CITY OF HUXLEY

MONDAY ** OCTOBER 19, 2015 ** CITY HALL ** 7:20 P.M.

CITY HALL – CITY COUNCIL CHAMBERS
REGULAR SESSION OF THE CITY OF HUXLEY'S
PLANNING AND ZONING COMMISSION

AGENDA

PUBLIC NOTICE IS HEREBY GIVEN THAT THE PLANNING AND ZONING COMMISSION OF THE CITY OF HUXLEY, IOWA, WILL MEET IN THE COUNCIL CHAMBERS AT CITY HALL, 515 NORTH MAIN AVE., HUXLEY, IOWA, IN A REGULAR SESSION AT 7:20 P.M. ON MONDAY THE *19TH DAY OF OCTOBER, 2015* TO CONSIDER THE MATTERS ENUMERATED IN THE AGENDA BELOW:

1.0) ROLL CALL

2.0) MOTION TO APPROVE THE MINUTES FROM THE FOLLOWING MEETINGS:

2.1) October 5, 2015 – Regular Meeting

COMMISSION AGENDA ITEMS:

3.0) PUBLIC HEARING : NONE

4.0) DISCUSSIONAND POSSIBLE ACTION

4.1) **Motion** to approve amended site plan for Van Wall Doosan Fork Lift for wind turbine and make recommendation to the City Council.

5.0) COMMENTS AND UPDATES
City Staff and Engineer, Mayor and Council and Public

6.0) ADJOURNMENT

THIS NOTICE IS HEREBY GIVEN AT LEAST 24 HOURS PRIOR TO THE COMMENCEMENT OF THE MEETING SPECIFIED ABOVE. THIS WAS DONE BY ADVISING THE NEWS MEDIA WHO HAVE FILED A REQUEST FOR NOTICE AND BY POSTING THE NOTICE ON THE FRONT WINDOW IN THE LOBBY AREA IN CITY HALL THAT IS ACCESSIBLE TO THE PUBLIC. THIS WAS ALL PURSUANT TO CHAPTER 21 OF THE CODE OF IOWA.

John Haldeman, CA ZA

John Haldeman, Zoning Administrator

CITY OF HUXLEY PLANNING & ZONING COMMISSION

THURSDAY ** JUNE 4, 2015 ** 7:00 P.M.
HUXLEY CITY HALL COUNCIL CHAMBERS
REGULAR SESSION OF THE CITY OF HUXLEY'S
PLANNING AND ZONING COMMISSION
AGENDA

PUBLIC NOTICE IS HEREBY GIVEN THAT THE PLANNING AND ZONING COMMISSION OF THE CITY OF HUXLEY, IOWA, WILL MEET AT THE HUXLEY CITY HALL, COUNCIL CHAMBERS, 515 NORTH MAIN AVE. HUXLEY, IOWA, IN A REGULAR SESSION AT 7:00 P.M. ON THURSDAY THE *4TH OF JUNE, 2015* TO CONSIDER THE MATTERS ENUMERATED IN THE AGENDA BELOW:

1.0) ROLL CALL

2.0) MOTION TO APPROVE THE MINUTES FROM THE FOLLOWING MEETINGS:

2.1) MAY 18, 2015 – REGULAR MEETING

COMMISSION AGENDA ITEMS:

MAIN AGENDA ITEMS

3.0) DISCUSSION AND POSSIBLE ACTION SETTING A DATE FOR A PUBLIC HEARING ON A REZONING APPLICATION SUBMITTING BY JAMES DEVIG, 406 WEST FIRST ST FROM R-2 RESIDENTIAL DISTRICT TO A-1 AGRICULTURAL DISTRICT.

4.0) DISCUSSION AND POSSIBLE ACTION ON REVIEW OF A SITE PLAN SUBMITTED BY WOODRUFF CONSTRUCTION FOR CONSTRUCTION OF A NEW BUILDING AT 1485 BLUE SKY BLVD IN THE BLUE SKY COMMONS BUSINESS PARK.

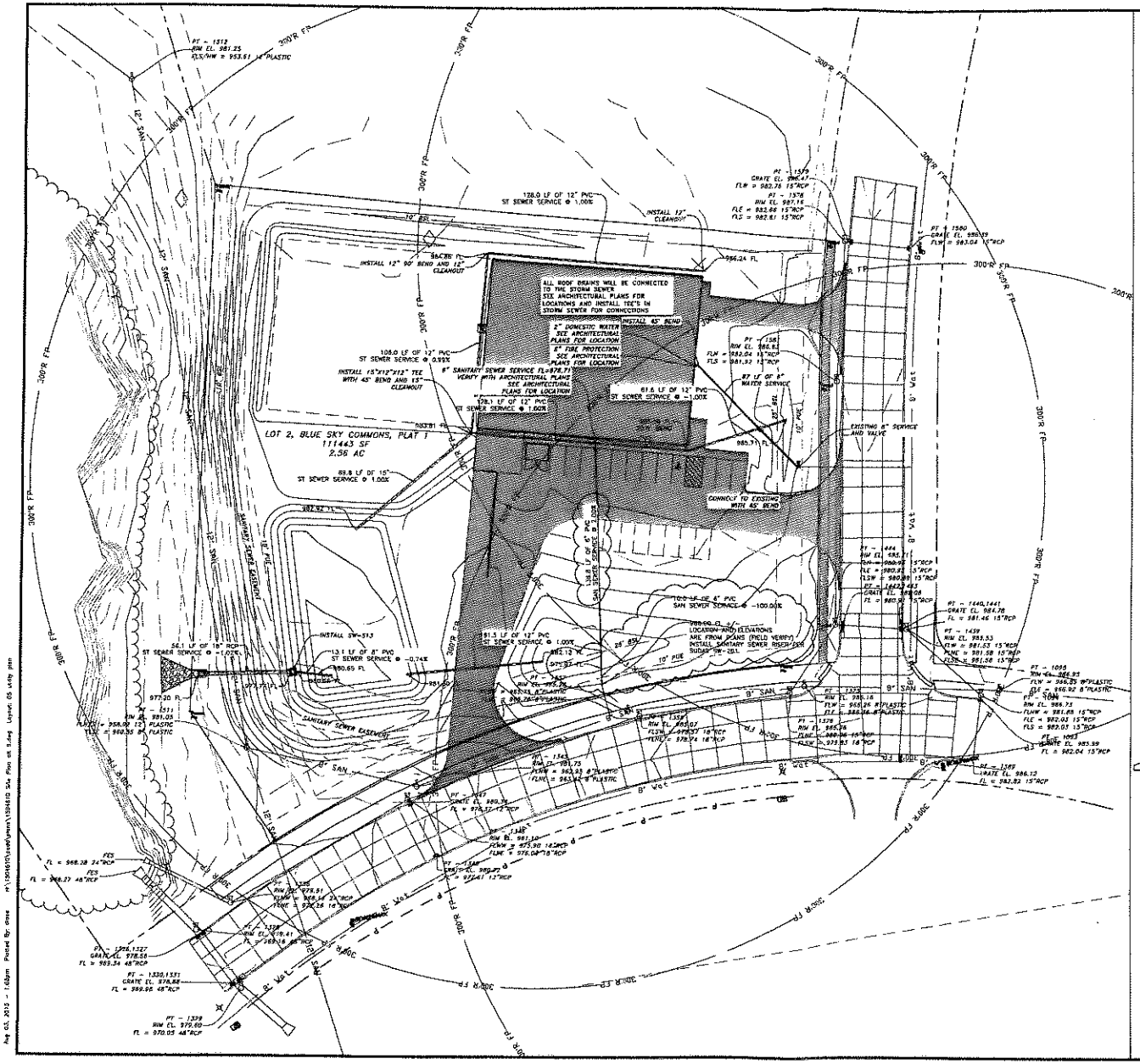
5.0) DISCUSSION AND POSSIBLE ACTION ON REVIEW OF A SITE PLAN SUBMITTED BY VISION BANK FOR CONSTRUCTION OF A NEW BUILDING AT 100 CENTENNIAL DRIVE LOCATED AT THE INTERSECTION OF US HIGHWAY 69 AND CENTENNIAL DRIVE.

6.0) MISCELLANEOUS/OTHER ITEMS

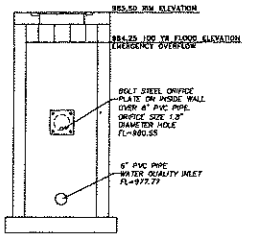
7.0) ADJOURNMENT

THIS NOTICE IS HEREBY GIVEN AT LEAST 24 HOURS PRIOR TO THE COMMENCEMENT OF THE MEETING SPECIFIED ABOVE. THIS WAS DONE BY ADVISING THE NEWS MEDIA WHO HAVE FILED A REQUEST FOR NOTICE AND BY POSTING THE NOTICE ON THE FRONT WINDOW IN THE LOBBY AREA IN CITY HALL THAT IS ACCESSIBLE TO THE PUBLIC. THIS WAS ALL PURSUANT TO CHAPTER 21 OF THE CODE OF IOWA.

Justin Moore, Zoning Administrator

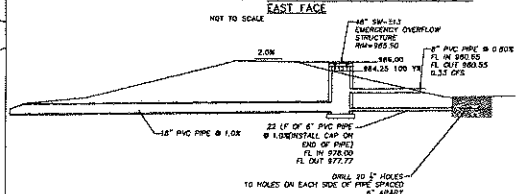


NOTE: SEE UTILITY AND GENERAL NOTES ON COVER SHEET



DETAIL– 48" SW-513 EMERGENCY OVERFLOW EAST FACE

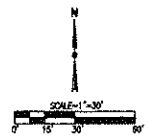
NOT TO SCALE



958.41+/- SANITARY SEWER FL

DETAIL–STORM WATER DETENTION OUTFALL

NOT TO SCALE



KIRKHAM MICHAEL

revisions	
4	8/1/15 Contractor Request for service riser
3	5/29/15 CITY COMMENTS
2	5/19/15 2ND CLIENT SUBMITTAL
1	5/1/15 1ST CLIENT SUBMITTAL

Van Wall Group
Blue Sky Commons Plat 1, Lot 2
1485 Blue Sky BLVD
Huxley Iowa

Utility Plan

date April 2015
design BEL
drawn CDC
file no. 15046113

SHEET 5

1st Site Plan

VanWall Doosan Fork Lift wind turbine site plan application required information

1485 Blue Sky Blvd., Huxley, Iowa

A. Site plan. Please find attached site plan. Nine complete copies.
   1) Location of SWEC- see site plan.
   2) Area of tower and depths. 30'x30' foundation, 8' deep
   3) Ok
   4) See electrical one-line.
   5) Ok
   6) See manufacturers dwgs, elevations, foundation dwgs.
   7) See electrical one-line.
   8) See Endurance E3120 50kW wind turbine data sheet.

B. See attached Terracon Geotechnical soil boring report

C. Certification: see attached Endurance data sheet and interconnection supplement. Foundation dwgs from Shuck Britson are stamped by qualified engineer. Tower design is sufficient to withstand 116 mph wind speeds. Electrical system design is provided by Endurance Wind Power and installed by Baker Electric from DSM. All electrical work has to pass NEC State of Iowa electrical inspectors before commissioning.

D. Decommissioning Plan: VanWall Energy will hire EduTech systems, (wind turbine installer), to take down the wind turbine after it is effective life is done or if the wind turbine remains un-operational for 1 year. VanWall will pay for decommissioning.

E. Proof of Insurance: See attached Certificate of liability insurance from Federated Mutual insurance company who insures the VanWall Group locations for the amount of one million dollars. Certificate holder is City of Huxley.

F. Identification of Qualified professional installer: EduTech Systems Inc., Paul Graff, President, 8325 Lee Blvd., Leawood, KS 66206, ph# 913-645-4691. EduTech has installed all 24 of our 50kW wind turbine projects.

G. Utility notification: Consumers Energy. See attached interconnection application for Consumers Energy.

Jake West, VanWall Energy, 515-221-0765, jake.west@vanwall.com

9/30/2015

VEENSTRA & KIMM, INC.
3000 Westown Parkway • West Des Moines, Iowa 50266-1320
515-225-8000 • 515-225-7848(FAX) • 800-241-8000(WATS)

October 14, 2015

John Haldeman
City of Huxley
515 N. Main Ave.
Huxley, Iowa 50124

HUXLEY, IOWA
BLUE SKY DOOSAN FORKLIFT WIND TOWER
SITE PLAN

We have reviewed the site plan and associated information for the Blue Sky Doosan Forklift Wind Tower and offer the following comments:

1. The new site location for the wind turbine will place the base of the wind turbine within the west storm water detention basin. There is the potential for the base to be covered in approximately 12" to 18" of water during a heavy rain event. The electrical and control equipment should be mounted and installed to protect from flooding.

2. The anchor bolt embedment length as shown on Sheet S-2 by Tower Engineering Professionals is 5'-10" from top of concrete to bottom of the anchor bolt. The footing depth as shown on Sheet S2 by Shuck-Britson is 6"-0". This will leave 2" of concrete cover over the bottom of the anchor bolt. This is different than how the anchor bolt embedment cover is shown on the drawing. Note 14 under "CONCRETE" on Sheet S1 by Shuck-Briston calls out for 3" of cover for reinforcing bars.

If you have any questions or comments, please contact us at 515-225-8000.

VEENSTRA & KIMM, INC.

Original Signed By
Forrest S. Aldrich

Forrest S. Aldrich

FSA:jat
45223
cc: Jake West, Van Wall Group

John Haldeman

From: Forrest Aldrich [faldrich@v-k.net]
Sent: Wednesday, October 14, 2015 11:03 AM
To: John Haldeman
Cc: Jake West; Greg Roth
Subject: Re: Emailing - Blue Sky Wind Tower Comment Ltr.pdf

John,

Reviewed the letter with Jake. The comments in the letter are for items to be evaluated before construction begins, but none of the comments need to be addressed prior to City approval of the wind tower.

Forrest Aldrich, P.E.
Veenstra and Kimm, Inc.
3000 Westown Parkway
West Des Moines, IA 50266
ph. 515-225-8000
www.v-k.net

John Haldeman wrote:

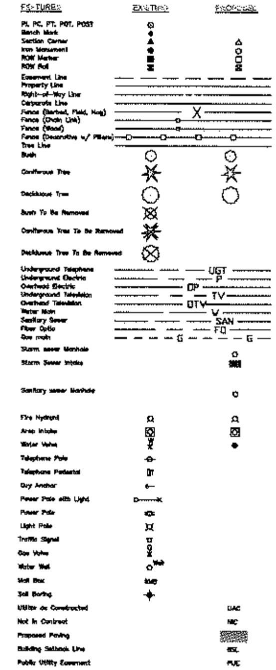
> Jake
>
> Here is the City's engineer review letter of the wind generator site plan. Please review and contact engineer addressing the concerns stated in the letter.
>
> Thank you
>
> John

Blue Sky Doosan Forklift Wind Tower

Site Plan

CITY OF HUXLEY,
STORY COUNTY, IOWA

LEGEND



OWNER
VAN HOUWELING PROPERTY, LLC
362 332ND PLACE
PERRY, IA 50220
PHONE: 515-465-5661

DEVELOPER
WOODRUFF CONSTRUCTION, LLC
CONTACT: LUKE WALL | PROJECT MANAGER
OFFICE (515) 232-4535 X26
CELL (515) 208-5135
www.woodruffcompanies.com

ENGINEER / SURVEYOR
KIRKHAM MICHAEL
CONTACT: GREG D CABALKA
11021 AURORA AVENUE
URBANDALE, IOWA 50322
PHONE 515-270-0848
EMAIL: gcabalka@kirkham.com

WIND TOWER DESIGN
ENDURANCE WIND POWER

CITY CONTACTS
JUSTIN MOORE
UTILITIES/ZONING
CITY OF HUXLEY
515-597-2561
EMAIL: JMOORE@HUXLEYIOWA.ORG

JEFF PETERSON
PUBLIC WORKS DIRECTOR
CITY OF HUXLEY
HUXLEY, IOWA 50124
515-597-2256
EMAIL: PUBLICWORKS@HUXLEYIOWA.ORG

GREG ROTH
CITY ENGINEER
VEENSTRA & KIMM, INC
WEST DES MOINES, IOWA 50266
515-225-8000
EMAIL: GROTH@V-K.NET

SITE ADDRESS
1485 BLUE SKY BOULEVARD
HUXLEY, IOWA 50111

PROPERTY DESCRIPTION

LOT 2, BLUE SKY COMMONS, PLAT 1, AN OFFICIAL PLAT NOW INCLUDED IN AND FORM PART OF THE CITY OF HUXLEY, STORY COUNTY, IOWA

SITE AREA
SITE CONTAINS 2.56 ACRES

ZONING
CURRENT ZONING: M-1
PROPOSED ZONING: M-1
ALL PROPERTY WITHIN 500' IS ZONED M-1

BULK REQUIREMENTS (M-1)
A. FRONT YARD SETBACK – 25 FOOT
B. SIDE YARD SETBACK – 10 FOOT
C. REAR YARD SETBACK – 10 FOOT
D. MAXIMUM HEIGHT – PRINCIPAL BUILDING–50 FEET, ACCESSORY BUILDING–30 FEET

CONSTRUCTION SCHEDULE
BEGIN CONSTRUCTION SEPTEMBER/OCTOBER 2015
FINISH CONSTRUCTION SEPTEMBER/OCTOBER 2015

PROPOSED USE
1 BUILDING UNDER CONSTRUCTION
1 NEW WIND TOWER GENERATOR — 140 S.F. TOWER BASE; 144.36 FEET TOWER BASE TO CENTER OF GENERATOR; 175.85 FEET FROM TOWER BASE TO TOP DEAD CENTER BLADE TIP

NO DWELLING UNITS
NUMBER OF EMPLOYEES TO BE DETERMINED

N

VICINITY MAP
NOT TO SCALE

INDEX OF SHEETS

CONTROL POINTS:

100	N=3422155.57	E=4900516.03	Z=987.59	DESC.= NE CORNER LOT 2 YELLOW CAP#18643
101	N=3422071.11	E=4900511.68	Z=988.98	DESC.= MIDDLE LOT CORNER, EAST PROPERTY LINE LOT 2, YELLOW CAP#18643
102	N=3421929.54	E=4900511.70	Z=988.34	DESC.= MIDDLE SOUTH CORNER, EAST PROPERTY LINE LOT 2, YELLOW CAP#18643
103	N=3421904.88	E=4900486.84	Z=986.30	DESC.= EAST LOT CORNER, SOUTH PROPERTY LINE LOT 2, YELLOW CAP#18643
104	N=3421875.29	E=4900142.02	Z=978.62	DESC.= MIDDLE LOT CORNER, WEST PROPERTY LINE LOT 2, YELLOW CAP#18643
105	N=3422185.20	E=4900153.59	Z=982.53	DESC.= NW CORNER LOT 2 YELLOW CAP#18643

BENCHMARKS
BENCHMARK ARE BASED ON THE I.D.O.T. R.T.K.

1335	N=3421749.64	E=4900237.74	Z=982.06	DESC.= TOP WORKING NUT, FIRE HYDRANT ACROSS THE STREET FROM SW CORNER OF LOT 2
1385	N=3421843.40	E=4900586.45	Z=989.10	DESC.= TOP WORKING NUT, FIRE HYDRANT AT THE SE CORNER BLUE SKY BLVD. AND BLUE SKY BLVD.

1. **General Notes:**
   a. All work shall be done in accordance with the current version of the Statewide Urban Standards Specifications for Public Improvements on the date of approval and the City of Huxley Supplemental Specifications.
   b. A pre-construction meeting is required prior to the start of construction. The Contractor shall be responsible to coordinate this meeting. Contact Greg Roth with City Engineering (515 225 8000).
   c. All permits (IDNR, IDOT, Army Corp., etc.) shall be obtained prior to the start of construction.
   d. The Developer and/or Contractor shall be responsible to provide the City of Huxley with Record Drawings of all improvements as per City standard procedures.

2. **NOTES:**
   1. UTILITY WARNING:
   THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND / OR RECORDS OBTAINED. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFY LOCATION OF ALL UTILITIES BEFORE CONSTRUCTION.
   2. ALL TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) (LATEST EDITION)
   3. NOTIFY ENGINEER AND CITY OF HUXLEY AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
   4. BACKFILL WITH SUITABLE MATERIAL AND COMPACT TO 95% MINIMUM DENSITY PER SUDAS.
   5. ADJUSTMENT OF EXISTING UTILITY APPURTENANCES TO FINAL GRADE IS CONSIDERED INCIDENTAL TO THE SITE WORK.
   6. DIMENSIONS, BUILDING LOCATION, UTILITIES AND GRADING OF THIS SITE ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF LAYOUT. DEVIATIONS MAY BE NECESSARY IN THE FIELD. ANY SUCH CHANGES OR CONFLICTS BETWEEN THIS PLAN AND FIELD CONDITIONS ARE TO BE REPORTED TO THE ARCHITECT/ENGINEER PRIOR TO STARTING CONSTRUCTION.
   7. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS PRIOR TO STARTING WORK.

LICENSED PROFESSIONAL ENGINEER
GREGORY D. CABALKA
21393
IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

GREGORY D. CABALKA, PE — DATE

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2015.
LICENSE NO. 21393
PAGES OR SHEETS COVERED BY THIS SEAL:
SHEETS 1 AND 3 THRU 7

KIRKHAM MICHAEL

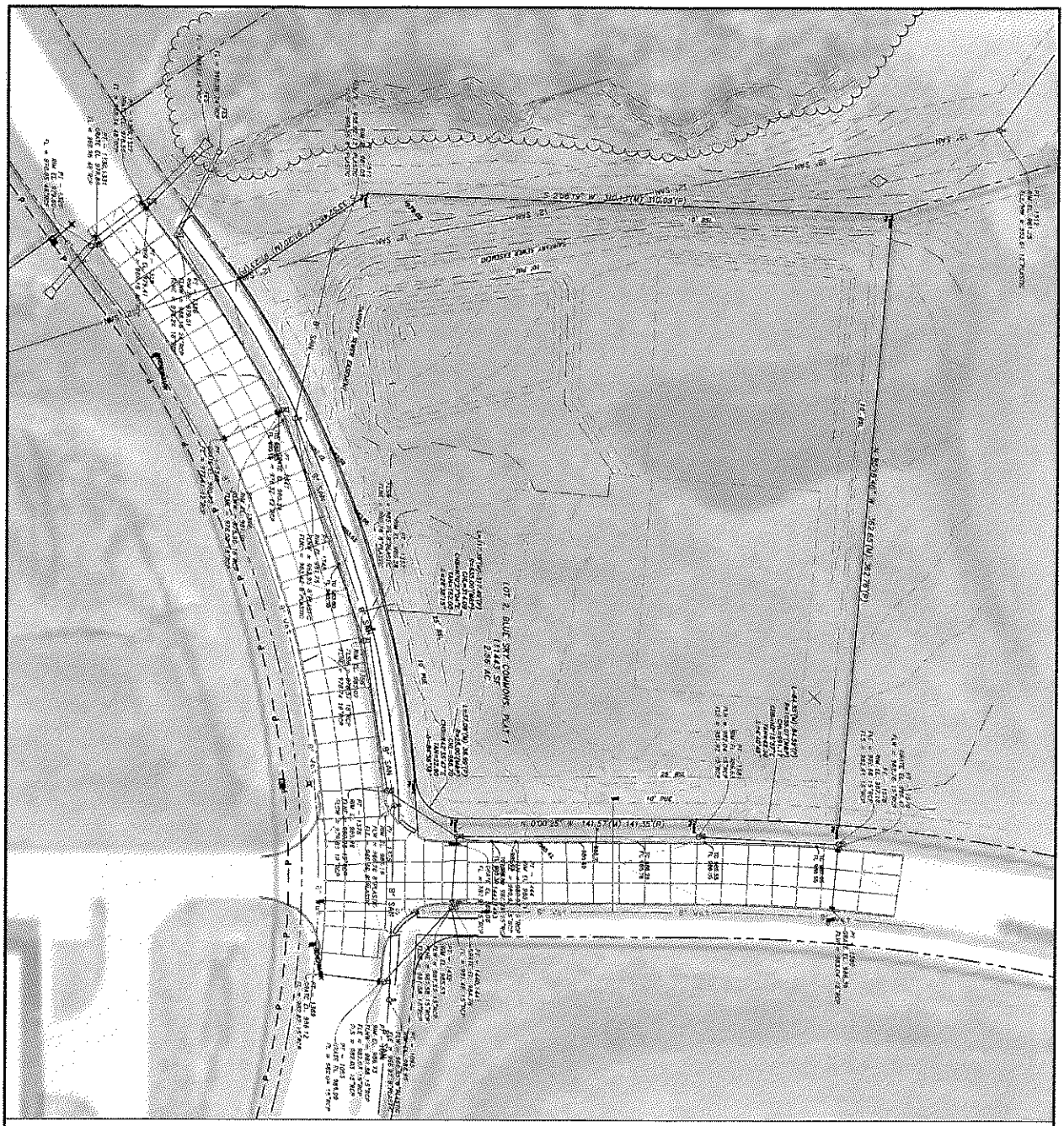
revisions
1 09/03/15 1ST CLIENT SUBMITTAL

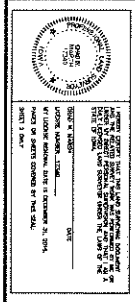
Van Wall Group
Blue Sky Commons Plat 1, Lot 2
1485 Blue Sky BLVD
Huxley Iowa

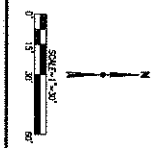
COVER SHEET

date April 2015
designed GDC
checked DEL
drawn GDC
km no. 1504610

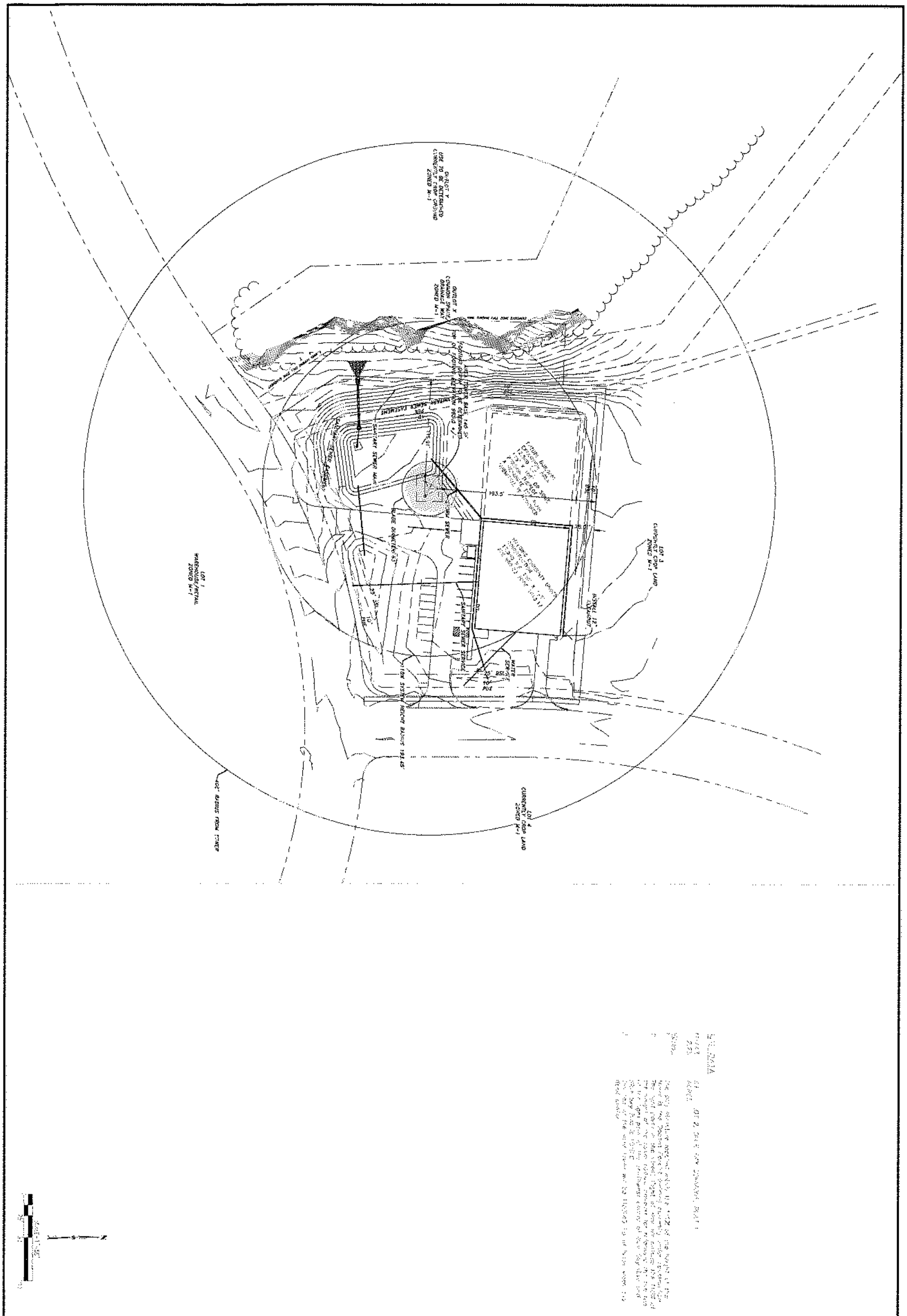
SHEET 1







SHEET 2	date April, 2015 designed DEL checked CDC job no. 1504610	Existing Conditions	Van Wall Group Blue Sky Commons Plat 1, Lot 2 1485 Blue Sky BLVD Huxley Iowa	revisions 1 09/03/2015 1ST CLIENT SUBMITTAL	KIRKHAM MICHAEL

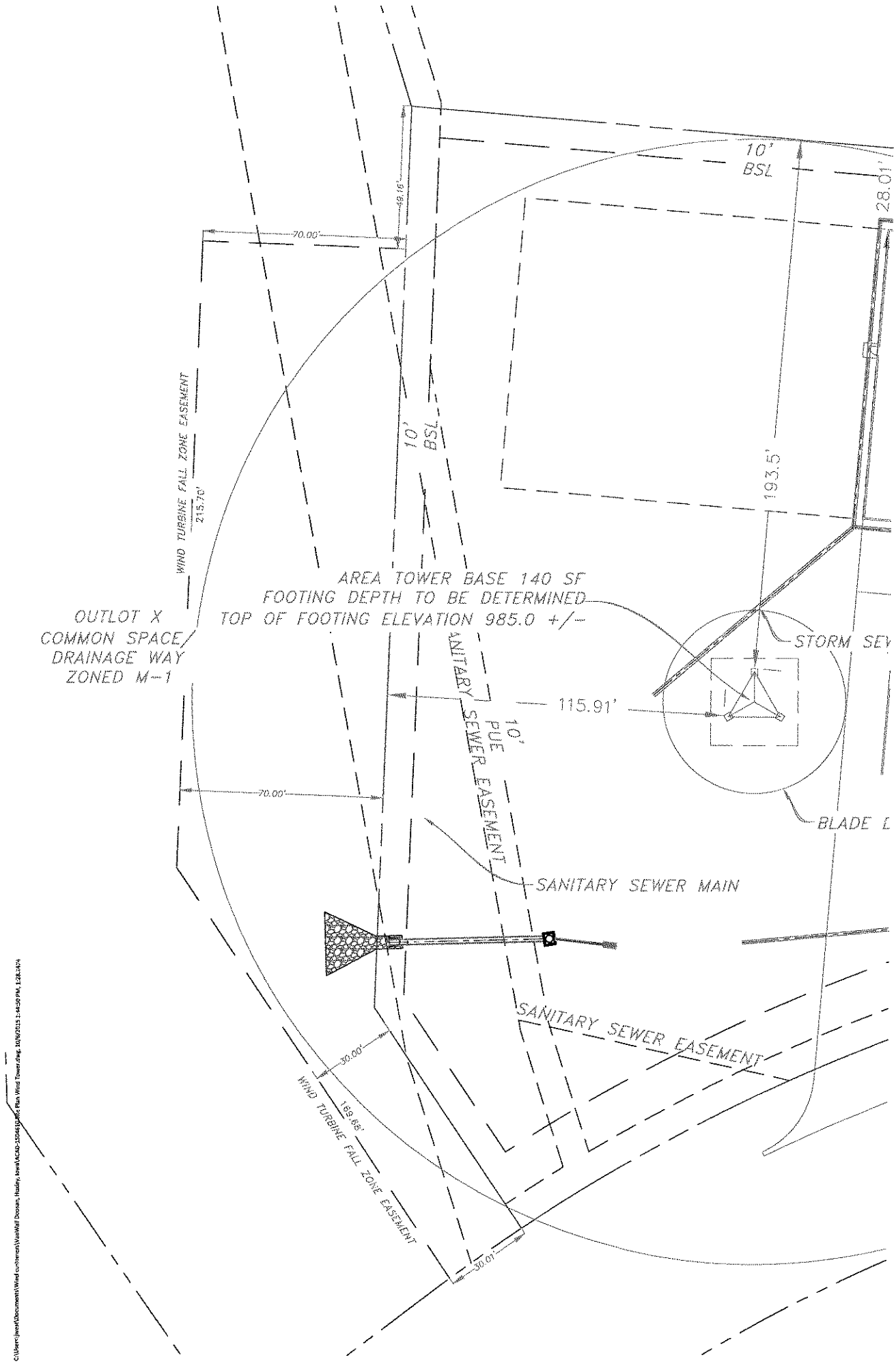


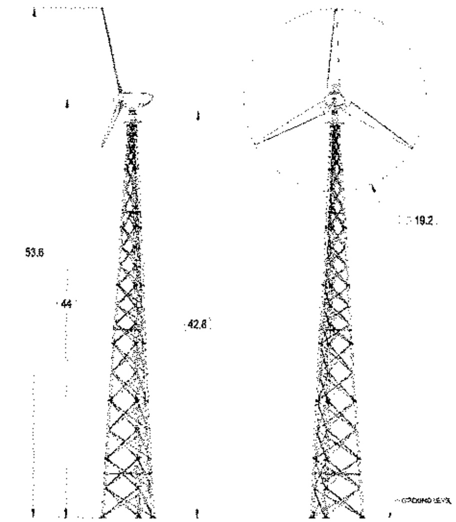
SHEET 3

Site Plan

Van Wall Group
Blue Sky Commons Plat 1, Lot 2
1485 Blue Sky BLVD

KIRKHAM MICHAEL



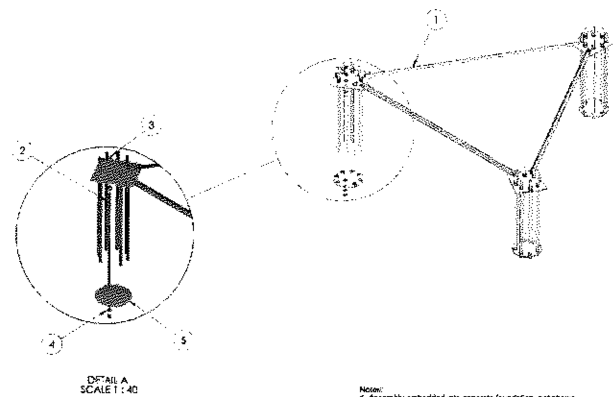


NOTE:
DIMENSIONS APPROXIMATE AND PROVIDED FOR PLANNING PURPOSE ONLY. FINAL CONSTRUCTION ELEVATIONS ARE AVAILABLE IN A PERMITTING PACKAGE ON A PER TOWER BASIS.

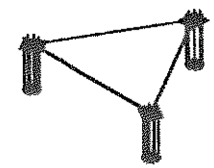
ALL DIMENSIONS ARE IN METERS

2011-10-17	Scale 1:250	Format A4	
Endurance wind power			
Title: E-3210 Elevation, 42m, Lattice			
Part number: 001597	Revision: 1	22/Nov/2011	1/1

ITEM	PART NUMBER	DESCRIPTION	MATERIAL	QTY
1	000636	Assembly, Foundation Template, Lattice, 42m	See BOM	1
2	000644	Anchor Rod, 1-3/4"-5 x 6'10", Min 12" thread either end, Galvanized	ASTM F1554 Grade 36	24
3	000645	Nut, Heavy Hex, 1-3/4"-5, ASTM A325M	8.8	120
4	000653	Washer, Hardened, 3.375ODx1.875 ID, ASTM F436, Galvanized	8.8	48
5	000643	Plate, Bearing, Foundation Template	Steel, ASTM A572M, 50KSI	3



DETAIL A
SCALE 1 : 40

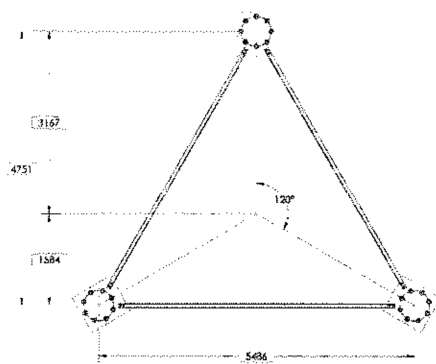


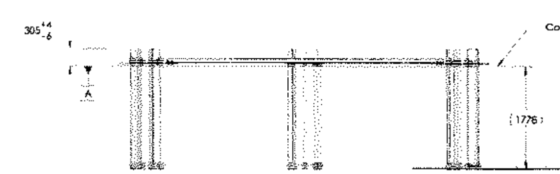
Notes:
1. Assembly embedded into concrete foundation, not shown.
2. Template Assembly removed after concrete sets
3. Upper nuts do NOT get embedded into concrete (used for leveling of tower).
4. Position and attach anchor bolt assemblies in template.
5. Secure anchor bolts and rebar in forms prior to placing concrete.
6. Plumb tower using leveling nuts.
7. Once the tower is plumb, Grout under the Base plate. Provide 3/4" PVC drain in Grout

REV	DESCRIPTION	DATE	APPROVED
1	Initial Release	01/Feb/2011	

ALL DIMENSIONS ARE MILLIMETER UNLESS NOTED
INTERPRET THIS DRAWING PER ASME Y14.5M
DO NOT SCALE OR MEASURE THIS DRAWING

See BOM	Scale 1:50	
RAJESH(CPT)	Format B	
Avi Feldberg	1059.06	
E-Series Lattice Tower		
Endurance wind power		
Assembly, Foundation, E-Series, Lattice, 42m		
000635	1	2/2/2011	1/2





ALL DIMENSIONS ARE MILLIMETER UNLESS NOTED
INTERPRET THIS DRAWING PER ASME Y14.5M
DO NOT SCALE OR MEASURE THIS DRAWING

See BOM	Scale 1:40		
RAJESH(CPT)	Format B		
1059.06			
E-Series Lattice Tower			
Endurance wind power			
Assembly, Foundation, E-Series, Lattice, 42m			
000635	1	2/2/2011	2/2

SHEET 4	date April 2015, designed DEL, checked GDC, job no. 15O461C	Details	Van Wall Group Blue Sky Commons Plat 1, Lot 2 1485 Blue Sky BLVD Huxley, Iowa	revisions: 1 ... 1st CLIENT SUBMITTAL

KIRKHAM MICHAEL

Prepared by and return to: James E. Nervig, 6701 Westown Parkway, Suite 100, West Des Moines, IA 50266
Telephone: (515) 274-1450

RESTRICTIVE EASEMENT AND COVENANT

That Van Houweling Property, LLC, (hereinafter called "Grantor") in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration paid by the City of Huxley, Iowa, (hereinafter called "Grantee"), the receipt of which is hereby acknowledged by the Grantor, does hereby sell, grant, and convey unto the Grantee a perpetual nonexclusive Restrictive Easement and Covenant over, through, and across the following described real estate:

> The East 70.0 feet of Outlot X, Blue Sky Commons Plat 1, an Official Plat, now included in and forming part of the City of Huxley, Story County, Iowa

(hereinafter called "Easement Area") for the purposes of providing an area where no above-ground uses are permitted so as to protect against loss of life or property from the collapse of a wind turbine tower located on Lot 2, Blue Sky Commons Plat 1, adjoining the Easement Area along its East boundary.

This Restrictive Easement and Covenant shall be subject to the following terms and conditions:

1. **PROHIBITION OF ABOVE-GROUND USES.** No buildings, structures, parking or other uses shall be permitted over, through, and across the Easement Area. This prohibition applies only to above-ground uses, and does not restrict use of the subsurface for utility or other purposes.

2. **EASEMENT RUNS WITH LAND.** This Restrictive Easement and Covenant shall be deemed to run with the land and shall be binding on the parties and on their successors and assigns. In the event that the wind turbine tower located on Lot 2, Blue Sky Commons Plat 1, is removed in the future, this Restrictive Easement and Covenant shall be released of record by Grantee.

Grantor does HEREBY COVENANT with Grantee that Grantor holds title to the Easement Area in fee simple; and that Grantor has good and lawful authority to convey the same; and Grantor covenants to WARRANT AND DEFEND the Easement Area against the lawful claims of all persons whomsoever.

Words and phrases herein including acknowledgement hereof shall be construed as in the singular or plural number, and as masculine or feminine gender, according to the context.

Signed this 13th day of October, 2015.

Van Houweling Property, LLC (Grantor)

By: C. Don Van Houweling
Printed Name:
Title:

STATE OF IOWA, COUNTY OF STORY, ss:

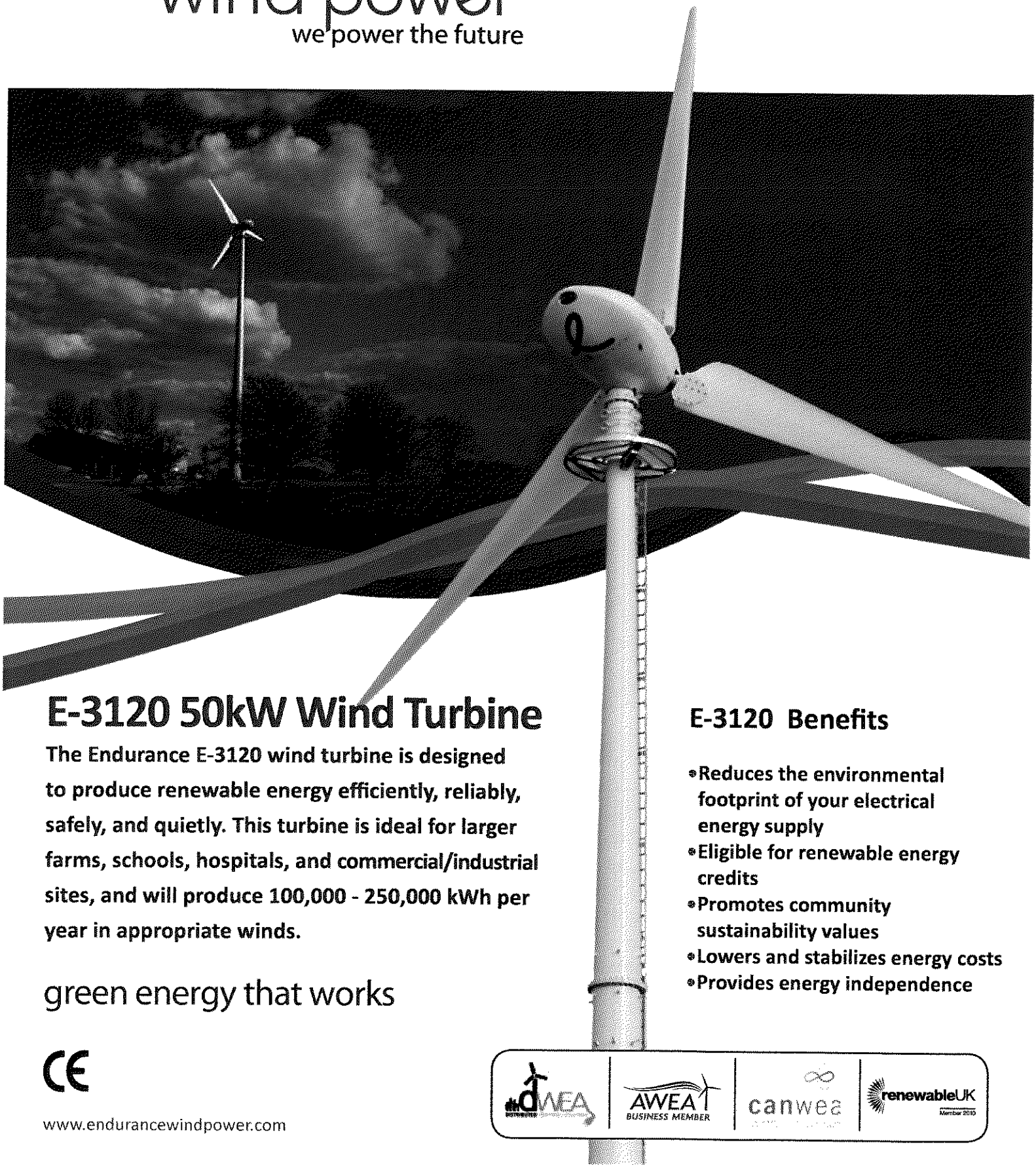
This record was acknowledged before me on Oct. 13th, 2015, by C. Don Van Houweling, as member of Van Houweling Property, LLC.

Barbara J. Menz
Notary Public

BARBARA J MENZ
Notarial Seal - Iowa
Commission # 711767
My Commission Expires 7-31-16

Endurance™ wind power

we power the future



E-3120 50kW Wind Turbine

The Endurance E-3120 wind turbine is designed to produce renewable energy efficiently, reliably, safely, and quietly. This turbine is ideal for larger farms, schools, hospitals, and commercial/industrial sites, and will produce 100,000 - 250,000 kWh per year in appropriate winds.

green energy that works

CE

www.endurancewindpower.com

E-3120 Benefits

- Reduces the environmental footprint of your electrical energy supply
- Eligible for renewable energy credits
- Promotes community sustainability values
- Lowers and stabilizes energy costs
- Provides energy independence

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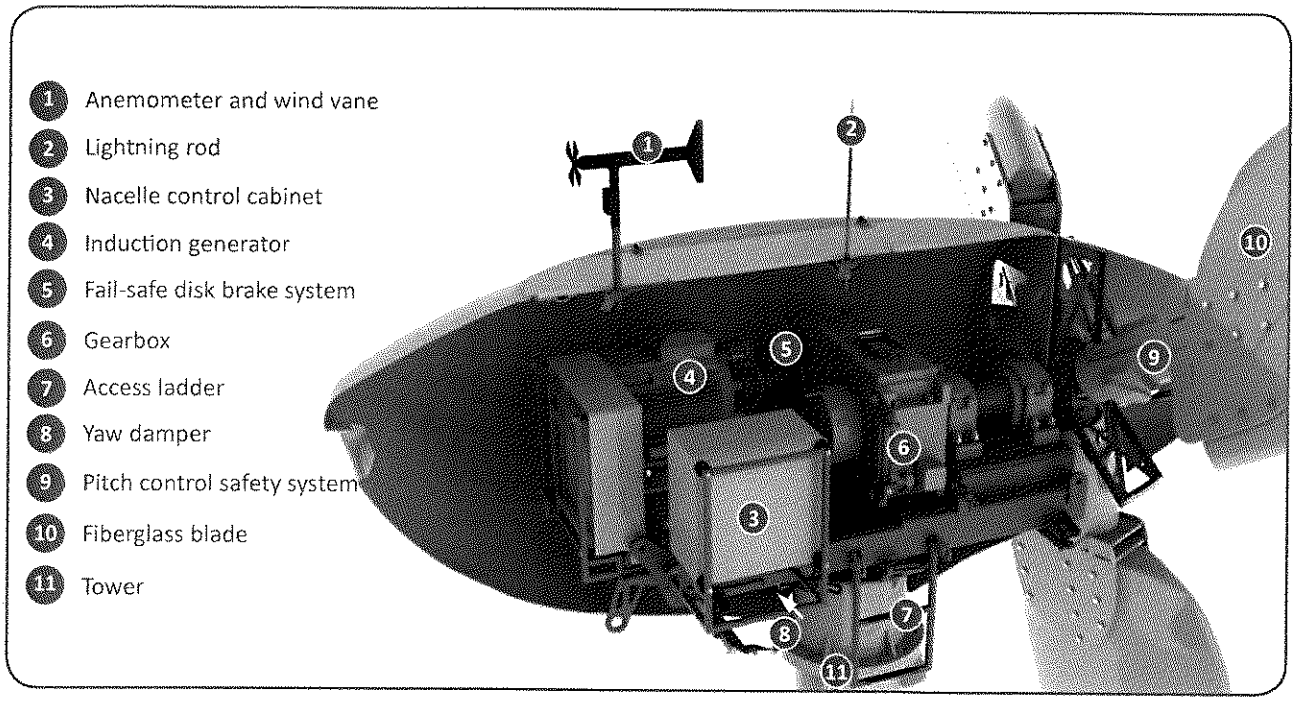
E-3120 50kW Wind Turbine



1 Anemometer and wind vane

Measures wind speed and direction to control starting, stopping, and orientation of the turbine to maximize power production.

2 Lightning rod

Guides lightning to the ground, protecting the turbine.

3 Nacelle control cabinet

Houses the tower-top electronics in a weather-protected environment for maximum reliability. The main turbine control panel is located at the base of the tower for easy access.

4 Induction generator

Delivers grid-compatible power and eliminates the need for an inverter or other power electronics. This improves efficiency and reliability, and reduces up-front costs.

5 Fail-safe disk brake system

Safely stops the wind turbine using twin brake calipers in situations such as extreme wind or grid failure.

6 Gearbox

Drives the generator at full speed while the rotor turns slowly. The gearbox uses rugged, conventional design for long life and high reliability.

7 Access ladder

Allows easy and safe access to the nacelle for maintenance. Safety is a top design priority.

8 Yaw damper

While the turbine is aerodynamically oriented by the wind, the yaw damper smooths the movement to ease tower and rotor loads.

9 Pitch control safety system

Provides backup protection against rotor over speed. If the rotor turns too fast for any reason, the blades are pitched by a spring mechanism to control the speed.

10 Fiberglass blade

Designed to quietly and efficiently produce energy, particularly in light winds.

11 Tower

Attractive monopole or economical lattice towers are available in sizes from 30.5 to 42.7meters (100 to 140ft) to comply with height restrictions or reach the best winds at your site.

www.endurancewindpower.com | info@endurancewindpower.com

Cornerstones of Endurance Design

Production Efficiency

Most distributed wind customers did not select their site for wind resources, but look to generate power from the wind available to them. Endurance wind turbines are designed specifically for less-than-perfect wind conditions.

Swept Area
The blades capture the energy of the wind. The larger the rotor diameter, the more wind energy the turbine captures. The Endurance E-3120 has a 19m (63 ft) rotor diameter- one of the largest rotor diameters per rated kW in its class- to capture the most wind energy.

Motoring
Motoring starts the blades spinning so the turbine operates in lighter wind conditions than if it relied solely on the wind to start (3-phase models only).

Generator Type
The induction generator produces electricity that can be transferred to the power grid without inverters. This provides lower equipment and maintenance costs and increases overall power production.

Reliability

All Endurance turbines have been extensively tested to ensure customers receive dependable energy production. They are built with proven commercial components for durability and easy support in the future.

Five Year Warranty
Endurance offers one of the best warranties in the wind industry, covering all defective components and labor for five years.

Safe Operation

When the turbine control system detects any fault, such as high wind or a grid power loss, the dual caliper disc brake system activates, safely stopping the turbine until the condition is cleared.

Passive Stall Rotor Design
The fixed-speed rotor aerodynamically stalls the blades as the first layer of protection for the turbine during high winds.

Control and Remote Interface Software
Each Endurance wind turbine is operated safely by an onboard computer system with advance control logic. This system also records data including energy production, average power, wind speed and event history. Turbine controls and data are also remotely available from a web browser.

Quiet Operation

Quiet operation is essential for a wind turbine in a community environment. Endurance turbines use slowly turning blades and high-quality manufactured components to make them the quietest turbines in their class.

Clean Aesthetics

A wind turbine makes a powerful statement about your commitment to the environment and clean energy. Endurance wind turbines have clean lines and make an attractive addition to any landscape.

Endurance™ wind power
we power the future

Turbine

Configuration	3 blades, horizontal axis, downwind
Rated power @ 9.5 m/s	50kW
Applications	Direct grid-tie
Rotor speed	42 rpm
Cut-in wind speed	3.5 m/s (7.8 mph)
Cut-out wind speed	25 m/s (56 mph)
Survival wind speed	52 m/s (116 mph)
Overall weight	3 990 kg (8 800 lbs)

Rotor

Rotor diameter	19.2 m (63.0 ft)
Swept area	290 m² (3120 ft²)
Blade length	9.00 m (29.5 ft)
Blade material	Fiberglass/Polyester
Power regulation	Stall control (constant speed)

Generator

Type	Induction generator
Configurations	3ϕ, 480 VAC or 600 VAC @ 60 Hz 1ϕ, 240VAC @ 60Hz

Brake & Safety Systems

Main brake system	Rapid fail-safe dual mechanical brakes
Secondary safety	Pitch control system (for over-speed regulation) using passive, spring-loaded mechanism
Automatic shut down triggered by :	- High wind speed - Grid failure - Over-speed - All other fault conditions

Controls

Control System	Programmable logic controller (PLC)
User interface	Wireless or wired network software interface for remote monitoring and control

Warranty

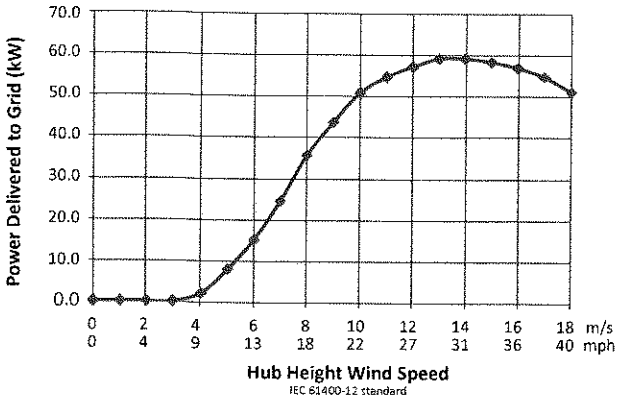
Turbine & controls	5 years parts and labour

Towers

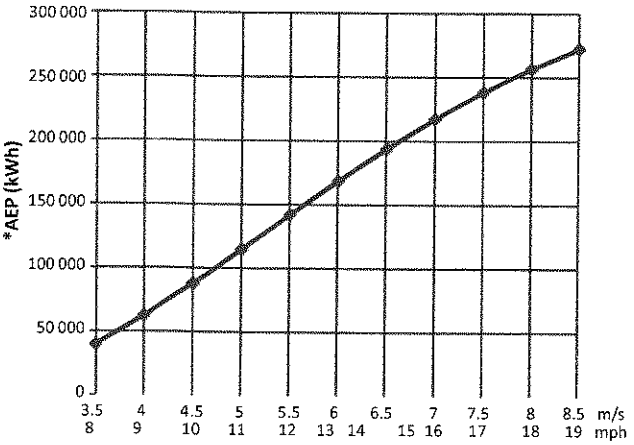
Free-standing monopole or lattice:	30.5m (100 ft), 36.5m (120 ft), 42.7m (140 ft)
Maintenance access	Safe climbing system Working space inside the nacelle Tower-top work platform

CE

Power Curve



Annual Energy Production (AEP)



Annual Average Hub Height Wind Speed (m/s)	Annual Energy Production (kWh)
3.5	40 100
4.0	62 500
4.5	88 000
5.0	114 900
5.5	142 200
6.0	168 900
6.5	194 300
7.0	217 700
7.5	238 800
8.0	257 200
8.5	273 000

Wind Speed Conversion Table

m/s	4	5	6	7	8	9	10	11	12	14
km/h	14	18	22	25	29	32	36	40	43	50
mph	9	11	13	16	18	20	22	25	27	31

VanWall ENERGY

Jake West 515-221-0765
Jake.West@vanwall.com

Clint Evans 515-783-8880
Clint.Evans@vanwall.com

P: 515-465-5681
22728 141st Drive
PO Box 575
Perry, Iowa 50220

energy.vanwall.com
www.harvestthewindnetwork.com

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