acciona

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March 21, 2010

Public Service Commission
State of North Dakota
600 East Boulevard Ave., Dept. 408
Bismark, North Dakota 58505-0480
Attn. Janet Marquart, Public Utilities Division

Re: Tatanka Wind Farm Decommissioning Study
North Dakota Administrative Code Chapter 69-09-09

Ms. Janet Marquart:

In response to your letter dated March 5, 2010 and in compliance with Administrative Rule Section 69-09-0906, Tatanka Wind Power, LLC, as owner of the Tatanka wind farm located in Dickey County, North Dakota and McPherson County, South Dakota, hereby submits its Decommissioning Plan with the Commission. This Decommissioning Plan covers the entire Tatanka wind farms consisting of 120 wind turbines and related supporting assets.
Tatanka Wind Power, LLC also provides the following information for ease in the Commission's review for compliance with the Administrative Rules.

1) The Tatanka wind farm went into Commercial Operation on July 24, 2008.

2) The wind turbines, which are the primary component of the wind farm, are estimated to have a useful life between 20 and 25 years.

3) The Decommissioning Plan being filed is a comprehensive plan prepared by Fehr-Graham and Associates and includes all decommissioning costs (including site restoration) required under Section 69-09-09-06. It also includes decommissioning costs of the related collection system and substation and removal of turbine foundations and ancillary equipment to a depth of 4 feet.

4) As detailed on Page 13 of the Decommissioning Plan, the decommissioning cost per turbine approximates $51,900. With 120 turbines, the total decommissioning cost is estimated at $6,225,328 after value of salvage (scrap steel and copper only; no resale value assumed for wind energy conversion system components).

5) Tatanka Wind Power, LLC intends to fund decommissioning activities with corporate funding from its parent company Acciona Wind Energy USA LLC. It is expected that Acciona Wind Energy USA LLC, as a developer, owner and operator of renewable energy facilities, will have sufficient corporate assets and tangible net worth to fund its obligations. In addition, Tatanka Wind Power, LLC currently has in place with the U.S. Fish and Wildlife

Service a letter of credit in the amount of $1,213,914 as security for its decommissioning obligation relating to easements with the U.S. Fish and Wildlife Service on the Tatanka wind farm site.

Please feel free to contact me if you have any questions.

Best regards,

Tatanka Wind Power, LLC

TATANKA WIND FARM
DECOMMISSIONING REPORT

Prepared For:

Tatanka Wind Power, LLC
Accionia Wind Energy USA LLC
333 West Wacker Drive, Suite 1500
Chicago, Illinois 60606

Prepared by:

Fehr-Graham & Associates, LLC
221 East Main Street, Suite 200
Freeport, IL 61032

Project No.: 09-246A

February 2009

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TATANKA WIND ENERGY CONVERSION SYSTEM (WECS)

System Description

The Tatanka Wind Energy Conversion System (WECS) is an approximate 180 - Megawatt wind energy conversion system, which was constructed in Dickey County, North Dakota and McPherson County, South Dakota, (See Exhibit A) and consists of the following key components:

Wind Turbines	120	Each
Turbine Foundations	120	Each
Access Roadways	140,000	Linear Feet
Service Drives	120	Each
Underground		
Medium Voltage Cable	667,500	Linear Feet
Ground Cable	222,500	Linear Feet
Fiber Optic Cable	222,500	Linear Feet
Overhead Transmission Line	68,600	Linear Feet
Meteorological Towers	3	Each

Decommissioning Sequence

In the event the Tatanka WECS requires decommissioning, the sequence for removal of the system components would be: wind turbines, turbine foundations, access roadways, service drives, collection cables, transmission lines, site substation equipment, and meteorological towers. The remainder of the decommissioning would involve earthwork and topsoil restoration. As such, this decommissioning plan will outline any removal and salvage activities in the same general sequence.

WIND TURBINES

Wind Turbine Technical Data

The Tatanka WECS was developed using one hundred twenty (120) AW77/1500 IEC IIa T 80m 1.5MW HH Wind Turbines, manufactured by Accionia Windpower, for a system capacity of approximately 180 Megawatts. A complete technical summary of the Accionia Windpower AW77/ 1.5MW wind turbine is included as Exhibit B of this plan.

Wind Turbine Decommissioning

The modular nature of wind turbine towers, blades, and generators allows for relative ease in the removal and salvage of individual wind turbine components. Although there is an active resale market for wind energy conversion system components, reportedly in the range of 5-10% of the new turbine cost, this report is not considering any resale value for salvage as it is feasible that technology advancements may actually outpace the resale market potential. The only salvage value that has been considered within this report is the actual salvage of the tower and nacelle components of each wind turbine.

The Accionia Wind Power AW77/ 1.5MW wind turbines include steel components estimated at approximately 200 Tons of salvage weight and copper components estimated at approximately 4.6 tons of salvage weight per wind turbine. Based upon research into the current scrap steel market, it is estimated that the scrap steel can currently be salvaged at a rate of $200 per Ton, and copper at $2,400 per ton. As a result, the salvage value assigned to each wind turbine for this report is $51,000 per turbine. With a total of 120 wind turbines on this project, the total estimated salvage value with consideration for scrap steel value and scrap copper value is $ 6,120,000.

From this salvage value, the cost to dismantle and transport the wind turbine components to a suitable salvage location must be subtracted. Marino Crane Services was contacted in an effort to determine an estimated cost of crane services to complete the dismantling of the wind turbines. Marino Crane Services has experience in both the erection and dismantling of wind turbines. Mr. Marino indicated that the most recent experience he had with wind turbine dismantling resulted in a crane service unit cost estimated at approximately $25,000 per wind turbine. Mr. Marino also indicated the procedure and time to dismantle wind turbines is essentially the same as wind turbine erection.

ATS Wind Energy Services then was contacted to assist in estimating the costs associated with transportation of the wind turbine components to a suitable salvage location. ATS Wind Energy Services has experience in the transport of wind turbine components. The cost of transportation of all components is also estimated at approximately $25,000 per wind turbine. As a result, the cost to dismantle and transport each of the wind turbines is estimated at $50,000 per turbine.

There are very likely to be some ancillary costs associated with the removal and transportation of the wind turbines. These ancillary costs may include, but are not necessarily limited to, minor road improvements to facilitate transport and inefficiencies that may occur related to having to break the crane down in lieu of walking from site to site. To account for these ancillary costs, a factor of 10% was added to the removal and transportation costs for this report. As a result, the estimated cost to dismantle and transport each turbine is $ 55,000 for a total cost of $ 6,600,000 for 120 wind turbines.

Certainly, there are other items associated with the wind turbines that have some salvage or resale value. These costs were not considered in the completion of this report. The purpose of this decommissioning report is to assure that there is adequate financial assurance provided to cover any costs associated with potential wind farm decommissioning activities. By using the most conservative figure for salvage value, and including a reasonable safety factor in the estimated costs associated with dismantling and transporting the components to a salvage facility, it is felt that the estimates provided in this report are extremely conservative and represent a worst-case scenario. The remainder of this plan will address the estimated decommissioning costs for those remaining WECS components.

WIND TURBINE FOUNDATIONS

Wind Turbine Foundation Construction

A wind turbine foundation design, consisting of a solid concrete pedestal with dimensions of 18' Diameter and 3.5' in height over a roughly 51'x 51' x 4.5' spread concrete footing, was constructed for the Tatanka WECS. There are 120 turbine foundations as part of the Tatanka Wind Power LLC project. The spread footing and pedestal foundation design is included in Exhibit C. The final design of the foundations was done by a licensed professional geotechnical engineer and based on specific site location conditions.

Wind Turbine Foundation Decommissioning

Due to the nature of turbine foundation construction proposed for this project, there is essentially no salvage value able to be determined. The decommissioning sequence for turbine foundations will consist of sufficiently excavating completely around the foundations to provide access to, and a working platform around, the foundation. Each foundation would be pulverized and removed to a minimum depth of 4'-0" and properly disposed of. The excavation would then be backfilled full-depth with native soils to complete the foundation decommissioning activity.

The decommissioning of wind turbine foundations would be very labor intensive, thus, two independent contractors, each with demolition experience, reviewed the foundation design and provided estimates of demolition costs. This plan has used the higher of these estimates with a unit cost of $15,000/turbine, or a total cost of $1,800,000 for the removal of concrete foundations should decommissioning occur.

Mobilization / Excavation	$ 2,000	/ foundation
Concrete Demolition	$ 10,000	/ foundation
Disposal / Backfill	$ 3,000	/ foundation
Subtotal	$ 15,000	/ foundation (120 foundations)
Total Cost	$ 1,800,000	

ACCESS ROADWAYS

Access Roadway Construction

The Tatanka Wind Farm WECS involves an estimated 140,000 lineal feet, or approximately 26.5 miles, of access roadway construction. The typical access roadway detail is included as Exhibit D of this report. The roadways are approximately 16 feet wide and widen slightly at the turbine, crane pad, and connecting roadway locations. The existing soils were excavated, shaped, and graded to a fairly level and compacted subgrade prior to constructing the roadways. The roadway construction consists of a geotextile fabric placed upon the prepared subgrade, with an initial eight (8) inch lift of compacted aggregate base course followed by a final two (2) inch lift of compacted aggregate base course surfacing.

Calculations used to estimate the construction material requirements for the access roadways are included in Exhibit E of this report, and are summarized below:

Geotextile Fabric	248,889 S.Y.
Aggregate Base Course	69,136 C.Y.

Access Roadway Decommissioning

It is feasible that the landowners may elect to leave the access roadways in place in lieu of removal during decommissioning; however, this plan assumes that the access roadways will be completely removed and the site restored under decommissioning. The decommissioning process for access roadways will involve excavation and transportation of the gravel materials to a nearby quarry or aggregate preparation site for reprocessing. The geotextile fabric will be removed and properly disposed. After reviewing the roadway decommissioning activities with two independent contractors, the following unit prices were used to estimate the access roadway decommissioning costs:

Geotextile Fabric Removal	$ 0.50/SY
Aggregate Base Course Removal	$ 8.00/CY

Although there is no foreseen salvage value in the removal of the geotextile fabric, there is some salvage value in the removal of the aggregate materials if provided they are reprocessed for future use. For purposes of evaluating the value of materials recovered from access roadways, a base material value of $ 8.50/CY was used and a salvage recovery value factor of 50% applied. As a result, the following salvage values were determined for the access roadway materials to be removed during access roadway decommissioning:

Geotextile Fabric Salvage	$ 0/SY
Aggregate Base Course Salvage[1]	$ 4.25/CY

[1] Salvage recovery factors based upon experience and actual bids for similar work on other projects.

As aggregate materials are relatively abundant in the region of the Tatanka WECS, the use of these materials as inert fill material may be selected in lieu of the actual recovery and reconditioning of these aggregates. The salvage value noted above would be offset by more economical removal techniques, lesser transportation costs, and some nominal value for the fill material. In our opinion, there appears to be essentially no appreciable difference in the ultimate decommissioning costs under either scenario. As a result, the following estimate is provided for the access roadway decommissioning:

Removal Item	**Quantity**	**Removal**	**Salvage**	**Net Cost**
Geotextile Fabric	248,889 SY	$ 124,444	$ 0	$ 124,444
Aggregate Base Course	69,136 CY	$ 553,088	$ 293,828	$ 259,260
Totals		$ 677,532	$ 293,828	$ 383,704

SERVICE DRIVES

Service Drive Construction

Each service drive was constructed with approximate average dimensions of 10 foot wide by 150 foot long, with an overall area of 1,500 square feet per service drive. The method of construction is very similar to that of the access roadways, with the exception that geotextile fabric was not utilized prior to the placement of aggregate materials. The existing soils were excavated, shaped, and graded to a fairly level and compacted subgrade prior to service drive construction. The drive construction consists of a prepared subgrade, with a six (6) inch lift of compacted aggregate base course surfacing. Calculations used to estimate the material requirements for the 120 service drives are included in Exhibit F of this plan, and the totals are as follows:

Aggregate Base Course 3,333 C.Y.

Service Drive Decommissioning

The decommissioning process for service drives will involve excavation and transportation of the materials to a nearby quarry or aggregate preparation site for reprocessing. The following unit prices were used to estimate the decommissioning costs related to the service drives:

Aggregate Base Course Removal $ 8.00/CY

It is believed there will be some salvage value in the removal of the aggregate materials if reprocessed for future use. For purposes of evaluating the value of materials recovered from access roadways, a base material value of $8.50/CY was used and recovery value factor of 50% applied. As a result, the following salvage values were determined for the items removed during service drive decommissioning:

Aggregate Base Course Salvage[1] $ 4.25/CY

Again, as aggregate materials are relatively abundant in the region of the Tatanka WECS, the use of these materials as inert fill material may be selected in lieu of the actual recovery and reconditioning of these aggregates. As with the access road materials, it is our opinion that there is essentially no appreciable difference in the ultimate decommissioning costs associated with recovery and reconditioning or using the aggregate materials for inert fill material at a nearby location. As a result, the following estimate is provided for the service drive decommissioning:

Removal Item	**Quantity**	**Removal**	**Salvage**	**Net Cost**
Aggregate Surface Course	3,333 CY	$ 26,664	$ 14,165	$ 12,499
Totals		$ 26,664	$ 14,165	$ 12,499

[1]Salvage recovery factors based upon experience and actual bids for similar work on other projects.

COLLECTION CABLES

Collection Cable Trench Construction

The cable trench construction details are included as Exhibit G of this plan. In all instances, the cable trenches provide for a minimum of 40 inches of cover over the cables, with at least 36 inches of earthen materials and topsoil in all areas other than road crossings. Conduit is provided for the cable trenches at road crossings only. Additional details regarding the type and lengths of cable runs are also included in Exhibit G. Collection cables consist of 222,500 linear feet (42 miles) of trenches.

Cable Trench Decommissioning

Collection cable decommissioning will be performed by disconnecting the cables and excavating to within 6 inches of the cable for the entire length and pulling them from the trench. The cables would be rolled into coils and salvaged for scrap aluminum and copper. The native soils will then be replaced and compacted into the trenches and the disturbed areas restored to original condition. As with decommissioning of wind turbines, the salvage value was established by computing the scrap value for the copper and aluminum wire to be recovered less an allowance for transportation to an acceptable salvage facility.

Removal of Cable	42 miles @ $ 64,000 /mile	$	2,688,000
Salvage Value of Copper and Aluminum Cable	42 miles @ $ 8,000 /mile	$	(336,000)
		$	2,352,000

TRANSMISSION LINES

Transmission Line Construction

Transmission line construction details are included as Exhibit H of this plan. The transmission line consists of 68,600 linear feet (13 miles) of 230 KV overhead cable on one hundred and two (102) pole assemblies, six (6) of which consist of steel structures.

Transmission Line Decommissioning

The transmission line decommissioning will be performed by disconnecting the overhead cables and removing the pole structures. The wooden poles are direct burial whereas the steel structures have concrete foundations which will require removal to a depth of 4'-6" below existing grades. After the poles have been removed and the foundations demolished, the holes will be filled with native soils and the disturbed areas reclaimed to original condition. There will be little salvage for the wooden poles and the salvage value of the steel structures would be offset by the cost for demolishing the concrete foundations.

The cost to decommission these lines is estimated by the contractor who erected the line to be $45,000 per mile less the salvage value of the cable. The cable is a weave of aluminum conducting cable and steel supporting cable. The lines consist of three conducting lines, a fiber optic line and a ground wire. The aluminum and steel salvage value for this type of cable was determined to be $ 5,500 per mile of cable length. All fastening and connecting hardware would also be salvaged but would of minimal salvage value.

Disassemble lines/pull poles	13 miles @ $45,000 per mile	$ 585,000
Salvage of aluminum/steel cable	13 miles @ $ 5,500 per mile	$ (71,500)
Net Decommissioning Cost		$ 513,500

PROJECT SUBSTATION

Project Substation Construction

The project substation details are included as Exhibit I of this plan. The project substation consists of a 218' by 170' fenced-in area with a gravel base and the necessary substation equipment. The equipment is supported by concrete foundations. There is an electrical building between the substation and the OM building which houses various electrical switchgear and controls.

Project Substation Decommissioning

The project substation decommissioning will be performed after disconnecting the transmission line. All electrical equipment within the fenced area will be removed, although buried wiring may be abandoned in place, and the concrete foundations will be removed to a depth of 4'-6" below existing grade. After the foundations are demolished, the holes will be filled with native soils and the disturbed areas repaired. There will be a salvage value for the steel structures and electrical equipment. The cost to dismantle the project substation is estimated by the contractor who erected the substation to be $166,450 less the salvage value of the equipment. The same contractor estimated the salvage value of electrical equipment to be $ 41,200. It is probable that any additional steel salvage value would be offset by the cost of miscellaneous removal activities and site restoration. For purposes of this report, the Operation and Maintenance building was assumed to remain in place for a future use.

As a result the decommissioning and salvage values associated with the project substation are estimated as follows:

Disassemble electrical equipment and demolish foundations	$	166,450
Salvage of electrical equipment and structural steel	$	(41,200)
Net Decommissioning Cost	$	125,250

METEOROLOGICAL TOWER

Meteorological Tower Construction

The three (3) meteorological towers are cable stabilized towers built with steel truss members. The cables are anchored to three (3) separate anchor foundations and a base foundation. The anchor foundations consist of approximately two (2) cubic yards of concrete buried 5' below grade. The tower foundation is a 6' x 6' x 18" footing buried 5'-6" deep with a 3'-0" diameter pier. Details for tower and footings are included in Exhibit J.

Meteorological Tower and Foundation Decommissioning

The towers would be decommissioned by lowering the towers and disconnecting the cables and tower from the foundations. Due to the truss framework of the towers these would be of little to no salvage value. The foundations would be uncovered and removed from the site to be disposed at a landfill. Their size is such that no breaking would be required for the cable footings and very little for the tower foundation. The estimated cost for the removal of the tower and disposal of them, including site restoration, would be $8,000 per Met Tower for a total of $24,000.

EARTHWORK AND TOPSOIL RESTORATION

With all of the above ground and surface components removed, all that would remain in the decommissioning of the Tatanka Wind Farm would be the necessary earthwork and topsoil restoration to return the areas occupied by the project improvements to as near as practicable the same condition that existed prior to construction of the WECS. Per the calculations in Exhibit E & F, it is estimated that approximately 46,914 CY of earthwork and 46,914 CY of topsoil restoration will be required. Based upon experience with earthwork activities and bid amounts received on prior projects, the following estimate is provided for the earthwork and topsoil restoration needed at the conclusion of the decommissioning of this project:

Item	**Quantity**	**Unit Cost**	**Total Cost**
Earthwork	32,099	$ 7.50 /CY	$ 240,745
Topsoil Restoration	32,099	$ 10.00 /CY	$ 320,990
Totals		$	$ 561,735

SUMMARY OF DECOMMISSIONING COSTS

The following summary represents the total decommissioning cost less any salvage value for the WECS:

DECOMMISSIONING COSTS:		
Turbine Removal (excluding salvage values)*	$	6,600,000
Turbine Foundation Removal	$	1,800,000
Access Roadway Removal	$	383,704
Service Drive Removal	$	12,499
Collection Cable Removal	$	2,325,000
Transmission Line Removal	$	513,500
Project Substation Removal	$	125,250
Meteorological Towers	$	24,000
Earthwork & Topsoil	$	561,375
Subtotal	$	12,345,328
SALVAGE VALUE:		
Turbine Component Salvage Value (120 Turbines x $51,000/turbine)	$	6,120,000
DECOMMISSIONING LESS SALVAGE:	**$**	6,225,328
Total Decommissioning Cost per Turbine (120)	Approx. $	51,900 / Turbine

FINANCIAL ASSURANCE

Financial assurance in an amount sufficient to adequately perform the required decommissioning per this plan and all local, state, and federal environmental regulations will be secured by Tatanka Wind Energy, LLC. The mechanism for financial assurance should be either a corporate guarantee, letter of credit, bond, or insurance policy. At the time financial assurance documents are provided, the triggering events for decommissioning and the procedures for the County to access the financial assurance for that purpose should be identified. The financial assurance should further provide that the terms of the Decommissioning Plan be binding upon Tatanka Wind Energy, LLC and any successors, assigns, or heirs; and that the County will have access to the site, pursuant to reasonable notice, to effect or complete the decommissioning, if required.

CONCLUSION

I certify that this report is an accurate representation of the anticipated decommissioning costs (including salvage values) and was prepared in accordance with industry standard of good engineering principals, and contains no intentional false statements or misrepresentations.

Signed: Richard T. Weegens P.E.
Richard T. Weegens, P.E.

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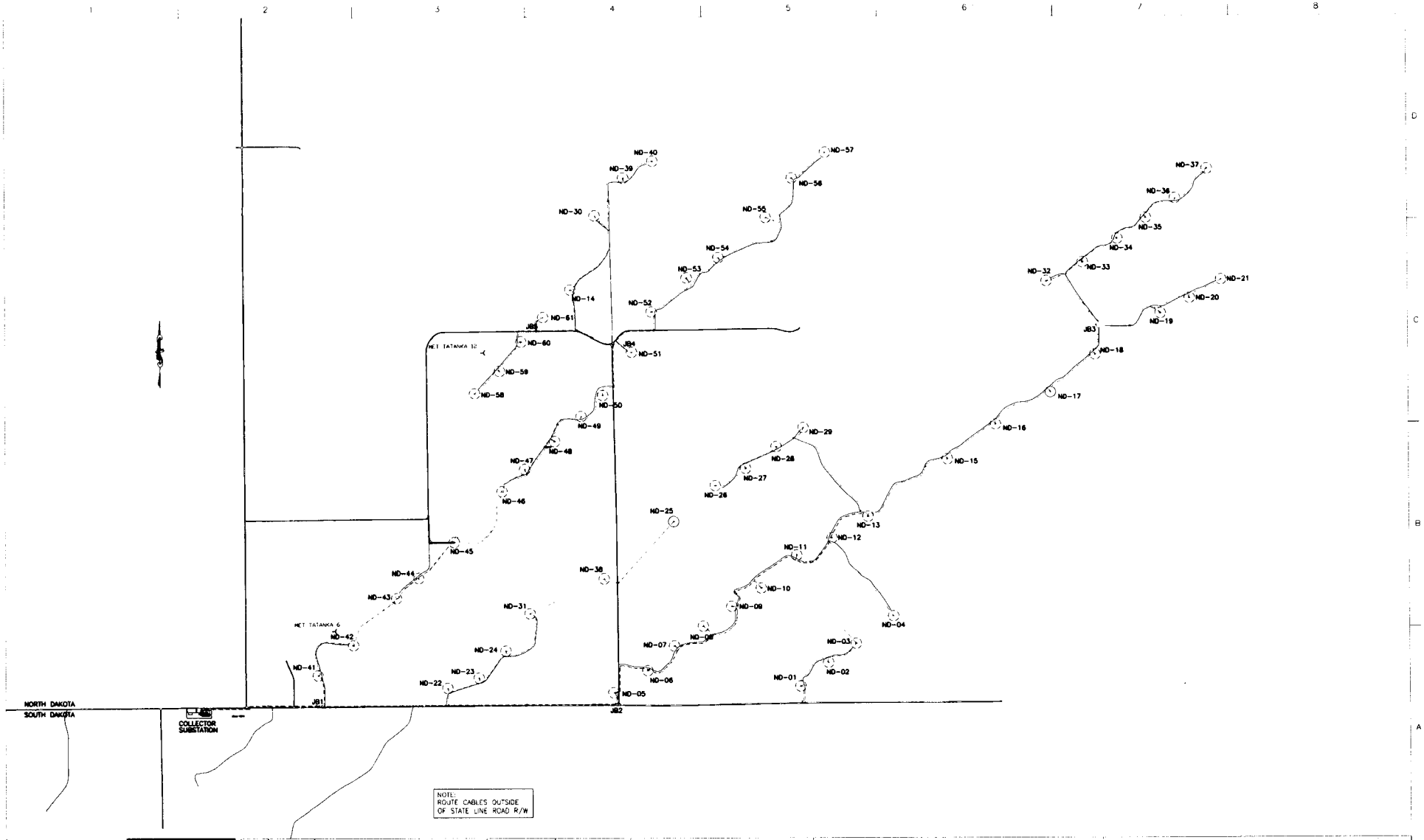
Exhibits

Exhibit A

Tatanka Wind Power Location Map



NOTE:
ROUTE CABLES OUTSIDE OF STATE LINE ROAD R/W

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HDR

ISSUE	DATE	DESCRIPTION
	07-7-08	AS-BUILT
1	04-27-07	PER CHANGES DATED 02-16-07
0	02-16-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
PROJECT ENGINEER	RLB
PROJECT NUMBER	48069

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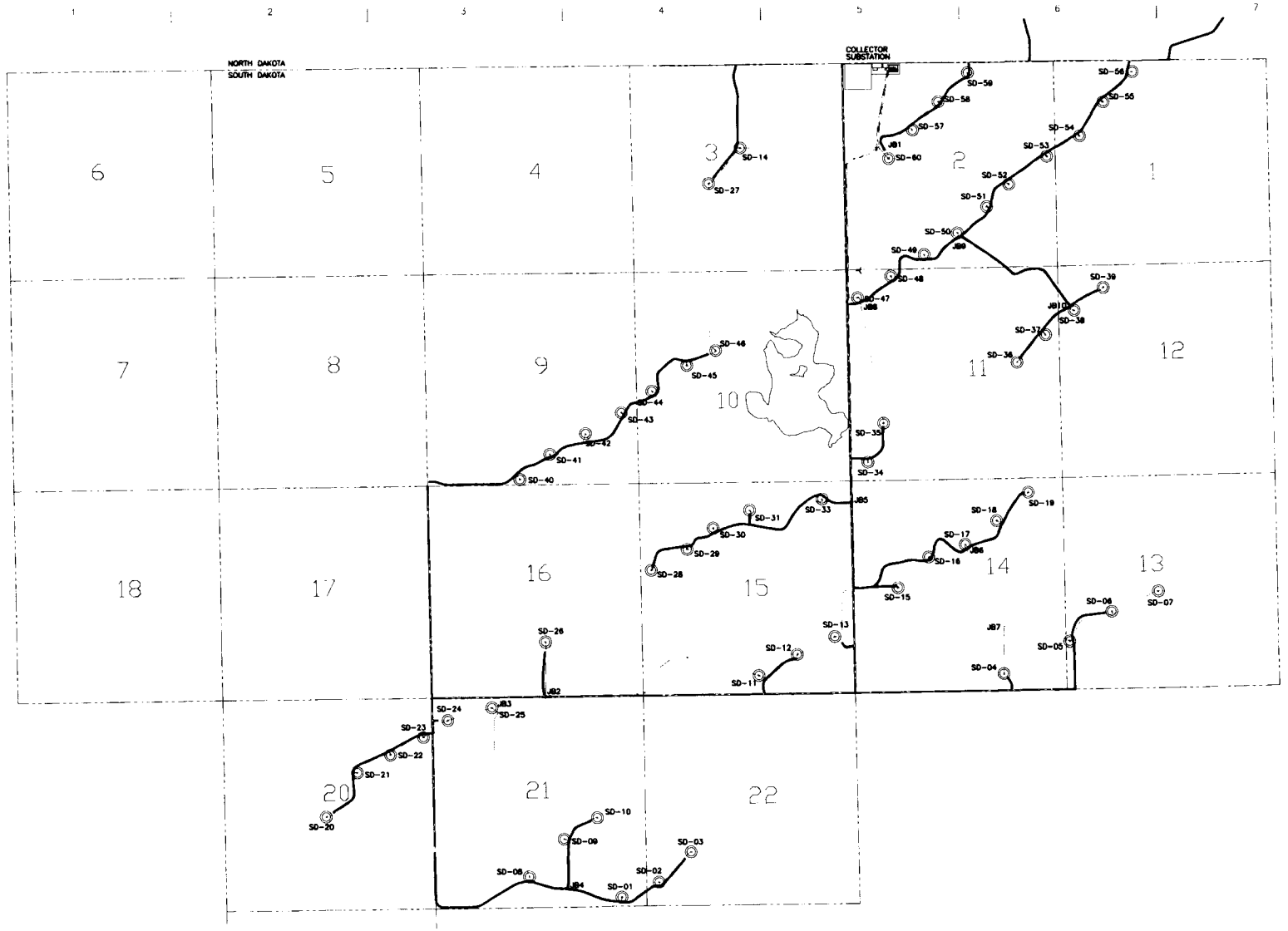
TATANKA WIND ENERGY

34.5kV UNDERGROUND COLLECTION SYSTEM ROUTING DIAGRAM NORTH DAKOTA

0 1" 2"

FILENAME	TWEDM01D1-ND
SCALE	NONE

SHEET INDEX
DM-01



MORTENSON

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
	07-7-08	AS-BUILT
1	04-27-07	PER CHANGES DATED 02-16-07
0	02-16-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
PROJECT ENGINEER	RLB
PROJECT NUMBER	48049

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TATANKA WIND ENERGY

34.5kV UNDERGROUND COLLECTION SYSTEM ROUTING DIAGRAM SOUTH DAKOTA

FILENAME	TWEDM01D1-SD
SCALE	NONE
SHEET INDEX	DM-01

Exhibit B

Technical Summary Acciona 1.5mW 60 Hz Wind Turbine

ESPECIFICACIONES TECNICAS

TECHNICAL SPECIFICATIONS

AW 77 / 1500 IEC IIa T 80 m

Rev	Fecha Date	Descripción de la revisión Description of the revision	Firmas Autorizadas Authorized Signatures		
A	15/05/08	Elaboración	Realizado BGM	Revisado EAL	Aprobado MNP
B	30/06/08	60 Hz turbine data updated			
C	17/07/08	Blades and control system information updated			
D			17.07.08	17.07.08	17.07.08
E					

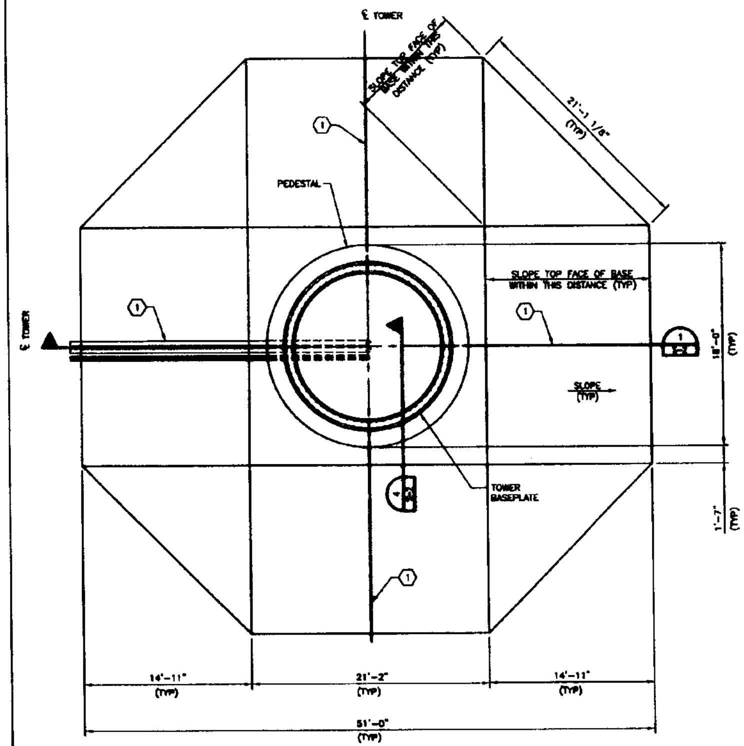
acciona Windpower	TECHNICAL SPECIFICATION	DATE: 17/07/08
		REVISION: C
	AW 77 / 1500 IEC IIa T 80 m WIND TURBINE	AUTHOR: EGM
		CHECKED: EAL
		APPROVED: MNP

ROTOR	Number of blades	3
	Orientation	Upwind
	Diameter	77 m
	Swept area	4657 m^2
	Rotational direction	Clockwise
	Rotational speed	Variable - 11.7 ... 18.3 rpm
	Hub height	80 m
	Power regulation	Full span blade pitch
	Overspeed control	Full span blade pitch
	Rotor shaft tilt angle	5º
	Nominal tip speed	67.5 m/s
	Cone angle	0º / 3º
BLADES	Material	GRP
	Weight range	5422 - 5932 kg / blade
	Pitch	Full span
	Aerodynamic Brake	Full feathering
HUB	Hub type	Rigid
	Material	Cast iron GJS 400 18U LT
	Protection	Zn metallized + Epoxy
PITCH SYSTEM	Pitch bearings	Double row four point contact
	Actuation	Hydraulic
	Linkage	Through hydraulic cylinders
	Failsafes	Accumulators on hub
DRIVE TRAIN	Gearbox	3 stages, planetary/helical
	Gearbox nominal power	1650 kW
	Gearbox ratio	1:65.72 (50 Hz) / 1:78 (60 Hz)
	Input speed	Variable - 11.7 ... 18.3 rpm
	Output speed	Variable - 770 ... 1200 rpm (50 Hz) Variable - 920 ... 1440 rpm (60 Hz)
	Lubrication	Pressure and splash with oil cooler / oil filter
	Gearbox oil volume	270 litres
GEAR HOUSING	Material	Torque arm: GJS 400 18U LT Helical housing: GJS 700 - 2
	Protection	Epoxy

ROTOR SHAFT	Type	Forged hollow shaft
	Material	34CrNiMo6
	Supporting	2 bearings
DRIVETRAIN BEARINGS	Type	Double spherical roller bearings
PARKING BRAKE	Type	Single disk
	Location	High speed shaft
YAW SYSTEM	Type	Four point ball bearing
	Slewing ring	external
	Slewing ring / yaw drive pinion ratio	11.6:1
	Braking system	Friction pads
	Number of yaw drives	4 x 1.5 kW
YAW GEARS AND MOTORS	Type	Planetary 4 stages
	Ratio	1:1451
	Yaw rate	0.08 rpm
	Motor types	Asyncronous 4 poles
	Voltage / Frequency	230/400 V - 50-60 Hz.
	Power rating	1.5 kW
HYDRAULIC POWER UNIT	Oil pump capacity	40 l/min
	Motor type	18.5 kW
	Voltage/frequency	380 V / 50-60 Hz
	Blade accumulator	20 l
	Principal accumulator	35 l
GENERATOR	Type	6 poles, double feeding
	Insulation Classes (stator/rotor)	H / H
	Rated Power	1500 kW
	Degree of protection	IP 54
	Frequency	50-60 Hz
	Voltage	12000 V
	Power factor (shortcircuited rotor)	0.853
	Speed range	770-1300rpm (50Hz) 920-1560rpm (60Hz)
CONTROL SYSTEM	Power control	Converter Control Unit
	Master processor	Programmable Logical Controller
	Interface	Scada
	Power factor correction	Programmable by software
TOWER	Type	Conical steel
	Tower height	76.9 m
	Material	S355 J2G3
	Protection	Epoxi - Zn
	Access to the tower	Door with lock system
	Access to nacelle cabin	Ladder or elevator
	Weight	135 Tn
	Foundation connection	Two studs races embedded in concrete
OPERATING DATA	Cut-in wind speed	3.5 m/s
	Nominal power wind speed	11.3 m/s
	Cut-out wind speed	25 m/s
	Nominal power	1500 kW

Exhibit C

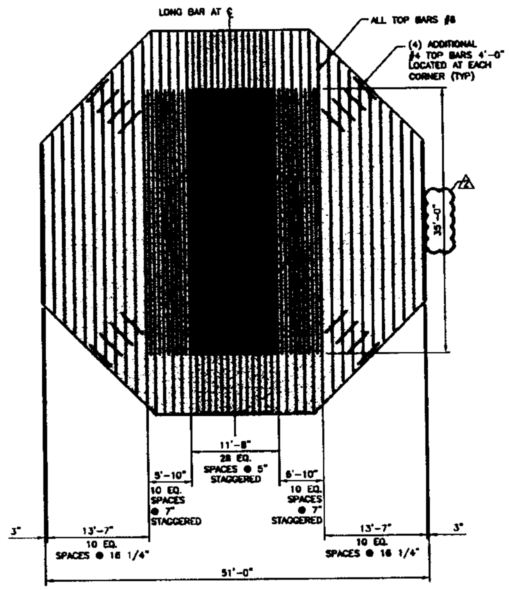
Foundation Designs for 1.5mW Wind Turbine



TOWER FOUNDATION PLAN
3/16" = 1'-0"

NOTE:

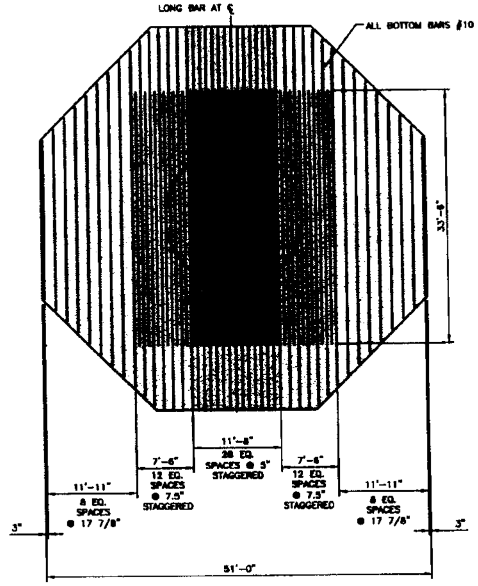
(1) ELECTRICAL CONDUITS SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL DRAWINGS FOR EXACT LOCATIONS AND SIZES.



BASE TOP REINFORCING PLAN
1/8" = 1'-0"

NOTES:

1. EAST-WEST BARS NOT SHOWN FOR CLARITY.
2. BAR SPACING TYPICAL BOTH DIRECTIONS.



BASE BOTTOM REINFORCING PLAN
1/8" = 1'-0"

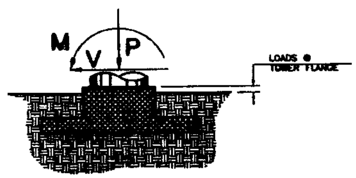
NOTES:

1. EAST-WEST BARS NOT SHOWN FOR CLARITY.
2. BAR SPACING TYPICAL BOTH DIRECTIONS.

N

PLAN NORTH

REFER TO GENERAL ARRANGEMENTS FOR FOUNDATION ALIGNMENTS AT SITE.



FOUNDATION DESIGN LOADS
NO SCALE

FOUNDATION DESIGN LOADS:

1. SERVICE LOADS (UNFACTORED) AT BOTTOM OF BASE PLATE.
   P= 440 KIP, MAX. VERTICAL LOAD DUE TO DEAD LOAD (KIPS)
   V= 116 KIP, MAX BASE SHEAR DUE TO WIND LOAD (KIPS)
   M= 26,979 KIP–FT. MAX. BASE OVERTURNING MOMENT DUE TO WIND LOAD

ESTIMATED MATERIAL QUANTITIES * (1)

1. BASE CONCRETE: .... 230.0 CU. YDS. (MIN REQUIRED)
2. PEDESTAL CONCRETE: .... 33.0 CU. YDS. (MIN REQUIRED)
3. LEAN CONCRETE: .... 16.0 CU. YDS. (2)
4. STEEL REINFORCEMENT: .... 43,800 LBS. (CONTRACTOR TO VERIFY)

* QUANTITIES ARE THEORETICAL. NO WASTEAGE CONSIDERED.

JAMES W. BOOTY REGISTERED PROFESSIONAL ENGINEER 2418 NORTH DAKOTA

REGISTERED PROFESSIONAL ENGINEER REG. NO. 6875 MICHAEL J. SIP SOUTH DAKOTA

4/23/07

MORTENSON

HDR

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
2	4-23-07	REVISIONS
1	2-16-07	REVISED ESTIMATED MATERIAL QUANTITIES
0	1-26-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	J. LARSON
DESIGNED BY	M. SIP
CHECKED BY	B. KRAUSE
CHECKED BY	J. BOOTY
DRAWN BY	H. HESS
PROJECT NUMBER	48203

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

DATE 4-23-07 REG. NO. PE-2418

acciona

TATANKA WIND ENERGY

ACCIONA 1.5mW AW 77 CII 80m HH WIND TURBINE FOUNDATION PLAN 3000 PSF GROSS ALLOWABLE SOIL

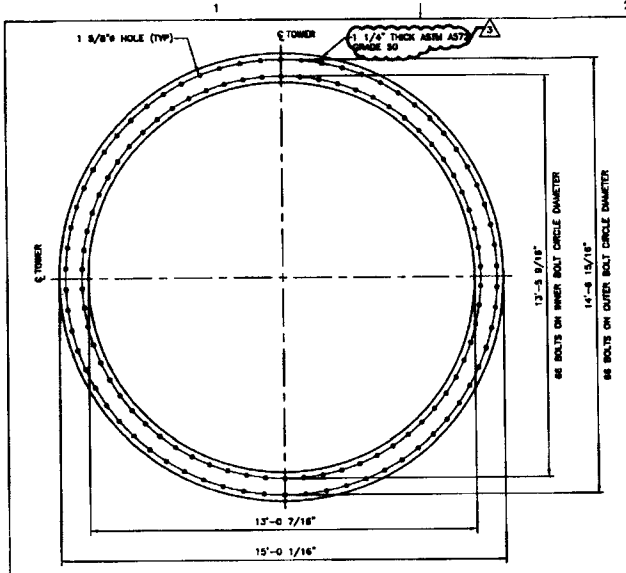
0 1" 2"

FILENAME 005-04.DWG

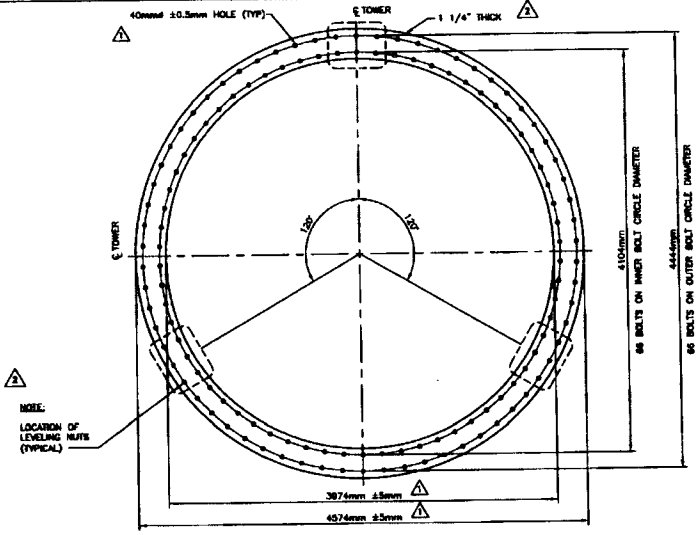
SCALE AS NOTED

SHEET S-4

\Pwworking\...\005-04.DWG, 4/23/2007 4:04:15 PM

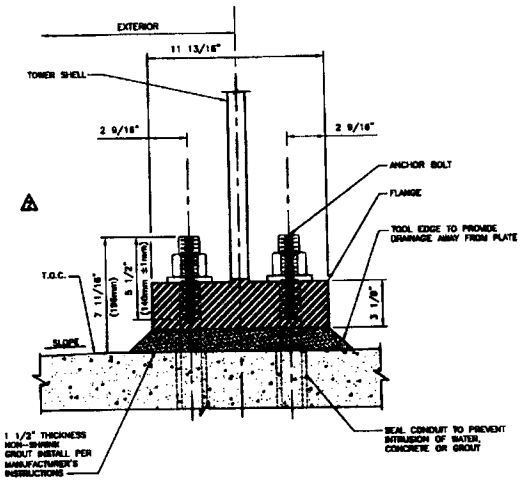


EMBEDMENT RING DETAIL
1/2" = 1'-0"

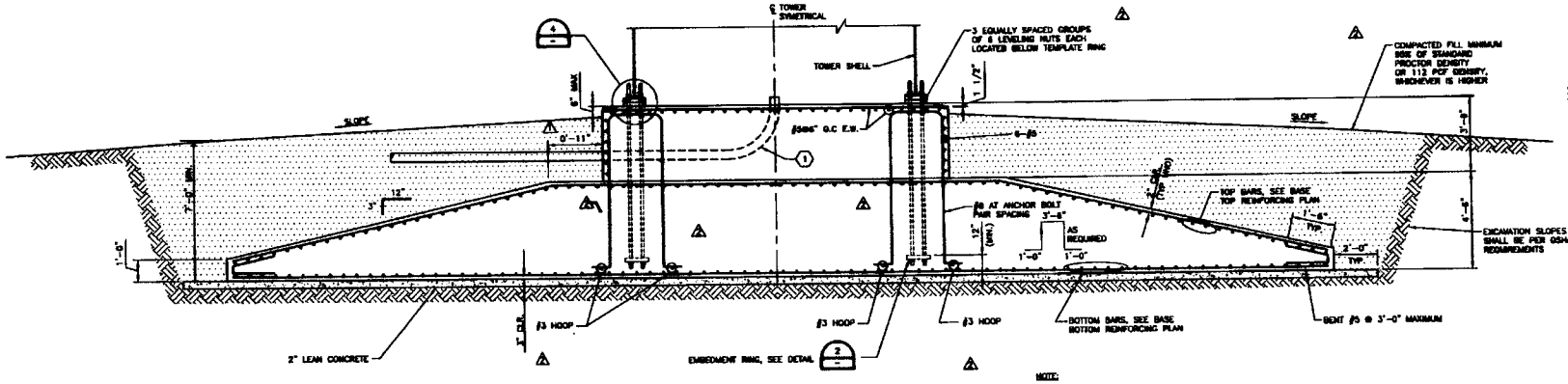


TEMPLATE RING DETAIL
1/2" = 1'-0"

NOTE:
TEMPORARY TEMPLATE RING USED DURING FOUNDATION CONSTRUCTION ONLY. TEMPLATE RING MUST BE REMOVED PRIOR TO TURBINE TOWER ERECTION.



TOWER BASE DETAIL
3" = 1'-0"



TOWER FOUNDATION SECTION
N.T.S.

NOTE:
(1) ELECTRICAL CONDUITS SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL DRAWINGS FOR EXACT LOCATIONS AND SIZES.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9878
MICHAEL J.
SIP
SOUTH DAKOTA
5/14/07

MORTENSON

HDR

ISSUE	DATE	DESCRIPTION
3	5-14-07	REVISIONS
2	4-23-07	REVISIONS
1	2-16-07	REVISED TEMPLATE RING DIMENSIONS
0	1-26-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	J. LARSON
DESIGNED BY	M. SIP
CHECKED BY	B. KRAUSE
CHECKED BY	J. BOOTY
DRAWN BY	H. HESS
PROJECT NUMBER	46203

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.
DATE 5-14-07 REG. NO. PE-3618

acciona

TATANKA WIND ENERGY

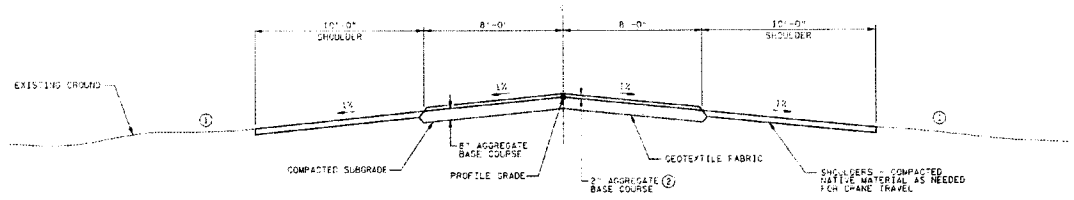
ACCIONA 1.5mW AW 77 C8 80m HH
WIND TURBINE
SECTION SHEET
3000 PSF GROSS ALLOWABLE SOIL

FILENAME	005-05.DWG
SCALE	AS NOTED
SHEET	S-5

C:\PWworking\ICMA\d0132\d0090005-05.DWG, Plot, 5/14/2007 4:10:13 PM, rdahl

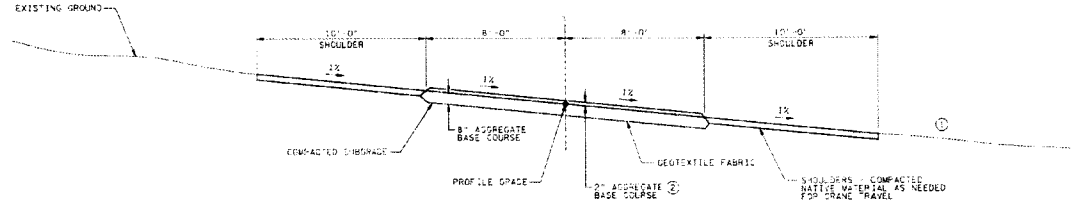
Exhibit D

Access Roadway Details



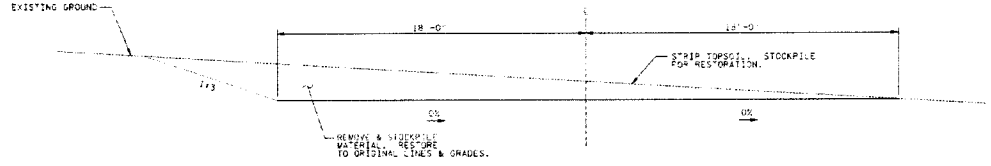
STRING ROAD - TYPICAL SECTION A

NOT TO SCALE



STRING ROAD - OPTIONAL SECTION

NOT TO SCALE



CRANE PATH - TYPICAL SECTION

NOT TO SCALE

GENERAL NOTES:

NO INFORMATION PROVIDED FOR RECORD DRAWINGS.
TYPICAL SECTIONS NOT UPDATED FOR
THE RECORD DRAWINGS.

HDR

ISSUE	DATE	DESCRIPTION
1	1/27/07	REVISION 1
2	5/18/08	RECORD DRAWINGS

PROJECT MANAGER | DATE

PROJECT NUMBER | 48203

acciona

TATANKA WIND ENERGY

TYPICAL SECTIONS

FILENAME 48203TYPDLGPT

SCALE NTS

SHEET TYPD1 OF TYPD2

Exhibit E

Access Roadways / Construction Material Requirements

Area of Access Roadways

$Area_{AR}$ = Length x Width
Length of Access Roadways = 140,000 feet
Width of Access Roadways = 16 feet
$Area_{AR}$ = 140,000' x 16' = 2,240,000 SF (248,889 SY)

Geotextile Fabric

Area of Fabric = Area of Access Roadway
$Area_{GF}$ = 248,889 SY

Aggregate Base Course

Volume of Aggregate Base = (Area of Access Roadway) x (Depth of Aggregate Base)
$Volume_{CG}$ = 248,889 SY x 10 inches (yd/36 inches) = 69,136 CY

Earthwork and Topsoil (Each)

Volume = Area x Depth
Volume = 248,889 x 4 inches (yd/36 inches) = 27,654 CY

Exhibit F

Service Drives / Construction Material Requirements

Area of Service Drive

$Area_{CP}$ = Length x Width x 120
Length of Service Drive = 150 feet (Each)
Width of Service Drive = 10 feet (Each)
$Area_{AR}$ = 10' x 150' x 120 = 180,000 SF (20,000 SY)

Aggregate Base Course

Volume of Aggregate Base = (Area of Service Drive) x (Depth of Aggregate Base)
Volume = 20,000 SY x 6 inches (yd/36 inches) = 3,333 CY

Earthwork and Topsoil (Each) – Service Drive, Temporary Crane Pads and Foundations

Volume = Area x Depth x 2
Volume = 20,000 SY x 4 inches (yd/36 inches) x 2 = 4,445 CY

Exhibit G

Cable Wire and Trench Construction Details

MEDIUM VOLTAGE CABLE

*One foot of trench length equals three feet of buried cable due to triplexed configuration

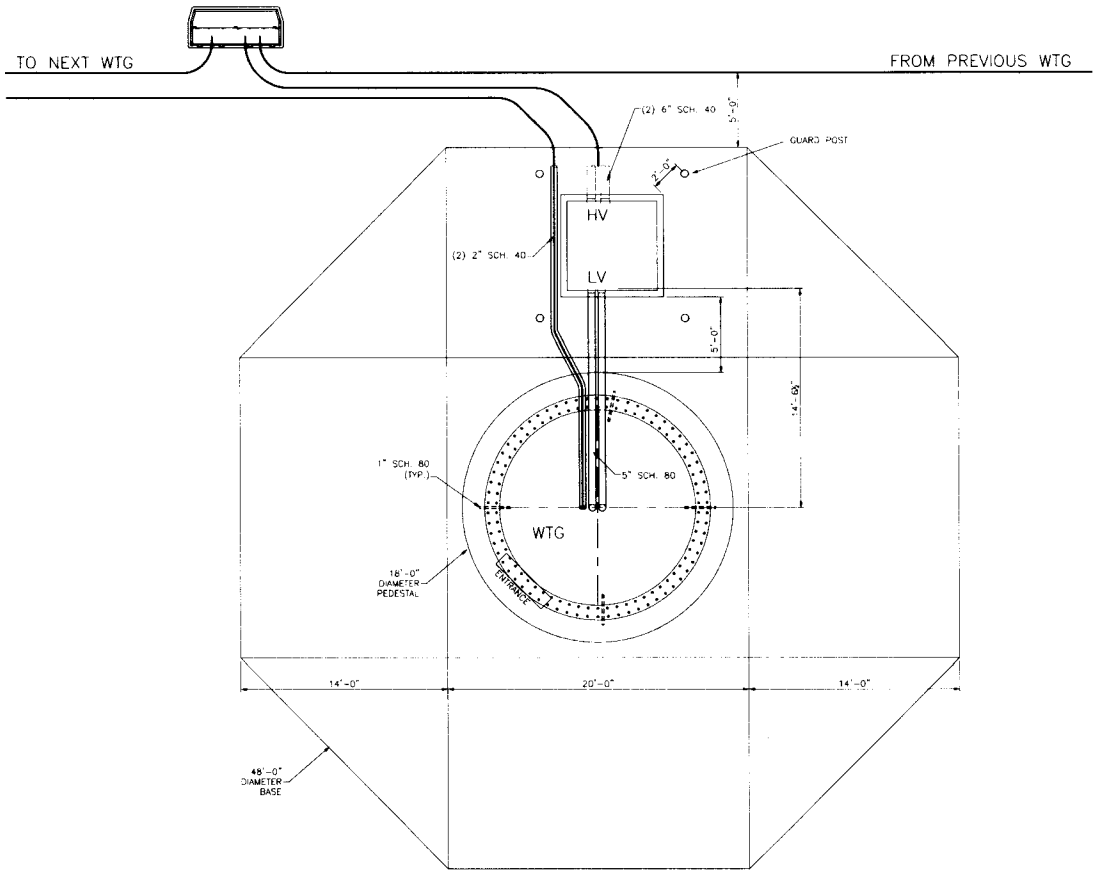
Total Trench Length by Cable	L(m)	L(ft)
TRXLP Cable	222,500	667,500

GROUND CABLE

Cable	L(m)	L(ft)
2/O Bare Copper Cable	222,500	222,500

FIBER OPTIC CABLE

Cable	L(m)	L(ft)
Multimode 62.5/125 um Fiber		



MORTENSON

HDR

ISSUE	DATE	DESCRIPTION
	07-7-08	AS-BUILT
0	02-16-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
[illegible]	RLB
PROJECT NUMBER	48069

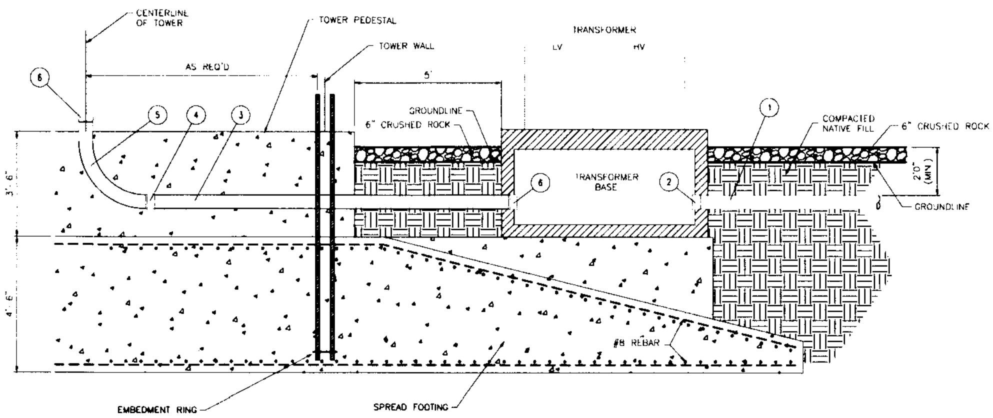
acciona

TATANKA WIND ENERGY

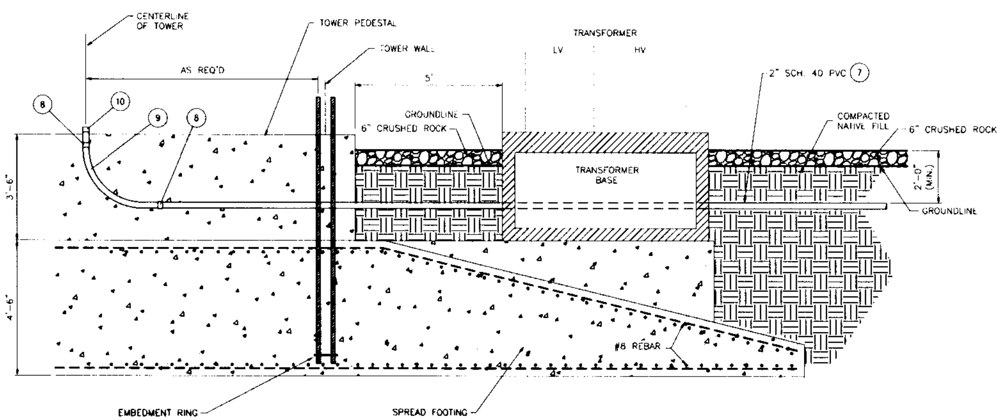
34.5kV UNDERGROUND COLLECTOR SYSTEM TOWER ENTRANCE DETAILS (OVERVIEW) NORTH DAKOTA

FILENAME	TWEND-TE-02
SCALE	1/4" = 1'-0"

SHEET TE-02



SECTION
35kV CONDUITS



SECTION
35kV CONDUITS

ITEM	QTY	MATERIAL DESCRIPTION
1		CONDUIT, 6" SCH. 40, PLAIN END
2		END BELL, 6" SCH. 40
3		CONDUIT, 5" SCH. 80, PLAIN END
4		COUPLING, 5" SCH. 80
5		SWEEP, 90°, 5" SCH. 80, 24" RADIUS
6		END BELL, 5" SCH. 80
7		CONDUIT, 2" SCH. 40, PLAIN END
8		COUPLING, 2" SCH. 40
9		SWEEP, 90°, 2" SCH. 40, 24" RADIUS
10		END BELL, 2" SCH. 40

MINIMUM BENDING RADIUS OF CONDUCTORS

SINGLE CONDUCTOR	CONDUCTOR DESCRIPTION
19"	1000 KCMIL, 35kV, 345 MIL TRXLPE, 61 STR. AL
16"	500 KCMIL, 35kV, 345 MIL TRXLPE, 37 STR. AL
13"	#4/0 AWG, 35kV, 345 MIL TRXLPE, 19 STR. AL
12"	#1/0 AWG, 35kV, 345 MIL TRXLPE, 19 STR. AL
8"	#1 AWG, 15kV, 175 MIL TRXPLE, 19 STR. AL

GENERAL NOTES

MORTENSON

HDR
HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
	07-7-08	AS-BUILT
0	02-16-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
PROJECT ENGINEER	RLB
PROJECT NUMBER	48069

acciona

TATANKA WIND ENERGY

34.5kV UNDERGROUND COLLECTOR SYSTEM
TOWER ENTRANCE DETAILS
(CROSS SECTION)

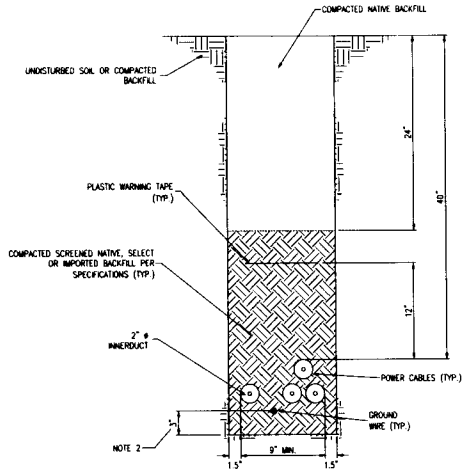
0 1" 2"

FILENAME	TWEND-TE-04
SCALE	NONE

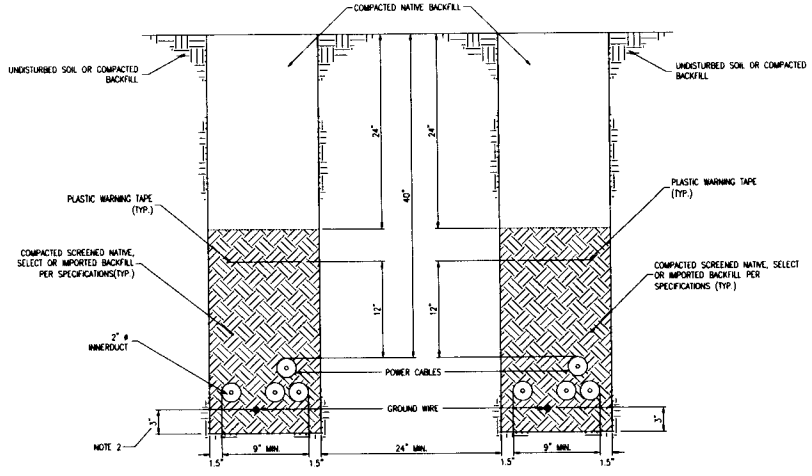
SHEET
TE-04

NOTES

1. TRIPLEX SEPARATION FOR POWER CABLES AND GROUND WIRE.
2. 3" BEDDING IS ONLY REQUIRED WHEN THE BOTTOM OF THE TRENCH IS ROCK AND/OR CANNOT BE ADEQUATELY CLEANED.
3. FIBER OPTIC CABLE MAY BE LOCATED BETWEEN 3" TO 12" ABOVE POWER CABLE DEPENDING ON CONTRACTORS CONSTRUCTION PRACTICE. DETAIL IS SHOWN AT 12" FOR ILLUSTRATION.



TRENCH DETAIL (ONE CIRCUIT) 1
SCALE: 1/2"=1'-0"



TRENCH DETAIL (TWO CIRCUITS) 2
SCALE: 1/2"=1'-0"

MORTENSON

HDR

ISSUE	DATE	DESCRIPTION
	07-7-08	AS-BUILT
0	02-16-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
	RLB
PROJECT NUMBER	48069

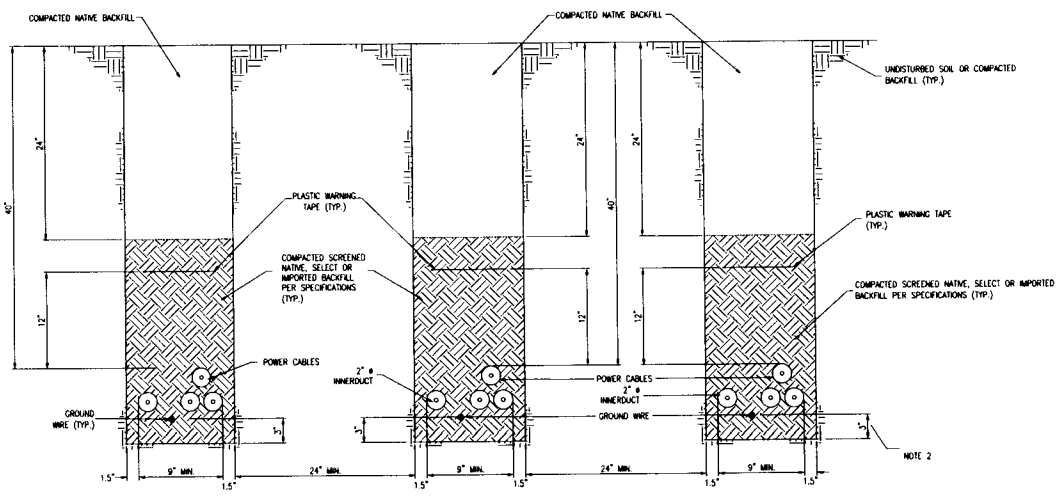
acciona

TATANKA WIND ENERGY

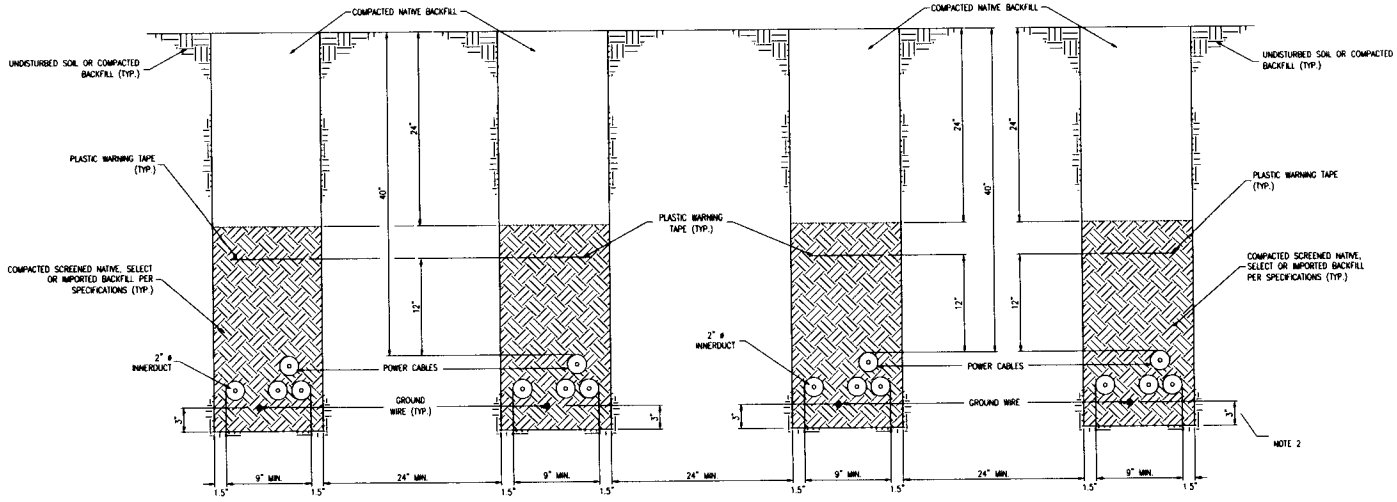
34.5kV UNDERGROUND COLLECTION SYSTEM 1 & 2 CIRCUIT TRENCH DETAILS NORTH DAKOTA

FILENAME	TWEND-TD-01
SCALE	1/2"=1'-0"

SHEET TD-01



TRENCH DETAIL (THREE CIRCUITS) 3
SCALE: 1/2"=1'-0"



TRENCH DETAIL (FOUR CIRCUITS) 4
SCALE: 1/2"=1'-0"

NOTES

1. TRIPLEX SEPARATION FOR POWER CABLES AND GROUND WIRE.
2. 3" BEDDING IS ONLY REQUIRED WHEN THE BOTTOM OF THE TRENCH IS ROCK AND/OR CANNOT BE ADEQUATELY CLEANED.
3. FIBER OPTIC CABLE MAY BE LOCATED BETWEEN 3" TO 12" ABOVE POWER CABLE DEPENDING ON CONTRACTORS CONSTRUCTION PRACTICE. DETAIL IS SHOWN AT 12" FOR ILLUSTRATION.

MORTENSON

HDR

ISSUE	DATE	DESCRIPTION
	07-7-08	AS-BUILT
0	02-16-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
	RLB
PROJECT NUMBER	48069

acciona

TATANKA WIND ENERGY

34.5kV UNDERGROUND COLLECTION SYSTEM 3 & 4 CIRCUIT TRENCH DETAILS NORTH DAKOTA

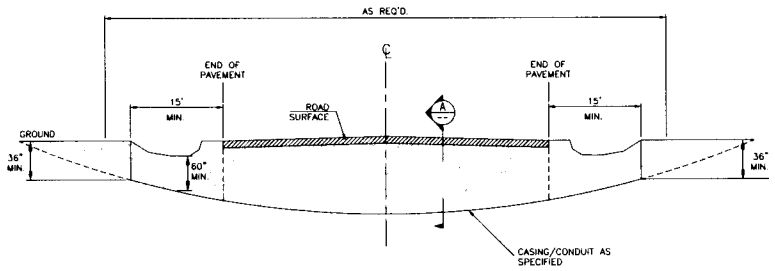
0 1" 2"

FILENAME	TWEND-TD-02
SCALE	1/2"=1'-0"

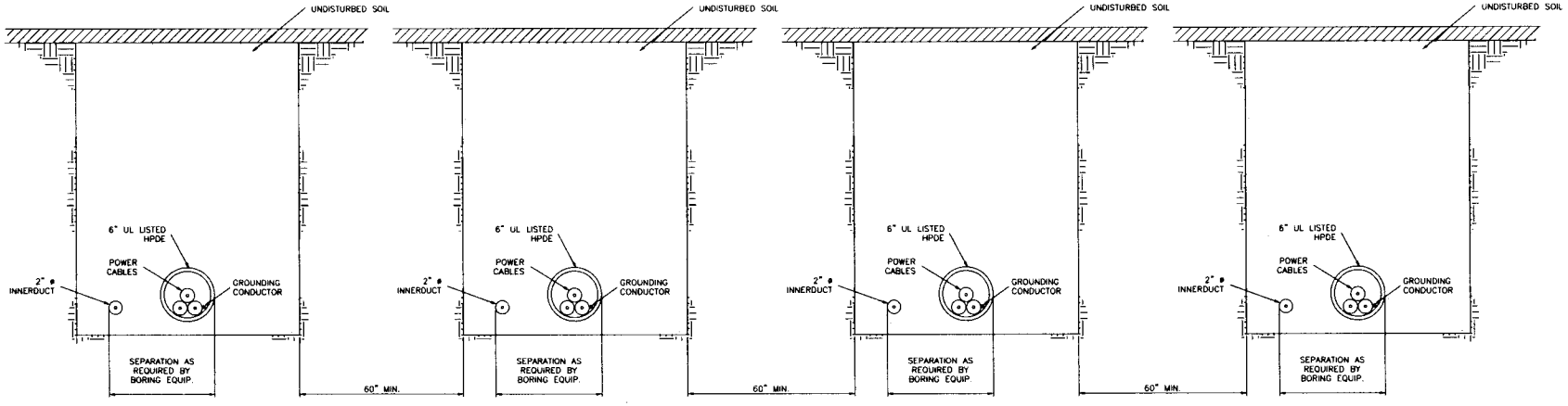
SHEET TD-02

NOTES

1. TRIPLEX SEPARATION FOR POWER CABLES AND GROUND WIRE.
2. 3" BEDDING IS ONLY REQUIRED WHEN THE BOTTOM OF THE TRENCH IS ROCK AND/OR CANNOT BE ADEQUATELY CLEANED.
3. FIBER OPTIC CABLE MAY BE LOCATED BETWEEN 3" TO 12" ABOVE POWER CABLE DEPENDING ON CONTRACTORS CONSTRUCTION PRACTICE. DETAIL IS SHOWN AT 12" FOR ILLUSTRATION.



DIRECTIONAL BORE DETAIL (3)
UNDER PAVED ROAD BETWEEN R/W
(REFERENCE TO STATE LINE ROAD)



SECTION (A)

MORTENSON	HDR Engineering, Inc.	PROJECT MANAGER	WEB
		PROJECT ENGINEER	RLB
	07-7-08	AS-BUILT	
0	02-16-07	ISSUED FOR CONSTRUCTION	
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER 48069

acciona

TATANKA WIND ENERGY

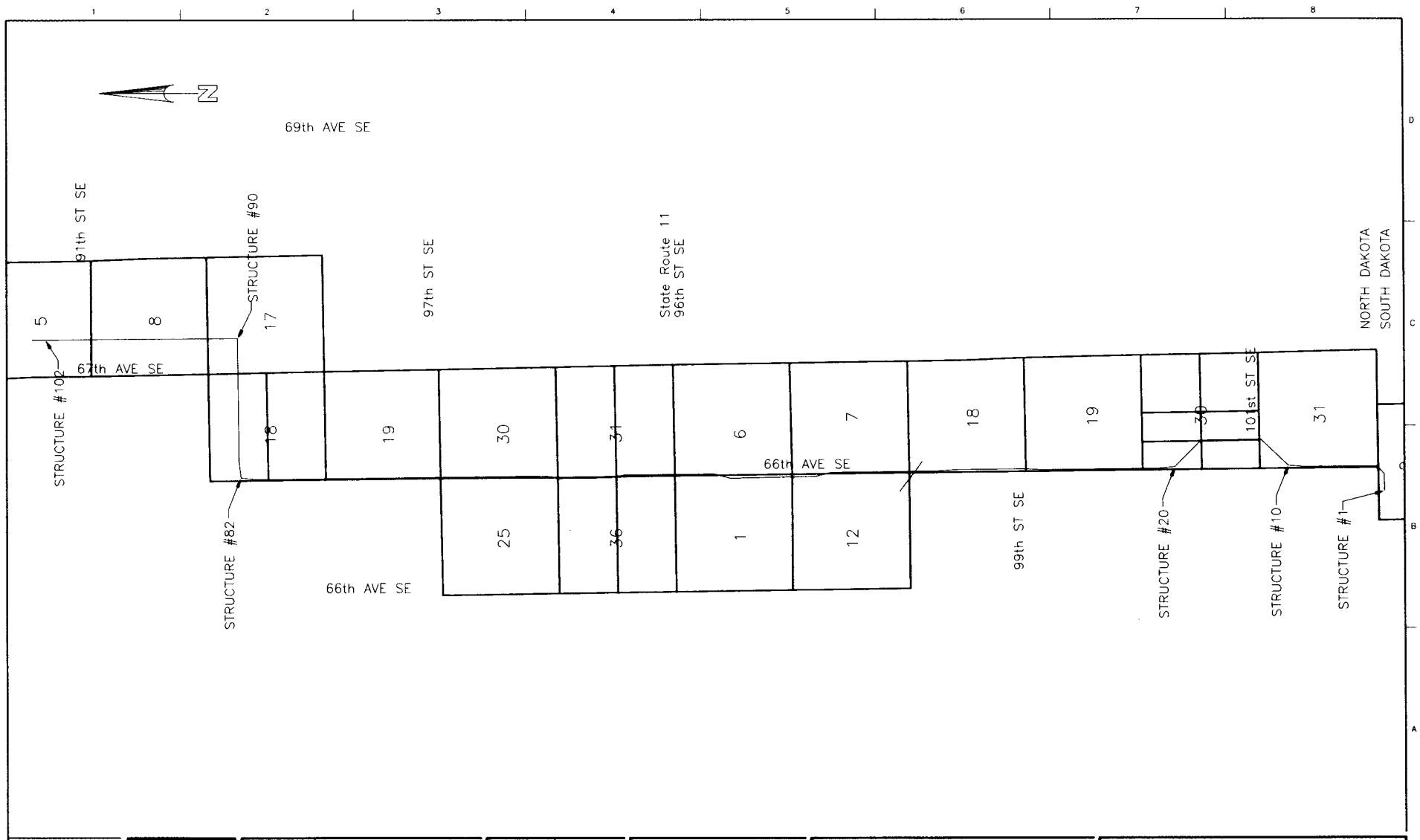
34.5kV UNDERGROUND COLLECTION SYSTEM DIRECTIONAL BORE DETAIL (PAVED ROAD) (REFERENCE TO STATE LINE ROAD) NORTH DAKOTA

0 1" 2"

FILENAME	TWEND-TD-03
SCALE	NONE
SHEET	TD-03

Exhibit H

Transmission Line Details



ISSUE	DATE	DESCRIPTION
2	4-17-08	AS-BUILT
1	4-30-07	RE-ISSUED FOR CONSTRUCTION
0	4-20-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER: BILL BARNHART

PROJECT NUMBER: 48069

HDR

MORTENSON

acciona

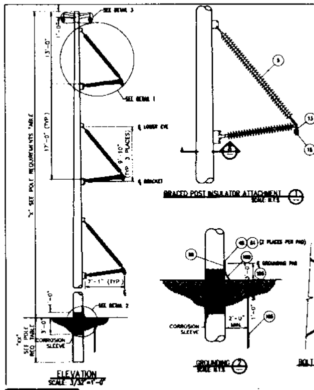
TATANKA WIND ENERGY
NORTH DAKOTA

TATANKA WIND FARM
230 KV TRANSMISSION LINE
ROUTE MAP

FILENAME: RM-01.dwg

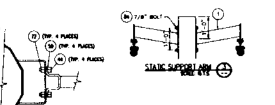
SCALE: NONE

SHEET: RM-01



MATERIAL LIST			
ITEM #	DESCRIPTION	MFG & CATALOG #	QUANTITY
1	STATIC SUPPORT ARM	HB# C4484-C-24	2
5	INSULATOR, 230KV BRACED POST ASSY., FLAT BASE, W/ CORONA RING	OB# 334229	3
13	Y-CLEVIS EYE, 30,000 LBS., ULTIMATE STRENGTH		6
16	CLAMP, SUSPENSION, 73-768 ACSR "T2/IBIS"	ANDERSON HAS721825	3
44	BOLT, SQUARE HEAD, GALVANIZED, 7/8"X2-1/2", W/ NUT	HB# B82-1/2-3	12
48	BOLT, STAINLESS STEEL, HEX HEAD, 1/2"X2-1/2"		4
59	WASHER, ROUND, GALVANIZED, FOR 7/8" BOLT		24
61	WASHER, STAINLESS STEEL, FLAT, 1/2"		4
64	BOLT, SQUARE HEAD, GALVANIZED, 7/8"XREQ'D LENGTH, W/ NUT	HB# B82-XX	2
72	NUT, LOCK, 7/8"	HB# MF80	12
98	CONNECTOR, COMPRESSION, #4 CU TO NEMA 2-HOLE PAD, TIN-PLATED CU		2
100	GROUND WIRE, #4 CU, 7 STRAND, SOFT DRAWN		2#
105	GROUND ROD, COPPER CLAD, 5/8"X8'		1
108	CADWELD, #4 CU TO 5/8" GROUND ROD, ONE SHOT		1

HB= HUGHES BROTHERS
SBD= SUPPLIED BY DISTRICT
OB= OHIO BRASS
VAL= VALMONT



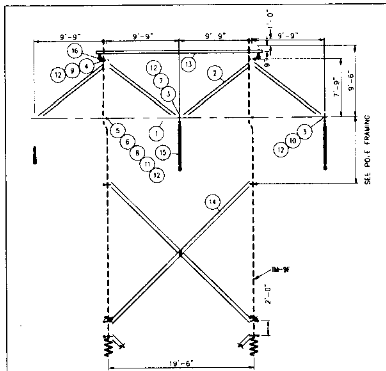
POLE REQUIREMENTS			
POLE HEIGHT "X"	SETTING DEPTH "XX"	STR. NUMBERS	MFG # & CAT #
105'-H6	16.5'	39,40 & 44	VAL# 0105 645-1
110'-H5	17'	41,42	VAL# 0110 645-1
110'-H6	17'	43	VAL# 0110 677-1

HDR

TATANKA WIND FARM
230KV TRANSMISSION LINE

STRUCTURE DRAWING
STEEL TANGENT BRACE POST

48049 — 1 OF 1
SBP.dwg
4-11-2007 — SBP



LIST OF MATERIALS		
ITEM	REQ	DESCRIPTION
1	2	X-ARM, 40'-0" #81
2	4	BRACE, X-ARM, 3-3/8" X 5-3/8" X REQ'D
3	3	SPACER ASSEMBLY, SEE CONST SPEC.
4	2	GRID GAIN, 4" X 4", 15/16" HOLE
5	4	PLATE, GAIN
6	4	PLATE, RIBBED TIE
7	1	D.E. BOLT, 7/8" BENT W/ 2 RESCUE NUTS
8	2	ROD, THREADED, 7/8" W/ 2 NUTS
9	2	BOLT, MACHINE 7/8" X REQ'D LENGTH
10	2	BOLT, 7/8" BENT
11	2	WASHER, SPRING, 15/16" HOLE
12	10	LOCKNUT, 7/8" MF TYPE
13	1	OHGW SUPPORT ASSEMBLY, TM-7D
14	1	X-BRACE ASSEMBLY, TM-110C
15	3	INSULATOR ASSEMBLY, TANGENT, TM-1B
16	2	OHGW ASSEMBLY, TANGENT, TM-4A, 4B (NOTE 1)

MISC. ASSEMBLIES:
TD-15F, TD-17F, TD-20, TCD-40, TPF-50, TM-121

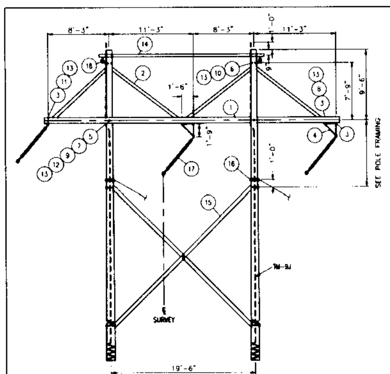
NOTE 1:
USE TM-4A ON 3/8" EHS.
USE TM-4B ON OPGW

HDR

TATANKA WIND FARM
230KV TRANSMISSION LINE

TANGENT H-FRAME

48049 — 1 OF 1
TH-230
4/20/07 — TH-230



LIST OF MATERIALS		
ITEM	REQ.	DESCRIPTION
1	2	X-ARM, 40'-0" #82
2	4	BRACE, X-ARM, 3-3/8" X 5-3/8" X REQ'D
3	5	SPACER ASSEMBLY, SEE CONST. SPEC
4	2	BRACKET, SWINGING ANGLE, ASSEMBLY, TM-112C
5	4	GRID GAIN, 4-1/2" X 9", 15/16" HOLE
6	2	GRID GAIN, 4" X 4", 15/16" HOLE
7	4	PLATE, RIBBED TIE
8	1	BOLT, D.E., 7/8" BENT W/ 2 RESCUE NUTS
9	2	ROD, THREADED, 7/8" W/ 2 NUTS
10	2	BOLT, MACHINE, 7/8" BY REQ'D LENGTH
11	2	BOLT, 7/8" BENT
12	2	WASHER, SPRING, 15/16" HOLE
13	10	LOCKNUT, 7/8" MF TYPE
14	1	OHGW SUPPORT ASSEMBLY, TM-7D
15	1	X-BRACE ASSEMBLY, TM-110C
16	2	GUY ATTACHMENT, MEDIUM DUTY, TG-26C
17	3	INSULATOR ASSEMBLY, TANGENT, TM-1B
18	2	OHGW ASSEMBLY, TANGENT, TM-4A, 4B (NOTE 1)

MISC. ASSEMBLIES:
TG-21C, TM-111, TD-15F, TD-17F, TD-20, TCD-40, TPF-50, TM-121

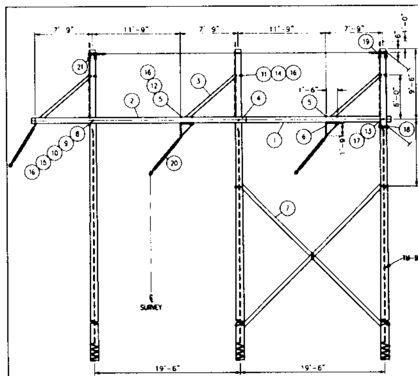
NOTE 1:
USE TM-4A ON 3/8" EHS.
USE TM-4B ON OPGW

HDR

TATANKA WIND FARM
230KV TRANSMISSION LINE

SMALL ANGLE H-FRAME

48049 — 1 OF 1
TH-231
4/20/07 — TH-231



LIST OF MATERIALS		
ITEM	REQ.	DESCRIPTION
1	2	X-ARM, 3-5/8"X9-3/8"X30'-0", #57
2	2	X-ARM, 3-5/8"X9-3/8"X28'-0", #62
3	3	BRACE, X-ARM, 3-3/8"X5-3/8"X REQ'D LENGTH
4	1	CHANNEL SPLICE ASSEMBLY, TM-114B
5	5	SPACER ASSEMBLY, SEE CONSTRUCTION SPEC.
6	2	BRACKET, SWING ANGLE, ASSEMBLY, TM-112C
7	1	X-BRACE ASSEMBLY, TM-110C
8	6	GRID GAIN, 4-1/2"X9", 15/16" HOLE
9	6	PLATE, RIBBED TIE, 2"X9-1/2"X1/4"
10	3	ROD, THREADED, 7/8" BY REQ'D LENGTH
11	3	BOLT, MACHINE, 7/8" X REQ'D LENGTH
12	3	BOLT, BENT, 7/8"
13	2	BOLT, WASHER HEAD, 1/2" W/ WASHER NUT
14	2	WASHER, CURVED, 4" SQX1/4", 15/16" HOLE
15	3	WASHER, SPRING, 15/16" HOLE
16	12	LOCKNUT, 7/8" MF TYPE
17	2	LOCKNUT, 1/2" MF TYPE
18	1	GUY ATTACHMENT, MEDIUM DUTY, TG-26C
19	1	POLE TIE, LARGE ANGLE, MED. DUTY, TG-58A
20	3	INSULATOR ASSEMBLY, TANGENT, TM-1B
21	2	OHGW ASSEMBLY, TANGENT, TM-4A, 4B (NOTE 1)

MISC. ASSEMBLIES:
TM-111, TG-21A, TD-15F, TD-17F, TD-20, TCD-20, TPF-50, TM-121, TCD-26, TG-92, TMG-12

NOTE 1:
USE TM-4A ON 3/8" EHS.
USE TM-4B ON OPGW

HDR

TATANKA WIND FARM
230KV TRANSMISSION LINE

INTERMEDIATE ANGLE H-FRAME

48049 — 1 OF 1
TH-232
4/20/07 — TH-232

HDR
HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
3	4-17-08	AS-BUILT
2	8-17-07	RE-ISSUED FOR CONSTRUCTION
1	4-30-07	RE-ISSUED FOR CONSTRUCTION
0	4-20-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER: BILL BARNHART
PROJECT NUMBER: 48069

MORTENSON®

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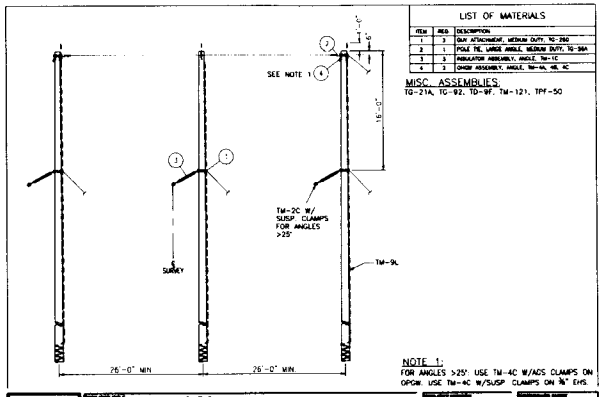
TATANKA WIND ENERGY
NORTH DAKOTA

TATANKA WIND FARM
230 KV TRANSMISSION LINE
STRUCTURE DRAWINGS

FILENAME	SD-01.dwg
SCALE	NONE

SHEET **SD-01**



LIST OF MATERIALS

ITEM	REQ.	DESCRIPTION
1	3	GUY ATTACHMENT, MEDIUM DUTY, TG-2SD
2	1	POLE TIE, LARGE ANGLE, MEDIUM DUTY, TG-36A
3	3	INSULATOR ASSEMBLY, ANGLE, TM-1C
4	3	CHAIR ASSEMBLY, ANGLE, TM-4A, 4B, 4C

MISC. ASSEMBLIES:
TG-21A, TG-92, TD-9F, TM-121, TPF-50

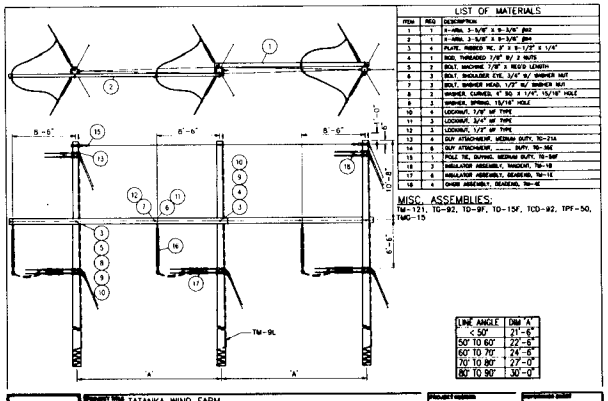
NOTE 1:
FOR ANGLES >25°, USE TM-4C W/ACS CLAMPS ON OPGW. USE TM-4C W/SUSP CLAMPS ON ⅜" EHS.

HDR

TATANKA WIND FARM
230KV TRANSMISSION LINE

LARGE ANGLE

48049 | 1 OF 1 | TH-234 | 4/20/07 | TH-234



LIST OF MATERIALS

ITEM	REQ.	DESCRIPTION
1	1	X-ARM, 3-5/8" X 8-3/8" ØX2
2	1	X-ARM, 3-5/8" X 8-3/8" ØX4
3	6	PLATE, RIBBED TIE, 3" X 8-1/2" X 1/4"
4	1	ROD, THREADED 7/8" W/ 2 NUTS
5	2	BOLT, MACHINE 7/8" X REQ'D LENGTH
6	3	BOLT, SHOULDER EYE, 3/4" W/ WASHER NUT
7	3	BOLT, WASHER HEAD, 1/2" W/ WASHER NUT
8	2	WASHER, CURVED, 4" SQ. X 1/4", 15/16" HOLE
9	3	WASHER, SPRING, 15/16" HOLE
10	6	LOCKNUT, 7/8" NF TYPE
11	2	LOCKNUT, 3/4" NF TYPE
12	3	LOCKNUT, 1/2" NF TYPE
13	6	GUY ATTACHMENT, MEDIUM DUTY, TG-21A
14	6	GUY ATTACHMENT, _____ DUTY, TG-36C
15	1	POLE TIE, GUYING, MEDIUM DUTY, TG-36F
16	2	INSULATOR ASSEMBLY, TANGENT, TM-1B
17	6	INSULATOR ASSEMBLY, DEADEND, TM-1E
18	4	CHAIR ASSEMBLY, DEADEND, TM-4E

MISC. ASSEMBLIES:
TM-121, TG-92, TD-9F, TD-15F, TCD-92, TPF-50, TMG-1S

LINE ANGLE	DIM "A"
< 50°	21'-6"
50° TO 60°	22'-6"
60° TO 70°	24'-6"
70° TO 80°	27'-0"
80° TO 90°	30'-0"

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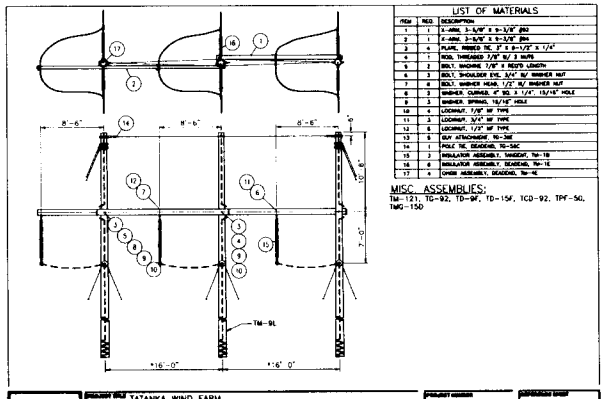
TATANKA WIND FARM
230KV TRANSMISSION LINE

LARGE ANGLE DOUBLE DEADEND

48049 | 1 OF 1 | TH-235 | 4/20/07 | TH-235



LIST OF MATERIALS

ITEM	REQ.	DESCRIPTION
1	1	X-ARM, 3-5/8" X 8-3/8" ØX2
2	1	X-ARM, 3-5/8" X 8-3/8" ØX4
3	6	PLATE, RIBBED TIE, 3" X 8-1/2" X 1/4"
4	7	ROD, THREADED 7/8" W/ 2 NUTS
5	2	BOLT, MACHINE 7/8" X REQ'D LENGTH
6	3	BOLT, SHOULDER EYE, 3/4" W/ WASHER NUT
7	8	BOLT, WASHER HEAD, 1/2" W/ WASHER NUT
8	3	WASHER, CURVED, 4" SQ. X 1/4", 15/16" HOLE
9	3	WASHER, SPRING, 15/16" HOLE
10	4	LOCKNUT, 7/8" NF TYPE
11	3	LOCKNUT, 3/4" NF TYPE
12	6	LOCKNUT, 1/2" NF TYPE
13	6	GUY ATTACHMENT, TG-36E
14	1	POLE TIE, DEADEND, TG-36C
15	3	INSULATOR ASSEMBLY, TANGENT, TM-1B
16	6	INSULATOR ASSEMBLY, DEADEND, TM-1E
17	6	CHAIR ASSEMBLY, DEADEND, TM-4E

MISC. ASSEMBLIES:
TM-121, TG-92, TD-9F, TD-15F, TCD-92, TPF-50, TMG-1SD

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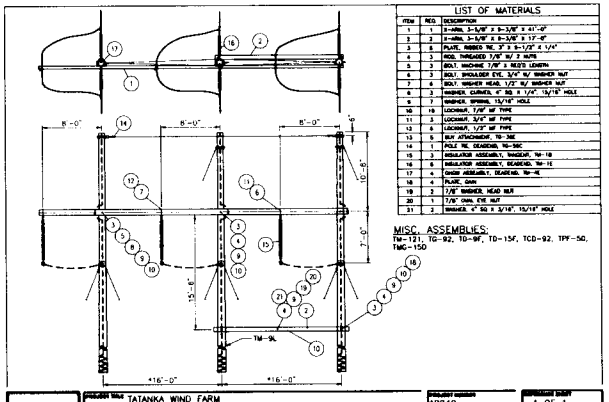
TATANKA WIND FARM
230KV TRANSMISSION LINE

TANGENT DOUBLE DEADEND

*SPECIAL FRAMING

48049 | 1 OF 1 | TH-235D | 4/20/07 | TH-235D



LIST OF MATERIALS

ITEM	REQ.	DESCRIPTION
1	1	X-ARM, 3-5/8" X 8-3/8" X 41'-0"
2	2	X-ARM, 3-5/8" X 8-3/8" X 17'-6"
3	6	PLATE, RIBBED TIE, 3" X 8-1/2" X 1/4"
4	3	ROD, THREADED 7/8" W/ 2 NUTS
5	3	BOLT, MACHINE 7/8" X REQ'D LENGTH
6	3	BOLT, SHOULDER EYE, 3/4" W/ WASHER NUT
7	6	BOLT, WASHER HEAD, 1/2" W/ WASHER NUT
8	3	WASHER, CURVED, 4" SQ. X 1/4", 15/16" HOLE
9	7	WASHER, SPRING, 15/16" HOLE
10	10	LOCKNUT, 7/8" NF TYPE
11	3	LOCKNUT, 3/4" NF TYPE
12	6	LOCKNUT, 1/2" NF TYPE
13	5	GUY ATTACHMENT, TG-36E
14	1	POLE TIE, DEADEND, TG-36C
15	3	INSULATOR ASSEMBLY, TANGENT, TM-1B
16	6	INSULATOR ASSEMBLY, DEADEND, TM-1E
17	6	CHAIR ASSEMBLY, DEADEND, TM-4E
18	4	PLATE, CAM
19	3	7/8" WASHER HEAD NUT
20	1	7/8" CAM, EYE NUT
21	3	WASHER, 4" SQ. X 3/16", 15/16" HOLE

MISC. ASSEMBLIES:
TM-121, TG-92, TD-9F, TD-15F, TCD-92, TPF-50, TMG-1SD

HDR

TATANKA WIND FARM
230KV TRANSMISSION LINE

TANGENT DOUBLE DEADEND

*SPECIAL FRAMING

48049 | 1 OF 1 | TH-235D SPEC | 4/20/07 | TH-235D SPEC

ISSUE	DATE	DESCRIPTION
3	4-17-08	AS-BUILT
2	8-17-07	RE-ISSUED FOR CONSTRUCTION
1	4-30-07	RE-ISSUED FOR CONSTRUCTION
0	4-20-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER | BILL BARNHART

PROJECT NUMBER | 48069

HDR Engineering, Inc.

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TATANKA WIND ENERGY
NORTH DAKOTA

TATANKA WIND FARM
230 KV TRANSMISSION LINE
STRUCTURE DRAWINGS

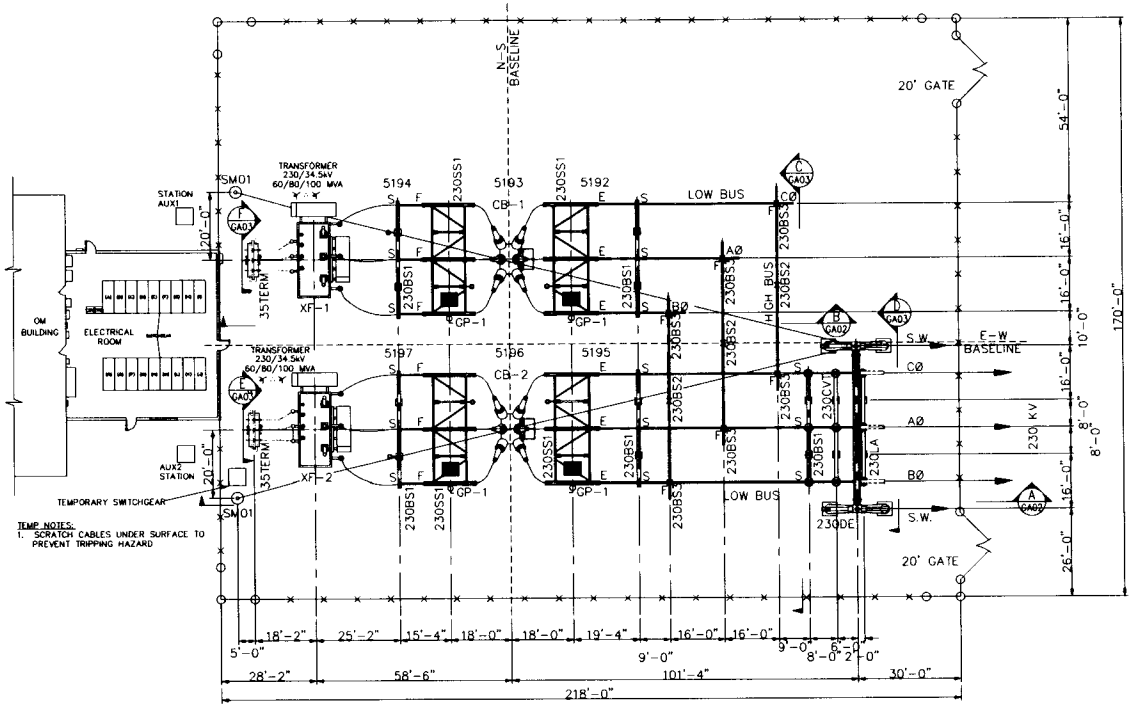
0 1" 2"

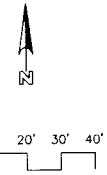
FILENAME | SD-02.dwg
SCALE | NONE

SHEET
SD-02

Exhibit I

Project Substation Details





STRUCTURAL STEEL SCHEDULE			
STRUCTURE DESIGNATION	DESCRIPTION	QTY	REF. DWG.
230SS1	230kV 3Ø SWITCH STAND (10'-6" BUS HEIGHT)	4	TWESD-SS-01
230BS1	230kV 3Ø BUS SUPPORT (11'-0" BUS HEIGHT)	5	TWESD-SS-02
230BS2	230kV 1Ø BUS SUPPORT (23'-0" BUS HEIGHT)	3	TWESD-SS-02
230BS3	230kV 1Ø BUS SUPPORT (11'-0" BUS HEIGHT)	6	TWESD-SS-02
GP-1	GROUND PLATFORM	4	TWESD-SS-03
35TERM	TERMINATION STAND	2	TWESD-SS-04
230CVT	230kV CVT SUPPORT	1	TWESD-SS-06
230LA	230kV ARRESTER SUPPORT	1	TWESD-SS-06
230DE	DEADEND TOWER	1	TWESD-SM-01
SM-01	STATIC MAST	2	TWESD-SM-01

NOTES:

1. ACTUAL 230KV BREAKER TO BE CONFIRMED.

LEGEND

A / CA02 — SECTION DETAIL NUMBER / REFER TO DRAWING FOR SECTION DETAIL

F – FIXED SUPPORT
S – SLIP SUPPORT
E – EXPANSION SUPPORT
C – APPROXIMATE COUPLER LOCATION

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ISSUE	DATE	DESCRIPTION
	07-07-08	AS BUILT
A	11-13-07	ADD MDU NAMING CONNECTION
A	10-24-07	TEMP SWGR
1	09-28-07	CONTROL ROOM CHANGES
1	09-04-07	REVISED PER MANUF. DRAWINGS
0	03-30-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
	RWC
	GDS
PROJECT NUMBER	48049

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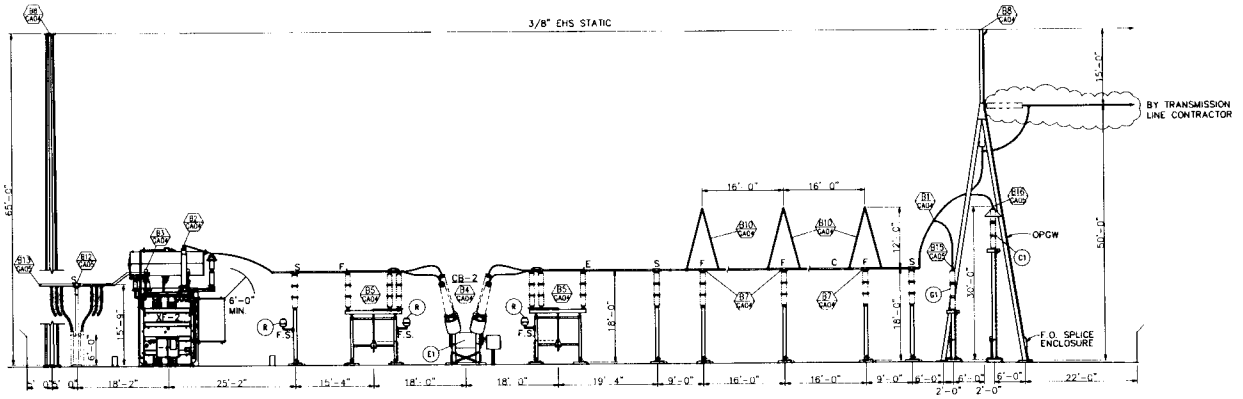
TATANKA WIND ENERGY

230/34.5kV PROJECT SUBSTATION GENERAL ARRANGEMENT

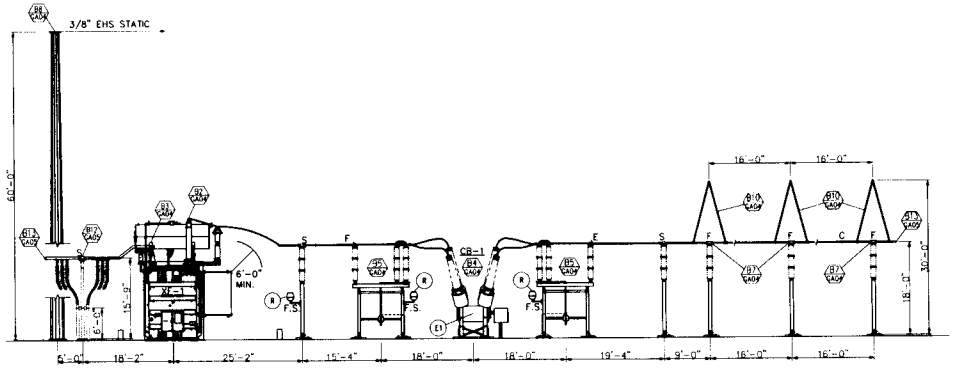
0 1" 2"

FILENAME	TWESD-GA-01
SCALE	NONE

SHEET GA-01



SECTION A



SECTION B

NOTES:

1. BUS HEIGHT IS FROM BOTTOM OF STEEL BASEPLATE TO CENTER-LINE OF BUS.
2. T.O.C. IS 'TOP OF CONCRETE'
3. ACTUAL 230KV BREAKER TO BE CONFIRMED.

LEGEND:

- (B4) — BUS CONNECTION DETAIL NUMBER REFER TO DRAWING TWESD-GA-04
- (H1) — BILL OF MATERIAL ITEM NUMBER REFER TO DRAWING TWESD-GA-06

S - SLIP
F - FIXED
E - EXPANSION
C - APPROXIMATE LOCATION OF COUPLER
F.O. - FIBER OPTIC
F.S. - FAR SIDE

MORTENSON

HDR

ISSUE	DATE	DESCRIPTION
	07-07-08	AS BUILT
A	11-06-07	REVISED PER VENDOR DRAWINGS
0	03-30-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER: WEB
PROJECT NUMBER: 48049

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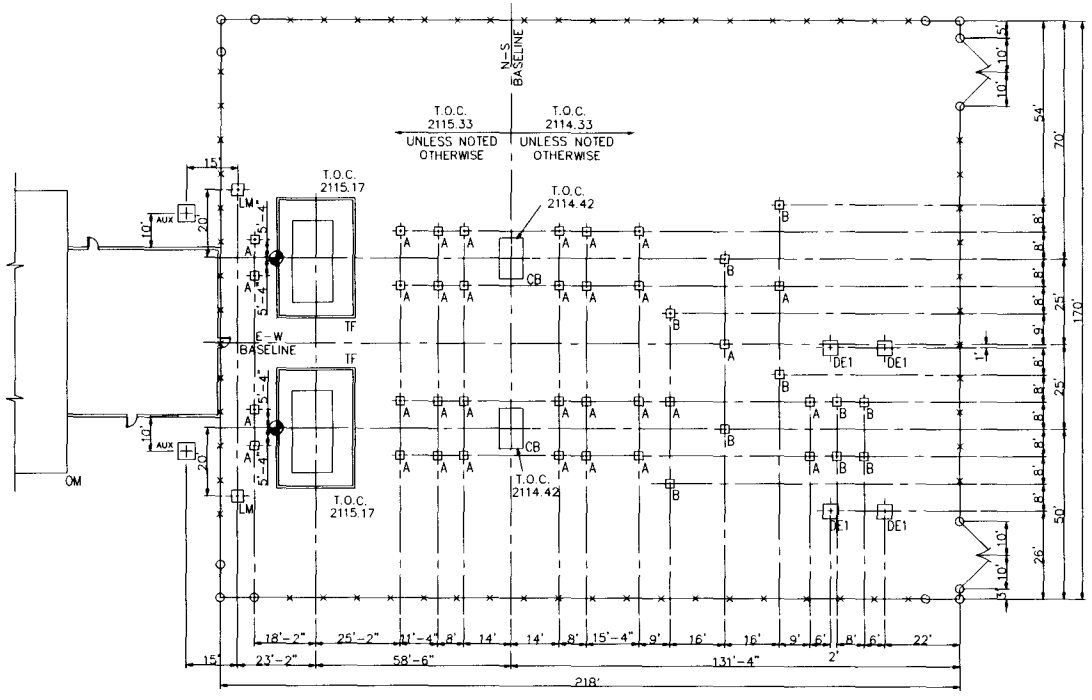
TATANKA WIND ENERGY

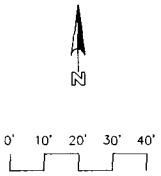
230/34.5kV PROJECT SUBSTATION GENERAL ARRANGEMENT SECTION A & B

0 1" 2"

FILENAME: TWESD-GA-02
SCALE: 3/32" = 1'

SHEET: GA-02





FOUNDATION SCHEDULE				
FOUNDATION DESIGNATION	DRAWING REFERENCE	QTY	CONCRETE REQUIREMENTS PER UNIT	TOTAL
A	TWESD-FD-02	33	2.6	85.8
B	TWESD-FD-02	10	2.6	26
CB	TWESD-FD-02	2	4.7	9.4
DE1	TWESD-FD-02	4	8.6	34.4
LM	TWESD-FD-02	2	5.9	11.8
TF	TWESD-FD-03	2	72.1	144.2
AUX	TWESD-FD-03	2	.9	1.8

NOTES:

1. T.O.C. = TOP OF CONCRETE
2. CONSTRUCTION JOINTS WILL NOT BE ALLOWED WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER, UNLESS OTHERWISE NOTED ON THE DRAWINGS.

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ISSUE	DATE	DESCRIPTION
	07-07-08	AS BUILT
2	09-28-07	CONTROL ROOM CHANGES
1	06-21-07	REVISED T.O.C. ELEVATION
0	03-30-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER: WEB

PROJECT NUMBER: 48049

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TATANKA WIND ENERGY

230/34.5kV PROJECT SUBSTATION FOUNDATION PLAN

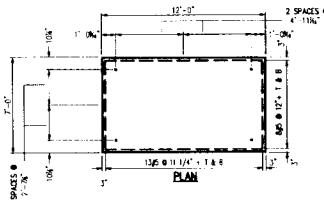
FILENAME: TWESD-FD-01

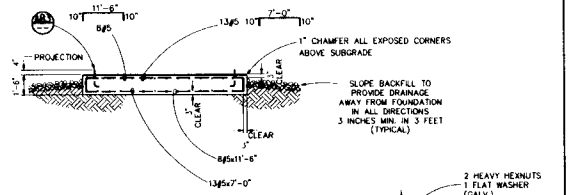
SCALE: NONE

SHEET: FD-01

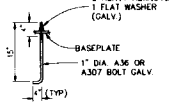
MATERIALS (1 FDN)

ITEM	QTY.	REMARKS
CONCRETE	4.7 c.y.	PER SPEC.
REBAR		PER SPEC.
#5	418.2 lb.	
ANCHOR BOLTS	4	1" DIA. A36 FURNISHED BY CONTRACTOR





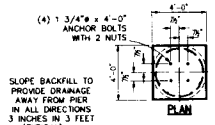
ELEVATION
230KV PCB FOUNDATION (CB / FD01)

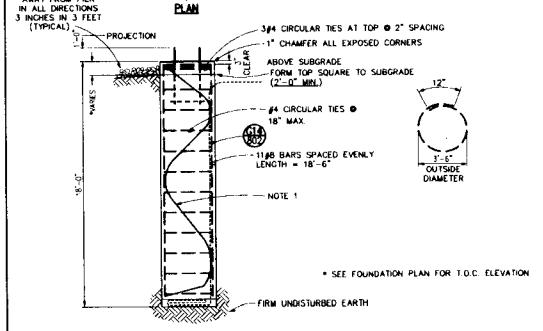


ANCHOR BOLT DETAIL (AB1)
SCALE: N.T.S.

MATERIALS (1 FDN)

ITEM	QTY.	REMARKS
CONCRETE	8.6 c.y.	PER SPEC.
REBAR		PER SPEC.
#4	145 lb.	
#8	543.3 lb.	
ANCHOR BOLTS	4	FURNISHED BY DE FABRICATOR INSTALLED BY CONTRACTOR





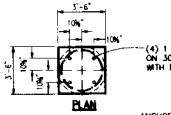
* SEE FOUNDATION PLAN FOR T.O.C. ELEVATION

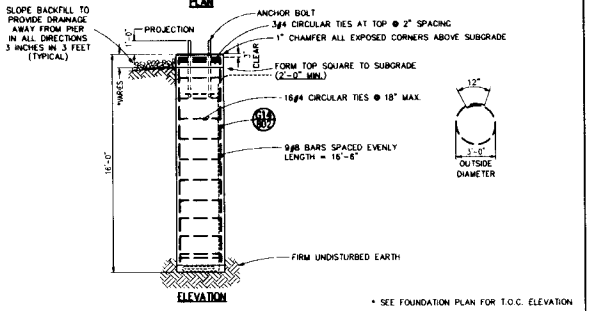
ELEVATION
FOUNDATION (DET / FD01)

NOTE:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING MATERIALS AND LABOR TO ADEQUATELY BRACE THE REBAR CAGE TO WITHSTAND CONSTRUCTION LOADS.

MATERIALS (1 FDN)

ITEM	QTY.	REMARKS
CONCRETE	5.9c.y.	PER SPEC.
REBAR		PER SPEC.
#4	110 lb.	
#8	396.5 lb.	
ANCHOR BOLTS	4	FURNISHED BY FABRICATOR INSTALLED BY CONTRACTOR





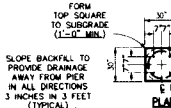
ELEVATION

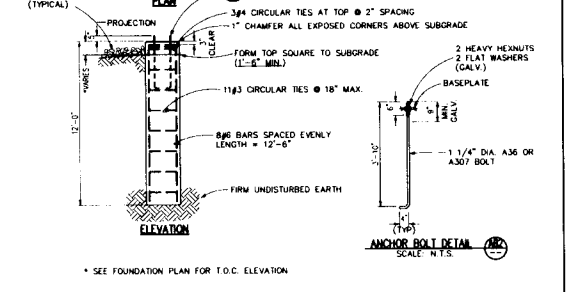
* SEE FOUNDATION PLAN FOR T.O.C. ELEVATION

FOUNDATION (LM / FD01)

MATERIALS (1 FDN)

ITEM	QTY.	REMARKS
CONCRETE	2.6 c.y.	PER SPEC.
REBAR		PER SPEC.
#6	150 lb.	
#3	29 lb.	
ANCHOR BOLTS AB2	4	FURNISHED AND INSTALLED BY CONTRACTOR





ELEVATION

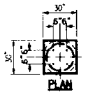
ANCHOR BOLT DETAIL (AB2)
SCALE: N.T.S.

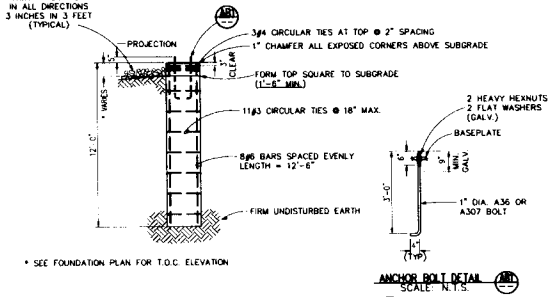
* SEE FOUNDATION PLAN FOR T.O.C. ELEVATION

FOUNDATION (A / FD01)

MATERIALS (1 FDN)

ITEM	QTY.	REMARKS
CONCRETE	2.6 c.y.	PER SPEC.
REBAR		PER SPEC.
#6	150 lb.	
#3	29 lb.	
ANCHOR BOLTS AB1	4	FURNISHED AND INSTALLED BY CONTRACTOR





* SEE FOUNDATION PLAN FOR T.O.C. ELEVATION

ELEVATION

ANCHOR BOLT DETAIL (AB1)
SCALE: N.T.S.

FOUNDATION (B / FD01)

MORTENSON

HDR

ISSUE	DATE	DESCRIPTION
	07-07-08	AS BUILT
1	06-21-07	REVISED FOUNDATION DETAILS
0	03-30-07	ISSUED FOR CONSTRUCTION

PROJECT MANAGER	WEB
PROJECT NUMBER	48049

acciona

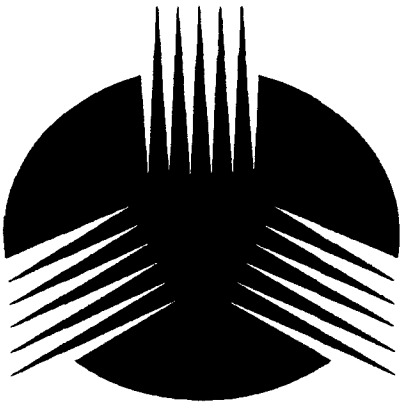
TATANKA WIND ENERGY

230/34.5kV PROJECT SUBSTATION FOUNDATION DETAILS

FILENAME	TWESD-FD-02	SHEET
SCALE	NONE	FD-02

Exhibit J

Meteorological Tower Details



WORLD TOWER
COMPANY, INC.

1213 Compressor Drive
P.O. Box 508
Mayfield, KY 42066
270.247.3642
Fax. 270. 247.0909
worldtower@worldtower.com
www.worldtower.com

Fabrication, Installation, and Maintenance of TV, AM, FM, & Wireless Communications Towers

World Tower
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P.O. Box 508
Mayfield, KY 42066
270-247-3642
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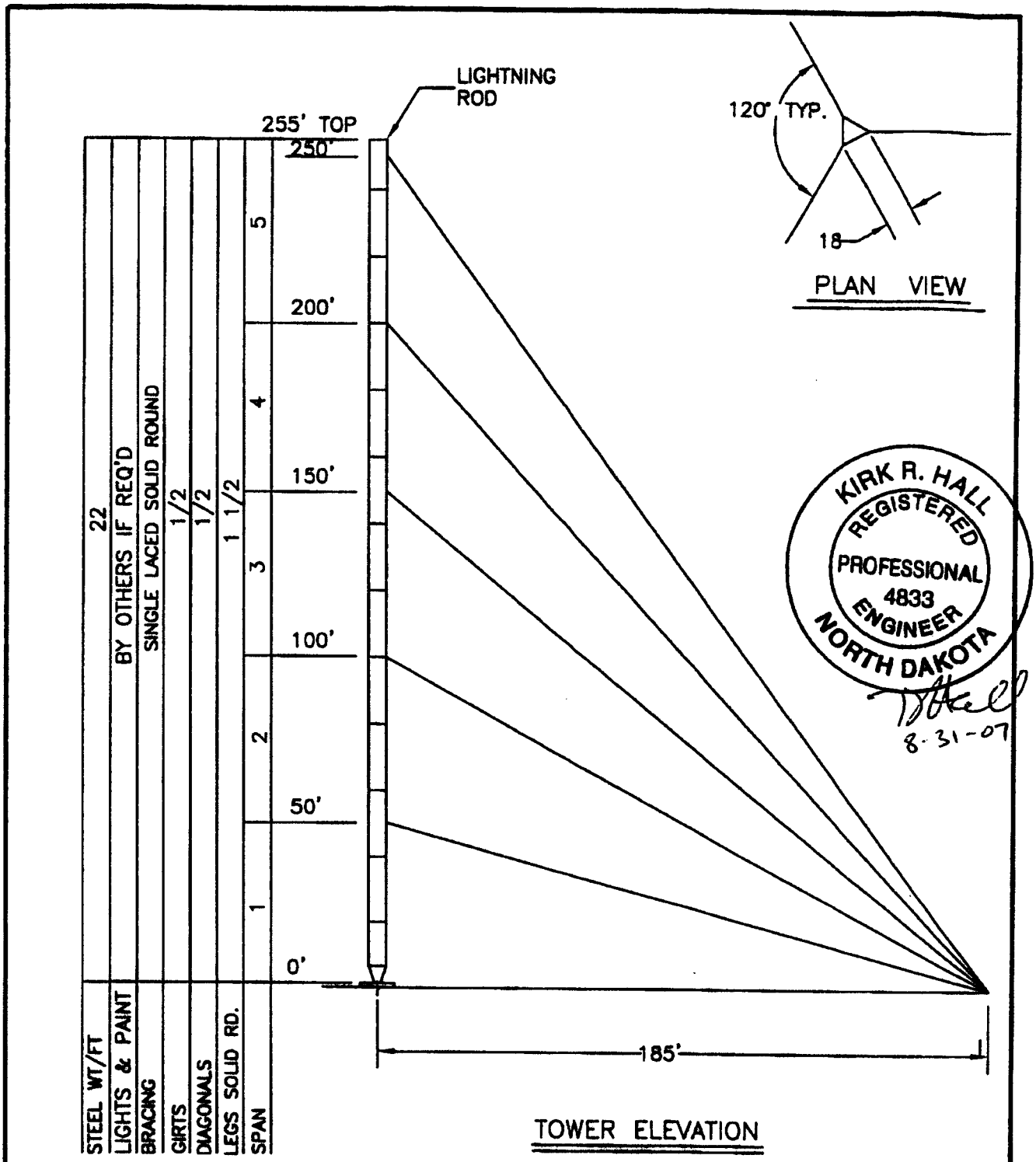
E-mail: worldtower@worldtower.com
Web: www.worldtower.com

255' TYPE 18SR TOWER
FOR: TATANKA WIND FARM PROJECT LLC
ACCIONA WIND ENERGY NORTH AMERICA
SITES: DICKEY COUNTY, ND
MCPHERSON COUNTY, SD
DESIGN PACKAGE

Fabrication, Installation, and Maintenance of TV, AM, FM, & Wireless Communications Towers



TITLE: 255' TYPE 18SR TOWER
FOR: TATANKA WIND FARM PROJECT LLC
ACCIONA WIND ENERGY NORTH AMERICA
SITES: DICKEY COUNTY, ND
MCPHERSON COUNTY, SD

WORLD TOWER

SCALE	DWN.	CKD.	DATE
NONE	JCD	JCD	8-21-07

FILE

DWG. NO. Q07177-1

ANTENNAS			
ELEV.	DESCRIPTION	LINE	AZIMUTH
255'	6 SQ. FT. CAAC NO ICE OR 12 SQ. FT. CAAC 1/2" ICE	1 1/4" COND.	
230'	6 SQ. FT. CAAC NO ICE OR 12 SQ. FT. CAAC 1/2" ICE	1 1/4" COND.	
197'	6 SQ. FT. CAAC NO ICE OR 12 SQ. FT. CAAC 1/2" ICE	1 1/4" COND.	

REACTIONS					
BASE			ANCHOR		
SHEAR	1.0	KIPS	RESULTANT	29.0	KIPS
COMPRESSION	46.0	KIPS	HORIZONTAL	23.0	KIPS
		KIPS	VERTICAL	18.0	KIPS

ELEV.	SIZE	BREAK STRENGTH	INITIAL TENSION	CUT LENGTH	SHACKLE	THIMBLE	TURN BUCKLE
250'	3/8 EHS	15400	1500	341'	---	3/8	5/8 X 12
200'	7/16 EHS	20800	2100	302'	---	1/2	3/4 X 12
150'	3/8 EHS	15400	1500	268'	---	3/8	5/8 X 12
100'	3/8 EHS	15400	1500	240'	---	3/8	5/8 X 12
50'	3/8 EHS	15400	1500	221'	---	3/8	5/8 X 12

GENERAL NOTES

1. TOWER IS DESIGNED TO SUPPORT THE GIVEN LOADS AND MEET THE PROVISIONS OF TIA/EIA-222-F FOR A 85 MPH BASIC WIND SPEED WITH NO ICE OR 73.6 MPH WITH 1/2" ICE.
2. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISION OF THE AMERICAN WELDING SOCIETY AWS.D 1.1.
3. TOWER AND ALL FABRICATED ACCESSORIES ARE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
4. ALL BOLTS SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATION FOR ZINC COATING OF IRON AND STEEL HARDWARE ASTM A153.
5. LEG STEEL IS 50 KSI MIN. YIELD SOLID ROUND AND BRACING STEEL IS 36 KSI MIN. YIELD SOLID ROUND.
6. ALL STRUCTURAL BOLTS ARE ASTM A325.
7. GUY LENGTHS SHOWN ARE CHORD LENGTHS PLUS 30'.
8. TOWER SECTIONS ARE NUMBERED CONSECUTIVELY FROM BASE TO TOP.
9. TOWER SHOULD BE INSPECTED IN ACCORDANCE WITH TIA/EIA-222-F EVERY 3 YEARS.
10. TOWER INSPECTION SHOULD ONLY BE PERFORMED BY EXPERIENCED QUALIFIED PERSONNEL. FOR ASSISTANCE IN PROPER MAINTENANCE OF YOUR TOWER, CALL WORLD TOWER ● 270-247-3642.

KIRK R. HALL REGISTERED PROFESSIONAL 4833 ENGINEER NORTH DAKOTA

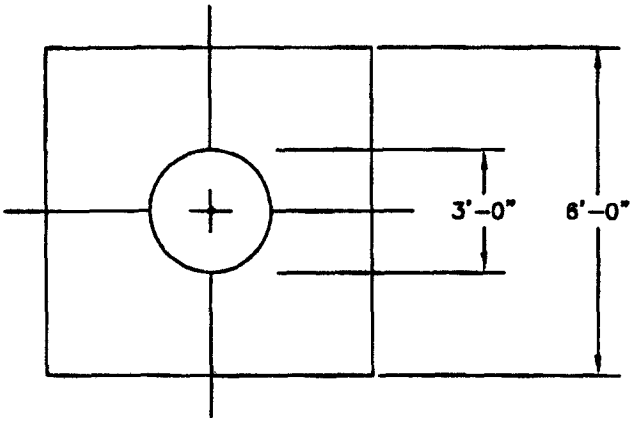
8-31-07

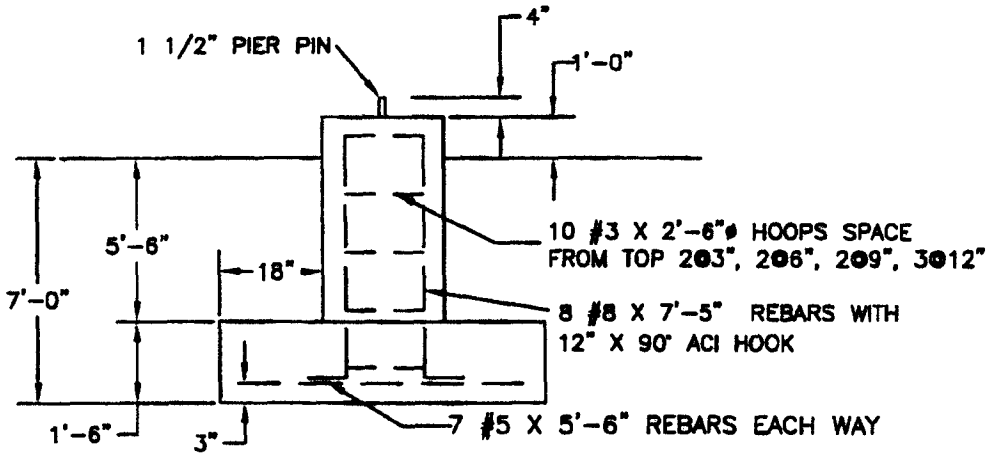
TITLE: 255' TYPE 18SR TOWER
FOR: TATANKA WIND FARM PROJECT LLC
ACCIONA WIND ENERGY NORTH AMERICA
SITES: DICKEY COUNTY, ND
MCPHERSON COUNTY, SD

WORLD TOWER

SCALE	NONE	DWN.	JCD	CKD.		DATE	8-21-07
FILE				DWG. NO.	Q07177T-1		

3.7 CU. YDS.
CONCRETE REQ'D.





GENERAL NOTES

1. CONCRETE TO HAVE 3000 PSI MIN. COMPRESSIVE STRENGTH AFTER 28 DAYS.
2. ALL REINFORCMENT STEEL IS DEFORMED AND MEETS THE STRENGTH REQUIREMENTS OF ASTM A615 GRADE 60.
3. EMBEDDED STEEL TO HAVE 3" MIN. CONCRETE COVER.
4. FOUNDATION DESIGN IS BASED ON EIA NORMAL SOIL.

REACTIONS	
SHEAR	1.0 MAX.KIPS
DOWNLOAD	46.0 KIPS

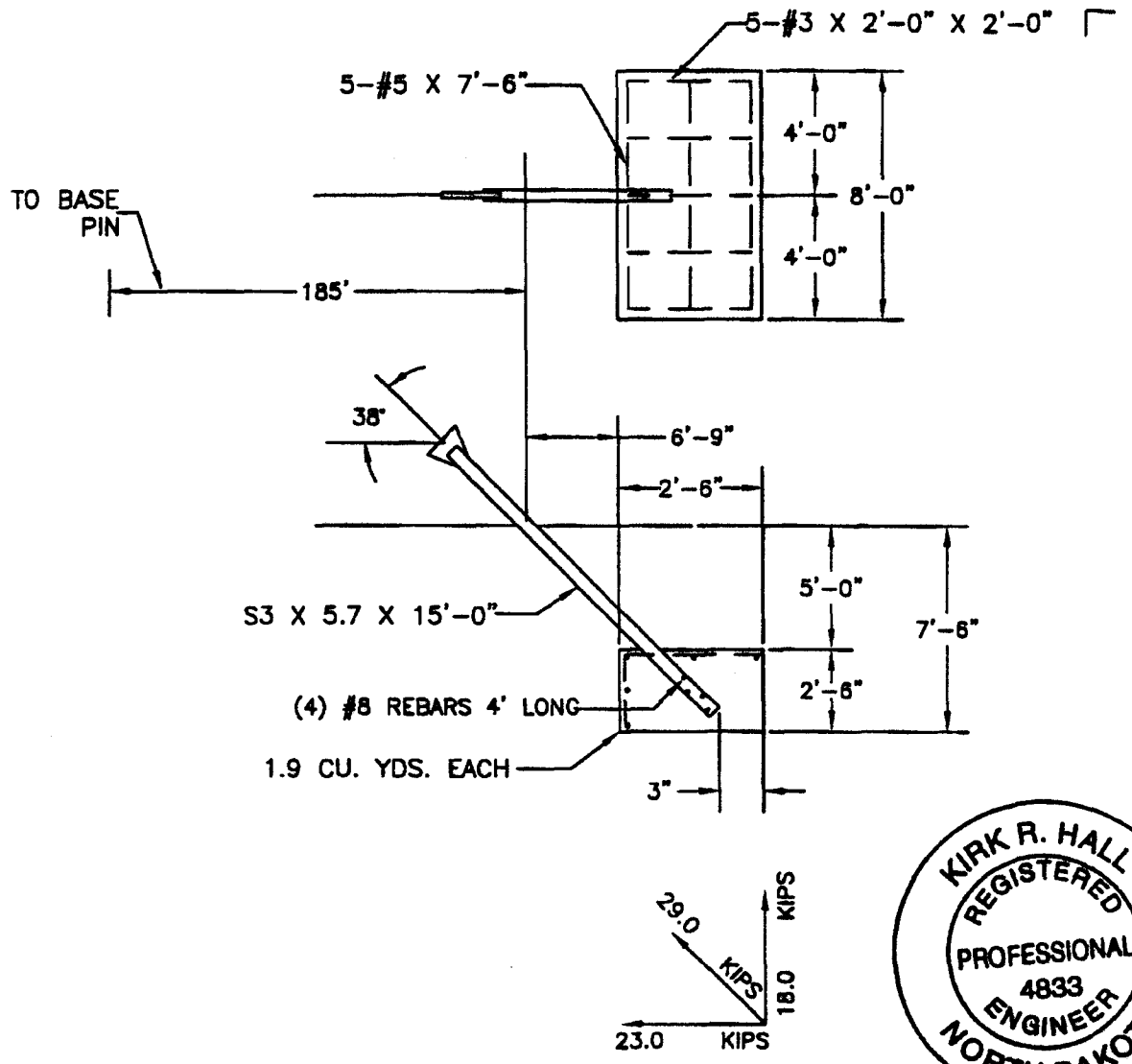
KIRK R. HALL
REGISTERED
PROFESSIONAL
4833
ENGINEER
NORTH DAKOTA

8-31-07

TITLE: BASE DETAILS
255' TYPE 18SR TOWER
SITES: DICKEY COUNTY, ND
MCPHERSON COUNTY, SD

WORLD TOWER

SCALE NONE | DWN. JCD | CKD. KH | DATE 8-21-07
FILE | DWG. NO. Q07177B-1



KIRK R. HALL
REGISTERED
PROFESSIONAL
4833
ENGINEER
NORTH DAKOTA

8-31-07

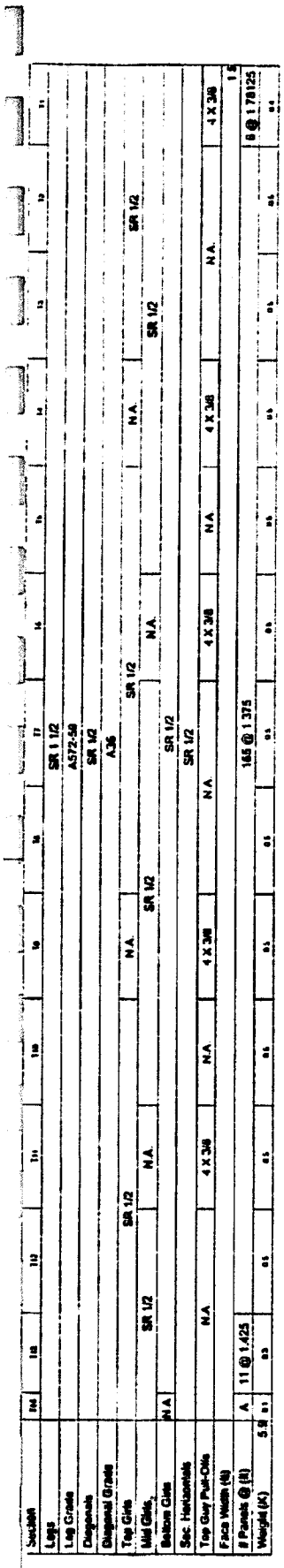
GENERAL NOTES

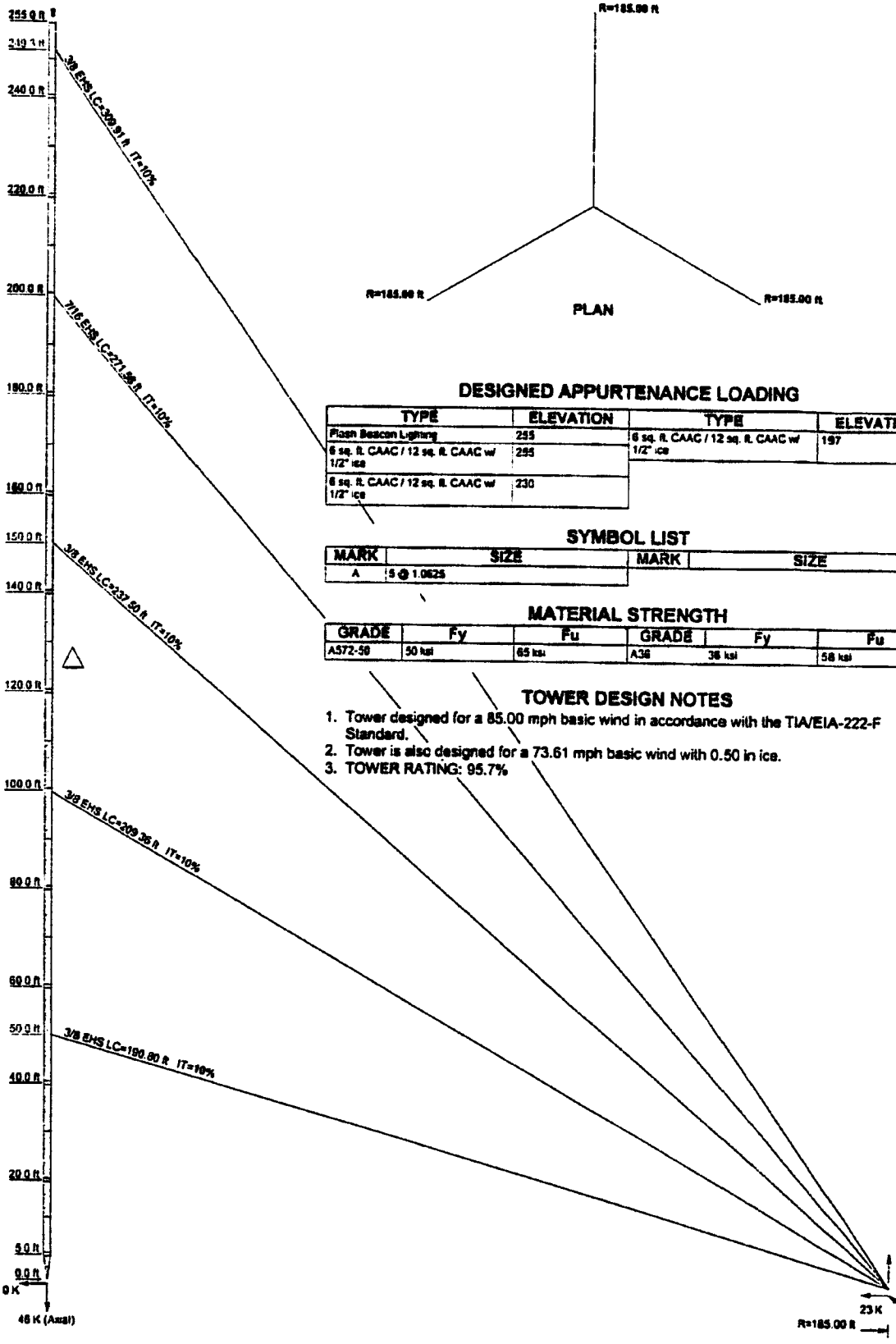
1. CONCRETE TO HAVE 3000 PSI MIN. COMPRESSIVE STRENGTH AFTER 28 DAYS.
2. REINFORCEMENT STEEL IS DEFORMED AND MEETS THE REQUIREMENTS OF ASTM A615 GRADE 60.
3. CENTER LINE OF ANCHOR BEAM TO PASS THROUGH CENTROID OF BLOCK.
4. EMBEDDED STEEL TO HAVE A MIN. 3" COVER.
5. FOUNDATION DESIGN IS BASED ON EIA NORMAL SOIL.

TITLE: ANCHOR DETAILS
255' TYPE 18SR TOWER
SITES: DICKEY COUNTY, ND
MCPHERSON COUNTY, SD

WORLD TOWER

SCALE	NONE	DWN.	JCD	CKD.	JCD	DATE	8-21-07
FILE				DWG. NO.	Q07177A-1		





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	255	6 sq. ft. CAAG / 12 sq. ft. CAAC w/ 1/2" ice	197
6 sq. ft. CAAC / 12 sq. ft. CAAC w/ 1/2" ice	255		
6 sq. ft. CAAC / 12 sq. ft. CAAC w/ 1/2" ice	230		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	5 @ 1.0625		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 85.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 73.61 mph basic wind with 0.50 in ice.
3. TOWER RATING: 95.7%

World Tower Company
1213 Compressor Drive
Mayfield, KY 42066
Phone: (270) 247-3842
FAX: (270) 247-0909

Job:	*255' Type 18SR Tower / Run# C708-171*
Project:	*Tatanka Wind Farm Project LLC / Dickey Co, ND / McPherson Co, SD*
Client: Acciona Wind Energy North America	Drawn by: Chris Dodson
Code: TIA/EIA-222-F	Date: 08/21/07
Path:	Scale: NTS
	Dwg No F-1