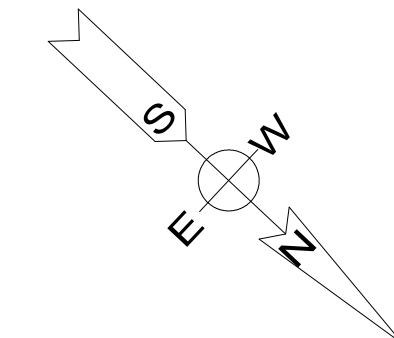
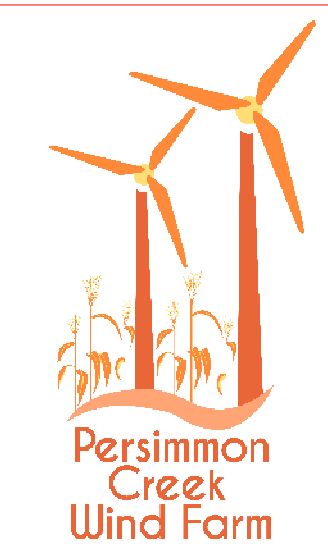


PERSIMMON CREEK WIND PROJECT  
OKLAHOMA WOODWARD COUNTY

REV.	DATE	DESCRIPTION	BY
A	03/31/17	30% DESIGN	JEP
B	09/18/17	60% DESIGN	IJO
C	01/31/18	90% DESIGN	IJO
0	03/02/18	ISSUED FOR CONST.	IJO
1	07/11/18	ISSUED FOR RECORD	IJO



**RECORD DRAWING**  
DRAWINGS ARE BASED UPON CONSTRUCTION CONTRACTOR REDLINES WHICH HAVE NOT BEEN FIELD VERIFIED BY ENGINEER OF RECORD



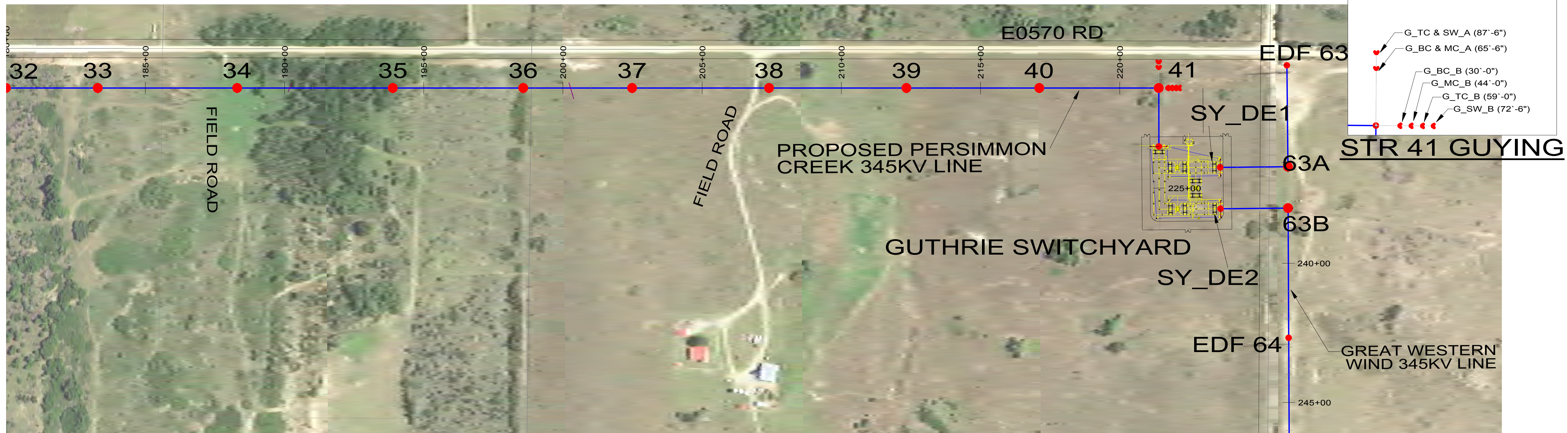
**Ulteig**  
3350 38TH AVENUE SOUTH  
FARGO, NORTH DAKOTA 58104  
PHONE: 701.280.8500  
FAX: 701.237.3191  
WWW.ULTEIG.COM

OKLAHOMA FIRM LICENSE: 5556  
DESIGN BY: IJO  
DRAWN BY: JEP  
APPROVED BY: BKF  
PROJECT NUMBER: 16.01958

**345KV TRANSMISSION LINE PLAN AND PROFILE**

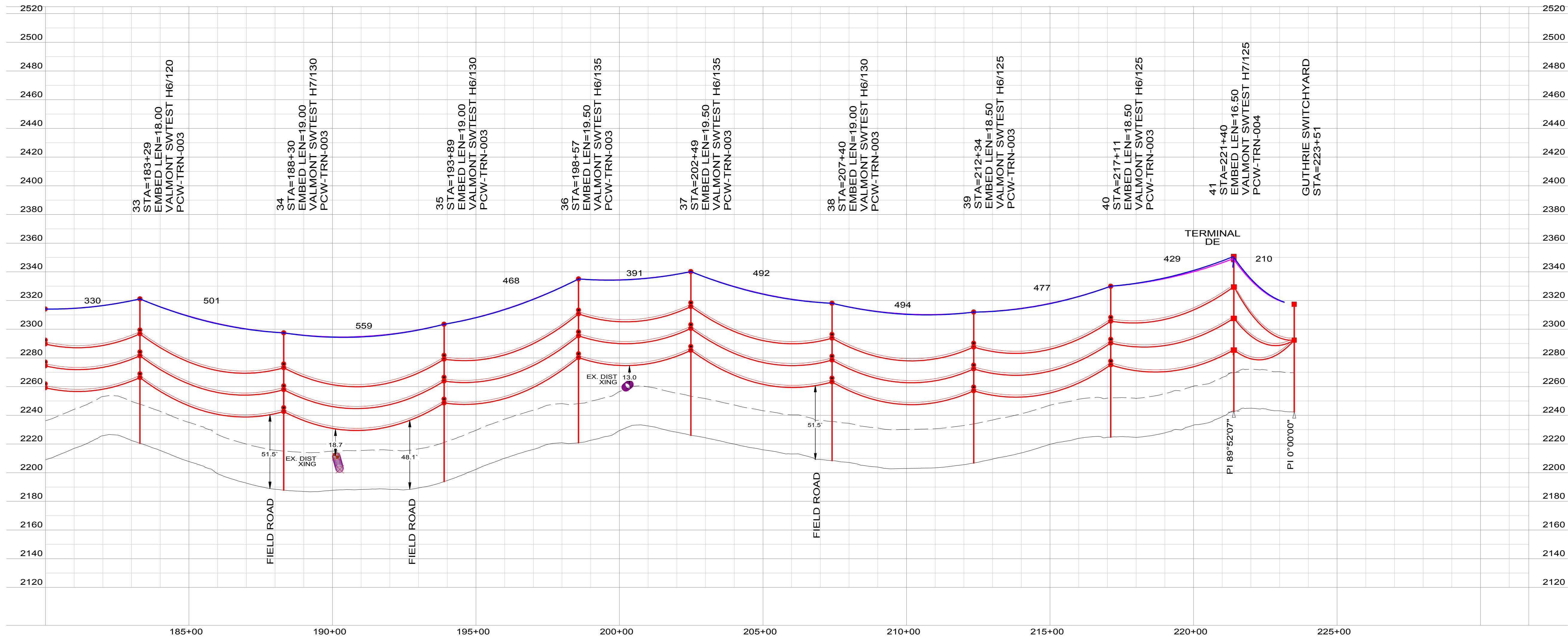
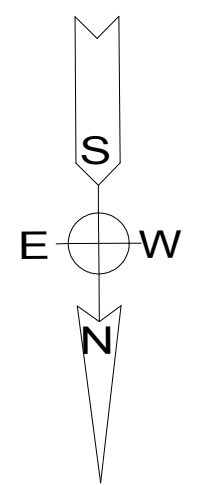
STR 26 TO STR 33  
DWG #: PCW-TRN-PP5  
REVISION: 1

200.0 FT. HORIZ. SCALE  
40.0 FT. VERT. SCALE

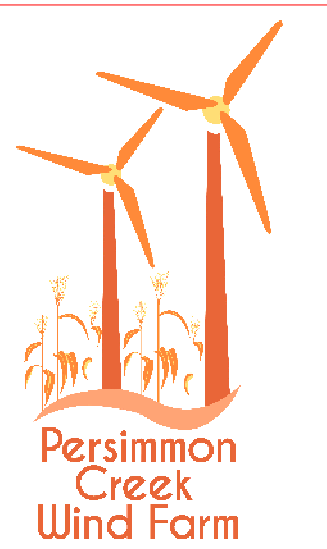


PERSIMMON CREEK WIND PROJECT  
OKLAHOMA WOODWARD COUNTY

REV.	DATE	DESCRIPTION	BY
A	03/31/17	30% DESIGN	JEP
B	09/18/17	60% DESIGN	IJO
C	01/31/18	90% DESIGN	IJO
0	03/02/18	ISSUED FOR CONST.	IJO
1	07/11/18	ISSUED FOR RECORD	IJO



**RECORD DRAWING**  
DRAWINGS ARE BASED UPON CONSTRUCTION CONTRACTOR REDLINES WHICH HAVE NOT BEEN FIELD VERIFIED BY ENGINEER OF RECORD

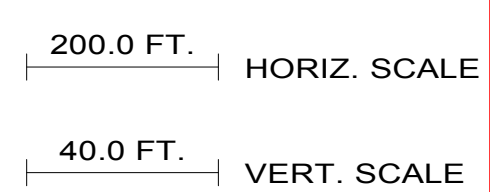


**Ulteig**  
3350 38TH AVENUE SOUTH  
FARGO, NORTH DAKOTA 58104  
PHONE: 701.280.8500  
FAX: 701.237.3191  
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OKLAHOMA FIRM LICENSE: 5556  
DESIGN BY: IJO  
DRAWN BY: JEP  
APPROVED BY: BKF  
PROJECT NUMBER: 16.01958

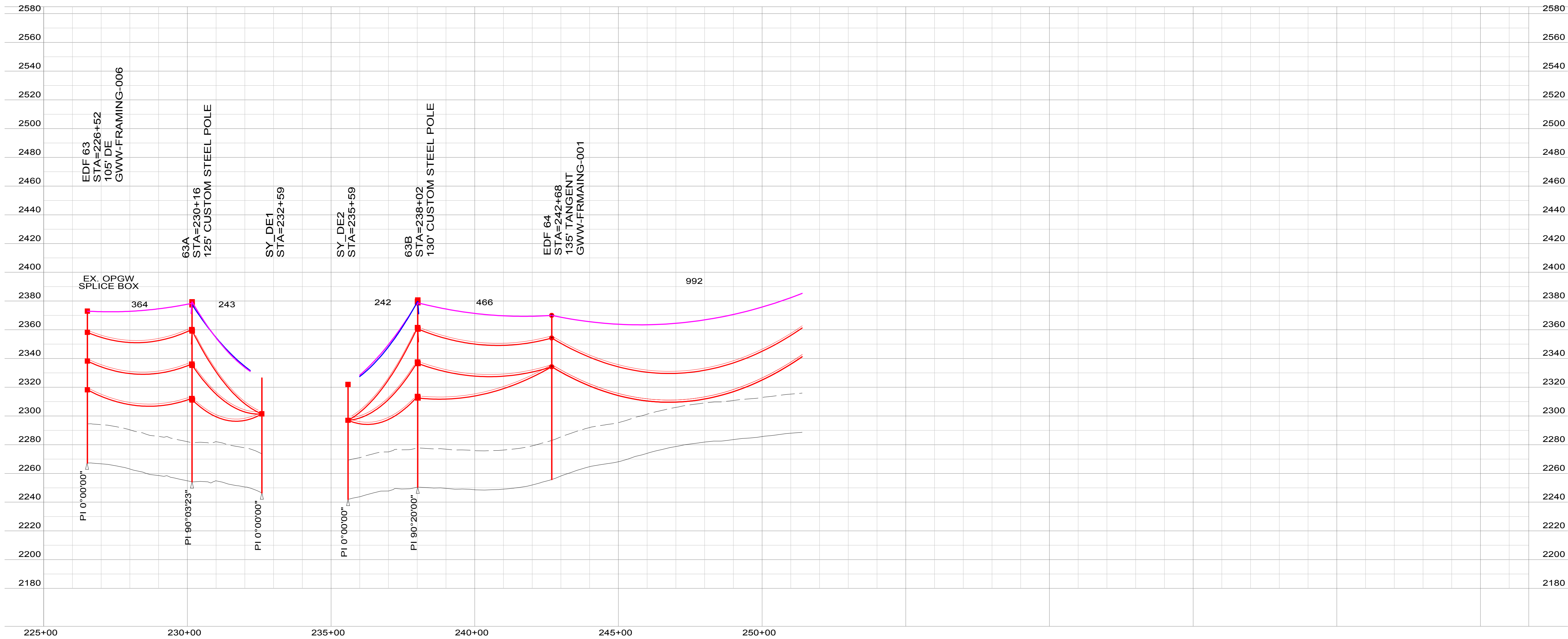
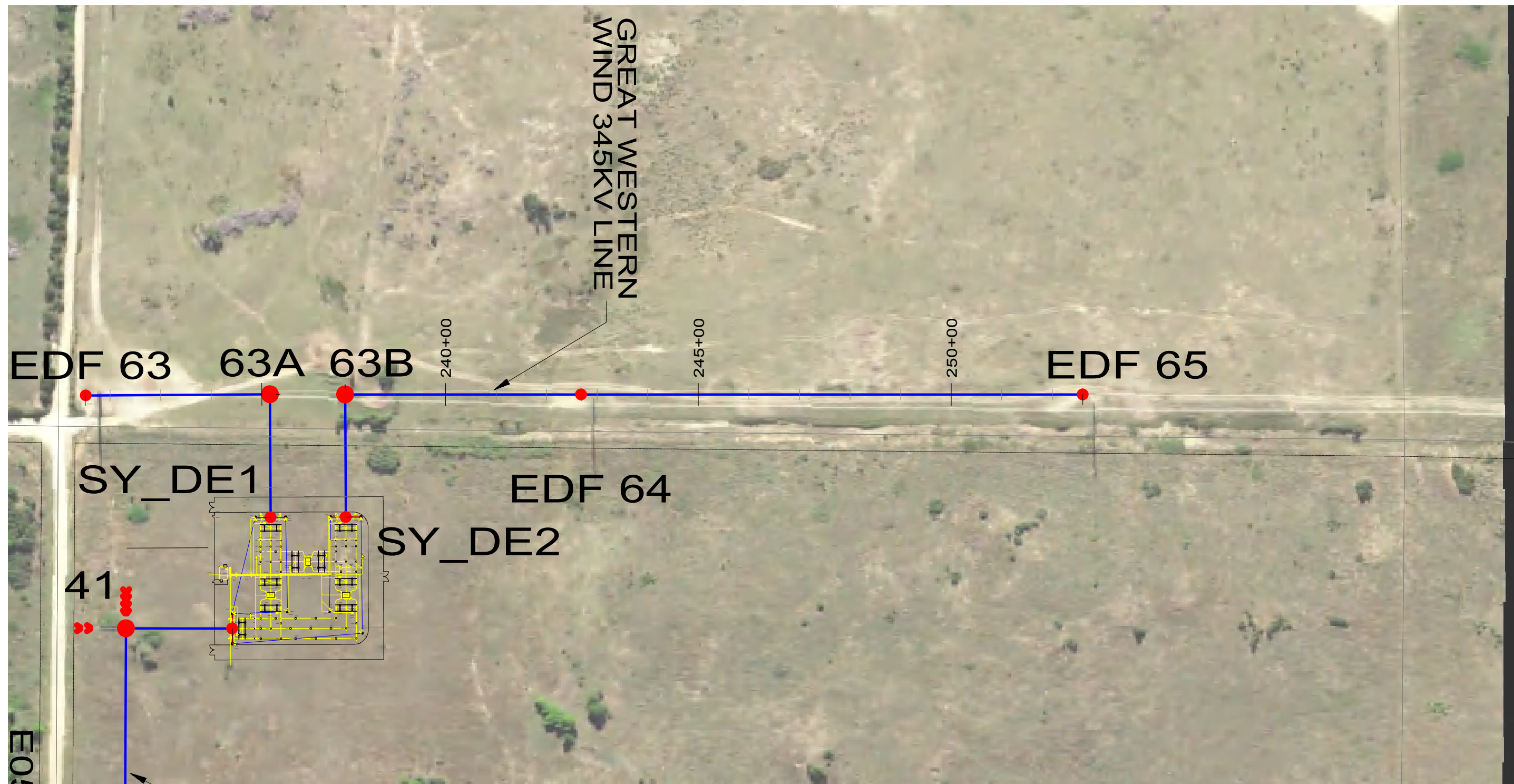
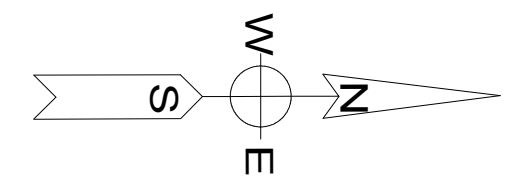
**345KV TRANSMISSION LINE PLAN AND PROFILE**

STR 33 TO GUTHRIE SWITCHYARD  
DWG #: PCW-TRN-PP6  
REVISION: 1



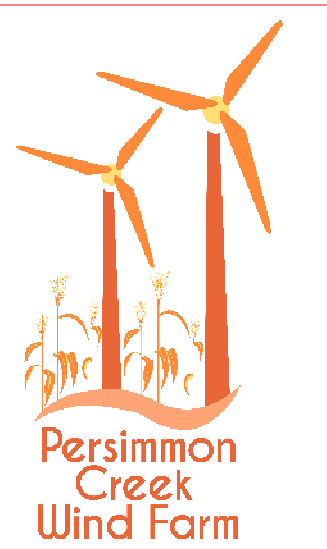
PERSIMMON CREEK  
WIND PROJECT  
OKLAHOMA  
WOODWARD COUNTY

REV.	DATE	DESCRIPTION	BY
A	03/31/17	30% DESIGN	JEP
B	09/18/17	60% DESIGN	IJO
C	01/31/18	90% DESIGN	IJO
0	03/02/18	ISSUED FOR CONST.	IJO
1	07/11/18	ISSUED FOR RECORD	IJO



**OBSOLETE**

**RECORD DRAWING**  
DRAWINGS ARE BASED UPON CONSTRUCTION CONTRACTOR REDLINES WHICH HAVE NOT BEEN FIELD VERIFIED BY ENGINEER OF RECORD



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BISMARCK - DENVER - DETROIT LAKES - FARGO - SIOUX FALLS - ST. PAUL  
OKLAHOMA FIRM LICENSE: 5556  
DESIGN BY: IJO  
DRAWN BY: JEP  
APPROVED BY: BKF  
PROJECT NUMBER: 16.01958

**345KV  
TRANSMISSION LINE  
PLAN AND PROFILE**

STR EDF 63 TO  
STR EDF 64  
DWG #: PCW-TRN-PP7  
REVISION: 1

200.0 FT. HORIZ. SCALE  
40.0 FT. VERT. SCALE

# PERSIMMON CREEK WIND PROJECT

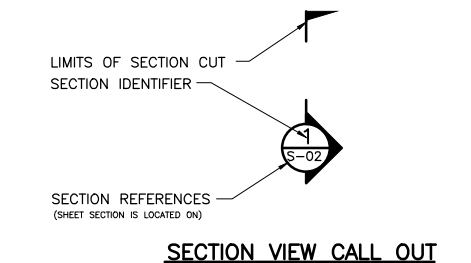
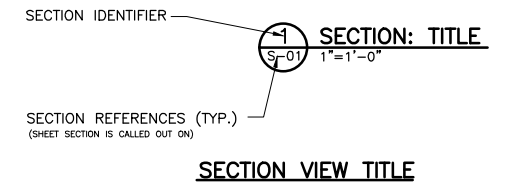
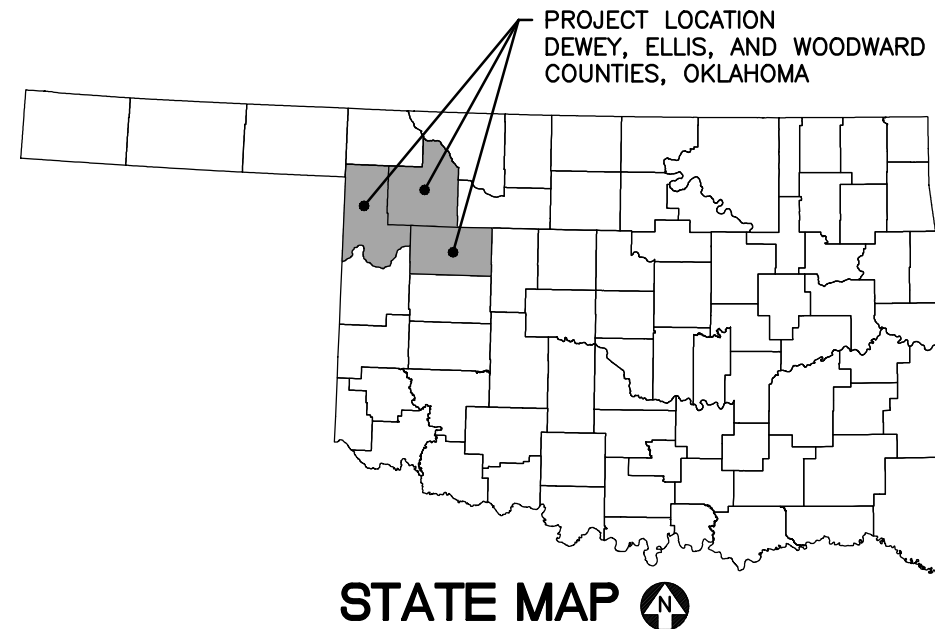
## WTG SPREAD FOOTING FOUNDATIONS

### DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA

### TURBINE MODELS

TURBINE ID	GEOTECH ID	TURBINE COORDINATES UTM NAD83 Zone 14		TURBINE MODEL	DWG. NO.
		X	Y		
WTG-05	5	463035	3998243	2.5-116	S-01
WTG-06	6	463391	3998278	2.5-116	S-01
WTG-07	7	463859	3998622	2.5-116	S-01
WTG-08	8	464190	3998632	2.5-116	S-01
WTG-09	9	464520	3998625	2.5-116	S-01
WTG-12	12RS-NE	465803	3998927	2.5-116	S-01
WTG-13	13R	466210	3998979	2.5-116	S-01
WTG-14	14	466624	3999016	2.5-116	S-01
WTG-15	15	466952	3999022	2.5-116	S-01
WTG-16	16	467283	3999005	2.5-116	S-01
WTG-17	17	467624	3999133	2.5-116	S-01
WTG-18	18	467964	3999206	2.5-116	S-01
WTG-21	21R	464328	4000716	2.5-116	S-01
WTG-22	22	464663	4000749	2.5-116	S-01
WTG-23	23	465005	4000769	2.5-116	S-01
WTG-24	24R	465323	4000797	2.5-116	S-01
WTG-25	25	465820	4000795	2.5-116	S-01
WTG-27	27	466633	4001023	2.5-116	S-01
WTG-28	28	466972	4001080	2.5-116	S-01
WTG-29	29	467301	4001050	2.5-116	S-01
WTG-30	30	467625	4000979	2.5-116	S-01
WTG-31	31	467948	4000898	2.5-116	S-01
WTG-32	32	468267	4000737	2.5-116	S-01
WTG-33	33	468586	4000574	2.5-116	S-01
WTG-34	34	468327	4002536	2.5-116	S-01
WTG-35	35	469162	4002581	2.5-116	S-01
WTG-36	36	469489	4002680	2.5-116	S-01
WTG-37	37R	469870	4002737	2.5-116	S-01
WTG-38	38RN	470227	4002754	2.5-116	S-01
WTG-39	39R	465846	4003784	2.5-116	S-01
WTG-40	40	466309	4003856	2.5-116	S-01
WTG-41	41	466647	4003855	2.5-116	S-01
WTG-42	42	467378	4003827	2.5-116	S-01
WTG-43	43	467702	4003751	2.5-116	S-01
WTG-44	44	468014	4003669	2.5-116	S-01
WTG-45	45R	468328	4003632	2.5-116	S-01
WTG-46	46	468685	4003632	2.5-116	S-01
WTG-47	47R	469034	4003857	2.3-116	S-01
WTG-48	48	469348	4003900	2.5-116	S-01
WTG-49	49	469952	4003884	2.5-116	S-01
WTG-50	50	470248	4003701	2.5-116	S-01
WTG-51	51R	470661	4003600	2.5-116	S-01
WTG-52	52	471756	4003453	2.5-116	S-01
WTG-53	53	472331	4003913	2.5-116	S-01
WTG-54	54R	472656	4003886	2.5-116	S-01
WTG-55	55	473031	4003877	2.5-116	S-01
WTG-57	57R	475505	4001454	2.5-116	S-01

TURBINE ID	GEOTECH ID	TURBINE COORDINATES UTM NAD83 Zone 14		TURBINE MODEL	DWG. NO.
		X	Y		
WTG-58	58R	475844	4001475	2.5-116	S-01
WTG-59	59	476183	4001452	2.5-116	S-01
WTG-61	61	476889	4001779	2.5-116	S-01
WTG-62	62R	477250	4001926	2.5-116	S-01
WTG-63	63	477566	4001979	2.5-116	S-01
WTG-65	65	475845	4002667	2.5-116	S-01
WTG-66	66	476282	4002704	2.5-116	S-01
WTG-67	67	476636	4002695	2.5-116	S-01
WTG-68	68	477032	4003735	2.5-116	S-01
WTG-69	69	477395	4003621	2.5-116	S-01
WTG-70	70R	477763	4003620	2.5-116	S-01
WTG-71	71	478071	4003531	2.5-116	S-01
WTG-72	72R	480325	4003732	2.5-116	S-01
WTG-73	73	480652	4003536	2.5-116	S-01
WTG-74	74R	480987	4003409	2.5-116	S-01
WTG-75	75	482637	4002986	2.5-116	S-01
WTG-76	76	482951	4002969	2.5-116	S-01
WTG-77	77	477373	4005480	2.5-116	S-01
WTG-78	78	477704	4005459	2.5-116	S-01
WTG-79	79R	478060	4005438	2.5-116	S-01
WTG-80	80	466878	4005438	2.5-116	S-01
WTG-81	81R	467182	4005388	2.5-116	S-01
WTG-82	Alt82	467541	4005406	2.5-116	S-01
WTG-83	Alt83	467858	4005399	2.5-116	S-01
WTG-86	Alt86	471291	4005916	2.5-116	S-01
WTG-87	4R	471704	4006090	2.5-116	S-01
WTG-88	11R	472071	4006188	2.5-116	S-01
WTG-90	20R	473119	4007002	2.3-116	S-01
WTG-91	26R	473474	4007051	2.3-116	S-01
WTG-92	56R	473852	4007172	2.3-116	S-01
WTG-93	60R	474256	4007275	2.3-116	S-01
WTG-94	64R	474625	4007417	2.3-116	S-02
WTG-95	10R	475004	4007583	2.3-116	S-01
				Total 2.5-116 =	73
				Total 2.3-116 =	7
				Total =	80



### DRAWING INDEX

SHEET	REV.	TITLE
S-00	5	TITLE SHEET, DRAWING INDEX, AND LOCATION MAP
S-01	3	2.3MW & 2.5MW SPREAD FOOTING FOUNDATION – PLAN, ELEVATION, SECTION AND DETAILS
S-02	3	BUOYANT SPREAD FOOTING FOUNDATION – PLAN, ELEVATION, SECTION AND DETAILS
S-03	2	SPREAD FOOTING FOUNDATION – TECHNICAL SPECIFICATIONS AND SUBMITTALS
S-04	1	SPREAD FOOTING FOUNDATION SOIL CORRECTION SECTIONS AND SPECIFICATIONS

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CADD USER: Charles P. Beauzoy FILE: M:\ADPTWORK\CPE\36221005.01\_S-00.DWG PLOT SCALE: 1:2 PLOT DATE: 7/26/2018 1:51 PM  
 J:\ad2 MA\adptwork\ad2\36221003\_reck\_fails\_s-00.dwg Plot at 0 04/18/2017 13:45:38

NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
0	JMW	JAD2	CAK	9/15/17	ISSUED FOR CONSTRUCTION
1	JMW	JAD2	CAK	9/26/17	REVISIONS AS NOTED
2	SMM3	JAD2	CAK	10/04/17	TURBINE SITE 47 COORDINATES
3	SMM3	JAD2	CAK	11/17/17	TURBINE SITE COORDINATES AND ID'S
4	JMW	JAD2	CAK	11/16/17	UPDATED DRAWING INDEX
5	CPB	JAD2	CAK	07/26/18	RECORD DRAWING

CLIENT	BID	CONSTRUCTION	PROCUREMENT	RELEASED TO/FOR	DATE RELEASED
BARR ENGINEERING CO.	9/15/17	9/26/17	10/04/17	11/01/17	11/16/17
4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435					
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 www.barr.com					

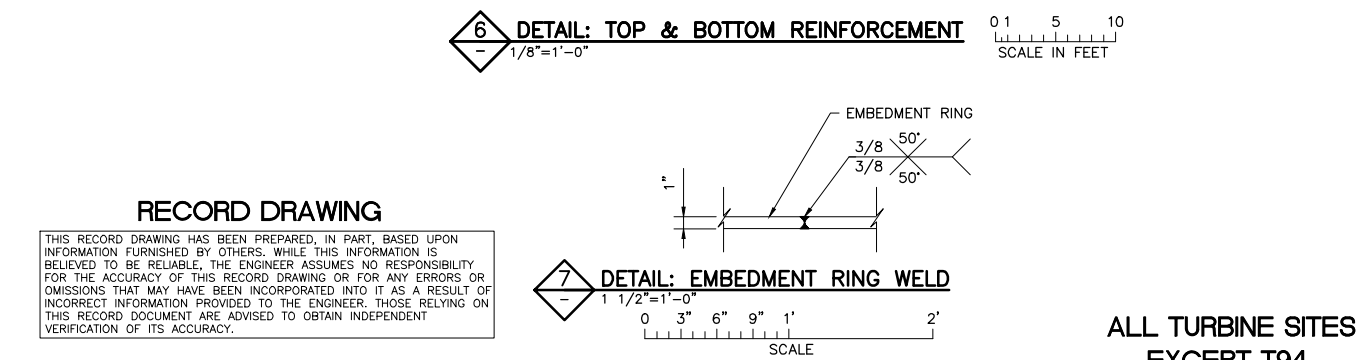
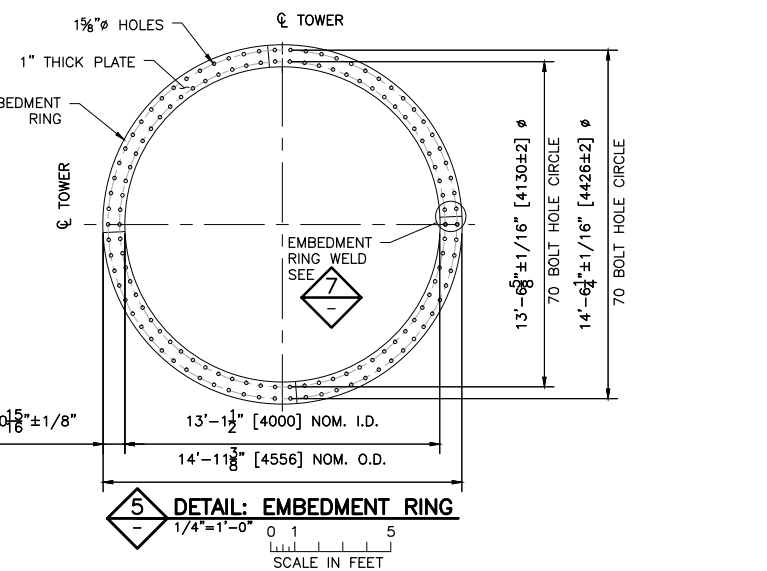
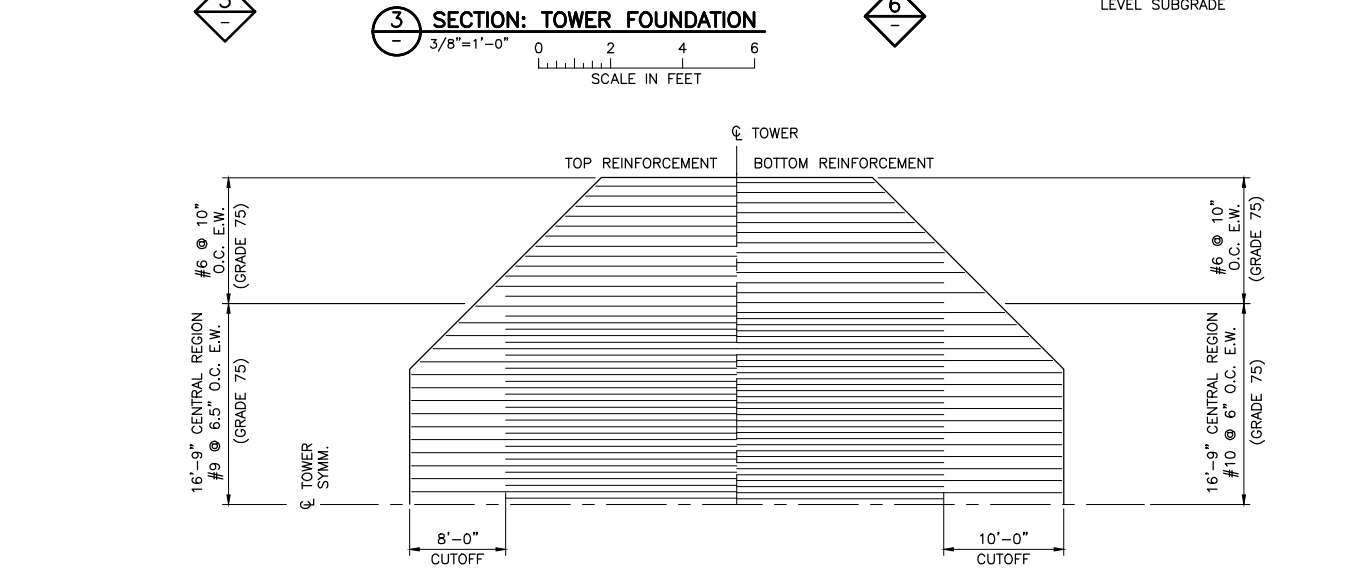
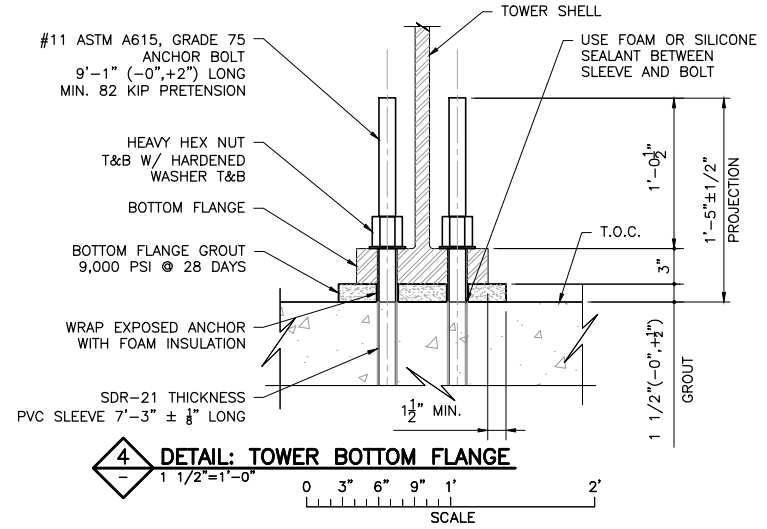
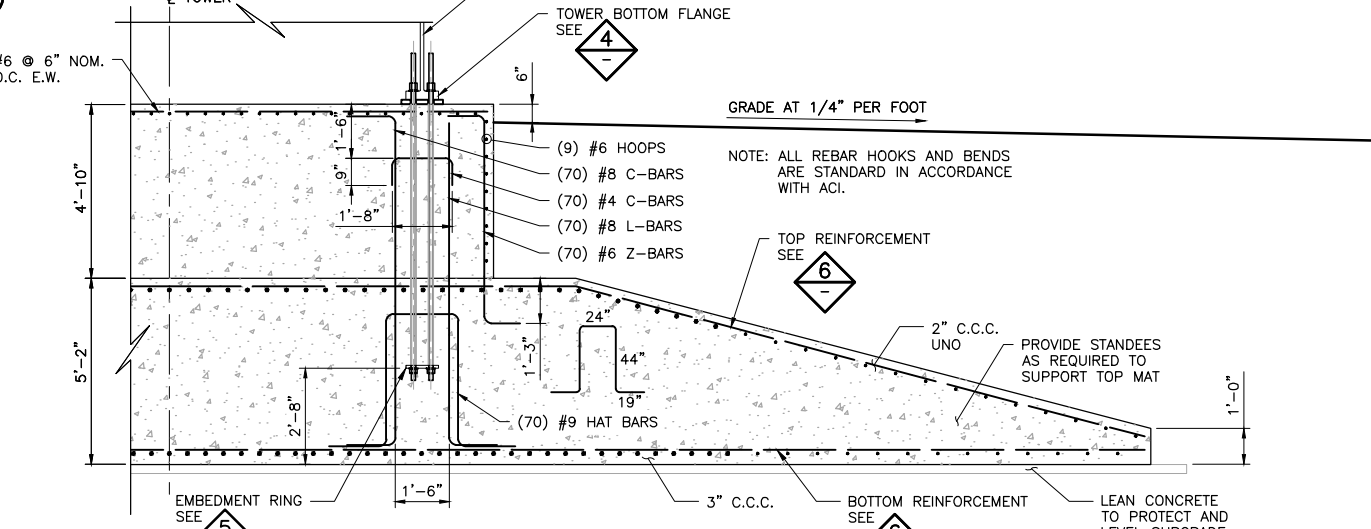
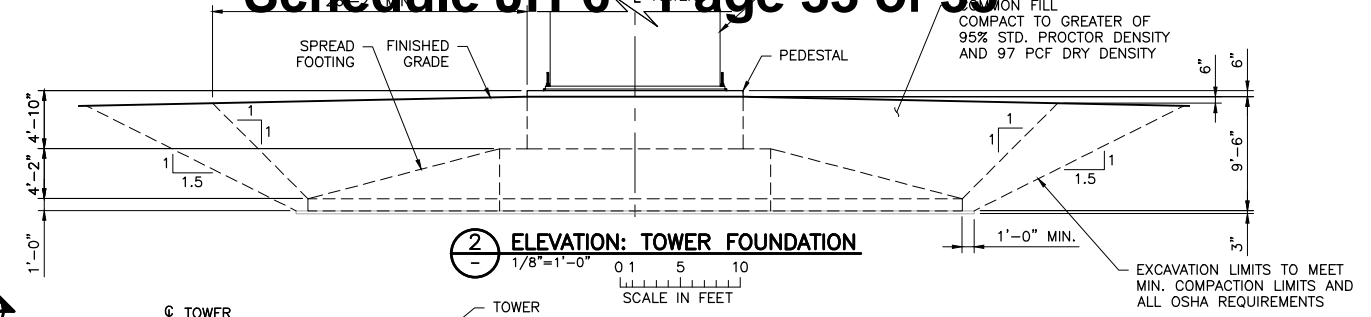
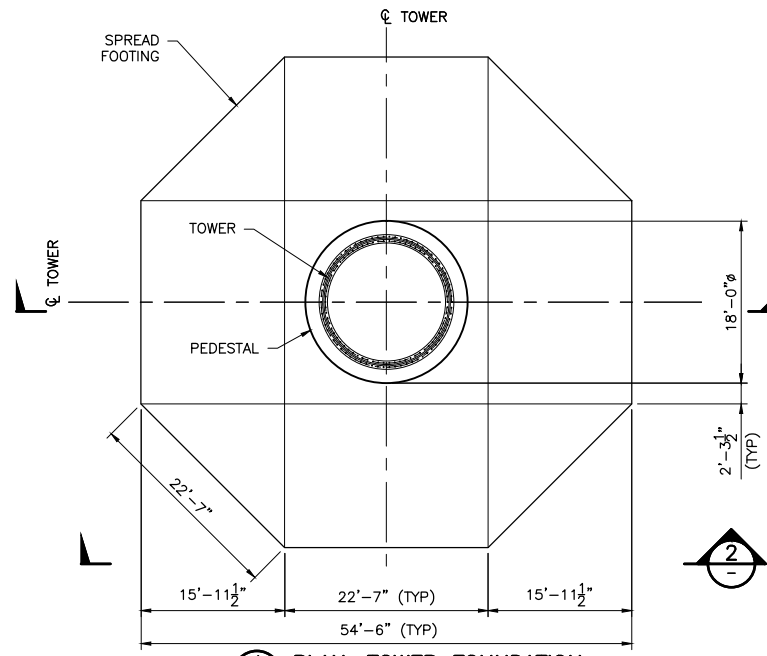
Scale	AS SHOWN
Date	4/24/2017
Drawn	JMW
Checked	JAD2
Designed	SMM3
Approved	CAK

Project Office:  
**BARR ENGINEERING CO.**  
 4300 MARKETPOINTE DRIVE  
 Suite 200  
 MINNEAPOLIS, MN 55435  
 Ph: 1-800-632-2277  
 Fax: (952) 832-2601  
 www.barr.com

**PERSIMMON CREEK WIND PROJECT**  
 DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA

**TITLE SHEET, DRAWING INDEX, AND LOCATION MAP**

BARR PROJECT No.	CLIENT PROJECT No.	DWG. No.	REV. No.
36221005.01		S-00	5



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ALL TURBINE SITES EXCEPT T94

**BUILDING AND DESIGN CODES:**  
 INTERNATIONAL BUILDING CODE 2015, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS.  
 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318, 2014, AMERICAN CONCRETE INSTITUTE.

**WIND TURBINE AND TOWER:**  
 MANUFACTURER: GE ENERGY  
 MODEL: 2.5-116 OR 2.3-116  
 POWER OUTPUT: 2.5MW OR 2.3MW  
 TURBINE HUB HEIGHT: 90m OR 79.9m  
 ROTOR DIAMETER: 116m

**DESIGN SERVICE LOADS:**  
 UNFACTORED SERVICE LOADS DUE TO NORMAL EXTREME WIND CONDITION CLASS IEC S:  
 (APPLY 1.40 LOAD FACTOR TO LOADS SHOWN BELOW TO OBTAIN FACTORED LOADS)  
 OVERTURNING MOMENT, MXY = 45,003 KN-M = 33,192 FT-KIPS  
 HORIZONTAL BASE SHEAR, HXY = 512 KN = 115 KIPS  
 VERTICAL TOWER LOAD, WZ = 2,699 KN = 607 KIPS

UNFACTORED SERVICE LOADS DUE TO ABNORMAL EXTREME WIND CONDITION CLASS IEC S:  
 (APPLY 1.14 LOAD FACTOR TO LOADS SHOWN BELOW TO OBTAIN FACTORED LOADS)  
 OVERTURNING MOMENT, MXY = 57,705 KN-M = 42,561 FT-KIPS  
 HORIZONTAL BASE SHEAR, HXY = 740 KN = 166 KIPS  
 VERTICAL TOWER LOAD, WZ = 2,617 KN = 588 KIPS

MISALIGNMENT LOAD = 1,335 KN-M = 985 FT-KIPS  
 25 YEAR DESIGN LIFE  
 NOTE: CONTROLLING LOADS SHOWN. SEE REFERENCE DOCUMENTS FOR LOADING DETAILS.

- FOUNDATION DESIGN DATA:**
- BARR ENGINEERING COMPANY, "FOUNDATION DESIGN COMPUTATIONS, GE2.5-116MR-90MH, PERSIMMON CREEK WIND PROJECT, GESTAMP WIND, DEWEY, ELLIS AND WOODWARD COUNTIES, OKLAHOMA", SEPTEMBER 2017.
  - BARR ENGINEERING COMPANY, "FOUNDATION DESIGN COMPUTATIONS, GE2.3-116MR-79.9MH, PERSIMMON CREEK WIND PROJECT, GESTAMP WIND, DEWEY, ELLIS AND WOODWARD COUNTIES, OKLAHOMA", SEPTEMBER 2017.

- REFERENCE DOCUMENTS:**
- GE RENEWABLE ENERGY, "FOUNDATION LOAD SPECIFICATION FOR WIND TURBINE GENERATOR SYSTEMS, PERSIMMON CREEK, OKLAHOMA, (GE PROJECT 828281), 2.5-116, 60 HZ, 90M HUB HEIGHT, STANDARD WEATHER, IEC CLASS S", REVISION 1, DATED 2017-04-17.
  - GE RENEWABLE ENERGY, "FOUNDATION LOAD SPECIFICATION FOR WIND TURBINE GENERATOR SYSTEMS, PERSIMMON CREEK, OKLAHOMA, (GE PROJECT 828281), 2.3-116, 60 HZ, 79.9M HUB HEIGHT, STANDARD WEATHER, IEC CLASS S", REVISION 01, DATED 2017-09-13.
  - BARR ENGINEERING COMPANY, "GEOTECHNICAL ENGINEERING REPORT, PERSIMMON CREEK WIND PROJECT, DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA", SEPTEMBER 2017.

**MIN. 28-DAY COMPRESSIVE STRENGTH CONCRETE:**  
 5000 PSI  
**MIN. YIELD POINT STRENGTH OF REINFORCING BAR:**  
 60 KSI UNO  
**MIN. STRENGTH OF ANCHOR BOLTS:**  
 TENSILE STRENGTH 100 KSI YIELD STRENGTH 75 KSI  
**MIN. 28-DAY COMPRESSIVE STRENGTH OF NON-SHRINK GROUT:**  
 9,000 PSI  
**MIN. YIELD POINT STRENGTH OF EMBEDMENT PLATE:**  
 36 KSI

**VOLUME OF FOUNDATION AS DIMENSIONED:**  
 347 CUBIC YARDS  
**ESTIMATED WEIGHT OF STEEL REINFORCING:**  
 24.6 TONS GRADE 75  
 5.2 TONS GRADE 60

**COARSE AGGREGATE GRADATION:**  
 ASTM C33 (SIZE NUMBER 6 OR 67) WITH A MINIMUM OF 2% RETAINED ON THE 3/4-INCH SIEVE.

**ABBREVIATIONS:**

B.O.	BOTTOM OF	O.C.	ON CENTER
C.C.C.	CLEAR CONCRETE COVER	O.D.	OUTSIDE DIAMETER
CL	CENTER LINE	R	RADIUS
EL.	ELEVATION	T&B	TOP AND BOTTOM
E.W.	EACH WAY	T.O.C.	TOP OF CONCRETE
EX.	EXISTING	TYP	TYPICAL
I.D.	INSIDE DIAMETER	UNO	UNLESS NOTED OTHERWISE
MIN.	MINIMUM	MAX.	MAXIMUM
NOM.	NOMINAL	W/	WITH
Ø	DIAMETER		

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CADD USER: Charles P. Bezouzy FILE: M:\A\DEPTWORK\CPR\36221005.01\_S-01.DWG PLOT SCALE: 1:2 PLOT DATE: 7/26/2018 1:54 PM  
 BARR MA AutoCAD 2011 Support\enu\Template\Barr\_2011\_Template.dwt Plot at 1 10/05/2010 14:03:50

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	JMW	JAD2	CAK	4/25/17	INITIAL RELEASE
0	JMW	JAD2	CAK	9/15/17	ISSUED FOR CONSTRUCTION
1	JMW	JAD2	CAK	9/26/17	REVISIONS AS NOTED
2	JMW	JAD2	CAK	11/16/17	REVISIONS AS NOTED
3	CPB	JAD2	CAK	07/26/18	RECORD DRAWING

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF OKLAHOMA.  
 PRINTED NAME: CHRIS KOPCHYNSKI  
 SIGNATURE: \_\_\_\_\_  
 DATE: 09/15/2017 LICENSE # 21813

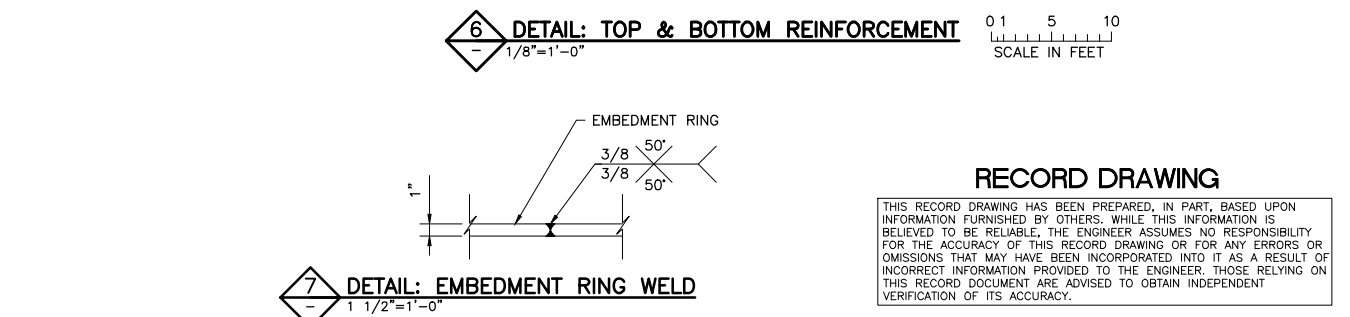
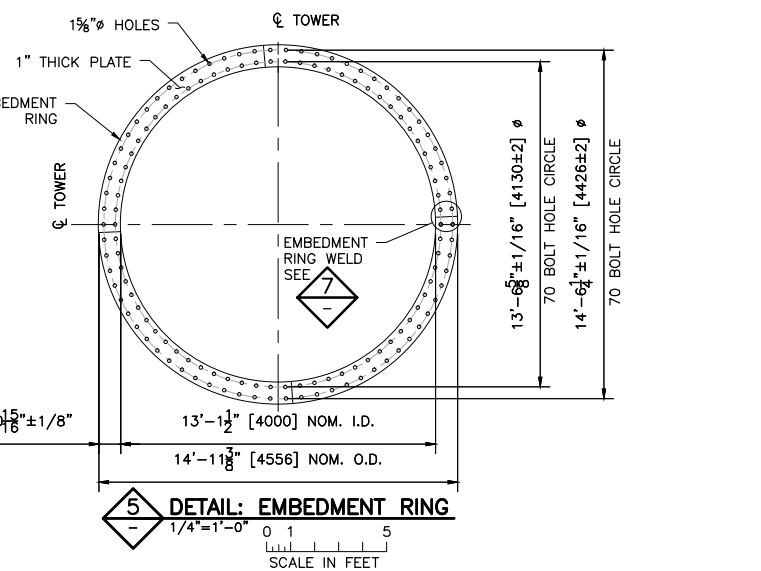
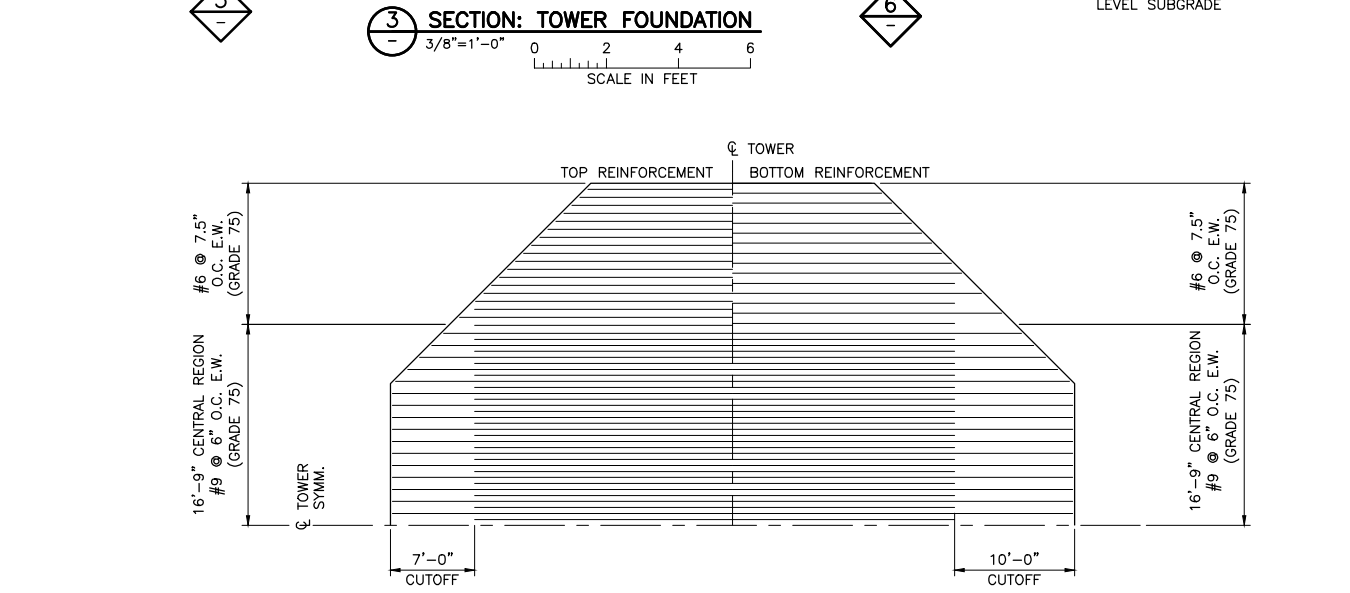
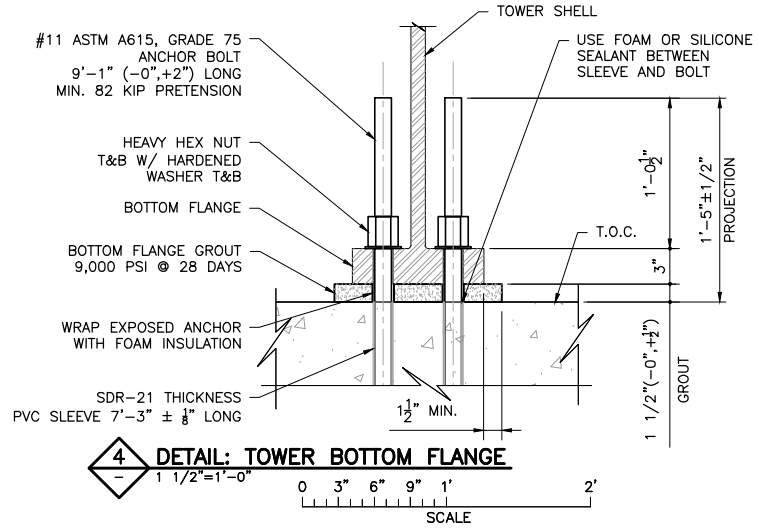
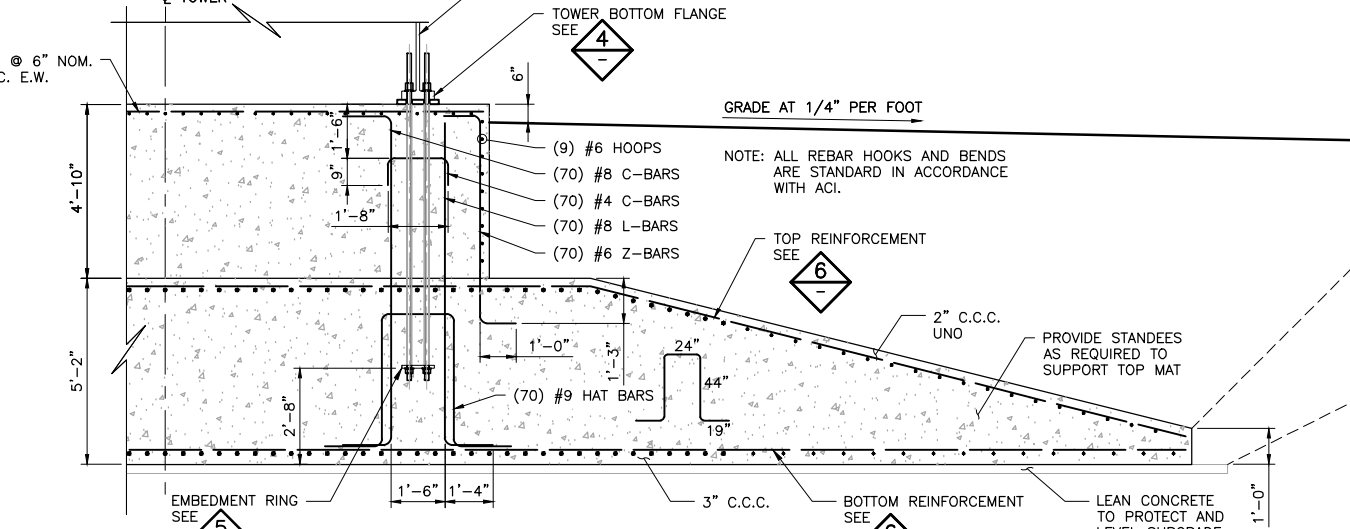
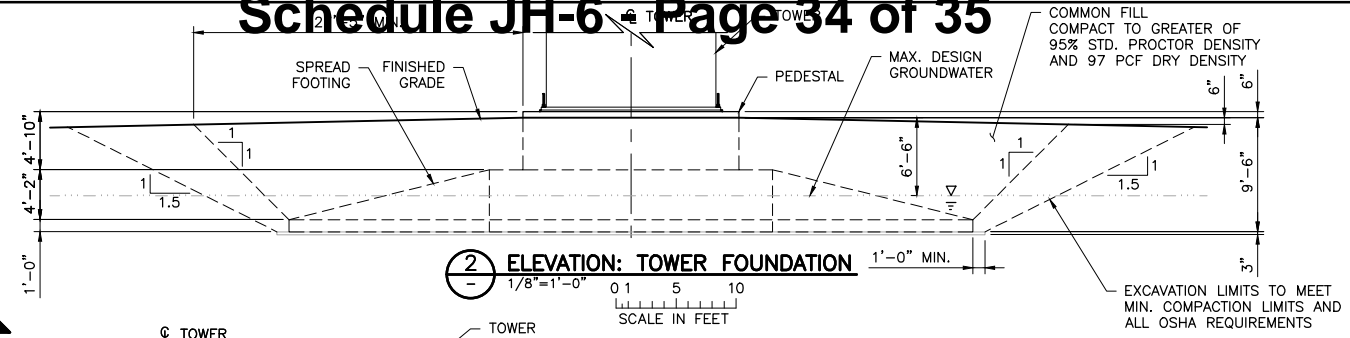
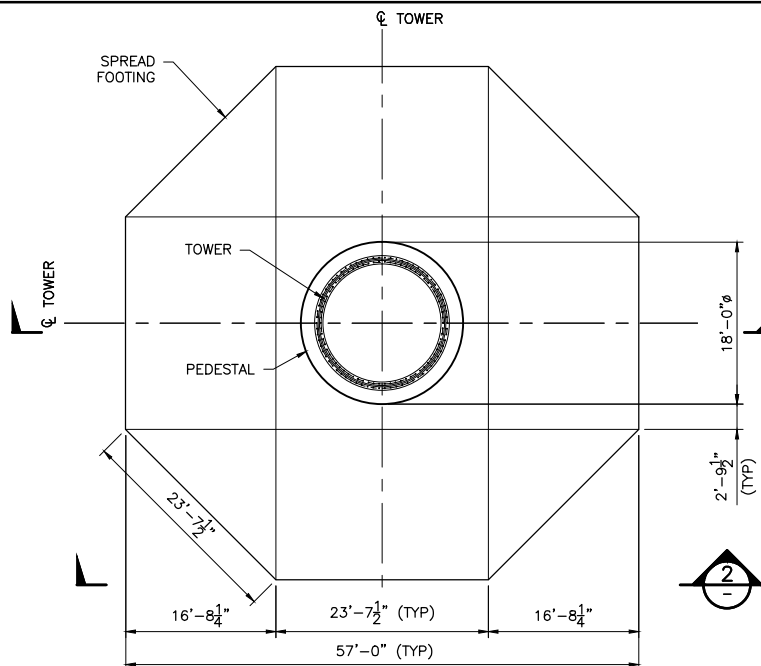
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BID					
CONSTRUCTION					
PROCUREMENT					
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DATE RELEASED					

**BARR**  
 Project Office:  
 BARR ENGINEERING CO.  
 4300 MARKETPOINTE DRIVE  
 Suite 200  
 MINNEAPOLIS, MN 55435  
 Corporate Headquarters:  
 Minneapolis, Minnesota  
 Ph: 1-800-632-2277  
 Fax: (952) 832-2601  
 www.barr.com

Scale	AS SHOWN
Date	4/12/2017
Drawn	JMW
Checked	JAD2
Designed	JAD2
Approved	CAK

**PERSIMMON CREEK WIND PROJECT**  
 DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA  
**2.3MW & 2.5MW SPREAD FOOTING FOUNDATION**  
 PLAN, ELEVATION, SECTION AND DETAILS

BARR PROJECT No. **36221005.01**  
 CLIENT PROJECT No. \_\_\_\_\_  
 DWG. No. **S-01** REV. No. **3**



**BUILDING AND DESIGN CODES:**  
INTERNATIONAL BUILDING CODE 2015, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS.

**BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE,** ACI 318, 2014, AMERICAN CONCRETE INSTITUTE.

**WIND TURBINE AND TOWER:**  
MANUFACTURER: GE ENERGY  
MODEL: 2.3-116  
POWER OUTPUT: 2.3 MW  
TURBINE HUB HEIGHT: 79.9m  
ROTOR DIAMETER: 116m

**DESIGN SERVICE LOADS:**

**UNFACTORED SERVICE LOADS DUE TO NORMAL EXTREME WIND CONDITION CLASS IEC S:**  
(APPLY 1.40 LOAD FACTOR TO LOADS SHOWN BELOW TO OBTAIN FACTORED LOADS)  
OVERTURNING MOMENT, MXY = 10,499 KN-M = 7,743 FT-KIPS  
HORIZONTAL BASE SHEAR, HXY = 171 KN = 38 KIPS  
VERTICAL TOWER LOAD, WZ = 2,433 KN = 547 KIPS

**UNFACTORED SERVICE LOADS DUE TO ABNORMAL EXTREME WIND CONDITION CLASS IEC S:**  
(APPLY 1.14 LOAD FACTOR TO LOADS SHOWN BELOW TO OBTAIN FACTORED LOADS)  
OVERTURNING MOMENT, MXY = 56,505 KN-M = 41,676 FT-KIPS  
HORIZONTAL BASE SHEAR, HXY = 740 KN = 166 KIPS  
VERTICAL TOWER LOAD, WZ = 2,617 KN = 588 KIPS

MISALIGNMENT LOAD = 1,335 KN-M = 985 FT-KIPS

25 YEAR DESIGN LIFE

**FOUNDATION DESIGN DATA:**

BARR ENGINEERING COMPANY, "BUOYANT FOUNDATION DESIGN COMPUTATIONS, GE2.3-116 79.9M HH, PERSIMMON CREEK WIND PROJECT, GESTAMP WIND, DEWEY, ELLIS AND WOODWARD COUNTIES, OKLAHOMA", APRIL 2018, REVISION 1.

**REFERENCE DOCUMENTS:**

- GE RENEWABLE ENERGY, "FOUNDATION LOAD SPECIFICATION FOR WIND TURBINE GENERATOR SYSTEMS, PERSIMMON CREEK, OKLAHOMA, (GE PROJECT 828281), 2.3-116, 60HZ, 79.9M HUB HEIGHT, STANDARD WEATHER, IEC CLASS S", REVISION 1, DATED 2017-09-13.
- BARR ENGINEERING COMPANY, "GEOTECHNICAL ENGINEERING REPORT, PERSIMMON CREEK WIND PROJECT, DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA", SEPTEMBER 2017.

**MIN. 28-DAY COMPRESSIVE STRENGTH CONCRETE:**  
5000 PSI

**MIN. YIELD POINT STRENGTH OF REINFORCING BAR:**  
60 KSI UNO

**MIN. STRENGTH OF ANCHOR BOLTS:**  
TENSILE STRENGTH 100 KSI YIELD STRENGTH 75 KSI

**MIN. 28-DAY COMPRESSIVE STRENGTH OF NON-SHRINK GROUT:**  
9,000 PSI

**MIN. YIELD POINT STRENGTH OF EMBEDMENT PLATE:**  
36 KSI

**VOLUME OF FOUNDATION AS DIMENSIONED:**  
376 CUBIC YARDS

**ESTIMATED WEIGHT OF STEEL REINFORCING:**  
25.6 TONS GRADE 75  
5.2 TONS GRADE 60

**COARSE AGGREGATE GRADATION:**  
ASTM C33 (SIZE NUMBER 6 OR 67) WITH A MINIMUM OF 2% RETAINED ON THE 3/4-INCH SIEVE.

**ABBREVIATIONS:**

B.O.	BOTTOM OF	O.C.	ON CENTER
C.C.C.	CLEAR CONCRETE COVER	O.D.	OUTSIDE DIAMETER
CL	CENTER LINE	R	RADIUS
EL	ELEVATION	T&B	TOP AND BOTTOM
E.W.	EACH WAY	T.O.C.	TOP OF CONCRETE
EX.	EXISTING	TYP	TYPICAL
I.D.	INSIDE DIAMETER	UNO	UNLESS NOTED OTHERWISE
MIN.	MINIMUM	MAX.	MAXIMUM
NOM.	NOMINAL	W/	WITH
Ø	DIAMETER		

**RECORD DRAWING**

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS THAT MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT OF INCORRECT INFORMATION PROVIDED TO THE ENGINEER. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY.

**TURBINE SITE T94**

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CADD USER: Charles P. Beuzoy FILE: M:\ADAPTWORK\CPB\36221005.01\_5-02.DWG PLOT SCALE: 1:2 PLOT DATE: 7/26/2018 1:58 PM  
BARR MA AutoCAD 2011 Support\enu\template\Barr\_2011\_Template.dwt Plot at 1 10/05/2010 14:03:50

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
1	JMW	JAD2	CAK	4/25/17	INITIAL RELEASE
2	JMW	JAD2	CAK	9/15/17	ISSUED FOR CONSTRUCTION
3	JMW	JAD2	CAK	10/04/17	BUOYANT DESIGN
4	JAD2	JAD2	CAK	11/01/17	UPDATED TO TURBINE SITE 94
5	CPB	JAD2	CAK	07/26/18	RECORD DRAWING UPDATED TO 2.3MW TURBINE

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

PRINTED NAME: CHRIS KOPCHYNSKI  
SIGNATURE: [Signature]  
DATE: 09/15/2017 LICENSE # 21813

CLIENT	4/25/17	9/15/17	10/04/17	11/01/17	07/26/18
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PROCUREMENT					
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4300 MARKETPOINTE DRIVE  
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Scale	AS SHOWN
Date	4/12/2017
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Checked	JAD2
Designed	JAD2
Approved	CAK

**WANZEK CONSTRUCTION, INC.**  
WEST FARGO, NORTH DAKOTA

**PERSIMMON CREEK WIND PROJECT**  
DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA

**BUOYANT SPREAD FOOTING FOUNDATION PLAN, ELEVATION, SECTION AND DETAILS**

BARR PROJECT No.	36221005.01
CLIENT PROJECT No.	
DWG. No.	S-02
REV. No.	3

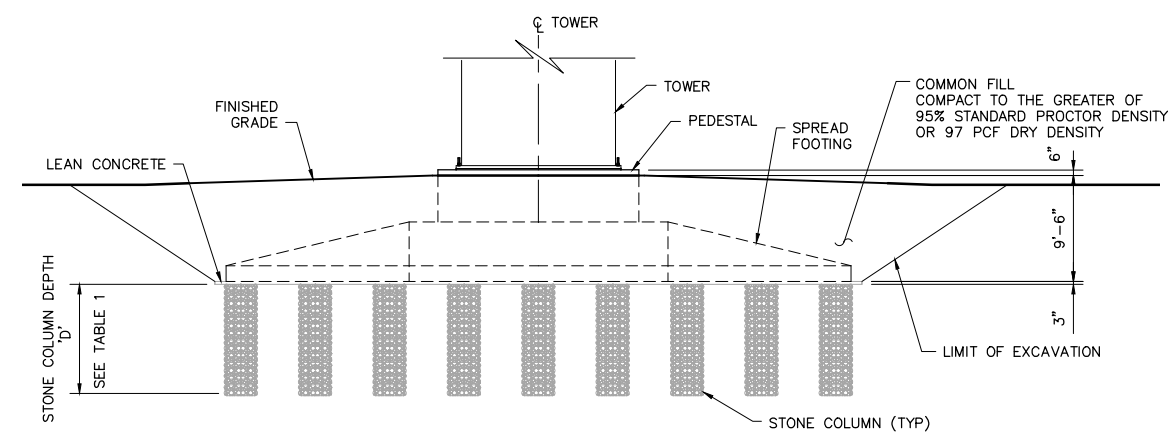
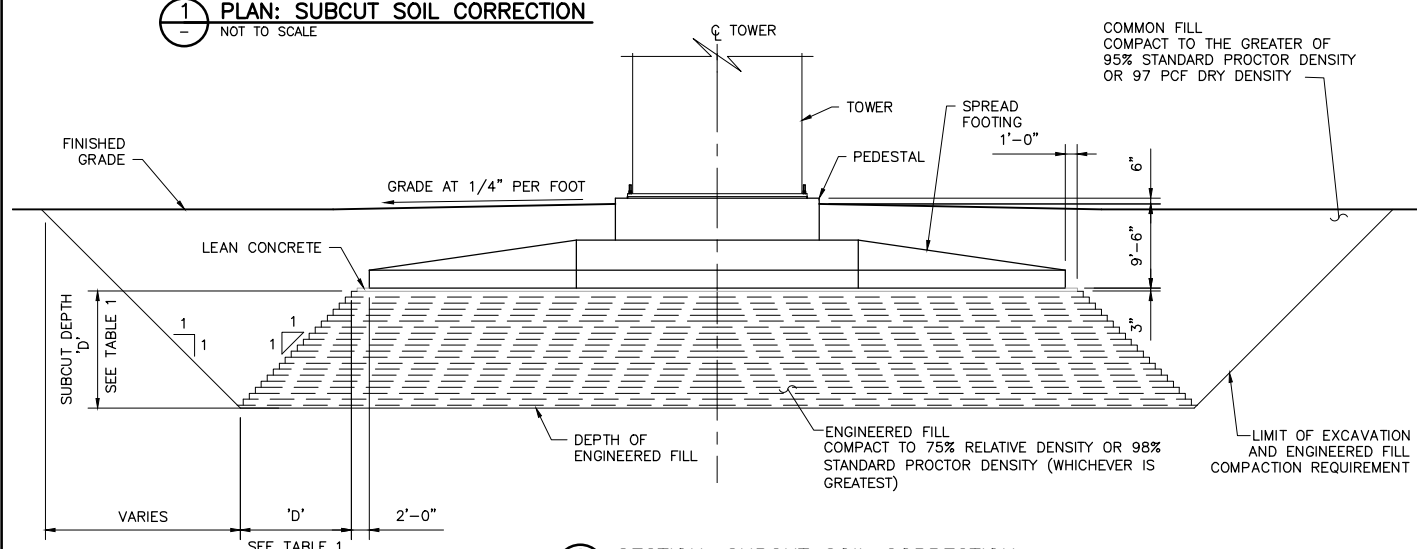
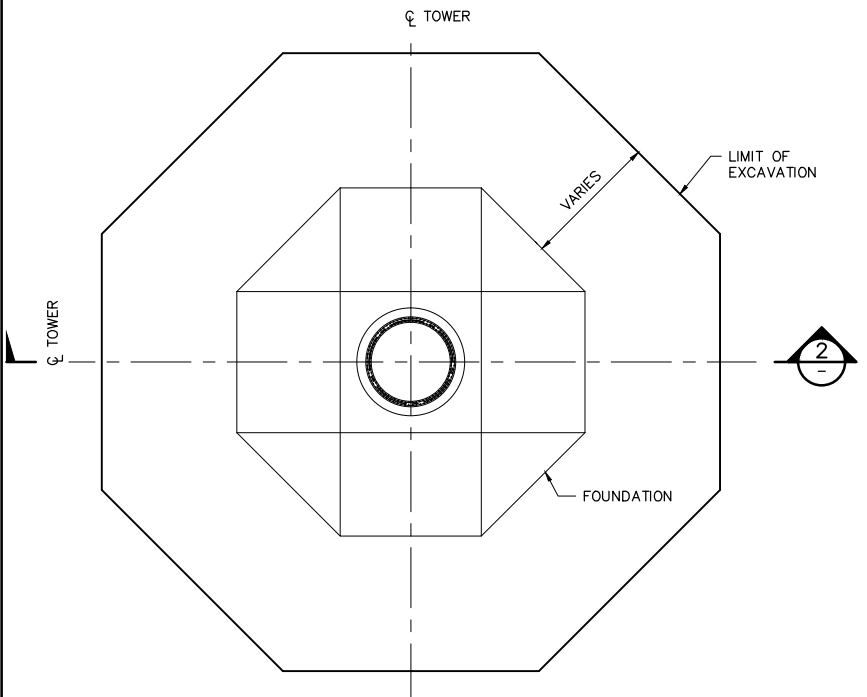


TABLE 1: ANTICIPATED REMEDIATION DEPTH 'D' BELOW BOTTOM OF FOUNDATION

TURBINE ID	GEOTECH ID	EASTING	NORTHING	ANTICIPATED REMEDIATION DEPTH (FT)	ANTICIPATED REMEDIATION DEPTH BELOW FOUNDATION 'D' (FT)	ANTICIPATED SOIL CORRECTION TYPE
88	11R	472063.9	4006187.4			SURFACE COMPACTION
12	12R	465799.7	3998973.3	25	15.5	STONE COLUMNS
14	14R	466649.4	3999015.2			SURFACE COMPACTION
15	15	466952.7	3999021.5			SURFACE COMPACTION
16	16	467283.8	3999004.2			SURFACE COMPACTION
21	21R	464328.3	4000714.9			SURFACE COMPACTION
24	24	465346.5	4000796.9			SURFACE COMPACTION
36	36	469489.8	4002679.4			SURFACE COMPACTION
38	38R	470228.4	4002742.3			SURFACE COMPACTION
39	39R	465843.9	4003783.3			SURFACE COMPACTION
40	40	466309.8	4003855.4			SURFACE COMPACTION
41	41	466647.8	4003854.4			SURFACE COMPACTION
42	42	467378.8	4003826.4			SURFACE COMPACTION
45	45	468365.8	4003632.1			SURFACE COMPACTION
48	48	469348.7	4003899.3			SURFACE COMPACTION
49	49	469952.7	4003883.1	30	20.5	STONE COLUMNS
50	50	470248.3	4003700.2			SURFACE COMPACTION
51	51R	470667.7	4003599.3	25	15.5	STONE COLUMNS
53	53	472331	4003913	△ PER RFI #37		SURFACE COMPACTION
55	55	473031.8	4003876.4			SURFACE COMPACTION
92	56R	473852.7	4007171.3			SURFACE COMPACTION
57	57R	475517.9	4001453.0			SURFACE COMPACTION
61	61	476889.6	4001778.8			SURFACE COMPACTION
62	62R	477255.7	4001925.5			SURFACE COMPACTION
63	63	477567.2	4001978.5			SURFACE COMPACTION
94	64R	474625.7	4007416.4	10	0.5	CONSTRUCTION TESTING
65	65	475845.8	4002666.2			SURFACE COMPACTION
68	68	477032.3	4003734.7			SURFACE COMPACTION
69	69	477395.7	4003620.3			SURFACE COMPACTION
70	70R	477764.1	4003619.2	△ -20	11.5	STONE COLUMNS
71	71	478071.4	4003530.1	△ ENTIRE SITE WAS CUT DOWN 25 FEET		SURFACE COMPACTION
75	75	482637.8	4002984.8			SURFACE COMPACTION
78	78	477704.9	4005458.3			SURFACE COMPACTION
81	81R	467178.4	4005386.8			SURFACE COMPACTION
82	ALT82	467541.8	4005405.2			SURFACE COMPACTION
83	ALT83	467873.7	4005398.4			SURFACE COMPACTION
86	ALT86	471291.7	4005915.2			SURFACE COMPACTION

TABLE 1 NOTES:  
 1. PROJECT CONTRACTOR/SPECIALTY DESIGN-BUILD CONTRACTOR TO DETERMINE FINAL SOIL CORRECTION METHOD(S). SUGGESTED GROUND REMEDIATION OPTIONS INCLUDE:  
 <4 FT - ENGINEERED FILL  
 >4 FT - STONE COLUMNS  
 2. APPROXIMATE REMEDIATION DEPTHS PER GEOTECHNICAL ENGINEERING REPORT. SEE REFERENCE ON DRAWINGS S-01 AND S-02.  
 3. VALUE ASSUMES A DISTANCE BELOW GROUND SURFACE TO BOTTOM OF EXCAVATION OF APPROXIMATELY 9'-6". ACTUAL DISTANCE BELOW GROUND SURFACE OF EXCAVATION MAY VARY BETWEEN SITES TO ACCOUNT FOR SITE SPECIFIC CONDITIONS OR TO ALLOW FOR PROPER GRADING AWAY FROM FOUNDATION PEDESTAL. IF DISTANCE BELOW GROUND SURFACE TO BOTTOM OF EXCAVATION DIFFERS FROM THE ASSUMED 9'-6", ADJUST 'D' VALUES ACCORDINGLY.  
 4. DATUM FOR COORDINATES IS UTM NAD83 ZONE 14.

## 1.0 SUBGRADE SOIL CORRECTION

- A. GENERAL**
- ENSURE FOUNDATION SITE IS EXCAVATED, BACKFILLED AND GRADED IN ACCORDANCE WITH THIS DRAWING AND DRAWINGS S-01 AND S-02.
  - PROJECT CONTRACTOR/SPECIALTY DESIGN-BUILD CONTRACTOR TO DETERMINE FINAL SOIL CORRECTION METHOD(S). SUGGESTED GROUND REMEDIATION OPTIONS INCLUDE ENGINEERED FILL, SURFACE COMPACTION, AND STONE COLUMNS.
  - THE MAXIMUM AND MINIMUM INDEX DENSITIES OF SOILS TO BE USED AS ENGINEERED FILL SHALL BE MEASURED ACCORDING TO ASTM D4253 AND D4254 OR A STANDARD PROCTOR DENSITY TO ASTM D698 PRIOR TO THE MATERIALS BEING PLACED.
  - ANTICIPATED CORRECTION DEPTHS AND SITE COORDINATES ARE REPRODUCED FROM THE PROJECT GEOTECHNICAL REPORT REFERENCED ON DRAWINGS S-01 AND S-02. BARR TAKES NO RESPONSIBILITY FOR THE SITE COORDINATES, DETERMINATION THAT SOIL CORRECTION IS REQUIRED, OR FOR THE METHOD OR DEPTH OF SOIL CORRECTION.
- B. SUBMITTALS**
- PRIOR TO THE MATERIALS BEING PLACED SUBMIT GRAIN SIZE ANALYSIS (ASTM D422), NATURAL MOISTURE CONTENT (ASTM D2216), AND EITHER STANDARD PROCTOR (ASTM D698) OR MAXIMUM (ASTM D4253) AND MINIMUM (ASTM D4254) INDEX DENSITY TEST RESULTS FOR SOILS TO BE USED AS ENGINEERED FILL.
  - SUBMIT COMPACTION TEST RESULTS FOR ENGINEERED FILL PLACED BENEATH THE FOUNDATION INDICATING LOCATION OF TEST, DRY DENSITY, AND MOISTURE CONTENT OF PLACED ENGINEERED FILL.
  - SUBMIT A STONE COLUMN DESIGN REPORT, DRAWINGS, AND SPECIFICATIONS STAMPED BY A OKLAHOMA PROFESSIONAL ENGINEER.
  - SUBMIT STONE COLUMN TESTING AND INSPECTION REPORTS.
  - THE SUBGRADE FOR EACH FOUNDATION SHALL BE INSPECTED BY A GEOTECHNICAL ENGINEER WITHIN 24 HOURS PRIOR TO PLACEMENT OF ENGINEERED FILL OR LEAN CONCRETE, AND WITHIN 24 HOURS AFTER SURFACE COMPACTION. SUBMIT SUBGRADE INSPECTION REPORT IN ACCORDANCE WITH DRAWING S-03 FOR EACH FOUNDATION COMPLETED BY A GEOTECHNICAL ENGINEER.
- C. PRODUCTS**
- ENGINEERED FILL:** A WELL GRADED GRANULAR SOIL CONSISTING OF GRAVEL, SAND OR CRUSHED STONE WITH A MAXIMUM SIZE OF 1 1/2", A MINIMUM OF 70% PASSING THE 3/4" SIEVE AND A MAXIMUM OF 10% PASSING THE NO. 200 SIEVE.
  - STONE COLUMNS:** TO STONE COLUMN CONTRACTOR REQUIREMENTS.
  - LEAN CONCRETE AND COMMON FILL:** SEE DRAWING S-03.
- D. EXECUTION**
- WHERE NOTED IN TABLE 1, PERFORM SUBGRADE CORRECTION EITHER BY SURFACE COMPACTION, SUBCUTTING DEFICIENT SOILS AND REPLACING WITH COMPACTED ENGINEERED FILL OR LEAN CONCRETE, OR INSTALLING STONE COLUMN CORRECTION TO THE DEPTHS INDICATED IN ACCORDANCE WITH THE APPLICABLE REMEDIATION METHOD REQUIREMENTS.
  - HAVE THE PROJECT GEOTECHNICAL ENGINEER VERIFY THE SURFACE COMPACTION, DEPTH OF SUITABLE BEARING CONDITIONS AND REQUIRED SUBCUT AT THE TIME OF EXCAVATION, OR THE STONE COLUMN DEPTH AT THE TIME OF INSTALLATION AND INCLUDE THAT INFORMATION WITH THE SUBGRADE INSPECTION REPORT.
  - CONTROL SURFACE WATER OR GROUNDWATER FLOWS INTO THE EXCAVATION USING MEANS DETERMINED BY THE CONTRACTOR. IF SUCH MEANS ARE EMPLOYED, RECORD THE MEANS UNDERTAKEN, SOURCE OF WATER (GROUND OR SURFACE), AND VOLUME OF WATER CONTROLLED. SUBMIT A DEWATERING RECORD TO THE FOUNDATION ENGINEER.
  - SURFACE COMPACTION: SURFACE COMPACT BY USING A SMOOTH DRUM VIBRATORY COMPACTOR OR OTHER EQUIPMENT TO A MINIMUM OF 98% OF STANDARD PROCTOR MAXIMUM DRY DENSITY.
  - ENGINEERED FILL PLACEMENT AND COMPACTION: PLACE AND COMPACT ENGINEERED FILL TO THE LIMITS, DEPTH AND RELATIVE DENSITY OR STANDARD PROCTOR DENSITY INDICATED IN SECTION 1. PLACE AN INITIAL LIFT OF ENGINEERED FILL IMMEDIATELY AFTER COMPLETION OF THE EXCAVATION AND APPROVAL BY THE GEOTECHNICAL ENGINEER. MOISTURE CONDITION THE MATERIAL TO WITHIN 3% OF OPTIMUM (PER ASTM D698). PLACE ENGINEERED FILL IN LOOSE LIFTS OF 9 INCHES OR LESS TO ACHIEVE THE SPECIFIED DENSITY.
  - PLACE LEAN CONCRETE IN ACCORDANCE WITH DRAWING S-03.
  - PLACE COMMON FILL AND GRADE THE SITE IN ACCORDANCE WITH DRAWING S-03.
- E. TESTING AND INSPECTION**
- FOR EVERY 1000 CUBIC YARDS OF PLACED ENGINEERED FILL: OBTAIN SAMPLES OF ENGINEERED FILL MATERIALS AND PERFORM GRAIN SIZE ANALYSIS, MOISTURE CONTENT, AND RELATIVE DENSITY OR PROCTOR TESTS.
  - FOR PLACED AND COMPACTED ENGINEERED FILL PROVIDE TWO DENSITY TESTS PER LIFT INDICATING TEST LOCATION, DRY DENSITY, MOISTURE CONTENT AND RELATIVE COMPACTION. IN THE EVENT THAT THE SPECIFIED COMPACTION REQUIREMENT IS NOT ACHIEVED, RECOMPACT AND RETEST THE ENGINEERED FILL.
  - FOR SURFACE COMPACTION PROVIDE FIVE DENSITY TESTS INDICATING TEST LOCATION (CENTER AND FOUR QUADRANTS), DRY DENSITY, MOISTURE CONTENT, AND RELATIVE COMPACTION. IN THE EVENT THAT THE SPECIFIED COMPACTION REQUIREMENT IS NOT ACHIEVED, RECOMPACT AND RETEST.
  - PERFORM STONE COLUMN TESTING AND INSPECTION IN ACCORDANCE WITH STONE COLUMN REQUIREMENTS.
  - PROVIDE A SUBGRADE INSPECTION REPORT TO BE COMPLETED BY A GEOTECHNICAL ENGINEER.

### RECORD DRAWING

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CADD USER: Charles P. Brzusky FILE: M:\DEPT\WORK\CPB\36221005.01\_S-04.DWG PLOT SCALE: 1:2 PLOT DATE: 7/26/2018 2:24 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
0	CPB	JAD2	CAK	11/06/17	ISSUED FOR CONSTRUCTION
1	CPB	JAD2	CAK	07/26/18	RECORD DRAWING

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

PRINTED NAME: CHRIS KOPCHYNSKI  
 SIGNATURE: \_\_\_\_\_  
 DATE: 11/06/17 REG. NO.: 21813

CLIENT	BID	CONSTRUCTION	REVIEW

Project Office:  
**BARR ENGINEERING CO.**  
 4300 MARKETPOINTE DRIVE  
 SUITE 200  
 MINNEAPOLIS, MN. 55435

Corporate Headquarters:  
 Minneapolis, Minnesota  
 Ph: 1-800-632-2277

Scale	AS SHOWN
Date	10/17/2017
Drawn	CPB
Checked	JAD2
Designed	SMM3
Approved	CAK

**WANZEK CONSTRUCTION, INC.**  
 WEST FARGO, NORTH DAKOTA

**PERSIMMON CREEK WIND PROJECT**  
 DEWEY, ELLIS, AND WOODWARD COUNTIES, OKLAHOMA

**SPREAD FOOTING FOUNDATION SOIL CORRECTION SECTIONS AND SPECIFICATIONS**

BARR PROJECT NO.	CLIENT PROJECT NO.	DWG. NO.	REV. NO.
36221005.01		S-04	1