR COAX COLORS



ALPHA SECTOR LTE/UMTS RRHS AT THE TOP

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NSB - WIC

SHEET TITLE  
COAX COLOR CODING

SHEET NUMBER  
**T-6**



PART 1 – GENERAL

- 1.1SCOPE:
- A. PROVIDE FABRICATION AND ERECTION OF STRUCTURAL STEEL AND OTHER ITEMS AS SHOWN ON THE DRAWINGS OR REQUIRED BY OTHER SECTIONS OF THESE SPECIFICATIONS.
- 1.2REFERENCES:
- A. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC). MANUAL OF STEEL CONSTRUCTION (13TH EDITION), ALLOWABLE STRESS DESIGN (ASD).
- B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).  
ASTM A36: STRUCTURAL STEEL  
ASTM A53: PIPE, STEEL BLACK AND HOT DIPPED, ZINC–COATED WELDED AND SEAMLESS.  
ASTM A108: STEEL BARS, CARBON, COLD FINISHED, STANDARD QUALITY.  
ASTM A123: ZINC (HOT–DIPPED GALVANIZED) COATING ON IRON AND STEEL PRODUCTS.  
ASTM A307: CARBON STEEL BOLTS AND STUDS, 60,000 PSI TENSILE STRENGTH.  
ASTM A325: HIGH–STRENGTH BOLT FOR STRUCTURAL STEEL JOINTS.  
ASTM A490: HEAT–TREATED, STRUCTURAL STEEL BOLTS, 150 (KSI) (1035MPA) TENSILE STRENGTH.  
ASTM A500: COLD–FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES.  
ASTM A563: CARBON AND ALLOY STEEL NUTS.  
ASTM B695: COATINGS OF ZINC MECHANICALLY DEPOSITED ON IRON AND STEEL.  
ASTM F436: HARDENED STEEL WASHERS.  
ASTM F959: COMPRESSIBLE–WASHER–TYPE DIRECT TENSION INDICATOR FOR USE WITH STRUCTURAL FASTENERS.
- C. AMERICAN WELDING SOCIETY (AWS):  
AWS A5.1: COVERED CARBON STEEL ARC WELDING ELECTRODES.  
AWS A5.5: LOW ALLOY STEEL COVERED ARC WELDING ELECTRODES.  
AWS D1.1: STRUCTURAL WELDING CODE – STEEL.
- D. RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC): "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS OR ASTM A490 BOLTS" AS ENDORSED BY AISC.
- E. STEEL STRUCTURES PAINTING COUNCIL (SSPC):  
SSPC–SP3: POWER TOOL CLEANING.  
SSPC–PAINT 11: RED IRON OXIDE, ZINC CHROME, RAW LINSEED OIL OR ALKYD PAINT.
- 1.3SUBMITTALS:
- A. SUBMIT THE FOLLOWING FOR APPROVAL:
1. FABRICATION AND ERECTION DRAWINGS SHOWING ALL DETAILS, CONNECTIONS, MATERIAL DESIGNATIONS, AND ALL TOP STEEL ELEVATIONS.
- B. WELDERS SHALL BE QUALIFIED AS PRESCRIBED IN AWS D1.1.

PART 2 – PRODUCTS

- 2.1STRUCTURAL STEEL:
- A. SHAPES, PLATES AND BARS SHALL CONFORM TO ASTM A36 AND ASTM A992.
- B. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B. STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B.
- 2.2ANCHOR BOLTS:
- A. ANCHOR BOLTS SHALL CONFORM TO ASTM A307 WITH HEAVY HEXAGONAL NUTS.
- 2.3BOLTS:
- A. COMMON (MACHINE) BOLTS SHALL CONFORM TO ASTM A307 GRADE A AND NUTS TO ASTM A563. ONE COMMON BOLT ASSEMBLY SHALL CONSIST OF A BOLT, A HEAVY HEX NUT, AND A HARDENED WASHER.
- B. HIGH STRENGTH BOLT SHALL CONFORM TO ASTM A325, ONE HIGH STRENGTH BOLT ASSEMBLY SHALL CONSIST OF A HEAVY HEX STRUCTURAL BOLT, A HEAVY HEX NUT, A HARDENED WASHER CONFIRMING WITH ASTM F436 AND A DIRECT TENSION INDICATOR CONFORMING WITH STM F959. THE HARDENED WASHER SHALL BE INSTALLED AGAINST THE ELEMENT TURNED IN TIGHTENING.UNLESS NOTED OTHERWISE ON THE DRAWINGS, ALL CONNECTIONS SHALL BE BEARING TYPE CONNECTIONS.
- 2.4WELDING ELECTRODES:
- A. WELDING ELECTRODES SHALL COMPLY WITH AWS D1.1 USING A5.1 OR A5.5 E70XX AND SHALL BE COMPATIBLE WITH THE WELDING PROCESS SELECTED.
- 2.5PRIMER:
- A. PRIMER SHALL BE RED OXIDE–CHROMATE PRIMER COMPLYING WITH SSPC PAINT SPECIFICATION NO. 11.

PART 3 – EXECUTION

- 3.1FABRICATION:
- A. SHOP FABRICATE AND ASSEMBLY MATERIALS AS SPECIFIED HEREIN.
1. FABRICATE ITEMS OF STRUCTURAL STEEL IN ACCORDANCE WITH THE AISC–ASD SPECIFICATION, AND AS INDICATED ON THE APPROVED SHOP DRAWINGS.
2. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED PER ASTM.
3. PROPERLY MARK AND MATCH–MARK MATERIALS FOR FIELD ASSEMBLY AND FOR IDENTIFICATION AS TO LOCATION FOR WHICH INTENDED.
4. FABRICATE AND DELIVER IN A SEQUENCE WHICH WILL EXPEDITE ERECTION AND MINIMIZE FIELD HANDLING OF MATERIALS.
5. WHERE FINISHING IS REQUIRED, COMPLETE THE ASSEMBLY, INCLUDING THE WELDING OF UNITS, BEFORE START OF FINISHING OPERATIONS.
6. PROVIDE FINISH SURFACE OF MEMBERS EXPOSED IN THE FINAL STRUCTURE FREE FROM MARKINGS, BURNS, AND OTHER DEFECTS.
- B. PROVIDE CONNECTIONS AS SPECIFIED HEREIN:
1. PROVIDE BOLTS AND WASHERS OF TYPES AND SIZE REQUIRED FOR COMPLETION OF FIELD ERECTION. USE 3/4 INCH DIAMETER A325 BOLTS UNLESS NOTED OTHERWISE.
2. INSTALL HIGH STRENGTH THREADED FASTENERS IN ACCORDANCE WITH RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS."

3. WELDED CONSTRUCTION SHALL COMPLY WITH AWS D1.1 FOR PROCEDURES, APPEARANCE, QUALITY OF WELD, AND METHODS USED IN CORRECTING WELDED WORK.
4. THE FABRICATOR SHALL FURNISH AND INSTALL ERECTION CLIPS FOR FIT–UP OF WELDED CONNECTIONS.
5. DOUBLE ANGLE MEMBERS SHALL HAVE WELDED FILLERS SPACED IN ACCORDANCE WITH CHAPTER E4 OF THE AISC–ASD SPECIFICATION.
6. GUSSET AND STIFFENER PLATES SHALL BE 3/8 INCH THICK MINIMUM.
- 3.2PRIMING:
- A. STRUCTURAL STEEL SHALL BE PRIMED AS SPECIFIED HEREIN, UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
- B. STRUCTURAL STEEL SURFACE PREPARATION SHALL CONFORM TO SSPC–SP3, "POWER TOOL CLEANING."
- C. SURFACE PREPARATION AND PRIMER SHALL BE IN ACCORDANCE WITH AISC CODE OF STANDARD PRACTICE AS INCLUDED IN THE ASD MANUAL OF STEEL CONSTRUCTION.
- D. MATERIALS SHALL REMAIN CLOSED UNTIL REQUIRED FOR USE, MANUFACTURER’S POT–LIFE REQUIREMENTS SHALL BE STRICTLY ADHERED TO.
- E. PRIMER SHALL BE APPLIED TO DRY, CLEAN, PREPARED SURFACE AND UNDER FAVORABLE CONDITIONS IN ACCORDANCE WITH MANUFACTURER’S INSTRUCTIONS. UNLESS OTHERWISE RECOMMENDED BY THE MANUFACTURER PRIMING SHALL NOT BE DONE WHEN AMBIENT TEMPERATURE IS LESS THAN 50 DEGREES F. THE RELATIVE HUMIDITY IS MORE THAN 90 PERCENT, OR THE SURFACE TEMPERATURE IS LESS THAN 5 DEGREES F ABOVE THE DEW POINT.
- F. GENERALLY ALL PRIMER SHALL BE SPRAY APPLIED. BRUSH OR ROLLER APPLICATION SHALL BE RESTRICTED TO TOUCHUP AND TO AREAS NOT ACCESSIBLE BY SPRAY GUN.
- G. PRIMER SHALL BE UNIFORMLY APPLIED WITHOUT RUNS, SAGS, SOLVENT BLISTERS, DRY SPRAY OR OTHER BLEMISHES. ALL BLEMISHES AND OTHER IRREGULARITIES SHALL BE REPAIRED OR REMOVED AND THE AREA RE–COATED. SPECIAL ATTENTION SHALL BE PAID TO CREVICES, WELD LINES, BOLT HEADS, CORNERS, EDGES, ETC., TO OBTAIN THE REQUIRED NOMINAL FILM THICKNESS.
- H. THE DRY FILM THICKNESS OF THE PRIMER SHALL BE 2.0 MILS.
- I. IF THE PRIMER IS DAMAGED BY WELDING OR PHYSICAL ABUSE, THE AREA SHALL BE TOUCHED–UP AND REPAIRED. THE TOUCHUP PAINT SHALL BE COMPATIBLE WITH THE APPLIED PRIMER WITH MINIMUM DRY FILM THICKNESS OF 1.5 MILS.
- 3.3INSTALLATION:
- A. INSTALLATION OF STRUCTURAL STEEL SHALL COMPLY WITH AISC "CODE OF STANDARD PRACTICE."
- B. STRUCTURAL FIELD WELDING SHALL BE DONE BY THE ELECTRIC SUBMERGED OR SHIELDED METAL ARC PROCESS. WELDED CONSTRUCTION SHALL COMPLY WITH AWS D1.1.
- C. PROVIDE ANCHOR BOLTS AND OTHER CONNECTORS REQUIRED FOR SECURING STRUCTURAL STEEL TO ELEVATOR SHAFT WALLS AND OTHER IN–PLACE WORK. PROVIDE TEMPLATES AND OTHER DEVICES NECESSARY FOR PRESETTING BOLTS AND ANCHORS TO ACCURATE LOCATIONS.
- D. SPLICE MEMBERS ONLY WHERE INDICATED ON THE DRAWINGS.
- E. ANY GAS CUTTING TORCHES HAVE TO BE APPROVED IN WRITING BY THE PROJECT STRUCTURAL ENGINEER.
- F. PROVIDE TEMPORARY SHORING BRACING WITH CONNECTIONS OF SUFFICIENT STRENGTH TO BEAR IMPOSED LOADS. REMOVE TEMPORARY CONNECTIONS AND MEMBERS WHEN PERMANENT MEMBERS ARE IN PLACE AND THE FINAL CONNECTIONS HAVE BEEN MADE.
- G. ALIGN AND ADJUST MEMBERS, AND OTHER SURFACES WHICH WILL BE IN PERMANENT CONTACT, BEFORE ASSEMBLY.
- H. HIGH–STRENGTH BOLTS AS A MINIMUM, SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED IN THE LATEST AISC SPECIFICATION. ALL HIGH–STRENGTH BOLTS SPECIFIED ON THE DESIGN DRAWINGS TO BE USED IN PRETENSIONED OR SLIP–CRITICAL JOINTS SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT GIVEN IN AISC TABLE J3.1. INSTALLATION SHALL BE BY ANY OF THE FOLLOWING METHODS: TURN–OF NUT METHOD, A DIRECT–TENSION–INDICATOR, TWIST–OFF–TYPE TENSION–CONTROL BOLT, CALIBRATED WRENCH, OR ALTERNATIVE DESIGN BOLT.

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PROJECT NO:	129049.4004
DRAWN BY:	VPB
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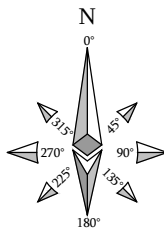
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DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB – WIC

SHEET TITLE  
TOWER SECTION  
NOTES

SHEET NUMBER

T-7



4' 2' 0 4' 8

$1/4" = 1' - 0"$

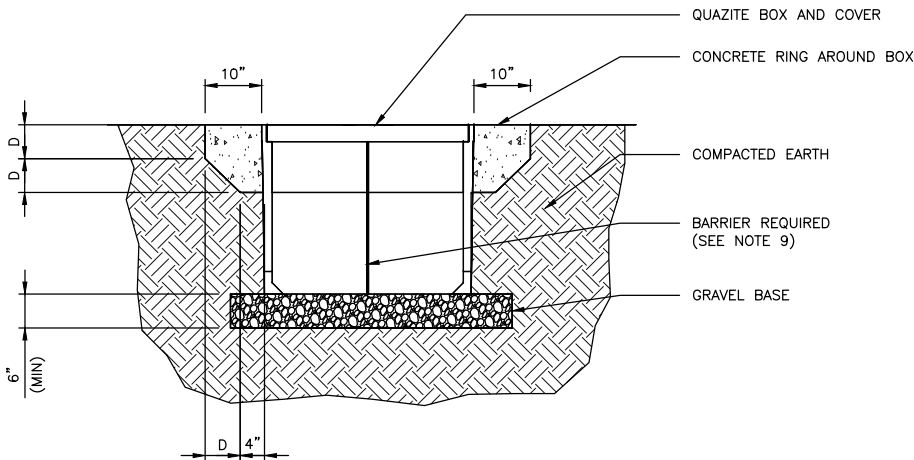
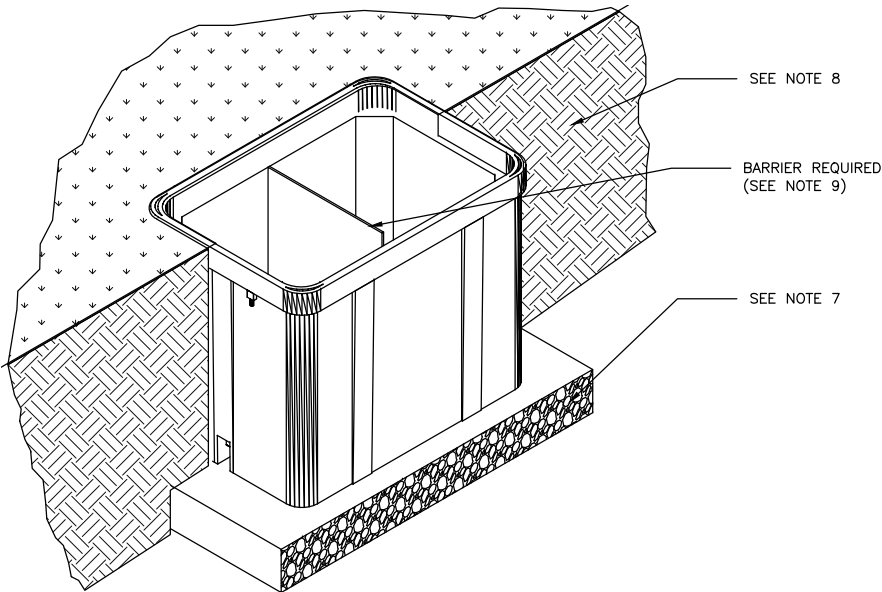
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1. ALL CONDUIT IN COMPOUND TO SWITCH TO SCH 80 WHEN CROSSING AN ACCESS POINT OR AREA FOR VEHICLE TRAFFIC (FIELD VERIFY LOCATION)
2. PULL STRING TO BE INSTALLED IN ALL PROPOSED CONDUIT
3. WHEN BORING, CHANGE CONDUIT TO 4" HDPE CONDUIT.
4. THE CONDUIT ROUTING IS DIAGRAMMATICALLY SHOWN ON THE PLANS AND ARE ONLY APPROXIMATIONS. THE EXACT LOCATION AND ROUTING SHALL BE FIELD VERIFIED.
5. ALL ELECTRICAL EQUIPMENT AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES, INDICATING THE CIRCUITS ORIGINATION AND ALL EQUIPMENT TERMINATIONS.
6. CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS, CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
7. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE 2017 NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.
8. EXISTING UTILITIES MUST BE PROTECTED DURING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS

The diagram illustrates a cross-section of a road and bridge structure. At the top, a dashed line represents the 'FENCE'. Below it is the 'LEASE AREA'. The main structure consists of two bridge decks, each with a cross-hatched pattern. The top deck is labeled 'PROPOSED ICE BRIDGE' and the bottom deck is labeled 'EXISTING ICE BRIDGE'. Between the two decks, there is a layer of 'OVERHEAD POWER' (OHP) and 'OVERHEAD UTILITIES' (OHU). Below the bridge decks, there are layers for 'UNDERGROUND POWER' (UGP) and 'UNDERGROUND FIBER AND POWER' (UGF/P). At the bottom, there is a layer for 'UNDERGROUND FIBER' (UGF). The diagram also shows a 'ROAD' surface and a 'DRAINAGE' system with a 'DRAINAGE MANHOLE' and a 'DRAINAGE DITCH'.

SHEET NUMBER

**E-1**



1. CONCRETE COLLARS MAY BE DESIRED FOR INSTALLATIONS IN DRIVEWAYS, PARKING LOTS AND OFF-ROADWAY APPLICATIONS WHERE SUBJECT TO OCCASIONAL NON-DELIBERATE TRAFFIC. THIS APPLIES TO BOXES MADE FROM ANY MATERIAL TO PROVIDE ADDED PROTECTION FOR THE TOP LID. THIS IS NOT NECESSARY IN GRASSY AREAS OR AREAS SUBJECT TO PEDESTRIAN TRAFFIC.
2. CONCRETE ENCASEMENT TO BE 3,000 PSI MIN.
3. CONCRETE ENCASEMENT COLLAR DIMENSION "D" TO BE EQUAL TO DESIGN PAVEMENT DEPTH.
4. PAVEMENT AND SUBGRADE TO BE SHOWN ON THE ENGINEERING PLANS.
5. EXCAVATE THE HOLE APPROXIMATELY 6 TO 8" DEEPER THAN SUGGESTED HAND HOLE BURIAL DEPTH.
6. COMPACT THE SUBSOIL WITH A BACK-HOE OR A HYDRAULIC TAMPER. ADD APPROXIMATELY 6 TO 8" OF GRAVEL TO THE BOTTOM OF HOLE.
7. PLACE THE HAND HOLE ON THE LEVELED GRAVEL BED. LEVEL THE HAND HOLE.
8. BACK-FILL WITH LOOSE EARTH MATERIAL UP TO THE TOP SURFACE OF THE HAND HOLE. DO NOT BACK-FILL WITH CHUNKS OF FROZEN MATERIAL OR LARGE ROCKS NEXT TO THE GROUND SLEEVE. PACK THE BACK-FILL MATERIAL BY FOOT TAMPING, NO MACHINE TAMPING.
9. PROVIDE BARRIER HUBBELL QUAZITE # PG 2436BC30 OR APPROVED 24"x36"x30" UL TIER 22 HAND HOLE.

CONCRETE COLLAR APPLICATION  
MOUNTED IN COMPACTED SOIL

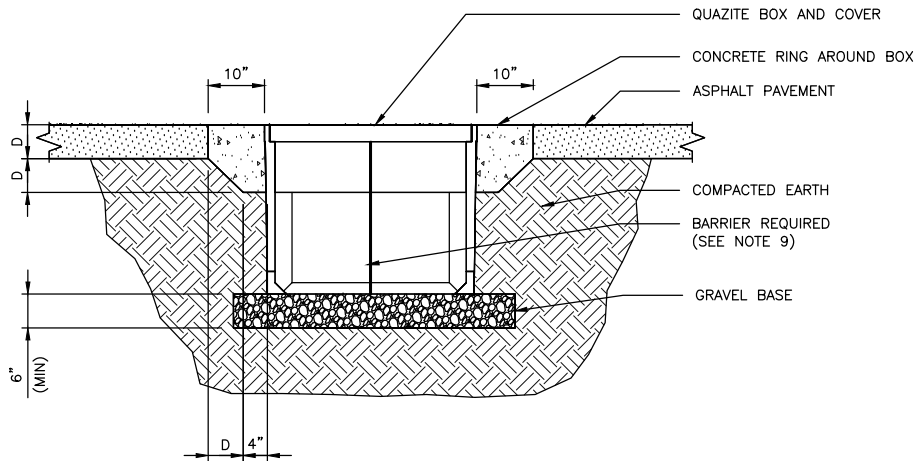
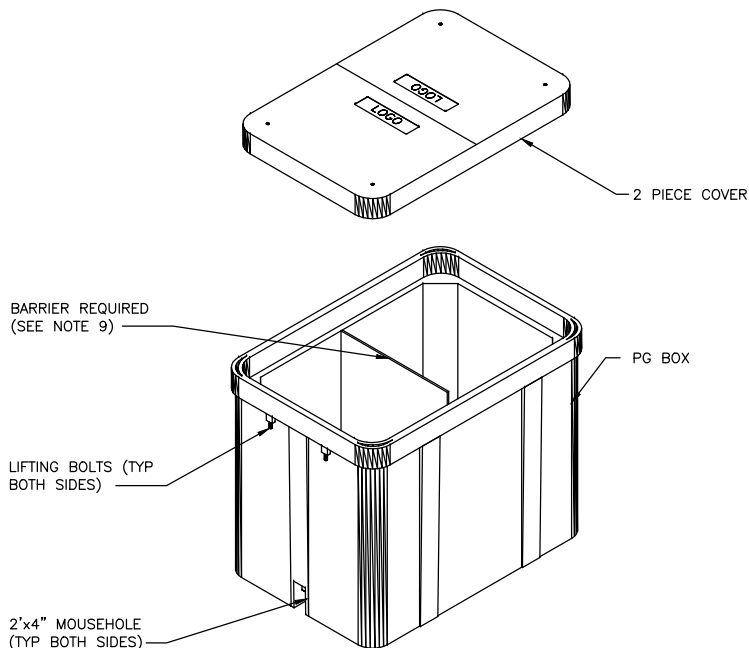
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CONCRETE COLLAR APPLICATION MOUNTED IN COMPACTED SOIL

NO SCALE

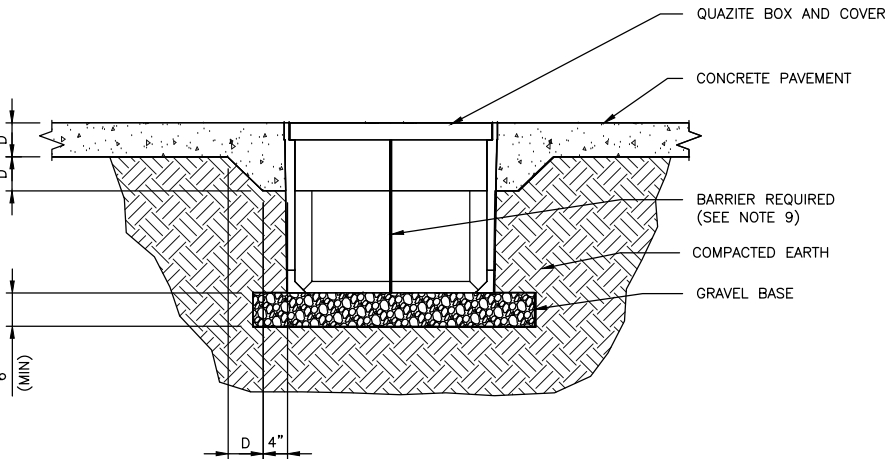
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CONCRETE COLLAR APPLICATION MOUNTED IN ASPHALT PAVEMENT

NO SCALE

4



QUAZITE PG BOX WITH 2 PIECE COVER

NO SCALE

3

PG BOX WITH NO CONCRETE COLLAR MOUNTED IN CONCRETE PAVEMENTS

NO SCALE

5

NOTES

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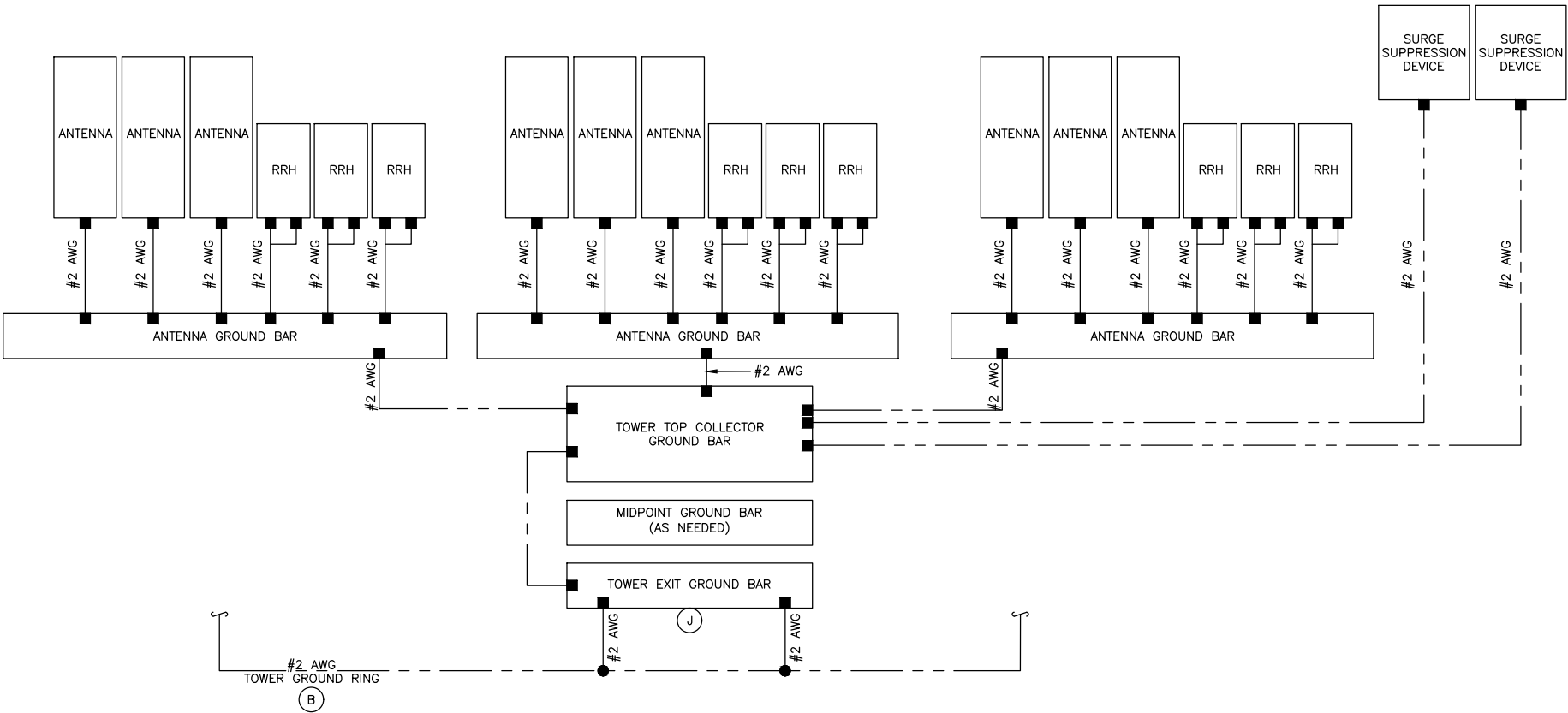
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SHEET TITLE  
ELECTRICAL DETAILS

SHEET NUMBER

E-2



- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- | | ●

GROUND ROD
- | | ●

TEST GROUND ROD WITH INSPECTION SLEEVE

LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY. FOR GROUNDING DETAILS SEE DRAWINGS E-5 THROUGH E-7.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND AT&T GROUNDING AND BONDING REQUIREMENTS (ATT-TP-76416) AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.
4. FOR ALCATEL-LUCENT 850 AND 1900 RRH's, TWO GROUNDS ARE REQUIRED (TOP AND BOTTOM).

NOTES

- A

EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING. (ATT-TP-76416 2.2.3.5/7.5.1)
- B

TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS. (ATT-TP-76416 7.5.1)
- C

INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR. (ATT-TP-76416 7.6.4)
- D

BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING. (ATT-TP-76416 7.5.2.2)
- E

GROUND ROD: UL LISTED COPPER CLAD STEEL, MINIMUM 5/8" DIAMETER BY EIGHT FEET LONG. ALL GROUND RODS MAY BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR. (ATT-TP-76416 1.4 / 2.2.3.10)
- F

CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS. (ATT-TP-76416 7.6.7)
- G

HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS.
- H

EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE. (ATT-TP-76416 7.6.7.2)
- J

TOWER EXIT GROUND BAR: #2 AWG SOLID TINNED COPPER BOND TO THE TOWER GROUND RING. (ATT-TP-76416 7.5.5)
- K

TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR AND EXTERIOR GROUND RING. (ATT-TP-76416 7.6.8)
- L

FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK. BOND THE FRAME GROUND BUS TO THE "I" SECTION OF THE CELL REFERENCE GROUND BAR. (ATT-TP-76416 7.8)
- M

INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITHIN THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING. (ATT-TP-76416 7.12.3.1)
- N

FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS. (ATT-TP-76416 7.12.2.2)
- P

EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. (ATT-TP-76416 7.12.2)
- Q

ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING. (ATT-TP-76416 7.4.2.6)
- R

DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICES CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR (CRGB) PER TP76300 SECTION H 6 AND TP76416 FIGURE 7-11 REQUIREMENTS.

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SHEET TITLE  
ONE-LINE  
GROUNDING DIAGRAM

SHEET NUMBER

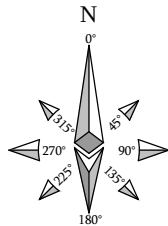
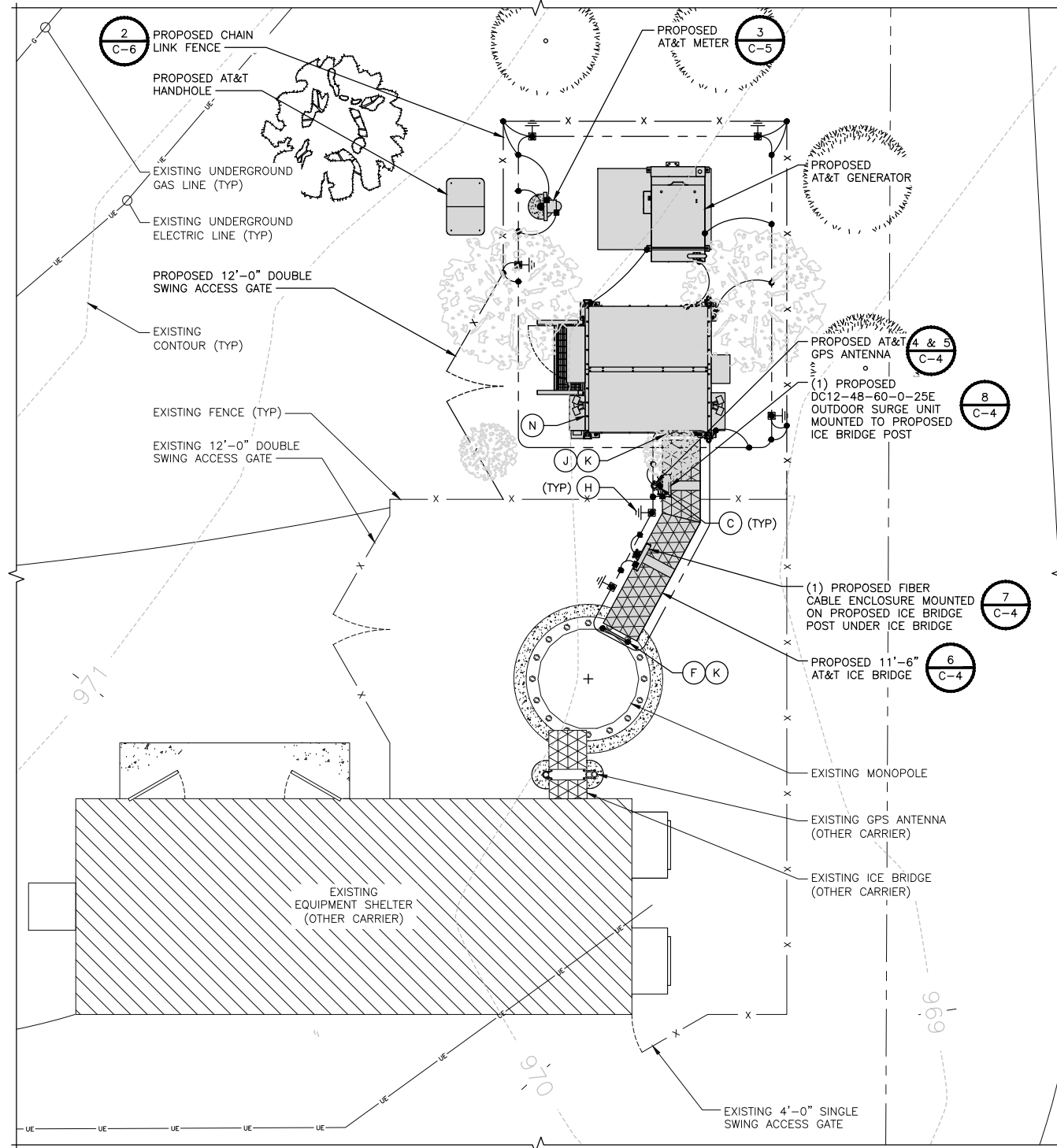
E-3

TOWER ANTENNA EQUIPMENT GROUNDING ONE-LINE

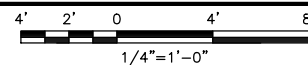
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GROUNDING KEY NOTES





COMPOUND GROUNDING PLAN



1

KEYNOTES

NOTES


- EXOTHERMIC TYPE CONNECTIONS
- COMPRESSION TYPE CONNECTIONS
- ⊗ CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
- ⊥-⊗ GROUND ROD WITH INSPECTION SLEEVE
- ⊥-⊗ T TEST GROUND ROD WITH INSPECTION SLEEVE
- ⊗ EXOTHERMIC WITH INSPECTION SLEEVE
- GROUNDING CONDUCTOR
- GROUNDING BAR

LEGEND

- (A) GROUNDING BAR: EXTEND TWO (2) #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING UP TO THE HATCHPLATE GROUNDING BAR AND MAKE A MECHANICAL CONNECTION.
- (B) GROUND ROD: COPPER CLAD STEEL 5/8" (10) TEN FEET LONG. ALL GROUNDING RODS MAY BE INSTALLED WITH INSPECTION SLEEVES.
- (C) ICE BRIDGE SUPPORT POST GROUNDING: EXTEND #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING TO ALL ICE BRIDGE SUPPORT POSTS AND EXOTHERMICALLY WELD.
- (D) FENCE GROUNDING: IF FENCE IS WITHIN 6' OF GROUNDING RING, EXTEND #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING TO FENCE POSTS EXOTHERMICALLY WELDED. FENCING FABRIC SHALL BE GROUNDED AT ADJACENT CORNER POST. (2) REQ'D. GROUND INTERMEDIATE POST TO MAINTAIN 25'-0" MAX SPACING.
- (E) PROPOSED TOWER GROUNDING: EXTEND TWO (2) #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING AND CONNECT TO THE PROPOSED TOWER. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR GROUNDING CONNECTIONS TO THE TOWER. (APPLICABLE TO NEW TOWERS ONLY.)
- (F) ANTENNA GROUNDING BAR: EXTEND TWO (2) #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING AND CONNECT TO THE PROPOSED ANTENNA GROUNDING BAR. MOUNT GROUNDING BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
- (G) GATE GROUNDING: EXTEND #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING TO GATE POSTS AND EXOTHERMICALLY WELD. SEE DETAIL G-6.
- (H) TEST GROUND ROD WITH INSPECTION SLEEVE: COPPER CLAD STEEL 5/8" DIA. TEN (10) FEET LONG WITH INSPECTION SLEEVE.
- (J) MASTER GROUNDING BAR: EXTEND TWO (2) #2 AWG TINNED CU CONDUCTORS FROM BURIED GROUNDING RING UP TO MASTER GROUNDING BAR & MAKE A EXOTHERMIC CONNECTIONS.
- (K) GROUNDING BAR LOCK BOX: TESSCO PART # 351546: INSTALL PER MANUFACTURER REQUIREMENTS.
- (L) TIE INTO EXISTING GROUNDING RING: (2) REQ'D
- (M) ANTENNA GROUNDING BAR: EXTEND TWO (2) #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING AND CONNECT TO THE PROPOSED ANTENNA GROUNDING BAR. MOUNT GROUNDING BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
- (N) PROPOSED EQUIPMENT CABINET: SEE MANUFACTURER SPECIFICATIONS FOR ALL INTERIOR EQUIPMENT GROUNDING.

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY. FOR GROUNDING DETAILS SEE DRAWINGS E-4 THROUGH E-6.
2. TESTING SHALL BE PERFORMED AT ALL SITES WHERE MODIFICATIONS OR ADDITIONS ARE MADE TO THE EXISTING GROUNDING SYSTEM AND SHALL BE IN ACCORDANCE WITH AT&T GROUNDING AND BONDING STANDARDS TP-76416. THE CONTRACTOR SHALL SUPPLY AT&T WITH RESULTS FROM PRE-CONSTRUCTION AND POST-CONSTRUCTION OHM TESTING (GROUNDING) RESULTS AND BE IN COMPLIANCE WITH AT&T GROUNDING AND BONDING STANDARDS TP-76416.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A "FALL OF POTENTIAL" TEST ON THE PROPOSED SUPPLEMENTAL GROUNDING FIELD PRIOR TO FINAL CONNECTION OF THE GROUNDING SYSTEM TO EQUIPMENT. THE TEST SHALL BE PERFORMED BY A QUALIFIED AND CERTIFIED TESTING AGENT. PROVIDE INDEPENDENT TEST RESULTS TO THE PROJECT MANAGER FOR REVIEW. THE GROUNDING SYSTEM RESISTANCE TO EARTH GROUNDING SHALL NOT EXCEED (5) OHMS. IF THE GROUNDING TEST EXCEEDS THE MAXIMUM OF (5) OHMS, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADDITIONAL GROUNDING RODS AND CONNECTIONS AS REQUIRED TO MEET THE (5) OHMS' MAXIMUM.
4. THE INSPECTOR HAVING JURISDICTION SHALL INSPECT ALL GROUNDING CONNECTIONS FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BEFORE BEING PERMANENTLY CONCEALED.
5. FOR ALL CONNECTIONS TO THE GROUNDING RING, SEE THE SHELTER MANUFACTURER'S DRAWINGS.
6. WHEN AN EXISTING METER RACK IS UTILIZED AND A NEW METER IS INSTALLED IN THE EXISTING METER RACK, THE GROUNDING RODS, AND GROUNDING CONDUCTORS OF THE EXISTING GROUNDING RING, SHALL BE EXTENDED TO THE PROPOSED GROUNDING RING AND BECOME A COMPLETE GROUNDING SYSTEM.
7. CONTRACTOR SHALL GROUND ALL EQUIPMENT INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. FOR GROUNDING INSTALLATIONS WHICH HAVE A LIMITED AREA AND IS BEING REQUIRED TO BE INSTALLED WITHIN THE LEASE AREA ONLY, THE GROUNDING RING CONDUCTORS CAN BE INSTALLED UNDER THE SHELTER'S FOOTINGS.
8. MAIN GROUNDING CONDUCTORS SHALL BE ROUTED AND BONDED TO ALL EFFECTIVE GROUNDING PATHS IN ACCORDANCE WITH AT&T GROUNDING AND BONDING SPECIFICATION 6.8.2 STATED IN TP-76416. THE NEW GROUNDING SYSTEM SHALL BE BONDED (2 PLACES) TO ALL EXISTING GROUNDING SYSTEMS, INCLUDING BUT NOT LIMITED TO BUILDING STEEL STRUCTURE, LIGHTNING PROTECTION SYSTEMS, BUILDING MAIN GROUNDING SYSTEM AND/OR MAIN WATER SUPPLY IF APPLICABLE.
9. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE. THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE AT&T GROUNDING AND BONDING STANDARDS TP-76416 SPECIFICATION 6.3.2.2.

AT&T  
MOBILITY  
7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431

  
**BLACK & VEATCH**  
BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO: 129049.4004

DRAWN BY: VPB

CHECKED BY: JAT

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REV	DATE	DESCRIPTION

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DELANO COUNTY LINE  
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SHEET TITLE  
COMPOUND  
GROUNDING PLAN

SHEET NUMBER  
**E-4**

INSPECTION WINDOW IN BARREL, REQUIRED FOR ALL INTERIOR TWO-HOLE CONNECTORS

EXTERNAL TOOTHED

3/8"Øx1 1/2"

S/S NUT

S/S LOCK WASHER

S/S FLAT WASHER

CLEAR HEAT SHRINK

CONDUCTOR INSULATION TO BUTT UP AGAINST THE CONNECTOR BARREL

CLEAR HEAT SHRINK

TINNED COPPER GROUND BAR

LABEL

LABEL

1/16" MINIMUM SPACING

S/S FLAT WASHER

S/S BOLT (1 OF 2)

DO NOT DISCONNECT

"DO NOT DISCONNECT" TAG ON ALL GROUND BAR INTERCONNECTS AND EQUALIZERS

**NOTES**

- EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
- ALL GROUND BARS SHALL BE STAMPED IN TO THE METAL "IF STOLEN DO NOT RECYCLE." THE CONTRACTOR SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "I") WITH 1" HIGH LETTERS.
- ALL HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
- FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUND BUS.
- NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION, ON ALL GROUND TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
- SUPPLIED AND INSTALLED BY CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
- ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).
- BOLTS SHALL BE MADE "SNUG-TIGHT" PLUS 1/4 TURN.

CLOSED BARREL, FOR ALL EXTERIOR TWO-HOLE CONNECTORS

EXTERNAL TOOTHED

3/8"Øx1 1/2"

S/S NUT

S/S LOCK WASHER

S/S FLAT WASHER

BLACK HEAT SHRINK UV RATED

CONDUCTOR INSULATION TO BUTT UP AGAINST THE CONNECTOR BARREL

CLEAR HEAT SHRINK

TINNED COPPER GROUND BAR

LABEL

LABEL

1/16" MINIMUM SPACING

S/S FLAT WASHER

S/S BOLT (1 OF 2)

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- SUPPLIED AND INSTALLED BY CONTRACTOR.
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- ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).
- BOLTS SHALL BE MADE "SNUG-TIGHT" PLUS 1/4 TURN.

INTERIOR TWO HOLE LUG DETAIL	NO SCALE	1
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EXTERIOR TWO HOLE LUG DETAIL	NO SCALE	2
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NEWTON INSTRUMENT COMPANY, INC.  
BUTNER, N.C.

NO	REQUIRED	PART NUMBER	DESCRIPTION
1	1	HAGAR TCBI-14420C OR A.L.T. 382227	GALVANIZED STEEL GROUND BAR * (1/4" x 4" x 20)
2	2	A-6056	WALL MOUNTING BRACKET
3	2	3061-4	INSULATORS
4	2	3012-1	5/8"-11x1" H.H.C.S. BOLTS
5	4	3015-8	5/8" LOCKWASHER

\* HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

**EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION**

**SECTION "P" - SURGE PROTECTORS**

(EC) CELL REFERENCE GROUND BAR (IF COLLOCATED)  
(EC) GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)  
(EC) TELCO GROUND BAR (#2 AWG)  
(EC) COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (3/0)  
(EC) FIBER GROUND BAR (#2 AWG)  
(EC) POWER ROOM REFERENCE GROUND BAR (#2 AWG)  
(AT&T) RECTIFIER FRAMES

**SECTION "A" - SURGE ABSORBERS**

(EC) INTERIOR GROUND RING (#2 AWG)  
(EC) EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)  
(EC) METALLIC COLD WATER PIPE (IF AVAILABLE) (1/0 AWG)  
(EC) BUILDING STEEL (IF AVAILABLE) (1/0 AWG)

**SECTION "I" - ISOLATED GROUND ZONE**

(AT&T) ALL ISOLATED GROUND REFERENCE  
(AT&T) GROUND WINDOW BAR

**DETAIL NOTES**

- EXOTHERMICALLY WELD #2 AWG BARE TINNED SOLID COPPER CONDUCTOR TO GROUND BAR. ROUTE CONDUCTOR TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
- THE INSTALLER SHALL USE PERMANENT MARKER TO DRAW THE LIKE BETWEEN SECTION AND LABEL EACH SECTION ("P", "A", "I" WITH 1" HIGH LETTERS

GROUNDING BAR DETAIL	NO SCALE	4
CONNECTION OF CABLE GROUNDING KIT TO ANTENNA CABLE	NO SCALE	5

REFERENCE GROUNDING BAR DETAIL	NO SCALE	3
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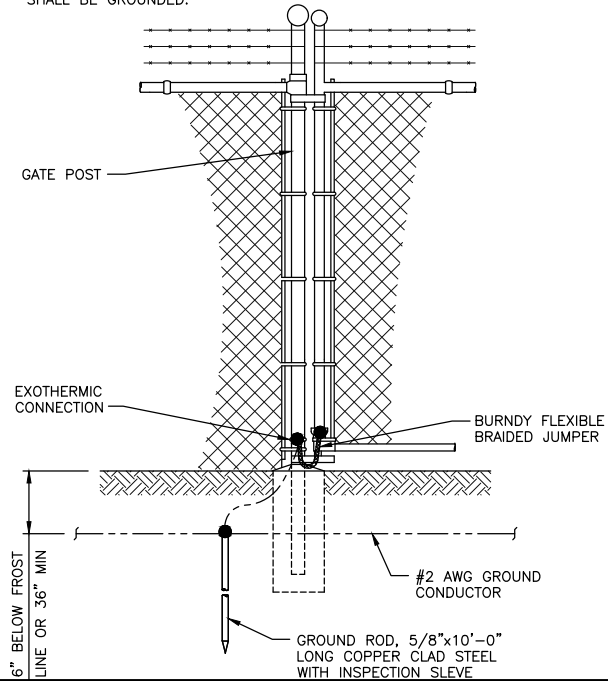
SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

**E-5**

- 1. ALL METAL FENCE POSTS SHALL BE GROUNDED.
- 2. GROUND LINE POSTS ADJACENT TO CORNER POSTS, THEN, GROUND LINE POSTS OR FENCE FABRIC AT 25' INTERVALS. (NO GROUNDS ON CORNER POSTS REQ'D)
- 3. WHEN A FENCE IS EXISTING AND FENCE POSTS HAVE BEEN VERIFIED TO BE GROUNDED, BUT REQUIRE FENCE TO BE GROUNDED FOR AT&T SPECIFICATION THE FENCING FABRIC SHALL BE GROUNDED.

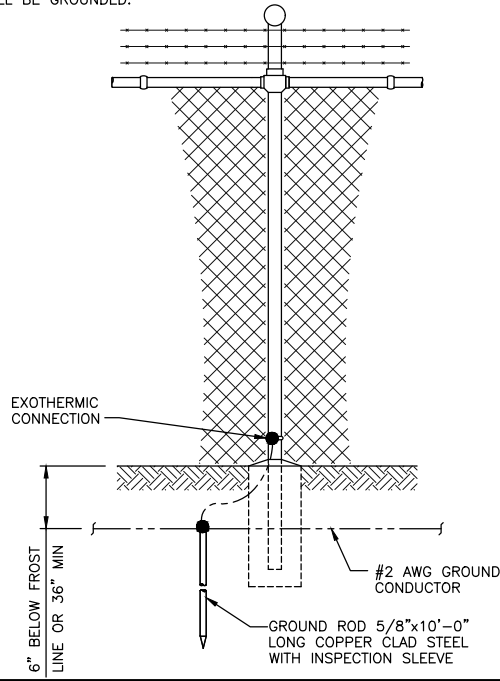


GATE AND GATE POST FENCE  
GROUNDING DETAIL

NO SCALE

1

- 1. ALL METAL FENCE POSTS SHALL BE GROUNDED.
- 2. GROUND LINE POSTS ADJACENT TO CORNER POSTS, THEN, GROUND LINE POSTS OR FENCE FABRIC AT 25' INTERVALS. (NO GROUNDS ON CORNER POSTS REQ'D)
- 3. WHEN A FENCE IS EXISTING AND FENCE POSTS HAVE BEEN VERIFIED TO BE GROUNDED, BUT REQUIRE FENCE TO BE GROUNDED FOR AT&T SPECIFICATION THE FENCING FABRIC SHALL BE GROUNDED.



TANGENT POST FENCE  
GROUNDING DETAIL

NO SCALE

2

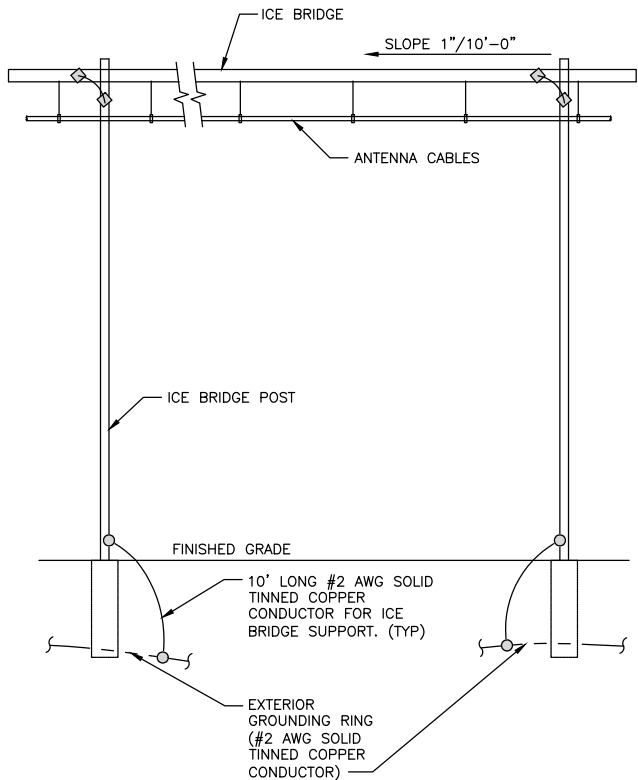
NOT USED

NO SCALE

3

NOTES

- 1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
- 2. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUND BAR.
- 3. GROUND KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
- 4. WEATHER PROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
- 5. PROVIDE GROUND KIT 6" BEFORE TURN TRANSITION FROM TOWER TO ICE BRIDGE.
- 6. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUND BAR TO AN EXISTING TOWER, THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUND BARS TO THE TOWER.
- 7. EXTEND TWO (2) #2 AWG TINNED CU CONDUCTOR FROM BURIED GROUND RING AND CONNECT TO THE PROPOSED TOWER. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR GROUND CONNECTIONS TO THE TOWER. (APPLICABLE TO NEW TOWERS ONLY.)



ICE BRIDGE DETAIL

NO SCALE

4

NOT USED

NO SCALE

5

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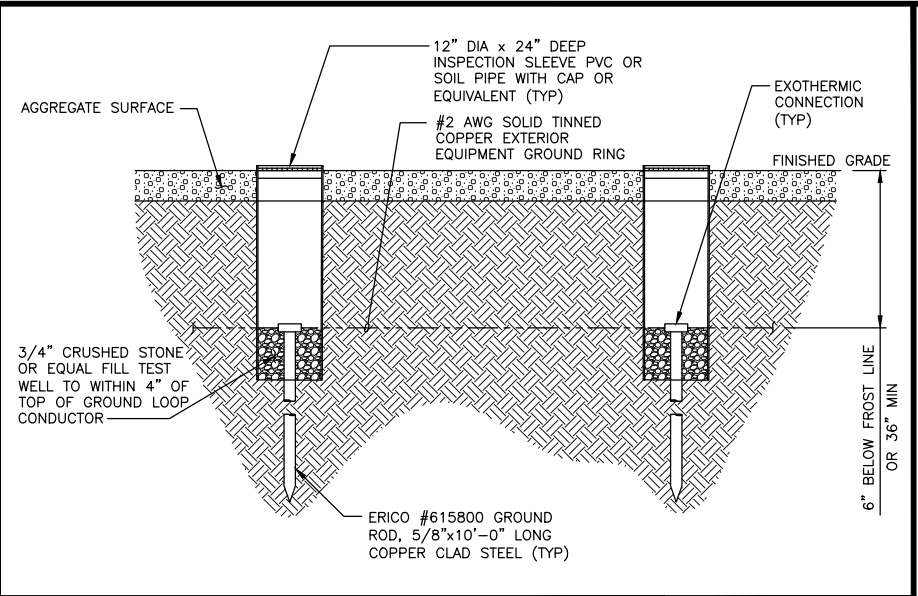
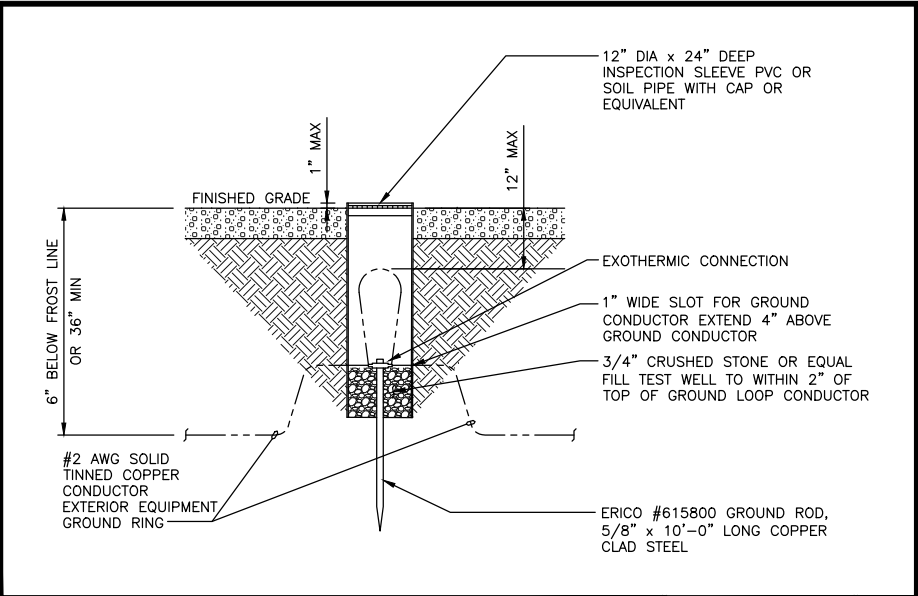
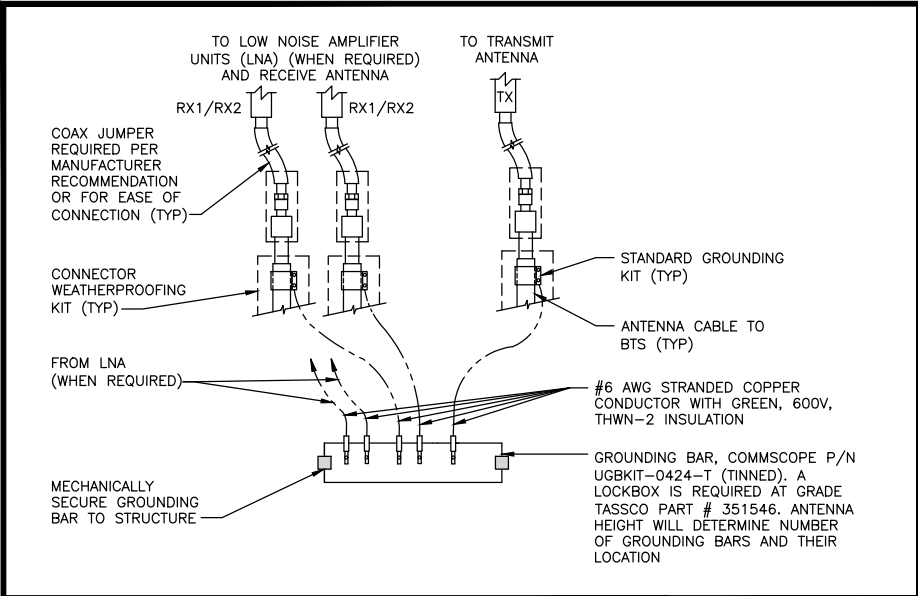
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SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER

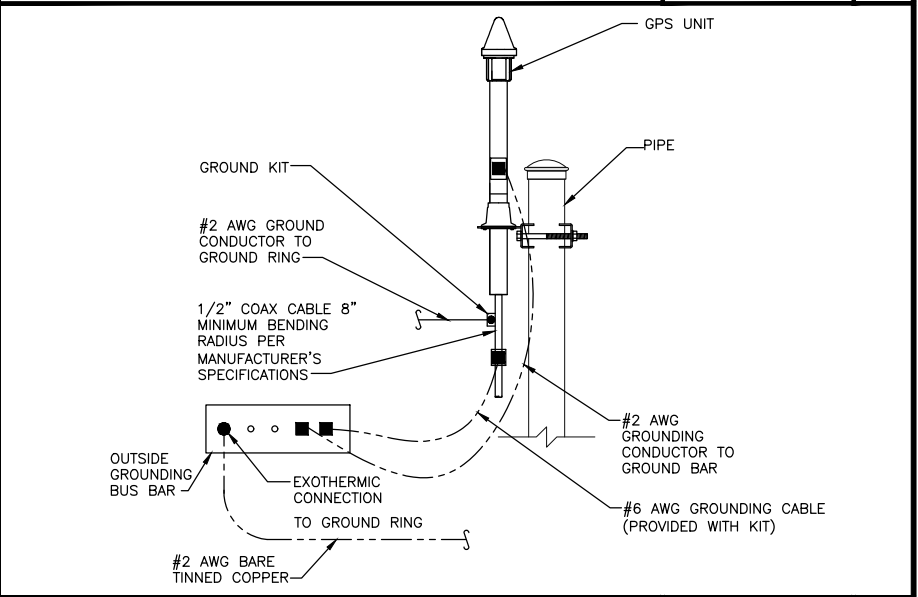
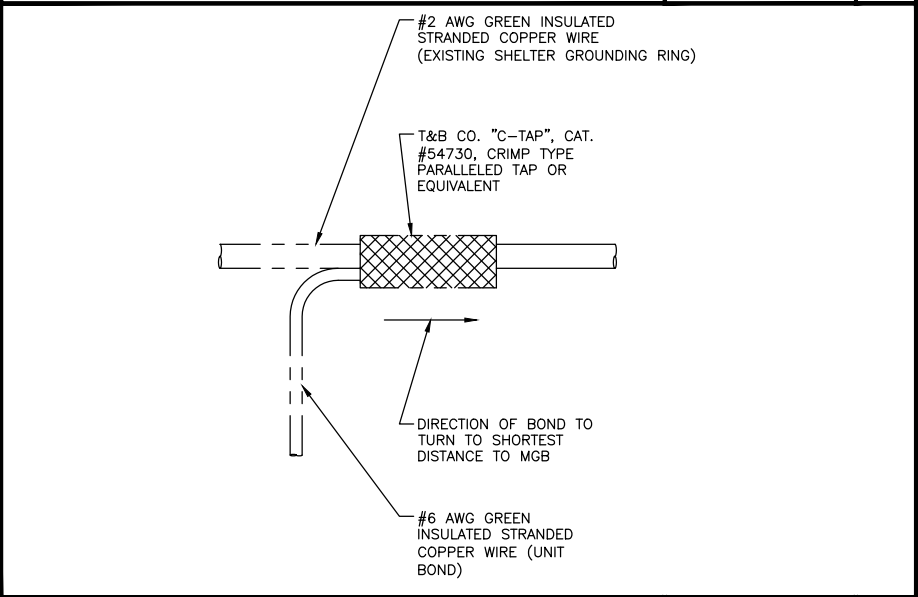
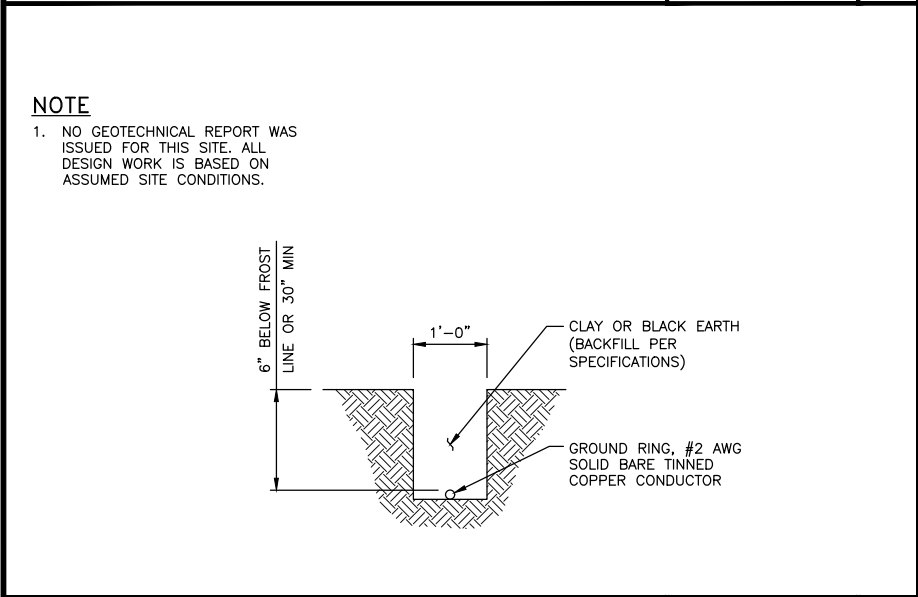
E-6



ANTENNA GROUNDING BAR DETAIL

TEST GROUND ROD WITH INSPECTION SLEEVE DETAIL

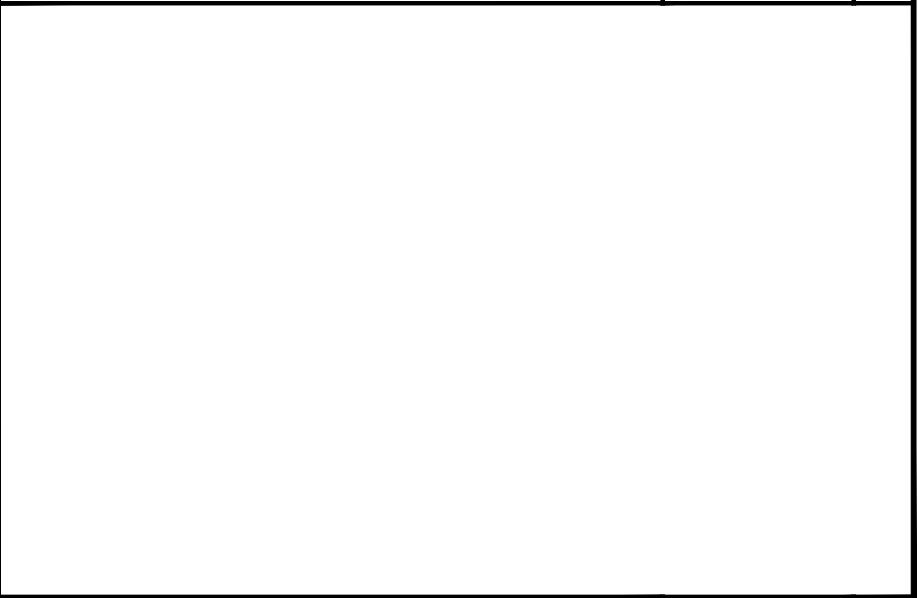
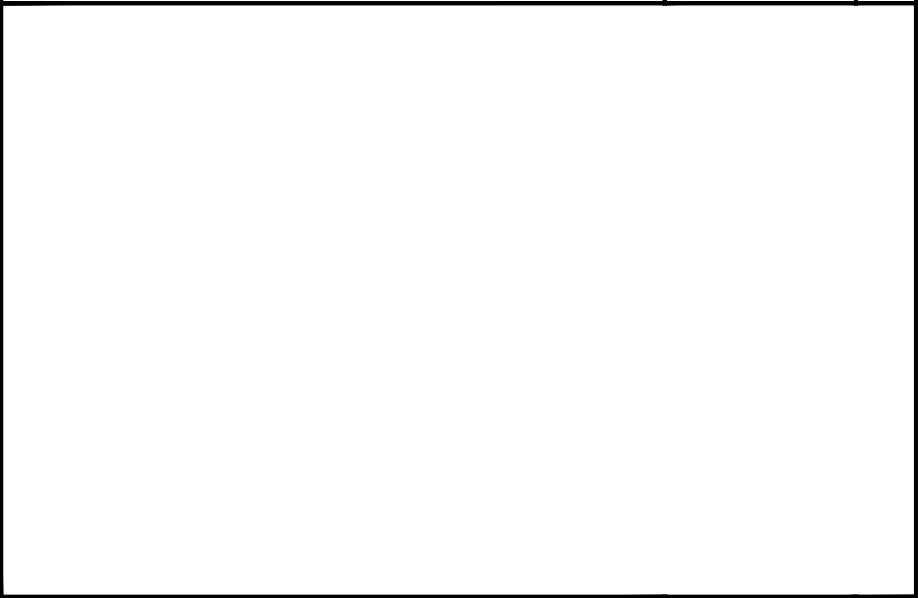
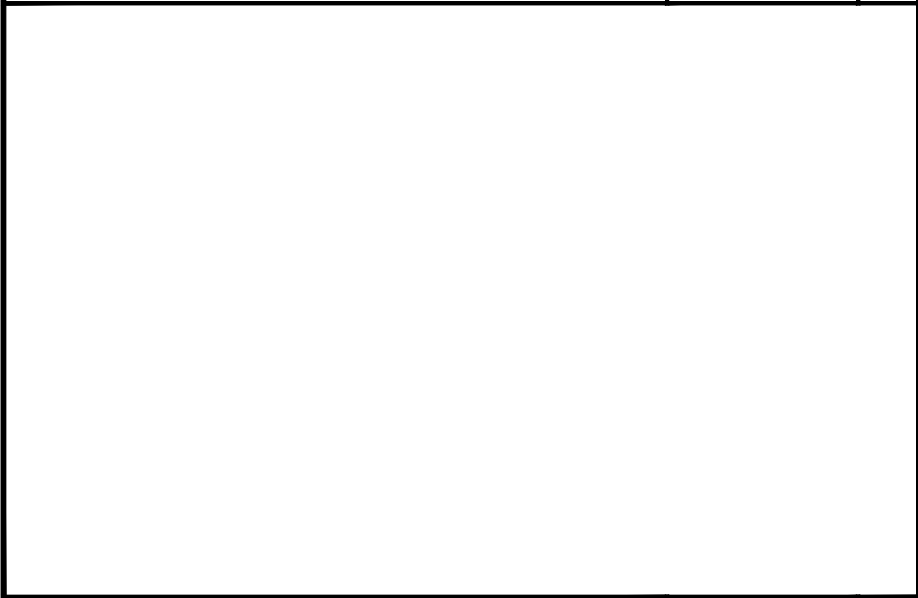
GROUNDING ROD WITH INSPECTION SLEEVE DETAIL



GROUNDING RING TRENCH DETAIL

GROUNDING WIRE CONNECTION DETAIL

LTE GPS ANTENNA GROUNDING DETAIL



NOT USED

NOT USED

NOT USED

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MOBILITY**

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SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
**E-7**

PART 1 – GENERAL

- 1.1GENERAL CONDITIONS:
- A.

CONTRACTOR SHALL INSPECT THE EXISTING SITE CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
- B.

THE CONTRACTOR SHALL OBTAIN PERMITS, LICENSES, MAKE ALL DEPOSITS, AND PAY ALL FEES REQUIRED FOR THE CONSTRUCTION PERFORMANCE FOR THE WORK UNDER THIS SECTION.
- C.

DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWING SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.
- 1.2LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.
- A.

ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES. CONDUIT BENDS SHALL BE THE RADIUS BEND FOR THE TRADE SIZE OF CONDUIT IN COMPLIANCE WITH THE LATEST EDITIONS OF NEC.
- 1.3REFERENCES:
- A.

THE PUBLICATIONS LISTED BELOW ARE PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE. THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENT SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISION OF THESE PUBLICATIONS.
1.

ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
2.

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
3.

ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
4.

NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
5.

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
6.

OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
7.

UL (UNDERWRITERS LABORATORIES INC.)
8.

AT&T GROUNDING AND BONDING STANDARDS TP-76416
- 1.4SCOPE OF WORK
- A.

WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL, AND ASSOCIATED SERVICES REQUIRED TO COMPLETE REQUIRED CONSTRUCTION AND BE OPERATIONAL.
- B.

ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.
- C.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.
- D.

THE CONTRACTOR SHALL FURNISH TO THE OWNER WITH CERTIFICATES OF A FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.
- E.

THE CONTRACTOR SHALL PREPARE A COMPLETE SET OF AS-BUILT DRAWINGS, DOCUMENT ALL WIRING EQUIPMENT CONDITIONS, AND CHANGES WHILE COMPLETING THIS CONTRACT. THE AS-BUILT DRAWINGS SHALL BE SUBMITTED AT COMPLETION OF THE PROJECT.

PART 2 – PRODUCTS

- 2.1GENERAL:
- A.

ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED, NEW, AND FREE FROM DEFECTS.
- B.

ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.
- C.

ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- D.

ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED. 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PER THE GOVERNING JURISDICTION.
- 2.2MATERIALS AND EQUIPMENT:
- A.

CONDUIT:
1.

RIGID METAL CONDUIT (RMC) SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
2.

LIQUDTIGHT FLEXIBLE METAL CONDUIT SHALL BE UL LISTED.
3.

CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION AND CONCRETE TIGHT TYPE. GROUNDING BUSHINGS WITH INSULATED THROATS SHALL BE INSTALLED ON ALL CONDUIT TERMINATIONS.
4.

NONMETALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC. INSTALL USING SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.
- B.

CONDUCTORS AND CABLE:
1.

CONDUCTORS AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN-2, 600 VOLT, SIZE AS INDICATED, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR USED.
2.

#10 AWG AND SMALLER CONDUCTOR SHALL BE SOLID OR STRANDED AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
3.

SOLDERLESS, COMPRESSION-TYPE CONNECTORS SHALL BE USED FOR TERMINATION OF ALL STRANDED CONDUCTORS.
4.

STRAIN-RELIEF SUPPORTS GRIPS SHALL BE HUBBELL KELLEMS OR APPROVED EQUAL. CABLES SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC AND CABLE MANUFACTURER'S RECOMMENDATIONS.
5.

ALL CONDUCTORS SHALL BE TAGGED AT BOTH ENDS OF THE CONDUCTOR, AT ALL PULL BOXES, J-BOXES, EQUIPMENT AND CABINETS AND SHALL BE IDENTIFIED WITH APPROVED PLASTIC TAGS (ACTION CRAFT, BRADY, OR APPROVED EQUAL).
- C.

DISCONNECT SWITCHES:
1.

DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCK WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE-D OR ENGINEER APPROVED EQUAL.
- D.

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:
1.

INSTALL CHEMICAL GROUNDING AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED PIGTAIL, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES K2-(\*)CS OR K2L-(\*)CS (\*) LENGTH AS REQUIRED.
2.

GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH "BREATHER" HOLES, XIT MODEL #XB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID NUMBERING, AND THE ELECTRICAL POWER SOURCE.
3.

BACKFILL MATERIAL SHALL BE LYNCONITE AND LYNCOLE GROUNDING GRAVEL.

- E.
- SYSTEM GROUNDING:
1.

ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER. ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.
2.

GROUNDING BUSSES SHALL BE BARE, TINNED, ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS MGB, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
3.

CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED, USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS. INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.
4.

EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
5.

GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 5/8"x10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.
6.

INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE AT&T SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- F.

OTHER MATERIALS:
1.

THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.
2.

PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.
- G.

PANELS AND LOAD CENTERS:
1.

ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

PART 3 – EXECUTION

- 3.1GENERAL:
- A.

ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- B.

EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.
- 3.2LABOR AND WORKMANSHIP:
- A.

ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE INSTALLED BY EXPERIENCED WIREMEN, IN A NEAT AND WORKMAN-LIKE MANNER.
- B.

ALL ELECTRICAL EQUIPMENT SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.
- C.

UPON COMPLETION OF WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.
- 3.3COORDINATION:
- A.

THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.
- 3.4INSTALLATION:
- A.

CONDUIT:
1.

ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH TRADE SIZE.
2.

PROVIDE RIGID PVC SCHEDULE 80 CONDUITS FOR ALL RISERS, RMC OTHERWISE NOTED. EMT MAY BE INSTALLED FOR EXTERIOR CONDUITS WHERE NOT SUBJECT TO PHYSICAL DAMAGE.
3.

INSTALL SCHEDULE 40 PVC CONDUIT WITH A MINIMUM COVER OF 24" UNDER ROADWAYS, PARKING LOTS, STREETS, AND ALLEYS. CONDUIT SHALL HAVE A MINIMUM COVER OF 18" IN ALL OTHER NON-TRAFFIC APPLICATIONS (REFER TO 2008 NEC, TABLE 300.5).
4.

USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION TO EQUIPMENT WITH MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUID TIGHT, FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORT TO ALLOW FOR EXPANSION AND CONTRACTION.
5.

A RUN OF CONDUIT BETWEEN BOXES OR EQUIPMENT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF THREE QUARTER-BENDS. CONDUIT BEND SHALL BE MADE WITH THE UL LISTED BENDER OR FACTORY 90 DEGREE ELBOWS MAY BE USED.
6.

FIELD FABRICATED CONDUITS SHALL BE CUT SQUARE WITH A CONDUIT CUTTING TOOL AND REAMED TO PROVIDE A SMOOTH INSIDE SURFACE.
7.

PROVIDE INSULATED GROUNDING BUSHING FOR ALL CONDUITS.
8.

CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
9.

ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF CONDUCTORS OR CABLES. CONDUIT SHALL BE FREE OF DIRT AND DEBRIS.
10.

INSTALL PULL STRINGS IN ALL CLEAN EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END.
11.

INSTALL 2" HIGHLY VISIBLE AND DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUITS AND CONDUCTORS.
12.

CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.
13.

PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS TO ALLOW FOR RACEWAYS AND CABLES TO BE ROUTED THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE EFFECTIVELY SEALED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FIRE STOPS AT FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE, AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
- B.

CONDUCTORS AND CABLE:
1.

ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:
- |             |                          |
|-------------|--------------------------|
| DESCRIPTION | 208/240/120 VOLT SYSTEMS |
| PHASE A     | BLACK                    |
| PHASE B     | RED                      |
| PHASE C     | BLUE                     |
| NEUTRAL     | WHITE                    |
| GROUNDING   | GREEN                    |
2.

SPICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAY CONDUITS APPROVED FOR THIS PURPOSE.
3.

PULLING LUBRICANTS SHALL BE UL APPROVED. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CONDUCTOR OR CABLES INTO THE CONDUIT.
4.

CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES & EQUIPMENT TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS. CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY AND MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS IS PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

- C.
- DISCONNECT SWITCHES:
1.

INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUNDING SYSTEM AS INDICATED.
- D.

GROUNDING:
1.

ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, AT&T GROUNDING AND BONDING STANDARDS TP-76416, ND-00135, AND THE NATIONAL ELECTRICAL CODE.
2.

PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3.

ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4.

BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE STANDARD 6.3.2.2.
5.

TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
6.

CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7.

ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
8.

APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHIELD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
9.

A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
10.

BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
11.

DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
12.

ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
13.

THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
14.

DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
15.

IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUNDING BAR AT THE BASE OF THE TOWER, A SECOND GROUNDING BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS.
16.

CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
- 3.5ACCEPTANCE TESTING:
- A.

CERTIFIED PERSONNEL USING CERTIFIED EQUIPMENT SHALL PERFORM REQUIRED TESTS AND SUBMIT WRITTEN TEST REPORTS UPON COMPLETION.
- B.

WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON-COMPLYING ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE FOR NON-COMPLIANCE.
- C.

TEST PROCEDURES:
1.

ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
2.

PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3.

MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4.

PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

AT&T  
MOBILITY

7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431



BLACK & VEATCH

BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO: 129049.4004

DRAWN BY: VPB

CHECKED BY: JAT

0	07/24/19	ISSUED FOR CONSTRUCTION
REV	DATE	DESCRIPTION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB – WIC

SHEET TITLE  
ELECTRICAL SECTION  
NOTES

SHEET NUMBER

E-8

ELECTRICAL SECTION NOTES

[illegible]

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:  
GENERAL CONTRACTOR – OVERLAND CONTRACTING INC. (B&V)  
CONTRACTOR: (CONSTRUCTION)  
OWNER – AT&T
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER’S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR’S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A-10-B-C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER’S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.

36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.
40. ALL COAXIAL CABLE INSTALLATIONS TO FOLLOW MANUFACTURER’S INSTRUCTIONS AND RECOMMENDATIONS.

ANTENNA MOUNTING

1. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.
2. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
3. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
4. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
5. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER’S RECOMMENDATIONS.
6. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER’S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
7. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
8. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.
9. JUMPERS FROM THE TMA<sub>s</sub> MUST TERMINATE TO OPPOSITE POLARIZATION’S IN EACH SECTOR.
10. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
11. TMA<sub>s</sub> SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

1. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
2. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.

A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.

B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.
3. ALL 8M ANTENNA HARDWARE SHALL BE TIGHTENED TO 9 LB–FT (12 NM).
4. ALL 12M ANTENNA HARDWARE SHALL BE TIGHTENED TO 43 LB–FT (58 NM).
5. ALL GROUNDING HARDWARE SHALL BE TIGHTENED UNTIL THE LOCK WASHER COLLAPSES AND THE GROUNDING HARDWARE IS NO LONGER LOOSE.
6. ALL DIN TYPE CONNECTIONS SHALL BE TIGHTENED TO 18–22 LB–FT (24.4 – 29.8 NM).
7. ALL N TYPE CONNECTIONS SHALL BE TIGHTENED TO 15–20 LB–IN (1.7 – 2.3 NM).

FIBER & POWER CABLE MOUNTING

1. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
2. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE OF (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
3. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

1. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
2. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
3. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION. REFER TO "ANTENNA SYSTEM LABELING STANDARD" ND–00027 LATEST VERSION.
4. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6’–0”.
5. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4’–0” OC.
6. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER’S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
7. CONTRACTOR SHALL WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF AMALGAMATING TAPE. WEATHERPROOFING SHALL BE COMPLETED IN STRICT ACCORDANCE WITH AT&T STANDARDS.
8. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA<sub>s</sub>, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER’S SPECIFICATION AND RECOMMENDATION.

9. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER’S SPECIFICATIONS AND RECOMMENDATIONS.
10. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMA<sub>s</sub>, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
2. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER’S RECOMMENDATIONS.
3. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
4. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
5. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:

A. TEMPERATURE SHALL BE ABOVE 50° F.

B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.

C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.

D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS.
6. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER’S RECOMMENDATIONS.

A. GROUNDING AT THE ANTENNA LEVEL.

B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200’–0”, ADDITIONAL CABLE GROUNDING REQUIRED.

C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.

D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.

E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
7. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4’–0” BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANTENNA AND THE COAX CONFIGURATION IS THE CORRECT MAKE AND MODELS, PRIOR TO INSTALLATION.
9. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER’S SPECIFICATION & RECOMMENDATIONS.
10. ANTENNA CONTRACTOR SHALL FURNISH AND INSTALL A 12’–0” STAND–OFF SECTOR ANTENNA MOUNT, OR 14’–16” PLATFORM WITH HANDRAIL, INCLUDING ALL HARDWARE AS REQUIRED AND NOTED ON DRAWINGS.

AT&T  
MOBILITY

7900 XERXES AVE S  
3RD FLOOR  
BLOOMINGTON MN 55431



BLACK & VEATCH

BLACK & VEATCH CORPORATION  
7760 FRANCE AVENUE SOUTH  
SUITE 1200  
BLOOMINGTON, MN 55435

PROJECT NO:	129049.4004
DRAWN BY:	VPB
CHECKED BY:	JAT

0	07/24/19	ISSUED FOR CONSTRUCTION
REV	DATE	DESCRIPTION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB – WIC

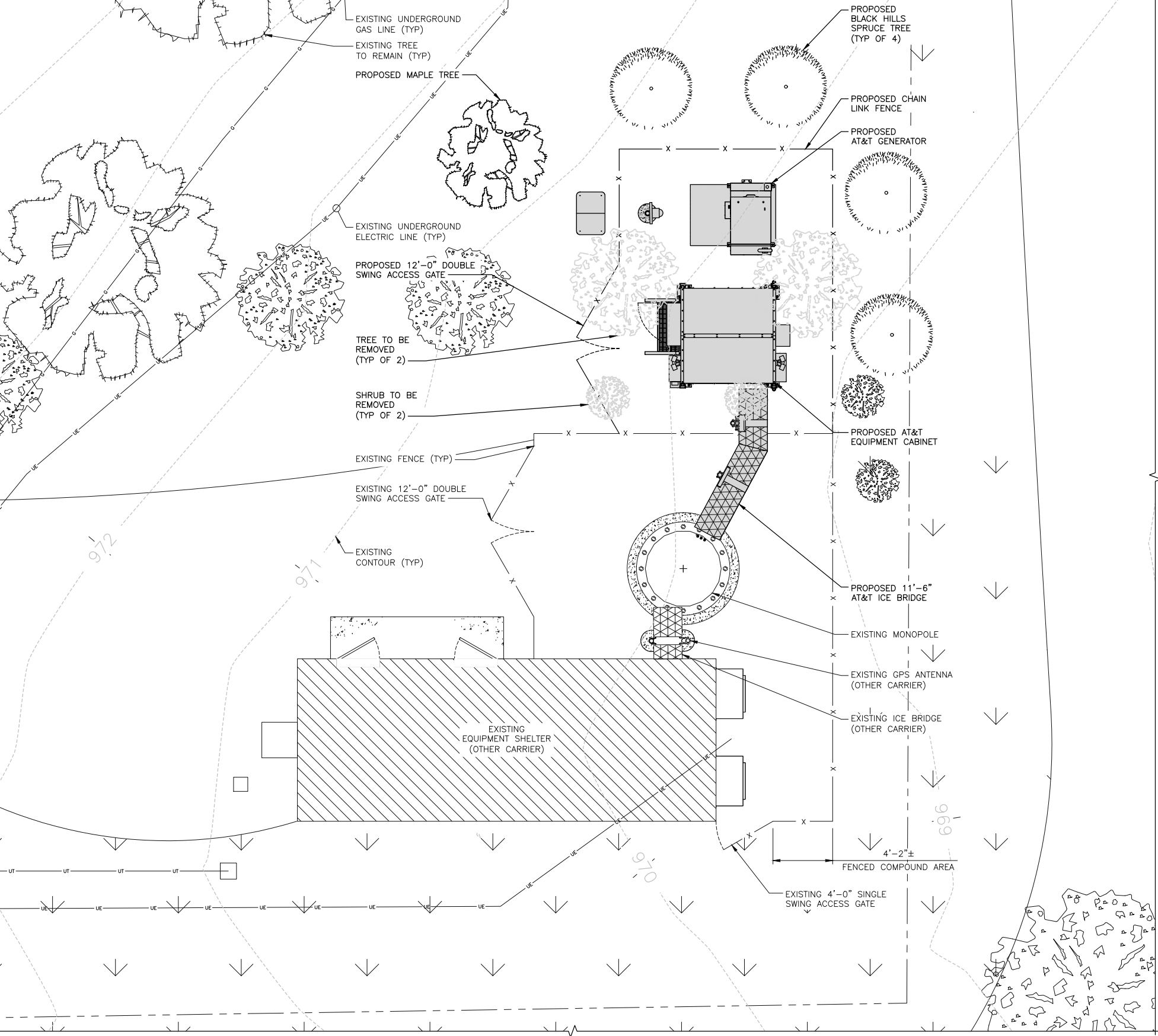
SHEET TITLE  
  
GENERAL NOTES

SHEET NUMBER  
  
N-2

GENERAL NOTES

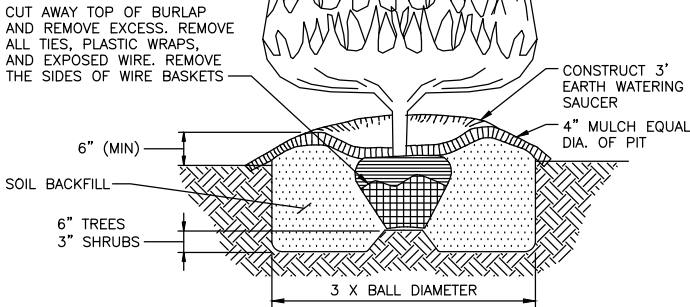


NOTE:  
EXISTING UTILITIES MUST BE PROTECTED DURING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.



LANDSCAPE PLAN

NOTE  
FOR CONTAINER GROWN PLANTS:  
ALL ROOT BALLS SHALL BE  
REMOVED FROM CANS AND SHALL  
BE SCARIFIED PRIOR TO PLANTING.



PLANTING DETAIL NO SCALE 2

1. IF TRANSFORMERS, GROUND-MOUNTED HVAC UNITS, UTILITY PEDESTALS, ETC. ARE NOT SHOWN ON THE SITE PLAN, ADDITIONAL LANDSCAPING/SCREENING MAY BE REQUIRED BASED UPON FIELD CONDITIONS DISCOVERED VIA THE SITE INSPECTION MADE BY STAFF PRIOR TO ISSUANCE OF THE CO, OR FINAL INSPECTION, AS APPLICABLE.
2. ALL PLANTS MUST BE HEALTHY, VIGOROUS MATERIAL, FREE OF PEST AND DISEASE.
3. ALL PLANTS MUST BE CONTAINER-GROWN OR BALLED AND BURLAPPED AS SPECIFIED.
4. ALL TREES MUST BE STRAIGHT TRUNKED, FULL HEADED AND MEET ALL REQUIREMENTS SPECIFIED.
5. ALL PLANTS ARE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE BEFORE, DURING AND AFTER INSTALLATION.
6. ALL TREES MUST BE GUYED OR STAKED.
7. ALL PLANTS AND PLANTING AREAS MUST BE COMPLETELY MULCHED AS SPECIFIED.
8. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING COURSE OF WORK. EXISTING UTILITIES MUST BE PROTECTED DURING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL DAMAGE TO UTILITIES.
9. THE CONTRACTOR IS RESPONSIBLE FOR FULLY MAINTAINING ALL PLANTING AREAS (INCLUDING, BUT NOT LIMITED TO: WATERING, SPRAYING, MULCHING, FERTILIZATION, ETC.) UNTIL THE WORK IS FULLY ACCEPTED.
10. THE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF (1) ONE YEAR BEGINNING AT THE DATE OF TOTAL ACCEPTANCE. THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS BEFORE OR AT THE END OF THE GUARANTEE PERIOD.
11. THE OWNER'S REPRESENTATIVE WILL APPROVE THE STAKED LOCATION OF ALL PLANT MATERIAL PRIOR TO INSTALLATION.
12. AFTER BEING DUG AT THE NURSERY SOURCE, ALL TREES IN LEAF SHALL BE ACCUMULATED FOR TWO (2) WEEKS UNDER A MIST SYSTEM PRIOR TO INSTALLATION.
13. ANY PLANT MATERIAL THAT DIES, TURNS BROWN OR DEFOLIATES (PRIOR TO TOTAL ACCEPTANCE OF THE WORK SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, SIZE AND MEETING ALL SPECIFICATIONS.
14. STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK". LATEST EDITION REPRESENTS GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.
15. ALL REQUIRED TREE PROTECTION MEASURES SHALL BE INSTALLED PRIOR TO GRADING OR EXCAVATING.
16. UNDISTURBED BUFFERS SHALL BE REPLANTED TO BUFFER STANDARDS WHERE SPARSELY VEGETATED OR WHERE DISTURBED AT APPROVED UTILITY CROSSINGS. REPLANTING IS SUBJECT COUNTY ARBORIST APPROVAL.

PLANTING NOTES

AT&T  
MOBILITY

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3RD FLOOR  
BLOOMINGTON MN 55431



BLACK & VEATCH

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PROJECT NO: 129049.4004  
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DELANO COUNTY LINE  
MNL01123  
3310 COUNTY LINE ROAD SE  
DELANO, MN 55328  
NSB - WIC

SHEET TITLE  
LANDSCAPE PLAN

SHEET NUMBER  
LS-1

**Black & Veatch Corp.**

7760 France Avenue South, Suite 920  
 Bloomington, MN 55435  
 651-325-8238

Friday, February 1, 2019

Bryan Lindsey

**Black & Veatch Corp.**

6800 W 115th ST, Suite 2292  
 Overland Park, KS 66211  
 (913) 458-8145  
[lindseybc@bv.com](mailto:lindseybc@bv.com)

## RIGOROUS STRUCTURAL ANALYSIS

### 185' Monopole

AT&T DESIGNATION:	Site ID:	229192 (MNL01123)		
	Site FA:	11571089		
	Site Name:	DELANO COUNTY LINE		
	AT&T Project:	Non-AT&T Owned Tower		
	BV Project:	129049 (229192ATTMN-S)		
ANALYSIS CRITERIA:	Codes:	TIA-222-G	115 mph	Ultimate 3-second Gust
		IBC 2012		

SITE DATA: 3310 County Line Road Se, Delano, MN 55328, Hennepin County  
 Latitude 45.037278, Longitude -93.765194  
 Market: ND/SD/NE/MN/IA  
 185' Monopole

Black & Veatch Corp. is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

### Analysis Results

Tower Stress Level with Proposed Equipment:	96.50%	Pass
Connection Stress Level with Proposed Equipment:	79.50%	Pass
Foundation Ratio with Proposed Equipment:	88.20%	Pass

We at Black & Veatch Corp. appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully Submitted by: Black & Veatch Corp.  
 Analysis Prepared by: Khushal Patel/ Amitkumar Kolhar  
 Analysis Reviewed by: Ping Jiang, P.E.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE MINNESOTA.

PRINT NAME: PING JIANG

SIGNATURE: 

This analysis was prepared by me or under my direct supervision and to the best of my knowledge and ability complies with the applicable provisions of the governing codes and ordinances.

DATE: Feb 05, 2019 LICENSE # 54790 EXP. 06/2020



**Black & Veatch Corp.**  
6800 W 115th ST, Suite 2292  
Overland Park, KS 66211  
B&V: 129041 (229192ATTMN-S)

### Documents

Document	Description	Source
Site Photos from 2013	Site Condition Data	AT&T Siterra
Carrier Co-Location Documents (Applications, Leases, Initial Co-Location Analyses, Modification Request for Information Form, etc.)	Tower Loading Data	AT&T Siterra
Structural Analysis completed by LETS America, Inc., dated 01/08/2014	Previous Structural Analysis w/Tower Geometry & Loading Data	AT&T Siterra
Tower Drawings completed by Valmont Microflect, dated 01/25/2001	Tower Geometry Data	AT&T Siterra
Foundation Drawings completed by LHB Engineers & Architects, dated 09/21/2001	Foundation Data	AT&T Siterra



**Black & Veatch Corp.**  
6800 W 115th ST, Suite 2292  
Overland Park, KS 66211  
B&V: 129041 (229192ATTMN-S)

## **Assumptions, Disclaimers, and Notes**

1. This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. If this information is not current and correct, this report should be considered obsolete and further analysis will be required.
2. This analysis assumes that the tower structural components and mounts, including all steel sections and attachment hardware, are in good working order and in their original state, free of rust or other forms of corrosion. Furthermore, it is assumed that the tower and the tower foundation have been properly maintained and monitored since the time of construction. This report should be considered obsolete and further analysis will be required if the tower and/or foundation does not meet all of the above specifications.
3. This analysis assumes that all existing and/or proposed equipment mounts on the tower will have adequate capacity to support the existing and proposed equipment loading.
4. Capacity of the structural members is based on theoretical values as shown in the attached TAS form.
5. When applicable, this structural analysis is only valid if the proposed coax cables are stacked as shown in the attached feedline sketch.
6. This analysis assumes that all existing and proposed port cuts are properly installed such that the overall structural capacity of the monopole is not reduced.
7. Foundation capacity determined by comparing analysis reactions to original design reactions.

## Tower Analysis Summary Form

### General Info

Site Name	DELANO COUNTY LINE
Site Number	229192ATTMN-S (MNL01123)
FA Number	11571089
Date of Analysis	02/01/2019
Company Performing Analysis	Black & Veatch Corp.

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	N/A
Tower Height (Top of Steel)	185 ft	N/A
Tower Manufacturer	Valmont	N/A
Tower Model	N/A	N/A
Tower Drawings	Valmont Microflex	01/25/2001
Foundation Drawings	LHB Engineers & Architects	09/21/2001
Geotech Report	N/A	N/A
Tower Mapping	N/A	N/A
Previous Structural Analysis	LETS America, Inc.	01/08/2014
Foundation Mapping	N/A	N/A

### Design Parameters

Design Code Used	TIA-222-G IBC 2012
Location of Tower (County, State)	Hennepin County, MN
Wind Speed (mph)	115
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	II
Exposure Category (B, C, D)	C
Topographic Category (1 to 5)	1

### Analysis Results (% Maximum Usage)

<b>Existing/Reserved + Future + Proposed Condition</b>	
Tower (%)	
Connection (%)	
Foundation (%)	
Foundation Adequate?	N/A

### Analysis Results (% Maximum Usage)

<b>Existing/Reserved</b>	REV G	REV F
Tower (%)		
Connection (%)		
Foundation (%)		
Foundation Adequate?	N/A	N/A

### Analysis Results (% Maximum Usage)

<b>Existing/Reserved + Proposed Condition</b>	
Tower (%)	96.50%
Connection (%)	79.50%
Foundation (%)	88.20%
Foundation Adequate?	Yes

### Steel Yield Strength (ksi)

Pole	A572-65
Base Plate	A633-60
Anchor Bolts	A615-75

### Existing Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Inside/Outside
Verizon Wireless	181	181	6	Panel	Antel	WBX065X17M050		1	Unknown	Platform w/Hand Rail	6	Unknown	1 5/8"	Inside
Verizon Wireless	181	181	6	Panel	Commscope	LNX-6515DS-VTM					6	Unknown	7/8"	Inside
Verizon Wireless	181	181	3	RRH	Ericsson	RRU-12								
Verizon Wireless	181	181	3	TMA	Commscope	E15S09P49								
Verizon Wireless	181	181	1	SA Box	Commscope	RCMDC-3315-PF-48								

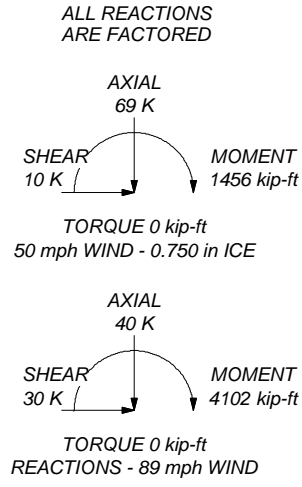
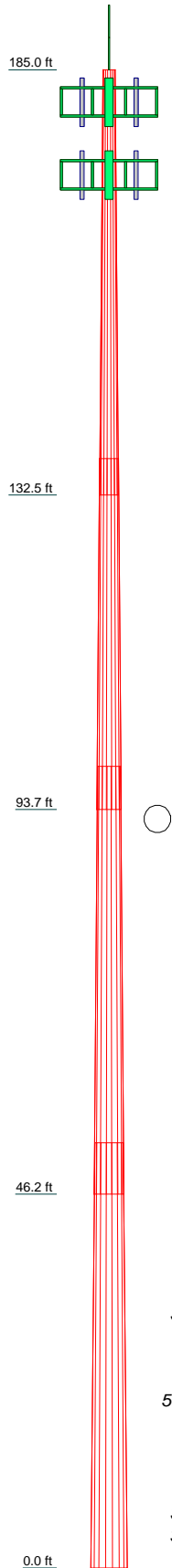
### Proposed Loading

Antenna							Mount			Transmission Line				
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T	172	172	9	Panel	KMW	EPBQ 654-L8H8-L2		1	Sabre	C10-855-721C HD Platform	6	DC Cable	1"	Inside
AT&T	172	172	15	RRH	Unknown	RRH					2	Fiber Cable	3/8"	Inside
AT&T	172	172	3	SA Box	Raycap	DC6-48-60-18-8C-EV								

### Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face

Section	1	2	3	4	
Length (ft)	52.50	43.33	52.83	52.50	
Number of Sides	16	16	16	16	
Thickness (in)	0.219	0.281	0.344	0.375	
Socket Length (ft)	4.50	5.33	6.33	42.759	
Top Dia (in)	18.610	27.534	34.388	42.759	
Bot Dia (in)	28.850	35.990	44.680	53.000	
Grade		A572-65			
Weight (K)	2.9	4.2	7.7	10.2	25.0



## DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 4' (Existing)	185	Sabre C10-855-721C HD Platform Mount [LP 602-1] (ATI-Proposed)	172
4"x2" Mount Pipe (Existing)	185	Side Arm Mount [SO 901-3] (ATI-Proposed)	172
Platform Mount [LP 301-1] (Verizon Wireless-Existing)	181	Side Arm Mount [SO 102-3] (ATI-Proposed)	172
(2) WBX065X17M050 w/ Mount Pipe (Verizon Wireless-Existing)	181	(4) 10' x 2" Mount Pipe (ATI-Proposed)	172
(2) WBX065X17M050 w/ Mount Pipe (Verizon Wireless-Existing)	181	(4) 10' x 2" Mount Pipe (ATI-Proposed)	172
(2) WBX065X17M050 w/ Mount Pipe (Verizon Wireless-Existing)	181	(4) 10' x 2" Mount Pipe (ATI-Proposed)	172
(2) LNX-6515DS-VTM w/ Mount Pipe (Verizon Wireless-Existing)	181	(3) EPBQ-654L8H8-L2 (ATI-Proposed)	172
(2) LNX-6515DS-VTM w/ Mount Pipe (Verizon Wireless-Existing)	181	(3) EPBQ-654L8H8-L2 (ATI-Proposed)	172
(2) LNX-6515DS-VTM w/ Mount Pipe (Verizon Wireless-Existing)	181	(3) EPBQ-654L8H8-L2 (ATI-Proposed)	172
RRU-12 (Verizon Wireless-Existing)	181	(5) RRH (ATI-Proposed)	172
RRU-12 (Verizon Wireless-Existing)	181	(5) RRH (ATI-Proposed)	172
RRU-12 (Verizon Wireless-Existing)	181	(5) RRH (ATI-Proposed)	172
E15S09P49 (Verizon Wireless-Existing)	181	DC6-48-60-18-8C-EV (ATI-Proposed)	172
E15S09P49 (Verizon Wireless-Existing)	181	DC6-48-60-18-8C-EV (ATI-Proposed)	172
E15S09P49 (Verizon Wireless-Existing)	181	DC6-48-60-18-8C-EV (ATI-Proposed)	172
RCMDC-3315V-PF-48 (Verizon Wireless-Existing)	181		

## MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

## TOWER DESIGN NOTES

1. Tower is located in Hennepin County, Minnesota.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 89 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 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 II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 96.5%

<b>tnxTower</b>  <b>Black &amp; Veatch Corp.</b> 6800 West 115th Street, Suite 2292, Overland Park, KS 66211 Phone: (913) 458-8145 FAX: (913) 458-8136	<b>Job</b>	229192 Delano County Line	<b>Page</b> 1 of 13
	<b>Project</b>	129049 (229192ATTMN-S)	<b>Date</b> 13:41:27 02/01/19
	<b>Client</b>	AT&T	<b>Designed by</b> Amitkumar Kolhar

## Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Hennepin County, Minnesota.

Basic wind speed of 89 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole 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	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are
		Known



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	AT&T		Amitkumar Kolhar	

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	185.00-132.50	52.50	4.50	16	18.610	28.850	0.219	0.876	A572-65 (65 ksi)
L2	132.50-93.67	43.33	5.33	16	27.534	35.990	0.281	1.124	A572-65 (65 ksi)
L3	93.67-46.17	52.83	6.33	16	34.388	44.680	0.344	1.376	A572-65 (65 ksi)
L4	46.17-0.00	52.50		16	42.759	53.000	0.375	1.500	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	18.932	12.848	548.991	6.547	9.491	57.843	1106.294	6.353	3.268	14.92
	29.372	20.002	2071.375	10.193	14.714	140.781	4174.113	9.890	5.305	24.225
L2	28.914	24.430	2292.282	9.702	14.042	163.239	4619.271	12.079	4.920	17.509
	36.640	32.009	5156.374	12.712	18.355	280.926	10390.822	15.827	6.603	23.498
L3	36.053	37.358	5469.910	12.120	17.538	311.892	11022.640	18.472	6.159	17.903
	45.488	48.653	12081.838	15.784	22.787	530.212	24346.610	24.056	8.207	23.857
L4	44.782	50.702	11506.319	15.089	21.807	527.644	23186.859	25.069	7.763	20.701
	53.965	62.953	22024.834	18.735	27.030	814.829	44383.150	31.127	9.801	26.135

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L1 185.00-132.50				1	1	1			
L2 132.50-93.67				1	1	1			
L3 93.67-46.17				1	1	1			
L4 46.17-0.00				1	1	1			

## Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
Safety Line 3/8 (Existing)	C	No	No	Inside Pole	185.00 - 10.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00	0.22 0.22 0.22
AVA7-50(1-5/8") (AT&T-Existing)	C	No	No	Inside Pole	181.00 - 7.00	6	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00	0.70 0.70 0.70
AVA5-50( 7/8") (AT&T-Existing)	C	No	No	Inside Pole	181.00 - 7.00	6	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00	0.30 0.30 0.30
1" DC Cable (AT&T-Proposed)	C	No	No	Inside Pole	172.00 - 7.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00	0.30 0.30 0.30
3/8" Fiber Cable	C	No	No	Inside Pole	172.00 - 7.00	2	No Ice 0.00	0.08

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
(AT&T-Proposed)						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	185.00-132.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.32
L2	132.50-93.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.26
L3	93.67-46.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.32
L4	46.17-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.26

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	185.00-132.50	A	1.753	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.32
L2	132.50-93.67	A	1.696	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.26
L3	93.67-46.17	A	1.616	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.32
L4	46.17-0.00	A	1.449	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.26

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	185.00-132.50	0.000	0.000	0.000	0.000
L2	132.50-93.67	0.000	0.000	0.000	0.000
L3	93.67-46.17	0.000	0.000	0.000	0.000
L4	46.17-0.00	0.000	0.000	0.000	0.000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

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## Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
---------------	----------------------	-------------	-------------------------	-----------------------	--------------------

## Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
Lighting Rod 5/8" x 4' (Existing)	C	From Face	0.00 0.00 6.00	0.00	185.00	No Ice 1/2" Ice 1" Ice	0.25 0.66 0.97	0.25 0.66 0.97	0.03 0.03 0.04
4'x2" Mount Pipe (Existing)	C	From Face	0.00 0.00 2.00	0.00	185.00	No Ice 1/2" Ice 1" Ice	0.87 1.11 1.36	0.87 1.11 1.36	0.01 0.02 0.03
*****									
Platform Mount [LP 301-1] (Verizon Wireless-Existing)	C	None		0.00	181.00	No Ice 1/2" Ice 1" Ice	30.10 40.80 51.50	30.10 40.80 51.50	1.59 2.03 2.47
(2) WBX065X17M050 w/ Mount Pipe (Verizon Wireless-Existing)	A	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	3.68 4.10 4.52	3.21 3.95 4.63	0.04 0.08 0.12
(2) WBX065X17M050 w/ Mount Pipe (Verizon Wireless-Existing)	B	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	3.68 4.10 4.52	3.21 3.95 4.63	0.04 0.08 0.12
(2) WBX065X17M050 w/ Mount Pipe (Verizon Wireless-Existing)	C	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	3.68 4.10 4.52	3.21 3.95 4.63	0.04 0.08 0.12
(2) LNX-6515DS-VTM w/ Mount Pipe (Verizon Wireless-Existing)	A	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	11.71 12.43 13.16	9.86 11.39 12.94	0.08 0.17 0.27
(2) LNX-6515DS-VTM w/ Mount Pipe (Verizon Wireless-Existing)	B	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	11.71 12.43 13.16	9.86 11.39 12.94	0.08 0.17 0.27
(2) LNX-6515DS-VTM w/ Mount Pipe (Verizon Wireless-Existing)	C	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	11.71 12.43 13.16	9.86 11.39 12.94	0.08 0.17 0.27
RRU-12 (Verizon Wireless-Existing)	A	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.05 0.07 0.10
RRU-12 (Verizon Wireless-Existing)	B	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.05 0.07 0.10
RRU-12 (Verizon Wireless-Existing)	C	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.05 0.07 0.10
E15S09P49 (Verizon Wireless-Existing)	A	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	0.78 0.89 1.00	0.40 0.49 0.58	0.02 0.03 0.04
E15S09P49 (Verizon Wireless-Existing)	B	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	0.78 0.89 1.00	0.40 0.49 0.58	0.02 0.03 0.04
E15S09P49 (Verizon Wireless-Existing)	C	From Face	3.00 0.00 0.00	0.00	181.00	No Ice 1/2" Ice 1" Ice	0.78 0.89 1.00	0.40 0.49 0.58	0.02 0.03 0.04
RCMDC-3315V-PF-48	A	From Face	3.00	0.00	181.00	No Ice	3.79	2.51	0.03

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	AT&T		Amitkumar Kolhar	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft <sup>2</sup>	CAAA Side ft <sup>2</sup>	Weight K
(Verizon Wireless-Existing)			0.00		1/2" Ice	4.04	2.72	0.06
			0.00		1" Ice	4.30	2.94	0.10
***								
Sabre C10-855-721C HD	C	None		0.00	172.00	No Ice	32.03	1.34
Platform Mount [LP 602-1]						1/2" Ice	38.71	1.80
(AT&T-Proposed)						1" Ice	45.39	2.26
Side Arm Mount [SO 901-3]	C	From Face	0.00	0.00	172.00	No Ice	1.66	0.32
(AT&T-Proposed)			0.00			1/2" Ice	2.17	0.33
			2.50			1" Ice	2.68	0.34
Side Arm Mount [SO 102-3]	C	From Face	0.00	0.00	172.00	No Ice	3.00	0.08
(AT&T-Proposed)			0.00			1/2" Ice	3.48	0.11
			-2.50			1" Ice	3.96	0.14
(4) 10' x 2" Mount Pipe	A	From Face	3.00	0.00	172.00	No Ice	2.00	0.08
(AT&T-Proposed)			0.00			1/2" Ice	3.02	0.10
			0.00			1" Ice	4.07	0.12
(4) 10' x 2" Mount Pipe	B	From Face	3.00	0.00	172.00	No Ice	2.00	0.08
(AT&T-Proposed)			0.00			1/2" Ice	3.02	0.10
			0.00			1" Ice	4.07	0.12
(4) 10' x 2" Mount Pipe	C	From Face	3.00	0.00	172.00	No Ice	2.00	0.08
(AT&T-Proposed)			0.00			1/2" Ice	3.02	0.10
			0.00			1" Ice	4.07	0.12
(3) EPBQ-654L8H8-L2	A	From Face	3.00	0.00	172.00	No Ice	18.09	0.09
(AT&T-Proposed)			0.00			1/2" Ice	18.72	0.18
			0.00			1" Ice	19.36	0.28
(3) EPBQ-654L8H8-L2	B	From Face	3.00	0.00	172.00	No Ice	18.09	0.09
(AT&T-Proposed)			0.00			1/2" Ice	18.72	0.18
			0.00			1" Ice	19.36	0.28
(3) EPBQ-654L8H8-L2	C	From Face	3.00	0.00	172.00	No Ice	18.09	0.09
(AT&T-Proposed)			0.00			1/2" Ice	18.72	0.18
			0.00			1" Ice	19.36	0.28
(5) RRH	A	From Face	3.00	0.00	172.00	No Ice	3.00	0.07
(AT&T-Proposed)			0.00			1/2" Ice	3.24	0.10
			0.00			1" Ice	3.48	0.13
(5) RRH	B	From Face	3.00	0.00	172.00	No Ice	3.00	0.07
(AT&T-Proposed)			0.00			1/2" Ice	3.24	0.10
			0.00			1" Ice	3.48	0.13
(5) RRH	C	From Face	3.00	0.00	172.00	No Ice	3.00	0.07
(AT&T-Proposed)			0.00			1/2" Ice	3.24	0.10
			0.00			1" Ice	3.48	0.13
DC6-48-60-18-8C-EV	A	From Face	1.00	0.00	172.00	No Ice	2.74	0.03
(AT&T-Proposed)			0.00			1/2" Ice	2.96	0.05
			0.00			1" Ice	3.20	0.08
DC6-48-60-18-8C-EV	B	From Face	1.00	0.00	172.00	No Ice	2.74	0.03
(AT&T-Proposed)			0.00			1/2" Ice	2.96	0.05
			0.00			1" Ice	3.20	0.08
DC6-48-60-18-8C-EV	C	From Face	1.00	0.00	172.00	No Ice	2.74	0.03
(AT&T-Proposed)			0.00			1/2" Ice	2.96	0.05
			0.00			1" Ice	3.20	0.08
***								

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	AT&T		Amitkumar Kolhar

## 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

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## Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	185 - 132.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.48	0.64	-0.37
			Max. Mx	20	-9.25	675.08	0.63
			Max. My	14	-9.26	-0.94	-674.21
			Max. Vy	20	-18.97	675.08	0.63
			Max. Vx	14	18.95	-0.94	-674.21
			Max. Torque	5			0.33
L2	132.5 - 93.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.41	0.64	-0.37
			Max. Mx	20	-14.89	1459.37	1.51
			Max. My	14	-14.89	-1.82	-1457.48
			Max. Vy	20	-22.29	1459.37	1.51
			Max. Vx	14	22.26	-1.82	-1457.48
			Max. Torque	24			0.31
L3	93.67 - 46.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.77	0.64	-0.37
			Max. Mx	20	-24.93	2596.65	2.59
			Max. My	14	-24.94	-2.90	-2593.53
			Max. Vy	20	-26.54	2596.65	2.59
			Max. Vx	14	26.51	-2.90	-2593.53
			Max. Torque	24			0.30
L4	46.17 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.80	0.64	-0.37
			Max. Mx	20	-40.02	4100.03	3.76
			Max. My	14	-40.02	-4.08	-4095.56
			Max. Vy	20	-30.41	4100.03	3.76
			Max. Vx	14	30.39	-4.08	-4095.56
			Max. Torque	24			0.30

## Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	68.80	9.94	0.00
	Max. H <sub>x</sub>	20	40.05	30.37	0.02
	Max. H <sub>z</sub>	2	40.05	0.02	30.34
	Max. M <sub>x</sub>	2	4094.69	0.02	30.34
	Max. M <sub>z</sub>	8	4099.78	-30.37	-0.02
	Max. Torsion	24	0.30	15.20	26.29
	Min. Vert	11	30.04	-26.31	-15.19
	Min. H <sub>x</sub>	8	40.05	-30.37	-0.02
	Min. H <sub>z</sub>	14	40.05	-0.02	-30.34
	Min. M <sub>x</sub>	14	-4095.56	-0.02	-30.34
	Min. M <sub>z</sub>	20	-4100.03	30.37	0.02
	Min. Torsion	15	-0.30	-0.02	-30.34

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## Tower Mast Reaction Summary

<i>Load Combination</i>	<i>Vertical</i>	<i>Shear<sub>x</sub></i>	<i>Shear<sub>z</sub></i>	<i>Overturning Moment, M<sub>x</sub></i>	<i>Overturning Moment, M<sub>z</sub></i>	<i>Torque</i>
	<i>K</i>	<i>K</i>	<i>K</i>	<i>kip-ft</i>	<i>kip-ft</i>	<i>kip-ft</i>
Dead Only	33.38	0.00	0.00	0.32	0.10	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	40.05	-0.02	-30.34	-4094.69	4.32	-0.30
0.9 Dead+1.6 Wind 0 deg - No Ice	30.04	-0.02	-30.34	-4023.64	4.20	-0.30
1.2 Dead+1.6 Wind 30 deg - No Ice	40.05	15.17	-26.27	-3543.98	-2046.25	-0.21
0.9 Dead+1.6 Wind 30 deg - No Ice	30.04	15.17	-26.27	-3482.50	-2010.72	-0.22
1.2 Dead+1.6 Wind 60 deg - No Ice	40.05	26.29	-15.15	-2043.49	-3548.47	-0.07
0.9 Dead+1.6 Wind 60 deg - No Ice	30.04	26.29	-15.15	-2008.09	-3486.81	-0.08
1.2 Dead+1.6 Wind 90 deg - No Ice	40.05	30.37	0.02	4.64	-4099.78	0.09
0.9 Dead+1.6 Wind 90 deg - No Ice	30.04	30.37	0.02	4.43	-4028.54	0.08
1.2 Dead+1.6 Wind 120 deg - No Ice	40.05	26.31	15.19	2051.59	-3552.56	0.22
0.9 Dead+1.6 Wind 120 deg - No Ice	30.04	26.31	15.19	2015.80	-3490.83	0.22
1.2 Dead+1.6 Wind 150 deg - No Ice	40.05	15.20	26.29	3548.96	-2053.46	0.30
0.9 Dead+1.6 Wind 150 deg - No Ice	30.04	15.20	26.29	3487.16	-2017.79	0.30
1.2 Dead+1.6 Wind 180 deg - No Ice	40.05	0.02	30.34	4095.56	-4.08	0.29
0.9 Dead+1.6 Wind 180 deg - No Ice	30.04	0.02	30.34	4024.26	-4.03	0.30
1.2 Dead+1.6 Wind 210 deg - No Ice	40.05	-15.17	26.27	3544.86	2046.49	0.21
0.9 Dead+1.6 Wind 210 deg - No Ice	30.04	-15.17	26.27	3483.13	2010.89	0.22
1.2 Dead+1.6 Wind 240 deg - No Ice	40.05	-26.29	15.15	2044.37	3548.71	0.07
0.9 Dead+1.6 Wind 240 deg - No Ice	30.04	-26.29	15.15	2008.73	3486.99	0.08
1.2 Dead+1.6 Wind 270 deg - No Ice	40.05	-30.37	-0.02	-3.76	4100.03	-0.08
0.9 Dead+1.6 Wind 270 deg - No Ice	30.04	-30.37	-0.02	-3.79	4028.73	-0.08
1.2 Dead+1.6 Wind 300 deg - No Ice	40.05	-26.31	-15.19	-2050.71	3552.83	-0.22
0.9 Dead+1.6 Wind 300 deg - No Ice	30.04	-26.31	-15.19	-2015.17	3491.03	-0.22
1.2 Dead+1.6 Wind 330 deg - No Ice	40.05	-15.20	-26.29	-3548.10	2053.72	-0.30
0.9 Dead+1.6 Wind 330 deg - No Ice	30.04	-15.20	-26.29	-3486.53	2017.97	-0.30
1.2 Dead+1.0 Ice+1.0 Temp	68.80	-0.00	0.00	0.37	0.64	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	68.80	-0.00	-9.93	-1452.97	1.81	-0.06
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.80	4.97	-8.60	-1257.80	-725.67	-0.02
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.80	8.61	-4.96	-725.40	-1258.50	0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.80	9.94	0.00	1.49	-1453.83	0.07



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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.80	8.61	4.97	728.10	-1259.52	0.09
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.80	4.97	8.61	1259.74	-727.45	0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.80	0.00	9.93	1453.90	-0.24	0.06
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.80	-4.97	8.60	1258.72	727.24	0.02
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.80	-8.61	4.96	726.32	1260.07	-0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.80	-9.94	-0.00	-0.57	1455.41	-0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.80	-8.61	-4.97	-727.18	1261.09	-0.09
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.80	-4.97	-8.61	-1258.82	729.02	-0.09
Dead+Wind 0 deg - Service	33.38	-0.01	-7.71	-1033.75	1.17	-0.08
Dead+Wind 30 deg - Service	33.38	3.85	-6.68	-894.69	-516.65	-0.06
Dead+Wind 60 deg - Service	33.38	6.68	-3.85	-515.78	-896.00	-0.02
Dead+Wind 90 deg - Service	33.38	7.72	0.01	1.43	-1035.22	0.02
Dead+Wind 120 deg - Service	33.38	6.69	3.86	518.35	-897.06	0.06
Dead+Wind 150 deg - Service	33.38	3.86	6.68	896.48	-518.48	0.08
Dead+Wind 180 deg - Service	33.38	0.01	7.71	1034.48	-0.95	0.08
Dead+Wind 210 deg - Service	33.38	-3.85	6.68	895.42	516.87	0.06
Dead+Wind 240 deg - Service	33.38	-6.68	3.85	516.51	896.23	0.02
Dead+Wind 270 deg - Service	33.38	-7.72	-0.01	-0.69	1035.45	-0.02
Dead+Wind 300 deg - Service	33.38	-6.69	-3.86	-517.62	897.29	-0.06
Dead+Wind 330 deg - Service	33.38	-3.86	-6.68	-895.75	518.71	-0.08

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-33.38	0.00	0.00	33.38	0.00	0.000%
2	-0.02	-40.05	-30.34	0.02	40.05	30.34	0.000%
3	-0.02	-30.04	-30.34	0.02	30.04	30.34	0.000%
4	15.17	-40.05	-26.27	-15.17	40.05	26.27	0.000%
5	15.17	-30.04	-26.27	-15.17	30.04	26.27	0.000%
6	26.29	-40.05	-15.15	-26.29	40.05	15.15	0.000%
7	26.29	-30.04	-15.15	-26.29	30.04	15.15	0.000%
8	30.37	-40.05	0.02	-30.37	40.05	-0.02	0.000%
9	30.37	-30.04	0.02	-30.37	30.04	-0.02	0.000%
10	26.31	-40.05	15.19	-26.31	40.05	-15.19	0.000%
11	26.31	-30.04	15.19	-26.31	30.04	-15.19	0.000%
12	15.20	-40.05	26.29	-15.20	40.05	-26.29	0.000%
13	15.20	-30.04	26.29	-15.20	30.04	-26.29	0.000%
14	0.02	-40.05	30.34	-0.02	40.05	-30.34	0.000%
15	0.02	-30.04	30.34	-0.02	30.04	-30.34	0.000%
16	-15.17	-40.05	26.27	15.17	40.05	-26.27	0.000%
17	-15.17	-30.04	26.27	15.17	30.04	-26.27	0.000%
18	-26.29	-40.05	15.15	26.29	40.05	-15.15	0.000%
19	-26.29	-30.04	15.15	26.29	30.04	-15.15	0.000%
20	-30.37	-40.05	-0.02	30.37	40.05	0.02	0.000%
21	-30.37	-30.04	-0.02	30.37	30.04	0.02	0.000%
22	-26.31	-40.05	-15.19	26.31	40.05	15.19	0.000%
23	-26.31	-30.04	-15.19	26.31	30.04	15.19	0.000%
24	-15.20	-40.05	-26.29	15.20	40.05	26.29	0.000%

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	AT&T		Amitkumar Kolhar

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
25	-15.20	-30.04	-26.29	15.20	30.04	26.29	0.000%
26	0.00	-68.80	0.00	0.00	68.80	-0.00	0.000%
27	-0.00	-68.80	-9.93	0.00	68.80	9.93	0.000%
28	4.97	-68.80	-8.60	-4.97	68.80	8.60	0.000%
29	8.61	-68.80	-4.96	-8.61	68.80	4.96	0.000%
30	9.94	-68.80	0.00	-9.94	68.80	-0.00	0.000%
31	8.61	-68.80	4.97	-8.61	68.80	-4.97	0.000%
32	4.97	-68.80	8.61	-4.97	68.80	-8.61	0.000%
33	0.00	-68.80	9.93	-0.00	68.80	-9.93	0.000%
34	-4.97	-68.80	8.60	4.97	68.80	-8.60	0.000%
35	-8.61	-68.80	4.96	8.61	68.80	-4.96	0.000%
36	-9.94	-68.80	-0.00	9.94	68.80	0.00	0.000%
37	-8.61	-68.80	-4.97	8.61	68.80	4.97	0.000%
38	-4.97	-68.80	-8.61	4.97	68.80	8.61	0.000%
39	-0.01	-33.38	-7.71	0.01	33.38	7.71	0.000%
40	3.85	-33.38	-6.68	-3.85	33.38	6.68	0.000%
41	6.68	-33.38	-3.85	-6.68	33.38	3.85	0.000%
42	7.72	-33.38	0.01	-7.72	33.38	-0.01	0.000%
43	6.69	-33.38	3.86	-6.69	33.38	-3.86	0.000%
44	3.86	-33.38	6.68	-3.86	33.38	-6.68	0.000%
45	0.01	-33.38	7.71	-0.01	33.38	-7.71	0.000%
46	-3.85	-33.38	6.68	3.85	33.38	-6.68	0.000%
47	-6.68	-33.38	3.85	6.68	33.38	-3.85	0.000%
48	-7.72	-33.38	-0.01	7.72	33.38	0.01	0.000%
49	-6.69	-33.38	-3.86	6.69	33.38	3.86	0.000%
50	-3.86	-33.38	-6.68	3.86	33.38	6.68	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	5	0.00000001	0.00011563
3	Yes	5	0.00000001	0.00004623
4	Yes	6	0.00000001	0.00094265
5	Yes	6	0.00000001	0.00023630
6	Yes	6	0.00000001	0.00094632
7	Yes	6	0.00000001	0.00023763
8	Yes	5	0.00000001	0.00007880
9	Yes	5	0.00000001	0.00002929
10	Yes	6	0.00000001	0.00094825
11	Yes	6	0.00000001	0.00023757
12	Yes	6	0.00000001	0.00094232
13	Yes	6	0.00000001	0.00023557
14	Yes	5	0.00000001	0.00003679
15	Yes	5	0.00000001	0.00001422
16	Yes	6	0.00000001	0.00094779
17	Yes	6	0.00000001	0.00023805
18	Yes	6	0.00000001	0.00094426
19	Yes	6	0.00000001	0.00023678
20	Yes	5	0.00000001	0.00003854
21	Yes	5	0.00000001	0.00001498
22	Yes	6	0.00000001	0.00094306
23	Yes	6	0.00000001	0.00023591
24	Yes	6	0.00000001	0.00094885
25	Yes	6	0.00000001	0.00023786

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26	Yes	4	0.00000001	0.00000816
27	Yes	6	0.00006557	0.00072686
28	Yes	7	0.00000001	0.00052122
29	Yes	7	0.00000001	0.00052132
30	Yes	6	0.00006558	0.00072719
31	Yes	7	0.00000001	0.00052673
32	Yes	7	0.00000001	0.00052372
33	Yes	6	0.00006559	0.00072776
34	Yes	7	0.00000001	0.00052535
35	Yes	7	0.00000001	0.00052558
36	Yes	6	0.00006557	0.00072871
37	Yes	7	0.00000001	0.00052467
38	Yes	7	0.00000001	0.00052736
39	Yes	4	0.00000001	0.00059214
40	Yes	5	0.00000001	0.00042321
41	Yes	5	0.00000001	0.00042669
42	Yes	4	0.00000001	0.00058728
43	Yes	5	0.00000001	0.00043280
44	Yes	5	0.00000001	0.00042704
45	Yes	4	0.00000001	0.00058977
46	Yes	5	0.00000001	0.00042985
47	Yes	5	0.00000001	0.00042693
48	Yes	4	0.00000001	0.00058632
49	Yes	5	0.00000001	0.00042710
50	Yes	5	0.00000001	0.00043229

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 132.5	58.512	43	3.00	0.00
L2	137 - 93.67	30.563	43	2.32	0.00
L3	99 - 46.17	15.122	43	1.52	0.00
L4	52.5 - 0	4.091	43	0.72	0.00

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	Lighting Rod 5/8" x 4"	43	58.512	3.00	0.00	21755
181.00	Platform Mount [LP 301-1]	43	56.014	2.95	0.00	21755
172.00	Sabre C10-855-721C HD Platform Mount [LP 602-1]	43	50.431	2.84	0.00	8366

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 132.5	230.706	20	11.87	0.01
L2	137 - 93.67	120.791	20	9.19	0.00
L3	99 - 46.17	59.837	20	6.01	0.00
L4	52.5 - 0	16.204	10	2.87	0.00

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### Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	°	°	ft
185.00	Lighting Rod 5/8" x 4'	20	230.706	11.87	0.01	5921
181.00	Platform Mount [LP 301-1]	20	220.889	11.68	0.01	5921
172.00	Sabre C10-855-721C HD Platform Mount [LP 602-1]	20	198.944	11.25	0.01	2274

### Compression Checks

### Pole Design Data

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	A	P <sub>u</sub>	φP <sub>n</sub>	Ratio P <sub>u</sub> / φP <sub>n</sub>
	ft		ft	ft		in <sup>2</sup>	K	K	
L1	185 - 132.5 (1)	TP28.85x18.61x0.219	52.50	0.00	0.0	19.389	-9.25	1327.28	0.007
L2	132.5 - 93.67 (2)	TP35.99x27.534x0.281	43.33	0.00	0.0	31.077	-14.88	2148.51	0.007
L3	93.67 - 46.17 (3)	TP44.68x34.388x0.344	52.83	0.00	0.0	47.299	-24.93	3251.64	0.008
L4	46.17 - 0 (4)	TP53x42.759x0.375	52.50	0.00	0.0	62.953	-40.02	4135.95	0.010

### Pole Bending Design Data

Section No.	Elevation	Size	M <sub>ux</sub>	φM <sub>ux</sub>	Ratio M <sub>ux</sub> / φM <sub>ux</sub>	M <sub>uy</sub>	φM <sub>uy</sub>	Ratio M <sub>uy</sub> / φM <sub>uy</sub>
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	185 - 132.5 (1)	TP28.85x18.61x0.219	675.64	754.45	0.896	0.00	754.45	0.000
L2	132.5 - 93.67 (2)	TP35.99x27.534x0.281	1460.43	1525.22	0.958	0.00	1525.22	0.000
L3	93.67 - 46.17 (3)	TP44.68x34.388x0.344	2598.34	2870.24	0.905	0.00	2870.24	0.000
L4	46.17 - 0 (4)	TP53x42.759x0.375	4102.41	4461.14	0.920	0.00	4461.14	0.000

### Pole Shear Design Data

Section No.	Elevation	Size	Actual V <sub>u</sub>	φV <sub>n</sub>	Ratio V <sub>u</sub> / φV <sub>n</sub>	Actual T <sub>u</sub>	φT <sub>n</sub>	Ratio T <sub>u</sub> / φT <sub>n</sub>
	ft		K	K		kip-ft	kip-ft	
L1	185 - 132.5 (1)	TP28.85x18.61x0.219	18.99	663.64	0.029	0.23	1523.22	0.000
L2	132.5 - 93.67 (2)	TP35.99x27.534x0.281	22.30	1074.26	0.021	0.22	3079.53	0.000
L3	93.67 - 46.17 (3)	TP44.68x34.388x0.344	26.55	1625.82	0.016	0.22	5795.07	0.000
L4	46.17 - 0 (4)	TP53x42.759x0.375	30.43	2067.97	0.015	0.22	9005.67	0.000

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	AT&T		Amitkumar Kolhar

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	185 - 132.5 (1)	0.007	0.896	0.000	0.029	0.000	0.903	1.000	4.8.2
L2	132.5 - 93.67 (2)	0.007	0.958	0.000	0.021	0.000	0.965	1.000	4.8.2
L3	93.67 - 46.17 (3)	0.008	0.905	0.000	0.016	0.000	0.913	1.000	4.8.2
L4	46.17 - 0 (4)	0.010	0.920	0.000	0.015	0.000	0.929	1.000	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	185 - 132.5	Pole	TP28.85x18.61x0.219	1	-9.25	1327.28	90.3	Pass
L2	132.5 - 93.67	Pole	TP35.99x27.534x0.281	2	-14.88	2148.51	96.5	Pass
L3	93.67 - 46.17	Pole	TP44.68x34.388x0.344	3	-24.93	3251.64	91.3	Pass
L4	46.17 - 0	Pole	TP53x42.759x0.375	4	-40.02	4135.95	92.9	Pass
							Summary	
							Pole (L2)	96.5
							<b>RATING =</b>	<b>96.5</b>
								Pass

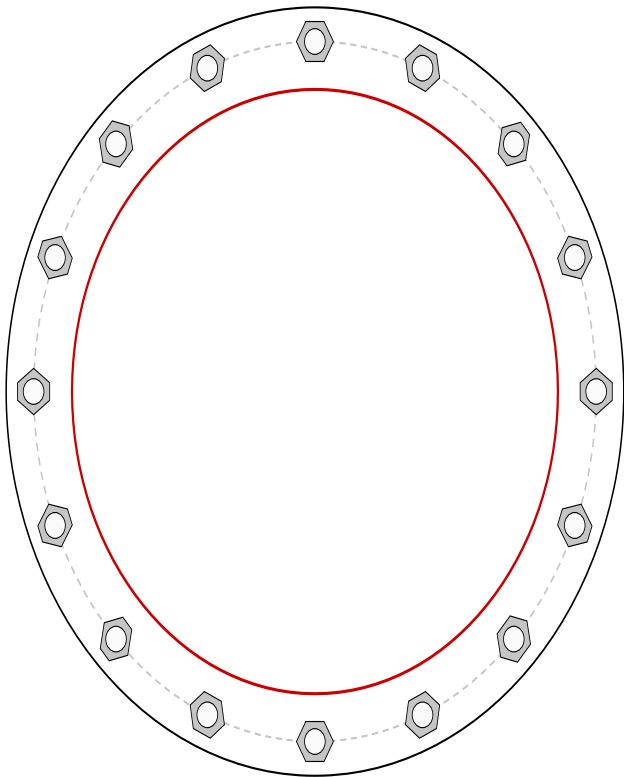
Program Version 8.0.5.0 - 11/28/2018 File:Y:/TELECOM/2018/Engineering/Projects/AT&T SA/229192/229192ATTMN-S (129049)/Verification/229192ATTMN-S Structural Analysis.eri

Monopole Base Plate Connection


Site Info	
Project #	129049
Site Name	Delano County Line
WO #	229192ATTMN-S

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
$I_{ar}$ (in)	0
Eta Factor, $\eta$	0.5

Applied Loads	
Moment (kip-ft)	4102.40
Axial Force (kips)	40.02
Shear Force (kips)	30.43



Connection Properties		Analysis Results	
<b>Anchor Rod Data</b>		<b>Anchor Rod Summary</b> <i>(units of kips, kip-in)</i>	
(16) 2-1/4" $\varnothing$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 61.37" BC		$P_{u\_c} = 202.93$	$\phi P_{n\_t} = 260$ <b>Stress Rating</b>
<b>Base Plate Data</b>		$V_u = 1.9$	$\phi V_n = n/a$ <b>79.5%</b>
67.37" OD x 2.5" Plate (S-128; $F_y=60$ ksi, $F_u=80$ ksi)		$M_u = n/a$	$\phi M_n = n/a$ <b>Pass</b>
<b>Stiffener Data</b>		<b>Base Plate Summary</b>	
N/A		Max Stress (ksi):	31.93 (Flexural)
<b>Pole Data</b>		Allowable Stress (ksi):	54
53" x 0.375" 16-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)		Stress Rating:	<b>59.1%</b> <b>Pass</b>

 <b>BLACK &amp; VEATCH</b> Building a world of difference. 6800 W. 115th St., Suite 2292 Overland Park, KS 66211 Phone: (913) 458-8145	<b>Client:</b>	AT&T	<b>Design:</b>	Khushal Patel
	<b>Project:</b>	129049	<b>Date:</b>	02/01/2019
	<b>Site:</b>	229192ATTMN-S	<b>Verify:</b>	Amit Kolhar
	<b>Title:</b>	Monopole Drilled Caisson Foundation Reaction Comparison	<b>Date:</b>	02/01/2019
			<b>Code:</b>	TIA/EIA-222-F

Template Version 1.6

#### **FOUNDATION ANALYSIS:**

##### **Original Tower Design Reactions:**

Drilled Caisson:

Shear:	28.6	Kip
Overturning moment:	3444.3	Kip-ft

##### **TnxTower Reactions:**

Drilled Caisson:

Shear:	30.0	Kip
Overturning moment:	4102.0	Kip-ft

##### **Stress Ratio:**

Drilled Caisson:

Shear:	77.7%
Overturning moment:	88.2%

##### **Conclusion:**

When the calculated reactions are compared to the original design reactions, the existing foundation is considered to have been designed and constructed with adequate capacity to support the existing and proposed loads.

##### **Controlling Foundation Stress Ratio:**

88.2%

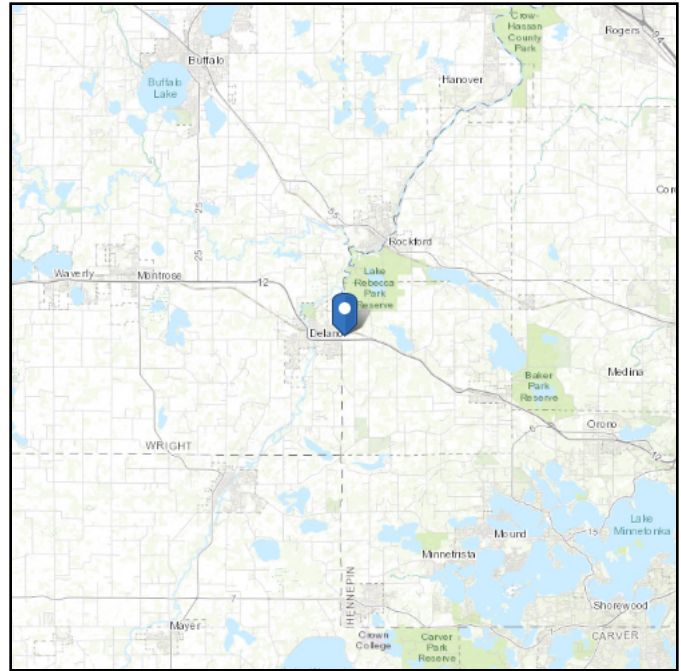


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 970.16 ft (NAVD 88)  
**Latitude:** 45.037278  
**Longitude:** -93.765194



## Wind

<b>Results:</b>	<b>76 Vmph</b>
Wind Speed:	115 Vmph
10-year MRI	76 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Mon Dec 10 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2.

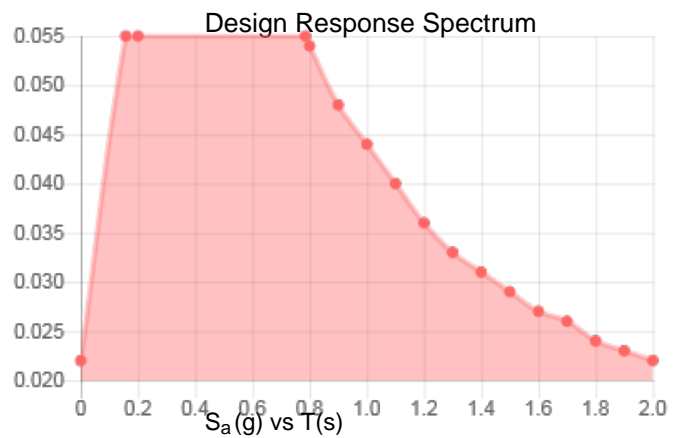
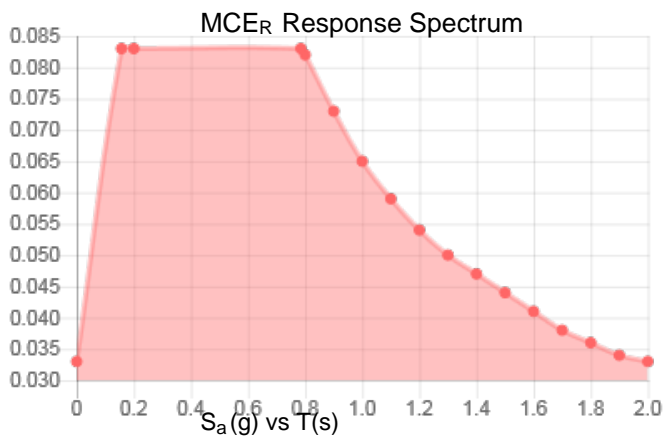
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.052	$S_{DS}$ :	0.055
$S_1$ :	0.027	$S_{D1}$ :	0.044
$F_a$ :	1.600	$T_L$ :	12.000
$F_v$ :	2.400	$PGA$ :	0.024
$S_{MS}$ :	0.083	$PGA_M$ :	0.039
$S_{M1}$ :	0.065	$F_{PGA}$ :	1.600
		$I_e$ :	1

**Seismic Design Category** A



**Data Accessed:**

Mon Dec 10 2018

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

**Results:**

Ice Thickness: 0.75 in.

Concurrent Temperature: -5 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Mon Dec 10 2018

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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City of Independence  
*Consideration to Amend City's Zoning Ordinance*

<i>To:</i>	Planning Commission
<i>From:</i>	Mark Kaltsas, City Planner
<i>Meeting Date:</i>	September 17, 2019

A proposed text amendment to the City of Independence Ordinances as follows:

- a. Chapter 5, Section 530.01, Subd. 3 Accessory Uses – Considering an amendment to the maximum height of an accessory structure. The City will discuss increasing the permitted height of detached accessory structures.

***UPDATE:***

**Accessory Structure Height**

Staff has determined that it is possible to establish a “Review Committee” that would likely be comprised of several members of the Planning Commission and City Council to review requests for accessory structures that exceed the maximum height permitted in the zoning ordinance. Details of the “Committee” makeup will be considered and approved by Council and will likely include 2 Planning Commissioners and 1 Council Member. The intent would be that the “Committee” would meet once a month if needed. The cost of an application would be nominal and no public hearing would be conducted. Staff has been working with the City’s attorney to develop a draft ordinance for consideration by the Planning Commission. The draft considers establishment of several specific criteria which must be satisfied prior to consideration by the “Committee”. If a proposal meets the criteria, the “Committee” will have the ability to review and approve an increased building height or if not approved recommend that the applicant apply for a variance. Any application that does not meet the initial criteria would have the option of applying for a variance.

Staff would like Planning Commissioners to review the proposed draft language and provide discussion and feedback at the meeting. The base criteria can be adjusted and or amended as directed. Staff offers the following initial criteria for consideration and discussion by the Planning Commission:

<sup>4</sup> An accessory structure may exceed the height of the principle structure if the accessory structure meets all applicable criteria of the Section and the following conditions are met:

- (1) Building plans containing any proposed accessory structure with a height exceeding that of the principle structure must be submitted to the City in advance of work to confirm compliance with this Section.
- (2) The City Council may establish an Accessory Building Height Review Committee to review building plans submitted for any proposed accessory structure with a height exceeding that of the principle structure to ensure compliance with the following:
  - a. On properties that are 2.5 acres or less, the proposed accessory structure must be located to the rear of the principle structure.
  - b. The proposed accessory structure must be detached and separated by a minimum distance of 75 feet from the principle structure.
  - c. The proposed accessory structure must meet the principle structure setbacks from all property lines.
  - d. All abutting property owners have consented to the proposed accessory structure on forms provided by the City.

It is not intended that Planning Commission will provide a recommendation relating to the information presented in this report at this meeting.

***Original Discussion on Accessory Building Heights:***

In 2013 the City updated the accessory structure ordinance to establish a more proportional relationship between the amount of detached accessory structure square footage allowed on a property and the size of the property. In practice, the new ordinance has worked well and there have been no variances granted relating to the size of a detached accessory structure since the amendment. One area of the ordinance that was changed at the same time was the maximum height permitted for detached accessory structures. The City has received concerns and comments from property owners relating to the maximum height permitted. The City has also granted two (2) variances relating to the maximum height of detached accessory structures. The general concern is that the maximum height permitted varies based on the height of the principal structure. If a resident has a single-level home, the maximum height of a detached accessory structure is limited to the single-level home height. This causes some issues for residents with larger properties that would like to have a larger detached accessory structure but have a single-level home.

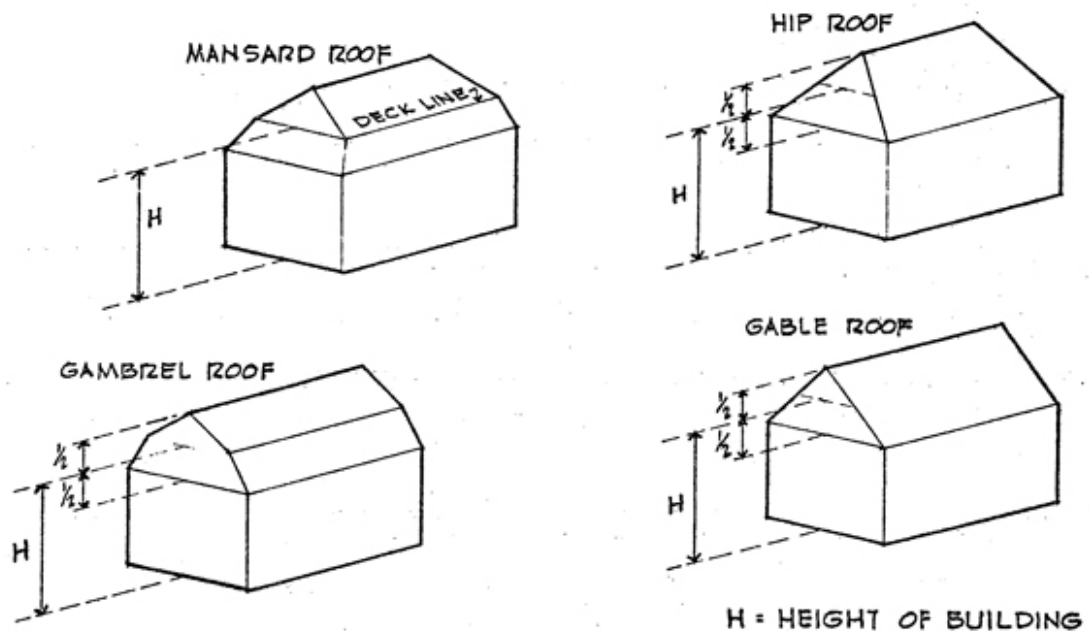
Staff has looked at the permitted heights of accessory structures from surrounding communities.

City Accessory Structure Comparison Table	
Jurisdiction	Height
Independence	height of principle structure
Winsted	1 story/16 feet
Delano	20 feet or height of principal***
Waconia	20 feet***
Minnetrista	height of principal structure
Mound	height of principal structure
Mayer	17 feet
Maple Plain	1 story/16 feet***
Victoria	24 feet/12 feet
Watertown	12 feet
* Cannot be located in front yard	
** Over 1,000 requires CUP	
*** Measured to Peak of roof	

It should be noted that not all communities allow as large of a detached accessory structure as the City of Independence. Staff would like to further discuss the maximum permitted height of detached accessory structures with the Planning Commission.

The City's current ordinance states the following:

<sup>3</sup> The height of an accessory structure shall not exceed the height of the principle structure. The height of the principle and accessory structure shall be measured in accordance with the definition provided in this ordinance, Section 510.05, Subdivision 10.



In application of the ordinance over the past 5 years, the City has consistently had requests for detached accessory structures that have heights (measured to the midpoint of the roof) in the 20-25-foot range. Many of the single-level homes measure closer to 17-20 feet in height measured to the midpoint of the roof. This typically leaves single-level property owners with an issue when considering building a detached accessory structure.

When the City considered the height in 2013, there was a general consensus that detached accessory structures should be proportional and subordinate to the principle structure on the property. In order to help achieve the subordinate relationship, the maximum height of the detached accessory structure was limited. Due to the wide array of property size, building architecture and other factors, many of the proposed detached accessory structures do not have a significant relationship with the principle structure.



**ORDINANCE NO. \_\_\_\_.**

**AMENDING SECTION 530 AND 530 OF THE INDEPENDENCE CITY CODE  
RELATING TO ACCESSORY USES**

**THE CITY COUNCIL OF THE CITY OF INDEPENDENCE, HENNEPIN COUNTY,  
MINNESOTA, ORDAINS:**

**SECTION 1.** The Independence City Code, Chapter IV, Section 530 is revised to include the following:

530.01. - Agricultural District established.

Subd. 1. *Purpose.* The agricultural district is established for the purpose of promoting continued farming of agricultural lands.

Subd. 2. *Permitted uses.* The following uses are permitted in the Agricultural District:

- (a) Agriculture and horticulture;
- (b) Feedlots and poultry facilities;
- (c) Farm drainage and irrigation systems;
- (d) Forestry;
- (e) Public recreation;
- (f) Single-family dwellings

Subd. 3. *Accessory uses.* The following accessory uses are permitted in the Agricultural District:

- (a) Private garages for single-family dwellings,
- (b) Home occupations operated in accordance with subsection 515.09 of this zoning code;
- (c) Fences;
- (d) Detached agricultural storage buildings, barns, or other structures, accessory to an existing single-family dwelling and subject to the following criteria:
  - 1. No accessory building or structure shall be constructed on any residential lot prior to the time of construction of the principal building to which it is accessory.
  - 2. Accessory buildings or structures of 120 square feet or less are exempt from the total square footage.
  - 3. The total square footage of all accessory structures on an individual property shall not exceed the following standards:

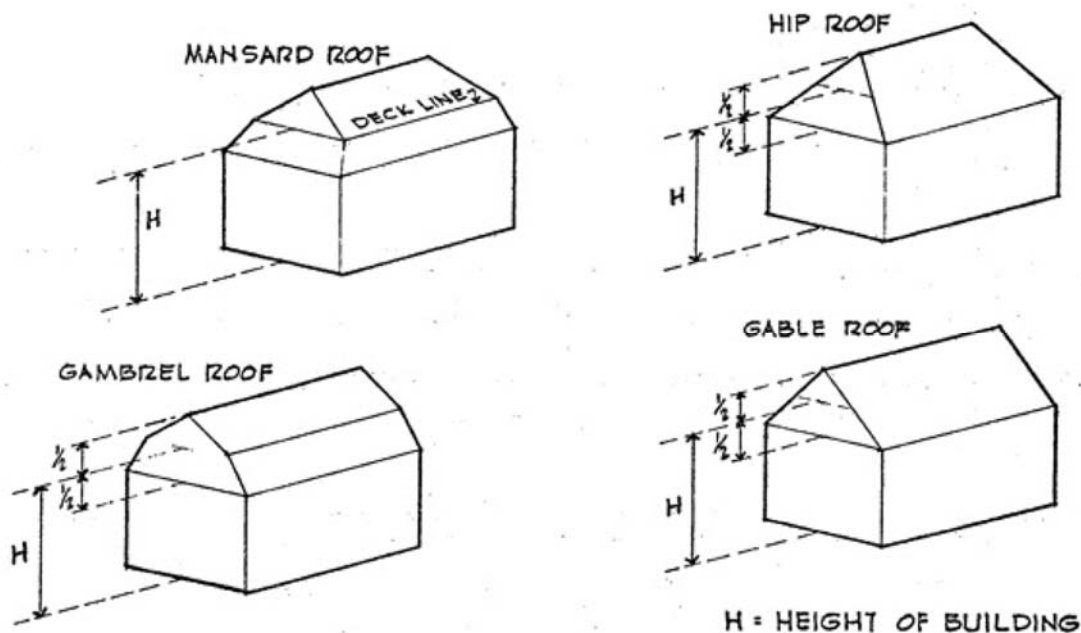
	Lots of record	Building Size <sup>1</sup>
--	----------------	----------------------------

(1)	2½ acres or less	1,850 square feet or 2% of lot area <sup>2</sup> (whichever is greater)
(2)	Greater than two and one-half acres but less than 10 acres	2% of lot area <sup>2</sup>
(3)	Ten or more acres	No requirement

<sup>1</sup> Building size shall be calculated by determining the footprint of the building.

<sup>2</sup> Percentage of lot area shall be based on the buildable land. Buildable land must be contiguous and not separated by streams, wetlands, slopes in excess of ten percent or other physical impediments. In no instance shall the total impervious surface area of any lot exceed 25 percent.

<sup>3</sup> The height of an accessory structure shall not exceed the height of the principle structure, except as provided in footnote 4. The height of the principle and accessory structure shall be measured in accordance with the definition provided in this ordinance, section 510.05, subdivision 10.



<sup>4</sup> An accessory structure may exceed the height of the principle structure if the accessory structure meets all applicable criteria of the Section and the following conditions are met:

- (1) Building plans containing any proposed accessory structure with a height exceeding that of the principle structure must be submitted to the City in advance of work to confirm compliance with this Section.

- (2) The City Council may establish an Accessory Building Height Review Committee to review building plans submitted for any proposed accessory structure with a height exceeding that of the principle structure to ensure compliance with the following:
- a. On properties that are 2.5 acres or less, the proposed accessory structure must be located to the rear of the principle structure.
  - b. The proposed accessory structure must be detached and separated by a minimum distance of 75 feet from the principle structure.
  - c. The proposed accessory structure must meet the principle structure setbacks from all property lines.
- (e) Retail sales, on a seasonal basis of agricultural and horticultural products grown on the premises by a person who occupies the premises as a principal residence, provided that the applicant apply for and receive an administrative permit from the city prior to commencing any sales of products. All applications shall meet and comply with all of the following standards:
- (1) Adequate off-street parking is provided for the number of persons reasonably anticipated to be on the site at any one time;
  - (2) The hours of operation must be limited so as not to unreasonably interfere with the character of the surrounding area and the neighboring property owners' peaceful enjoyment of their properties;
  - (3) The following signs may be permitted: one permanent on-site sign of no greater than 32 square feet in area per surface and having no greater than two surfaces, two temporary off-site signs of no greater than eight square feet in area per surface and having no greater than two surfaces and such other signs as city may reasonably determine to not interfere with public safety or the character of the surrounding area;
  - (4) Any new accessory structure constructed for the purpose of such sales and any adjacent parking area must satisfy those requirements as to setback, size, appearance and screening as the city may reasonably determine for purposes of protecting public safety and the character of the surrounding area;
  - (5) Greenhouses may not be artificially lit between the hours of 9:00 p.m. and 7:00 a.m. unless shielded so as to prevent any light from escaping in any direction;
  - (6) Such requirements, including application of dust control materials and grading of roadways, as the city reasonably determine are necessary in order to minimize the impact of any increase in traffic on city roadways as a result of such sales being conducted on the premises;
  - (7) All applicable federal, state and local statutes, ordinances, codes and regulations, including, but without limitation, all applicable health and safety regulations, must be complied with.
- (f) Aeration or decorative windmills provided the following performance standards are satisfied:
- (1) Permit required. A building permit shall be required for the construction of a recreational or aeration windmill.

- (2) Minimum lot size requirement. Lot must be 5 acres in total area or larger.
- (3) Setback requirements. The windmill must be setback from all property lines and residential structures, ten feet plus the height of the windmill.
- (4) Height restrictions. The maximum height of the windmill, as measured to the top of the highest point of the structure or blade) must not exceed the height of the principal structure or 35 feet, whichever is less.
- (5) Stability. The windmill shall be installed to withstand a wind force of 90 miles per hour.
- (6) The function of the windmill can only be used for the purpose of water aeration or decoration and not for any other on or off-site use; including the generation of electric power, either for use or sale.
- (7) No more than one windmill shall be permitted per property.
- (8) Windmills less than ten feet in height shall not require a permit.

Subd. 4. *Conditional uses.* The following conditional uses may be permitted in the Agricultural District, by action of the city council pursuant to subsections 520.09, 520.11 and 520.13.

- (a) Accessory dwelling units;
- (b) Riding stables;
- (c) Bunkhouses;
- (d) Farrieries;
- (e) Detached agricultural storage buildings, barns, or other accessory structures that exceed the size limitations of subdivision 3(d) of this subsection;
- (f) Kennels;
- (g) Local government buildings;
- (h) Churches;
- (i) Cemeteries;
- (j) Extraction;
- (k) Essential services;
- (l) Temporary use of a mobile home or camper as a dwelling unit during construction of a permanent dwelling for a period not to exceed six calendar months;
- (m) Wind energy conversion systems (WECS);
- (n) Commercial indoor storage in existing farm buildings, provided:
  - (1) The applicant establishes that the building has been in continuous use for agricultural purposes for at least ten years preceding the application for the conditional use permit;
  - (2) The building is located on property that is owner-occupied; and

- (3) The applicant establishes that the structure cannot be economically used for agricultural purposes.
- (o) Guest houses and non-rental guest apartments;
- (p) Commercial golf courses;
- (q) Telecommunications towers approved pursuant to section 540 of this Code;
- (r) Forestry products processing, provided that:
  - (1) The operation of the conditional use must be on a lot that is being used as an occupied single-family dwelling;
  - (2) The lot upon which the conditional use is operated must be not less than ten acres in area;
  - (3) The area devoted to the conditional use, including buildings, parking, storage area, and all related uses may not exceed 15,000 square feet or 12 percent of the size of the lot, whichever is smaller, subject to existing accessory building standards.
- (s) Polo grounds.
- (t) Catering business, provided that:
  - (1) The business is subordinate to the principal use of the property as a residence;
  - (2) No materials, equipment or parts used in the business may be stored on the premises other than within the dwelling unit or accessory structure;
  - (3) No signs relating to the business may be visible from the exterior of the dwelling unit or accessory structure except signs that are permitted under subsection 550.09, subdivision 2 of this zoning ordinance;
  - (4) No exterior alterations may be made to the dwelling unit to accommodate the business except those alterations customarily found with the dwelling units on lots of similar size within the district;
  - (5) No traffic shall be generated by the business beyond what is reasonable and normal for the area in which it is located;
  - (6) The hours and days during which the business is conducted on the premises is limited so as not to unreasonably interfere with the residential character of the surrounding areas;
  - (7) No over the counter retail sales may occur on-site.
- (u) New wireless support structures for small wireless facilities.

Subd. 5. *Animal assisted therapy operation.* AAT may be permitted as a conditional use by action of the city council pursuant to subsections 520.09, 520.11 and 520.13 of the zoning ordinance, subject to the following additional conditions:

- (a) The applicant shall provide proof of insurance in an amount and with such coverage as the city attorney deems reasonable, and shall thereafter maintain such insurance.

- (b) The applicant shall provide proof of licensing or appropriate educational attainment and training in AAT for all therapists delivering services at the site. This requirement shall be continuing and the city may request such proof on a periodic basis for all therapists then delivering services.
- (c) The applicant shall provide documentation and a site plan describing the AAT program(s) to be delivered. Such documentation shall include a description of the goal-directed process and criteria for evaluating the effectiveness of the program(s).
- (d) The applicant shall identify all species of animals that will be present at the site and used in delivering AAT. No other species of animals shall be allowed with the city's approval.
- (e) For parcels of less than ten acres, the maximum density of animal units is two acres for the first animal unit and one additional acres for each additional animal unit.
- (f) Other than the delivery of AAT, no commercial or business activities may be conducted on the site except the production of agricultural products in de minimis amounts as a result of the delivery of AAT.
- (g) The city may periodically inspect the site without notice.

530.05. - Rural Residential District established.

Subd. 1. *Established.* The Rural Residential District is established for the purpose of providing for residential development affording enjoyment of the rural life style.

Subd. 2. *Permitted uses.* The following uses are permitted in the Rural Residential District:

- (a) Single-family dwellings;
- (b) Commercial agriculture;
- (c) Public recreation;
- (d) Horticulture;
- (e) Forestry.

Subd. 3. *Accessory uses.* The following accessory uses are permitted in the Rural Residential District:

- (a) Private fences, gardening and landscaping;
- (b) Recreation equipment;
- (c) Home occupations operated in accordance with subsection 515.09 of this zoning code;
- (d) Non-commercial greenhouses;
- (e) Private garage, additional storage buildings, barns or other structures, accessory to an existing single-family dwelling and subject to the following criteria:
  - 1. No accessory building or structure shall be constructed on any residential lot prior to the time of construction of the principal building to which it is accessory.

2. Accessory buildings or structures of 120 square feet or less are exempt from the total square footage.
3. The total square footage of all accessory structures on an individual property shall not exceed the following standards:

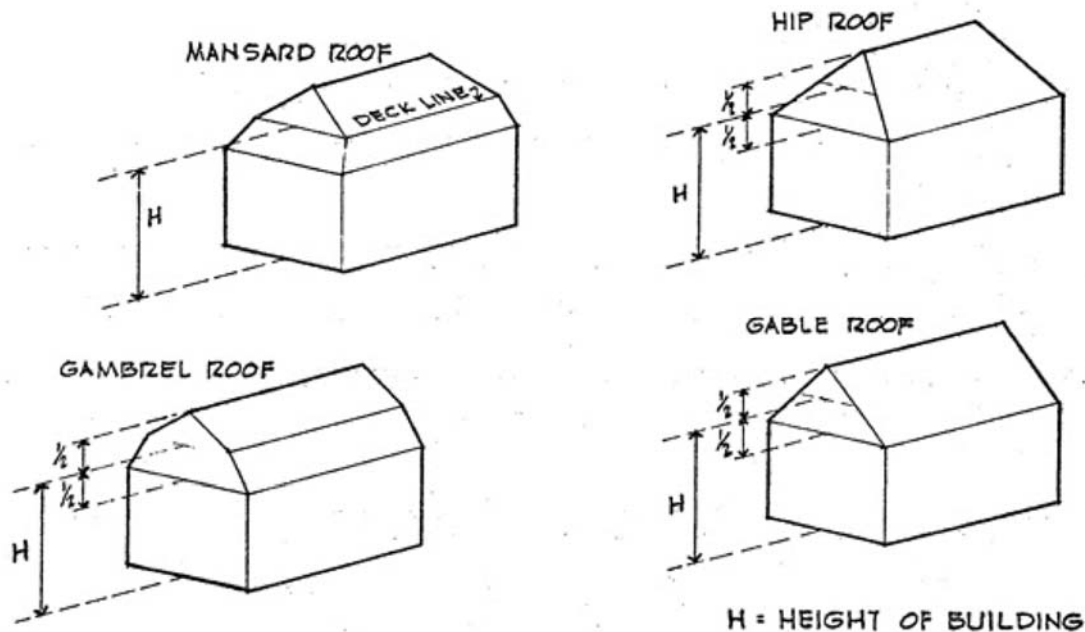
	Lots of Record	Building Size <sup>1</sup>
(1)	2½ acres or less	1,850 square feet or 2% of lot area <sup>2</sup> (whichever is greater)
(2)	Greater than two and one-half acres but less than 10 acres	1,850 square feet
(3)	Ten or more acres	No Requirement

<sup>1</sup> Building size shall be calculated by determining the footprint of the building.

<sup>2</sup> Percentage of lot area shall be based on the buildable land. Buildable land must be contiguous and not separated by streams, wetlands, slopes in excess of ten percent or other physical impediments. In no instance shall the total impervious surface area of any lot exceed 25 percent.

<sup>3</sup> The height of an accessory structure shall not exceed the height of the principle structure, except as provided in footnote 4. The height of the principle and accessory structure shall be measured in accordance with the definition provided in this ordinance, section 510.05, subdivision 10.





<sup>4</sup> An accessory structure may exceed the height of the principle structure if the accessory structure meets all applicable criteria of the Section and the following conditions are met:

- (1) Building plans containing any proposed accessory structure with a height exceeding that of the principle structure must be submitted to the City in advance of work to confirm compliance with this Section.
- (2) The City Council may establish an Accessory Building Height Review Committee to review building plans submitted for any proposed accessory structure with a height exceeding that of the principle structure to ensure compliance with the following:
  - a. On properties that are 2.5 acres or less, the proposed accessory structure must be located to the rear of the principle structure.
  - b. The proposed accessory structure must be detached and separated by a minimum distance of 75 feet from the principle structure.
  - c. The proposed accessory structure must meet the principle structure setbacks from all property lines.

Subd. 4. *Conditional uses.* The following conditional uses may be permitted in the Rural Residential District by action of the city council pursuant to subsections 520.09, 520.11, and 520.13 of this Code:

- (a) Cluster development meeting the standards of subdivision 6 of this section;
- (b) Kennels;
- (c) Nurseries;
- (d) Commercial recreation;
- (e) Local government buildings;
- (f) Churches;

- (g) Cemeteries;
- (h) Essential services;
- (i) Temporary use of a mobile home as a dwelling unit during construction of a permanent dwelling for a period not to exceed six calendar months;
- (j) Guest houses and non-rental guest apartments;
- (k) Telecommunications towers approved pursuant to section 540 of this Code; and
- (l) New wireless support structures for small wireless facilities.

**SECTION 2.** This ordinance shall be in force and effect after enactment and publication as required by law.

Adopted this \_\_\_\_\_ day of September, 2019, by the Independence City Council.

\_\_\_\_\_  
Marvin Johnson, Mayor

ATTEST:

\_\_\_\_\_  
Mark Kaltsas, City Administrator