BROOKINGS COUNTY PLANNING & ZONING COMMISSION

BROOKINGS CITY & COUNTY GOVERNMENT CENTER
520 3rd St, 310 Chambers, Brookings, SD 57006

AGENDA

1. **Call to Order at 8:00 PM on May 3rd, 2016**

2. **Approval of Minutes from April 5th, 2016 meeting.**

   Documents: April 5th, 2016 - Draft Minutes.pdf

3. **Items to be Added to Agenda by Commission Members or Staff**

4. **Invitation for Citizens to Schedule Time on the Commission Agenda for an Item Not Listed**
   (Time limited to 5-minutes per person to address the commission.)

5. **Approval of Agenda**

6. **Convene as Brookings County Board of Adjustment**
   (The Board of Adjustment needs 2/3 approval of the full board to approve any agenda item.)

7. **2016var006**
   Kingbrook Rural Water System Inc. by Chad Bjerke has made an application, 2016var006, to the Brookings County Board of Adjustment for a variance. Article 11.00: Section 11.01 "A" Agricultural District: Area Regulation # 3): Side Yard: the minimum width of a side yard shall be twenty-five (25) feet; Area Regulation # 4): Rear Yard: the minimum depth of a rear yard shall be fifty (50) feet. The property is described as: "Booster Site in SE1/4 SW1/4 Sec. 8, T109N, R51W (Oslo Township)" ~~ located at 46126 216th St, Volga, SD 57071.

   Documents: 2016var006 Staff Report.pdf

8. **2016var007**
   Barret Marshall has made an application, 2016var007, to the Brookings County Board of Adjustment for a variance. Article 11.00: Section 11.01 "A" Agricultural District: Area Regulation # 2: Front Yard: The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards. The property is described as: "E1025' of N451' in NE1/4 Section 18, T111N, R52W (Winsor Township)" ~~ located at 45491 204th St, Arlington, SD 57212.

   Documents: 2016var007 Staff Report.pdf

9. **2016var008**
   Alan Clark has made an application, 2016var008, to the Brookings County Board of Adjustment for a variance. Article 11.00: Section 11.01 "A" Agricultural District: Area Regulation # 2: Front Yard: The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards. The property is described as: "N 2060' of W 275' of SW1/4

Section 17, T109N, R48W (Parnell Township)" ~~ located at 21656 479th Ave, Aurora, SD 57002.

Documents: 2016var008 Staff Report.pdf

10. **2016var009**
    Michael J. Stern has made an application, 2016var009, to the Brookings County Board of Adjustment for a variance. Article 11.00: Section 11.01 "A" Agricultural District: Area Regulation # 2: Front Yard: The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards. The property is described as: "E1700' Exc W1400' of E1700' of S670' of S1/2 SE1/4 Sec. 4, T112N, R50W (Eureka Township)" ~~ located at 46898 197th St, Bruce, SD 57220.

    Documents: 2016var009 Staff Report.pdf

11. **Convene as Brookings County Planning and Zoning Commission**

12. **2016cu004**
    Heartland Wind, LLC by Jesse Bermel, has made an application, 2016cu004, to the Brookings County Planning & Zoning Commission for a conditional use. Article 11.00: Section 11.01: "A" Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23 Section 23.01: Wind Energy Systems (WES) Requirements. The property is described as: "NW1/4 of Section 10, T111N, R48W (Sherman Township)".

    Documents: 2016cu004 -Staff Report.pdf, MET Tower Specs.pdf

13. **2016cu005**
    Heartland Wind, LLC by Jesse Bermel, has made an application, 2016cu005, to the Brookings County Planning & Zoning Commission for a conditional use. Article 11.00: Section 11.01: "A" Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23 Section 23.01: Wind Energy Systems (WES) Requirements. The property is described as: "NW1/4 Exc H-1 & Exc S 294' of W 296.33' of Section 12, T111N, R48W (Sherman Township)".

    Documents: 2016cu005 - Staff Report.pdf, MET Tower Specs.pdf

14. **2016cu006**
    Heartland Wind, LLC by Jesse Bermel, has made an application, 2016cu006, to the Brookings County Planning & Zoning Commission for a conditional use. Article 11.00: Section 11.01: "A" Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23 Section 23.01: Wind Energy Systems (WES) Requirements. The property is described as: "SE1/4 of Section 34, T112N, R48W (Oaklake Township)".

    Documents: 2016cu006 - Staff Report.pdf, MET Tower Specs.pdf

15. **2016cu007**
    Heartland Wind, LLC by Jesse Bermel, has made an application, 2016cu007, to the Brookings County Planning & Zoning Commission for a conditional use. Article 11.00: Section 11.01: "A" Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23 Section 23.01: Wind Energy Systems (WES) Requirements. The property is described as: "E1/2 SW1/4 Exc. E1/2 NE1/4 SW1/4 of Section 27, T112N, R48W (Oaklake Township)".

Documents: 2016cu007 - Staff Report.pdf, MET Tower Specs.pdf

16. **2016cu008**

    Heartland Wind, LLC by Jesse Bermel, has made an application, 2016cu008, to the Brookings County Planning & Zoning Commission for a conditional use. Article 11.00: Section 11.01: "A" Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23 Section 23.01: Wind Energy Systems (WES) Requirements. The property is described as: "SW1/4 of Section 33, T112N, R48W (Oaklake Township)".

    Documents: 2016cu008-Staff Report.pdf, MET Tower Specs.pdf

17. **2016cu009**

    Michael J. Stern has made an application, 2016cu009, to the Brookings County Planning and Zoning Commission for a conditional use. Article 11.00: Section 11.01 "A" Agricultural District: Conditional Use #20: "Home Extended Business". The property is described as: "E1700' Exc W1400' of E1700' of S670' of S1/2 SE1/4 Section 4, T112N, R50W (Eureka Township)" ~~ located at 46898 197th St, Bruce, SD 57220.

    Documents: 2016cu009 Staff Report.pdf

18. **Consideration of Plats**

    A. **2016plat002**

    2016plat002: "Plat of Lots 1 & 2 of Risty Addition in the SW1.4 of Section 8, T109N, R52W of the 5th P.M., Brookings County, South Dakota."

    Documents: 2016plat002 Staff Report.pdf

    B. **2016plat003**

    2016plat003: "Plat of Lot 1 of Wills Addition in the SE1/4 of Section 12, T109N, R52W of the 5th P.M., Brookings County, South Dakota."

    Documents: 2016plat003 Staff Report.pdf

19. **Department Reports**

    A. **Plan for updating Zoning Ordinance**

20. **Adjourn**

21. **Public Notices**

BROOKINGS COUNTY DEVELOPMENT DIRECTOR
BROOKINGS CITY & COUNTY GOVERNMENT CENTER
520 3rd Street, Suite 200
BROOKINGS, SOUTH DAKOTA 57006
(605)-696-8350
ROBERT W. HILL
TELEPHONE (605) 696-8350
FAX (605) 696-8355
E-MAIL: zoning@brookingscountysd.gov

April 5th, 2016 Minutes

Brookings County Planning & Zoning Commission
April 5th, 2016 – 8:00 PM
Brookings City & County Government Center
310 Chambers

Chair Robbins called the meeting to order at 8:01 PM. Commission members present were: Lee Ann Pierce, Robert Rochel, Kimberly Elenkiwich, Darrell Nelson, Terrell Spence, Laurie Nichols, Randy Jensen, and alternate board members Tom Davis and Roger Erickson. Darrel Kleinjan was absent.

Chair Robbins read **agenda item # 1: Approval of minutes from March 1st, 2016 meeting.** Darrell Nelson moved to approve the minutes Roger Erickson second. Chair Robbins called for a voice vote. 9-ayes and 0-nays, motion carried.

Chair Robbins read **agenda item # 2: Items to be added to agenda by commission members or staff.** No items were added by commission members or staff.

Chair Robbins read **agenda item # 3: Invitation for citizen to schedule time on the commission agenda for an item not listed. Time limited to 5 minutes per person to address the board.** No one scheduled time to address the board.

Chair Robbins read **agenda item # 4: Approval of Agenda.** Terrell Spence moved to approve the agenda. Laurie Nichols second. Chair Robbins called for a voice vote. 9-ayes and 0-nays, motion carried.

Chair Robbins stated, "We are now acting as the Brookings County Planning and Zoning Commission" read the opening statement and **agenda item # 5. 2016cu003: Kodiak Pork RE, LLC by Barry R. Kerkaert has made an application, 2016cu003, to the Brookings County Planning and Zoning Commission for a conditional use. Article 11: Section 11.01: "A" Agricultural District: Conditional Use Permit # 11: Class A, B, C and D Concentrated Animal Feeding Operation. The property is described as: "SE1/4 Section 3, T109N, R48W (Parnell Township)".** Randy Jensen moved to approve the conditional use request. Robert Rochel second. Chair Robbins opened up for discussion and asked Mr. Haugen for his staff report. Mr. Haugen

stated, “The applicant is Kodiak Pork RE, LLC by Barry Kerkaert. The land owners are David and Sandra Diedrich. They are applying for a Conditional Use for a Class “A” Swine CAFO for a maximum head of 7,224 head of swine greater than 55 pounds and 640 head of swine less than 55 pounds, equaling 3,500 animal units. The breakdown is: 936 farrowing sows, 5,328 gestating sows/bred gilts, 640 replacement gilts less than 55 pounds and 640 replacement gilts greater than 55 pounds equaling a total of 7,864 head of swine. They have stated the facility will be a swine breeding, gestation, farrowing, and nursery facility, with the feeder pigs moved out at 15 pounds, only the selected replacement gilt piglets will be kept on site for breeding stock replacements. The animals will be housed in 3 separate building: the gilt development unit, gestation unit and farrowing unit. The building will be connected with alleyways between the structures, which will be used for moving the animals from one building to another, with center alley having a load out facility.” Mr. Haugen noted: 1) Engineers report by Todd Van Maanen of Stockwell Engineers was included with the application and contained all the information required per the zoning ordinance. 2) Site visit was made and would meet all set-back requirements. 3) A shelterbelt plan and permission slip/shelterbelt waiver and purchase agreement are on file. 4) Site is not located in Zone “A” (Well head protection area) or Zone “B” (shallow/surficial aquifer) and was noted in the engineer’s report. 5) Applicant is part of Pipestone Systems based in Pipestone, MN. 6) Road agreement with Parnell Township received and on file. Chair Robbins asked applicant and/or representatives to come forward and address the board. The applicant, Dr. Barry Kerkaert introduced himself and his engineer Todd Van Maanen. Todd Van Maanen presented a power point presentation describing the confinement project, going over the requirements required to meet the current zoning ordinance Article 22: Section 22.01. Chair Robbins opened up for questions from the board. Board members Pierce, Nelson, Rochel, Nichols and Jensen asked questions regarding: private wells, directional flow of any surface run-off, details of manure handling with distances of 1-2 miles mentioned, odor control and traffic. Mr. Haugen also noted that the Brookings County Highway Superintendent, Dick Birk was given a copy of the staff report and had no objections to the application. Chair Robbins opened up the public hearing portion. No one came forward. Chair Robbins closed the public portion and asked for further questions or comments from the board. Board member Rochel stated, “The reason this board probably doesn’t have a lot of questions is because we received an extensive Engineering report and we have spent a lot of time studying this.” Board members Nelson, Elenkiwich, Spence, Nichols and Rochel asked additional questions regarding: pest and rodent control, feed source, possible future growth plans at the site, nutrient management plan, length records are archived, any concerns or complaints from neighbors, and shelterbelt purpose. Chair Robbins asked for additional comments from the board, hearing none he asked Mr. Haugen to go over the findings of the facts, with any additions, which are on file. Chair Robbins called for a roll-call vote: Rochel-aye, Nelson-aye, Erickson-aye, Nichols-aye, Spence-aye, Jensen-aye, Elenkiwich-aye, Pierce-aye, Robbins- aye. 9-ayes, 0-nays, motion carried.

Mr. Hill addressed the board and audience and recognized the SDSU Swine students and Dr. Robert Thaler that were in attendance at the meeting. He welcomed and thanked them on behalf of the Brookings County Commission for taking the time to attend the meeting.

Chair Robbins stated, "We are now acting as the Brookings County Board of Adjustment", read the opening statement and **agenda item # 6. Appeal of 2016cu002: request by Scott Underwood regarding the issuing of Conditional Use Permit 2016cu002 on March 1st, 2016 by the Brookings County Planning and Zoning Commission.** Chair Robbins read, "appealing on the grounds that*: 1) Testimony about cost savings of $300,000 by construction of building with uncovered lagoon versus under building storage of manure should not have been allowed or considered by board. There is nothing in Zoning Ordinances that allows board to consider costs associated with construction. Voting was prejudice by testimony. 2). By attaching the Conditional Use requirement of injection of manure as a best management practice the board did not consider the current best management practice for that same manure stored in a uncovered lagoon which is no longer considered a best management practice in the swine industry in the upper Midwest. 3.) No consideration was considered for the citizens of the colony themselves. They have a church, a school, a cafeteria which are public meeting places in their community which will be located about 400 yard from the uncovered lagoon.*" Laurie Nichols moved to approval appeal request. Kimberly Elenkiwich second. Chair Robbins then opened up for discussion and asked Mr. Hill for his staff report. Mr. Hill's report contained the following comments: 1.) During a conditional use hearing the staff contends that since there is nothing in the ordinances prohibiting the cost of construction then it is permissible. This was a conditional use permit application, not a variance, so costs are allowed in the discussion and have been discussed in previous conditional use permit hearing on various subjects. 2.) In reference to best management practice - in the zoning ordinance on page 22.00-2. The staff contends that the Planning Commission used the Best Management Practices as defined in the Brookings County Ordinance page 22-2 in their review which stated the following: *"Best Management Practices (BMP) means schedules of activities, prohibitions of practice, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state. BMP's also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge, manure disposal, manure application, waste or manure stockpiles, or drainage from raw material storage."* The Brookings county Planning Commission carefully heard the Conditional Use Permit application and followed zoning ordinance and considered several items that are include in the Findings of Facts for 2016cu002. 3.) All standards listed on pages 22.00-17 to 22.00-19 were met during the review of the conditional use permit review. Chair asked the board for questions from the board. Hearing none Chair opened the public hearing portion noting a time limit of 5 minutes per person. Chair Robbins called appellant forward. Appellant identified himself as Scott Underwood and noted concerns: 1) Swine operation with an open lagoon within 400-500 yards of 100 people. 2) Close to a neighbor that raises hogs,

worry of disease being spread either by air or traffic. 3) Doesn't think the site location is ideal for an open storage facility. 4) Odor concerns. 5) Need to attach a special condition that manure must be injected. Chair Robbins opened for comments from other supports of the appeal. The following member of the audience came forward and addressed the board: 1) Alan Nelson noted he was a close neighbor to the proposed site and still had questions with the open lagoon, concern with smell and the threat of airborne disease. 2) Catherine Carter presented the board members with a handout and expressed concern with the Topeka shiner and the location of the proposed facility in relation to Deer Creek, and environmental concerns regarding the open pit. 3) Bryon Ramlo wanted it noted that he was not for this and had concerns with odor, composting, and the type of development. 4) Bill Gibbons questioned cost considerations, current common manure management storage practices and expressed concern for the youth of the colony. Hearing no other opposition Chair Robbins asked for further questions from the board, hearing none he called CAFO applicants forward. Brian Friedrichsen the project Engineer and Jim Stahl from Norfeld Colony introduced themselves. Mr. Stahl stated, "Regarding the lagoon, Brian has the number here vs. a deep pit. We need to establish enterprise for our future generation and we have willing young guys interested in raising pigs. We have 98 members. The pond area will be fenced in and no children are allowed in the area." Mr. Stahl described the voting process that takes place on the Colony and noted that all members agreed and signed off on the project. Brian Friedrichsen asked the board if they had any questions. Board member Pierce asked, "It is my understanding that the South Dakota DENR takes the position that neither a lagoon nor a pit is the best management practice, but either one is acceptable. Is that correct?" Mr. Friedrichsen replied, "That is correct." Chair Robbins asked if the board had any more questions or comments, hearing none allowed Mr. Friedrichsen to add any additional comments. Mr. Friedrichsen addressed the comments regarding: 1) Topeka shiner 2) New permit and changing rules regarding manure application near noted streams. 3) Lagoons vs. Pit storage. 4) Odor management tool. Those that spoke in favor were: Rein Landman, Rusty Antonen and Neil Dobson from Impact Solution Inc. Mr. Dobson presented a short presentation regarding a product that can be used to enhance the natural value of lagoon manure. Chair Robbins asked if the board had any additional questions. Board member Nelson addressed a question to Mr. Friedrichsen regarding possibility of a field in the nutrient management plan already being used under another plan. Mr. Friedrichsen noted that DENR reviews and no over lapping usage would be allowed. Board member Spence wanted to address the odor map and the fact that it was introduced after the public portion. Board member Pierce noted that additional material is often added later. Mr. Hill added, "Our zoning ordinance does not address the odor footprint, it doesn't require an odor footprint for a conditional use to be heard." Chair Robbins opened up for rebuttal from the appellant. Mr. Underwood came forward and voiced concern of the odor of the area, the site being selected for convenience not that it was selected as the best site. Chair Robbins asked the applicant forward for final comments. Mr. Stahl noted that they had hired the injection of manure for seven

years, they now have their own equipment and the manure is in fact injected. Chair Robbins closed the public hearing portion and opened up for deliberation of the board. Chair Robbins clarified that a yes vote would allow the appeal process to move forward and a no vote would deny the appeal. Chair Robbins asked for further questions or comments from the board, hearing none Chair Robbins asked for a roll-call vote: Nelson-nay, Nichols-aye, Spence-aye, Jensen-nay Elenkiwich-nay, Erickson-nay, Rochel-nay, Pierce-nay, Robbins-nay. 2-ayes, 7-nays, motion denied. Mr. Hill noted that the staff would prepare a document and then it would be published in the legal newspaper as the final record of this meeting.

Chair Robbins noted the time concern and that board would continue on. Chair Robbins then removed himself from the board at this time due to conflict of interest. Vice Chair Elenkiwich assumed chair role and alternate board member Tom Davis took his position on the board. Chair Elenkiwich then read **agenda item # 7. 2016var003: Chad Shultz has made an application, 2016var003, to the Brookings County Board of Adjustment for a variance. Article 11.00: Section 11.01 "A" Agricultural District: Area Regulation # 2: Front Yard: The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards. The property is described as: "N 528' of S 1596' of E 420' of SE1/4 of Section 33, T112N, R51W (Preston Township)" ~~ located at 20177 463rd Ave, Bruce, SD 57220.** Darrell Nelson moved to approve the variance request. Roger Erickson second. Chair Elenkiwich opened for discussion and asked Mr. Haugen for his staff report. Mr. Haugen stated, "Mr. Shultz has applied for a front yard variance to build a 30 foot x 60 foot hoop barn, 88 feet from the center of 463rd Ave (Preston Township road). A variance of 45 feet. The required setback distance is 133 feet from the center of the road. The house and outbuilding meet the setback requirements. The proposed site area is level, the land to the south and west of the residence drops off significantly to the west. There is a 7 foot drop from East to West. Telephone and waterlines along with existing buildings, livestock pens and the shelterbelt limit his building locations. The applicant has spoken to the township and has a letter stating they have no objection to the request." Chair Elenkiwich asked Mr. Shultz to address the board. Mr. Shultz stated, "One correction is that it is a 36 foot x 60 foot hoop barn. My consideration was the land erosion and the steepness of the grade." Board member Nichols asked for clarification of the grade. Mr. Shultz and Mr. Haugen used photos to describe the location issues. Chair Elenkiwich noted her appreciation that he had went to the township board, discussed it with them and that they had granted their approval to his project. Chair Elenkiwich asked for further questions from the board. Board member Davis asked, "Will there be any livestock pens out toward the road?" Mr. Shultz stated, "No, this is just to be used for storage." Chair Elenkiwich opened up for discussion from the audience, hearing none she asked for further discussion from the board, hearing none she asked Mr. Haugen to go over the finding of the facts, with any additions, which are on file. Chair Elenkiwich called for a roll-call vote: Erickson-aye, Nichols-aye, Spence-aye, Jensen-aye, Davis-aye, Nelson-aye, Rochel-aye, Pierce-aye, Elenkiwich-aye. 9-ayes, 0-nays, motion carried.

Alternate board member Tom Davis removed himself from the board at this time and Chair Robbins returned, Co-chair Elenkiwich resumed her seat.

Chair Robbins read **agenda item # 8: 2016var004: Harris Hoistad has made an application, 2016var004, to the Brookings County Board of Adjustment for a variance. Article 13.00: Section 13.01: "LP" Lake-Park District: Density, Area and Yard Regulation (Lake Front). The property is described as: "Lot 11 Wacek Beach in NW ¼ Section 3, T112N, R52W (Laketon Township)" ~~ located at 294 SE Lake Dr., Estelline, SD 57234.** Robert Rochel moved to approve the variance request. Terrell Spence second. Chair Robbins opened up for discussion and asked Mr. Haugen for his staff report. Mr. Haugen stated, "Mr. Harris has applied for a lake front variance on Lake Poinsett. They have an existing cabin and want to build a 30 foot wide x 60 foot addition with a 12 foot x 30 foot attached deck. It would be 42 feet 4 inches from the high watermark, a variance of 32 feet 6 inches. The current residence is 99 feet from the high watermark to the existing deck. The proposed addition would meet the side setbacks of 8 feet. The property is not in the floodplain and the elevation of the property is 5 feet 2 inches above the high watermark. The deck addition would be farther back than the residence on either side. Wacek Beach was platted in 1967 prior to the zoning ordinance. Hardships would be the shape and size of the lot and the lots were platted before the zoning ordinance was adopted." Chair Robbins asked Mr. Hoistad to address the board. Mr. Hoistad stated, "We purchased the property 11 years ago and built a small cabin in the back with the intention that as we neared retirement age we would add a home to the front. Once we retire we would live out their on a full-time basis. We would be behind our neighbors as far as the location of the addition and deck. We had no issues in the 2010-2011 floods." Chair opened up for discussion from the board. Board member Nelson asked a question regarding ice movement and wind. Mr. Hoistad noted that in the 11 years they have owned the property they have had no issues. Board member Pierce asked, "You built the cabin that is currently there?" Mr. Hoistad stated, "Correct, my wife and I built that." Board member Pierce noted, "The 75 foot setback is not just for the protection of the homeowner but is for the protection of the lake and I encouraged the other commission members to keep that in mind. You kind of made a decision when you put that cabin way back there, to limit the amount of room that you had to build in." Mr. Hoistad replied, "The current cabin that we have there is built according to the current setback from the center of the road. We are as far back from the lake now with the current cabin as we can be and meet the setback on the back side as well as on the sides." Board member Pierce stated, "I don't mind giving a variance on the back end where it is the road as that is not an environmental issue, but it's that front end for the protection of the lake that always concerns me and the is why we have the 75 foot setback, to protect the lake." Chair Robbins asked for further comments from the board, hearing none he opened up to the audience. Hearing none he asked the board for further questions or comments. Board member Nichols asked for clarification and a review of the site and the setbacks. Site and setbacks were review with septic

system noted as an issue in designing of the addition. Chair Robbins asked for additional comments from the board, hearing none he asked Mr. Haugen to go over the findings of facts, with any additions, which are on file. Chair Robbins called for a roll-call vote: Spence-aye, Jensen-nay, Elenkiwich-nay, Pierce-nay, Rochel-nay, Nelson-aye, Nichols-nay, Robbins-aye, Erickson-aye. 4-ayes, 5-nays, motion failed.

Chair Robbins stated, "We are now acting as the Brookings County Planning and Zoning Commission" read the opening statement and **agenda item # 9. Consideration of Plats: a. 2016plat001: "Plat of Block 1; Lots 1-5 in Block 1; and Block 2 of Pearson-Overby Addition an addition in Govt. Lot 4 of Section 22, T112N, R47W of the 5th P.M., Brookings County, South Dakota."** Darrell Nelson moved to approve the final plat. Kimberly Elenkiwich second. Chair Robbins opened up for discussion and asked Mr. Haugen for his staff report. Mr. Haugen stated, "Mr. Pearson has applied for a final plat of Block 1 Lots 1-5 and Block 1 & Block 2 of Pearson-Overby Addition. The preliminary was approved March 1st, 2016. It meets all the Lake Park zoning requirements and all the lots meet the setback requirements. The rest of the lots in Block 1 will be platted as they are sold. They meet the 20,000 square foot requirement and meet the non-lake front set back requirement of 50 foot front, 50 foot rear and 8 foot side." Chair Robbins opened up for questions from the board. Board members Nichols asked to clarify what was being approved at this time. Chair Robbins asked the applicant to come forward and address the board. Mr. Pearson stated, "I have lots 1-5 that I am going to plat and in the future if I sell more they will be mirrored of lots 4 & 5 all the way to the end for people to build a house or garage on." Mr. Pearson noted that he had purchase agreements on lots 1 thru 3 for the back lots of the cabins. Chair Robbins asked for additional comments from the board, seeing none he called for a roll-call vote: Nichols-aye, Spence-aye, Jensen-aye, Pierce-aye, Rochel-aye, Nelson-aye, Elenkiwich-aye, Erickson-aye, Robbins-aye. 9-ayes and 0-nays, motion carried.

Chair Robbins stated, "We are now acting as the Brookings County Board of Adjustment", read the opening statement and **agenda item # 10. 2016var005: Greg Pearson has made an application, 2016var005, to the Brookings County Board of Adjustment for a variance. Article 13.00: Section 13.01: "LP" Lake-Park District: Density, Area and Yard Regulation (Non-Lake Front). The property is described as: "Lot 1 in Block 1 of Pearson-Overby Addition an addition in Govt Lot 4 of Section 22, T112N, R47W of the 5th P.M., Brookings County, South Dakota (Lake Hendricks Township)."** Laurie Nichols moved to approve the variance request. Roger Erickson second. Chair Robbins opened up for discussion and asked Mr. Haugen for his staff report. Mr. Haugen stated, "Mr. Pearson has applied for a variance on Lot 1 of Block 1 on the plat that was just approved. He has applied to reverse the non-lake front rear and side setbacks to build an accessory building on. The accessory building will meet the Lake Park zoning size requirements." Mr. Haugen then described and showed the changes that were being requested using the map that Mr. Pearson had submitted in his application. Mr. Haugen noted the county's definition of a rear yard according to the Brookings County Zoning Ordinance. He also noted

that Mr. Pearson was also asking for a 35 foot front yard set-back instead of the required 50 foot. Mr. Haugen stated, “Looking back in the past history, the Board of Adjustment has not had any requests like this in the past so we have no history of board actions. It has been brought up that when we update the zoning ordinance that we look at possibly changing the definition of the rear yard to clarify that, but right now the red outline area is our current zoning setbacks.” Board members discussed: 1) Possible use of the lots. 2) Possible request for similar requests on other lots in the area. 3) Why the need for an additional variance request on the front yard? 4) Why it initially was platted in such a way that this became an issue? Mr. Pearson’s replies to the questions: 1) “I have purchase agreements for lots 1-3, I am buying lot 1 for myself, lot 2 the purchaser would build a garage on. The lots will be adjacent to the homeowners to the north.” 2) “Lot 3 would be the only other one that could ask for a similar request. That will be based on how they choose to face their garage.” 3) “The reason I want a 35 foot setback is, as of right now the road is 20 feet from the edge of the property. So the property pins are actually 20 feet from the actual road, so my driveway before I can even put a building would be 70 feet from the edge of the road. Because the setback goes from the edge of your property. I would like to be 55 feet from the edge of the road.” 4) “No other way to plat it, the lot (Lot 1) is a 3/4-acre lot, the definition is where it is hanging me up, I want the same setbacks to the neighbor to the north. Because of your definition I am restricted on what I can build on.” Board member Jensen directed a question to Luke Muller from First District, asking if this was a common issue in other counties. Luke Muller stated, “Thanks for asking, I went through our ordinances in the eleven counties that we work with, I have spoken with the applicant and the zoning office here. I went thru several months ago who has a similar definition and who doesn’t in terms of counties. From counties it is a mixed bag. I would say half of the eleven counties we work will have the same definition that you do. The question about do we see a lot of them get a variance to switch these. In some cases they do although they are typically on lots that have already had development occur on them. Usually we see them on plats that have already been developed and not typically on new lots.” Mr. Hill added into the discussion that the Lot in question is not a ‘Takings’. The lot is buildable, a structure can be put on that location. Mr. Haugen noted that Lake Dreams (Preston Mettler and Jim Breckenridge) had emailed the office and were not in favor of the variance request. Chair Robbins asked for additional questions or comments from the board, seeing none he asked for additional questions or comments from the audience. Hearing none he directed back to the board. Board member Rochel stated, “Mr. Chairman I think this commission is uncomfortable moving or approving this as is, and if this is denied he doesn’t have much option. He can’t come back for six months. I am uncomfortable with this and setting precedence in going forward.” Board members discussed concerns with the request. The board discussed options to further review this request or withdraw it with the applicant. Laurie Nichols moved to table the variance request for one month to the May 3rd, 2016 meeting. Robert Rochel second. Chair Robbins called for a voice vote. 9-ayes and 0-nays, motion carried.

Chair Robbins then read **agenda item # 11: Department Reports.** Chair Robbins asked Mr. Hill for his Directors report. Mr. Hill stated, “We would like to thank Dr. Nichols for her service and the County Commission would like to thank her as well. There is still 7 months left in her term and we need someone from her area to replace her.” Mr. Hill then directed commission members to the hand-out he provided them and noted that it would be the format of the zoning ordinance and that staff would be working on taking the existing zoning ordinance and putting it into the new format. He also noted that at next month’s meeting a plan for updating the ordinance would be on the agenda.

Terrell Spence moved to adjourn the meeting. Laurie Nichols second. Chair Robbins adjourned the meeting at 11:10 PM.

Rae Lynn Maher
Brookings County
Development Department.

2016var006 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Kingbrook Rural Water by Chad Bjerke, 302 E Ash St, Arlington, SD 57212

Site: 46126 216th St, Volga, SD 57071

Legal Description: "Booster Site in SE1/4 SW1/4 Sec. 8 T109N, R51W (Oslo Township)"

2016var006: Kingbrook Rural Water has applied for a rear yard and side yard variance to move in a 12' wide x 24' long storage building to be 10 feet from the rear yard lot line and 10 feet from the side yard lot line. A rear yard setback variance of 40 feet and a side yard setback variance of 15 feet.

Brookings County Zoning Ordinance, Article 11:00 "A" Agricultural District – Area Regulations - # 4: Rear Yard – The minimum depth of the rear yard shall be fifty (50) feet.

3: Side Yard – The minimum depth of the side yard shall be twenty-five (25) feet.

The property was platted on November 10th, 1993 with the size of the lot being 125 feet x 125 feet. There is a booster pump and related valves located on the west one-third of the property, limiting the space to locate the building. The building will be 103 feet from the ROW (Right of Way), meeting the front yard setback of 100 feet. The building will be used for material storage.

Hardship: The hardship to consider 1) shape and size of lot, 2) location of booster pump and valves.

The Board of Adjustment has granted similar variances in the past:

June 1st, 2010: 2010var010: 12x24 telephone equipment building to be 58 feet from ROW of 476th Ave, a Brookings County road and 30 feet from the rear lot line.

October 5th, 2010: 2010var023: 12x24 telephone equipment building to be 58 feet from ROW of 471st Ave, a Brookings County road.

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and Volga Tribune on April 21st and 28th, 2015

Letters were sent to the adjoining landowner's, Oslo Township Chairman and Clerk.

Granting the variance request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the variance request would be maintaining the Agricultural Zoning Ordinance Setback requirements.

RECEIVED
MAR 23 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

APPLICATION FOR VARIANCE TO ZONING REGULATIONS

Date of Application: 3-23-16 Variance Number: 2016 var 006

To: Brookings County Board of Adjustment
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Board of Adjustment of Brookings County, South Dakota, to grant a Variance to the Brookings County Zoning Regulations for the purpose of:

Portable storage building for on-site storage
Building size 12'x24'

B.) Section(s) of Zoning Regulations to be exempted:

Article 11- Section 11.01 A Agricultural District : Area Regulation [redacted] # 3 Side Yard + # 4 Rear yard.

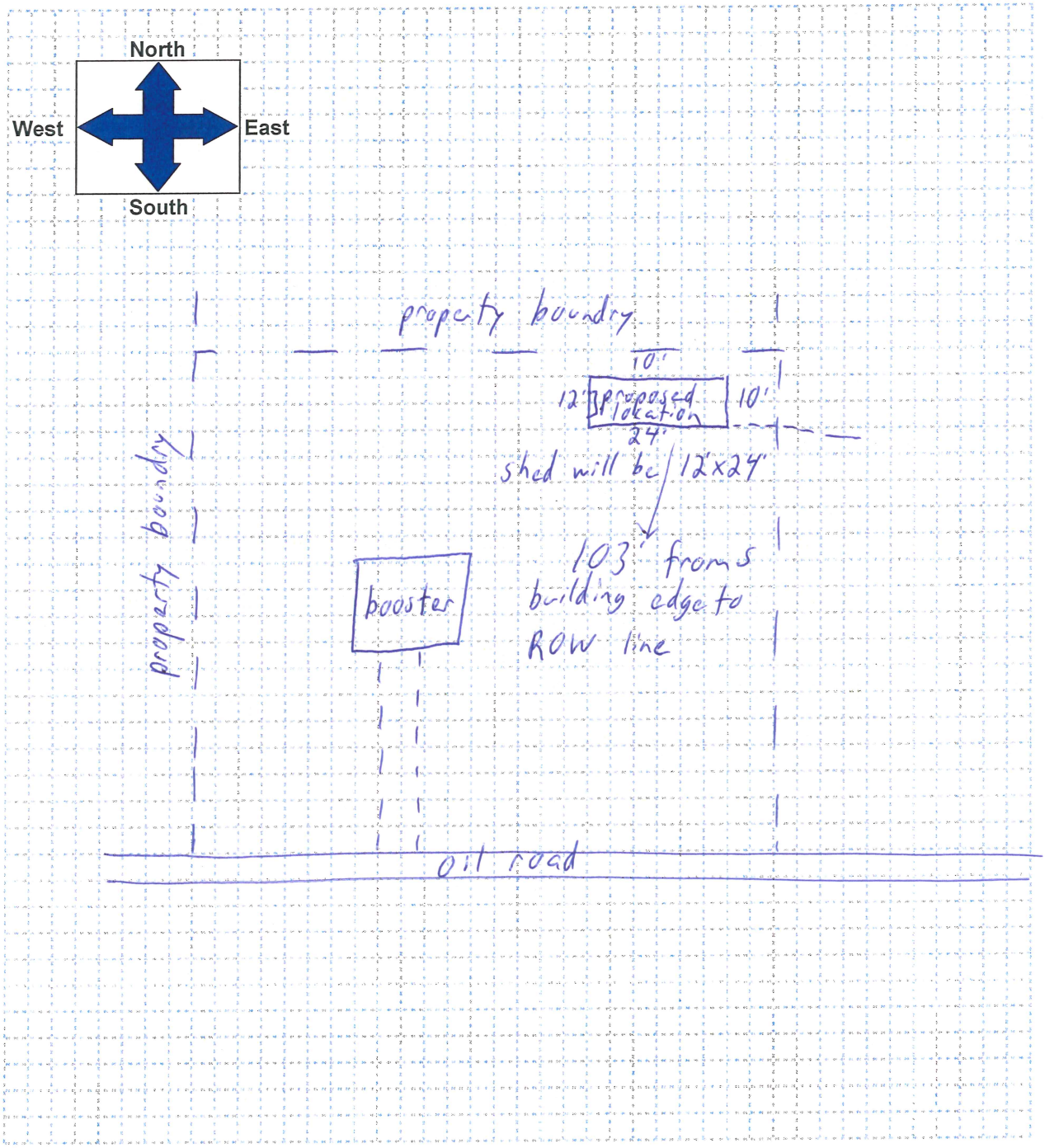
C.) Special conditions and circumstances that exist which are peculiar to the land, structure, or buildings in the same district: that literal interpretation of the provisions of this regulation would deprive the applicant of rights commonly enjoyed by other properties in the same district under terms of this regulation: that the special conditions and circumstances do not result from the actions of the applicant, and that granting the variance requested will not confer on the applicant, and privilege that is denied by this regulation to other lands, structures, or buildings in the same district.

lot size does not meet current set back requirements

SKETCH

Please draw a sketch of the site. Show both the existing and the proposed structures. Include the location of public roads, septic treatment systems, feedlots, streams, lakes and drainage ditches.

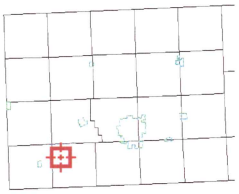
2016 var 006



Beacon™ Brookings County, SD

2016 var006

Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels

Floodplain 2008

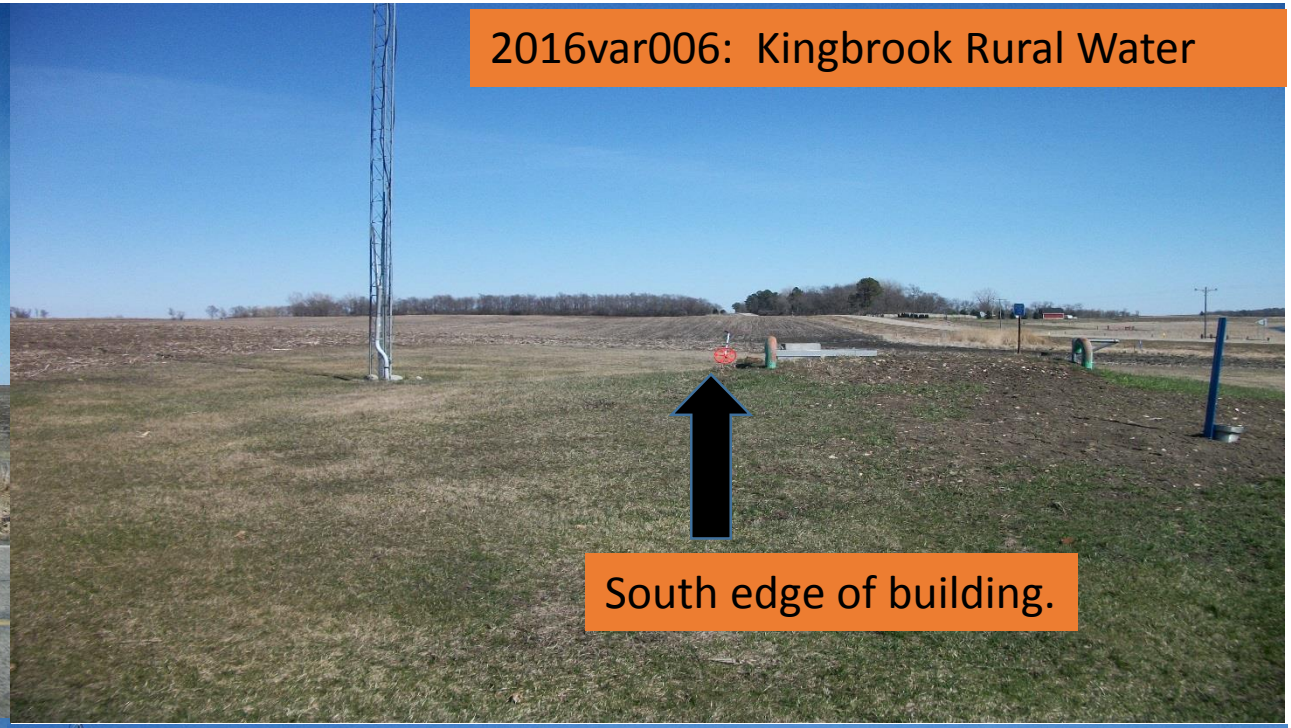
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE
- X

Parcel ID	151501095108300	**Alternate ID**	n/a	**Owner Address**	KINGBROOK RURAL WATER SYS INC
Sec/Twp/Rng	8-109-51	**Class**	X		PO BOX 299
Property Address	46126 216TH ST VOLGA	**Acreage**	n/a		ARLINGTON SD 57212
District	1505				
Brief Tax Description	BOOSTER SITE IN SE 1/4 SW 1/4 SEC 8-109-51 .50 ACRES (Note: Not to be used on legal documents)				

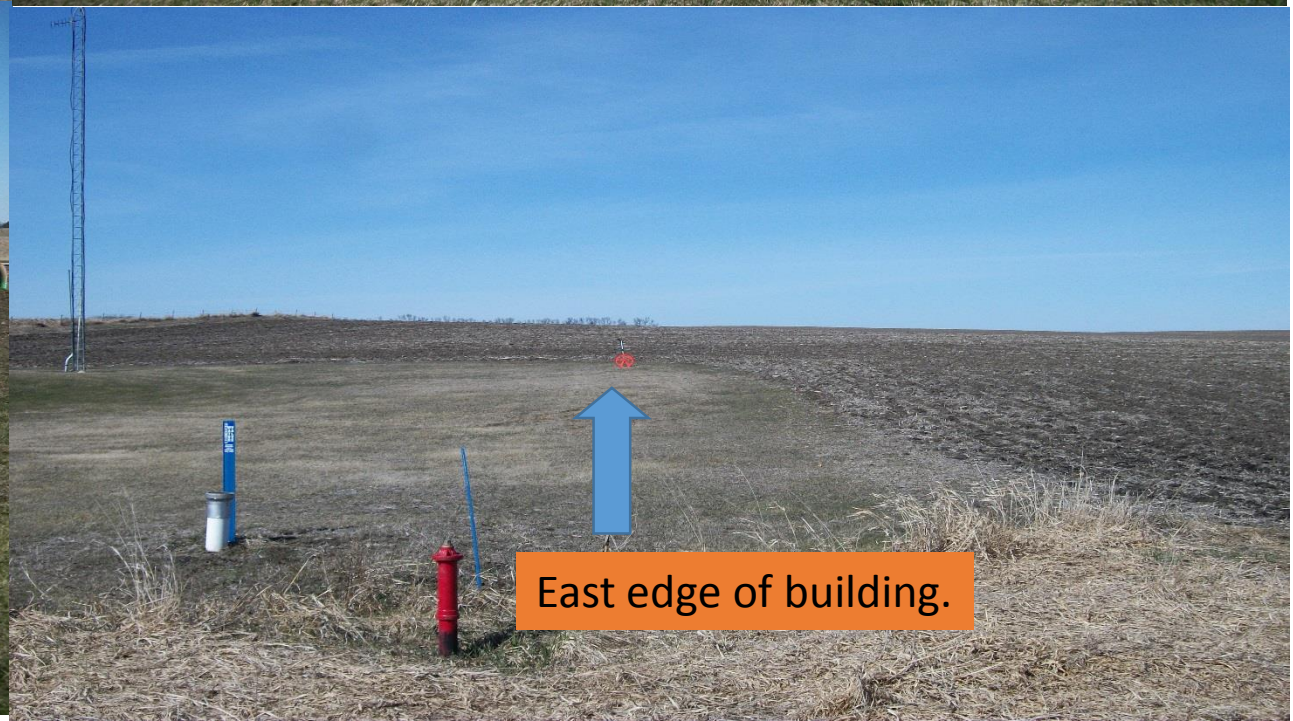
Date created: 3/23/2016
Last Data Uploaded: 2/18/2014 4:02:57 AM

Developed by
The Schneider Corporation


NO PASSING ZONE


2016var006: Kingbrook Rural Water
South edge of building.


North edge of building.


East edge of building.

2016var007 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Barret Marshall, 45491 204th St, Arlington, SD 57212
Legal Description: "E1025' of N451" in NE1/4 Sec. 18 T111N, R52W (Winsor Township)"

2016var007: Barret Marshall has applied for a front yard variance to build a 40' wide x 30' long, addition on their house 84 feet from the center of 204th St (Brooking County blacktop road-Oakwood/Bruce Road). A variance of 66 feet. The required setback distance is 150 feet from the center of the road.

The current residence is 84 feet from the center of the road and was built in 1910. They would like to add a 12x30 house addition and 28x30 attached garage(total addition 40'x30") onto the west side of their existing house. The addition would be the same distance from the road as the current house. The building site was deeded off in 2007.

Brookings County Zoning Ordinance, Article 11:00 "A" Agricultural District – Area Regulations - # 2; Front Yard – The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards.

Hardship: The hardship to consider 1) location of current residence, 2) location of overhead electrical line.

The Board of Adjustment has granted similar variances in the past:

May 7th, 2013: 2013var005: 12x44 residential addition 87' from center of a Brookings County road.

July 7, 2015: 2015var010: 10'x32' deck 79' and 12'x12' residential addition 101'; both from the center of 205th St a Sterling Township road.

August 4, 2015: 2015var014: 16'x18' residential addition 140' from center of 464th Ave a Brookings County road.

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and Arlington Sun on April 21st and 28th, 2015

Letters were sent to the adjoining landowner's, Winsor Township Chairman and Clerk.

Granting the variance request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the variance request would be maintaining the Agricultural Zoning Ordinance Setback requirements.

APPLICATION FOR VARIANCE
TO
ZONING REGULATIONS

RECEIVED
MAR 31 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

Date of Application: 3.31-2016 Variance Number: 2016var007

To: Brookings County Board of Adjustment
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Board of Adjustment of Brookings County, South Dakota, to grant a Variance to the Brookings County Zoning Regulations for the purpose of:

Remodel of our home, adding living space and a garage

Addn- 30x40 : 12x30 Living + 28'x30 Garage

B.) Section(s) of Zoning Regulations to be exempted:

Article 11.00: Section 11.01 "A" Agricultural District; Area Regulation # 2. Front yard. The minimum depth of front yard shall be one hundred (100') feet. A corner lot will have two front yards.

C.) Special conditions and circumstances that exist which are peculiar to the land, structure, or buildings in the same district: that literal interpretation of the provisions of this regulation would deprive the applicant of rights commonly enjoyed by other properties in the same district under terms of this regulation: that the special conditions and circumstances do not result from the actions of the applicant, and that granting the variance requested will not confer on the applicant, and privilege that is denied by this regulation to other lands, structures, or buildings in the same district.

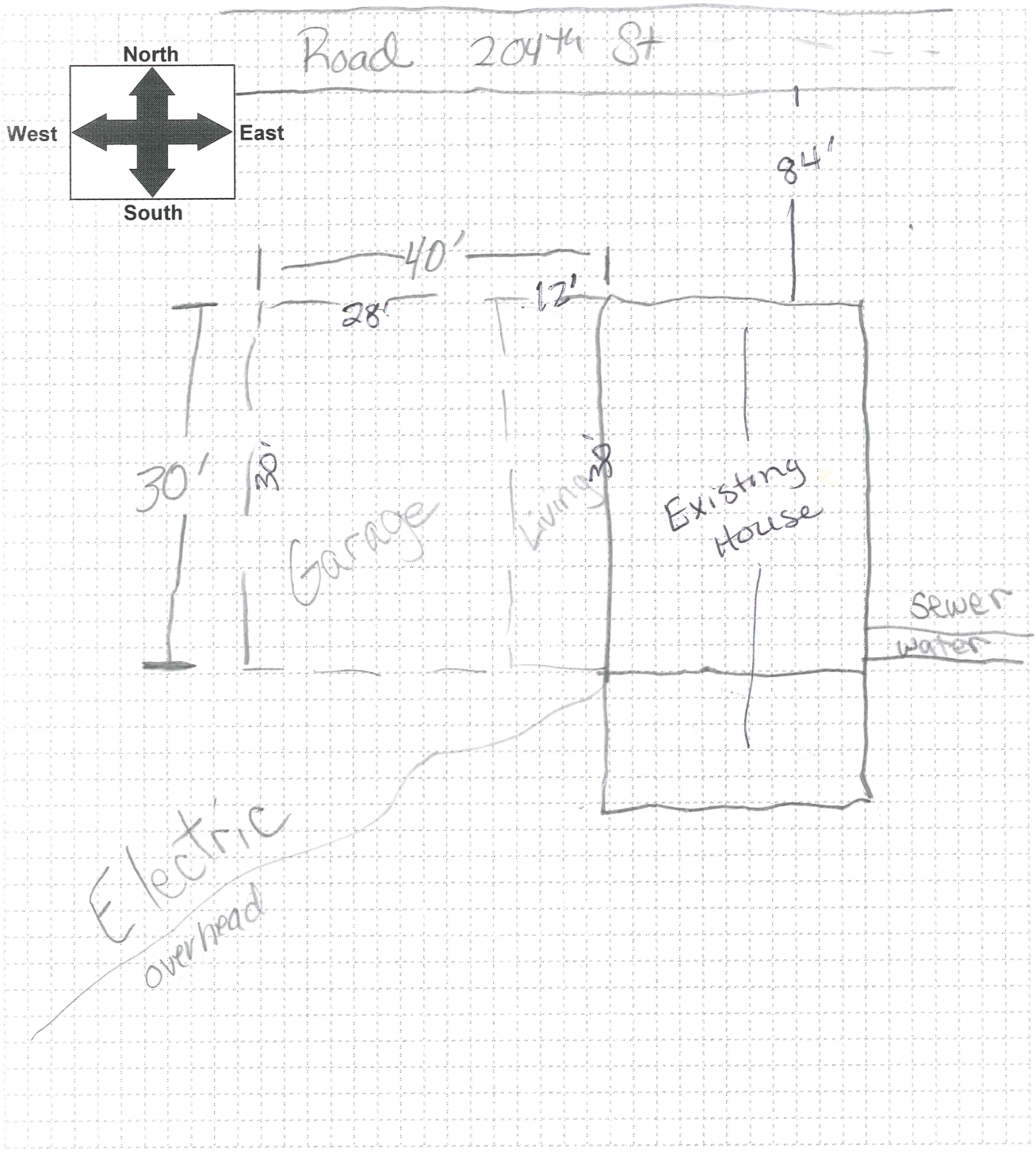
Existing Building is already there we would just like to add on to it!

30x40 Addition w Living area + garage

SKETCH

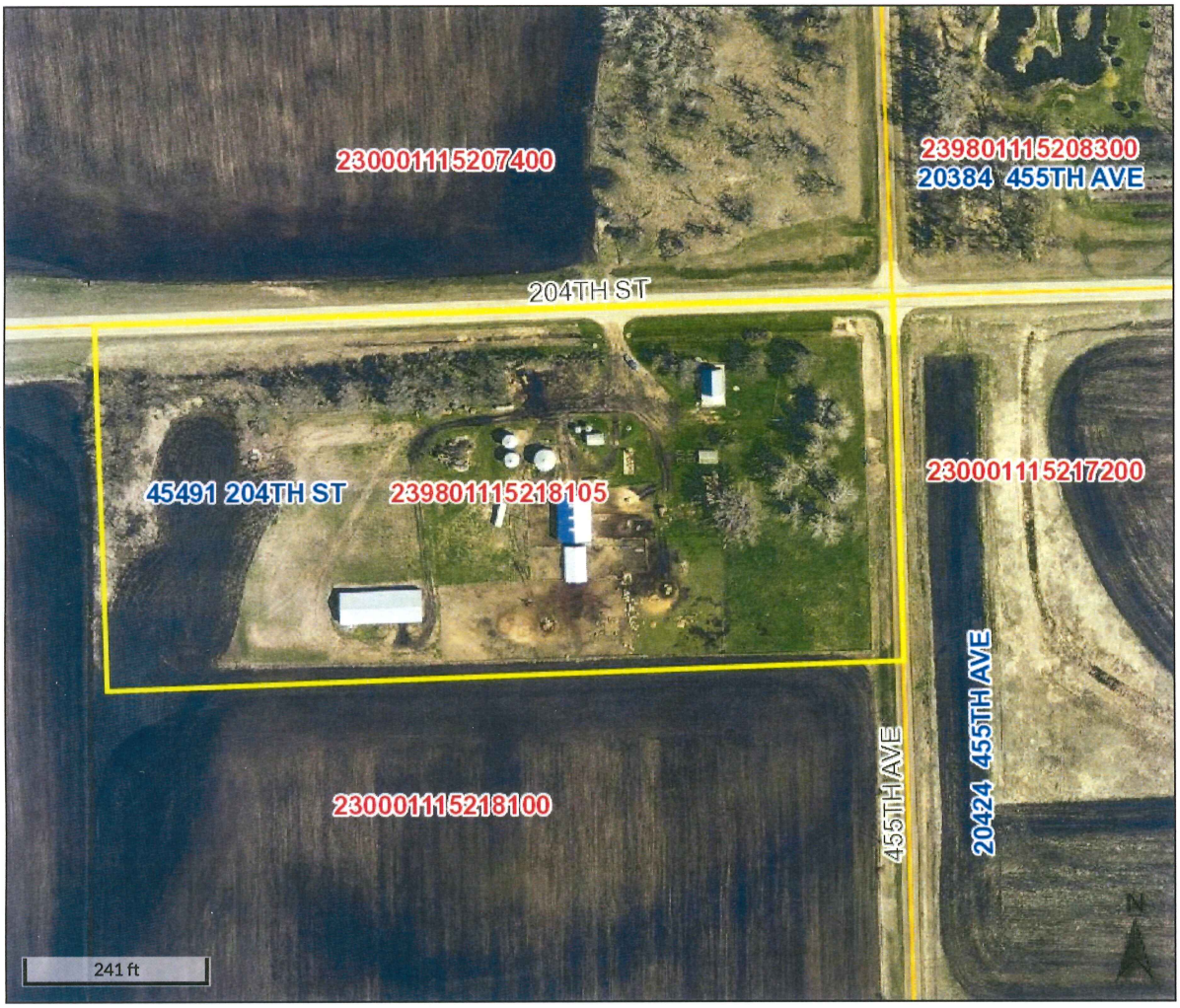
Please draw a sketch of the site. Show both the existing and the proposed structures. Include the location of public roads, septic treatment systems, feedlots, streams, lakes and drainage ditches.

2016 var 007

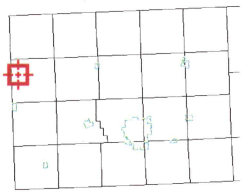


Beacon™ Brookings County, SD

20160NR007



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Floodplain 2008

- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE
- X

Parcel ID	239801115218105	**Alternate ID**	n/a	**Owner Address**	MARSHALL, BARRET ET UX
Sec/Twp/Rng	18-111-52	**Class**	NACS		45491 204TH ST
Property Address	45491 204TH ST ARLINGTON	**Acreage**	n/a		ARLINGTON SD 57212
District	2309				
Brief Tax Description	E 1025' OF N 451' IN NE 1/4 SEC 18-111-52 10.61 ACRES 3 LEASED SITE GRAIN BINS 23990-11152-181-00 ALSO SIT ON THIS PARCEL (Note: Not to be used on legal documents)				

Date created: 4/18/2016

Developed by
The Schneider Corporation

2016var007: Barret Marshall

2016var008 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Alan Clark, 21656 479th Ave, Aurora, SD 57002

Legal Description: "N2060' of W275'of SW1/4 Sec. 17 T109N, R48W (Parnell Township)"

2016var008: Alan Clark has applied for a front yard variance to build a 45' wide x 64' feet long pole shed 110 feet from the center of 479th Ave (Parnell Township road). A variance of 23 feet. The required setback distance is 133 feet from the center of the road.

Brookings County Zoning Ordinance, Article 11:00 "A" Agricultural District – Area Regulations - # 2; Front Yard – The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards.

Mr. Clark's building site is long and narrow, limiting his building options. His current residence and existing out building meet the setback requirements. The parcel was subdivided off in September of 1998.

Hardship: The hardship to consider 1) is the shape and size of lot, 2) location of existing building and shelterbelt.

The Board of Adjustment has granted similar variances in the past:

April 5th, 2016: 2016var005: hoop barn 88 feet from the center of a township road.

June 24th, 2013: 2013var013: shed 110 feet from the center of a township road.

November 5th, 2013: 2013var020: shed 80 feet from the center of a township road.

June 2nd, 2009: 2009var010 – shed 116 feet from center of a county road & 112 feet from center of a township road.

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and Elkton Record on April 21st and 28th, 2016.

Letters were sent to the adjoining landowner's, Parnell Township Chairman and Clerk.

Granting the variance request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the variance request would be maintaining the Agricultural Zoning Ordinance Setback requirements.

RECEIVED
APR - 4 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

APPLICATION FOR VARIANCE TO ZONING REGULATIONS

Date of Application: 4-4-16 Variance Number: 2016var008

To: Brookings County Board of Adjustment
520 3rd St, Suite 200
Brookings, South Dakota 57006

X A.) I/We, the undersigned property owner (s), do hereby petition the Board of Adjustment of Brookings County, South Dakota, to grant a Variance to the Brookings County Zoning Regulations for the purpose of:

Building a 45ft x 64ft pole shed

B.) Section(s) of Zoning Regulations to be exempted:
Article 11.00: Section 11.01 "A" Agricultural District: Area Regulation #2. Front Yard. The minimum depth of front yard shall be one hundred (100') feet. A corner lot will have two front yards.

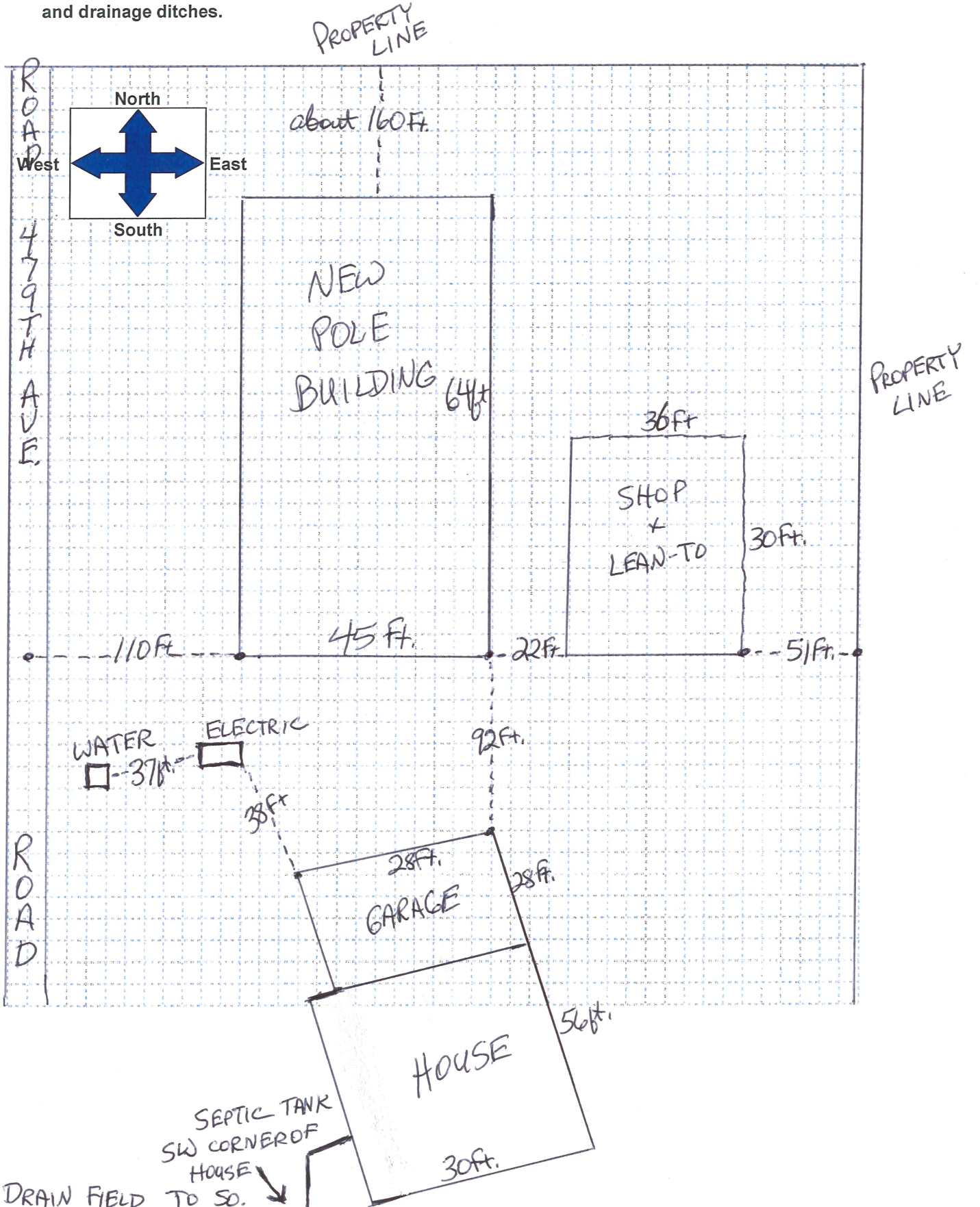
X C.) Special conditions and circumstances that exist which are peculiar to the land, structure, or buildings in the same district: that literal interpretation of the provisions of this regulation would deprive the applicant of rights commonly enjoyed by other properties in the same district under terms of this regulation: that the special conditions and circumstances do not result from the actions of the applicant, and that granting the variance requested will not confer on the applicant, and privilege that is denied by this regulation to other lands, structures, or buildings in the same district.

I need the variance because the size and shape of my property is not large enough width wise to meet setback requirements and keep my building close to my established yard

2016 var 008

SKETCH

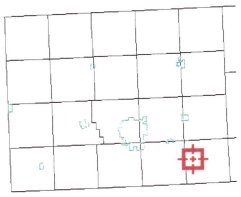
Please draw a sketch of the site. Show both the existing and the proposed structures. Include the location of public roads, septic treatment systems, feedlots, streams, lakes and drainage ditches.



Beacon™ Brookings County, SD

2016 var 008

Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels

Parcel ID	169801094817300	**Alternate ID**	n/a	**Owner Address**	CLARK, ALAN ET UX
Sec/Twp/Rng	17-109-48	**Class**	NACS		21656 479TH AVE
Property Address	21656 479TH AVE AURORA	**Acreage**	n/a		AURORA SD 57002
District	1603				
Brief Tax Description	N 2060' OF W 275' OF SW 1/4 SEC 17-109-48 13.00 AC (Note: Not to be used on legal documents)				

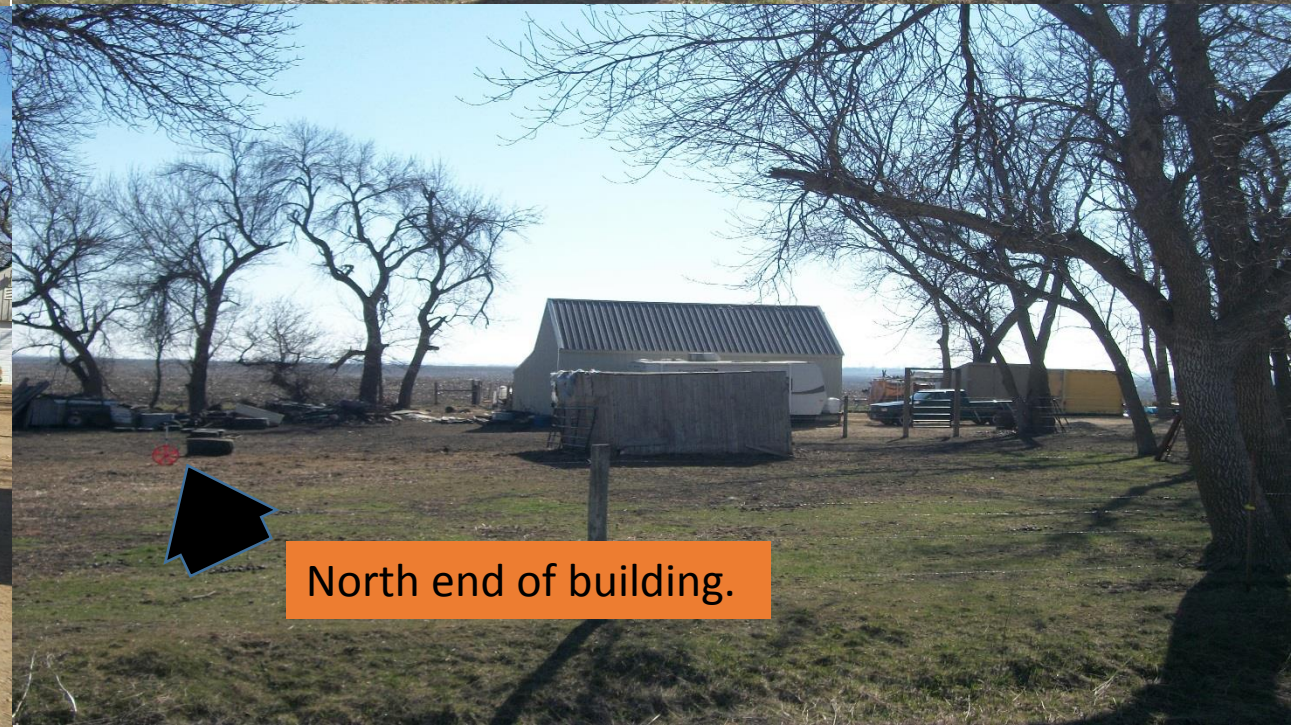
Date created: 4/4/2016

Developed by
The Schneider Corporation


21656


2016var008: Alan Clark
South edge of building .
SPORTSMEN


110 ft from center of 479th Ave


North end of building.

2016var009 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Michael Stern, 46898 197th St, Bruce, SD 57220

Legal Description: "E1700' Exc W1400' of E1700' of S670' of S1/2 SE1/4 of Sec. 4, T112N, R50W (Eureka Township)"

2016var009: Michael Stern has applied for a front yard variance to build a 32' wide x 40' long shop, 116 feet from the center of 197th St (Brookings County gravel road) and 112 feet from the center of 469th Ave (Eureka Township road). 197th St and 469th Ave have a 33 feet Right of Way (ROW). A variance distance of 17 feet on 197th St and 21 feet on 469th Ave. His existing shed and residence meet the setback requirements. He would like to build his new shop where an existing old out building is located. The proposed new building would be the same distance from the road as the existing building. Mr. Stern's building site is long and narrow. There is a telephone line located between the north side of the driveway and his house, limiting his building options.

The Brookings County Board of Adjustment did grant this same variance request on June 2nd 2009, 2009var010, he did not use it within 3 years, so he is now reapplying.

Brookings County Zoning Ordinance, Article 11:00 "A" Agricultural District – Area Regulations - # 2; Front Yard – The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards.

Hardship: The hardship to consider 1) is the shape and size of lot, 2) location of existing telephone line.

The Board of Adjustment has granted similar variances in the past:

April 5th, 2016: 2016var005: hoop barn 88 feet from the center of a township road.

June 24th, 2013: 2013var013: shed 110 feet from the center of a township road.

November 5th, 2013: 2013var020: shed 80 feet from the center of a township road.

April 3rd, 2012: 2012var006: garage 112 feet from the center of a county road

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and Volga Tribune on April 21st and 28th, 2016.

Letters were sent to the adjoining landowner's, Eureka Township Chairman and Clerk.

Granting the variance request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the variance request would be maintaining the Agricultural Zoning Ordinance Setback requirements.

RECEIVED
APR 11 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

APPLICATION FOR VARIANCE TO ZONING REGULATIONS

Date of Application: 10 April 2016 Variance Number: 2016var009

To: Brookings County Board of Adjustment
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Board of Adjustment of Brookings County, South Dakota, to grant a Variance to the Brookings County Zoning Regulations for the purpose of:

I request a Variance to tear down an existing building (old House), and construct a new shop on the existing site; NO farther south or east than current foundation; which sits 116'± & from County Rd 40 (197st) and 112'± & from an maintained Eureka township Rd 469 Ave. The proposed dimensions will be 40' (N-S) by 32' (E-W)

B.) Section(s) of Zoning Regulations to be exempted:

Article 11: Section 11:01- "A" Agricultural District: Area Regulations: #2 - Front Yard: The minimum depth of the front yard shall be one hundred (100) feet. A corner lot will have two front yards.

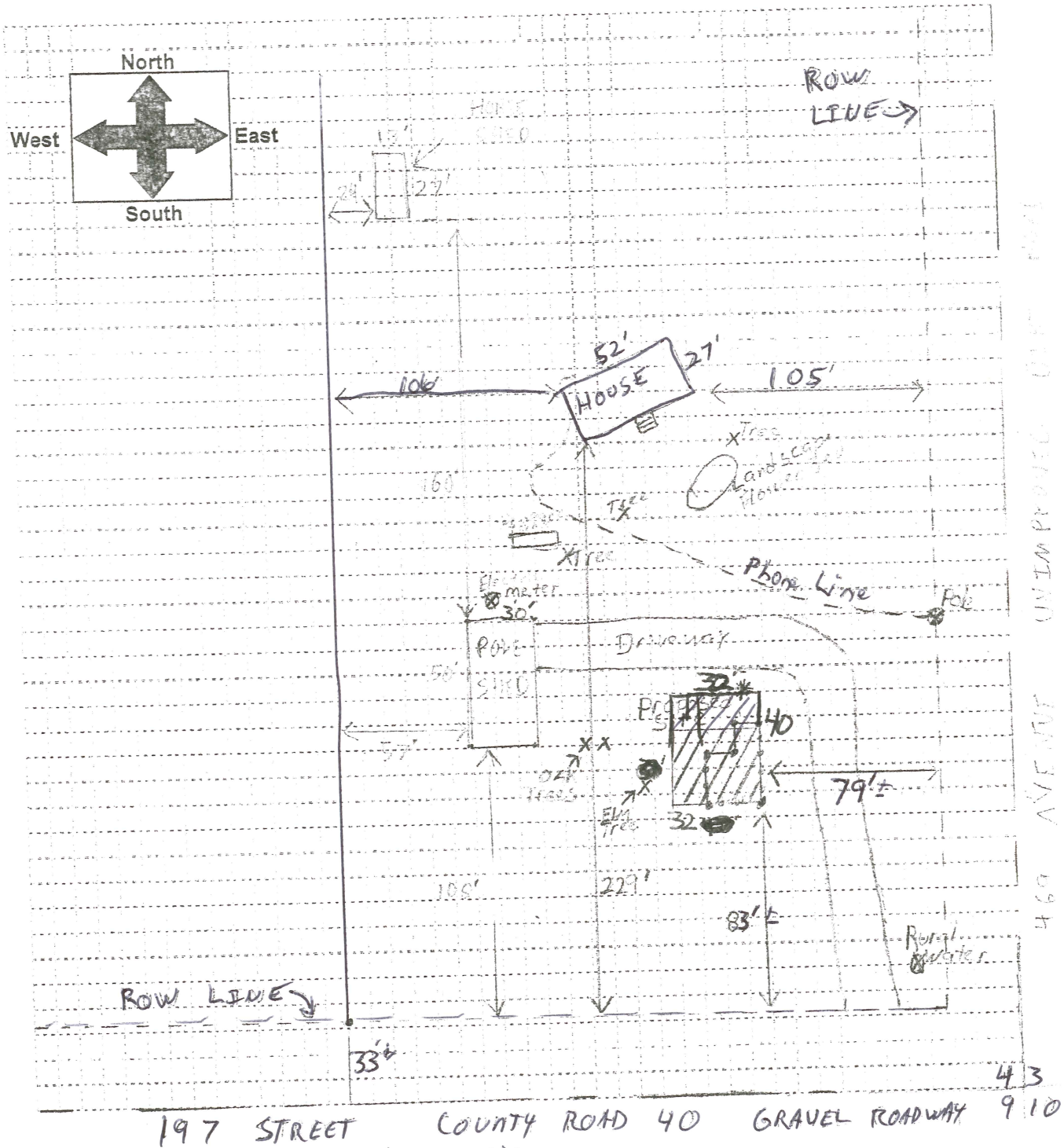
C.) Special conditions and circumstances that exist which are peculiar to the land, structure, or buildings in the same district: that literal interpretation of the provisions of this regulation would deprive the applicant of rights commonly enjoyed by other properties in the same district under terms of this regulation: that the special conditions and circumstances do not result from the actions of the applicant, and that granting the variance requested will not confer on the applicant, and privilege that is denied by this regulation to other lands, structures, or buildings in the same district.

IF the proposed building was erected the required 150' from the Centerline of Co Rd 40, the building would stand on top of our current drive way and utility lines, forcing us to lay new lines at considerable expense. Moving the proposed building 133' from the centerline of 469 Ave would create excessive congestion around the pole barn and yard and would require Removal of several mature trees.

SKETCH

Please draw a sketch of the site. Show both the existing and the proposed structures. Include the location of public roads, septic treatment systems, feedlots, streams, lakes and drainage ditches.

2016 var 009

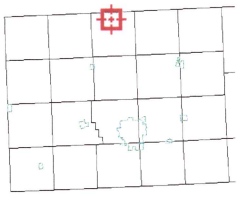


✳ Shaded Area is proposed shop site
Dot outlined Area is existing old House

Beacon™ Brookings County, SD

2016 var 009 + 2016 cu 009

Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	089801125004410	**Alternate ID**	n/a	**Owner Address**	STERN, MICHAEL ET UX
Sec/Twp/Rng	4-112-50	**Class**	AGC		46898 197TH ST
Property Address	46898 197TH ST BRUCE	**Acreage**	29.99		BRUCE SD 57220

District 0808

Brief Tax Description E 1700' EXC W 1400' OF E 1700' OF S 670' OF S1/2 SE1/4 SEC 4-112-50 29.99 AC
(Note: Not to be used on legal documents)

Date created: 4/14/2016

Developed by
The Schneider Corporation

2016var009 & 2016cu009: Michael Stern

South edge of building

North end of building

West end of building

2016cu004 – May 3rd, 2016

Prepared by Richard Haugen

Applicant: Heartland Wind LLC by Jesse Bermel of Iberdrola Renewables.
Land Owner: Harold Haber, 20476 481st Ave, White, SD 57276

Legal Description: "NW1/4 Exc H-1 of Sec. 10, T111N, R48W (Sherman Township)"

2016cu004: Heartland Wind LLC is a subsidiary of Iberdrola Renewables, has applied for a conditional use # 25: Wind Energy Systems, for a meteorological tower (MET tower). A meteorological tower tracks wind speed, direction and duration. This data will be used for tracking of data for possible future wind farm. The tower will be meet the setback requirements and is located off 481st Ave a Sherman Township road. The applicant has an agreement with current landowner for the MET tower. Iberdrola Renewables have existing wind farms located in Brookings County.

A "Wind Energy System" is an allowed policy in the Brookings County 2016 Comprehensive Plan found in Appendix "B" on page 86 of the Comprehensive Plan.

Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23: Wind Energy System (WES) Requirements

The Brookings County Planning and Zoning Commission has granted Wind Energy Systems, MET towers in the past:

August 7th, 2007 – 2007cu016 and 2007cu018 – MET Tower.

November 6-2007 – 2007cu017A – MET Tower

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and White Tri-City Star on April 21st and 28th, 2016.
Letters were sent to the adjoining landowner's, Sherman Township Chairman and Clerk.

Granting the conditional use request would allow the applicant have the same benefit as those previously granted.

Denying the conditional use request would be maintaining the agricultural use of the rural area of Brookings County.

RECEIVED
MAR 29 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

APPLICATION FOR CONDITIONAL USE PERMIT

Date of Application: 3-29-16 Permit Number: 2016CU004

To: Brookings County Planning Commission
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Brookings County Planning & Zoning Commission of Brookings County, South Dakota, to grant a Conditional Use to the Brookings County Zoning Regulations for the purpose of:

Permitting and installation of a meteorological test tower

B.) Section(s) of Zoning Regulations authorizing Conditional Use:

Article 11, Section 11.01: "A" Agricultural District: Conditional Use #25: Wind Energy Systems (WES); Article 23, Section 23.01: Wind Energy Systems (WES) Requirements.

C.) Legal Description of Property:

~~T 111N - R 48W NE¼ of the SE¼ of Section 9.~~
~~SW¼ of the NW¼ of Section 10~~
NW1/4 Exc H-1, Section 10, T111N, R 48W
(Sherman Twp) Parcel # 190001114810200

Form continued on page 2

Temporary Met Tower

Property

N

0 200 400 600

Feet

Temporary Met Tower

Buffalo Ridge IV Wind Project

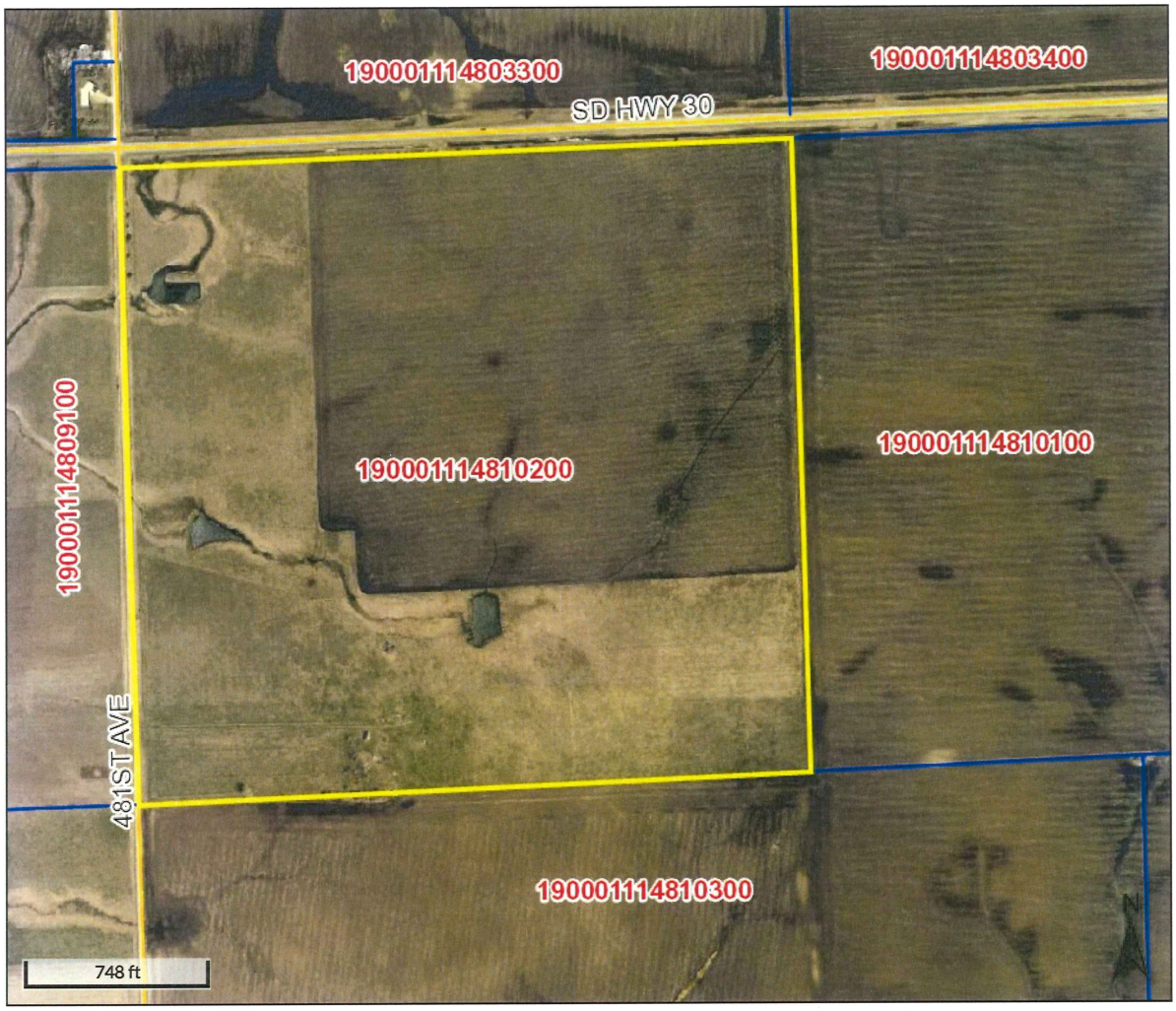
IBERDROLA RENEWABLES

Path: \\Porgis01\GIS Data\Projects\SD\Buffalo Ridge\MapDocuments\Report Figures\Met Towers\BR IV\2016-03-16\Met Towers.mxd

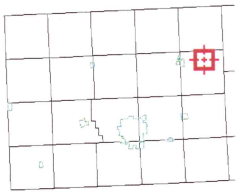
Modified Date: 3/22/2016

Beacon™ Brookings County, SD

2016 cu 004



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	190001114810200	**Alternate ID**	n/a	**Owner Address**	HABER, HAROLD TRUST
Sec/Twp/Rng	10-111-48	**Class**	AGA		20476 481ST AVE
Property Address		**Acreage**	154.94		WHITE SD 57276
District	1910				
Brief Tax Description	NW 1/4 EXC. H-1 SEC 10-111-48 154.95 AC				
	(Note: Not to be used on legal documents)				

Date created: 4/21/2016

Developed by
The Schneider Corporation

IBERDROLA RENEWABLES

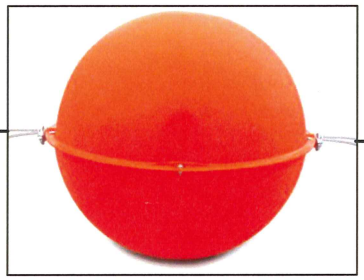
NRG Meteorological Tower Used by Iberdrola Renewables
- Standard Marking Convention -

Image depicts one side of a tower (out of four), with guy wires, sensor booms, and aircraft marker balls.

-Alternating orange and white paint, upper third of tower

-2 sets of aircraft marker balls (top is 90 feet down the wire from the tower)

-Guy guards on all wires, second set on outer wires



Aircraft Marker Ball
(8 on a complete tower)

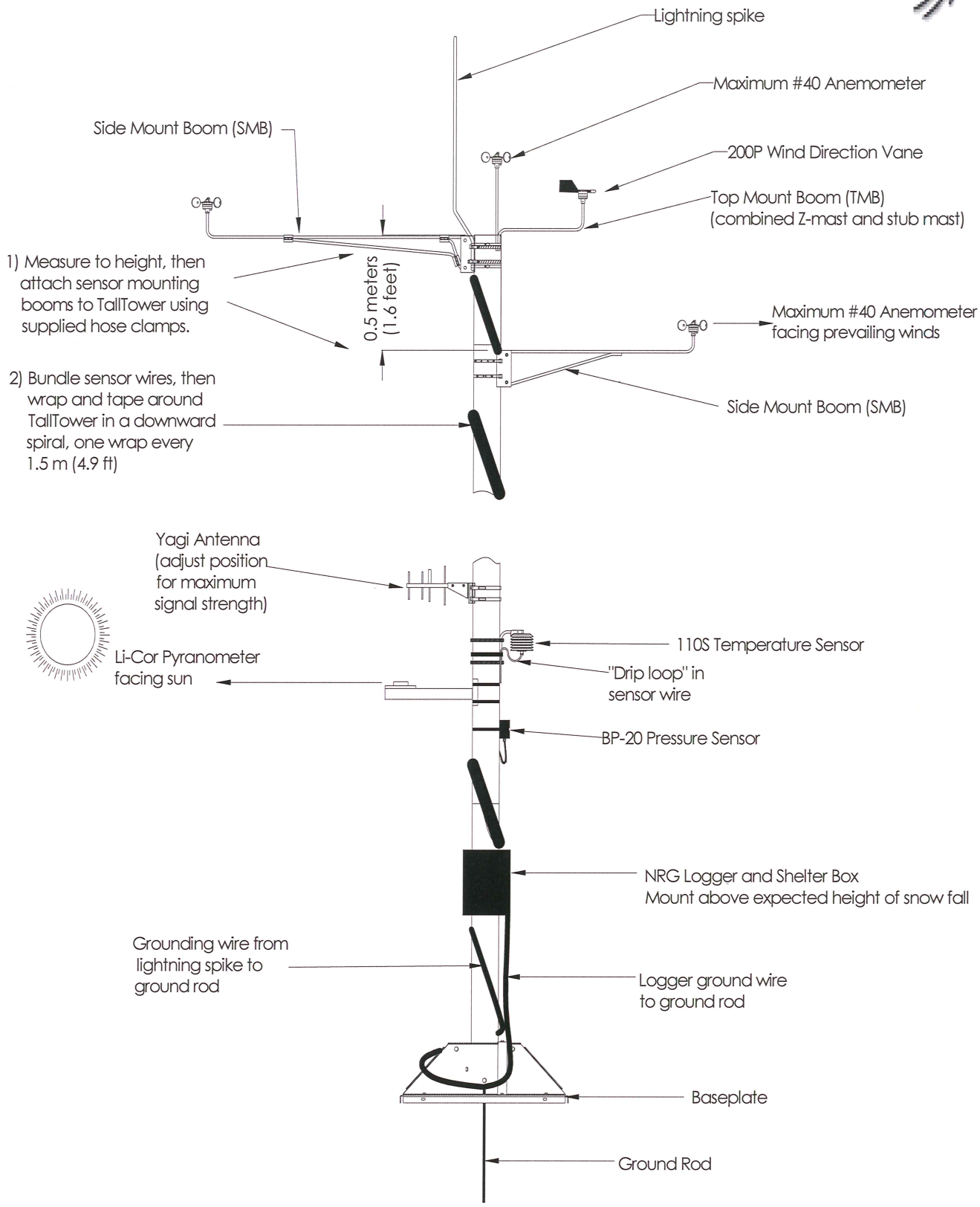
60 Meters (198 Feet)

5 Meters

50 Meters (165 Feet)

REV2 3/15

Typical Wind Monitoring Site



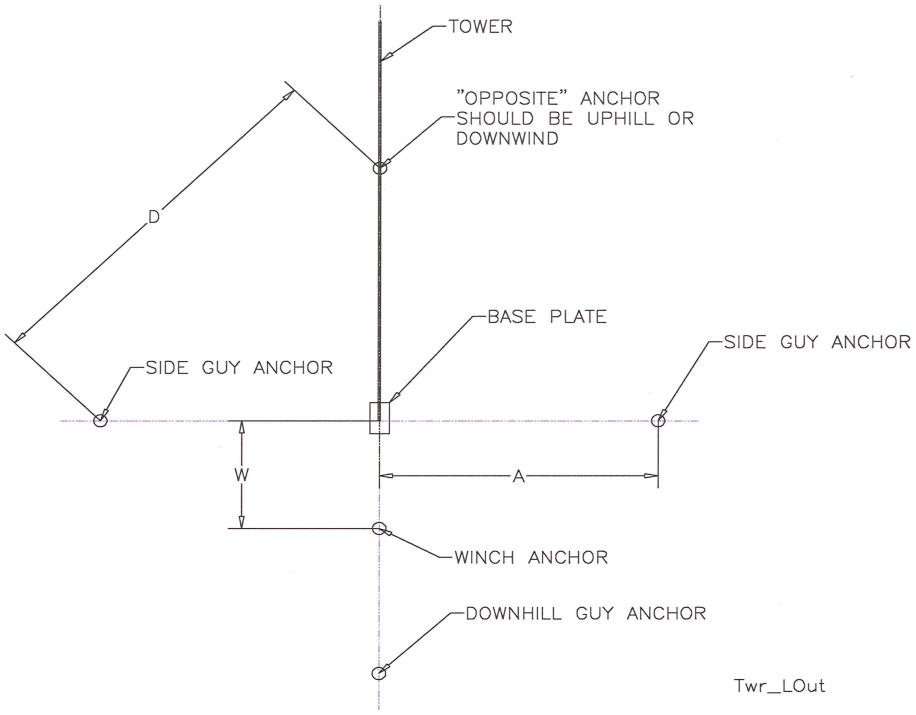


Figure 1: Tower Site Layout

Tower	Dimensions		
	A	D	W
10 m	4.9 m (16 feet)	6.9 m (22.6 feet)	N/A
20 m	12.8 m (42 feet)	18.1 m (59.4 feet)	6.1 m (20 feet)
30 m, 30 m HD, 30 m SHD	18.3 m (60 feet)	25.9 m (84.9 feet)	9.1 m (30 feet)
40 m, 40 m HD (Inner Guy Point)*	21.3 m (70 feet)	30.2 m (99 feet)	9.1 m (30 feet)*
40 m, 40 m HD (Outer Guy Point)*	22.9 m (75 feet)	32.3 m (106 feet)	9.1 m (30 feet)*
50 m, 50 m HD (Inner Guy Point)*	30.5 m (100 feet)	43.1 m (141.4 feet)	12.2 m (40 feet)*
50 m, 50 m HD (Outer Guy Point)*	33.5 m (110 feet)	47.4 m (155.6 feet)	12.2 m (40 feet)*
60 m (Inner Guy Point)♦	38.1 m (125 feet)	53.9 m (176.8 feet)	14.6 m (48 feet)*
*60 m (Middle Guy Point)♦	44.5 m (146 feet)	63 m (206.5 feet)	14.6 m (48 feet)*
60 m (Outer Guy Point)♦	50.8 m (166.6 feet)	71.9 m (235.7 feet)	14.6 m (48 feet)*

Table 1: Tower and Anchor Layout Dimensions

***40 meter and 50 meter towers have two anchors per side and two winch anchors.**

♦ 60 meter tower has three anchors per side and two winch anchors.

NOTE: The winch anchor must be in line with the tower. It is very important that the distance from the base plate to the winch anchor (dimension W in Table 1) be exact. See **Figure 2.**

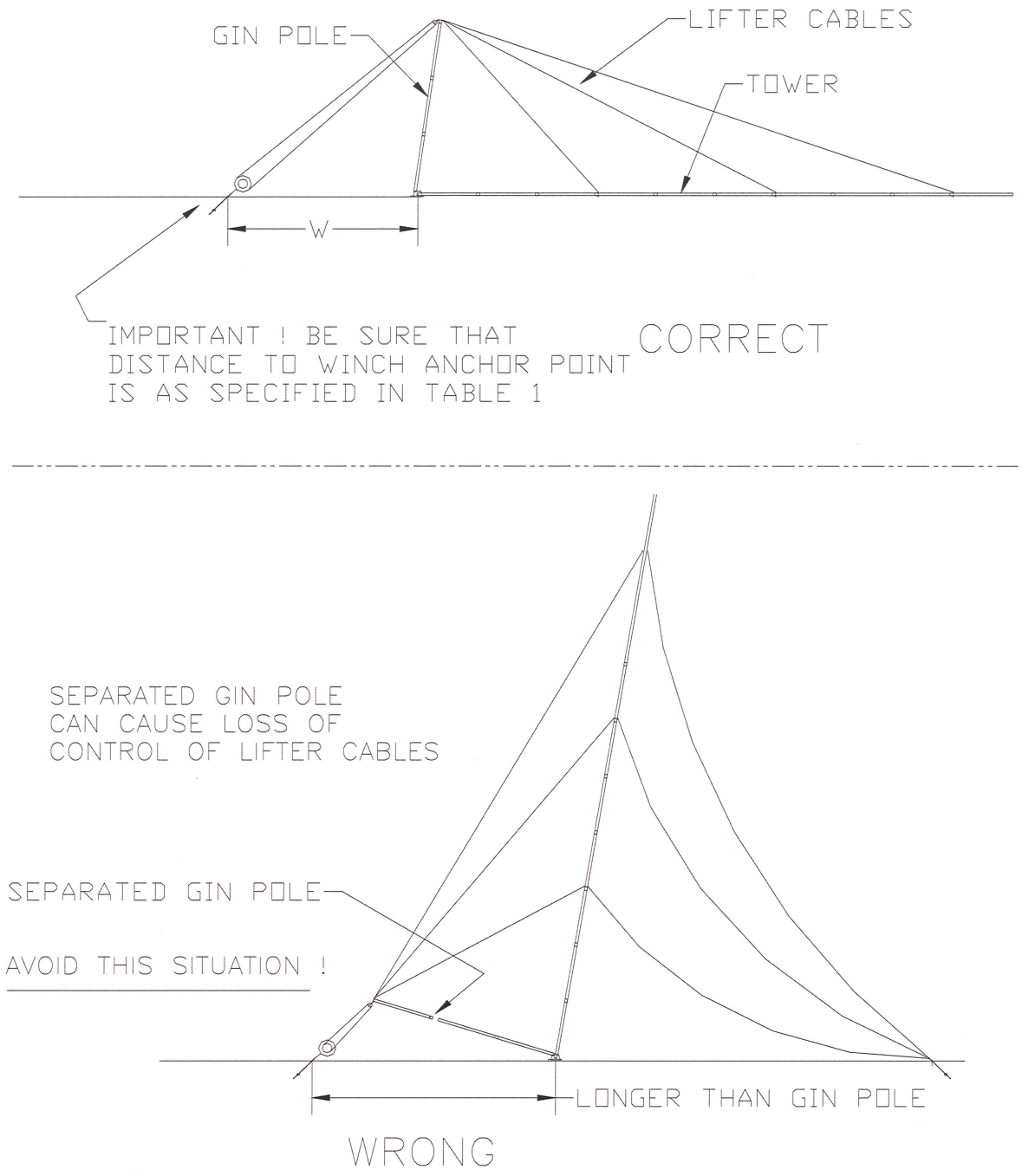


Figure 2: Winch Anchor Placement

NOTE: The gin pole safety wire **MUST** be used to prevent gin pole separation.

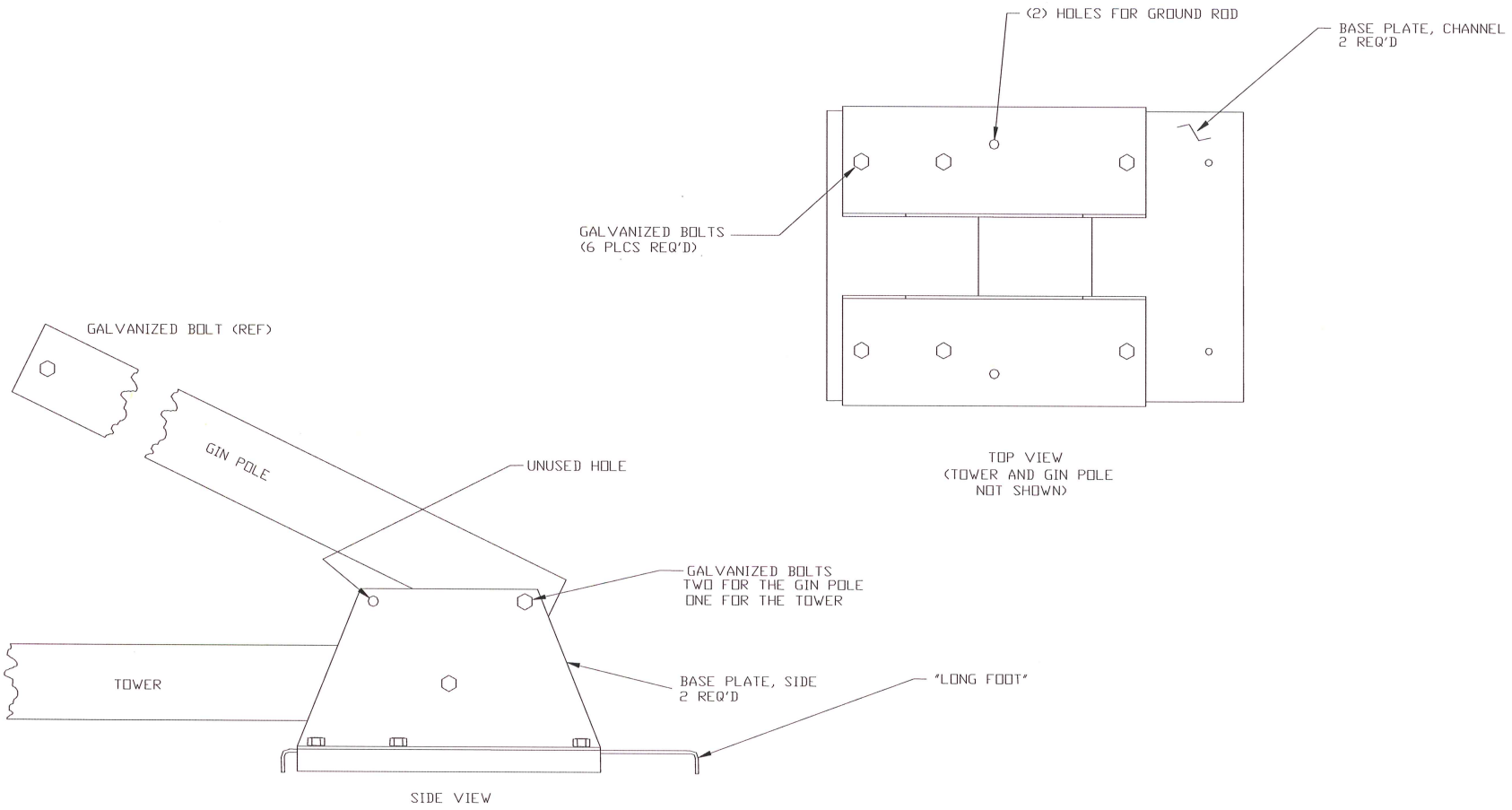


Figure 3: TallTower Base Plate Assembly (for 3.5 inch dia. towers)

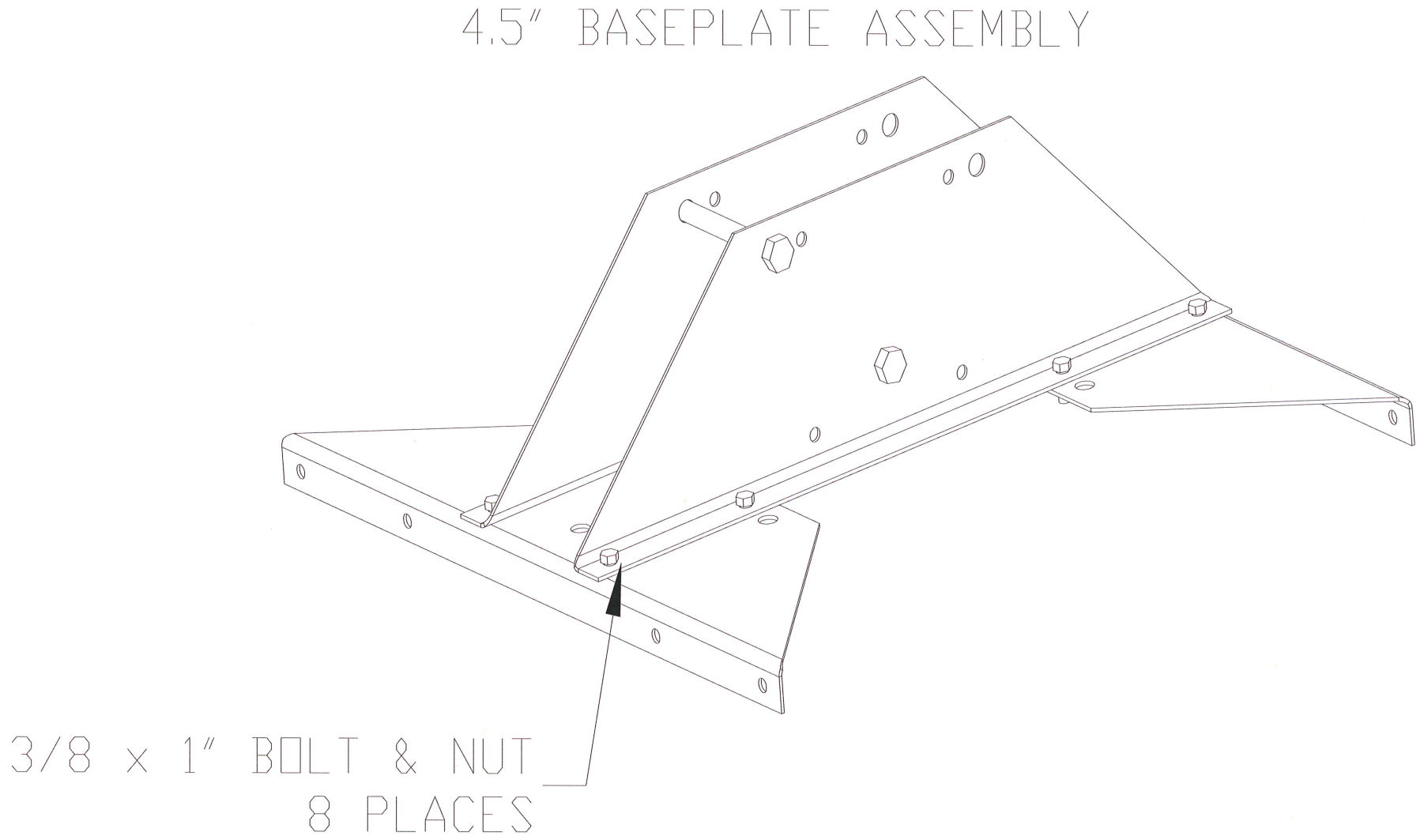


Figure 4: TallTower Base Plate Assembly (for 4.5 inch dia. towers)

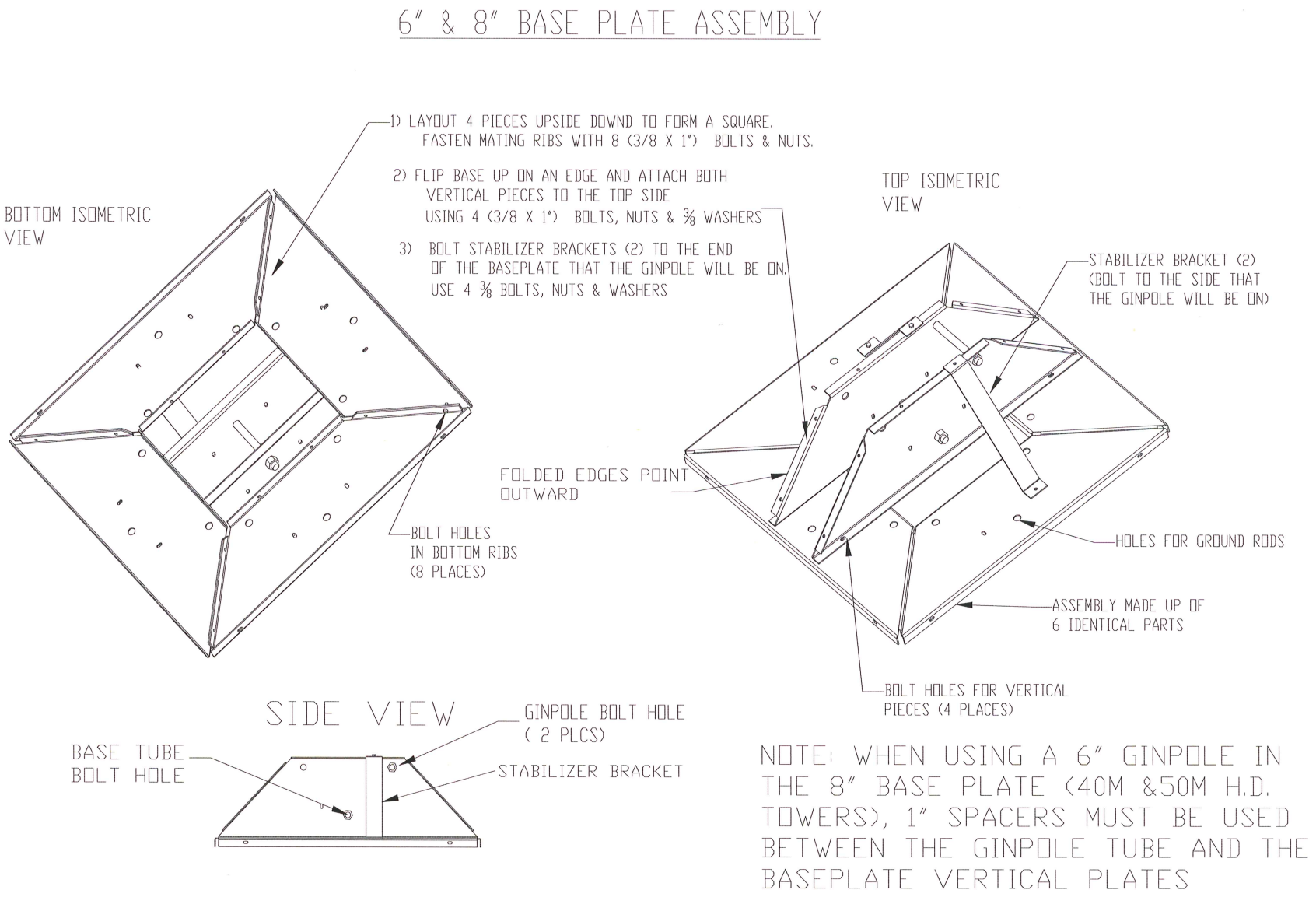


Figure 5: TallTower Base Plate Assembly (for 6 inch and 8 inch dia. towers)

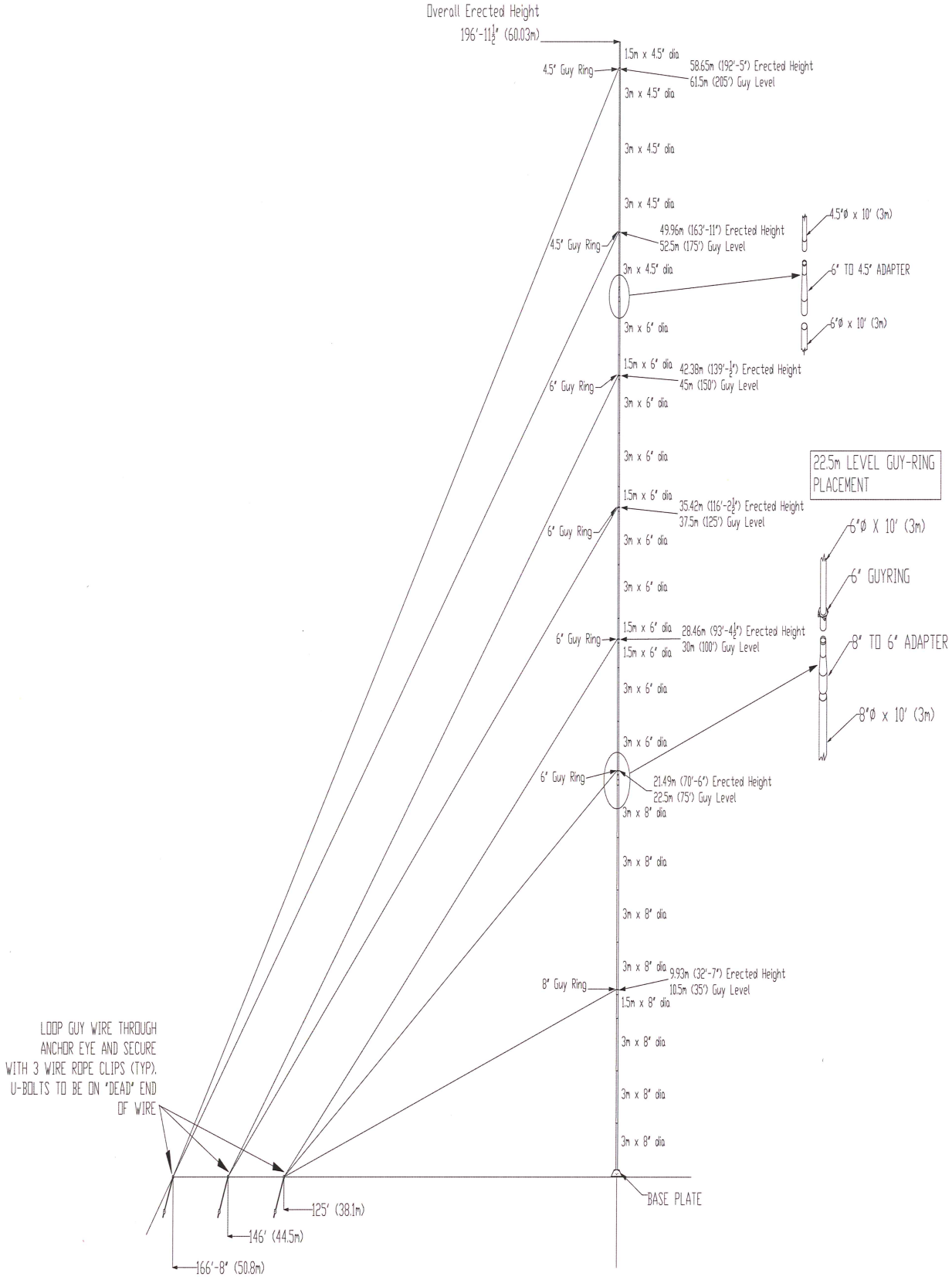


Figure 15: 60 m TallTower Assembly

Appendix A: Anchoring Guidelines

Before the tower is ordered, the soil type should be determined and the correct anchors ordered. The purpose of this section is to give you the information needed to provide suitable anchoring for your TallTower. **Because anchor requirements are site specific, it remains the responsibility of the customer to determine anchor requirements. If you are not sure what is required, seek professional guidance.** Local utility companies can often provide useful information regarding anchoring used in the site area.

The choice of anchors must take into consideration soil type, maximum winds to be experienced, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements.

Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, periodic soaking of the soil which may shift or become undermined, and icing events.

Table 3 lists the maximum anchor loads for each tower at the maximum rated wind speed. Anchors must be placed at the correct angle to provide specified holding power and to prevent shifting of the anchors under load.

Table 3: Upwind Anchor Loads

Tower size	Tube diameter	EIA-222-F wind velocity (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	6200 N (1400 pounds) at 45°	5300 N (1200 pounds) at 45°
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	7100 N (1600 pounds) at 45°	7100 N (1600 pounds) at 45°
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	9800 N (2200 pounds) at 45°
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	8500 N (1900 pounds) at 51°	12500 N (2800 pounds) at 45°
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	9800 N (2200 pounds) at 51°	16500 N (3700 pounds) at 45°
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	10200 N (2300 pounds) at 49°	14200 N (3200 pounds) at 45°
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	10700 N (2400 pounds) at 49°	18700 N (4200 pounds) at 45°
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	20500 N (4600 pounds) at 45°

NOTES:
(a) Fastest mile wind velocity per EIA-222-F at 10 meters (33 ft) above ground level
(b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.
(c) Maximum force on the winch anchor during erection

Screw-In Anchors

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. They are installed by hand, using a cross bar to screw them into the earth like a corkscrew.

Screw-in anchors can also used to provide the anchoring rod and eye for site-built anchors, such as concrete. Refer to the information on concrete anchors below.

150 mm (6.0 inches) screw-in anchors are the standard anchors supplied with NRG TallTowers.

Table 4: Specifications for Screw-In Anchors

	150 mm (6 inches) Anchor
Helix diameter:	152 mm (6.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	19 mm (0.75 inches)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	3,000 kg (6,500 pounds)
Class 6 soils *	2,300 kg (5,000 pounds)
Class 7 soils *	1,100 kg (2,500 pounds)

* Consult the Soil Classes chart, **Table 5**.

** In class 7 soils, it is advisable to place anchors deep enough to penetrate to underlying class 5 or 6 soil.

Table 5: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

Reproduced by permission, The A. B. Chance Co.

Arrowhead Anchors

Arrowhead anchors can penetrate stiff and rocky soils because the unique triangular design tends to thread its way between obstacles such as rocks, which can prevent successful installation of screw-in anchors. Arrowhead anchors are driven into the ground with a hardened steel drive rod. Once in the ground, upward force on the attached cable rotates the anchor perpendicular to the cable for maximum holding power.

Table 6: Specifications for Arrowhead Anchors

Length Overall:	1.22 m (48.0 inches).
Arrowhead Length:	203 mm (8.0 inches)
Materials:	6.35 mm (0.25 inches) galvanized (7x19) steel cable; breaking strength - 1905 kg (4200 pounds); with malleable iron head.
Holding Power:	
Class 3 soils *	1905 kg (4200 pounds)
Class 4 soils *	1361 kg (3000 pounds)
Class 5 soils *	907 kg (2000 pounds)
Class 6 soils *	544 kg (1200 pounds)
Class 7 soils *	272 kg (600 pounds)

* See **Table 5** for soil class descriptions

Rock Anchors

Rock anchors are placed into solid rock, when anchoring to either bare rock, or thin soils with solid rock near the surface. They are constructed of a threaded rod with integral eye, and two opposing wedge halves. The anchor is placed in a hole pre-drilled in the rock. Twisting the eye of the anchor forces the wedges against the sides of the hole, locking the anchor in place. Load actually increases the wedging force, developing holding power equal to the full tensile strength of the rod.

Table 7: Specifications for Rock Anchors

Holding Power:	9072 kgf (20,000 pounds)
Rod Length Overall:	0.38 m (15 inches), 0.76 m (30 inches) or 1.35 m (53 inches), other lengths available
Anchor Diameter:	44 mm (1.75 inches) as supplied, 60 mm (2.375 inches) max. expanded
Rod Diameter:	19 mm (.75 inches)
Materials:	Malleable iron, dipped in rust-resisting black paint
Required Hole Size:	50 mm (2 inches) diameter (nominal)
Use Rock Drill Size:	50 mm (2 inches) diameter

Table 8: NRG TALL TOWERS DESIGN LOADS

Tower size	Tube diameter	EIA-222-F wind velocity	Vertical base reaction (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	12500 N (2800 pounds)	6200 N (1400 pounds) @ 45	5300 N (1200 pounds) @ 45
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	13300 N (3000 pounds)	7100 N (1600 pounds) @ 45	7100 N (1600 pounds) @ 45
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	14700 N (3300 pounds)	8900 N (2000 pounds) @ 45	9800 N (2200 pounds) @ 45
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	19100 N (4300 pounds)	8500 N (1900 pounds) @ 51	12500 N (2800 pounds) @ 45
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	20500 N (4600 pounds)	9800 N (2200 pounds) @ 51	16500 N (3700 pounds) @ 45
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	26700 N (6000 pounds)	10200 N (2300 pounds) @ 49	14200 N (3200 pounds) @ 45
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	28000 N (6300 pounds)	10700 N (2400 pounds) @ 49	18700 N (4200 pounds) @ 45
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	32500 N (7300 pounds)	8900 N (2000 pounds) @ 45	20500 N (4600 pounds) @ 45

Notes:

Fastest mile wind velocity per EIA-222-F at 10 meters (33 feet) above ground level.

a) Vertical base reaction. The maximum horizontal reaction is equal to horizontal component of winch anchor reaction.

b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.

c) Maximum force on the winch anchor during tower erection.

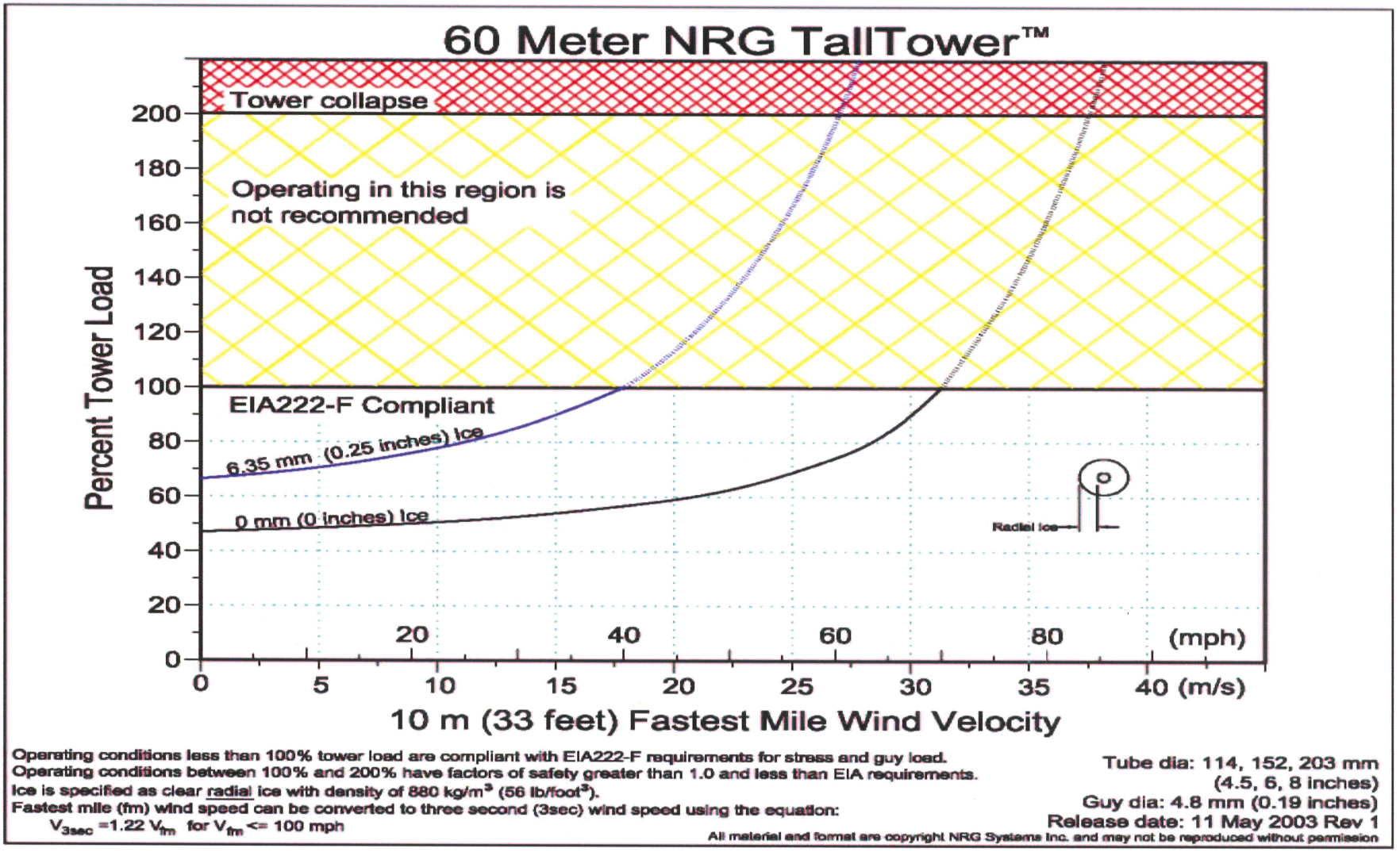


Figure 36: Tower Load and Performance Chart: 60 m TallTower

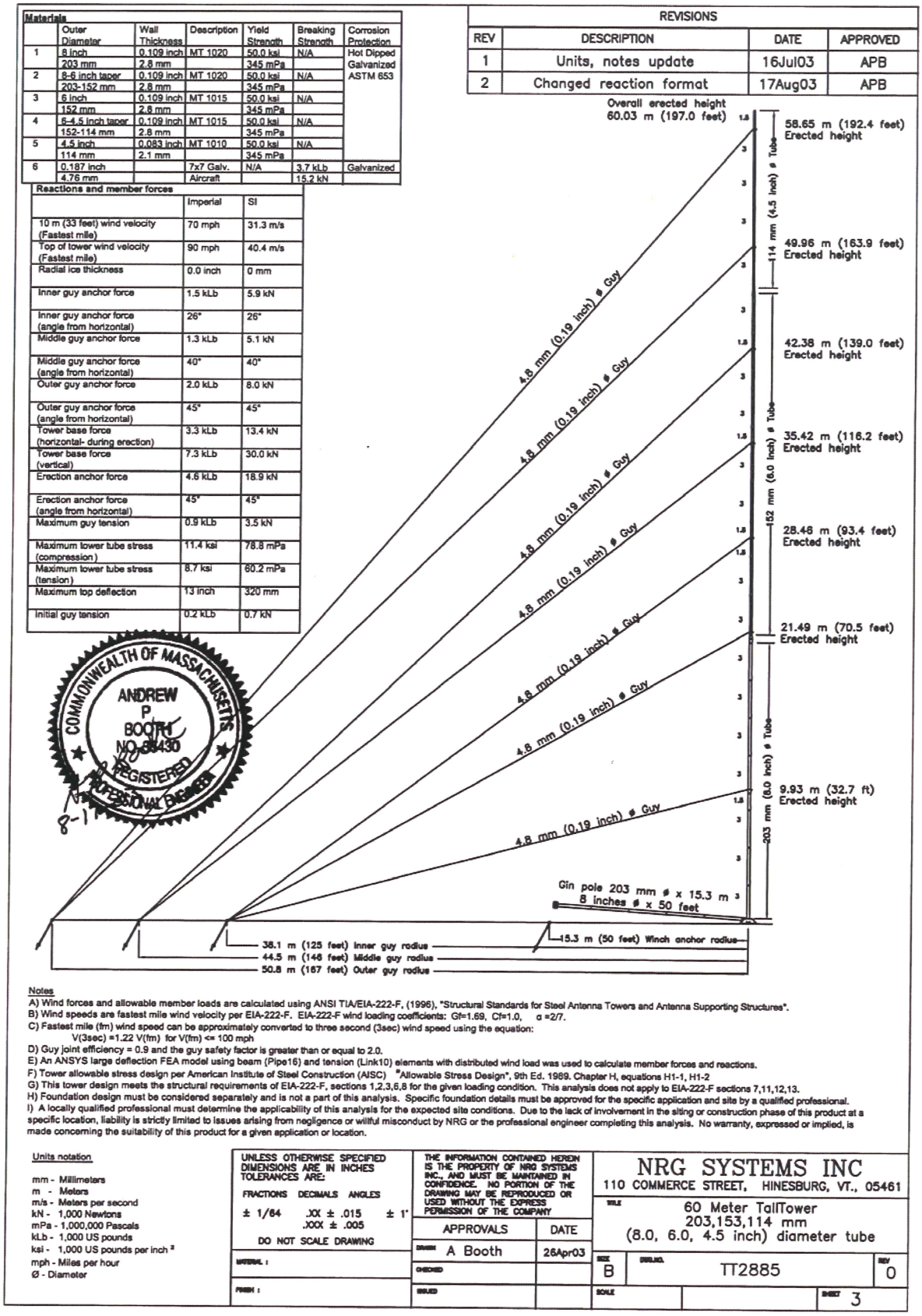


Figure 49: 60 m TallTower

2016cu005 – May 3rd, 2016

Prepared by Richard Haugen

Applicant: Heartland Wind LLC by Jesse Bermel of Iberdrola Renewables.
Land Owner: Timothy Murphy, 20346 483rd Ave, White, SD 57276

Legal Description: "NW1/4 Exc H-1 and Exc. S294' of W296.33' of Sec. 12, T111N, R48W (Sherman Township)"

2016cu005: Heartland Wind LLC is a subsidiary of Iberdrola Renewables, has applied for a conditional use # 25: Wind Energy Systems, for a meteorological tower (MET tower). A meteorological tower tracks wind speed, direction and duration. This data will be used for tracking of data for possible future wind farm. The tower will be meet the setback requirements and is located off 483rd Ave a Sherman Township road. The applicant has an agreement with current landowner for the MET tower. Iberdrola Renewables have existing wind farms located in Brookings County.

A "Wind Energy System" is an allowed policy in the Brookings County 2016 Comprehensive Plan found in Appendix "B" on page 86 of the Comprehensive Plan.

Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23: Wind Energy System (WES) Requirements

The Brookings County Planning and Zoning Commission has granted Wind Energy Systems, MET towers in the past:

August 7th, 2007 – 2007cu016 and 2007cu018 – MET Tower.

November 6-2007 – 2007cu017A – MET Tower

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and White Tri-City Star on April 21st and 28th, 2016.
Letters were sent to the adjoining landowner's, Sherman Township Chairman and Clerk.

Granting the conditional use request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the conditional use request would be maintaining the agricultural use of the rural area of Brookings County.

APPLICATION FOR CONDITIONAL USE PERMIT

Date of Application: 3.29.16 Permit Number: 2016CU005

To: Brookings County Planning Commission
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Brookings County Planning & Zoning Commission of Brookings County, South Dakota, to grant a Conditional Use to the Brookings County Zoning Regulations for the purpose of:

permitting and installation of a meteorological test tower.

B.) Section(s) of Zoning Regulations authorizing Conditional Use:

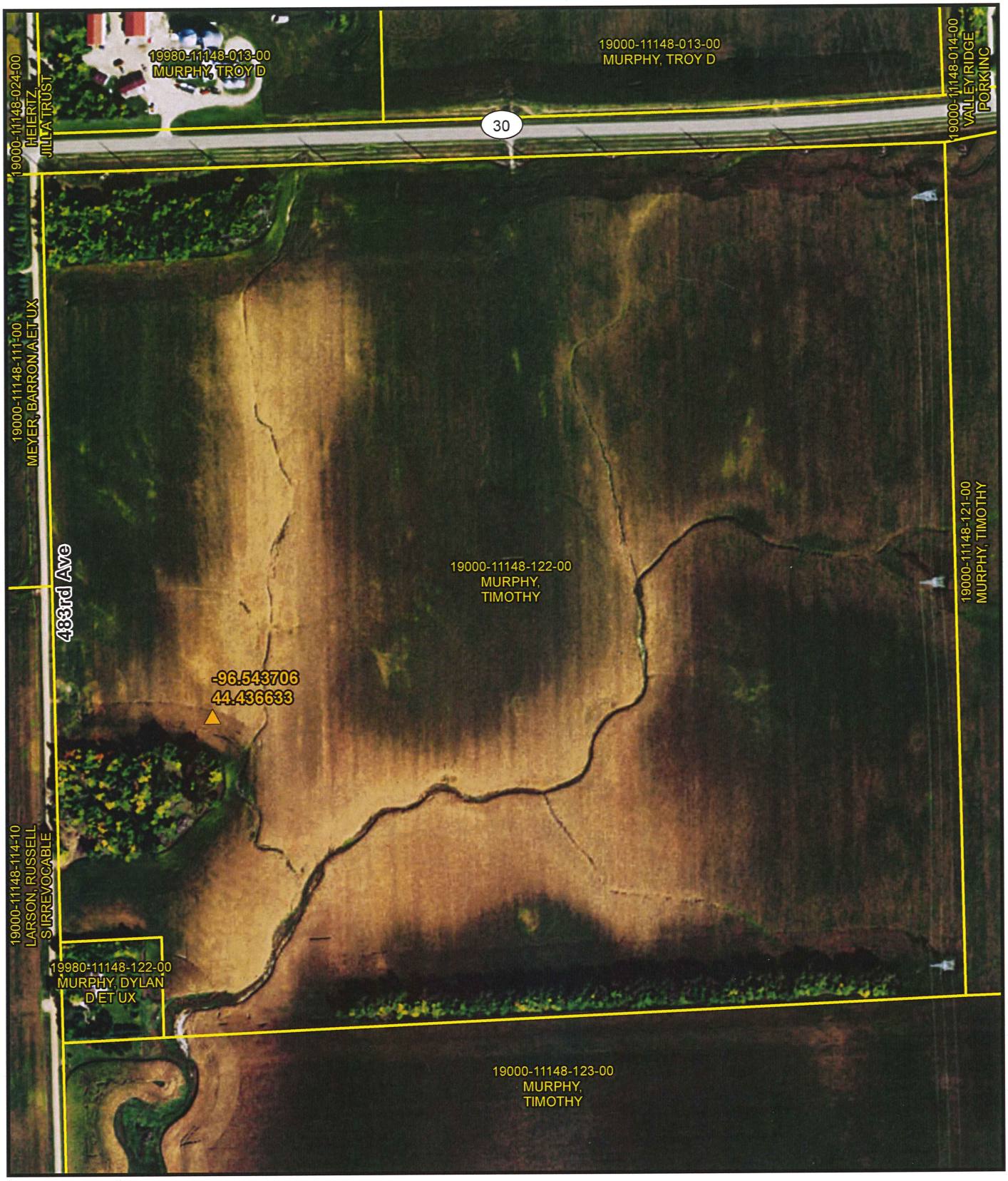
Article 11, Section 11.01: "A" Agricultural District: Conditional Use #25: Wind Energy Systems (WES); Article 23, Section 23.01: Wind Energy Systems (WES) Requirements.

C.) Legal Description of Property:

~~(tower Township 111N - R48W - W½ of the NW¼ of Section 12.)~~

NW1/4 Exc. H-1 + Exc. S 294' of W 296.33' Section 12 T111N, R48W (Sherman Twp) Parcel # 19000111481220 0

Form continued on page 2



Temporary Met Tower

Property

N

0 200 400 600

1" = 400'

Temporary Met Tower

Buffalo Ridge IV Wind Project

IBERDROLA RENEWABLES

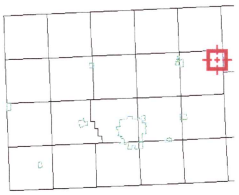
Path: \\Porgis01\GIS Data\Projects\SD\Buffalo Ridge\MapDocuments\Report Figures\Met Towers\BR IV\2016-03-16\Met Towers.mxd

Modified Date: 3/16/2016

Beacon™ Brookings County, SD

2016 CU 005

Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	190001114812200	**Alternate ID**	n/a	**Owner Address**	MURPHY, TIMOTHY
Sec/Twp/Rng	12-111-48	**Class**	AGA		20346 483RD AVE
Property Address		**Acreage**	151.63		WHITE SD 57276
District	1910				
Brief Tax Description	NW 1/4 EXC. H-1 & EXC. S 294' OF W 296.33' SEC 12-111-48 151.63 AC				
	(Note: Not to be used on legal documents)				

Date created: 3/30/2016

Developed by
The Schneider Corporation

IBERDROLA RENEWABLES

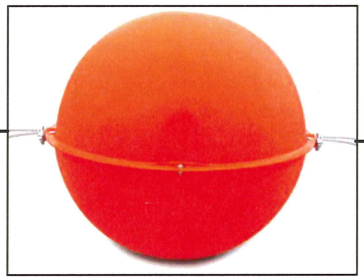
NRG Meteorological Tower Used by Iberdrola Renewables
- Standard Marking Convention -

Image depicts one side of a tower (out of four), with guy wires, sensor booms, and aircraft marker balls.

-Alternating orange and white paint, upper third of tower

-2 sets of aircraft marker balls (top is 90 feet down the wire from the tower)

-Guy guards on all wires, second set on outer wires



Aircraft Marker Ball
(8 on a complete tower)

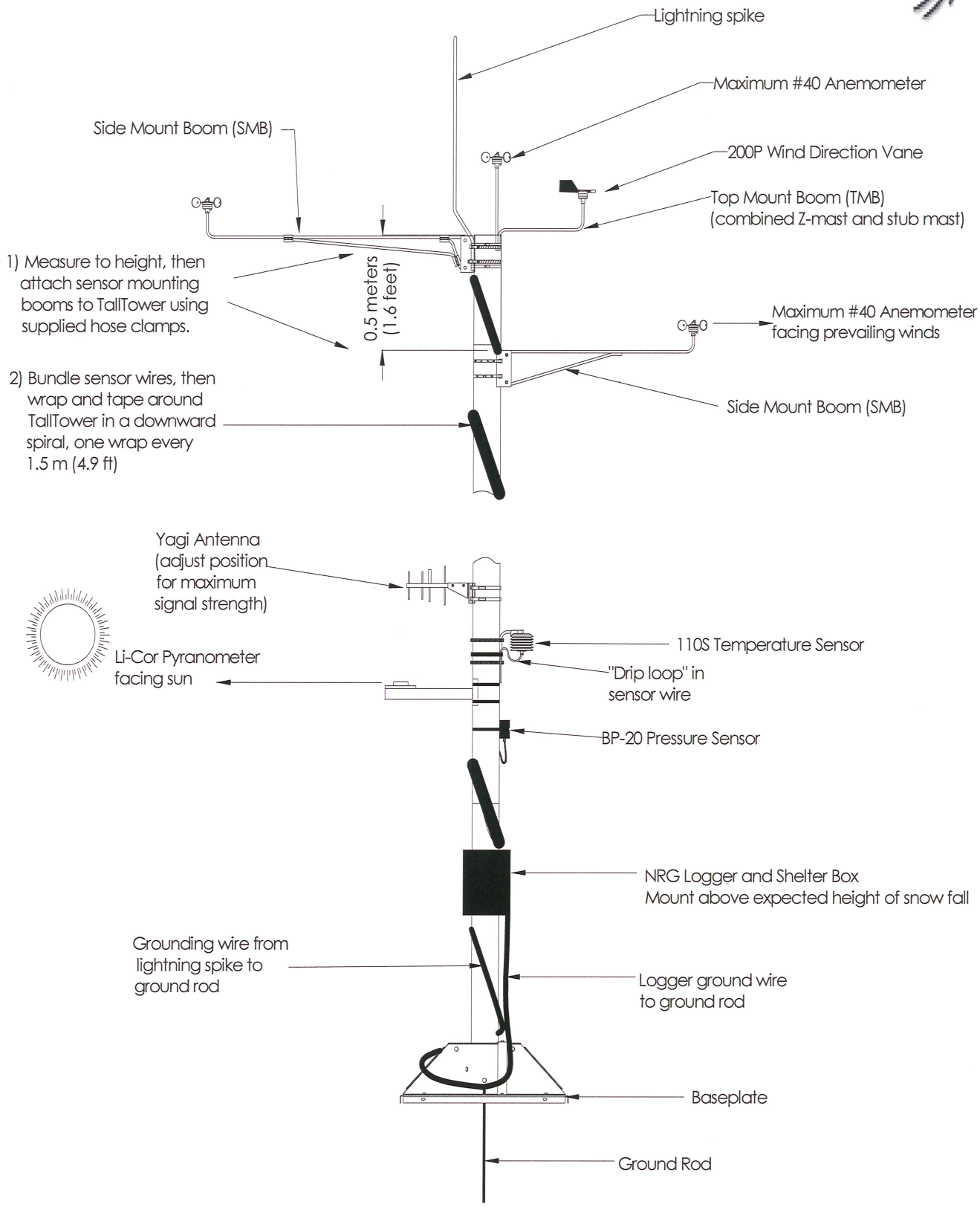
60 Meters (198 Feet)

5 Meters

50 Meters (165 Feet)

REV2 3/15

Typical Wind Monitoring Site



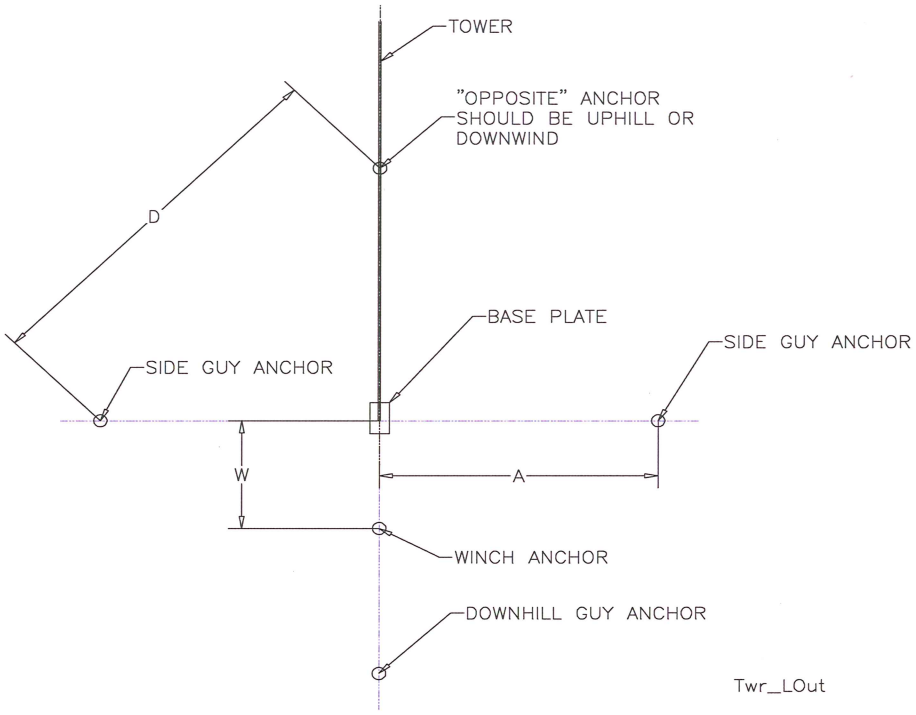


Figure 1: Tower Site Layout

Tower	Dimensions		
	A	D	W
10 m	4.9 m (16 feet)	6.9 m (22.6 feet)	N/A
20 m	12.8 m (42 feet)	18.1 m (59.4 feet)	6.1 m (20 feet)
30 m, 30 m HD, 30 m SHD	18.3 m (60 feet)	25.9 m (84.9 feet)	9.1 m (30 feet)
40 m, 40 m HD (Inner Guy Point)*	21.3 m (70 feet)	30.2 m (99 feet)	9.1 m (30 feet)*
40 m, 40 m HD (Outer Guy Point)*	22.9 m (75 feet)	32.3 m (106 feet)	9.1 m (30 feet)*
50 m, 50 m HD (Inner Guy Point)*	30.5 m (100 feet)	43.1 m (141.4 feet)	12.2 m (40 feet)*
50 m, 50 m HD (Outer Guy Point)*	33.5 m (110 feet)	47.4 m (155.6 feet)	12.2 m (40 feet)*
60 m (Inner Guy Point)♦	38.1 m (125 feet)	53.9 m (176.8 feet)	14.6 m (48 feet)*
*60 m (Middle Guy Point)♦	44.5 m (146 feet)	63 m (206.5 feet)	14.6 m (48 feet)*
60 m (Outer Guy Point)♦	50.8 m (166.6 feet)	71.9 m (235.7 feet)	14.6 m (48 feet)*

Table 1: Tower and Anchor Layout Dimensions

***40 meter and 50 meter towers have two anchors per side and two winch anchors.**

♦ 60 meter tower has three anchors per side and two winch anchors.

NOTE: The winch anchor must be in line with the tower. It is very important that the distance from the base plate to the winch anchor (dimension W in Table 1) be exact. See **Figure 2.**

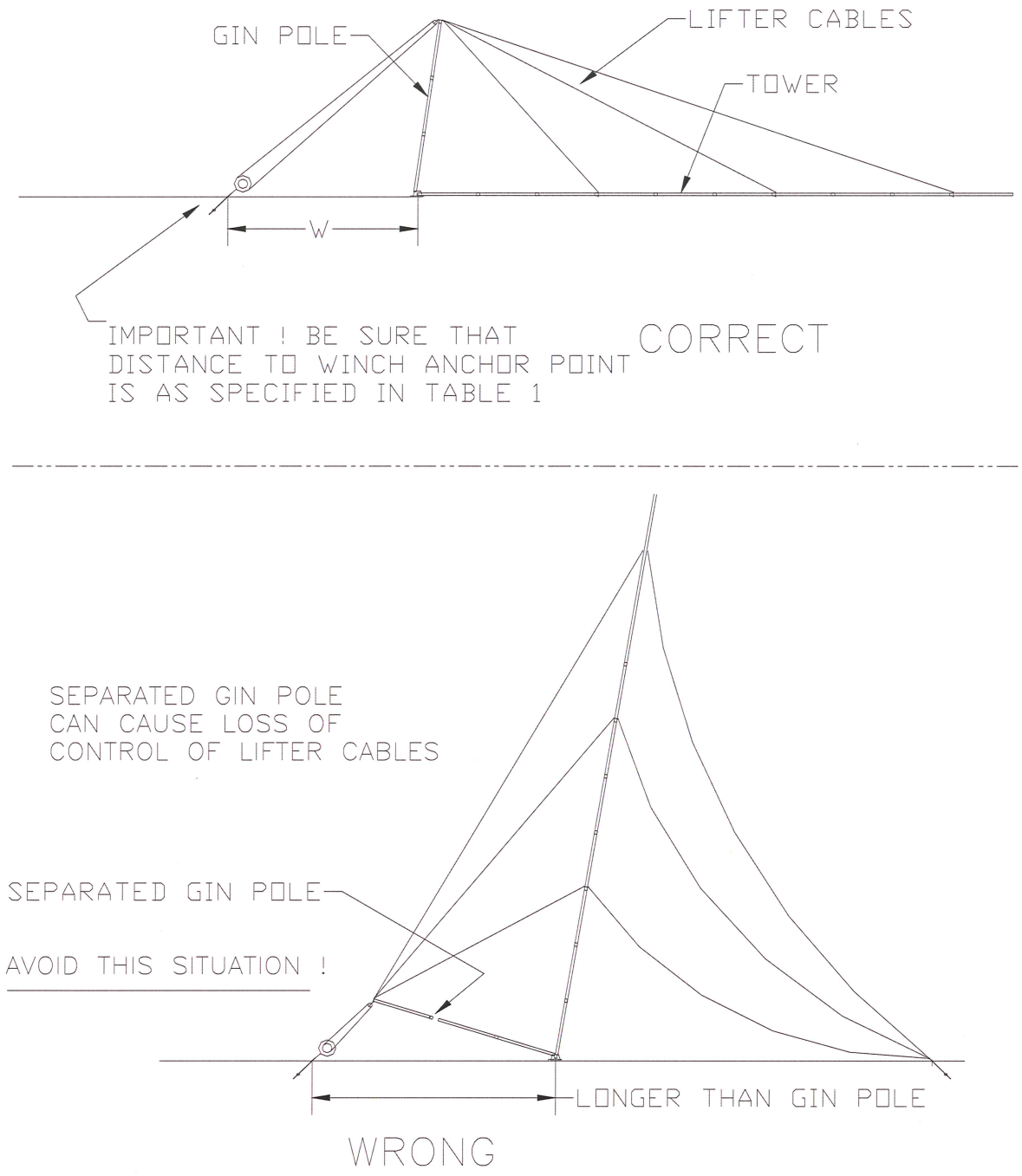


Figure 2: Winch Anchor Placement

NOTE: The gin pole safety wire **MUST** be used to prevent gin pole separation.

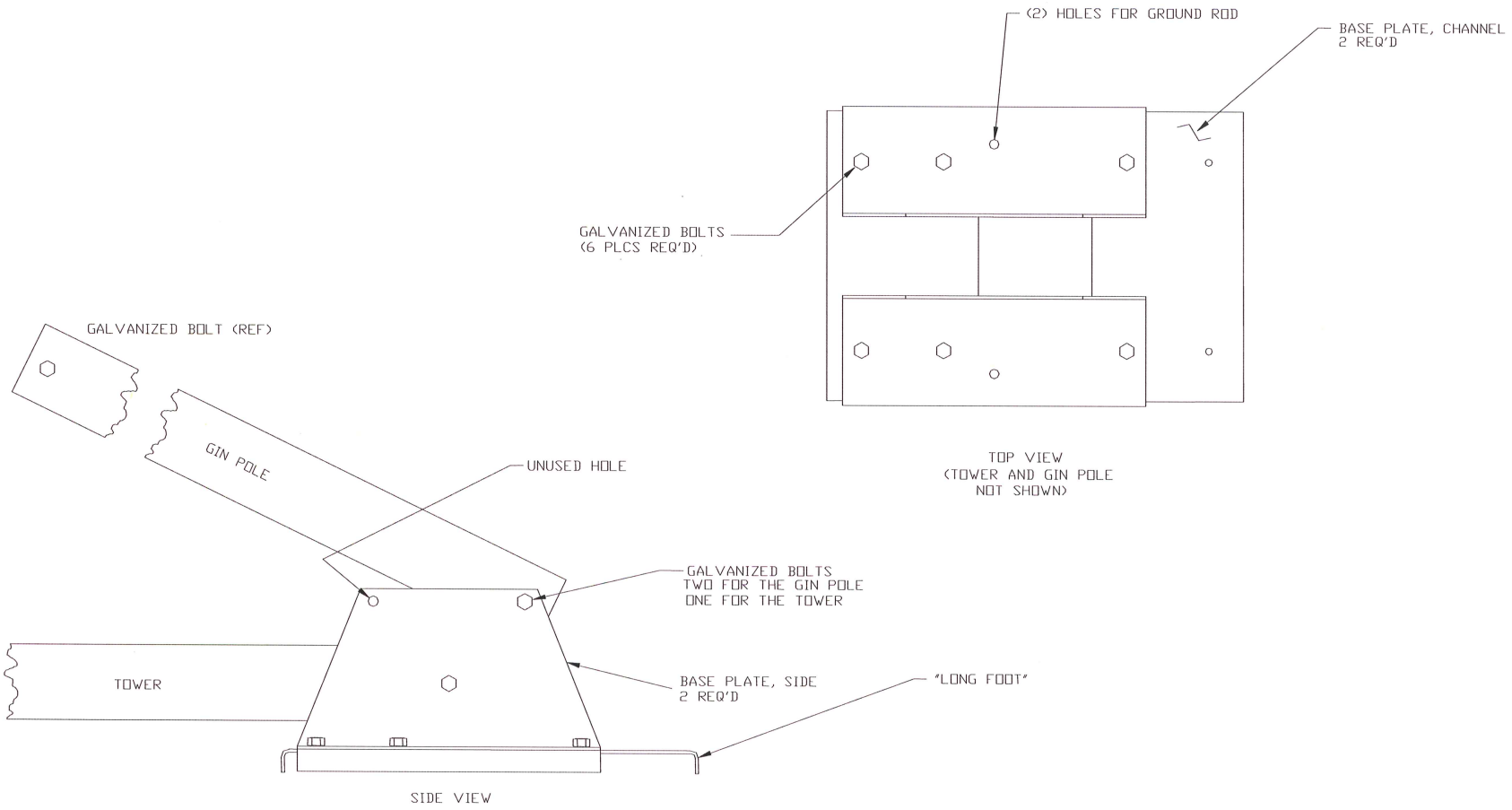


Figure 3: TallTower Base Plate Assembly (for 3.5 inch dia. towers)

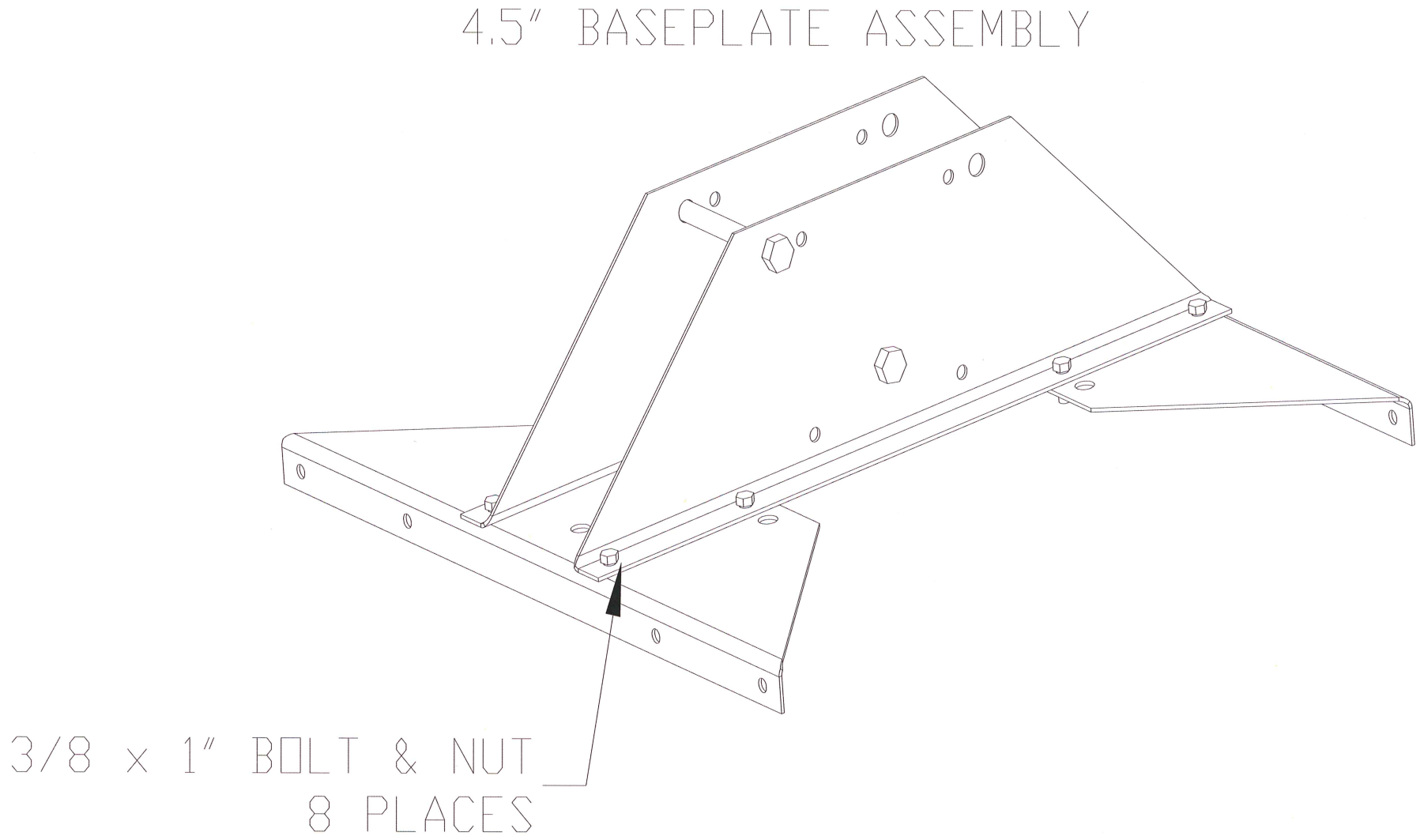


Figure 4: TallTower Base Plate Assembly (for 4.5 inch dia. towers)

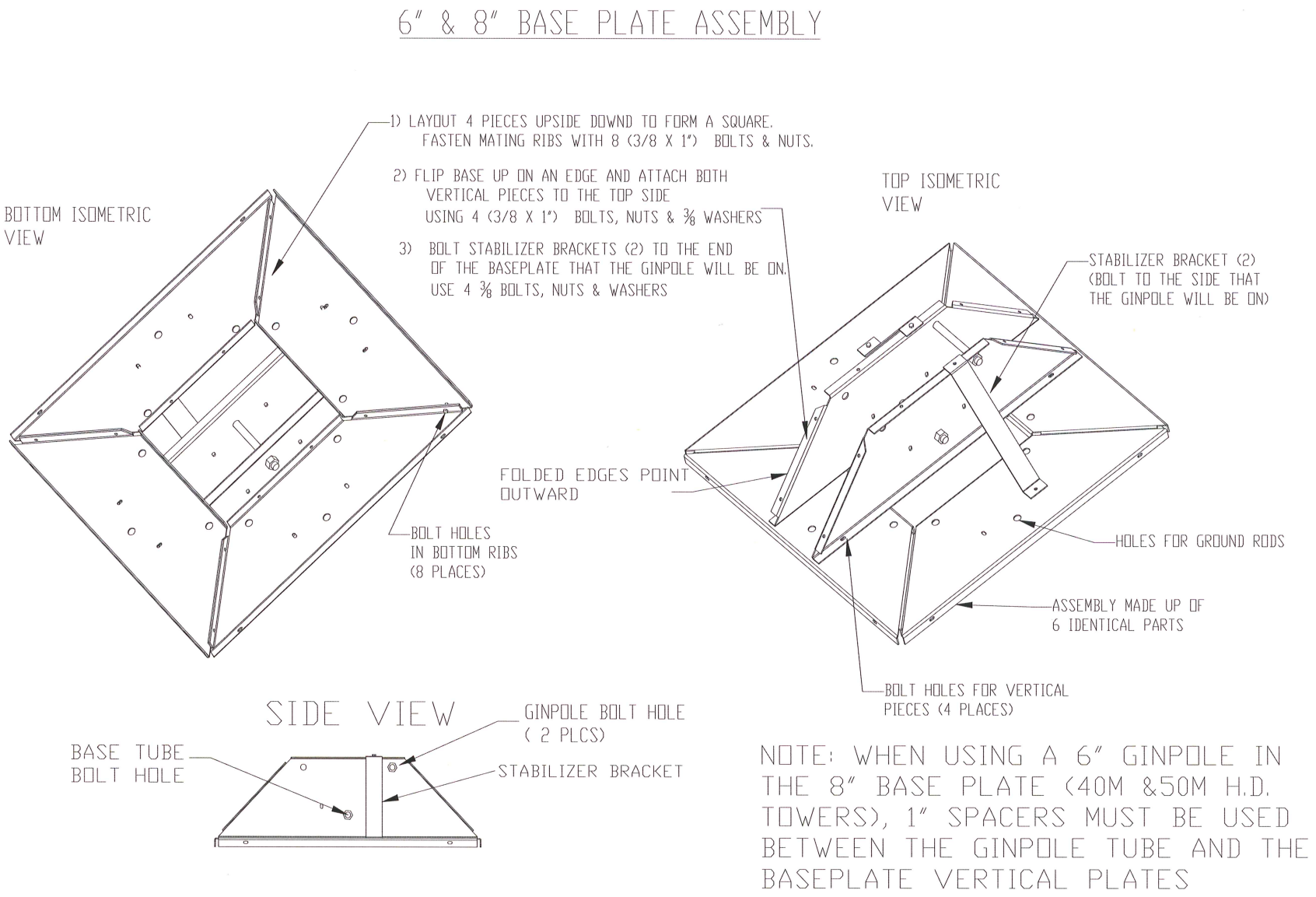


Figure 5: TallTower Base Plate Assembly (for 6 inch and 8 inch dia. towers)

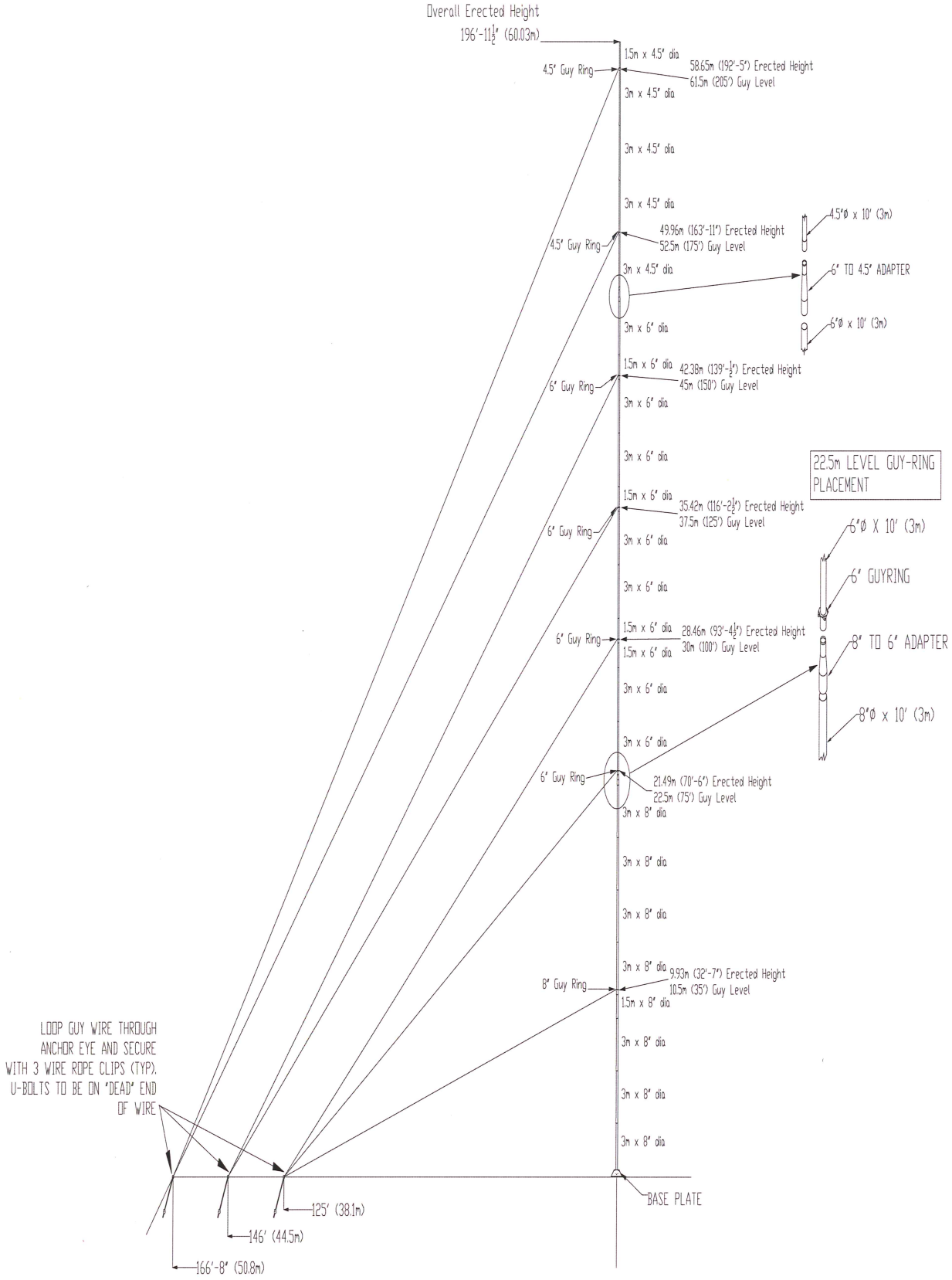


Figure 15: 60 m TallTower Assembly

Appendix A: Anchoring Guidelines

Before the tower is ordered, the soil type should be determined and the correct anchors ordered. The purpose of this section is to give you the information needed to provide suitable anchoring for your TallTower. **Because anchor requirements are site specific, it remains the responsibility of the customer to determine anchor requirements. If you are not sure what is required, seek professional guidance.** Local utility companies can often provide useful information regarding anchoring used in the site area.

The choice of anchors must take into consideration soil type, maximum winds to be experienced, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements.

Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, periodic soaking of the soil which may shift or become undermined, and icing events.

Table 3 lists the maximum anchor loads for each tower at the maximum rated wind speed. Anchors must be placed at the correct angle to provide specified holding power and to prevent shifting of the anchors under load.

Table 3: Upwind Anchor Loads

Tower size	Tube diameter	EIA-222-F wind velocity (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	6200 N (1400 pounds) at 45°	5300 N (1200 pounds) at 45°
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	7100 N (1600 pounds) at 45°	7100 N (1600 pounds) at 45°
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	9800 N (2200 pounds) at 45°
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	8500 N (1900 pounds) at 51°	12500 N (2800 pounds) at 45°
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	9800 N (2200 pounds) at 51°	16500 N (3700 pounds) at 45°
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	10200 N (2300 pounds) at 49°	14200 N (3200 pounds) at 45°
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	10700 N (2400 pounds) at 49°	18700 N (4200 pounds) at 45°
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	20500 N (4600 pounds) at 45°

NOTES:
(a) Fastest mile wind velocity per EIA-222-F at 10 meters (33 ft) above ground level
(b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.
(c) Maximum force on the winch anchor during erection

Screw-In Anchors

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. They are installed by hand, using a cross bar to screw them into the earth like a corkscrew.

Screw-in anchors can also used to provide the anchoring rod and eye for site-built anchors, such as concrete. Refer to the information on concrete anchors below.

150 mm (6.0 inches) screw-in anchors are the standard anchors supplied with NRG TallTowers.

Table 4: Specifications for Screw-In Anchors

	150 mm (6 inches) Anchor
Helix diameter:	152 mm (6.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	19 mm (0.75 inches)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	3,000 kg (6,500 pounds)
Class 6 soils *	2,300 kg (5,000 pounds)
Class 7 soils *	1,100 kg (2,500 pounds)

* Consult the Soil Classes chart, **Table 5**.

** In class 7 soils, it is advisable to place anchors deep enough to penetrate to underlying class 5 or 6 soil.

Table 5: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

Reproduced by permission, The A. B. Chance Co.

Arrowhead Anchors

Arrowhead anchors can penetrate stiff and rocky soils because the unique triangular design tends to thread its way between obstacles such as rocks, which can prevent successful installation of screw-in anchors. Arrowhead anchors are driven into the ground with a hardened steel drive rod. Once in the ground, upward force on the attached cable rotates the anchor perpendicular to the cable for maximum holding power.

Table 6: Specifications for Arrowhead Anchors

Length Overall:	1.22 m (48.0 inches).
Arrowhead Length:	203 mm (8.0 inches)
Materials:	6.35 mm (0.25 inches) galvanized (7x19) steel cable; breaking strength - 1905 kg (4200 pounds); with malleable iron head.
Holding Power:	
Class 3 soils *	1905 kg (4200 pounds)
Class 4 soils *	1361 kg (3000 pounds)
Class 5 soils *	907 kg (2000 pounds)
Class 6 soils *	544 kg (1200 pounds)
Class 7 soils *	272 kg (600 pounds)

* See **Table 5** for soil class descriptions

Rock Anchors

Rock anchors are placed into solid rock, when anchoring to either bare rock, or thin soils with solid rock near the surface. They are constructed of a threaded rod with integral eye, and two opposing wedge halves. The anchor is placed in a hole pre-drilled in the rock. Twisting the eye of the anchor forces the wedges against the sides of the hole, locking the anchor in place. Load actually increases the wedging force, developing holding power equal to the full tensile strength of the rod.

Table 7: Specifications for Rock Anchors

Holding Power:	9072 kgf (20,000 pounds)
Rod Length Overall:	0.38 m (15 inches), 0.76 m (30 inches) or 1.35 m (53 inches), other lengths available
Anchor Diameter:	44 mm (1.75 inches) as supplied, 60 mm (2.375 inches) max. expanded
Rod Diameter:	19 mm (.75 inches)
Materials:	Malleable iron, dipped in rust-resisting black paint
Required Hole Size:	50 mm (2 inches) diameter (nominal)
Use Rock Drill Size:	50 mm (2 inches) diameter

Table 8: NRG TALL TOWERS DESIGN LOADS

Tower size	Tube diameter	EIA-222-F wind velocity	Vertical base reaction (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	12500 N (2800 pounds)	6200 N (1400 pounds) @ 45	5300 N (1200 pounds) @ 45
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	13300 N (3000 pounds)	7100 N (1600 pounds) @ 45	7100 N (1600 pounds) @ 45
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	14700 N (3300 pounds)	8900 N (2000 pounds) @ 45	9800 N (2200 pounds) @ 45
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	19100 N (4300 pounds)	8500 N (1900 pounds) @ 51	12500 N (2800 pounds) @ 45
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	20500 N (4600 pounds)	9800 N (2200 pounds) @ 51	16500 N (3700 pounds) @ 45
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	26700 N (6000 pounds)	10200 N (2300 pounds) @ 49	14200 N (3200 pounds) @ 45
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	28000 N (6300 pounds)	10700 N (2400 pounds) @ 49	18700 N (4200 pounds) @ 45
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	32500 N (7300 pounds)	8900 N (2000 pounds) @ 45	20500 N (4600 pounds) @ 45

Notes:

Fastest mile wind velocity per EIA-222-F at 10 meters (33 feet) above ground level.

a) Vertical base reaction. The maximum horizontal reaction is equal to horizontal component of winch anchor reaction.

b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.

c) Maximum force on the winch anchor during tower erection.

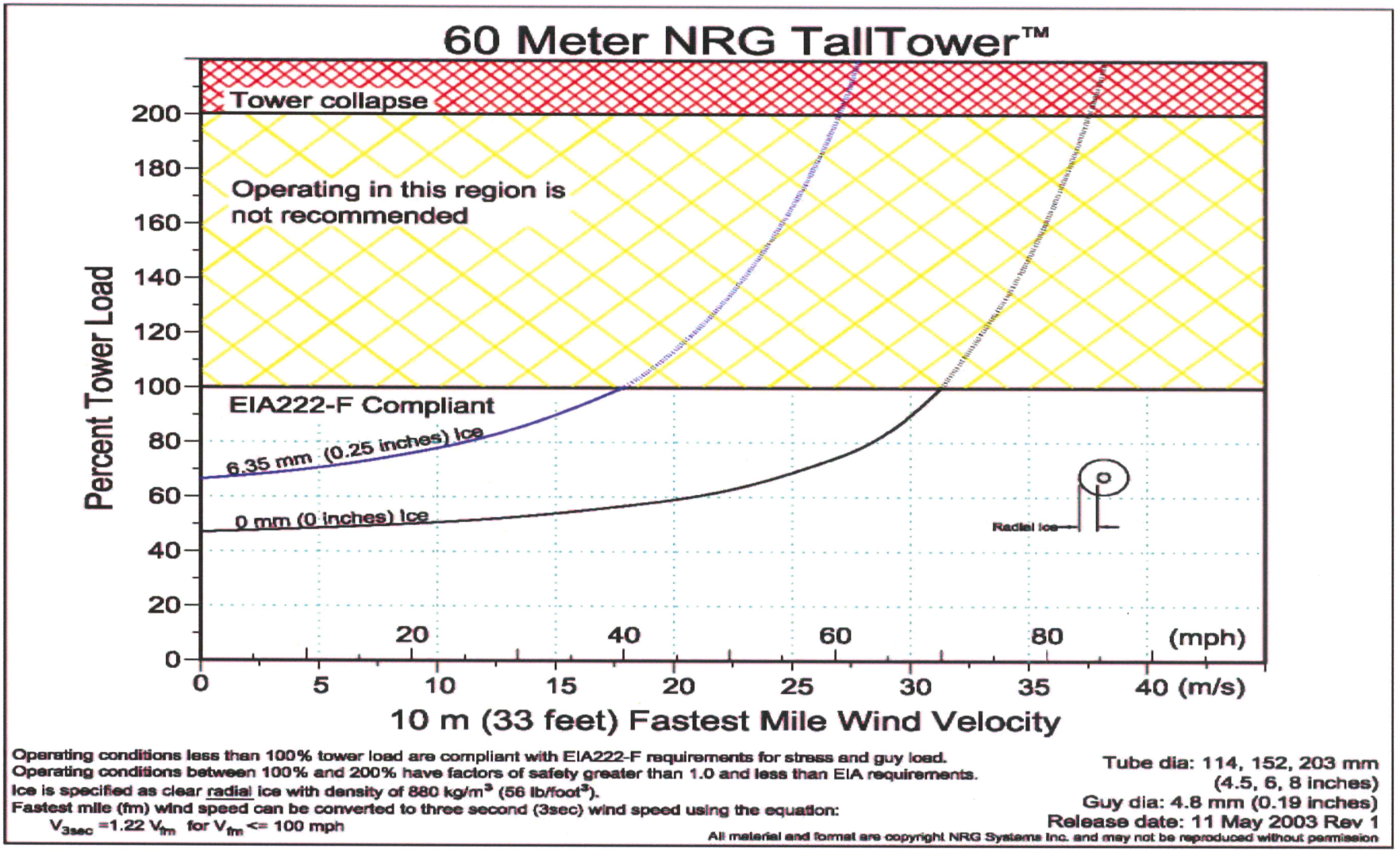


Figure 36: Tower Load and Performance Chart: 60 m TallTower

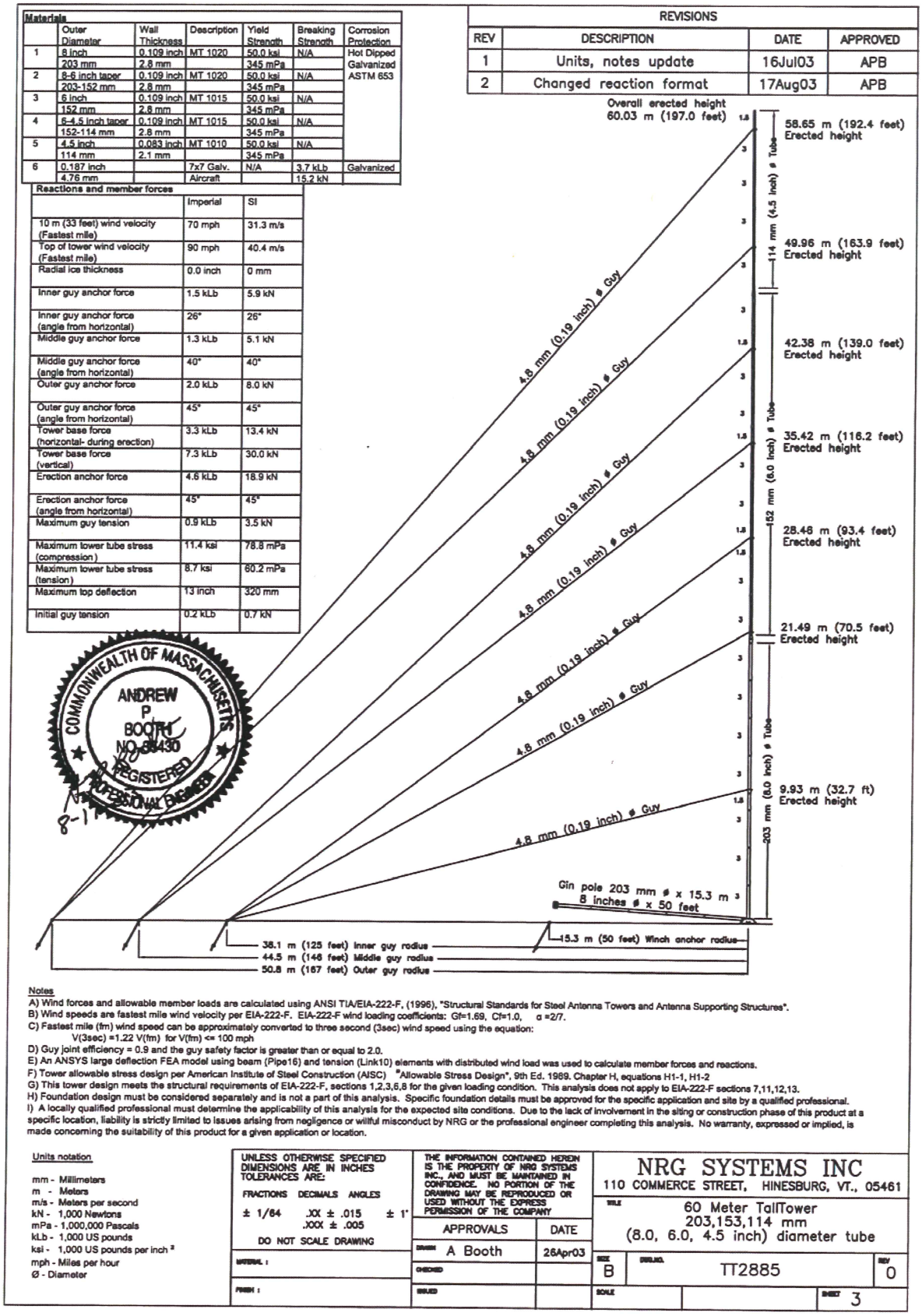


Figure 49: 60 m TallTower

2016cu006 – May 3rd, 2016

Prepared by Richard Haugen

Applicant: Heartland Wind LLC by Jesse Bermel of Iberdrola Renewables.
Land Owner: Troy Murphy, 48308 SD Hwy 30, White, SD 57276

Legal Description: "SE1/4 of Sec. 34, T112N, R48W (Oak Lake Township)"

2016cu006: Heartland Wind LLC is a subsidiary of Iberdrola Renewables, has applied for a conditional use # 25: Wind Energy Systems, for a meteorological tower (MET tower). A meteorological tower tracks wind speed, direction and duration. This data will be used for tracking of data for possible future wind farm. The tower will be meet the setback requirements and is located off 482nd Ave an Oak Lake Township road. The applicant has an agreement with current landowner for the MET tower. Iberdrola Renewables have existing wind farms located in Brookings County.

A "Wind Energy System" is an allowed policy in the Brookings County 2016 Comprehensive Plan found in Appendix "B" on page 86 of the Comprehensive Plan.

Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23: Wind Energy System (WES) Requirements

The Brookings County Planning and Zoning Commission has granted Wind Energy Systems, MET towers in the past:

August 7th, 2007 – 2007cu016 and 2007cu018 – MET Tower.

November 6th, 2007 – 2007cu017A – MET Tower

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and White Tri-City Star on April 21st and 28th, 2016.

Letters were sent to the adjoining landowner's, Oak Lake Township Chairman and Clerk.

Granting the conditional use request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the conditional use request would be maintaining the agricultural use of the rural area of Brookings County.

APPLICATION FOR CONDITIONAL USE PERMIT

Date of Application: 3-29-16 Permit Number: 2016-06

To: Brookings County Planning Commission
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Brookings County Planning & Zoning Commission of Brookings County, South Dakota, to grant a Conditional Use to the Brookings County Zoning Regulations for the purpose of:

Permitting and installation of a meteorological test tower

B.) Section(s) of Zoning Regulations authorizing Conditional Use:

Article 11, section 11.01: "A" Agricultural District: Conditional Use #25: Wind Energy Systems (WES); Article 23, Section 23.01: Wind Energy Systems (WES) Requirements.

C.) Legal Description of Property:

~~T-112N - R48W - NE¼ of Section 34~~

SE¼ Section 34, T112N, R48W
(Oaklake Twp)
parcel # 13000112483440 0

Form continued on page 2

Temporary Met Tower

Buffalo Ridge IV Wind Project

Temporary Met Tower

Property

N

0 200 400 600

1" = 400'

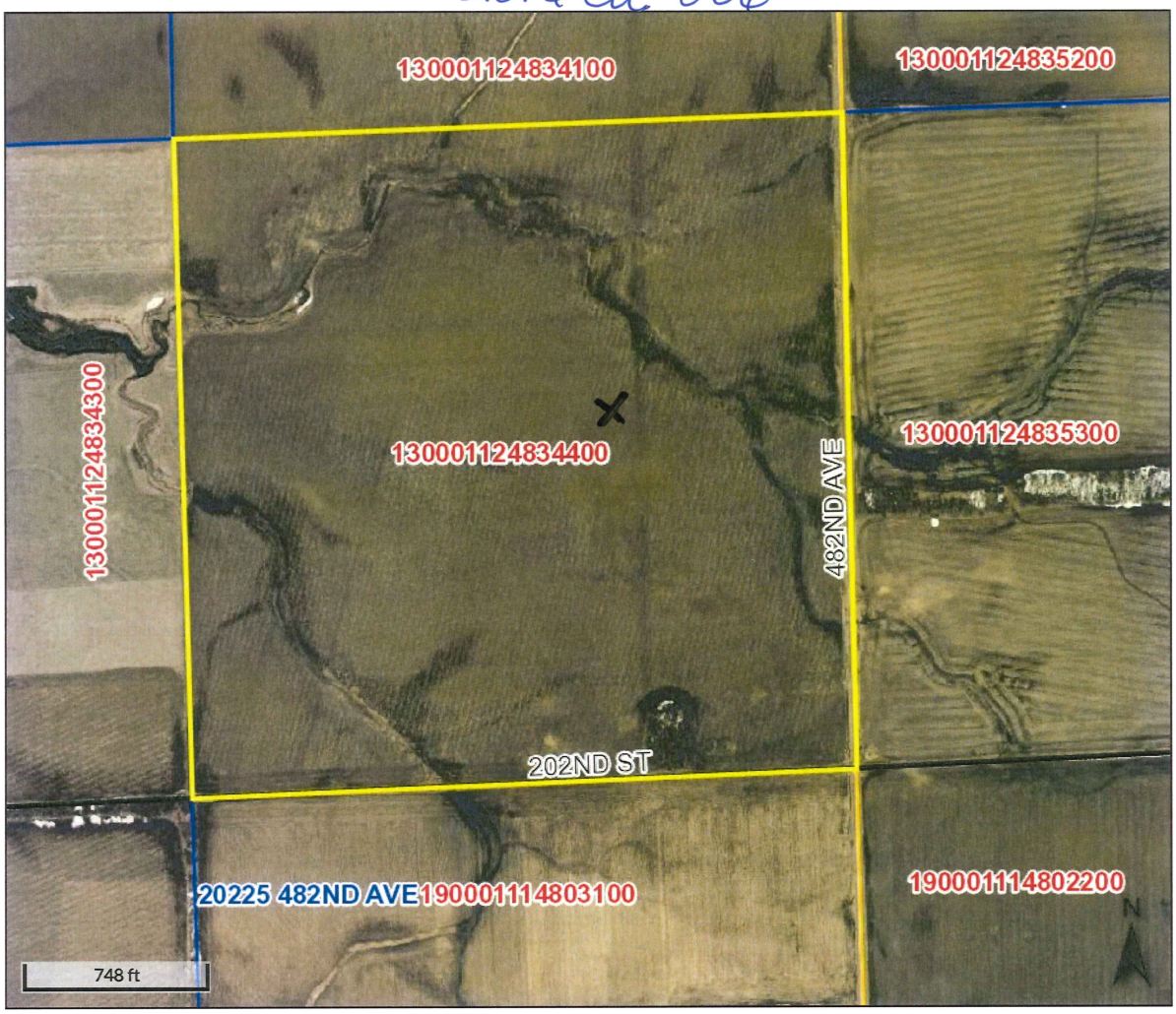
IBERDROLA RENEWABLES

Path: \\Porgis01\GIS Data\Projects\SD\Buffalo Ridge\MapDocuments\Report Figures\Met Towers\BR IV\2016-03-16\Met Towers.mxd

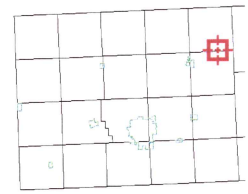
Modified Date: 3/16/2016

Beacon™ Brookings County, SD

2016 CU 006



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	130001124834400	**Alternate ID**	n/a	**Owner Address**	MURPHY, TROY D
Sec/Twp/Rng	34-112-48	**Class**	AGA		48308 SD HWY 30
Property Address		**Acreage**	160		WHITE SD 57276
District	1310				
Brief Tax Description	SE 1/4 SEC 34-112-48 160.0 AC				
	(Note: Not to be used on legal documents)				

Date created: 3/30/2016

Developed by
The Schneider Corporation

IBERDROLA RENEWABLES

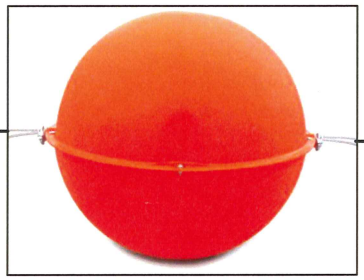
NRG Meteorological Tower Used by Iberdrola Renewables
- Standard Marking Convention -

Image depicts one side of a tower (out of four), with guy wires, sensor booms, and aircraft marker balls.

-Alternating orange and white paint, upper third of tower

-2 sets of aircraft marker balls (top is 90 feet down the wire from the tower)

-Guy guards on all wires, second set on outer wires



Aircraft Marker Ball
(8 on a complete tower)

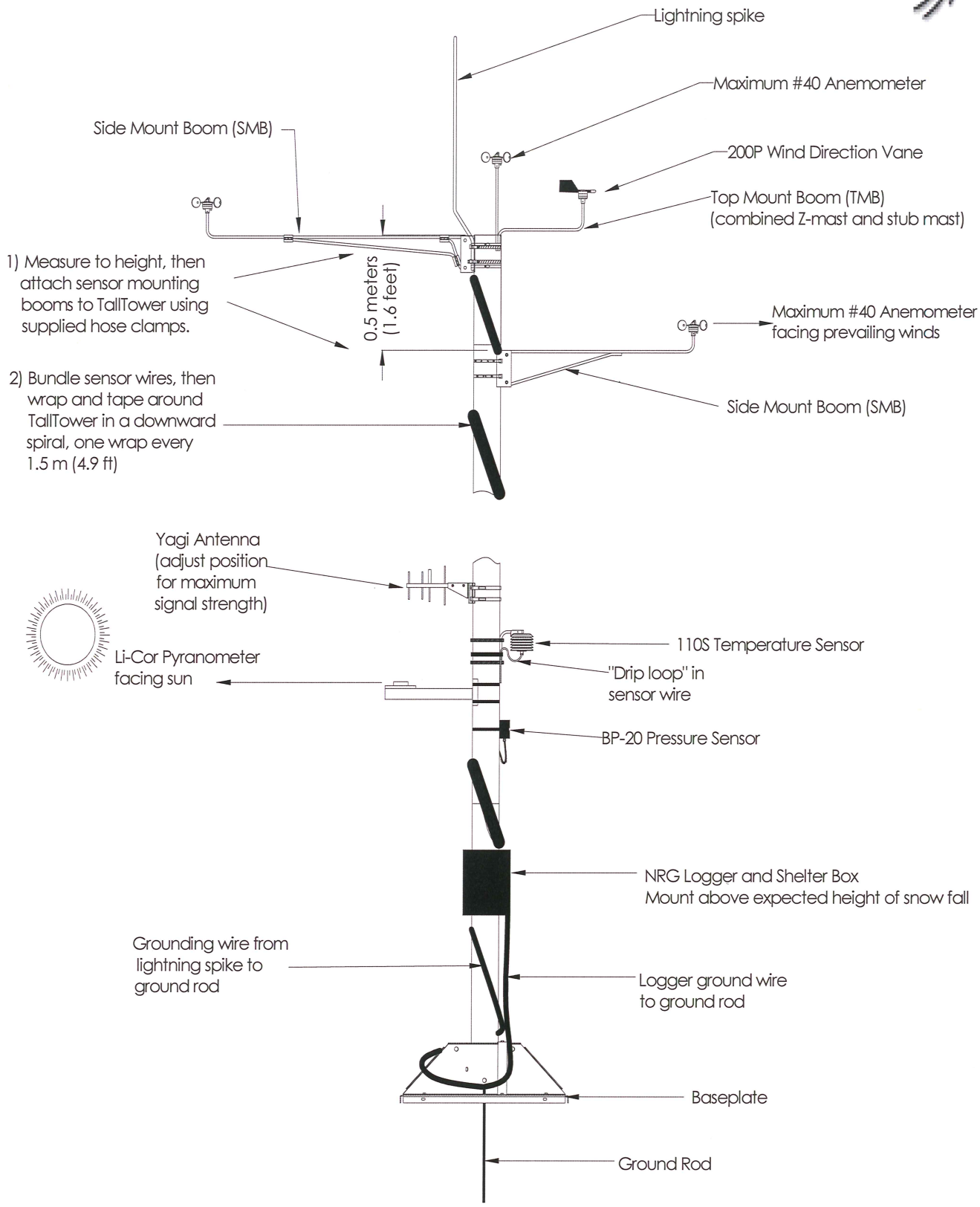
60 Meters (198 Feet)

5 Meters

50 Meters (165 Feet)

REV2 3/15

Typical Wind Monitoring Site



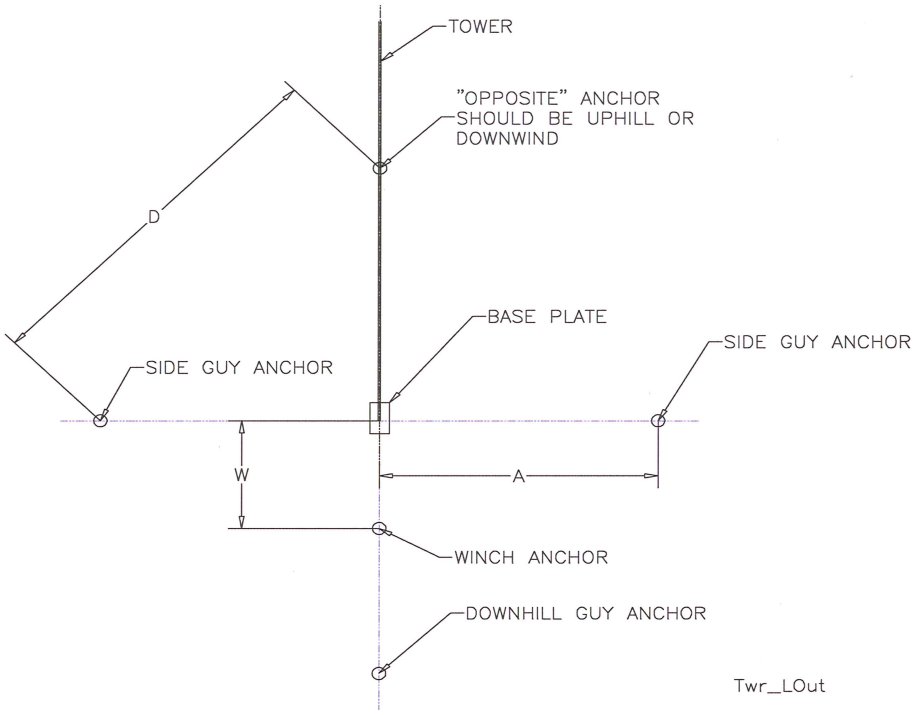


Figure 1: Tower Site Layout

Tower	Dimensions		
	A	D	W
10 m	4.9 m (16 feet)	6.9 m (22.6 feet)	N/A
20 m	12.8 m (42 feet)	18.1 m (59.4 feet)	6.1 m (20 feet)
30 m, 30 m HD, 30 m SHD	18.3 m (60 feet)	25.9 m (84.9 feet)	9.1 m (30 feet)
40 m, 40 m HD (Inner Guy Point)*	21.3 m (70 feet)	30.2 m (99 feet)	9.1 m (30 feet)*
40 m, 40 m HD (Outer Guy Point)*	22.9 m (75 feet)	32.3 m (106 feet)	9.1 m (30 feet)*
50 m, 50 m HD (Inner Guy Point)*	30.5 m (100 feet)	43.1 m (141.4 feet)	12.2 m (40 feet)*
50 m, 50 m HD (Outer Guy Point)*	33.5 m (110 feet)	47.4 m (155.6 feet)	12.2 m (40 feet)*
60 m (Inner Guy Point)♦	38.1 m (125 feet)	53.9 m (176.8 feet)	14.6 m (48 feet)*
*60 m (Middle Guy Point)♦	44.5 m (146 feet)	63 m (206.5 feet)	14.6 m (48 feet)*
60 m (Outer Guy Point)♦	50.8 m (166.6 feet)	71.9 m (235.7 feet)	14.6 m (48 feet)*

Table 1: Tower and Anchor Layout Dimensions

***40 meter and 50 meter towers have two anchors per side and two winch anchors.**

♦ 60 meter tower has three anchors per side and two winch anchors.

NOTE: The winch anchor must be in line with the tower. It is very important that the distance from the base plate to the winch anchor (dimension W in Table 1) be exact. See **Figure 2.**

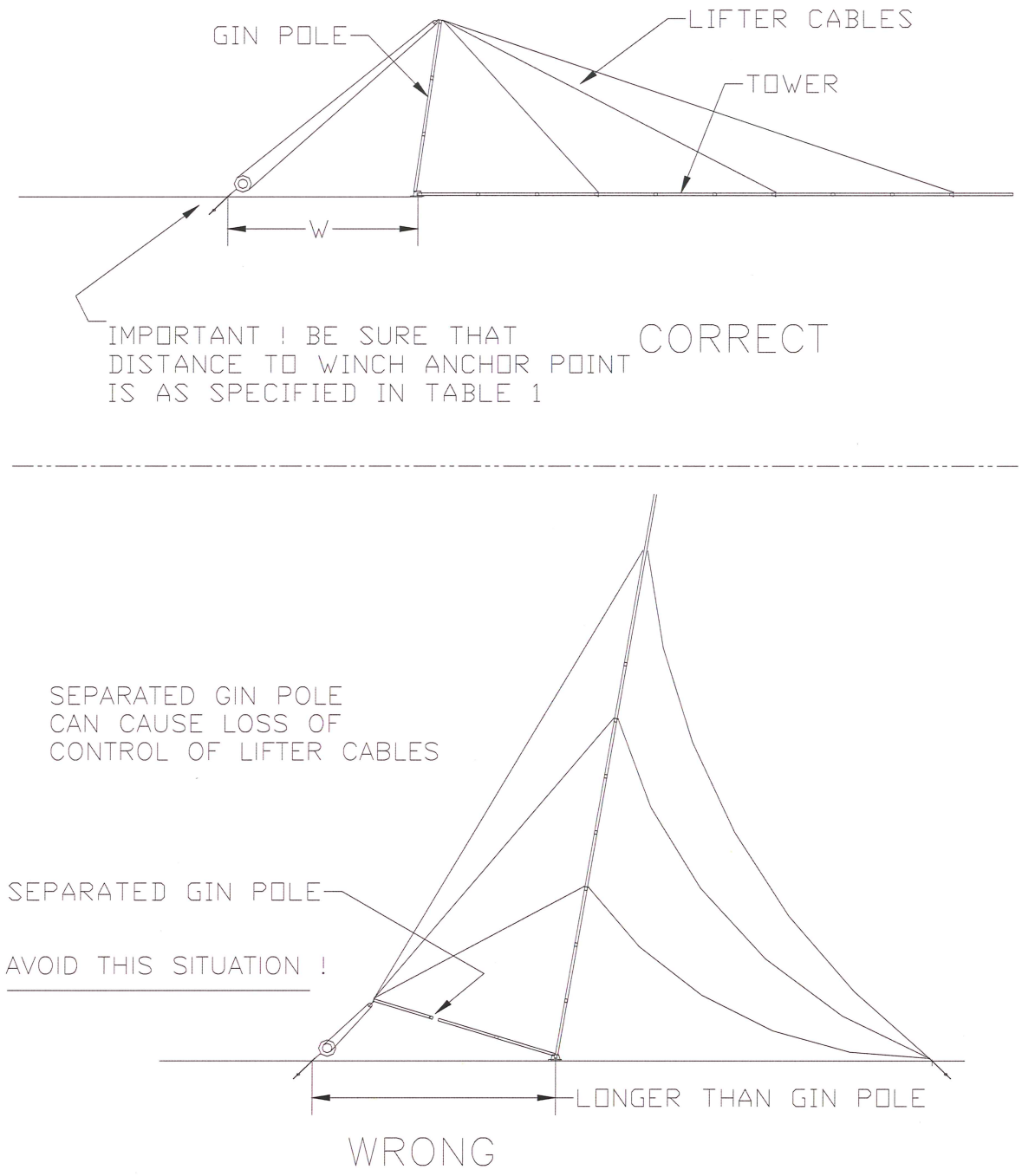


Figure 2: Winch Anchor Placement

NOTE: The gin pole safety wire **MUST** be used to prevent gin pole separation.

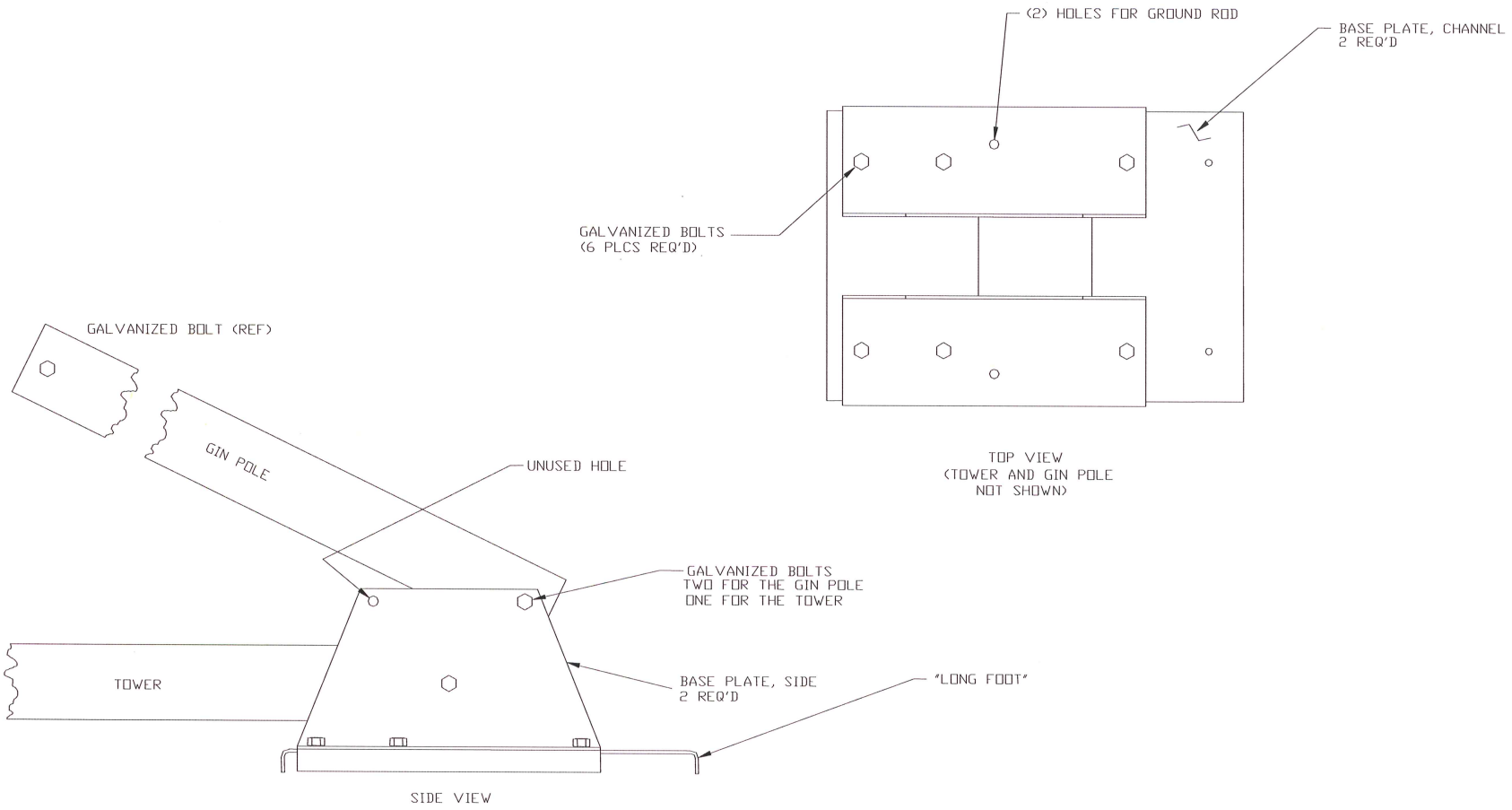


Figure 3: TallTower Base Plate Assembly (for 3.5 inch dia. towers)

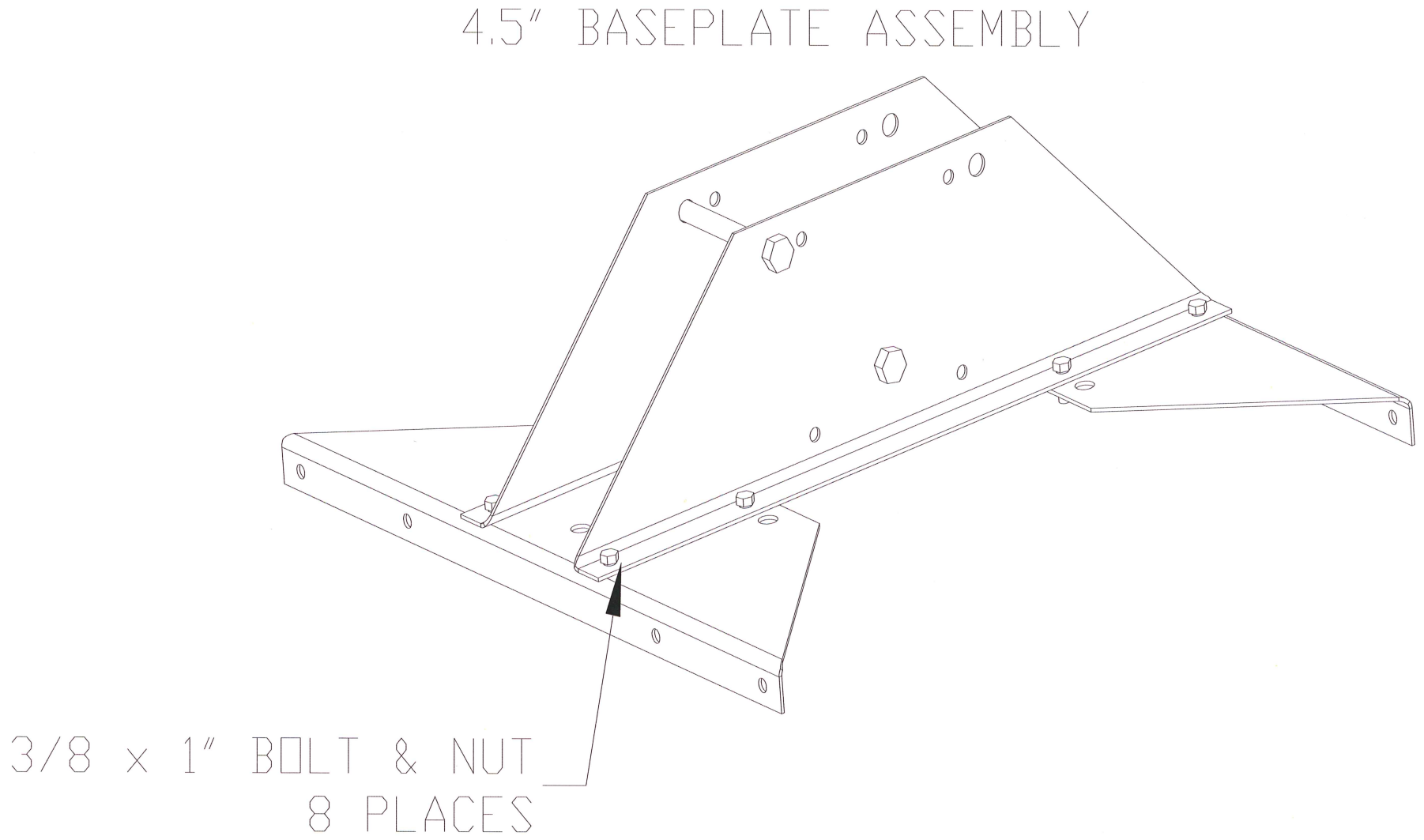


Figure 4: TallTower Base Plate Assembly (for 4.5 inch dia. towers)

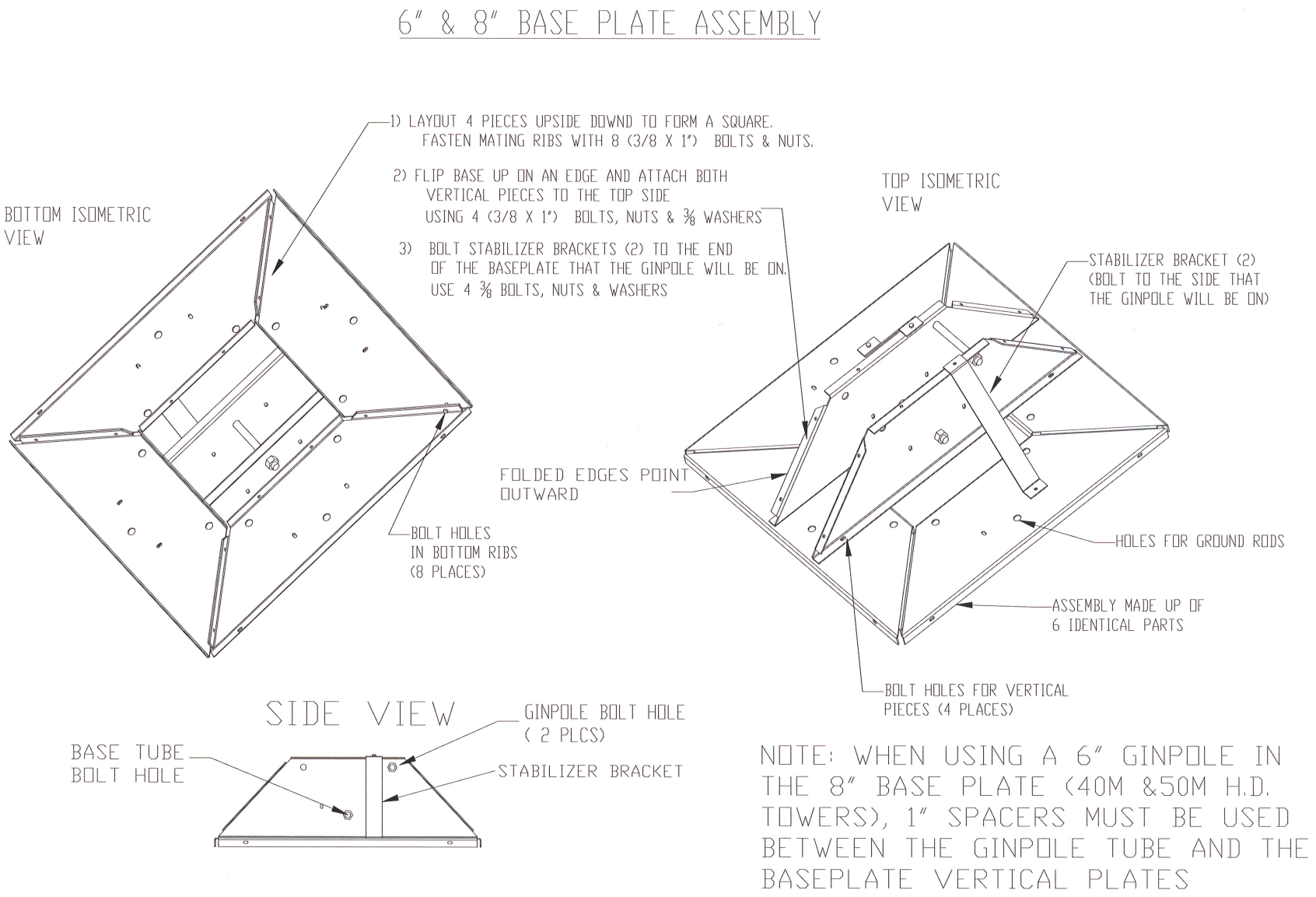


Figure 5: TallTower Base Plate Assembly (for 6 inch and 8 inch dia. towers)

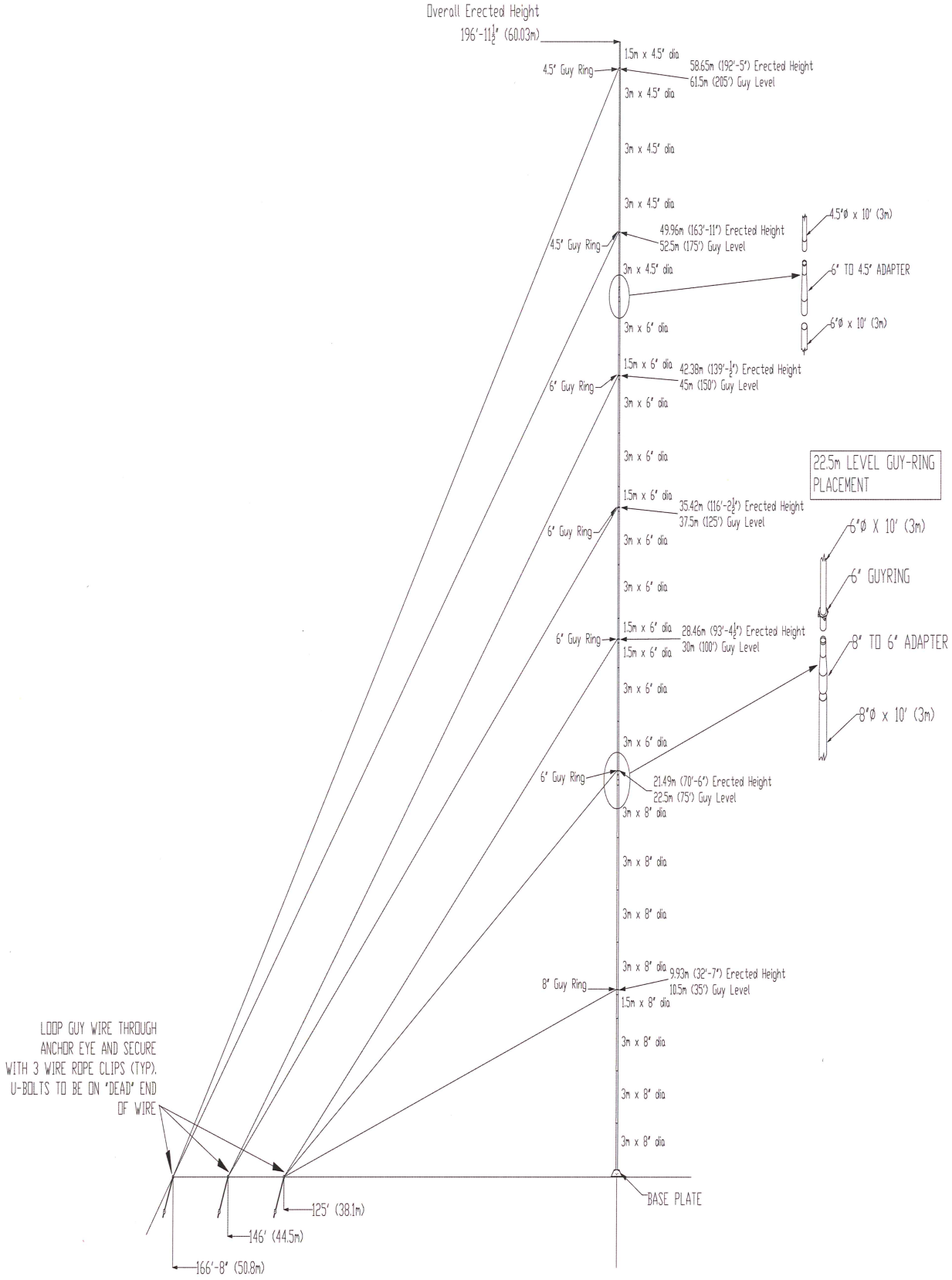


Figure 15: 60 m TallTower Assembly

Appendix A: Anchoring Guidelines

Before the tower is ordered, the soil type should be determined and the correct anchors ordered. The purpose of this section is to give you the information needed to provide suitable anchoring for your TallTower. **Because anchor requirements are site specific, it remains the responsibility of the customer to determine anchor requirements. If you are not sure what is required, seek professional guidance.** Local utility companies can often provide useful information regarding anchoring used in the site area.

The choice of anchors must take into consideration soil type, maximum winds to be experienced, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements.

Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, periodic soaking of the soil which may shift or become undermined, and icing events.

Table 3 lists the maximum anchor loads for each tower at the maximum rated wind speed. Anchors must be placed at the correct angle to provide specified holding power and to prevent shifting of the anchors under load.

Table 3: Upwind Anchor Loads

Tower size	Tube diameter	EIA-222-F wind velocity (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	6200 N (1400 pounds) at 45°	5300 N (1200 pounds) at 45°
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	7100 N (1600 pounds) at 45°	7100 N (1600 pounds) at 45°
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	9800 N (2200 pounds) at 45°
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	8500 N (1900 pounds) at 51°	12500 N (2800 pounds) at 45°
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	9800 N (2200 pounds) at 51°	16500 N (3700 pounds) at 45°
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	10200 N (2300 pounds) at 49°	14200 N (3200 pounds) at 45°
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	10700 N (2400 pounds) at 49°	18700 N (4200 pounds) at 45°
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	20500 N (4600 pounds) at 45°

NOTES:
(a) Fastest mile wind velocity per EIA-222-F at 10 meters (33 ft) above ground level
(b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.
(c) Maximum force on the winch anchor during erection

Screw-In Anchors

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. They are installed by hand, using a cross bar to screw them into the earth like a corkscrew.

Screw-in anchors can also used to provide the anchoring rod and eye for site-built anchors, such as concrete. Refer to the information on concrete anchors below.

150 mm (6.0 inches) screw-in anchors are the standard anchors supplied with NRG TallTowers.

Table 4: Specifications for Screw-In Anchors

	150 mm (6 inches) Anchor
Helix diameter:	152 mm (6.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	19 mm (0.75 inches)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	3,000 kg (6,500 pounds)
Class 6 soils *	2,300 kg (5,000 pounds)
Class 7 soils *	1,100 kg (2,500 pounds)

* Consult the Soil Classes chart, **Table 5**.

** In class 7 soils, it is advisable to place anchors deep enough to penetrate to underlying class 5 or 6 soil.

Table 5: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

Reproduced by permission, The A. B. Chance Co.

Arrowhead Anchors

Arrowhead anchors can penetrate stiff and rocky soils because the unique triangular design tends to thread its way between obstacles such as rocks, which can prevent successful installation of screw-in anchors. Arrowhead anchors are driven into the ground with a hardened steel drive rod. Once in the ground, upward force on the attached cable rotates the anchor perpendicular to the cable for maximum holding power.

Table 6: Specifications for Arrowhead Anchors

Length Overall:	1.22 m (48.0 inches).
Arrowhead Length:	203 mm (8.0 inches)
Materials:	6.35 mm (0.25 inches) galvanized (7x19) steel cable; breaking strength - 1905 kg (4200 pounds); with malleable iron head.
Holding Power:	
Class 3 soils *	1905 kg (4200 pounds)
Class 4 soils *	1361 kg (3000 pounds)
Class 5 soils *	907 kg (2000 pounds)
Class 6 soils *	544 kg (1200 pounds)
Class 7 soils *	272 kg (600 pounds)

* See **Table 5** for soil class descriptions

Rock Anchors

Rock anchors are placed into solid rock, when anchoring to either bare rock, or thin soils with solid rock near the surface. They are constructed of a threaded rod with integral eye, and two opposing wedge halves. The anchor is placed in a hole pre-drilled in the rock. Twisting the eye of the anchor forces the wedges against the sides of the hole, locking the anchor in place. Load actually increases the wedging force, developing holding power equal to the full tensile strength of the rod.

Table 7: Specifications for Rock Anchors

Holding Power:	9072 kgf (20,000 pounds)
Rod Length Overall:	0.38 m (15 inches), 0.76 m (30 inches) or 1.35 m (53 inches), other lengths available
Anchor Diameter:	44 mm (1.75 inches) as supplied, 60 mm (2.375 inches) max. expanded
Rod Diameter:	19 mm (.75 inches)
Materials:	Malleable iron, dipped in rust-resisting black paint
Required Hole Size:	50 mm (2 inches) diameter (nominal)
Use Rock Drill Size:	50 mm (2 inches) diameter

Table 8: NRG TALL TOWERS DESIGN LOADS

Tower size	Tube diameter	EIA-222-F wind velocity	Vertical base reaction (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	12500 N (2800 pounds)	6200 N (1400 pounds) @ 45	5300 N (1200 pounds) @ 45
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	13300 N (3000 pounds)	7100 N (1600 pounds) @ 45	7100 N (1600 pounds) @ 45
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	14700 N (3300 pounds)	8900 N (2000 pounds) @ 45	9800 N (2200 pounds) @ 45
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	19100 N (4300 pounds)	8500 N (1900 pounds) @ 51	12500 N (2800 pounds) @ 45
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	20500 N (4600 pounds)	9800 N (2200 pounds) @ 51	16500 N (3700 pounds) @ 45
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	26700 N (6000 pounds)	10200 N (2300 pounds) @ 49	14200 N (3200 pounds) @ 45
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	28000 N (6300 pounds)	10700 N (2400 pounds) @ 49	18700 N (4200 pounds) @ 45
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	32500 N (7300 pounds)	8900 N (2000 pounds) @ 45	20500 N (4600 pounds) @ 45

Notes:

Fastest mile wind velocity per EIA-222-F at 10 meters (33 feet) above ground level.

a) Vertical base reaction. The maximum horizontal reaction is equal to horizontal component of winch anchor reaction.

b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.

c) Maximum force on the winch anchor during tower erection.

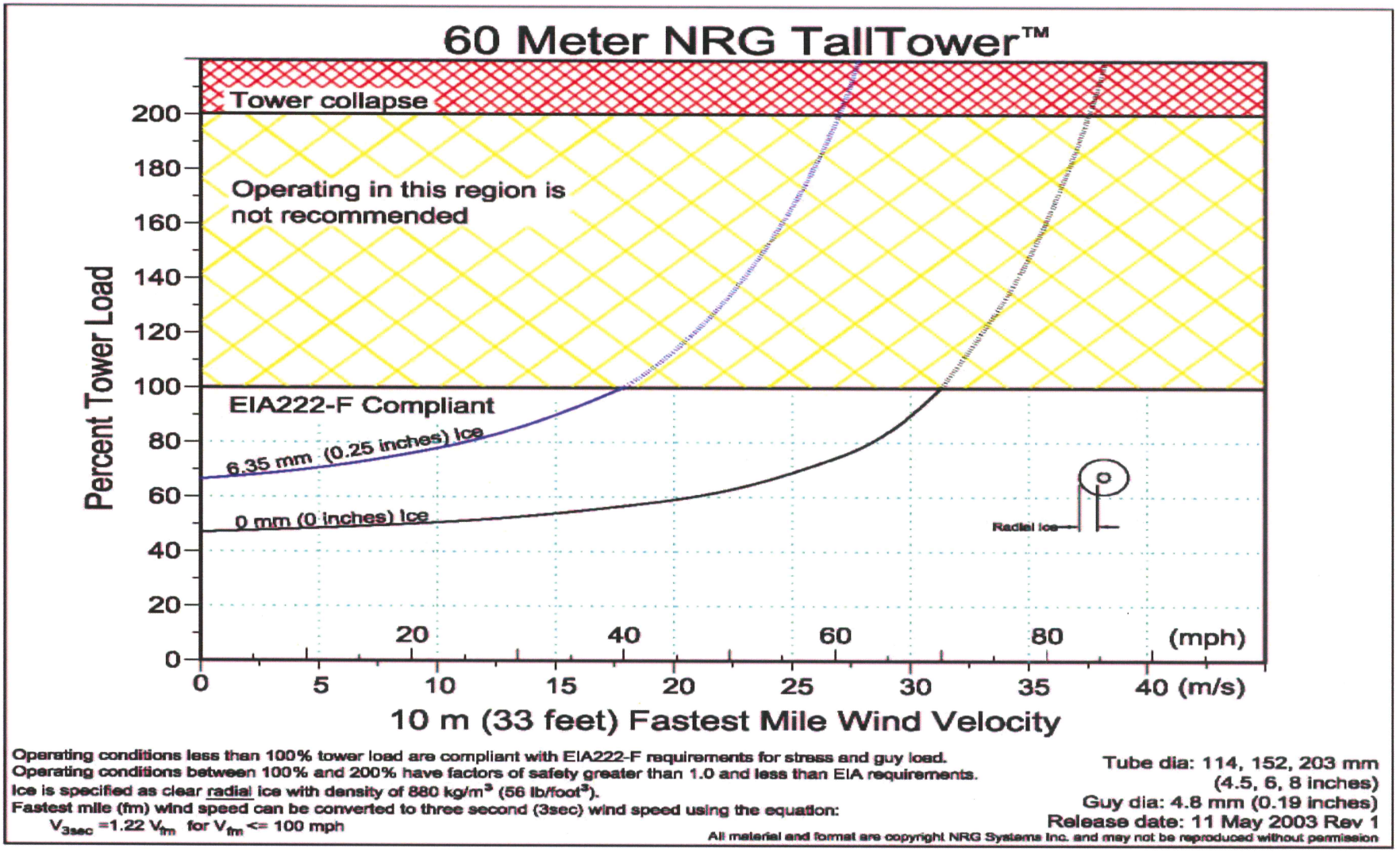


Figure 36: Tower Load and Performance Chart: 60 m TallTower

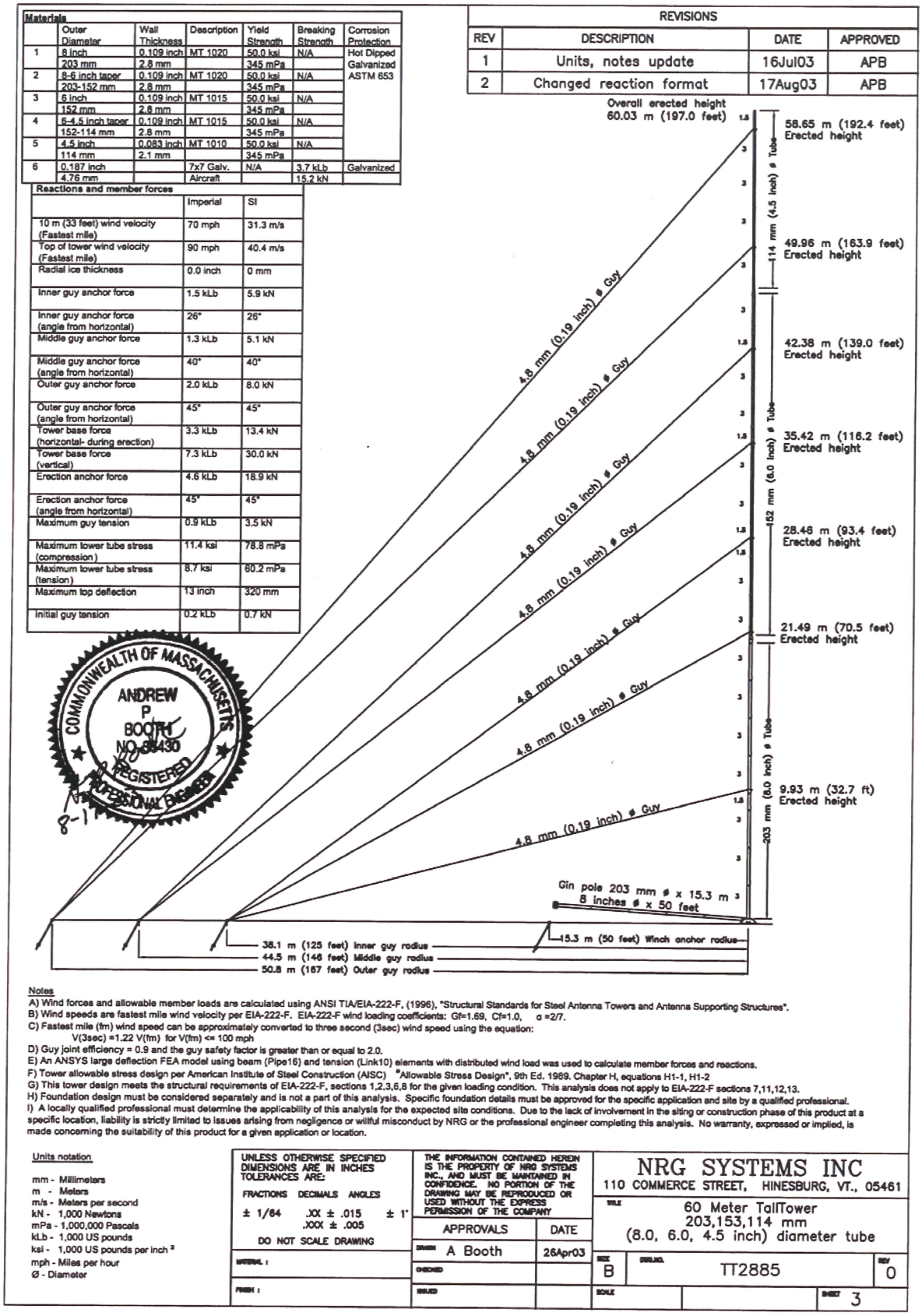


Figure 49: 60 m TallTower

2016cu007 – May 3rd, 2016

Prepared by Richard Haugen

Applicant: Heartland Wind LLC by Jesse Bermel of Iberdrola Renewables.
Land Owner: Norris Patrick, 20062 482nd Ave, White, SD 57276

Legal Description: "E1/2 SW1/4 Exc E1/2 NE1/4 SW1/4 of Sec. 27, T112N, R48W (Oak Lake Township)"

2016cu007: Heartland Wind LLC is a subsidiary of Iberdrola Renewables, has applied for a conditional use # 25: Wind Energy Systems, for a meteorological tower (MET tower). A meteorological tower tracks wind speed, direction and duration. This data will be used for tracking of data for possible future wind farm. The tower will be meet the setback requirements and is located off 201st Street an Oak Lake Township road. The applicant has an agreement with current landowner for the MET tower. Iberdrola Renewables have existing wind farms located in Brookings County.

A "Wind Energy System" is an allowed policy in the Brookings County 2016 Comprehensive Plan found in Appendix "B" on page 86 of the Comprehensive Plan.

Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23: Wind Energy System (WES) Requirements

The Brookings County Planning and Zoning Commission has granted Wind Energy Systems, MET towers in the past:

August 7th, 2007 – 2007cu016 and 2007cu018 – MET Tower.

November 6th, 2007 – 2007cu017A – MET Tower

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and White Tri-City Star on April 21st and 28th, 2016.

Letters were sent to the adjoining landowner's, Oak Lake Township Chairman and Clerk.

Granting the conditional use request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the conditional use request would be maintaining the agricultural use of the rural area of Brookings County.

APPLICATION FOR CONDITIONAL USE PERMIT

2016 CU 007

Date of Application: 3-29-16 Permit Number:

RECEIVED
MAR 29 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

To: Brookings County Planning Commission
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Brookings County Planning & Zoning Commission of Brookings County, South Dakota, to grant a Conditional Use to the Brookings County Zoning Regulations for the purpose of:

Permitting and installation of a meteorological test tower

B.) Section(s) of Zoning Regulations authorizing Conditional Use:

Article 11, Section 11.01: "A" Agricultural District: Conditional Use #25: Wind Energy Systems (WES); Article 23, Section 23.01: Wind Energy Systems (WES) Requirements.

C.) Legal Description of Property:

T112N R48W - E½ of the SW¼ of Section 27.

E1/2 SW1/4 Exc. E1/2 NE1/4 SW1/4 Section 27, T112N, R48W
(Oaklake Twp)
Parcel # 13000112482740O

Form continued on page 2

Temporary Met Tower

Buffalo Ridge IV Wind Project

Temporary Met Tower

Property

N

0 200 400 600

1" = 400'

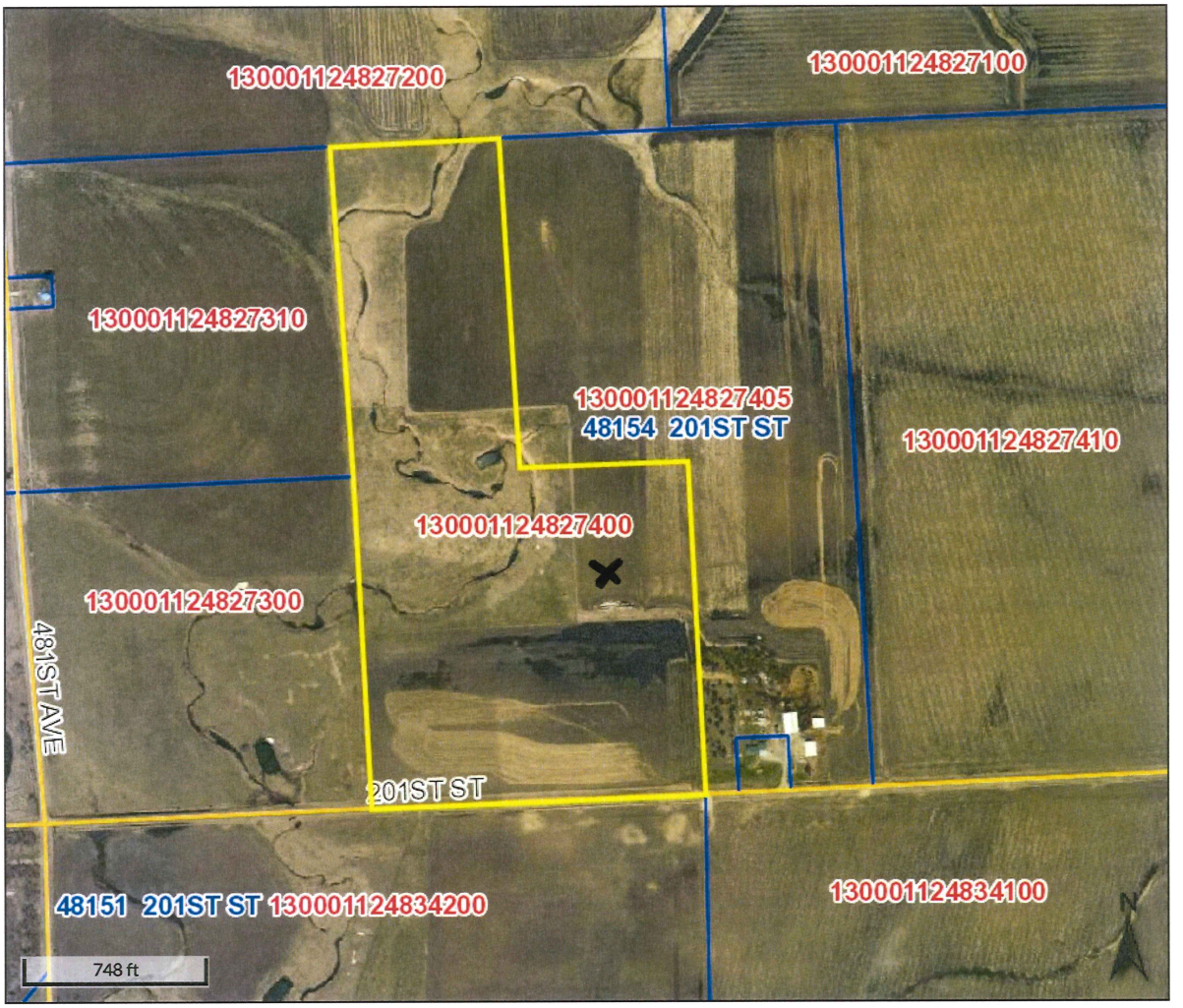
IBERDROLA RENEWABLES

Path: \\Porgis01\GIS Data\Projects\SD\Buffalo Ridge\MapDocuments\Report Figures\Met Towers\BR IV\2016-03-16\Met Towers.mxd

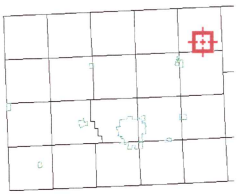
Modified Date: 3/21/2016

Beacon™ Brookings County, SD

2016 cu007



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	130001124827400	**Alternate ID**	n/a	**Owner Address**	PATRICK, NORRIS A ET UX
Sec/Twp/Rng	27-112-48	**Class**	AGA		20062 482ND AVE
Property Address		**Acreage**	60		WHITE SD 57276
District	1310				
Brief Tax Description	E 1/2 SW 1/4 EXC E 1/2 NE 1/4 SW 1/4 SEC 27-112-48 60.0 AC				
	(Note: Not to be used on legal documents)				

Date created: 3/30/2016

Developed by
The Schneider Corporation

IBERDROLA RENEWABLES

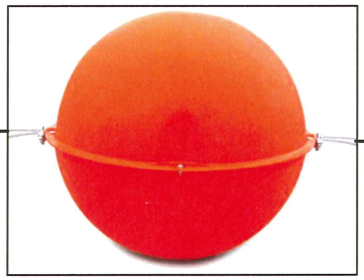
NRG Meteorological Tower Used by Iberdrola Renewables
- Standard Marking Convention -

Image depicts one side of a tower (out of four), with guy wires, sensor booms, and aircraft marker balls.

-Alternating orange and white paint, upper third of tower

-2 sets of aircraft marker balls (top is 90 feet down the wire from the tower)

-Guy guards on all wires, second set on outer wires



Aircraft Marker Ball
(8 on a complete tower)

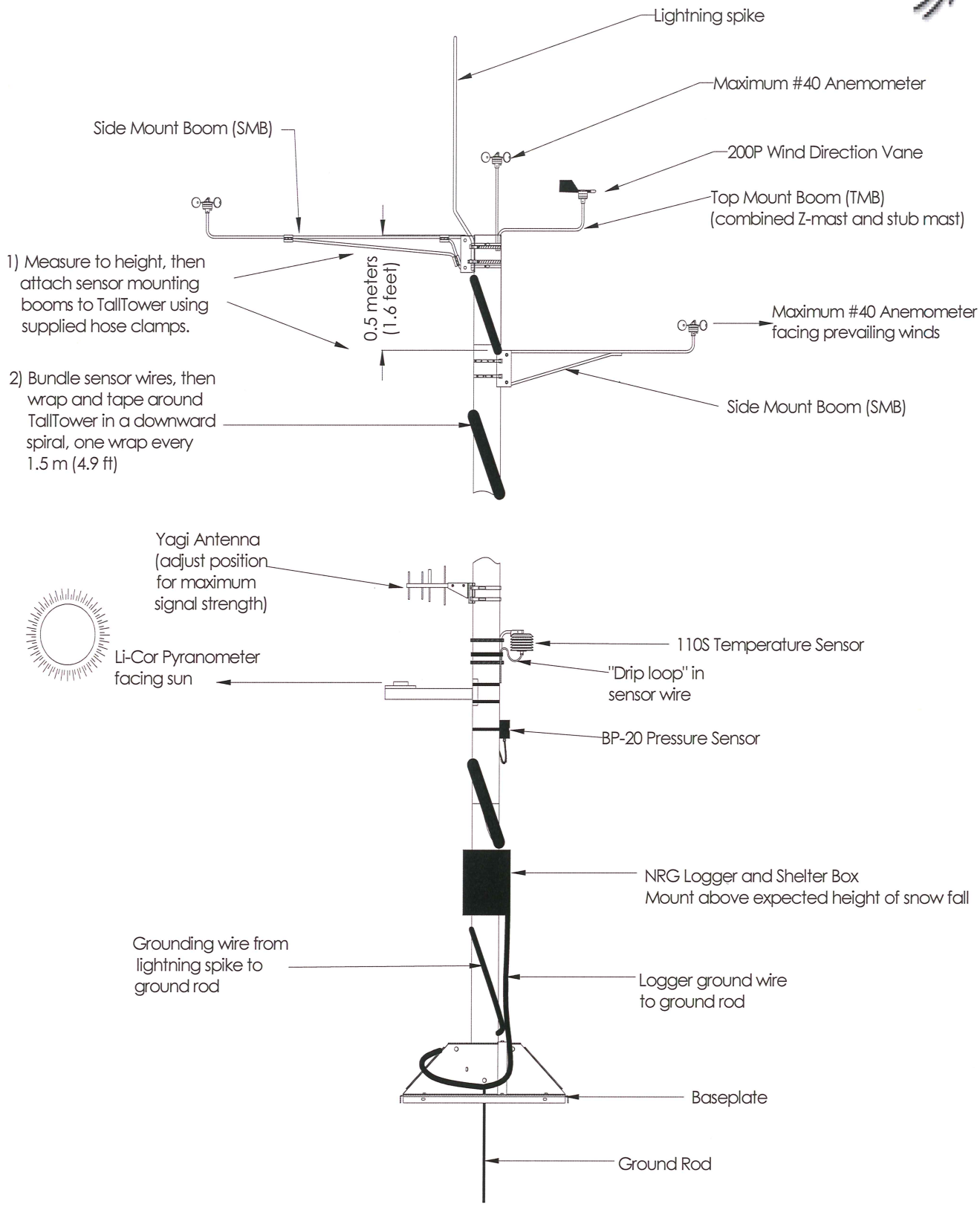
60 Meters (198 Feet)

5 Meters

50 Meters (165 Feet)

REV2 3/15

Typical Wind Monitoring Site



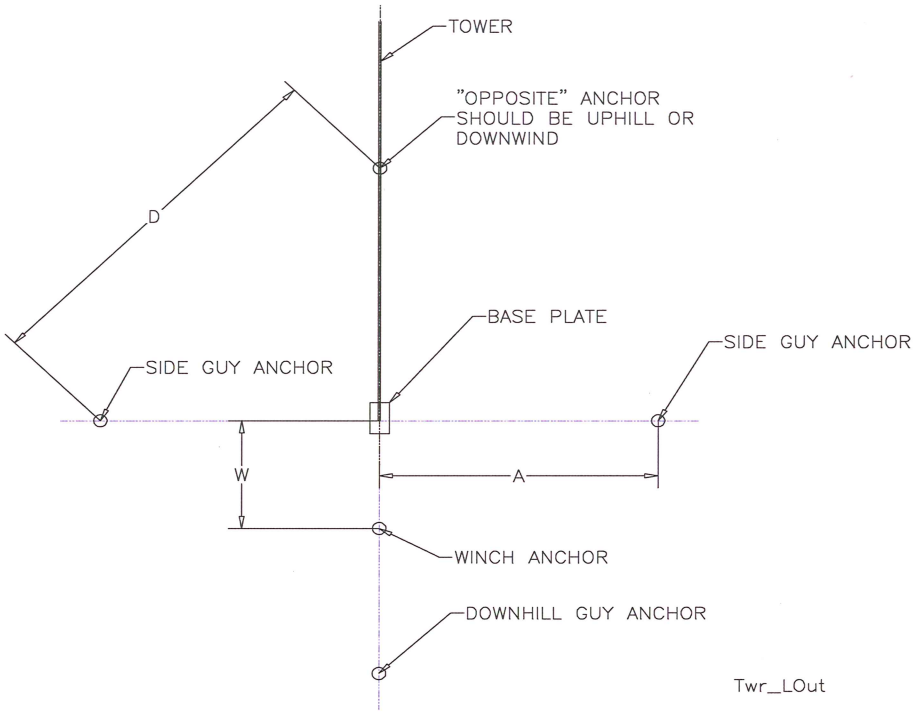


Figure 1: Tower Site Layout

Tower	Dimensions		
	A	D	W
10 m	4.9 m (16 feet)	6.9 m (22.6 feet)	N/A
20 m	12.8 m (42 feet)	18.1 m (59.4 feet)	6.1 m (20 feet)
30 m, 30 m HD, 30 m SHD	18.3 m (60 feet)	25.9 m (84.9 feet)	9.1 m (30 feet)
40 m, 40 m HD (Inner Guy Point)*	21.3 m (70 feet)	30.2 m (99 feet)	9.1 m (30 feet)*
40 m, 40 m HD (Outer Guy Point)*	22.9 m (75 feet)	32.3 m (106 feet)	9.1 m (30 feet)*
50 m, 50 m HD (Inner Guy Point)*	30.5 m (100 feet)	43.1 m (141.4 feet)	12.2 m (40 feet)*
50 m, 50 m HD (Outer Guy Point)*	33.5 m (110 feet)	47.4 m (155.6 feet)	12.2 m (40 feet)*
60 m (Inner Guy Point)♦	38.1 m (125 feet)	53.9 m (176.8 feet)	14.6 m (48 feet)*
*60 m (Middle Guy Point)♦	44.5 m (146 feet)	63 m (206.5 feet)	14.6 m (48 feet)*
60 m (Outer Guy Point)♦	50.8 m (166.6 feet)	71.9 m (235.7 feet)	14.6 m (48 feet)*

Table 1: Tower and Anchor Layout Dimensions

***40 meter and 50 meter towers have two anchors per side and two winch anchors.**

♦ 60 meter tower has three anchors per side and two winch anchors.

NOTE: The winch anchor must be in line with the tower. It is very important that the distance from the base plate to the winch anchor (dimension W in Table 1) be exact. See **Figure 2.**

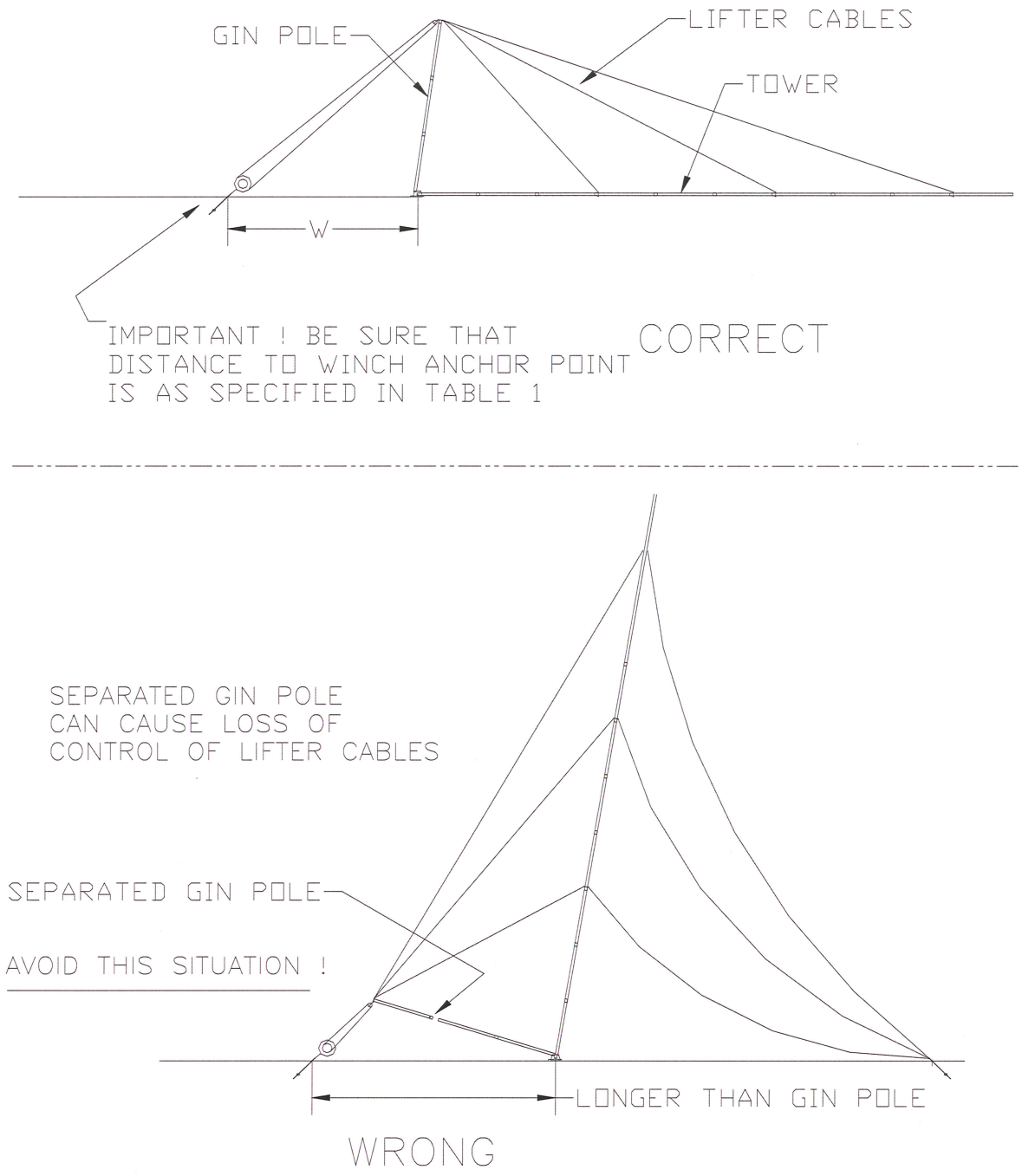


Figure 2: Winch Anchor Placement

NOTE: The gin pole safety wire **MUST** be used to prevent gin pole separation.

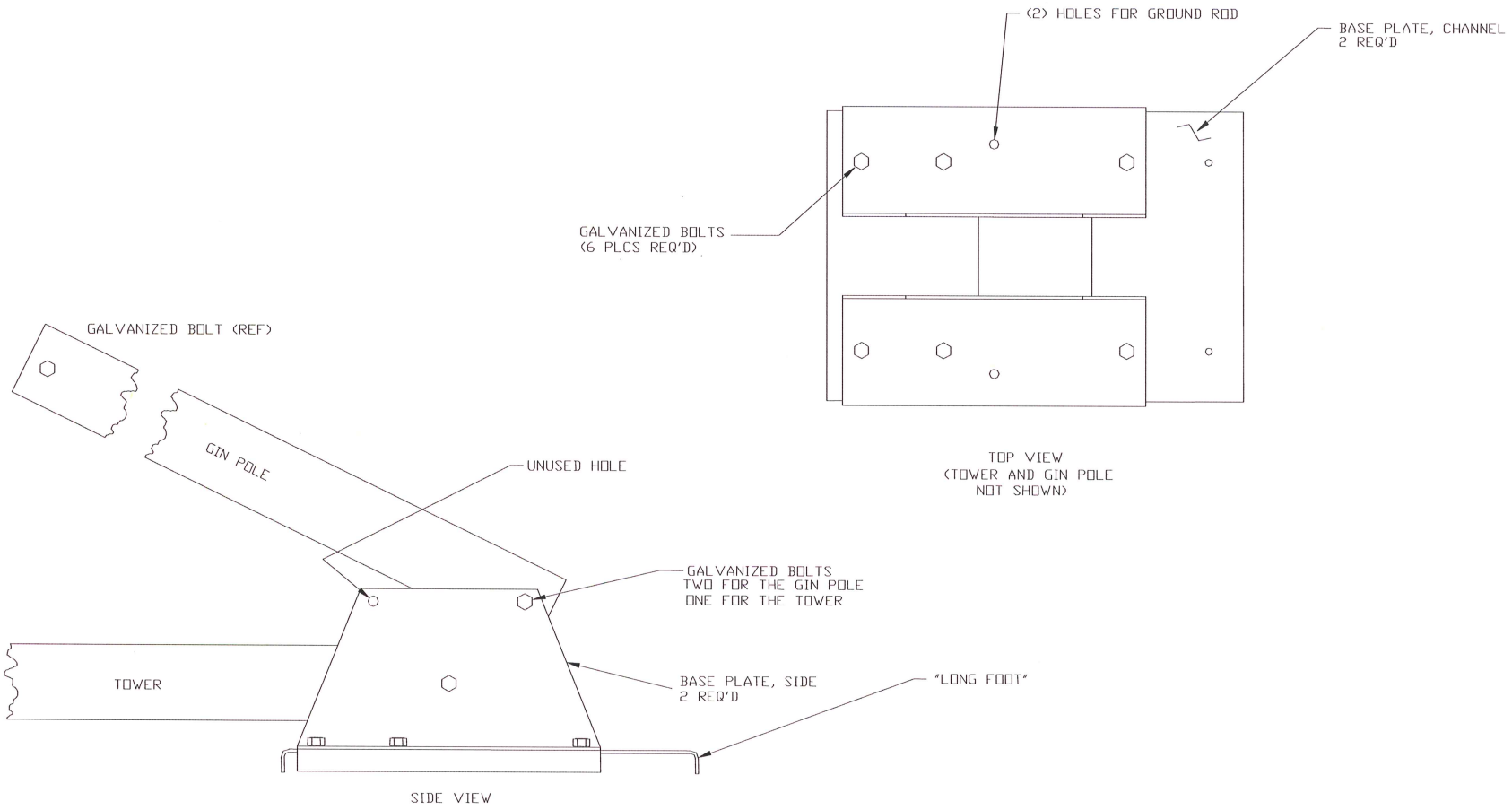


Figure 3: TallTower Base Plate Assembly (for 3.5 inch dia. towers)

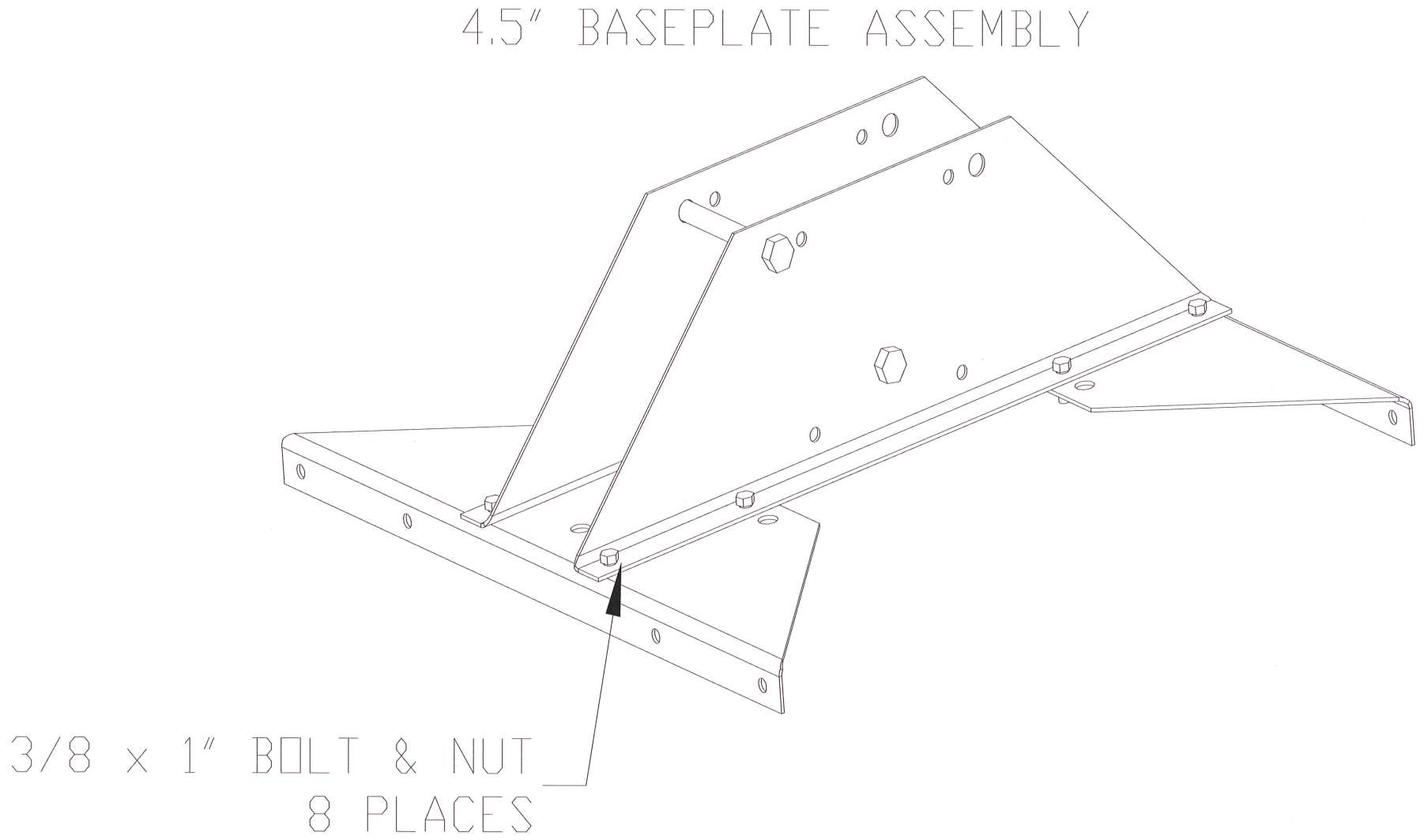


Figure 4: TallTower Base Plate Assembly (for 4.5 inch dia. towers)

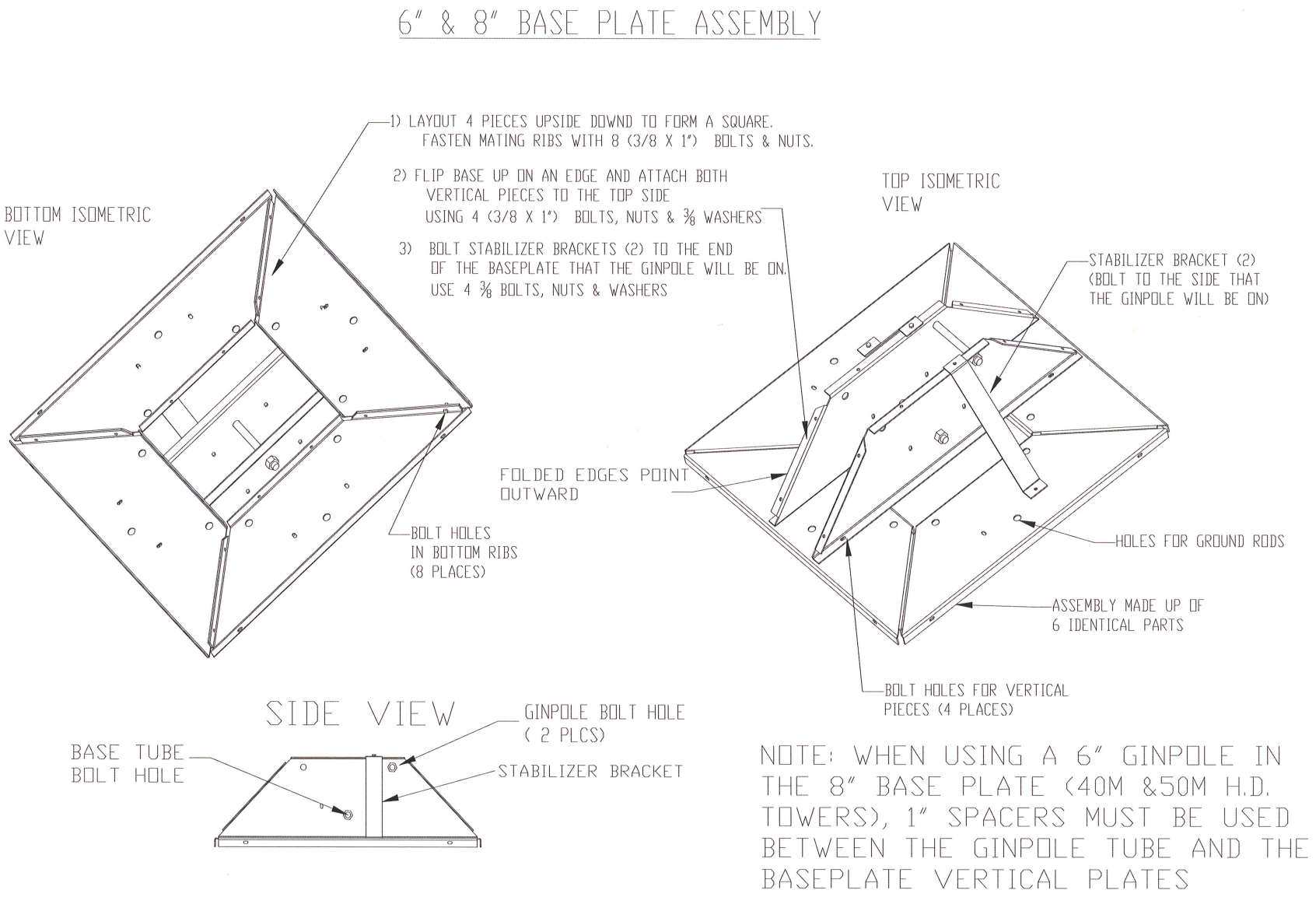


Figure 5: TallTower Base Plate Assembly (for 6 inch and 8 inch dia. towers)

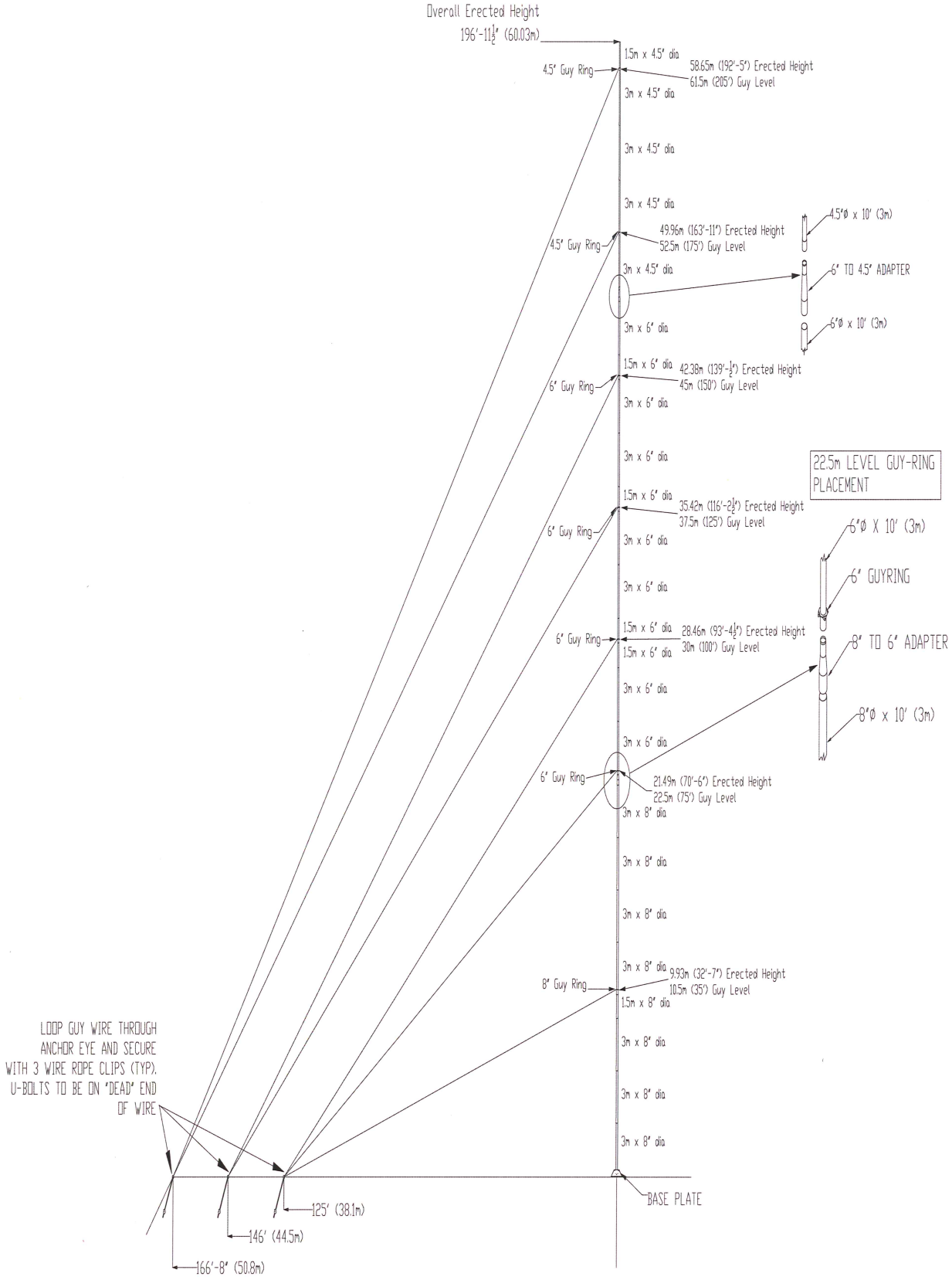


Figure 15: 60 m TallTower Assembly

Appendix A: Anchoring Guidelines

Before the tower is ordered, the soil type should be determined and the correct anchors ordered. The purpose of this section is to give you the information needed to provide suitable anchoring for your TallTower. **Because anchor requirements are site specific, it remains the responsibility of the customer to determine anchor requirements. If you are not sure what is required, seek professional guidance.** Local utility companies can often provide useful information regarding anchoring used in the site area.

The choice of anchors must take into consideration soil type, maximum winds to be experienced, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements.

Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, periodic soaking of the soil which may shift or become undermined, and icing events.

Table 3 lists the maximum anchor loads for each tower at the maximum rated wind speed. Anchors must be placed at the correct angle to provide specified holding power and to prevent shifting of the anchors under load.

Table 3: Upwind Anchor Loads

Tower size	Tube diameter	EIA-222-F wind velocity (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	6200 N (1400 pounds) at 45°	5300 N (1200 pounds) at 45°
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	7100 N (1600 pounds) at 45°	7100 N (1600 pounds) at 45°
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	9800 N (2200 pounds) at 45°
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	8500 N (1900 pounds) at 51°	12500 N (2800 pounds) at 45°
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	9800 N (2200 pounds) at 51°	16500 N (3700 pounds) at 45°
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	10200 N (2300 pounds) at 49°	14200 N (3200 pounds) at 45°
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	10700 N (2400 pounds) at 49°	18700 N (4200 pounds) at 45°
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	20500 N (4600 pounds) at 45°

NOTES:
(a) Fastest mile wind velocity per EIA-222-F at 10 meters (33 ft) above ground level
(b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.
(c) Maximum force on the winch anchor during erection

Screw-In Anchors

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. They are installed by hand, using a cross bar to screw them into the earth like a corkscrew.

Screw-in anchors can also used to provide the anchoring rod and eye for site-built anchors, such as concrete. Refer to the information on concrete anchors below.

150 mm (6.0 inches) screw-in anchors are the standard anchors supplied with NRG TallTowers.

Table 4: Specifications for Screw-In Anchors

	150 mm (6 inches) Anchor
Helix diameter:	152 mm (6.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	19 mm (0.75 inches)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	3,000 kg (6,500 pounds)
Class 6 soils *	2,300 kg (5,000 pounds)
Class 7 soils *	1,100 kg (2,500 pounds)

* Consult the Soil Classes chart, **Table 5**.

** In class 7 soils, it is advisable to place anchors deep enough to penetrate to underlying class 5 or 6 soil.

Table 5: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

Reproduced by permission, The A. B. Chance Co.

Arrowhead Anchors

Arrowhead anchors can penetrate stiff and rocky soils because the unique triangular design tends to thread its way between obstacles such as rocks, which can prevent successful installation of screw-in anchors. Arrowhead anchors are driven into the ground with a hardened steel drive rod. Once in the ground, upward force on the attached cable rotates the anchor perpendicular to the cable for maximum holding power.

Table 6: Specifications for Arrowhead Anchors

Length Overall:	1.22 m (48.0 inches).
Arrowhead Length:	203 mm (8.0 inches)
Materials:	6.35 mm (0.25 inches) galvanized (7x19) steel cable; breaking strength - 1905 kg (4200 pounds); with malleable iron head.
Holding Power:	
Class 3 soils *	1905 kg (4200 pounds)
Class 4 soils *	1361 kg (3000 pounds)
Class 5 soils *	907 kg (2000 pounds)
Class 6 soils *	544 kg (1200 pounds)
Class 7 soils *	272 kg (600 pounds)

* See **Table 5** for soil class descriptions

Rock Anchors

Rock anchors are placed into solid rock, when anchoring to either bare rock, or thin soils with solid rock near the surface. They are constructed of a threaded rod with integral eye, and two opposing wedge halves. The anchor is placed in a hole pre-drilled in the rock. Twisting the eye of the anchor forces the wedges against the sides of the hole, locking the anchor in place. Load actually increases the wedging force, developing holding power equal to the full tensile strength of the rod.

Table 7: Specifications for Rock Anchors

Holding Power:	9072 kgf (20,000 pounds)
Rod Length Overall:	0.38 m (15 inches), 0.76 m (30 inches) or 1.35 m (53 inches), other lengths available
Anchor Diameter:	44 mm (1.75 inches) as supplied, 60 mm (2.375 inches) max. expanded
Rod Diameter:	19 mm (.75 inches)
Materials:	Malleable iron, dipped in rust-resisting black paint
Required Hole Size:	50 mm (2 inches) diameter (nominal)
Use Rock Drill Size:	50 mm (2 inches) diameter

Table 8: NRG TALL TOWERS DESIGN LOADS

Tower size	Tube diameter	EIA-222-F wind velocity	Vertical base reaction (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	12500 N (2800 pounds)	6200 N (1400 pounds) @ 45	5300 N (1200 pounds) @ 45
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	13300 N (3000 pounds)	7100 N (1600 pounds) @ 45	7100 N (1600 pounds) @ 45
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	14700 N (3300 pounds)	8900 N (2000 pounds) @ 45	9800 N (2200 pounds) @ 45
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	19100 N (4300 pounds)	8500 N (1900 pounds) @ 51	12500 N (2800 pounds) @ 45
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	20500 N (4600 pounds)	9800 N (2200 pounds) @ 51	16500 N (3700 pounds) @ 45
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	26700 N (6000 pounds)	10200 N (2300 pounds) @ 49	14200 N (3200 pounds) @ 45
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	28000 N (6300 pounds)	10700 N (2400 pounds) @ 49	18700 N (4200 pounds) @ 45
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	32500 N (7300 pounds)	8900 N (2000 pounds) @ 45	20500 N (4600 pounds) @ 45

Notes:

Fastest mile wind velocity per EIA-222-F at 10 meters (33 feet) above ground level.

a) Vertical base reaction. The maximum horizontal reaction is equal to horizontal component of winch anchor reaction.

b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.

c) Maximum force on the winch anchor during tower erection.

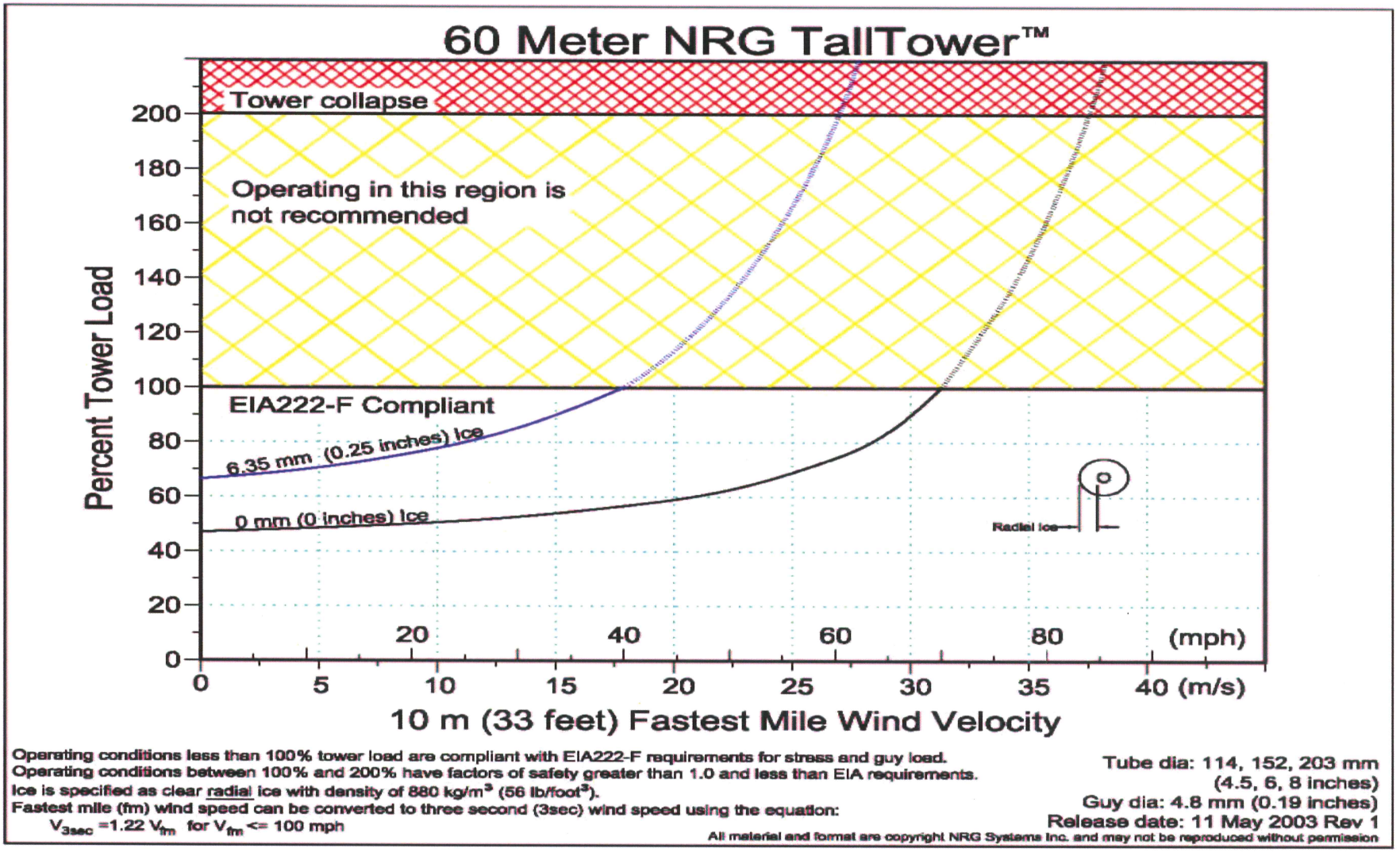


Figure 36: Tower Load and Performance Chart: 60 m TallTower

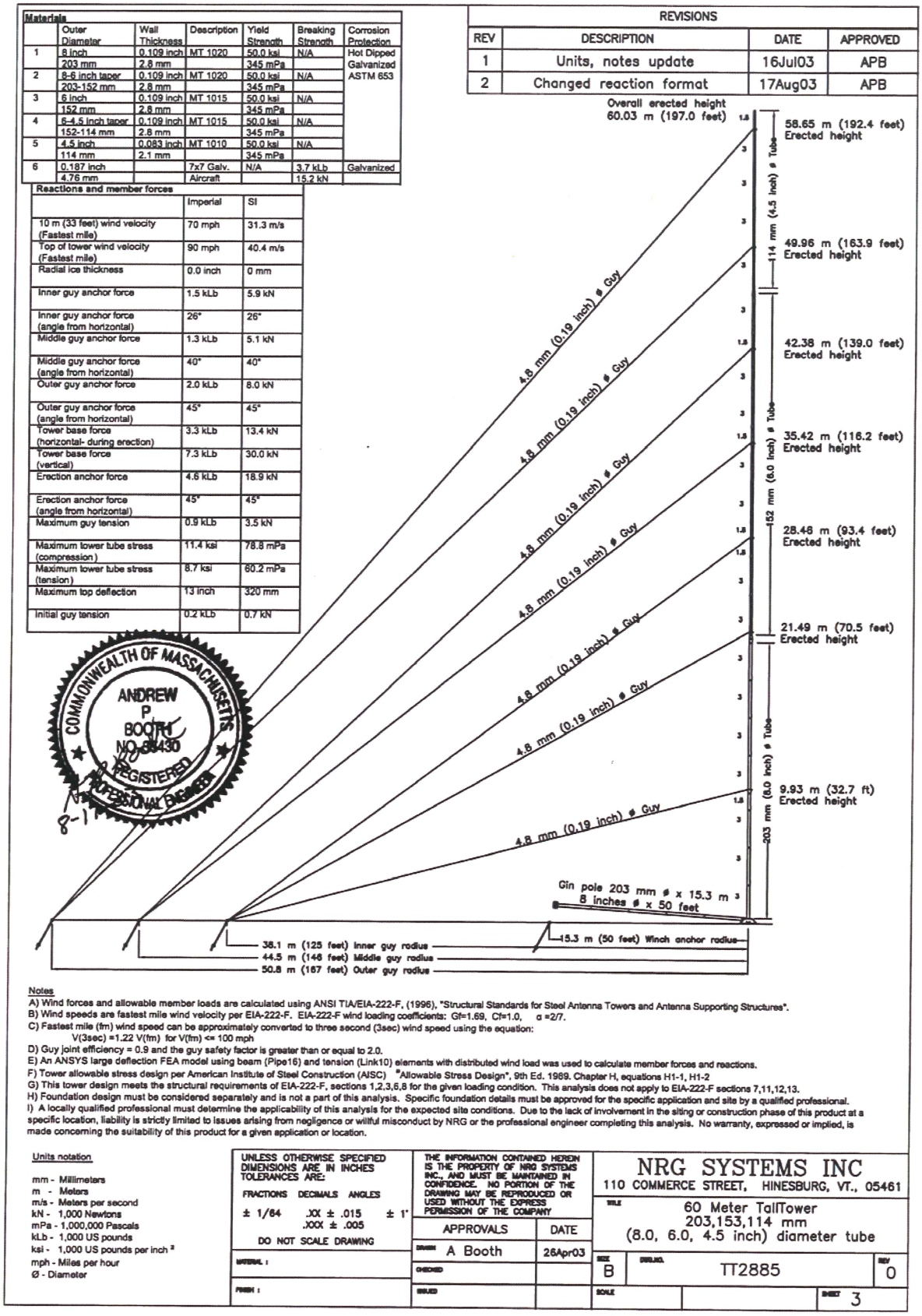


Figure 49: 60 m TallTower

2016cu008 – May 3rd, 2016

Prepared by Richard Haugen

Applicant: Heartland Wind LLC by Jesse Bermel of Iberdrola Renewables.
Land Owner: Thomas L. Murphy, 48097 201st St, White, SD 57276

Legal Description: "SW1/4 of Sec. 33, T112N, R48W (Oak Lake Township)"

2016cu008: Heartland Wind LLC is a subsidiary of Iberdrola Renewables, has applied for a conditional use # 25: Wind Energy Systems, for a meteorological tower (MET tower). A meteorological tower tracks wind speed, direction and duration. This data will be used for tracking of data for possible future wind farm. The tower will be meet the setback requirements and is located off 202nd Street an Oak Lake Township road. The applicant has an agreement with current landowner for the MET tower. Iberdrola Renewables have existing wind farms located in Brookings County.

A "Wind Energy System" is an allowed policy in the Brookings County 2016 Comprehensive Plan found in Appendix "B" on page 86 of the Comprehensive Plan.

Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Conditional Use # 25: Wind Energy Systems (WES); Article 23: Wind Energy System (WES) Requirements

The Brookings County Planning and Zoning Commission has granted Wind Energy Systems, MET towers in the past:

August 7th, 2007 – 2007cu016 and 2007cu018 – MET Tower.

November 6th, 2007 – 2007cu017A – MET Tower

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and White Tri-City Star on April 21st and 28th, 2016.

Letters were sent to the adjoining landowner's, Oak Lake Township Chairman and Clerk.

Granting the conditional use request would allow the applicant have the same benefit as others in the area with similar hardships.

Denying the conditional use request would be maintaining the agricultural use of the rural area of Brookings County.

APPLICATION FOR CONDITIONAL USE PERMIT

Date of Application: 3-29-16 Permit Number: 2016CU008

To: Brookings County Planning Commission
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Brookings County Planning & Zoning Commission of Brookings County, South Dakota, to grant a Conditional Use to the Brookings County Zoning Regulations for the purpose of:

permitting and installation of a meteorological test tower

B.) Section(s) of Zoning Regulations authorizing Conditional Use:

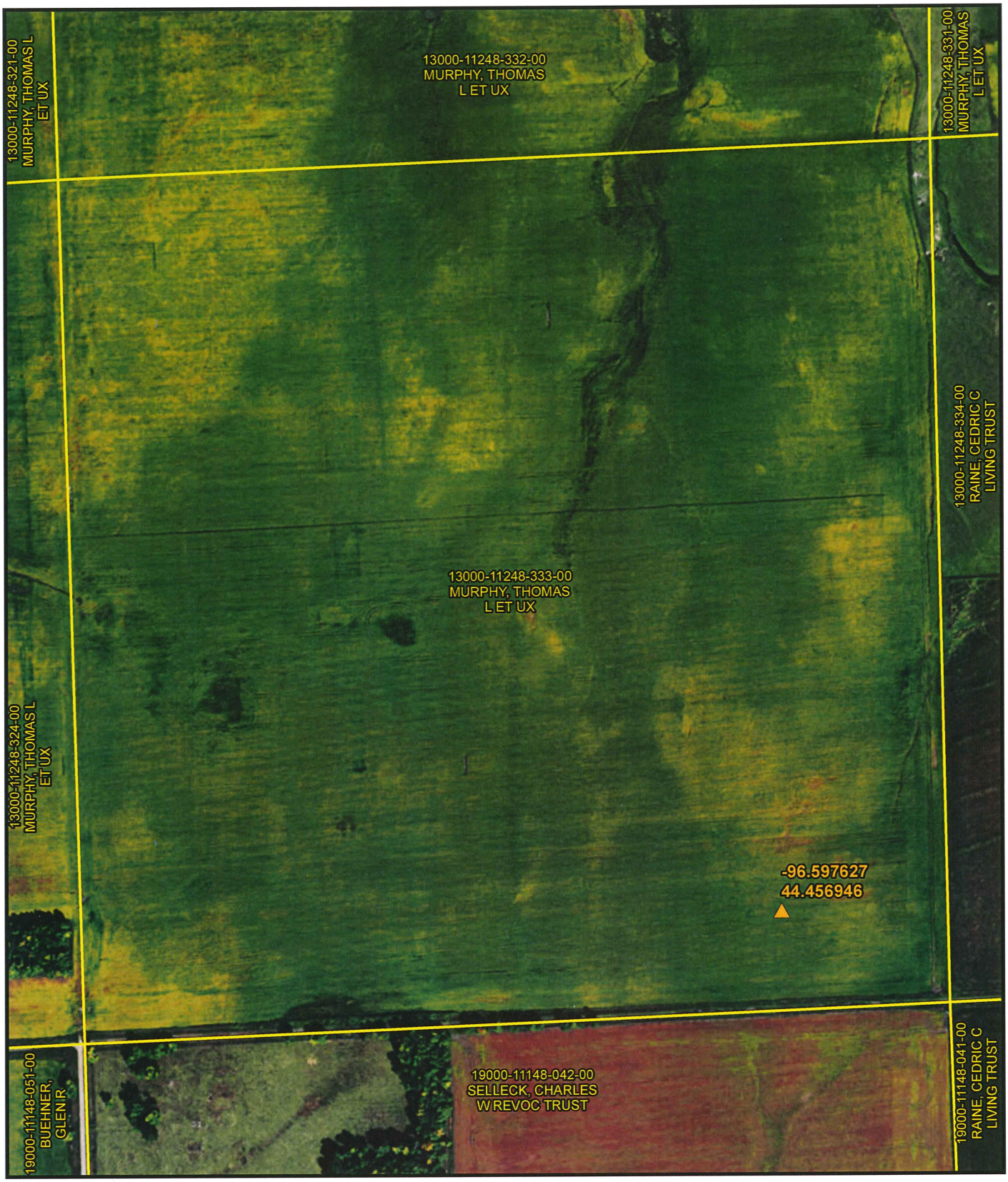
Article 11 Section 11.01: "A" Agricultural District: Conditional Use #25: Wind Energy Systems (WES); Article 23, Section 23.01: Wind Energy Systems (WES) Requirements.

C.) Legal Description of Property:

~~T112N R48W - SW¼ of Sec. 33~~

SW¼ Section 33, T112N, R48W (Oaklake Twp)
Parcel # 13000 11248 33300

Form continued on page 2



Temporary Met Tower

Buffalo Ridge IV Wind Project

Temporary Met Tower

Property

N

0 200 400 600

Feet

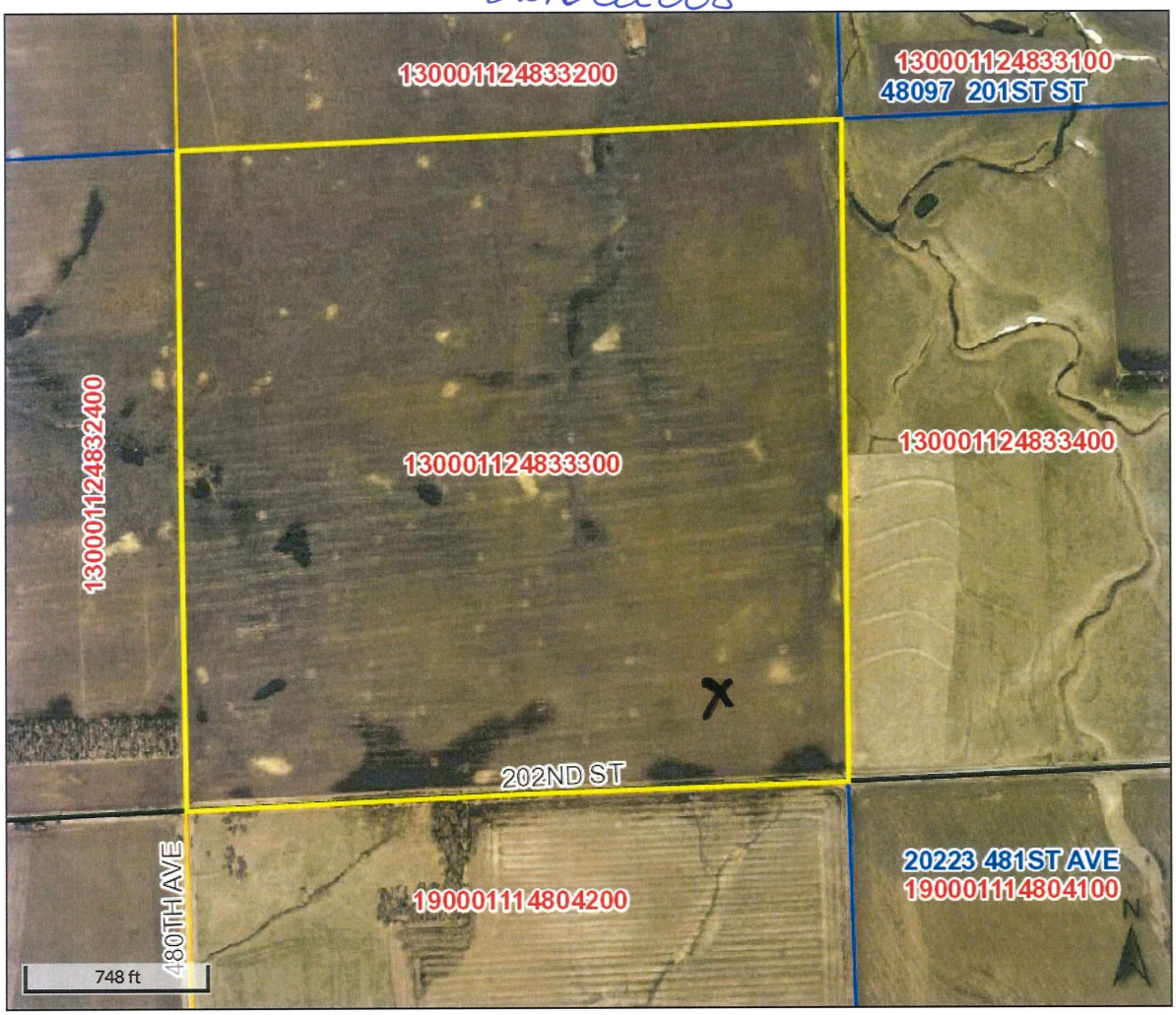
IBERDROLA RENEWABLES

Path: \\Porgis01\GIS Data\Projects\SD\Buffalo Ridge\MapDocuments\Report Figures\Met Towers\BR IV\2016-03-16\Met Towers.mxd

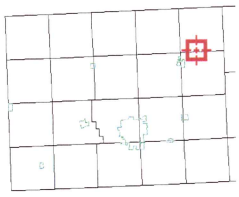
Modified Date: 3/21/2016

Beacon™ Brookings County, SD

2016CU008



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	130001124833300	**Alternate ID**	n/a	**Owner Address**	MURPHY, THOMAS L ET UX
Sec/Twp/Rng	33-112-48	**Class**	AGA		48097 201ST ST
Property Address		**Acreage**	160		WHITE SD 57276
District	1310				
Brief Tax Description	SW 1/4 SEC 33-112-48 160.0 AC				
	(Note: Not to be used on legal documents)				

Date created: 3/30/2016

Developed by
The Schneider Corporation

IBERDROLA RENEWABLES

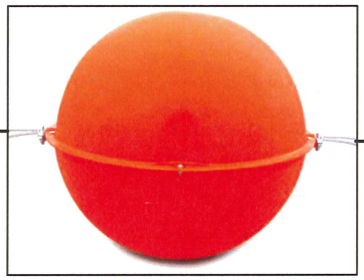
NRG Meteorological Tower Used by Iberdrola Renewables
- Standard Marking Convention -

Image depicts one side of a tower (out of four), with guy wires, sensor booms, and aircraft marker balls.

-Alternating orange and white paint, upper third of tower

-2 sets of aircraft marker balls (top is 90 feet down the wire from the tower)

-Guy guards on all wires, second set on outer wires



Aircraft Marker Ball
(8 on a complete tower)

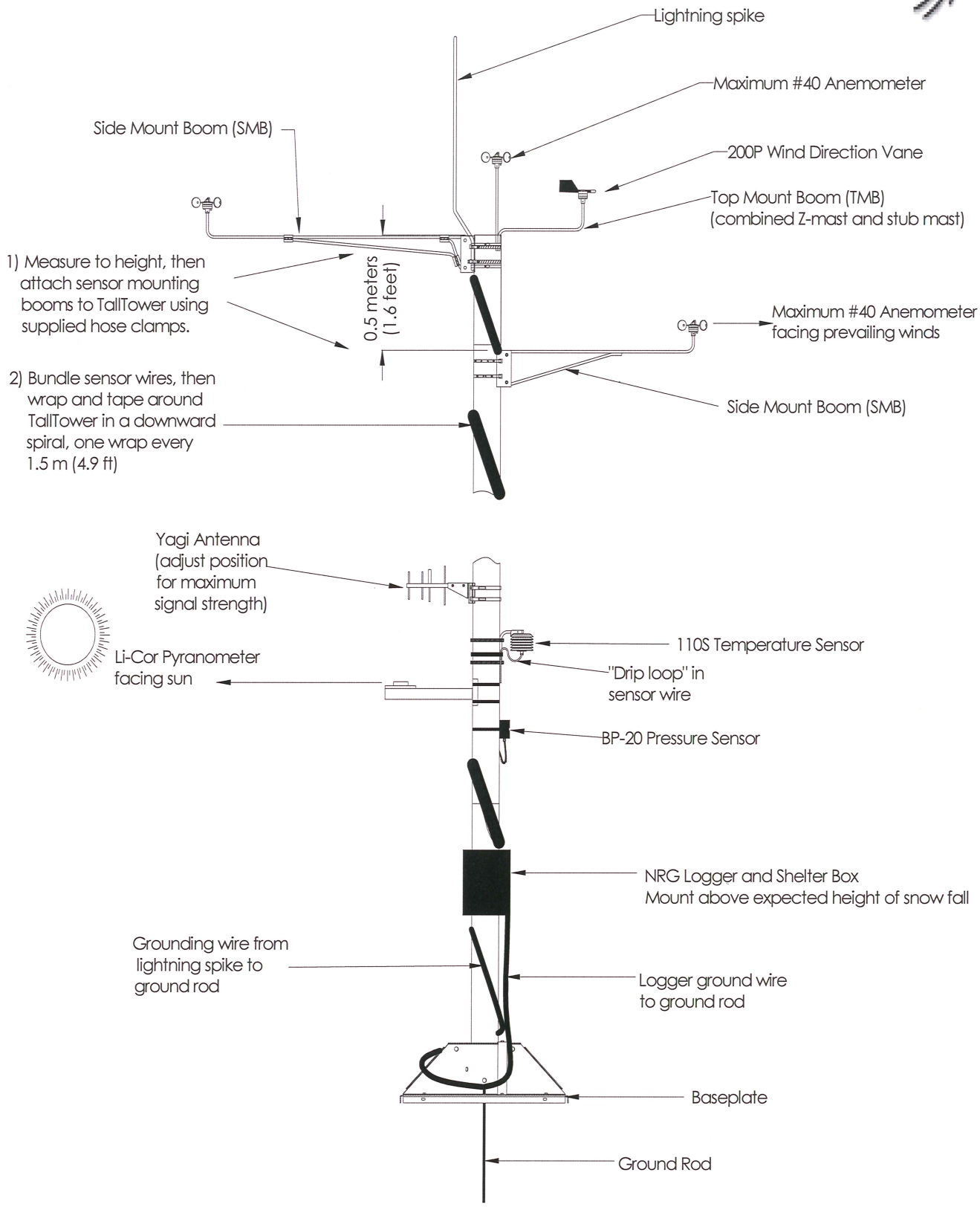
60 Meters (198 Feet)

5 Meters

50 Meters (165 Feet)

REV2 3/15

Typical Wind Monitoring Site



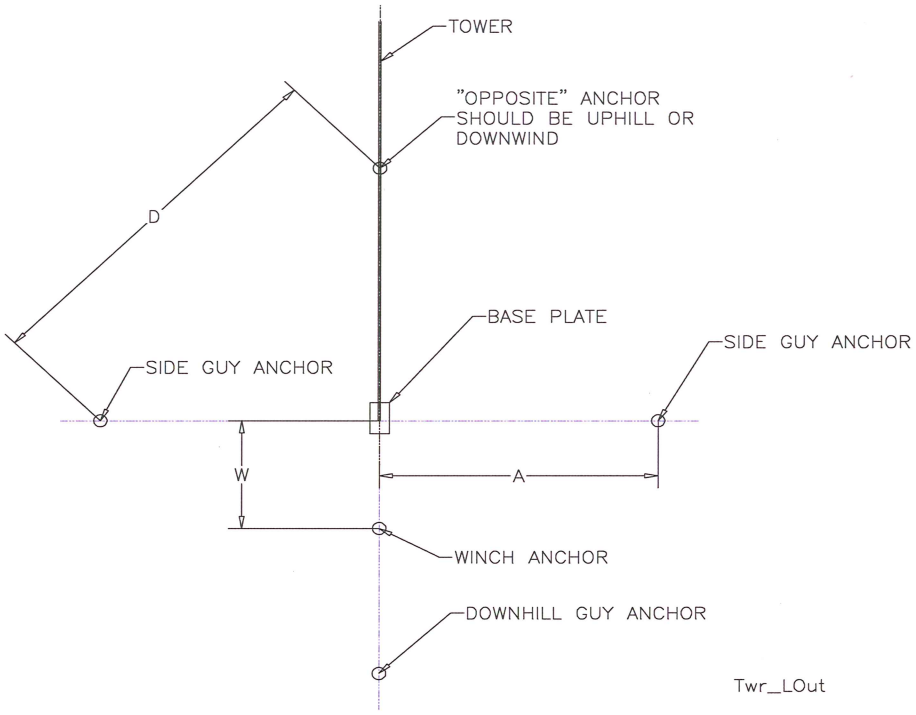


Figure 1: Tower Site Layout

Tower	Dimensions		
	A	D	W
10 m	4.9 m (16 feet)	6.9 m (22.6 feet)	N/A
20 m	12.8 m (42 feet)	18.1 m (59.4 feet)	6.1 m (20 feet)
30 m, 30 m HD, 30 m SHD	18.3 m (60 feet)	25.9 m (84.9 feet)	9.1 m (30 feet)
40 m, 40 m HD (Inner Guy Point)*	21.3 m (70 feet)	30.2 m (99 feet)	9.1 m (30 feet)*
40 m, 40 m HD (Outer Guy Point)*	22.9 m (75 feet)	32.3 m (106 feet)	9.1 m (30 feet)*
50 m, 50 m HD (Inner Guy Point)*	30.5 m (100 feet)	43.1 m (141.4 feet)	12.2 m (40 feet)*
50 m, 50 m HD (Outer Guy Point)*	33.5 m (110 feet)	47.4 m (155.6 feet)	12.2 m (40 feet)*
60 m (Inner Guy Point)♦	38.1 m (125 feet)	53.9 m (176.8 feet)	14.6 m (48 feet)*
*60 m (Middle Guy Point)♦	44.5 m (146 feet)	63 m (206.5 feet)	14.6 m (48 feet)*
60 m (Outer Guy Point)♦	50.8 m (166.6 feet)	71.9 m (235.7 feet)	14.6 m (48 feet)*

Table 1: Tower and Anchor Layout Dimensions

***40 meter and 50 meter towers have two anchors per side and two winch anchors.**

♦ 60 meter tower has three anchors per side and two winch anchors.

NOTE: The winch anchor must be in line with the tower. It is very important that the distance from the base plate to the winch anchor (dimension W in Table 1) be exact. See **Figure 2.**

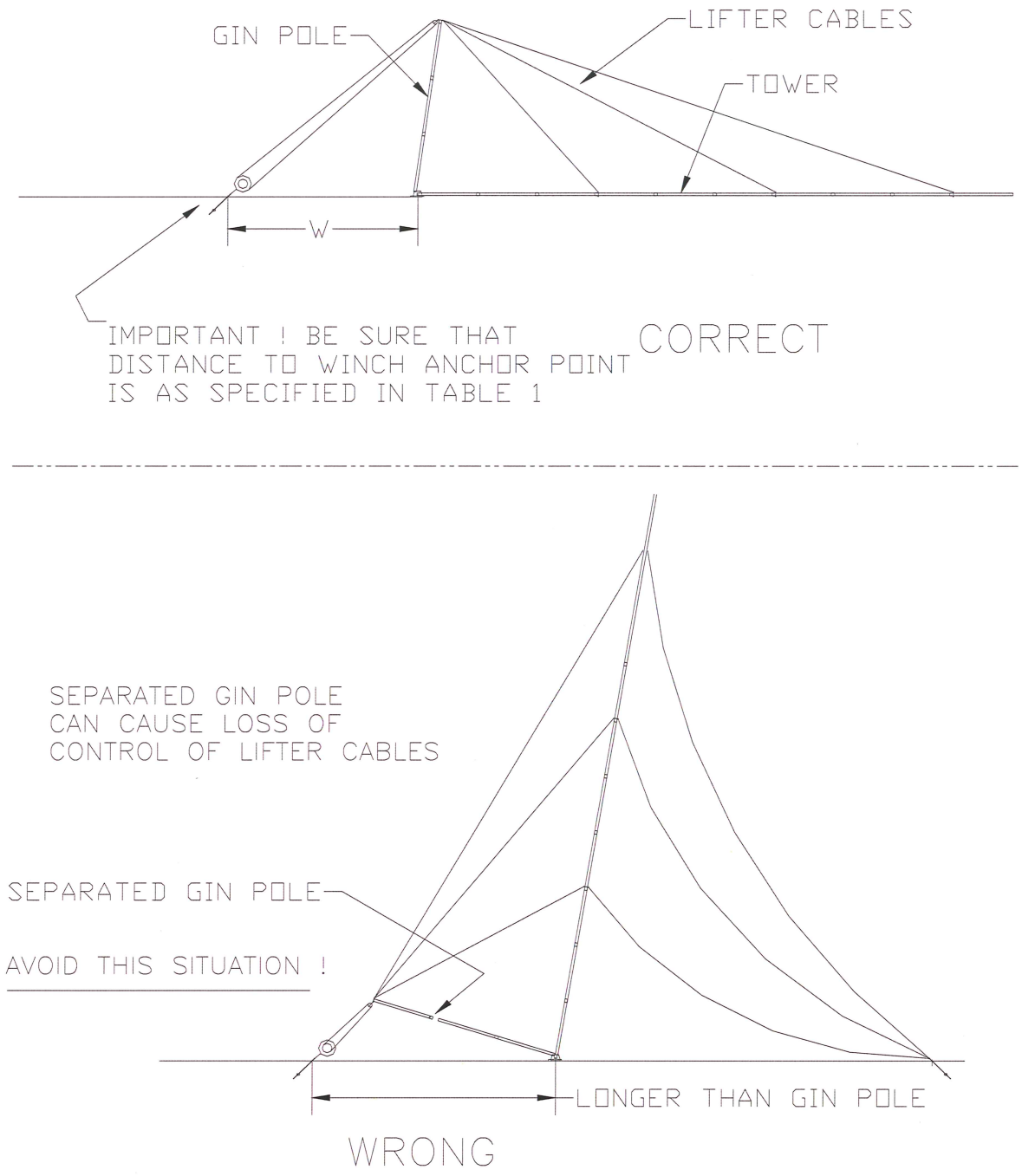


Figure 2: Winch Anchor Placement

NOTE: The gin pole safety wire **MUST** be used to prevent gin pole separation.

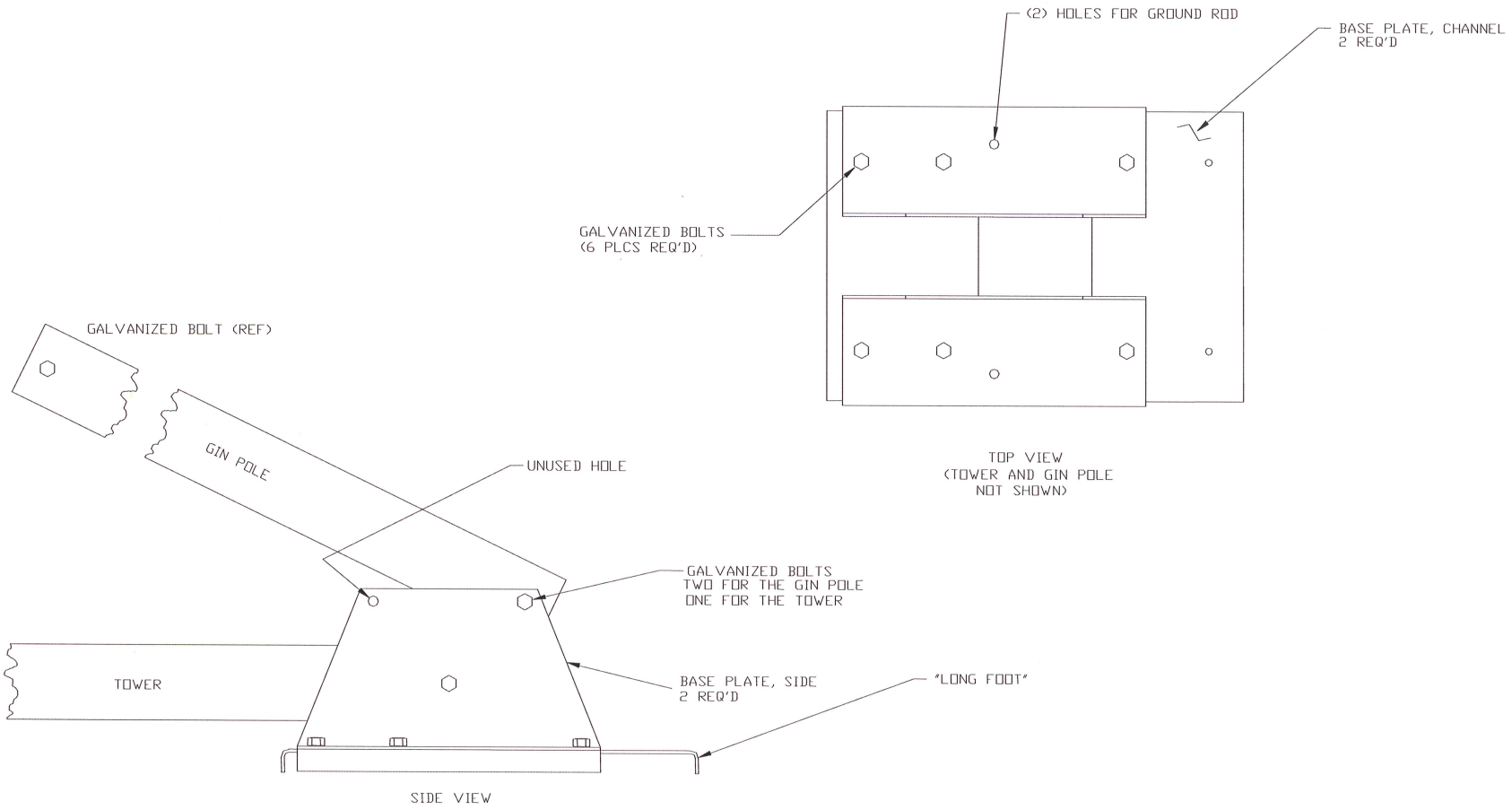


Figure 3: TallTower Base Plate Assembly (for 3.5 inch dia. towers)

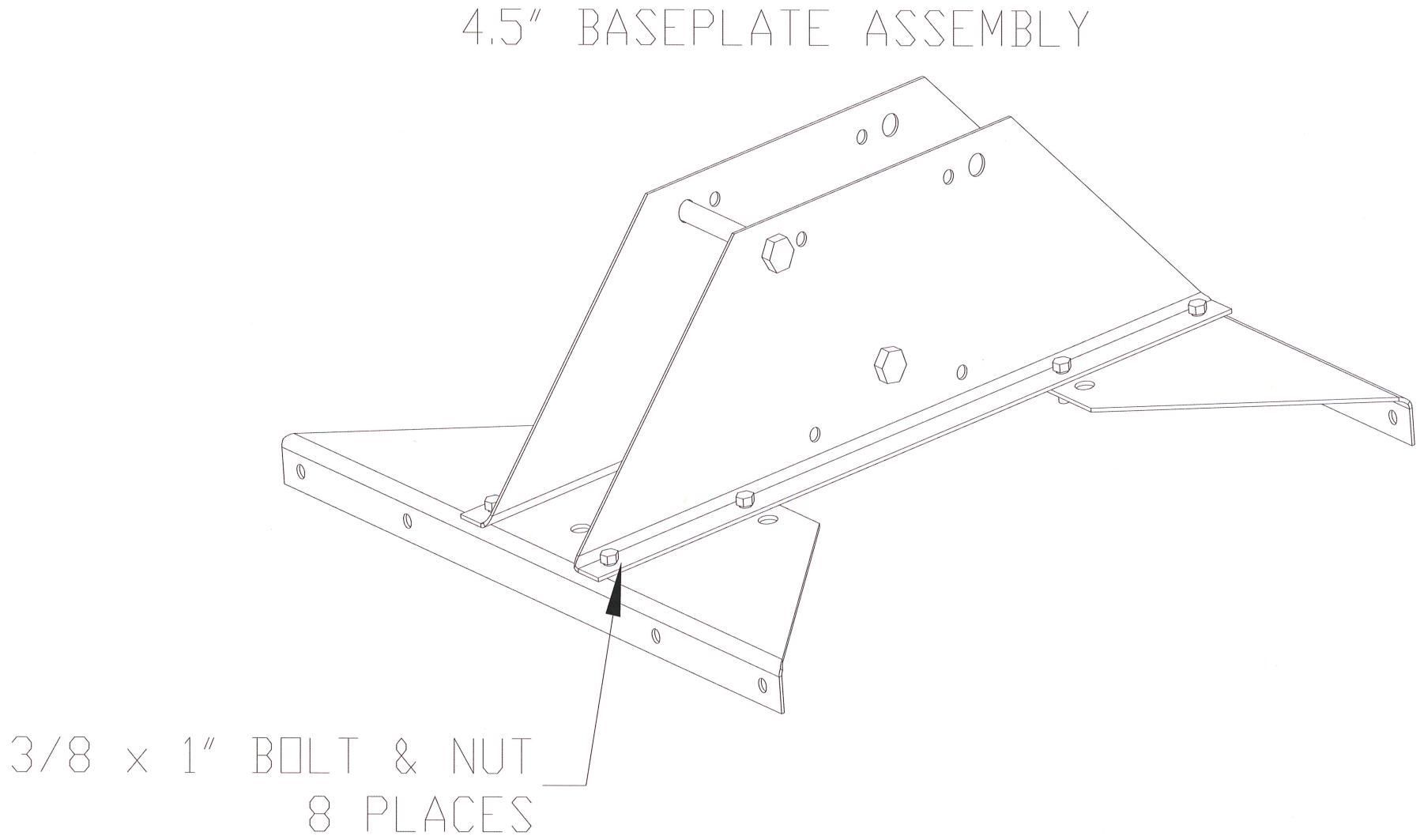


Figure 4: TallTower Base Plate Assembly (for 4.5 inch dia. towers)

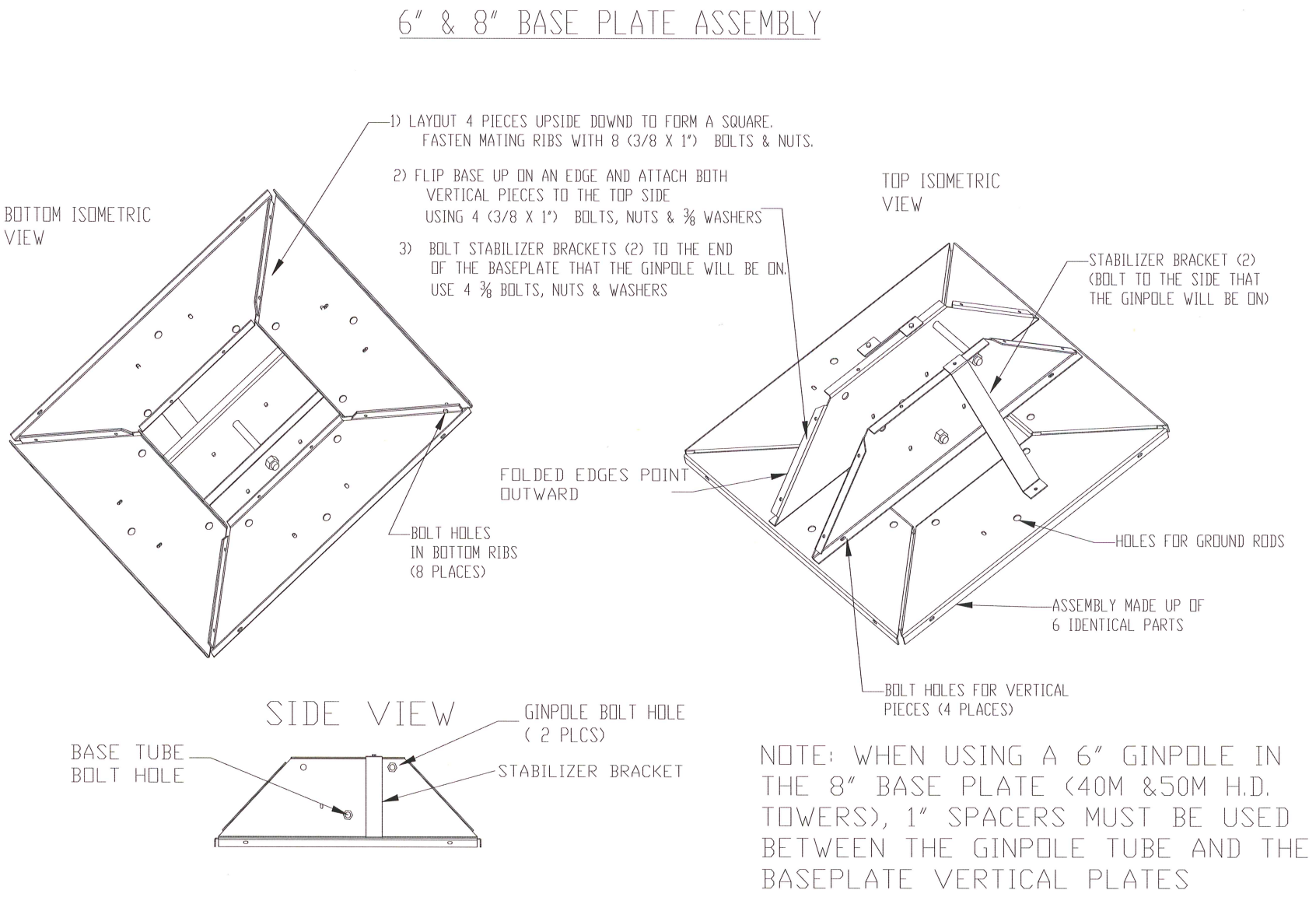


Figure 5: TallTower Base Plate Assembly (for 6 inch and 8 inch dia. towers)

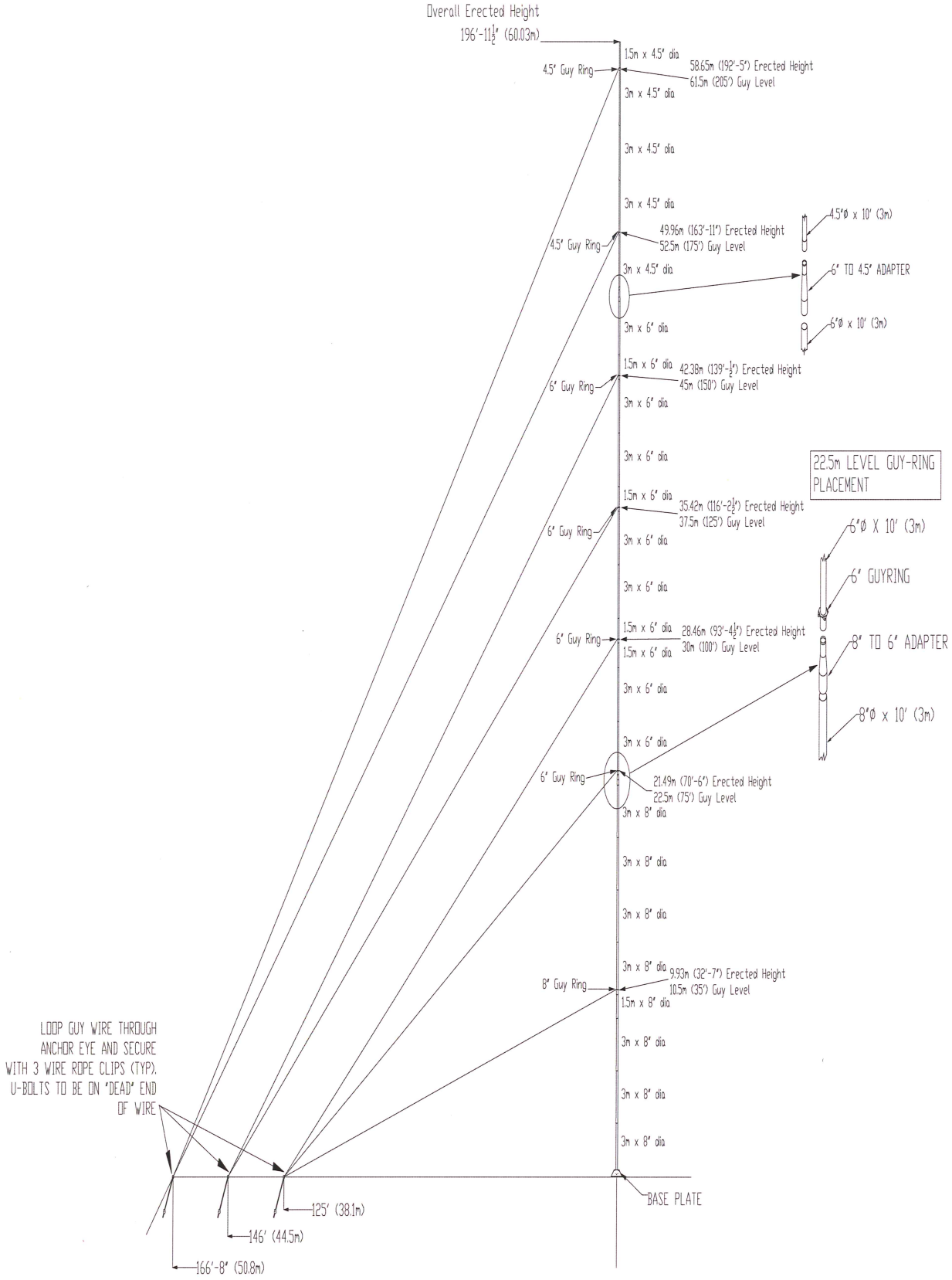


Figure 15: 60 m TallTower Assembly

Appendix A: Anchoring Guidelines

Before the tower is ordered, the soil type should be determined and the correct anchors ordered. The purpose of this section is to give you the information needed to provide suitable anchoring for your TallTower. **Because anchor requirements are site specific, it remains the responsibility of the customer to determine anchor requirements. If you are not sure what is required, seek professional guidance.** Local utility companies can often provide useful information regarding anchoring used in the site area.

The choice of anchors must take into consideration soil type, maximum winds to be experienced, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements.

Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, periodic soaking of the soil which may shift or become undermined, and icing events.

Table 3 lists the maximum anchor loads for each tower at the maximum rated wind speed. Anchors must be placed at the correct angle to provide specified holding power and to prevent shifting of the anchors under load.

Table 3: Upwind Anchor Loads

Tower size	Tube diameter	EIA-222-F wind velocity (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	6200 N (1400 pounds) at 45°	5300 N (1200 pounds) at 45°
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	7100 N (1600 pounds) at 45°	7100 N (1600 pounds) at 45°
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	9800 N (2200 pounds) at 45°
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	8500 N (1900 pounds) at 51°	12500 N (2800 pounds) at 45°
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	9800 N (2200 pounds) at 51°	16500 N (3700 pounds) at 45°
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	10200 N (2300 pounds) at 49°	14200 N (3200 pounds) at 45°
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	10700 N (2400 pounds) at 49°	18700 N (4200 pounds) at 45°
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	8900 N (2000 pounds) at 45°	20500 N (4600 pounds) at 45°

NOTES:
(a) Fastest mile wind velocity per EIA-222-F at 10 meters (33 ft) above ground level
(b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.
(c) Maximum force on the winch anchor during erection

Screw-In Anchors

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. They are installed by hand, using a cross bar to screw them into the earth like a corkscrew.

Screw-in anchors can also used to provide the anchoring rod and eye for site-built anchors, such as concrete. Refer to the information on concrete anchors below.

150 mm (6.0 inches) screw-in anchors are the standard anchors supplied with NRG TallTowers.

Table 4: Specifications for Screw-In Anchors

	150 mm (6 inches) Anchor
Helix diameter:	152 mm (6.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	19 mm (0.75 inches)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	3,000 kg (6,500 pounds)
Class 6 soils *	2,300 kg (5,000 pounds)
Class 7 soils *	1,100 kg (2,500 pounds)

* Consult the Soil Classes chart, **Table 5**.

** In class 7 soils, it is advisable to place anchors deep enough to penetrate to underlying class 5 or 6 soil.

Table 5: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

Reproduced by permission, The A. B. Chance Co.

Arrowhead Anchors

Arrowhead anchors can penetrate stiff and rocky soils because the unique triangular design tends to thread its way between obstacles such as rocks, which can prevent successful installation of screw-in anchors. Arrowhead anchors are driven into the ground with a hardened steel drive rod. Once in the ground, upward force on the attached cable rotates the anchor perpendicular to the cable for maximum holding power.

Table 6: Specifications for Arrowhead Anchors

Length Overall:	1.22 m (48.0 inches).
Arrowhead Length:	203 mm (8.0 inches)
Materials:	6.35 mm (0.25 inches) galvanized (7x19) steel cable; breaking strength - 1905 kg (4200 pounds); with malleable iron head.
Holding Power:	
Class 3 soils *	1905 kg (4200 pounds)
Class 4 soils *	1361 kg (3000 pounds)
Class 5 soils *	907 kg (2000 pounds)
Class 6 soils *	544 kg (1200 pounds)
Class 7 soils *	272 kg (600 pounds)

* See **Table 5** for soil class descriptions

Rock Anchors

Rock anchors are placed into solid rock, when anchoring to either bare rock, or thin soils with solid rock near the surface. They are constructed of a threaded rod with integral eye, and two opposing wedge halves. The anchor is placed in a hole pre-drilled in the rock. Twisting the eye of the anchor forces the wedges against the sides of the hole, locking the anchor in place. Load actually increases the wedging force, developing holding power equal to the full tensile strength of the rod.

Table 7: Specifications for Rock Anchors

Holding Power:	9072 kgf (20,000 pounds)
Rod Length Overall:	0.38 m (15 inches), 0.76 m (30 inches) or 1.35 m (53 inches), other lengths available
Anchor Diameter:	44 mm (1.75 inches) as supplied, 60 mm (2.375 inches) max. expanded
Rod Diameter:	19 mm (.75 inches)
Materials:	Malleable iron, dipped in rust-resisting black paint
Required Hole Size:	50 mm (2 inches) diameter (nominal)
Use Rock Drill Size:	50 mm (2 inches) diameter

Table 8: NRG TALL TOWERS DESIGN LOADS

Tower size	Tube diameter	EIA-222-F wind velocity	Vertical base reaction (a)	Guy anchor reaction (b)	Winch anchor reaction (c)
30 m	114 mm (4.5 inches)	31.3 m/s (70 mph)	12500 N (2800 pounds)	6200 N (1400 pounds) @ 45	5300 N (1200 pounds) @ 45
30 m HD	152 mm (6 inches)	31.3 m/s (70 mph)	13300 N (3000 pounds)	7100 N (1600 pounds) @ 45	7100 N (1600 pounds) @ 45
30 m SHD	203 mm (8 inches)	31.3 m/s (70 mph)	14700 N (3300 pounds)	8900 N (2000 pounds) @ 45	9800 N (2200 pounds) @ 45
40 m	152 mm (6 inches)	31.3 m/s (70 mph)	19100 N (4300 pounds)	8500 N (1900 pounds) @ 51	12500 N (2800 pounds) @ 45
40 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	20500 N (4600 pounds)	9800 N (2200 pounds) @ 51	16500 N (3700 pounds) @ 45
50 m	152 mm (6 inches)	31.3 m/s (70 mph)	26700 N (6000 pounds)	10200 N (2300 pounds) @ 49	14200 N (3200 pounds) @ 45
50 m HD	203 mm (8 inches)	31.3 m/s (70 mph)	28000 N (6300 pounds)	10700 N (2400 pounds) @ 49	18700 N (4200 pounds) @ 45
60 m	114, 152, 203 mm (4.5, 6, 8 inches)	31.3 m/s (70 mph)	32500 N (7300 pounds)	8900 N (2000 pounds) @ 45	20500 N (4600 pounds) @ 45

Notes:

Fastest mile wind velocity per EIA-222-F at 10 meters (33 feet) above ground level.

a) Vertical base reaction. The maximum horizontal reaction is equal to horizontal component of winch anchor reaction.

b) Maximum guy anchor reaction vector opposing the guy wires. Angle below horizontal.

c) Maximum force on the winch anchor during tower erection.

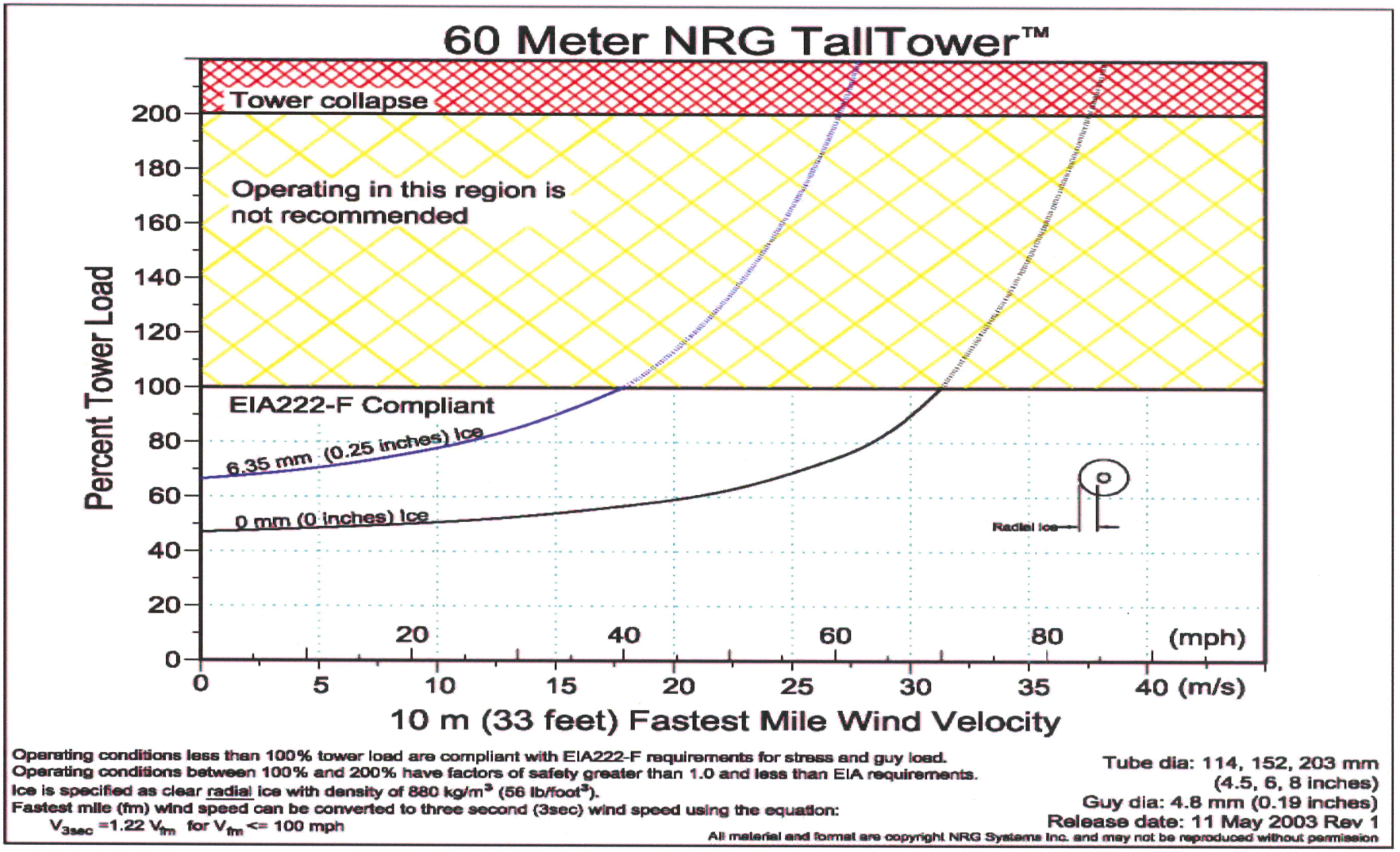


Figure 36: Tower Load and Performance Chart: 60 m TallTower

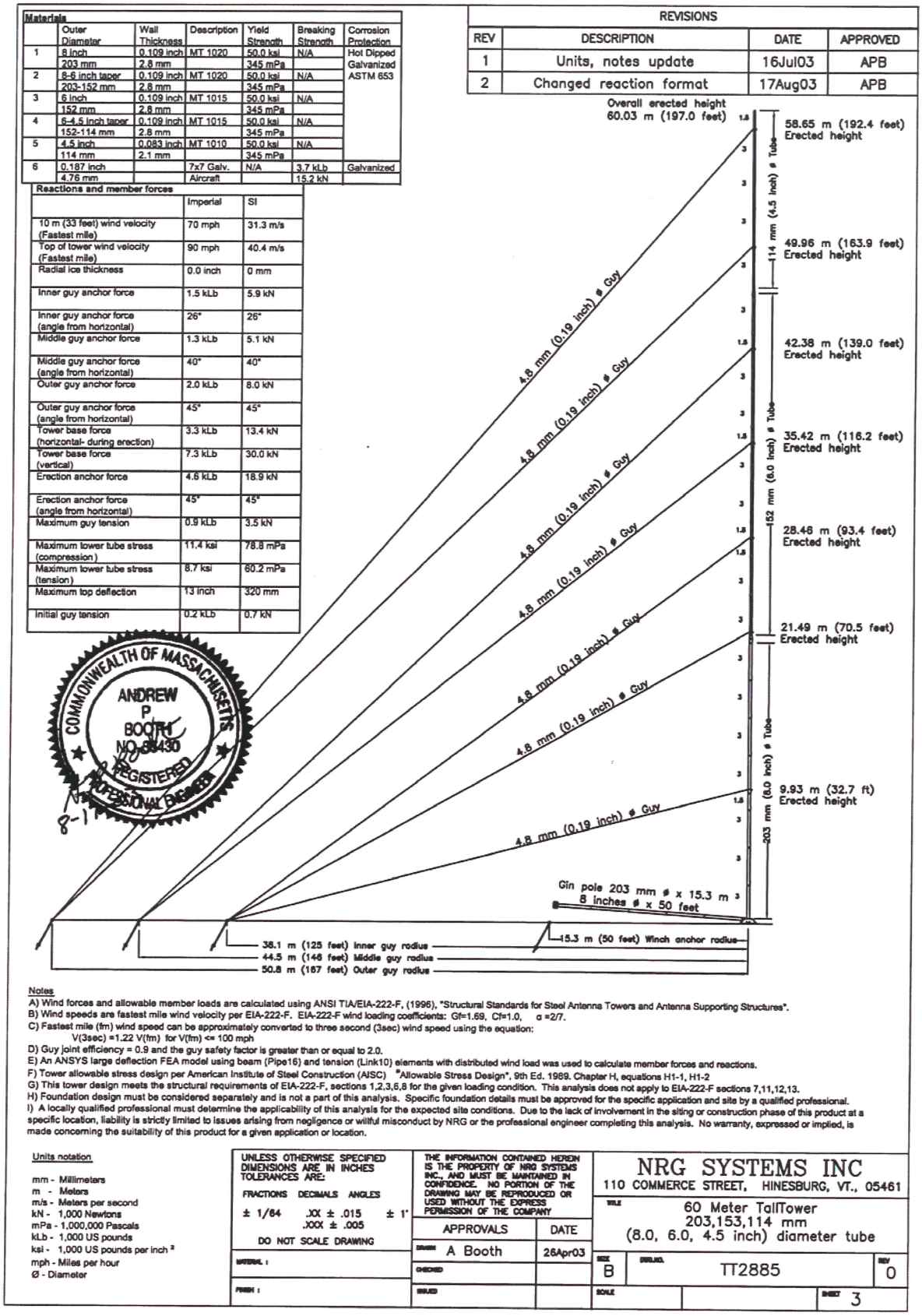


Figure 49: 60 m TallTower

2016cu009 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Michael Stern, 46898 197th St, Bruce, SD 57220

Legal Description: "E1700' Exc W1400' of E1700' of S670' of S1/2 SE1/4 of Sec. 4, T112N, R50W (Eureka Township)"

2016cu009: Michael Stern has applied for a conditional use # 20: Home Extended Business to: operate a gunsmith (firearm/gun repair) business. His business plan is attached with the following highlights: 1) He is applying for his Federal Firearms License (FFL) to enable him to repair a customer's firearm when the owner is not present and be able to buy and sell firearms, but his main business will be in the repair of firearms; 2) The business would be located in another building at his residence and not in his home; 3) His hours of operation will be Monday-Friday from 12:00pm-6:00pm; 4) He expects 1 delivery truck (UPS or FEDEX) per week, depending on parts orders; 5) Customer parking will be on the east side of the building, between the building and the driveway; 6) He has spoken with Brookings County Sherriff Marty Stanwick and given him a copy of his FFL license application.

I visited with Sherriff Stanwick and he had no objections to his request. He is located on a Brookings County gravel road. He has applied for a variance 2016var009, to be heard the same night as this, for his shop building. The Brookings County Planning and Zoning Commission did grant this same conditional use request on June 2nd 2009, 2009cu006, he did not use it within 3 years, so he is now reapplying.

A "Home Extended Business" is an allowed policy in the Brookings County 2016 Comprehensive Plan found in Appendix "B" on page 72 of the Comprehensive Plan.

Brookings County Zoning Ordinance, Article 11:00 "A" Agricultural District – Conditional Use # 20: Home Extended Business

The Brookings County Planning and Zoning Commission has granted similar home extended business in the past:

May 6, 2014: 2014cu008: FFL firearm sales.

September 3rd, 2013: 2013cu010: rebuilding and sale of farm trucks.

April 3rd, 2012: 2012cu003: used car dealer.

January 4th, 2011: 2011cu001: bakery.

June 1st, 2010: 2010cu005: body shop.

Public notices were published in the Brooking Register on April 19th and 26th, 2016 and Volga Tribune on April 21st and 28th, 2016.

Letters were sent to the adjoining landowner's, Eureka Township Chairman and Clerk.

Granting the conditional use request would allow the applicant have the same benefit as others in the area with similar extended home businesses.

Denying the conditional use request would be maintaining the Agricultural use in the Zoning Ordinance.

APPLICATION FOR CONDITIONAL USE PERMIT

Date of Application: 10 April 2016 Permit Number: 2016cu009

To: Brookings County Planning Commission
520 3rd St, Suite 200
Brookings, South Dakota 57006

A.) I/We, the undersigned property owner (s), do hereby petition the Brookings County Planning & Zoning Commission of Brookings County, South Dakota, to grant a Conditional Use to the Brookings County Zoning Regulations for the purpose of:

I petetion Brookings County Zoning Commission to grant a conditional use permit to allow a gunsmithing business to start operation on my home property. I plan to construct a seperate building, away from the home to opperate my business.

B.) Section(s) of Zoning Regulations authorizing Conditional Use:

Article 11: Section 11.01: "A" Agricultural District, Conditional Use #20: "Home Extended Business.

C.) Legal Description of Property:

The E1700' except the W1400' of the E1700' of the S. 670' thereof in the S½ of the SE¼ of ~~Section 4 T112N R50W~~ Sec. 4, T112N, R50W Brookings County

(Eureka Twp)
Parcel # 089801125004410

Form continued on page 2

RECEIVED
APR 11 2016
BROOKINGS COUNTY
ZONING & DRAINAGE

STERN CUSTOM GUNSMITHING INC.

MICHAEL STERN: PRESIDENT

46898-197ST

BRUCE, SD 57220

Stern Custom Gunsmithing Inc. (SCG Inc.) will be a full service firearm repair shop, specializing in custom rifles and handguns, as well as general repairs, and limited retail. Ten years of full time experience and thousands of firearms have passed through my hands. I was employed the last ten years at Gary's Gunshop as a full time gunsmith. Prior to my employment, I attended Colorado School of Trades in Lakewood, Colorado and graduated in the top 10 percent of the school with a degree in gunsmithing.

I am proposing to build a shop on our farm, located at 46898-197st Bruce, SD. My wife, Laura, and I, and our four children have lived here almost eight years, raising registered Limousin cattle. By building and starting my business on the farm, I can concentrate on the shop without the worry and loss of the livestock.

The shop will be about 1,280 square feet, including a customer lounge area separate from the shop floor. Security will include surveillance cameras and a security alarm. I have visited with Brookings County Sheriff Martin Stanwick and gave him a copy of my FFL application to file. The shop will abide by BATFE's guidelines and regulations. The corporation is filed and in good standing with the Secretary of the State of South Dakota. SCG Inc. will be insured against liability.

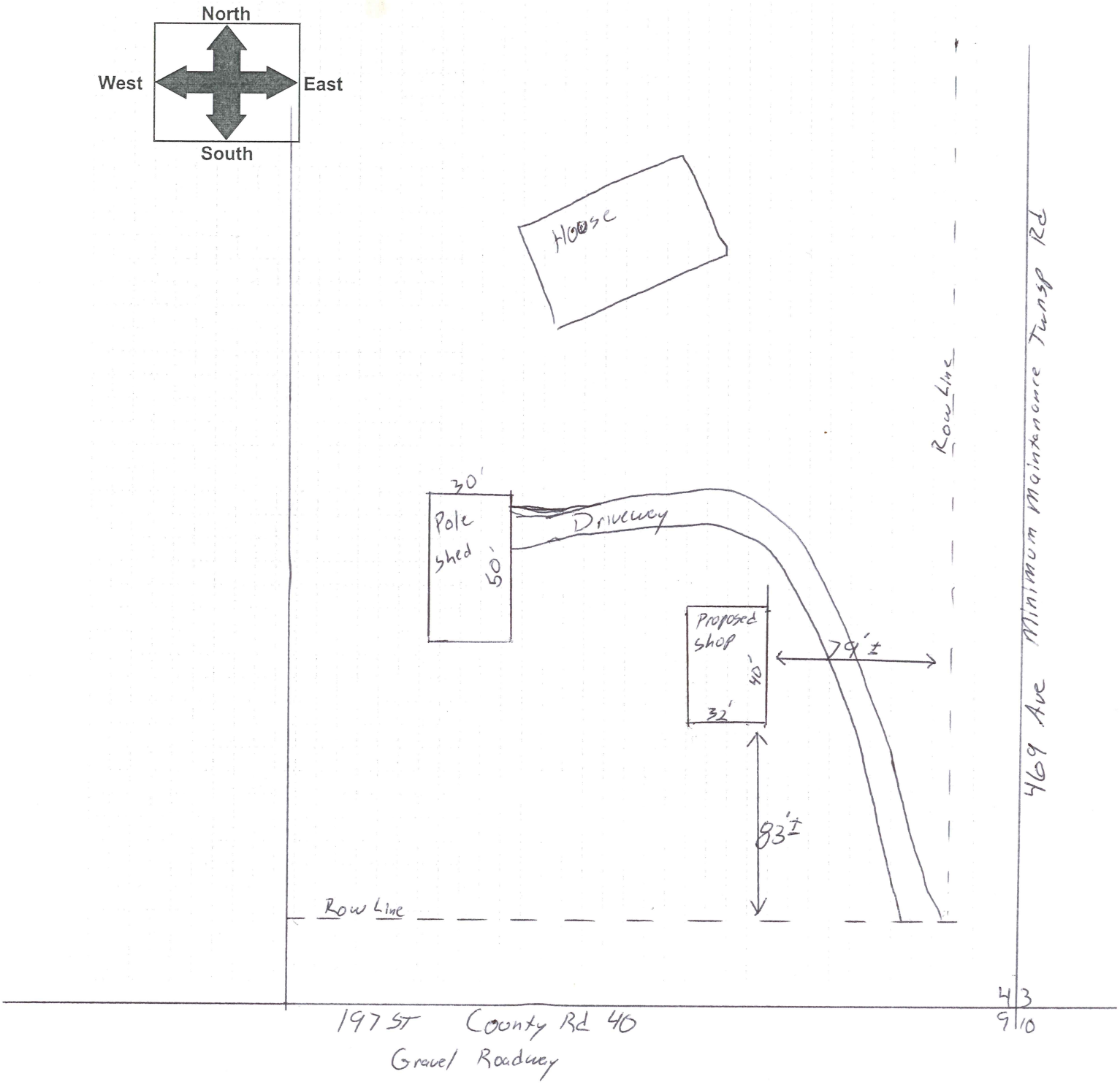
Business hours will be 12:00 to 6:00 Monday-Friday, and available by appointment after hours. The shop's entrance will be on the east side of the building with parking. Hopefully by keeping the shop away from the rest of the farm, I can prevent people from "drifting" around our home. I expect approximately 100 customers a month when in full swing, not including shipments. I will be advertising online and expect repair shipments via UPS and FEDEX. It is hard to gauge the delivery traffic, but I will estimate once a week.

Firearm sales will be very minimal, as I cannot compete with the larger gun stores. This being said, I do intend to sell firearms by order only. My primary business objective is in repairs.

2016 CUP 09

SKETCH

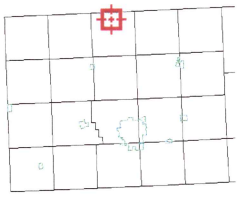
Please draw a sketch of the site. Show both the existing and the proposed structures. Include the location of public roads, septic treatment systems, feedlots, streams, lakes and drainage ditches.



Beacon™ Brookings County, SD

2016 var 009 + 2016 cu 009

Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	089801125004410	**Alternate ID**	n/a	**Owner Address**	STERN, MICHAEL ET UX
Sec/Twp/Rng	4-112-50	**Class**	AGC		46898 197TH ST
Property Address	46898 197TH ST BRUCE	**Acreage**	29.99		BRUCE SD 57220

District 0808

Brief Tax Description E 1700' EXC W 1400' OF E 1700' OF S 670' OF S1/2 SE1/4 SEC 4-112-50 29.99 AC
(Note: Not to be used on legal documents)

Date created: 4/14/2016

Developed by
The Schneider Corporation

2016var009 & 2016cu009: Michael Stern

South edge of building

North end of building

West end of building

2016plat002 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Risty Farms Inc., 45956 216th St, Volga, SD 57071

Legal Description: "Plat of Lots 1 & 2 of Risty Addition in the SW1/4 of Section 8, Township 109 North, Range 52 West of the 5th P.M., Brookings County, South Dakota."

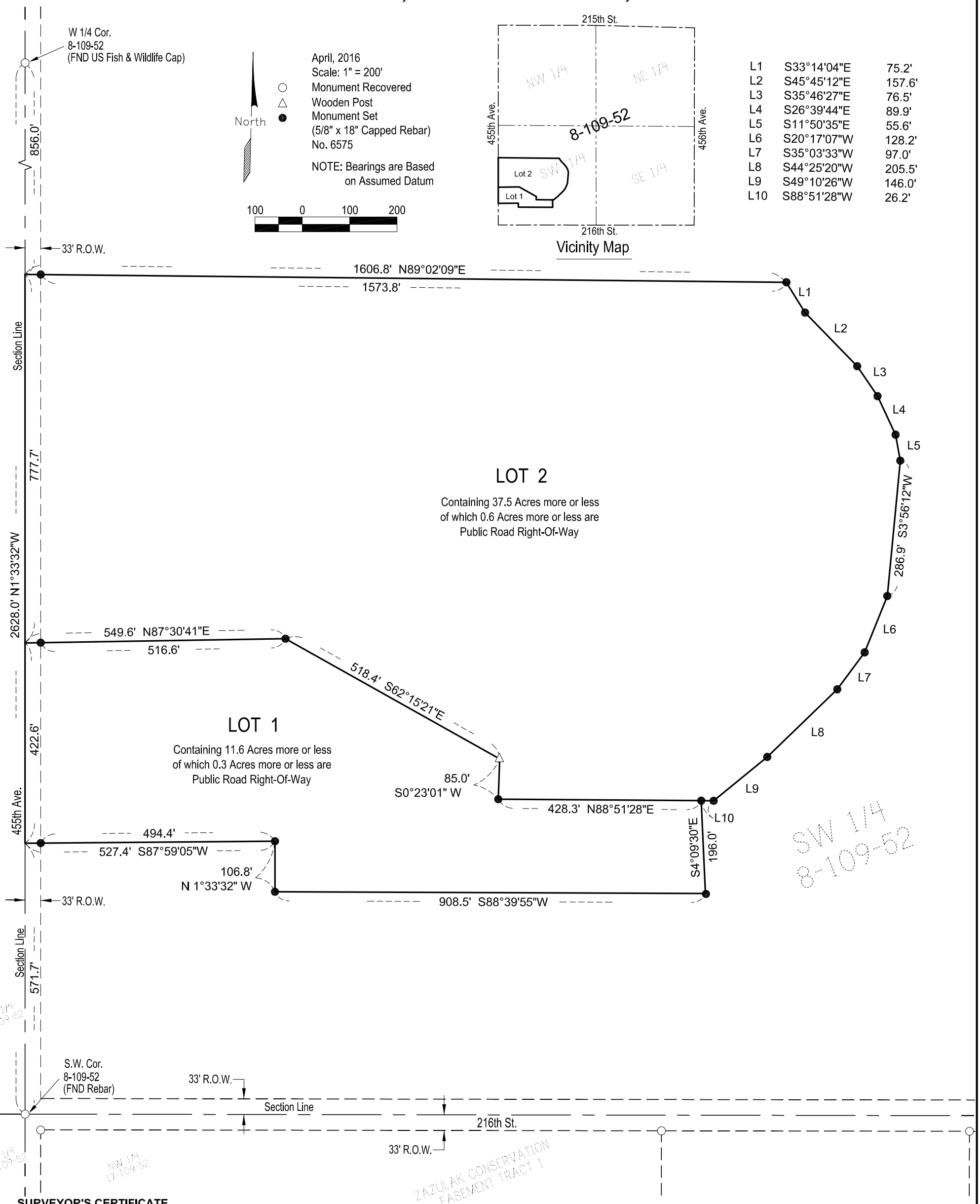
2016plat002: Risty Farms Inc. has submitted a plat for Lot 1 and Lot 2 of Risty Addition, with an address of 21586 455th Ave, Arlington, SD 57212, located in the SW1/4 of Section 8, T109N, R52W which they own. Lot 1 is for 11.6 acre existing building site and Lot 2 is for 37.5 acres of a wetland area.

Subdividing of an established building site is an allowed policy in the 2016 Brookings County Comprehensive Plan; "Exception to large lot residential development"- Policy # 3 found on page 45 of the Comprehensive Plan.

Established residences are a permitted use in the Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Permitted Uses # 2, found on page 11.00-1.

PLAT OF

LOTS 1 & 2 OF RISTY ADDITION IN THE SW ¼ OF SECTION 8, TOWNSHIP 109 NORTH, RANGE 52 WEST OF THE 5TH P.M., BROOKINGS COUNTY, SOUTH DAKOTA



SURVEYOR'S CERTIFICATE

I, Mike J. Lapka, a Registered Land Surveyor of the State of South Dakota, do hereby certify that I did on or before April 7th, 2016, survey a parcel of land located in the SW¼ of Section 8, T109N, R52W of the 5th P.M., Brookings County, South Dakota, as shown on the plat, and marked upon the ground thereof in the manner shown on the plat and that the attached is a true and correct representation of said survey and that the parcel of land so platted contains: **"PLAT OF LOTS 1 & 2 OF RISTY ADDITION IN THE SW ¼ OF SECTION 8, TOWNSHIP 109 NORTH, RANGE 52 WEST OF THE 5TH P.M., BROOKINGS COUNTY, SOUTH DAKOTA."**

IN WITNESS WHEREOF, I have executed the Surveyor's Certificate this 7th day of April, 2016.

Prepared By:

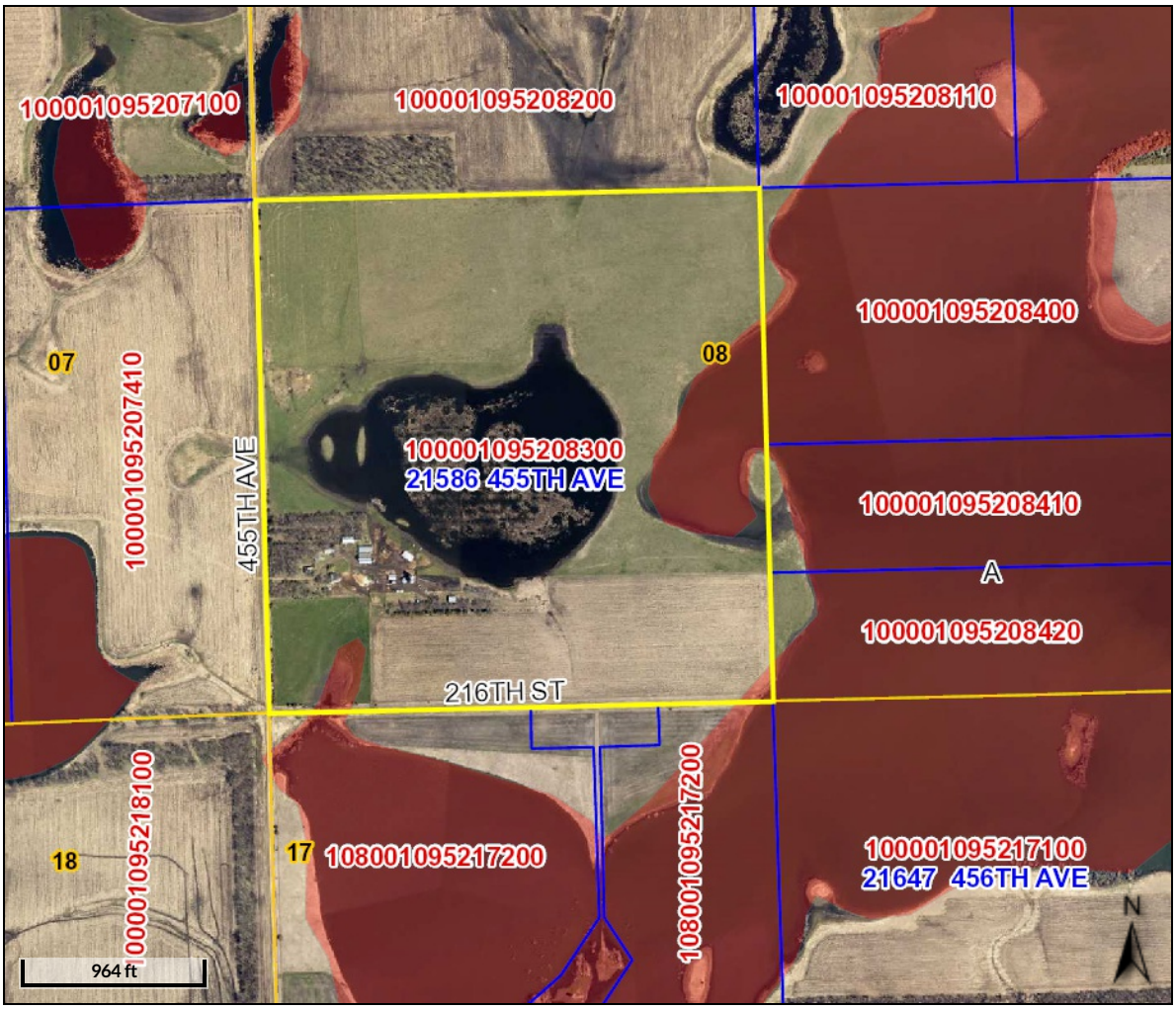
CIVIL DESIGN INC

Civil Engineers & Land Surveyors

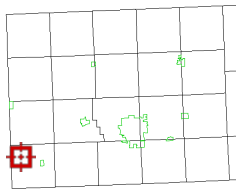
Brookings, South Dakota

Ph. 605-696-3200

Beacon™ Brookings County, SD



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Floodplain 2008

- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE
- X

Parcel ID	100001095208300	**Alternate ID**	n/a	**Owner Address**	RISTY FARMS INC
Sec/Twp/Rng	8-109-52	**Class**	AGA		45956 216TH ST
Property Address	21586 455TH AVE ARLINGTON	**Acreage**	160		VOLGA SD 57071
District	1009				
Brief Tax Description	SW 1/4 SEC 8-109-52 160.0 AC (Note: Not to be used on legal documents)				

Date created: 4/12/2016

Developed by
The Schneider Corporation

2016plat003 – May 3rd, 2016

Prepared by Richard Haugen

Applicant/Owner: Risty Farms Inc., 45956 216th St, Volga, SD 57071

Legal Description: "Plat of Lot 1 of Wills Addition in the SE1/4 of Section 12, Township 109 North, Range 52 West of the 5th P.M., Brookings County, South Dakota."

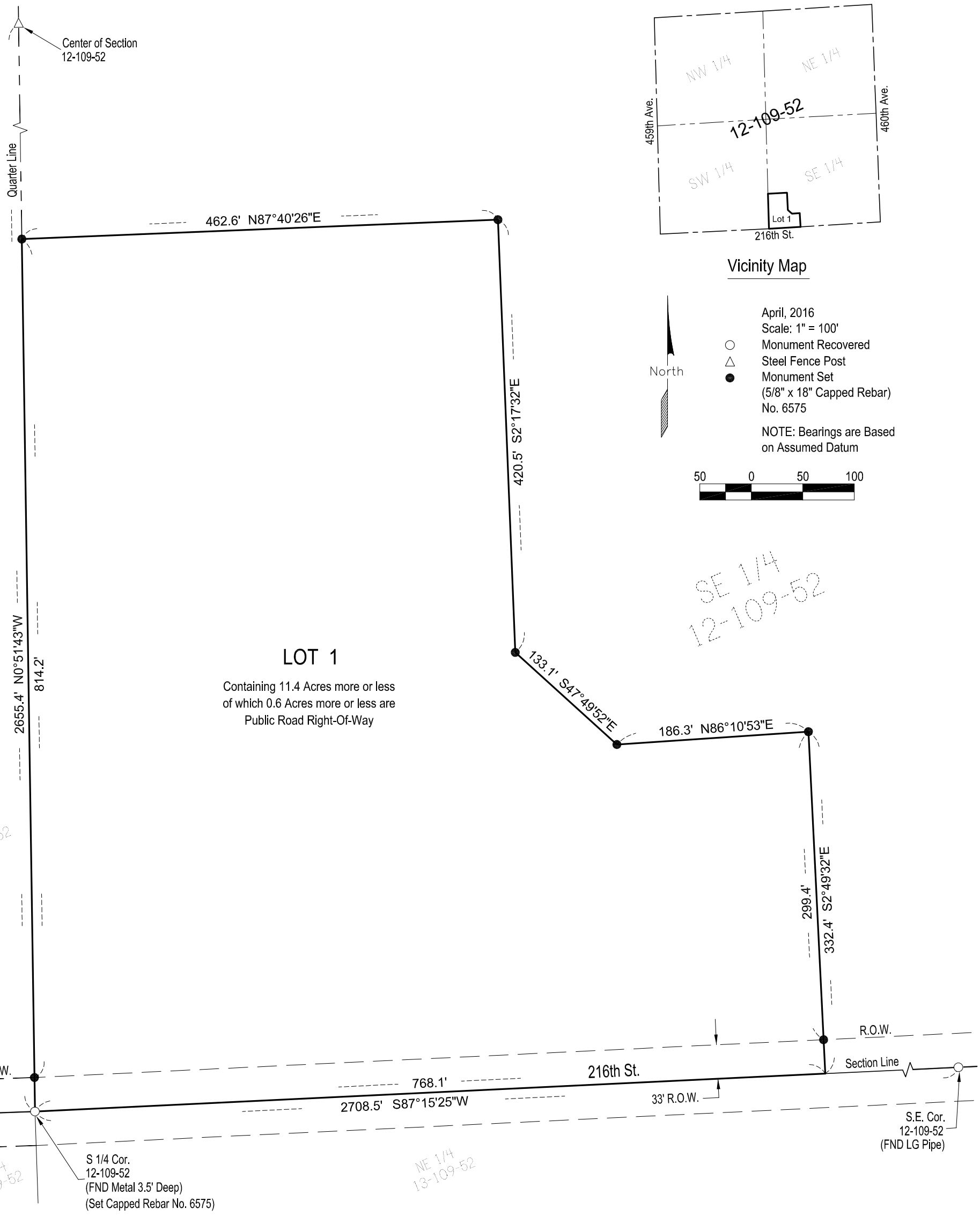
2016plat003: Risty Farms Inc. has submitted a plat for Lot 1 of Wills Addition, with an address of 45956 216th St, Volga, SD, located in the SE1/4 of Section 12, T109N, R52W which they own. Lot 1 is for 11.4 acre existing established building site.

Subdividing of an established building site is an allowed policy in the 2016 Brookings County Comprehensive Plan; "Exception to large lot residential development"- Policy # 3 found on page 45 of the Comprehensive Plan.

Established residences are a permitted use in the Brookings County Zoning Ordinance, Article 11:00-Agricultural District; Section 11:01-"A"-Agricultural District: Permitted Uses # 2, found on page 11.00-1.

PLAT OF

LOT 1 OF WILLS ADDITION IN THE SE ¼ OF SECTION 12, TOWNSHIP 109 NORTH, RANGE 52 WEST OF THE 5TH P.M., BROOKINGS COUNTY, SOUTH DAKOTA



Vicinity Map

April, 2016
Scale: 1" = 100'
○ Monument Recovered
△ Steel Fence Post
● Monument Set
(5/8" x 18" Capped Rebar)
No. 6575

NOTE: Bearings are Based on Assumed Datum

50 0 50 100

SURVEYOR'S CERTIFICATE

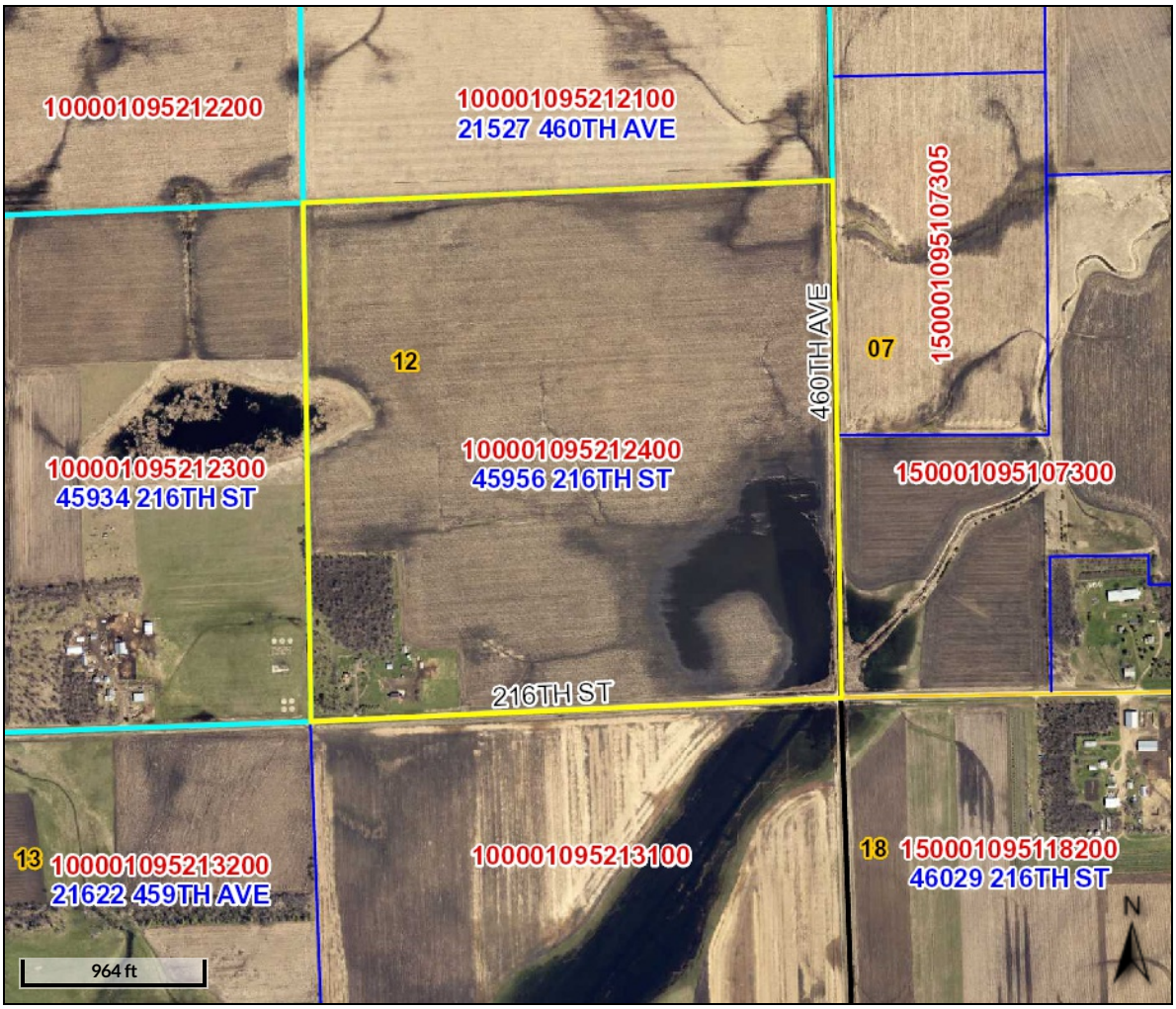
I, Mike J. Lapka, a Registered Land Surveyor of the State of South Dakota, do hereby certify that I did on or before April 7th, 2016, survey a parcel of land located in the SE¼ of Section 12, T109N, R52W of the 5th P.M., Brookings County, South Dakota, as shown on the plat, and marked upon the ground thereof in the manner shown on the plat and that the attached is a true and correct representation of said survey and that the parcel of land so platted contains: **"PLAT OF LOT 1 OF WILLS ADDITION IN THE SE¼ OF SECTION 12, TOWNSHIP 109 NORTH, RANGE 52 WEST OF THE 5TH P.M., BROOKINGS COUNTY, SOUTH DAKOTA".**

IN WITNESS WHEREOF, I have executed the Surveyor's Certificate this 7th day of April, 2016.

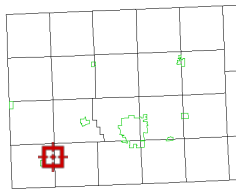
Prepared By:

CIVIL DESIGN INC
Civil Engineers & Land Surveyors
Brookings, South Dakota
Ph. 605-696-3200

Beacon™ Brookings County, SD



Overview



Legend

- Brookings City Limits
- City Limits
- Township Boundar
- Sections
- Parcels
- Roads

Parcel ID	100001095212400	**Alternate ID**	n/a	**Owner Address**	RISTY FARMS INC
Sec/Twp/Rng	12-109-52	**Class**	AGA		45956 216TH ST
Property Address	45956 216TH ST	**Acreage**	160		VOLGA SD 57071
	VOLGA				
District	1005				
Brief Tax Description	SE 1/4 SEC 12-109-52 160.0 AC				
	(Note: Not to be used on legal documents)				

Date created: 4/12/2016

Developed by
The Schneider Corporation