

PLAN NORTH

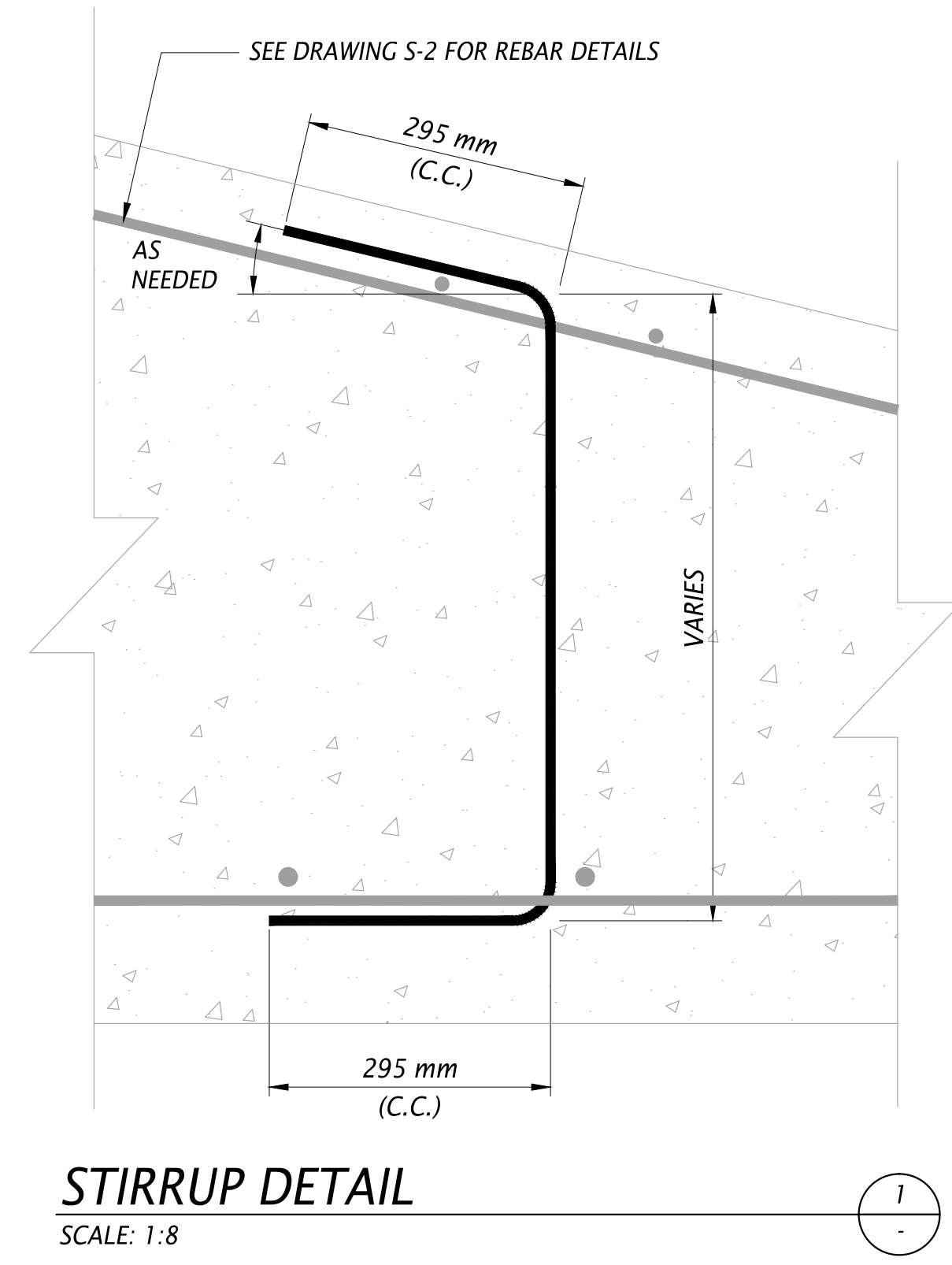
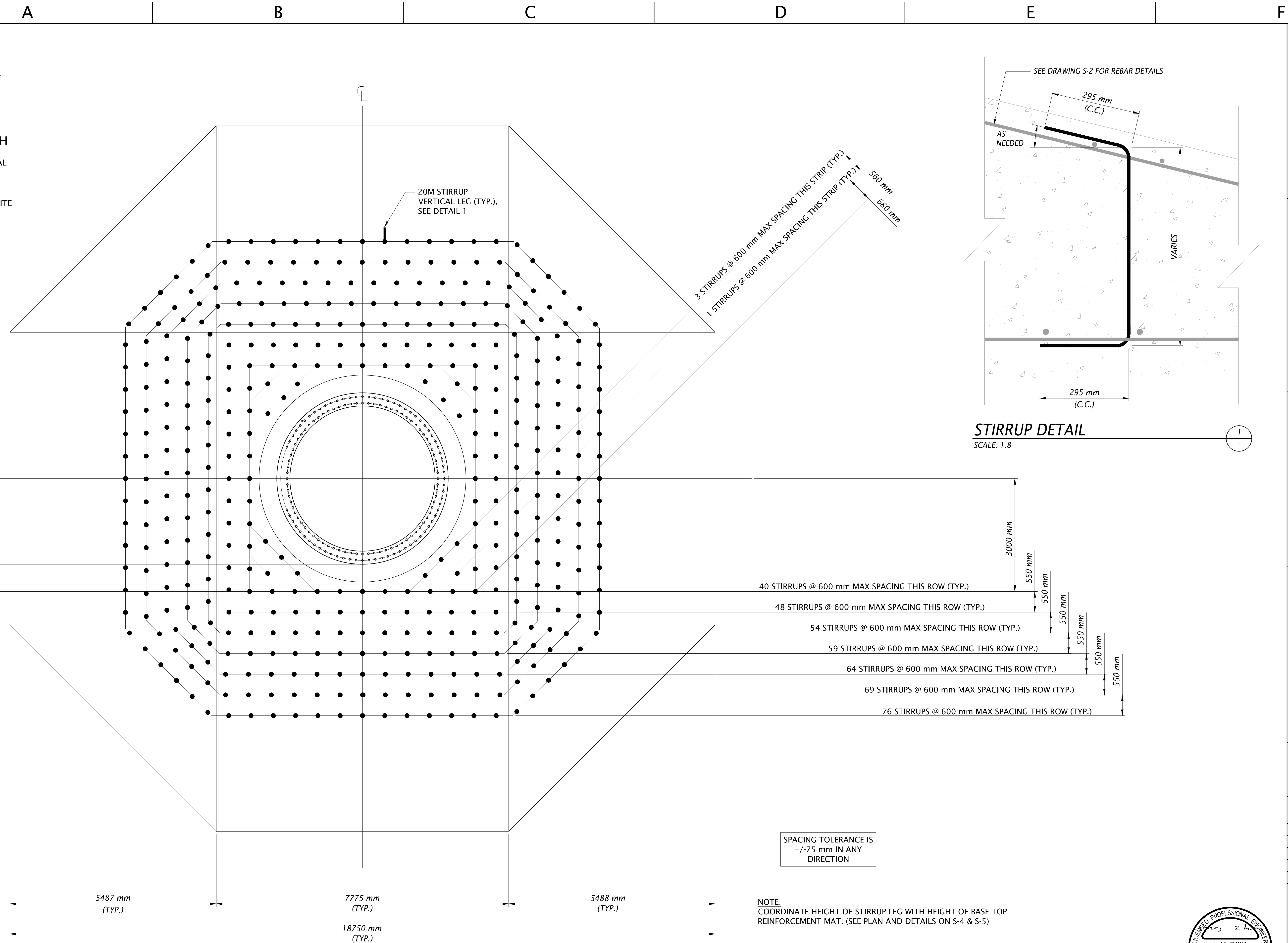
REFER TO GENERAL ARRANGEMENT DRAWINGS FOR FOUNDATION ALIGNMENT ON SITE

1

2

3

4



STIRRUP DETAIL
SCALE: 1:8

- 40 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
- 48 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
- 54 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
- 59 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
- 64 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
- 69 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
- 76 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)

SPACING TOLERANCE IS +/- 75 mm IN ANY DIRECTION

NOTE:
COORDINATE HEIGHT OF STIRRUP LEG WITH HEIGHT OF BASE TOP REINFORCEMENT MAT. (SEE PLAN AND DETAILS ON S-4 & S-5)



CWE Consultants, ULC
1050 Britannia Road East, Unit 24
Mississauga, ON L4W4N9, Canada
Phone (289) 742-0035
www.CWEconsultants.com

BOREA CONSTRUCTION
JERICHO WIND PROJECT
LAMBTON COUNTY,
ONTARIO, CANADA

GE 1.6-100 NAMTS 79.7m HH
IEC TC IIIB GE 48.7 CWE/STW
WIND TURBINE
SHEAR REINFORCEMENT
DETAILS SHEET
18750mm DIA FOUNDATION

REV.	DATE	DESCRIPTION
1	4/24/2014	REVISION
0	12/6/2013	ISSUED FOR CONSTRUCTION

DESIGNED BY: L ZHOU
CHECKED BY: G WU

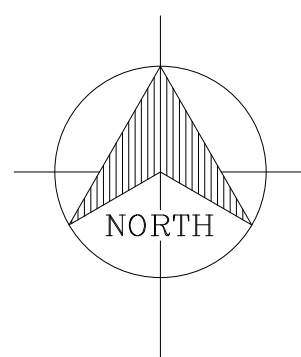
PROJECT # 130107

FILENAME:
JERICHO DRAWING SET

SCALE: AS SHOWN

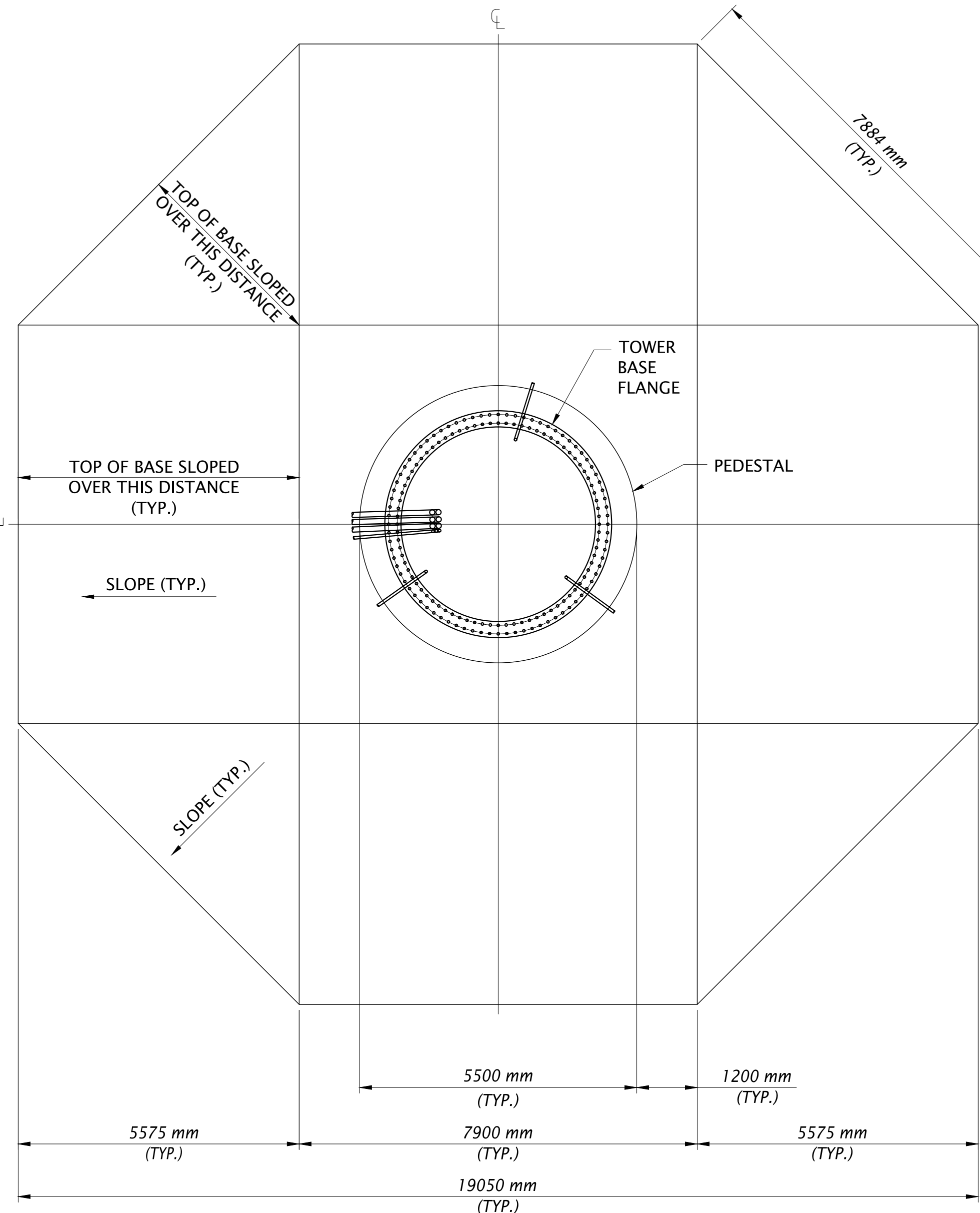
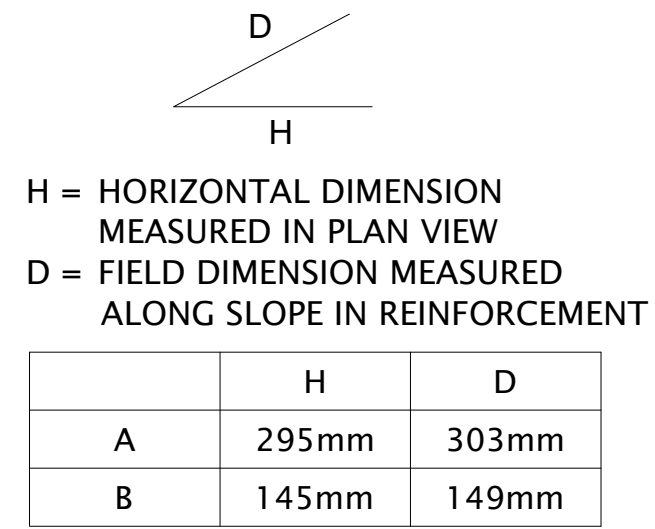
SHEET **S-6** REV. **1**

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PLAN NORTH

REFER TO GENERAL ARRANGEMENT DRAWINGS FOR FOUNDATION ALIGNMENT ON SITE

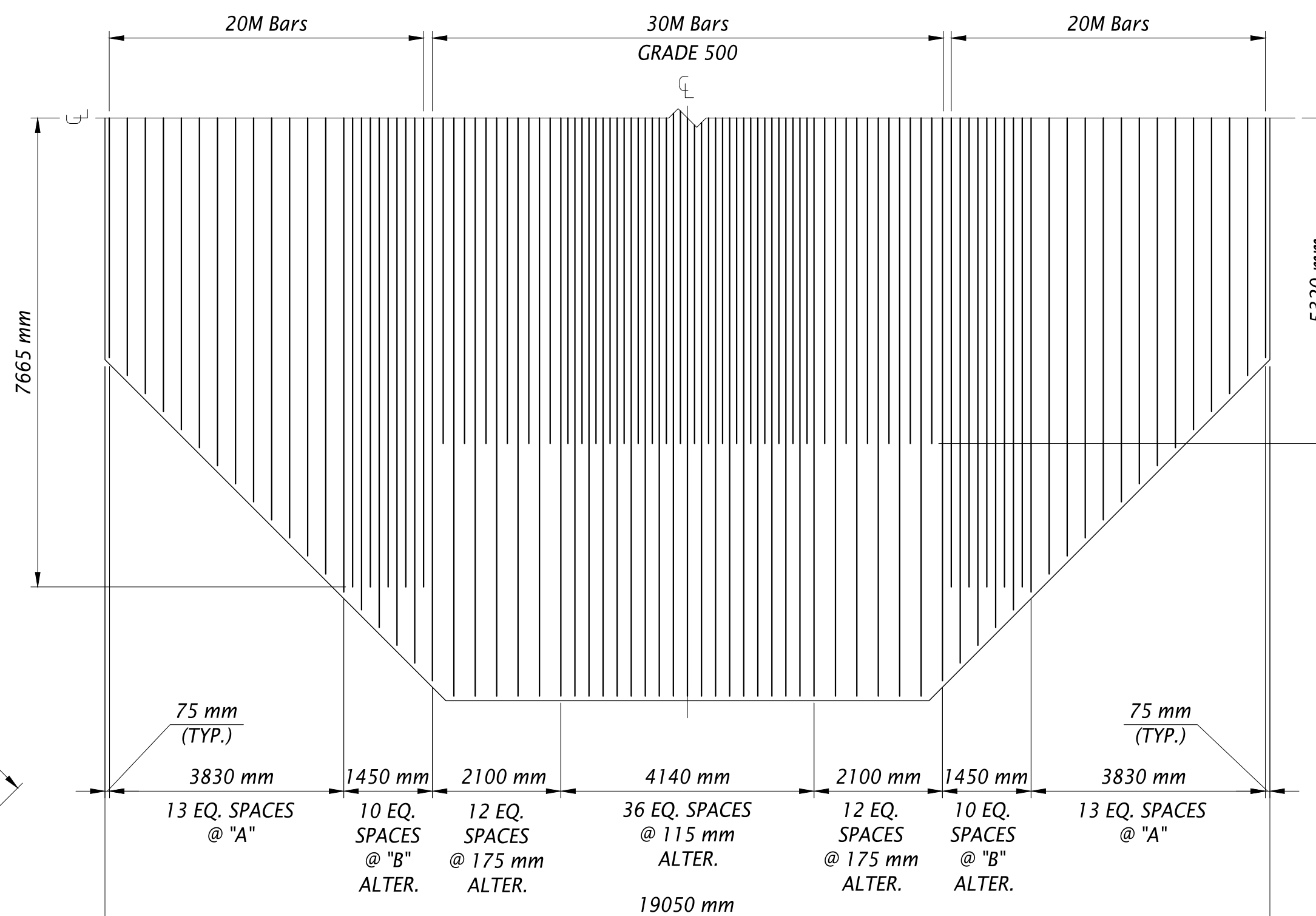


FOUNDATION PLAN

SCALE: 1:75

NOTES:

- ELECTRICAL CONDUIT SIZE, NUMBER, AND LOCATIONS MUST BE PROVIDED BY THE ELECTRICAL ENGINEER. FOR FINAL PLACEMENT AND REQUIREMENTS SEE ELECTRICAL DRAWINGS.

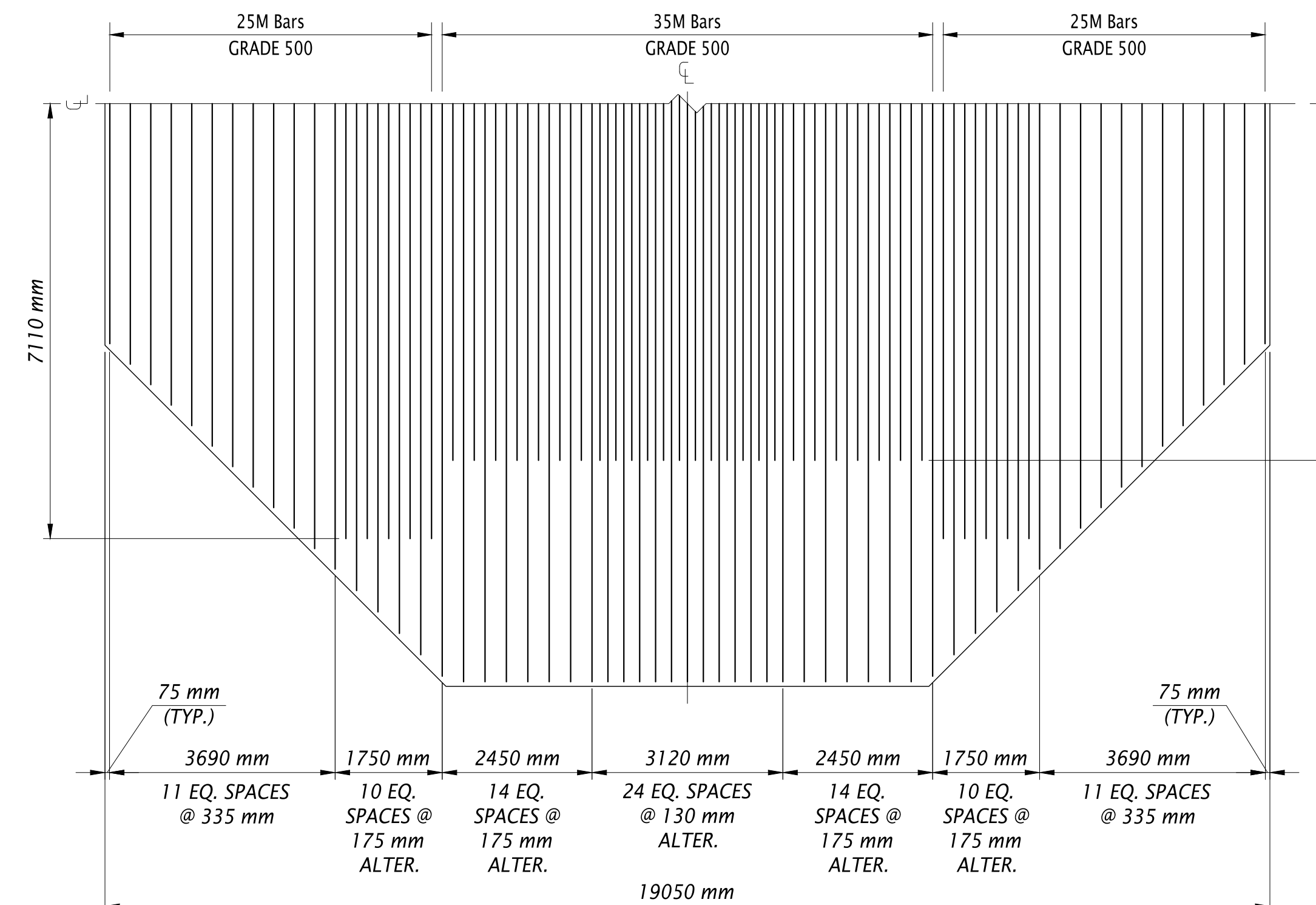


BASE TOP REINFORCING PLAN

SCALE: 1:75

NOTES:

- REINFORCEMENT LAYOUT AND SPACING SHOWN IN ONE DIRECTION ONLY FOR CLARITY. FINAL REINFORCEMENT SHALL BE PLACED EACH WAY.

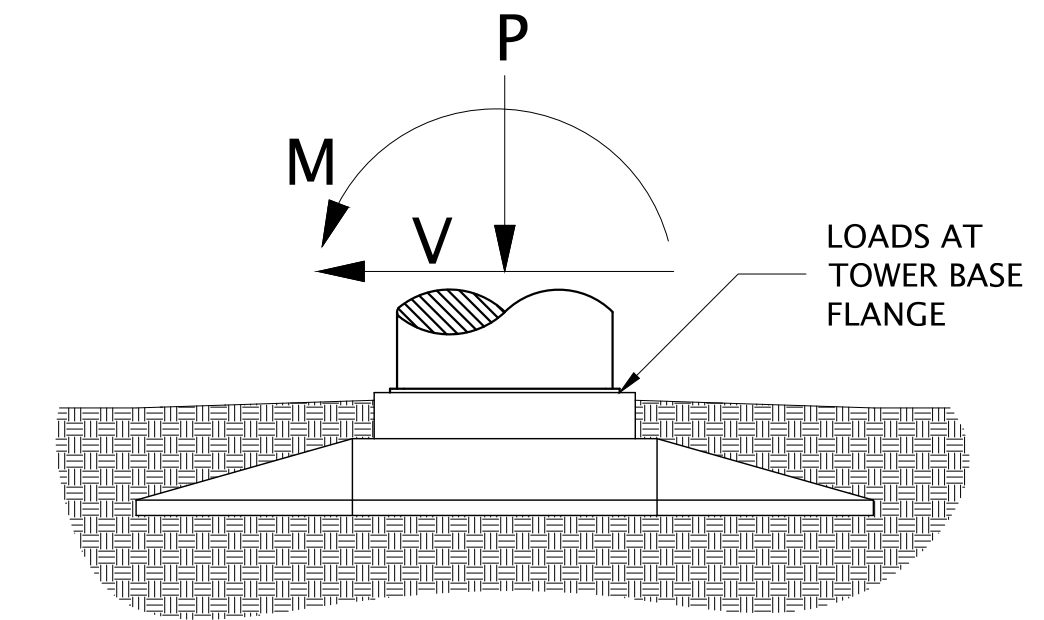


BASE BOTTOM REINFORCING PLAN

SCALE: 1:75

NOTES:

- REINFORCEMENT LAYOUT AND SPACING SHOWN IN ONE DIRECTION ONLY FOR CLARITY. FINAL REINFORCEMENT SHALL BE PLACED EACH WAY.



FOUNDATION DESIGN LOADS

SCALE: N.T.S.

DESIGN CRITERIA

- FOUNDATION DESIGN LOADS
EXTREME CHARACTERISTIC LOADS (UNFACTORED) LOCATED AT THE BOTTOM OF THE TOWER BASE FLANGE:
P = 2,271 kN
V = 671 kN
M = 51,147 kN-m
- ESTIMATED STRUCTURAL MATERIAL QUANTITIES

a. BASE CONCRETE:	304.2 m ³ (MIN.)
b. PEDESTAL CONCRETE:	28.5 m ³ (MIN.)
c. LEAN CONCRETE:	12.0 m ³ (MIN.)
d. STEEL REINFORCEMENT (GRADE 400):	9,700 Kg
e. STEEL REINFORCEMENT (GRADE 500):	27,200 Kg

NOTE: ESTIMATED MATERIAL QUANTITIES DO NOT INCLUDE ANY MATERIAL REQUIRED FOR INSTALLATION PURPOSES (STANDEES, DOBIES, ETC.)
- STRUCTURAL MATERIAL PROPERTIES

a. BASE CONCRETE STRENGTH (28-DAY):	35 MPa
b. PED. CONCRETE STRENGTH (28-DAY):	35 MPa
c. LEAN CONCRETE STRENGTH (3-DAY):	14 MPa
d. GROUT STRENGTH (28-DAY):	60 MPa
e. STEEL REINFORCEMENT (CAN/CSA-G30.18):	GRADE 400 (U.N.O.)
f. EMBEDMENT PLATE (ASTM A36):	1-1/4" (32 mm), GRADE 36 (250 MPa)
g. ANCHOR BOLTS: (ASTM A615):	#10 GRADE 75
h. CONCRETE DENSITY RANGE:	22.8 TO 23.6 kN/m ³
- GEOTECHNICAL CONDITIONS

a. MIN. REQUIRED NET SLS BEARING CAPACITY:	90 KPa
b. MIN. REQUIRED NET ULS BEARING CAPACITY:	150 KPa
c. MAX. ALLOWABLE GROUNDWATER LEVEL ABOVE FINISHED GRADE (ALSO ASSUMES FULL BUOYANT CONDITION BELOW GRADE):	0.2 m
d. MIN. COMPACTED DRY BACKFILL DENSITY:	14.9 kN/m ³
e. MAX. COMPACTED WET BACKFILL DENSITY:	22.0 kN/m ³

ABBREVIATIONS

B.O.	BOTTOM OF	N.T.S.	NOT TO SCALE
C.C.	CLEAR COVER	O.C.	ON CENTER
CL.	CENTER LINE	O.D.	OUTSIDE DIAMETER
CLR.	CLEAR	R	RADIUS
EL.	ELEVATION	SP.	SPACES
EQ.	EQUAL	T&B	TOP AND BOTTOM
E.W.	EACH WAY	T.O.C.	TOP OF CONCRETE
I.D.	INSIDE DIAMETER	TYP.	TYPICAL
MIN.	MINIMUM	U.N.O.	UNLESS NOTED OTHERWISE
MAX.	MAXIMUM	W/	WITH
NOM.	NOMINAL	Ø	DIAMETER



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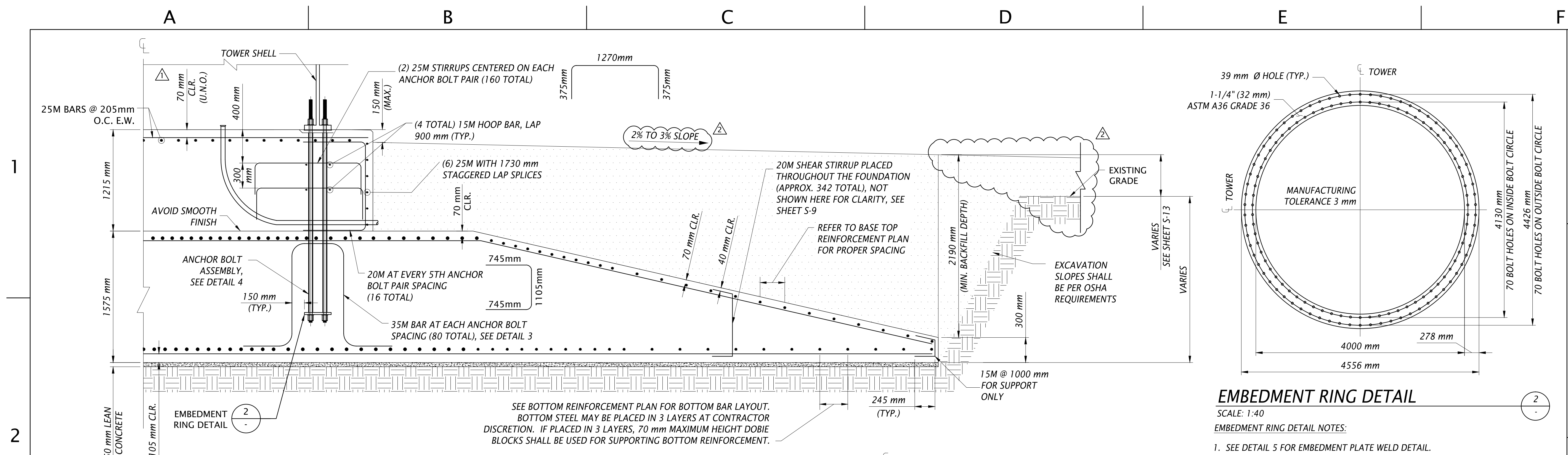
GE 1.6-100 NAMTS 79.7m HH
IEC TC IIB GE 48.7 CWE/STW
WIND TURBINE
PLAN SHEET
19050mm DIA FOUNDATION

ISSUED FOR CONSTRUCTION	DATE	DESCRIPTION
0	3/26/2014	

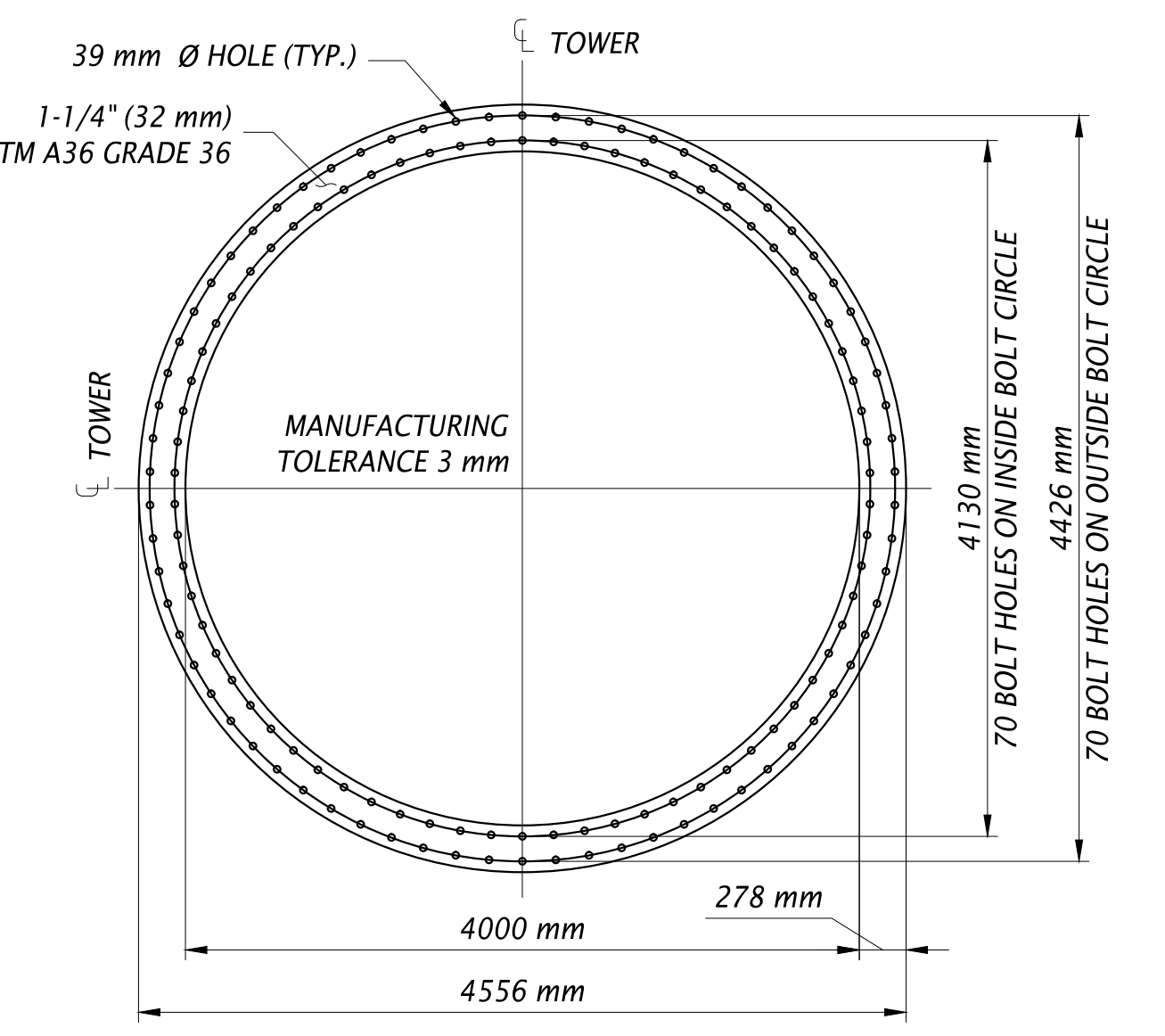
DESIGNED BY	L ZHOU
CHECKED BY	G WU
PROJECT #	130107

FILENAME:	JERICHO DRAWING SET
SCALE:	AS SHOWN
SHEET	S-7
REV.	0

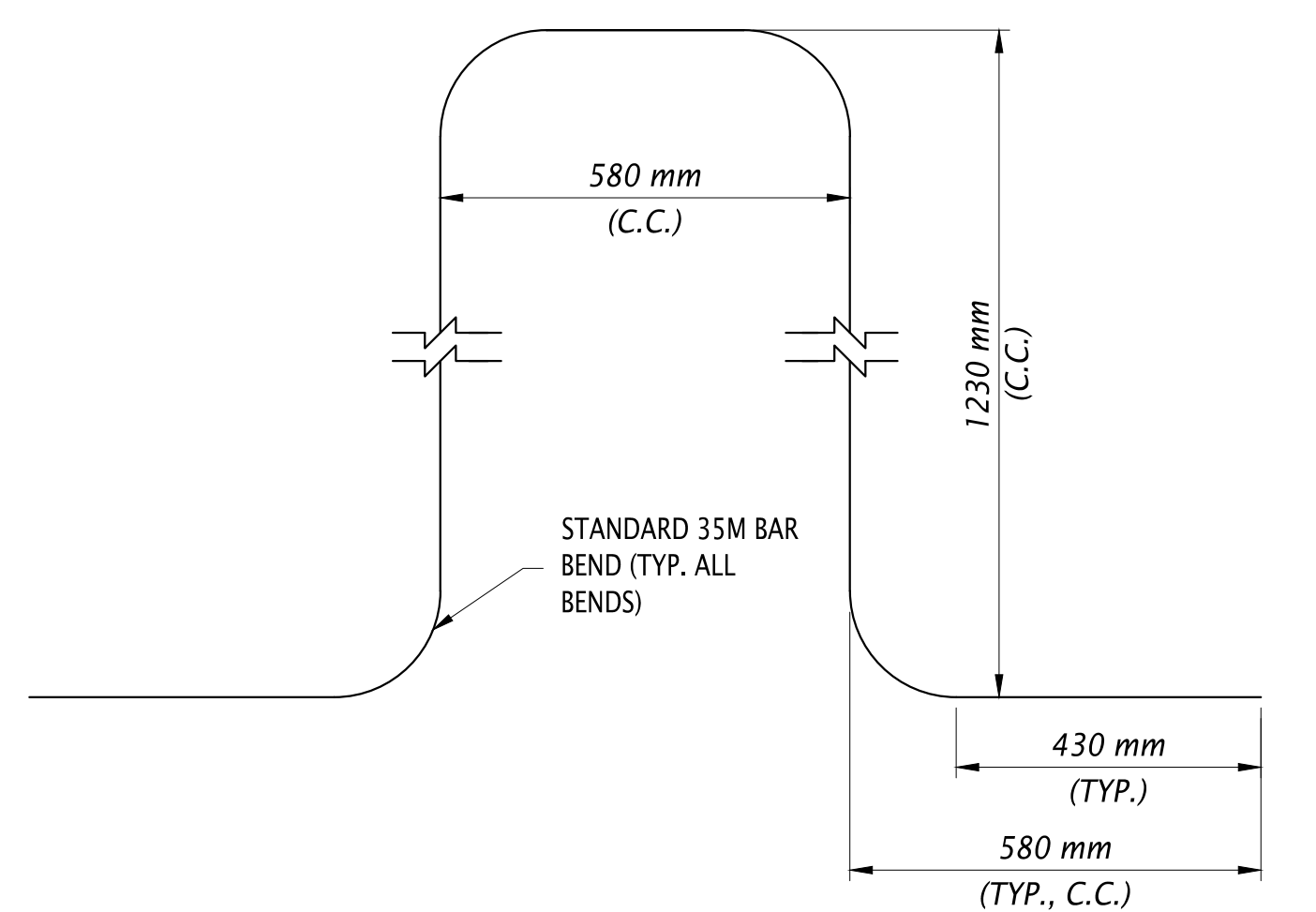
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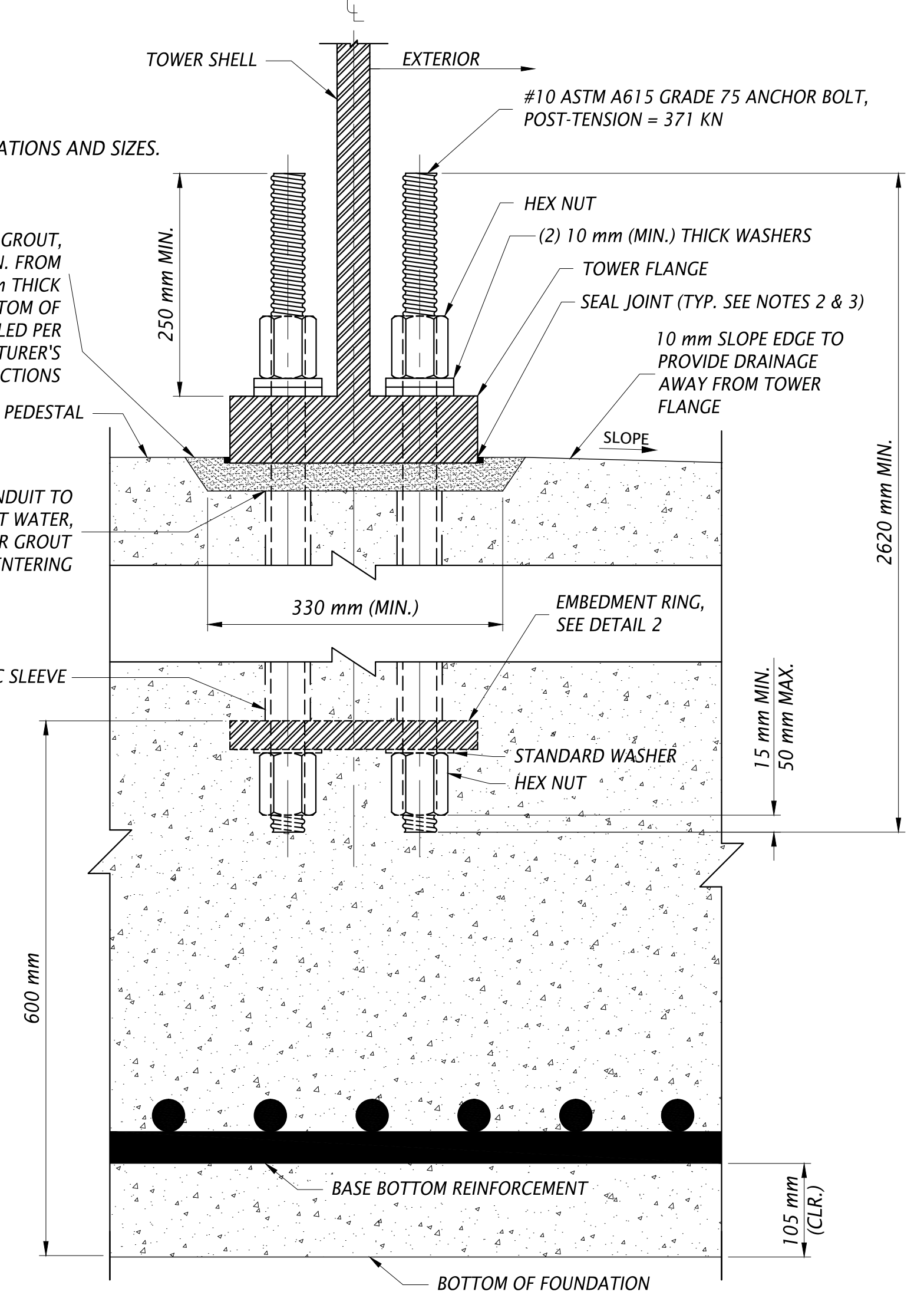
FOUNDATION SECTION DETAIL
SCALE: 1:25
NOTE:
1. ELECTRICAL CONDUITS SHOWN FOR REFERENCE ONLY. SEE ELECTRICAL DRAWINGS FOR EXACT LOCATIONS AND SIZES.
2. FOR CONSOLIDATION OF FINAL LIFT OF BASE CONCRETE, SEE NOTE CM-11.A.



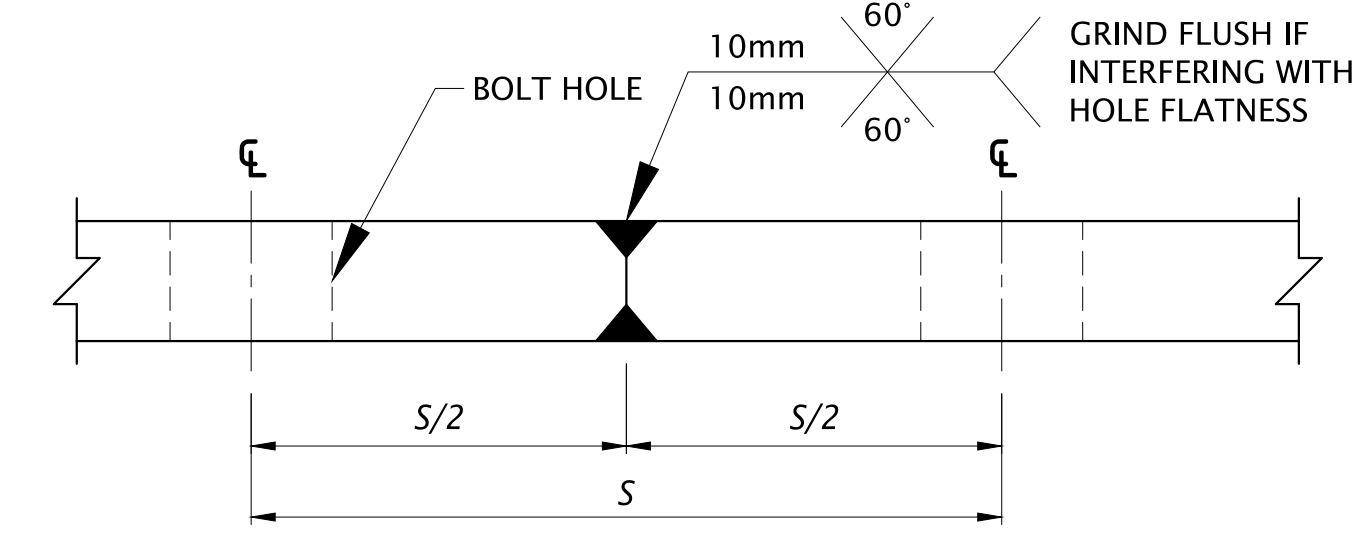
EMBEDMENT RING DETAIL
SCALE: 1:40
EMBEDMENT RING DETAIL NOTES:
1. SEE DETAIL 5 FOR EMBEDMENT PLATE WELD DETAIL.
2. TEMPLATE RING SHALL BE AS FOLLOWS:
A. THICKNESS: 40mm MIN.
B. MATERIAL: ASTM A36M GRADE 250 OR GRADE 300 OR ASTM A36 GRADE 36.
C. HOLE: MATCH EMBEDMENT RING SIZE, NUMBER, AND LOCATIONS.
D. BEVEL: MIN. 20 DEGREES.
E. WIDTH: REFER TO THE GROUT WIDTH SHOWN IN DETAIL 4.



VERTICAL REINFORCEMENT DETAIL
SCALE: 1:10



ANCHOR BOLT ASSEMBLY DETAIL
SCALE: 1:5



EMBEDMENT PLATE WELD DETAIL
SCALE: NONE

- ANCHOR ASSEMBLY NOTES:**
- PEDESTAL AND VERTICAL REINFORCEMENT NOT SHOWN FOR CLARITY.
 - FLANGE SHALL BE EMBEDDED INTO THE GROUT 6mm TO 15mm. A TEMPORARY SPACER SHALL BE USED ALONG THE INSIDE AND OUTSIDE OF THE FLANGE THAT SHALL BE REMOVED ONCE THE GROUT STIFFENS. THE GAP CREATED SHALL BE FILLED WITH A WEATHER-RESISTANT AND UV-RESISTANT SEALANT FLUSH WITH OR HIGHER THAN THE TOP OF THE GROUT TO PREVENT WATER FROM INFILTRATING THE JOINT.
 - BOTTOM OF TOWER FLANGE SHALL NOT BE INSTALLED ABOVE TOP OF CONCRETE.



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GE 1.6-100 NAMTS 79.7m HH
IEC TC IIB GE 48.7 CWE/STW
WIND TURBINE
DETAILS SHEET
19050mm DIA FOUNDATION

REV.	DATE	DESCRIPTION
2	4/4/2014	REVISION
1	3/27/2014	REVISION
0	3/26/2014	ISSUED FOR CONSTRUCTION

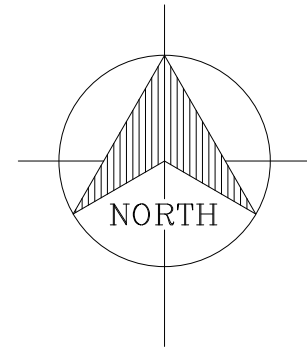
DESIGNED BY: L ZHOU
CHECKED BY: G WU

PROJECT #: 130107

FILENAME: JERICHO DRAWING SET
SCALE: AS SHOWN

SHEET: S-8 REV: 2

4/24/2014 10:29:46 AM



PLAN NORTH

REFER TO GENERAL ARRANGEMENT DRAWINGS FOR FOUNDATION ALIGNMENT ON SITE

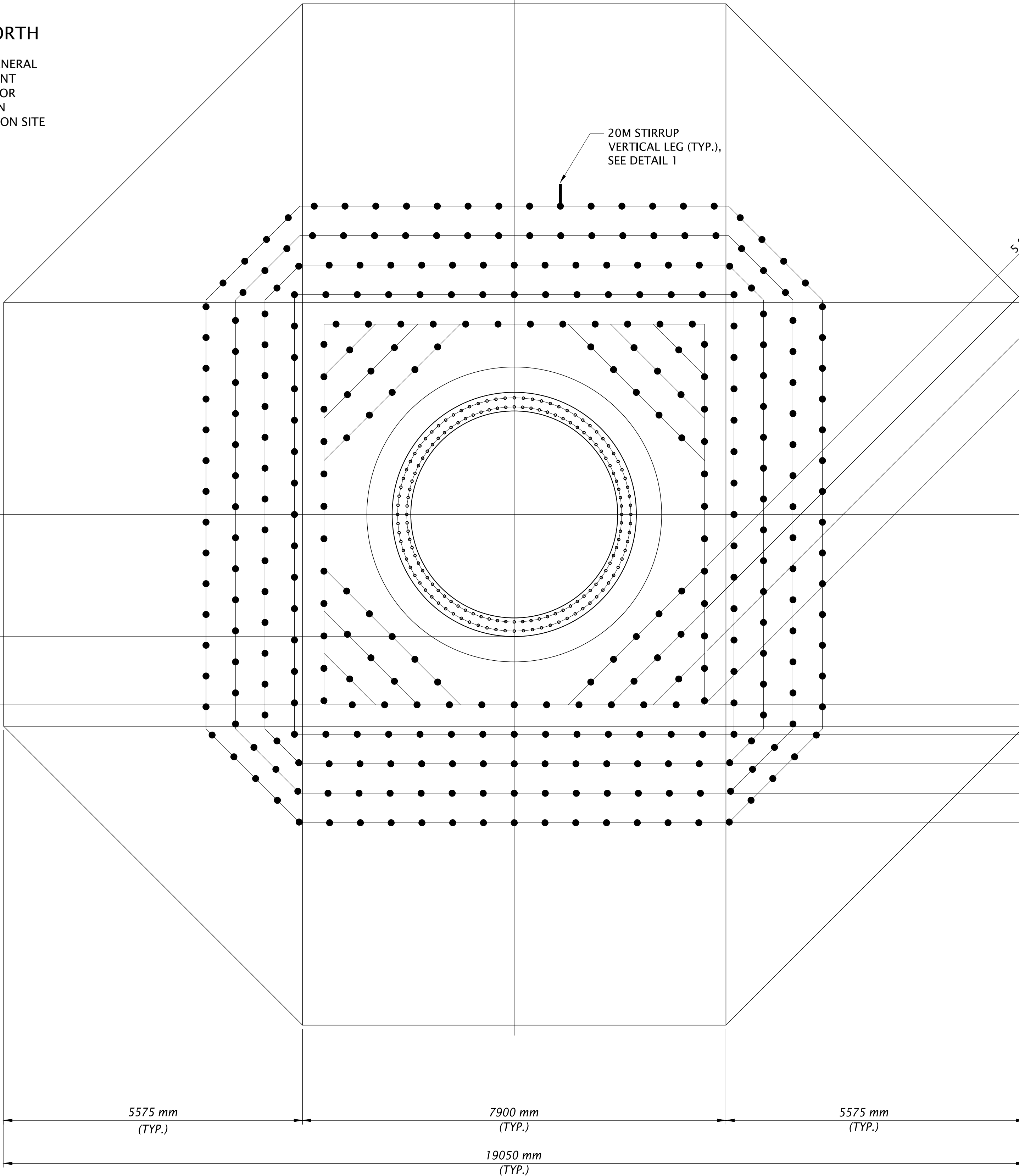
1

2

3

4

1272 mm TO EDGE OF EMBED. RING

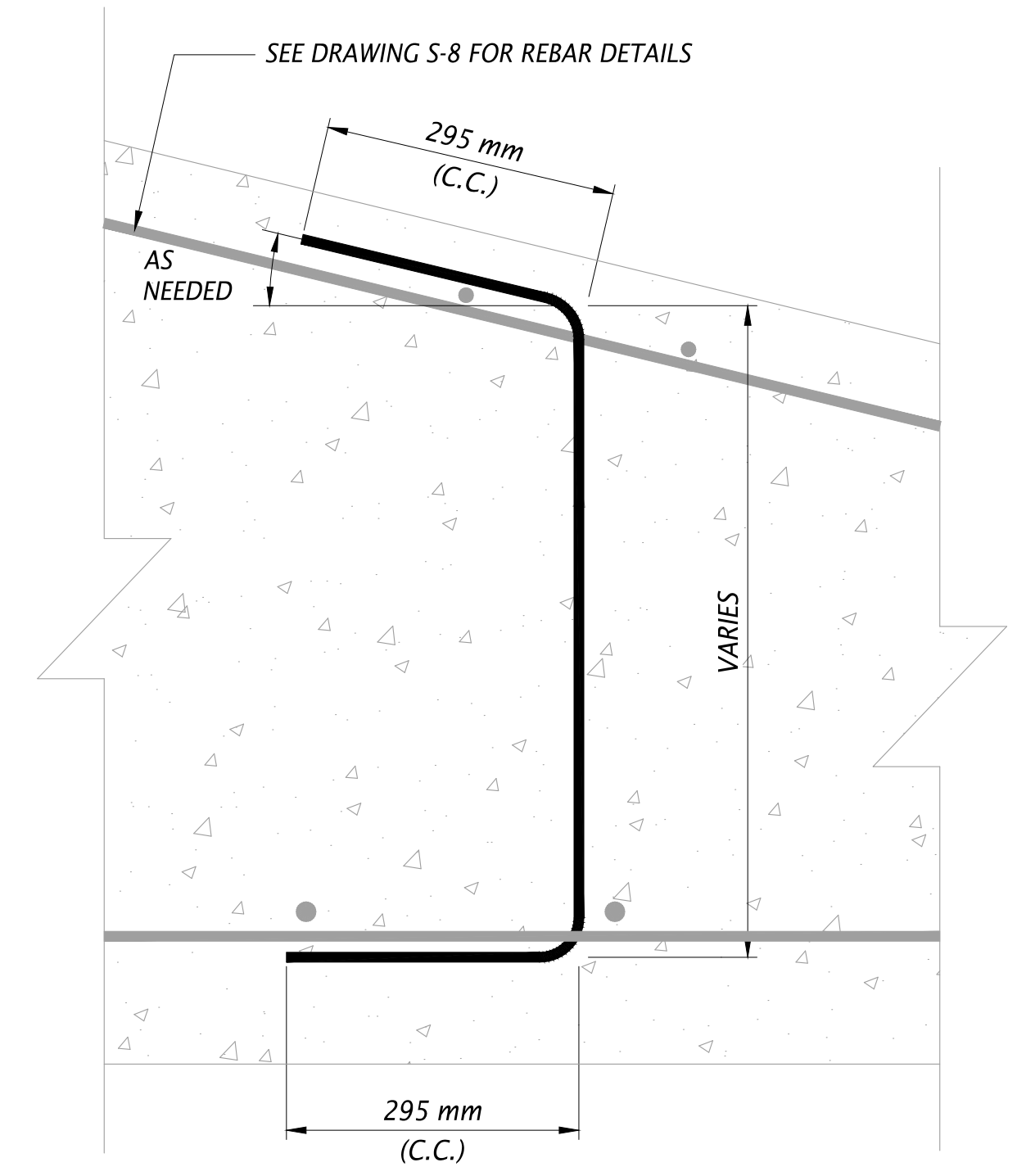


5 STIRRUPS @ 600 mm MAX SPACING THIS STRIP (TYP.)
 3 STIRRUPS @ 600 mm MAX SPACING THIS STRIP (TYP.)
 1 STIRRUP @ 600 mm MAX SPACING THIS STRIP (TYP.)

48 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
 56 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
 62 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
 67 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)
 73 STIRRUPS @ 600 mm MAX SPACING THIS ROW (TYP.)

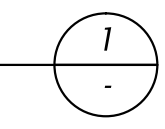
SPACING TOLERANCE IS +/-75 mm IN ANY DIRECTION

NOTE:
 COORDINATE HEIGHT OF STIRRUP LEG WITH HEIGHT OF BASE TOP REINFORCEMENT MAT. (SEE PLAN AND DETAILS ON S-7 & S-8)



STIRRUP DETAIL

SCALE: 1:8



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GE 1.6-100 NAMTS 79.7m HH
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 WIND TURBINE
 SHEAR REINFORCEMENT
 DETAILS SHEET
 19050mm DIA FOUNDATION

REV.	DATE	DESCRIPTION
1	4/24/2014	REVISION
0	3/26/2014	ISSUED FOR CONSTRUCTION

DESIGNED BY: L ZHOU
 CHECKED BY: G WU

PROJECT # 130107

FILENAME:
 JERICHO DRAWING SET

SCALE: AS SHOWN

SHEET **S-9** REV. **1**



4/24/2014 10:29:48 AM

ALL CONCRETE CONSTRUCTION SHALL CONFORM TO ALL REQUIREMENTS OF CSA A23.1/A23.2 PUBLISHED BY THE CANADIAN STANDARDS ASSOCIATION, EXCEPT AS MODIFIED BY THESE DESIGN DRAWINGS.

TURBINE REFERENCE DATA:

- TR-1 TURBINE TYPE: GE 1.6-100 NAMTS 79.7m HH IEC TC IIIB GE 48.7 CWE/STW.
TR-2 TOWER FOUNDATION DESIGN LOADINGS PROVIDED BY GE ENERGY 'LOAD SPECIFICATION FOR THE FOUNDATION OF THE WIND TURBINE GENERATOR SYSTEM, GE'S 1.6-100 NAMTS WITH 79.7m HH TC IIIB GE 48.7 60 HZ CWE/STW' DATED APRIL 22, 2011 REV. C.
TR-3 TURBINE TOWER FLANGE GEOMETRY PROVIDED BY GE ENERGY 'LOAD SPECIFICATION FOR THE FOUNDATION OF THE WIND TURBINE GENERATOR SYSTEM, GE'S 1.6-100 NAMTS WITH 79.7m HH TC IIIB GE 48.7 60 HZ CWE/STW' FIGURE 8 DATED APRIL 22, 2011 REV. C.

STRUCTURAL CODES:

- SC-1 DESIGN BUILDING CODE: ONTARIO BUILDING CODE, 2006.
SC-2 REINFORCED CONCRETE CODE: CSA A23.3-2004.
SC-3 STEEL CODE: CSA S16-09.

SEISMIC PARAMETERS:

- SP-1 SPECTRAL ACCELERATIONS:
A. S_{a(0.2)}: 0.143.
B. S_{a(0.5)}: 0.078.
C. S_{a(1.0)}: 0.042.
D. S_{a(2.0)}: 0.011.
SP-2 IMPORTANCE CATEGORY: NORMAL.
SP-3 SITE CLASSIFICATION: D.
SP-4 SEISMIC LOADS DO NOT GOVERN.

GEOTECHNICAL DATA:

GEOTECHNICAL REPORT AND RECOMMENDATIONS FOR THIS PROJECT ARE BASED ON:

"GEOTECHNICAL INVESTIGATION REPORT, PROPOSED JERICO WIND TURBINE GENERATORS, LAMBTON COUNTY, ONTARIO" BY AMEC ENVIRONMENT & INFRASTRUCTURE DATED MAY 13, 2013, AMEC REFERENCE NO.: SW0812019.

"SUPPLEMENTARY GEOTECHNICAL INVESTIGATION, JERICO WIND TURBINE GENERATORS, TURBINES T1, T2, T66, T79, T105, T107, T109, T112, LAMBTON COUNTY, ONTARIO" BY AMEC ENVIRONMENT & INFRASTRUCTURE DATED APRIL 2, 2014, AMEC REFERENCE NO.: SW0812019.

"SUPPLEMENTARY GEOTECHNICAL INVESTIGATION, JERICO WIND TURBINE GENERATORS, TURBINES T7, T26, T106, and T108, LAMBTON COUNTY, ONTARIO" BY AMEC ENVIRONMENT & INFRASTRUCTURE DATED APRIL 17, 2014, AMEC REFERENCE NO.: SW0812019.

"REVISED ULS AND SLS BEARING RESISTANCES AT SEVENTEEN WIND TURBINE LOCATIONS, JERICO WIND PROJECT, LAMBTON COUNTY, ONTARIO" FROM AMEC ENVIRONMENT & INFRASTRUCTURE DATED APRIL 21, 2014, AMEC REFERENCE NO.: SW0812019.

"JERICO WIND ENERGY CENTRE, FLOODPLAIN ANALYSIS, AUSABLE BAYFIELD CONSERVATION AUTHORITY AREA" BY AECOM DATED MARCH 2014, PROJECT NUMBER: 60304152.

QUESTIONS, COMMENTS, RFIS, AND SUBMITTALS REGARDING THE GEOTECHNICAL SPECIFICATIONS SHALL BE DIRECTED TO THE GEOTECHNICAL ENGINEER OF RECORD.

GD-1 REQUIRED NET BEARING CAPACITY: SEE SHEETS S-1, S-4 AND S-7.

GD-2 THE FOUNDATION SUBGRADE AND EXCAVATION SHALL BE PREPARED IN THE FOLLOWING MANNER:

- A. THE EXCAVATION AREA SHALL BE CLEARED OF DELETERIOUS MATERIALS SUCH AS VEGETATION, ROOT SYSTEMS, ORGANIC TOPSOIL, DEBRIS, EXISTING FILL, AND SOFT, FROZEN, OR OTHERWISE UNSUITABLE MATERIALS.
B. ROOT ZONE SOILS, ORGANIC-RICH TOPSOIL (SOIL WITH 5% OR MORE ORGANICS), VEGETATION, AND SOFT OR OTHERWISE UNSUITABLE MATERIALS FROM THE SURFACE OF THE PROPOSED CONSTRUCTION AREAS SHALL BE STOCKPILED FOR POSSIBLE USE AS TOPSOIL OR SHALL BE REMOVED FROM THE SITE. ORGANIC SOILS SHALL NOT BE USED AS BACKFILL BENEATH OR BESIDE THE TURBINE FOUNDATIONS.
C. MODIFICATION OF SOFT SOILS SHALL CONSIST OF OVEREXCAVATION AND REPLACEMENT WITH STRUCTURAL FILL MEETING THE CRITERIA SHOWN IN THESE SPECIFICATIONS.
D. WHERE OVEREXCAVATION IS REQUIRED, EXTEND LATERALLY ONE (1) METER BEYOND THE OUTSIDE EDGES OF THE FOUNDATION AND THEN DOWNWARD AT A SLOPE OF AT LEAST 0.75 METER OUTWARD FOR EACH METER OF EXCAVATION BELOW THE FOUNDATION BEARING ELEVATION.
E. A QUALIFIED GEOTECHNICAL REPRESENTATIVE SHALL BE PRESENT DURING SITE PREPARATION OPERATIONS TO OBSERVE STRIPPING AND GRUBBING DEPTHS, OBSERVE THE REMOVAL OF UNSUITABLE SOILS, OBSERVE THE PREPARATION OF THE SUBGRADE, AND TO VERIFY THAT THE EXPOSED SUBGRADE HAS BEEN PREPARED IN ACCORDANCE WITH THESE SPECIFICATIONS.
F. THE FOUNDATION BEARING SURFACE SHALL BE FREE OF WEATHERED, LOOSE ROCK, AND SHALL HAVE DISCONTINUITIES AT SPACINGS NOT CLOSER THAN 0.3 METERS AS VERIFIED BY THE GEOTECHNICAL CONSULTANT.
G. DURING EXCAVATION OF THE TURBINE FOUNDATIONS, IF THE SUBGRADE IS DISTURBED, THE RESULTING SURFACE SHALL BE SCARIFIED, MOISTURE CONDITIONED, AND RECOMPACTED TO ACHIEVE A MINIMUM COMPACTION OF 100% AND A MOISTURE CONTENT WITHIN 2% OF OPTIMUM IN ACCORDANCE WITH ASTM D698.
H. IF WATER INFILTRATION IN THE EXCAVATION IS ENCOUNTERED AS DETERMINED BY THE ON-SITE GEOTECHNICAL REPRESENTATIVE, FOUNDATION EXCAVATIONS SHALL INCLUDE THE EXCAVATION OF ONE OR MORE SLUMP PITS LOCATED WITHIN THE EXCAVATION AND OUTSIDE OF A 1H:1V AREA EXTENDING DOWN AND AWAY FROM THE OUTER EDGE OF THE MUD MAT THAT WILL SERVE TO COLLECT INFILTRATED OR PRECIPITATED WATER FOR PUMPING.

I. REQUIRED GROUND IMPROVEMENT TECHNIQUES BEYOND OVEREXCAVATION (IF ANY) SHALL BE COORDINATED WITH THE GEOTECHNICAL ENGINEER OF RECORD.

J. WHERE THE FOUNDATION SUBGRADES ARE OR BECOME FROZEN, THE FROZEN SOILS SHALL BE COMPLETELY REMOVED FROM BELOW THE FOUNDATION AND ITS OVERSIZE AREA. THE FROZEN SOILS SHALL BE REPLACED BY SUITABLY MOISTURE CONDITIONED AND COMPACTED SOILS. IF THE REPLACEMENT IS PERFORMED IN NEAR- OR BELOW-FREEZING TEMPERATURES, ONLY THE PLACEMENT OF GRANULAR MATERIALS WILL SUFFICE. TURBINE FOUNDATIONS SHALL NOT BE CONSTRUCTED OVER FROZEN SOILS OR A FROZEN MUD MAT.

K. STRIPPING, EXCAVATION, GRADING, AND SUBGRADE PREPARATION SHALL BE PERFORMED IN A MANNER AND SEQUENCE THAT WILL PROVIDE POSITIVE DRAINAGE THROUGHOUT CONSTRUCTION AND PROVIDE PROPER CONTROL OF EROSION.

L. PONDING OF WATER NEAR THE FOUNDATION ELEMENTS FROM IMPROPER DRAINAGE SHALL NOT BE PERMITTED.

- 1. ACCUMULATED WATER SHALL BE REMOVED FROM SUBGRADES AND WORK AREAS IMMEDIATELY PRIOR TO PERFORMING FURTHER WORK IN THE AREA.
2. THE PLANNED SITE WORK AREAS SHALL BE GRADED TO PREVENT WATER FROM PONDING IN CONSTRUCTION AREAS AND/OR FLOWING INTO EXPOSED SUBGRADE AREAS.
3. EXPOSED SOILS SHALL BE CROWNED, SLOPED, AND SMOOTH-DRUM ROLLED AT THE END OF THE DAY TO FACILITATE DRAINAGE IF INCLEMENT WEATHER IS FORECASTED.
4. SOILS THAT BECOME DISTURBED OR WEAKENED FROM ACCUMULATED WATER SHALL BE IMPROVED BY AERATION AND RECOMPACTION, CHEMICAL TREATMENT, OR REMOVAL AND REPLACEMENT WITH NEW COMPACTED FILL.

M. THE CONTRACTOR SHALL SUBMIT A SUBGRADE TESTING PROCEDURE TO THE GEOTECHNICAL ENGINEER OF RECORD FOR APPROVAL PRIOR TO CONSTRUCTION.

- 1. PROOF-ROLLING SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A HEAVY (15 TO 60 TONNE) RUBBER-TIRED ROLLER HAVING 4 WHEELS AHEAD ON INDEPENDENT AXLES WITH HIGH CONTACT WHEEL PRESSURES (INFLATION PRESSURES RANGING FROM 550 kPa TO 1030 kPa) OR A HEAVILY LOADED TANDEM AXLE GRAVEL TRUCK LOADED TO APPROXIMATELY 10 TONNES PER AXLE AND A MINIMUM TIRE PRESSURE OF 550 kPa TO ASSESS THE NEED FOR ANY SMALL REMEDIAL MEASURES.
2. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 40 mm, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
3. THE USE OF EITHER STATIC OR DYNAMIC CONE PENETROMETER (DEPENDING ON THE SUBGRADE MATERIALS EXPOSED AT THE FOUNDATION BEARING ELEVATION) MAY ALSO BE USED WITH APPROVAL OF THE GEOTECHNICAL ENGINEER OF RECORD.

M. THE LEAN CONCRETE MUD MAT SHALL BE PLACED IMMEDIATELY AFTER THE SUBGRADE HAS BEEN INSPECTED AND APPROVED.

GD-3 BACKFILL MATERIAL OVER AND AROUND THE FOUNDATION SHALL HAVE THE MINIMUM DEPTH AS SHOWN ON THESE DESIGN DRAWINGS AND SHALL BE PREPARED ACCORDING TO THE FOLLOWING:

- A. MINIMUM COMPACTED DRY DENSITY: 14.9 kN/m³.
B. MAXIMUM COMPACTED WET DENSITY: 22.0 kN/m³.
C. THE PROPOSED BACKFILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER OF RECORD PRIOR TO ITS USE AND SHALL CONFORM TO SS GRANULAR "A" OR GRANULAR "B", TYPE I MATERIAL SPECIFICATIONS.
1. THE ON-SITE NATIVE SOIL MAY BE USED AS BACKFILL MATERIAL PROVIDED IT IS FREE FROM ANY ORGANICS AND DELETERIOUS MATERIAL.

D. BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 AND MOISTURE CONDITIONED WITHIN 2% OF OPTIMUM MOISTURE CONTENT.

E. BACKFILL TO BE PLACED OVER THE FOUNDATIONS SHALL BE PLACED IN LIFTS HAVING A MAXIMUM LOOSE LIFT THICKNESS OF 200 mm PRIOR TO COMPACTION. IF THE TESTING AGENCY CANNOT TEST THIS FULL DEPTH, (I.E. 200 mm NUCLEAR GAUGE) THEN THE LIFTS SHALL BE REDUCED ACCORDINGLY.

F. ANY PARTICLES IN EXCESS OF 150 mm SHALL BE SCREENED AND REMOVED FROM THE OVERBURDEN MATERIAL.

G. SAMPLES OF THE FILL MATERIAL SHALL BE OBTAINED DURING EXCAVATION BY AN EXPERIENCED GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE TO DETERMINE MOISTURE DENSITY RELATIONSHIPS AND CLASSIFICATION TESTING FOR ACCEPTABILITY. ALL TESTING SHALL BE COMPLETED BY AN APPROVED, INDEPENDENT TESTING AGENCY.

H. DURING EXCAVATION AND GRADING, PROPOSED BACKFILL MATERIAL NOT IMMEDIATELY PLACED AND COMPACTED SHALL BE STOCKPILED AND PROTECTED FROM MOISTURE BY SEALING THE SURFACE WITH LIGHT COMPACTION.

I. FILL PLACEMENT AT THE SITE SHALL INCLUDE IN-SITU DENSITY TESTING TO DOCUMENT THAT PLACEMENT OF THE FILL MATERIAL MEETS OR EXCEEDS THESE PROJECT SPECIFICATIONS. EACH LIFT OF COMPACTED FILL SHALL BE CLOSELY OBSERVED AND TESTED BY AN APPROVED, INDEPENDENT TESTING AGENCY.

1. DENSITY AND MOISTURE OF THE BACKFILL SHALL BE TESTED FOR EACH LIFT AT A FREQUENCY OF ONE (1) TEST EVERY 250 SQUARE METERS AND A MINIMUM OF TWO (2) TESTS PER LIFT.

2. IF THE RESULTS OF IN-PLACE DENSITY TESTS INDICATE THE SPECIFIED MOISTURE OR COMPACTION LIMITS HAVE NOT BEEN MET, THE AREA REPRESENTED BY THE TEST SHALL BE REWORKED AND RETESTED AS REQUIRED UNTIL THE SPECIFIED MOISTURE AND COMPACTION REQUIREMENTS ARE ACHIEVED.

J. DURING CONSTRUCTION, THE TOP SURFACE OF THE FILL SHALL BE KEPT WITH SUFFICIENT SLOPE (MINIMUM 2% GRADIENT) TO ALLOW RUNOFF OF WATER DURING RAINFALL WITHOUT INDUCING EROSION.

K. IN AREAS WHERE STRUCTURAL ELEMENTS, SUCH AS TRANSFORMER PADS, ARE LOCATED WITHIN THE BACKFILL ZONE, THESE SUBGRADE SOILS SHALL BE COMPACTED TO A MINIMUM OF 98% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 AND MOISTURE CONDITIONED WITHIN 2% OF OPTIMUM MOISTURE CONTENT.

1. NON-FROST SUSCEPTIBLE FILL MATERIAL SHALL BE USED BELOW THE TRANSFORMER PADS AND STAIR PADS.

GD-4 STRUCTURAL FILL TO BE PLACED BELOW THE TURBINE FOUNDATION SHALL MEET THE FOLLOWING REQUIREMENTS:

A. THE PROPOSED STRUCTURAL FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER OF RECORD PRIOR TO ITS USE.

B. STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM OF 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 AND MOISTURE CONDITIONED WITHIN 2% OF OPTIMUM MOISTURE CONTENT.

C. STRUCTURAL FILL MATERIAL SHALL CONSIST OF CLEAN, WELL-GRADED INORGANIC GRANULAR SOILS.

D. STRUCTURAL FILL SHALL BE PLACED IN LIFTS HAVING A MAXIMUM LOOSE LIFT THICKNESS OF 200 mm PRIOR TO COMPACTION. IF THE TESTING AGENCY CANNOT TEST THIS FULL DEPTH, (I.E. 200 mm NUCLEAR GAUGE) THEN THE LIFTS SHALL BE REDUCED ACCORDINGLY.

E. ALL SURFACES SHALL BE COMPACTED TO A FIRM, UNYIELDING CONDITION.

F. ACTUAL DEPTHS OF SUBEXCAVATIONS SHALL BE VERIFIED BY OBSERVATIONS AND TESTING OF THE FOUNDATION SUBGRADE SOILS AFTER EXCAVATING TO THE DESIGN FOUNDATION SUBGRADE ELEVATION.

G. COMPACTION SHALL ONLY BE CARRIED OUT DURING FAVORABLE WEATHER CONDITIONS, FILL MATERIAL SHALL NOT BE ALLOWED TO FREEZE, AND PLACED FILL MATERIAL SUBGRADES SHALL BE FIRM AND STABLE AFTER PLACEMENT AND COMPACTION. CARE SHALL BE TAKEN THAT FROZEN MATERIALS ARE NOT PLACED AS FILL NOR SHALL NEW FILL BE PLACED ON FROZEN GROUND.

H. STRUCTURAL FILL SHALL BE FREE OF DELETERIOUS, ORGANIC, OR FROZEN MATTER.

I. SHOULD THE RESULTS OF THE IN-PLACE DENSITY TESTS INDICATE THE SPECIFIED MOISTURE OR COMPACTION REQUIREMENTS HAVE NOT BEEN MET, THE AREA REPRESENTED BY THE TEST SHALL BE REWORKED AND RETESTED AS REQUIRED UNTIL THE SPECIFIED MOISTURE AND COMPACTION REQUIREMENTS ARE ACHIEVED.

J. IRRIGATION OF ANY KIND SHALL BE PROHIBITED WITHIN AT LEAST 30 METERS FROM THE PERIMETER OF EACH WIND TURBINE FOUNDATION TO PREVENT LARGER THAN PREDICTED SETTLEMENT OF THE FOUNDATIONS.

K. NATIVE SOILS ARE SUSCEPTIBLE TO EROSION AND SHALL BE PROTECTED OVER THE LIFE OF THE PROJECT.

GD-5 TURBINE FOUNDATIONS LOCATED ADJACENT TO NATURAL OR MAN-MADE SLOPES SHALL BE LATERALLY SETBACK FROM THE TOP OF THE SLOPE. THIS SETBACK DISTANCE CAN BE ESTIMATED BY ESTABLISHING AN IMAGINARY PLANE DRAWN AT A 45-DEGREE ANGLE EXTENDING DOWNWARD FROM THE EDGE OF THE FOUNDATION.

A. THE TURBINE FOUNDATION SHALL NOT BE LOCATED IN ANY AREA WHERE THIS SETBACK PLANE WILL INTERCEPT ANY PORTION OF THE DOWNHILL SLOPE. IF A PROPOSED TURBINE FOUNDATION WILL VIOLATE THIS CRITERIA, THE FOUNDATION CAN BE MOVED EITHER HORIZONTALLY OR DEEPENED A SUFFICIENT DISTANCE TO MEET THE SETBACK REQUIREMENT PROVIDED THE DEPTH OF BACKFILL OVER THE FOUNDATION DOES NOT EXCEED THE DEPTH SHOWN ON THESE DESIGN DRAWINGS.

B. IN ALL SUCH CASES, PROPER DRAINAGE MEASURES SHALL BE TAKEN TO REDUCE THE IMPACTS TO MAN-MADE CUT AND FILL SLOPES AS WELL AS ALL UNDISTURBED NATURAL SLOPES.

GD-6 A QUALIFIED GEOTECHNICAL ENGINEER OR ENGINEERING GEOLOGIST SHALL BE RETAINED BY THE CONTRACTOR TO CONFIRM ALL FOUNDATION GEOTECHNICAL ASPECTS DURING FOUNDATION CONSTRUCTION.

GD-7 ALL BEARING CAPACITIES AT DESIGN BURIAL DEPTHS SHALL BE VERIFIED BY GEOTECHNICAL REPRESENTATIVE PRIOR TO PLACEMENT OF REINFORCING STEEL OR CONCRETE TO CONFIRM MINIMUM NET ALLOWABLE BEARING PRESSURES.

GD-8 GEOTECHNICAL REPRESENTATIVE SHALL RECORD SOIL DESIGNATION AND ANY PERCHED/GROUNDWATER ENCOUNTERED. ANYTIME WATER ENCOUNTERED IS CONSIDERED TO BE GROUNDWATER AND IS NEARER TO THE NATURAL GROUND SURFACE THAN THE FOUNDATION HAS BEEN DESIGNED FOR AT THAT LOCATION, THE STRUCTURAL ENGINEER SHALL BE CONTACTED IN WRITING WITH RESOLUTION PRIOR TO INSTALLATION OF ANY LEAN CONCRETE MAT, REINFORCING STEEL, OR STRUCTURAL CONCRETE.

GD-9 SUBGRADE SHALL BE FREE FROM FROST AND ICE PRIOR TO LEAN CONCRETE PLACEMENT.

GD-10 PONDING OF WATER NEAR THE FOUNDATION ELEMENTS FROM IMPROPER DRAINAGE SHALL NOT BE PERMITTED.

A. A DEWATERING CONTRACTOR SHOULD BE CONSULTED FOR DETERMINING THE MEANS AND METHODS FOR PROPERLY DEWATERING THE FOUNDATION EXCAVATIONS DURING CONSTRUCTION IF DEWATERING IS REQUIRED.

GD-11 LEAN CONCRETE MAT SHALL BE PLACED AS LEVEL AS POSSIBLE TO ALLOW FOR INSTALLATION OF BOTTOM MAT OF REINFORCING STEEL.

GD-12 FINAL SITE GRADING SHALL ENSURE NO PONDING OCCURS DIRECTLY OVER FOUNDATION EXCAVATION. THE GROUND SURFACE WITHIN A 5 METER ZONE FROM THE EXTERIOR PERIMETER OF THE FOUNDATION SHALL BE GRADED TO DRAIN AWAY FROM THE FOUNDATIONS AT A GRADIENT OF 5%.

GD-13 STRUCTURAL BACKFILL AROUND BASE AND/OR PEDESTAL MAY BE PLACED WHEN CONCRETE COMPRESSIVE STRENGTHS ARE 60% OF THE 28-DAY REQUIREMENTS SPECIFIED ON DESIGN DRAWINGS AND THE FOUNDATION CONCRETE HAS CURED FOR A MINIMUM OF 72 HOURS.

A. BACKFILL EQUIPMENT SHALL NOT COME IN CONTACT WITH THE FOUNDATION CONCRETE WHILE BACKFILLING AND NO VIBRATORY EQUIPMENT SHALL BE USED TO COMPACT THE BACKFILL UNLESS THERE IS A MINIMUM OF 300 mm OF BACKFILL MATERIAL BETWEEN THE FOUNDATION CONCRETE BASE SURFACE AND THE COMPACTION EQUIPMENT AT ALL TIMES. VIBRATORY COMPACTION EQUIPMENT SHALL NOT MAKE DIRECT CONTACT WITH EITHER THE FOUNDATION BASE OR PEDESTAL CONCRETE.

GD-14 WHEN TURBINE IS FULLY ERECTED AND OPERATIONAL, NO DISTURBANCES SHALL BE MADE TO THE BACKFILL MATERIAL DIRECTLY OVER THE FOUNDATION FOOTPRINT.

CONCRETE:

C-1 28-DAY CONCRETE COMPRESSIVE STRENGTH, FOR BASE: 35 MPa, FOR PEDESTAL: 35 MPa.

C-2 FOUNDATION CONCRETE SHALL MEET THE MINIMUM REQUIREMENTS OF CSA A23.1-09 CLASS S-2.

C-3 CEMENT: CSA A3001, TYPE HS OR H5B.

C-4 FLY ASH (IF USED): CSA A3001, CLASS F ONLY (CLASS C IS NOT PERMITTED), MAXIMUM 25% OF CEMENTITIOUS MATERIAL CONTENT.

C-5 AGGREGATE: CSA A23.1, GROUP I, SIZE 20-5.

A. WHEN A SINGLE SIZE OR COMBINATION OF TWO OR MORE AGGREGATES IS USED, THE FINAL GRADING SHALL CONFORM TO THE GRADING REQUIREMENTS OF CSA A23.1 UNLESS OTHERWISE SPECIFIED OR PERMITTED. AGGREGATES USED IN CONCRETE SHALL BE OBTAINED FROM THE SAME SOURCES AND HAVE THE SAME SIZE RANGES AS THE AGGREGATES USED IN THE CONCRETE REPRESENTED BY SUBMITTED HISTORICAL DATA OR USED IN TRIAL MIXTURES.

B. FINE AND COARSE AGGREGATE FOR USE IN CONCRETE SHALL NOT CONTAIN ANY MATERIALS THAT ARE DELETERIOUSLY REACTIVE WITH ALKALINE IN THE CEMENT IN AN AMOUNT SUFFICIENT TO CAUSE EXCESSIVE EXPANSION OF MORTAR OR CONCRETE. IF SUCH MATERIALS ARE PRESENT IN INJURIOUS AMOUNTS, SEPARATE CONSIDERATION NEED BE TAKEN FOR CORRECTIVE ACTION WHICH SHALL CLEARLY DEMONSTRATE THROUGH TESTING SATISFACTORY PERFORMANCE FOR PROJECT DESIGN LIFE.

C-6 CURING AGENT: ASTM C309, TYPE 2 (WHITE PIGMENTED).

C-7 WATER/CEMENT RATIO SHALL BE DETERMINED IN THE FOUNDATION ENGINEER-APPROVED MIX DESIGN, NOT TO EXCEED 0.45, AND FIELD PERSONNEL SHALL CONFORM TO THE WATER/CEMENT RATIO AS DETERMINED IN THE FOUNDATION ENGINEER-APPROVED MIX DESIGN.

C-8 SLUMP: MAXIMUM 130 mm AT POINT OF PLACEMENT.

A. WHEN THE USE OF A TYPE I OR II PLASTICIZING ADMIXTURE CONFORMING TO ASTM C1017M OR WHEN A TYPE F OR G HIGH-RANGE WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494M IS PERMITTED TO INCREASE THE SLUMP OF CONCRETE, CONCRETE SHALL HAVE A SLUMP OF 50 mm TO 130 mm INCHES BEFORE THE ADMIXTURE IS ADDED AND A MAXIMUM SLUMP OF 200 mm AT POINT OF PLACEMENT AFTER THE ADMIXTURE IS ADDED.

C-9 WATER USED FOR MIXING AND TO MAKE ICE SHALL MEET THE REQUIREMENTS OF ASTM C1602M. USE POTABLE WATER UNLESS ALTERNATIVE SOURCES OF WATER COMPLYING WITH ASTM C1602M ARE PERMITTED.

C-10 IF USED, ADMIXTURES SHALL MEET THE REQUIREMENTS OF THE FOLLOWING:

A. AIR-ENTRAINING MIXTURES: ASTM C260.

B. CHEMICAL ADMIXTURES: ASTM C494M.

C. CHEMICAL ADMIXTURES FOR USE IN PRODUCING FLOWING CONCRETE: ASTM C1017M.

D. ADMIXTURES USED IN CONCRETE SHALL BE THE SAME AS THOSE USED IN THE CONCRETE REPRESENTED BY SUBMITTED FIELD TEST RECORDS OR USED IN TRIAL MIXTURES.

C-11 AIR CONTENT AT POINT OF PLACEMENT: 4% TO 7% FOR ALL STRUCTURAL FOUNDATION CONCRETE. NO SPECIFIED AIR CONTENT REQUIRED IN LEAN (MUD MAT) CONCRETE.

A. ENTRAPPED AIR ONLY SHALL NOT BE USED WHEN AIR CONTENT HAS BEEN SPECIFIED.

C-12 IF DOBIE BLOCKS ARE USED FOR SUPPORTING BOTTOM REINFORCEMENT, DOBIES SHALL HAVE MINIMUM COMPRESSIVE STRENGTH AS REQUIRED BY THE CONCRETE CAST IN THE BASE.

A. DOBIE BLOCKS SHALL NOT BE MADE OF CLAY.

C-13 THE CONTRACTOR MUST RETAIN THE SERVICES OF A PRIVATE, ACCREDITED LABORATORY.

A. THE CONCRETE TRIALS CONFORM TO THE ACNOR STANDARDIZED CURING METHOD.

B. THE LABORATORY SHALL TAKE SAMPLES OF A MINIMUM OF EIGHT (8) CYLINDERS BY RAFT AND EIGHT (8) CYLINDERS BY BASE. ADDITIONAL CYLINDERS MAY BE CAST AT THE DISCRETION OF THE CONTRACTOR TO EVALUATE THE RESISTANCE OF THE CONCRETE AT DIFFERENT AGES BETWEEN 7 TO 56 DAYS.

C. THE LABORATORY SHALL ALSO UNDERTAKE TESTS OF SUBSIDENCE AND AIR CONTENT OF THE CONCRETE.

EXECUTION OF CONCRETE MIXING AND PLACEMENT:

CM-1 UNLESS OTHERWISE SPECIFIED, MEASURE, BATCH, AND MIX CONCRETE MATERIALS AND CONCRETE IN CONFORMANCE WITH ASTM C94M.

CM-2 CONCRETE SHALL POSSESS THE SPECIFIED CHARACTERISTICS IN THE FRESHLY MIXED STATE AT THE POINT OF PLACING. TRANSPORT AND DELIVER CONCRETE IN EQUIPMENT CONFORMING TO THE REQUIREMENTS OF ASTM C94.

CM-3 CONCRETE SHALL BE PLACED IN ACCORDANCE WITH THE LATEST EDITION OF CSA A23.1. PLACEMENT METHOD SHALL ENSURE PROPER CONSOLIDATION OF CONCRETE AS DEFINED BY CSA.

CM-4 SLUMP ADJUSTMENT:

A. WHEN CONCRETE ARRIVES AT THE POINT OF DELIVERY WITH A SLUMP BELOW THAT WHICH WILL RESULT IN THE SPECIFIED SLUMP AT THE POINT OF PLACEMENT AND IS UNSUITABLE FOR PLACING AT THAT SLUMP, THE SLUMP MAY BE ADJUSTED TO THE REQUIRED VALUE BY ADDING WATER UP TO THE AMOUNT ALLOWED IN THE ACCEPTED MIXTURE PROPORTIONS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.

B. ADDITION OF WATER SHALL BE IN ACCORDANCE WITH ASTM C94M.

C. DO NOT EXCEED THE SPECIFIED WATER-CEMENTITIOUS MATERIAL RATIO OR SLUMP.

D. DO NOT ADD WATER TO CONCRETE DELIVERED IN EQUIPMENT NOT ACCEPTABLE FOR MIXING.

E. IF PLASTICIZING OR HIGH-RANGE WATER-REDUCING ADMIXTURES ARE ADDED TO THE CONCRETE AT THE SITE TO ACHIEVE FLOWABLE CONCRETE, DO NOT ADD WATER TO THE CONCRETE.

F. MEASURE SLUMP AND AIR CONTENT OF AIR-ENTRAINED CONCRETE AFTER SLUMP ADJUSTMENTS TO VERIFY COMPLIANCE WITH SPECIFIED REQUIREMENTS.

CM-5 TIME FOR COMPLETION OF DISCHARGE SHALL COMPLY WITH ASTM C94M UNLESS OTHERWISE PERMITTED. WHEN DISCHARGE IS PERMITTED AFTER MORE THAN 90 MINUTES HAVE ELAPSED SINCE BATCHING OR AFTER THE DRUM HAS REVOLVED 300 REVOLUTIONS, VERIFY AIR CONTENT OF AIR-ENTRAINED CONCRETE, SLUMP, AND TEMPERATURE OF CONCRETE AS SPECIFIED.

CM-6 DO NOT PLACE CONCRETE UNTIL DATA ON MATERIALS AND MIXTURE PROPORTIONS ARE ACCEPTED.

CM-7 THE CONTRACTOR SHALL PLACE THE MINIMUM CONCRETE VOLUME FOR THE BASE/PEDESTAL AS SHOWN BY THE DIMENSIONS/ESTIMATED QUANTITIES SHOWN ON THESE DESIGN DRAWINGS.

CM-8 BASE CONCRETE SHALL CURE FOR A MINIMUM OF 24 HOURS AND UNTIL IT IS OF SUFFICIENT STIFFNESS TO RESIST DAMAGE BEFORE PLACING THE PEDESTAL CONCRETE.

CM-9 CONVEYING EQUIPMENT:

A. RAPIDLY CONVEY CONCRETE FROM MIXER TO THE PLACE OF FINAL DEPOSIT BY METHODS THAT PREVENT SEGREGATION OR LOSS OF INGREDIENTS AND ENSURE THE REQUIRED QUALITY OF CONCRETE. DO NOT USE ALUMINUM PIPES OR CHUTES.

B. CLEAN CONVEYING EQUIPMENT BEFORE EACH PLACEMENT.

C. USE BELT CONVEYORS THAT ARE HORIZONTAL OR AT A SLOPE THAT WILL NOT CAUSE EXCESSIVE SEGREGATION OR LOSS OF INGREDIENTS. USE ACCEPTABLE DISCHARGE BAFFLE OR HOPPER AT THE DISCHARGE END TO PREVENT SEGREGATION. DO NOT ALLOW MORTAR TO ADHERE TO THE RETURN LENGTH OF THE BELT.

D. USE METAL OR METAL-LINED CHUTES HAVING ROUNDED BOTTOMS, AND SLOPED BETWEEN ONE VERTICAL TO TWO HORIZONTAL AND ONE VERTICAL TO THREE HORIZONTAL. CHUTES LONGER THAN 6 METERS LONG AND CHUTES NOT MEETING SLOPE REQUIREMENTS MAY BE USED PROVIDED THE DISCHARGE IS INTO A HOPPER BEFORE DISTRIBUTION INTO THE PLACEMENT AREA.

E. USE PUMPING EQUIPMENT THAT PERMITS PLACEMENT RATES THAT AVOID COLD JOINTS AND PREVENTS SEGREGATION IN DISCHARGE OF PUMPED CONCRETE.

CM-10 DEPOSITING CONCRETE:

A. DEPOSIT CONCRETE CONTINUOUSLY IN ONE LAYER OR IN LAYERS TO HAVE FRESH CONCRETE DEPOSITED ON IN-PLACE CONCRETE THAT IS STILL PLASTIC.

B. DO NOT DEPOSIT FRESH CONCRETE ON CONCRETE THAT HAS HARDENED SUFFICIENTLY TO CAUSE FORMATION OF SEAMS OR PLANES OF WEAKNESS WITHIN THE SECTION.

C. DO NOT USE CONCRETE THAT HAS SURFACE-DRIED, PARTIALLY HARDENED, OR CONTAINS FOREIGN MATERIAL.

D. DEPOSIT CONCRETE AS NEAR AS PRACTICABLE TO THE FINAL POSITION TO AVOID SEGREGATION.

CM-11 CONSOLIDATION:

A. CONSOLIDATE CONCRETE BY VIBRATION INCLUDING FINAL LIFT OF CONCRETE. THOROUGHLY WORK CONCRETE AROUND REINFORCEMENT AND EMBEDDED ITEMS AND INTO CORNERS OF FORMS, ELIMINATING AIR AND STONE POCKETS THAT MAY CAUSE HONEYCOMBING, PITTING, OR PLANES OF WEAKNESS.

1. FINAL LIFT OF BASE CONCRETE SHALL BE CONSOLIDATED AS SPECIFIED ABOVE. IN ADDITION, DUE TO THE EXTENDED TIME OF EXPOSURE OF THE SECOND TO LAST LIFT, THE NECESSARY EFFORT SHOULD BE TAKEN TO ENSURE THE VIBRATOR IS ALLOWED AMPLE TIME TO PENETRATE THROUGH THE FINAL LIFT INTO THE PREVIOUS LIFT IN ORDER TO ADEQUATELY KNIT THE TWO LAYERS TOGETHER. THIS WILL PROVIDE THE CRITICAL HORIZONTAL SHEAR TRANSFER OF THE TOP MAT OF REINFORCING TO THE CONCRETE BELOW.

CWE Consultants, ULC
1050 Britannia Road East, Unit 24
Mississauga, ON L4W4N9, Canada
Phone (289) 742-0035
www.CWEconsultants.com

BOREA CONSTRUCTION
JERICO WIND PROJECT
LAMBTON COUNTY, ONTARIO, CANADA
SPECIFICATIONS SHEET 1

GE 1.6-100 NAMTS 79.7m HH
IEC TC IIIB GE 48.7 CWE/STW
WIND TURBINE

Table with 4 columns: REVISION, DATE, DESCRIPTION, and a blank column. Contains 3 revision entries.

DESIGNED BY: L ZHOU
CHECKED BY: G WU

PROJECT # 130107

FILENAME: JERICO DRAWING SET

SCALE: AS SHOWN

Table with 2 columns: SHEET, REV. Contains sheet number S-10 and revision number 3.



A

B

C

D

E

F

B. USE INTERNAL VIBRATORS OF THE LARGEST SIZE AND POWER THAT CAN PROPERLY BE USED IN THE CONCRETE PLACEMENT.

C. DO NOT USE VIBRATORS TO MOVE CONCRETE.

D. VIBRATIONS OF CONCRETE SHALL FOLLOW THE METHOD BELOW:

- 1. VIBRATION OF CONCRETE SHALL PROCEED RAPIDLY TO THE BOTTOM OF THE FRESH LAYER AND PENETRATE AT LEAST 150 mm INTO THE PRECEDING LAYER INCLUDING FINAL LIFT OF CONCRETE.
2. THE VIBRATOR SHALL BE MANIPULATED IN AN UP-AND-DOWN MOTION, GENERALLY FOR 5 TO 15 SECONDS TO KNIT THE TWO LAYERS TOGETHER. THE VIBRATOR SHALL THEN BE WITHDRAWN GRADUALLY WITH A SERIES OF UP-AND-DOWN MOTIONS. THE DOWN MOTION SHALL BE A RAPID DROP.
3. THE SPACING BETWEEN VIBRATOR INSERTIONS SHALL BE APPROXIMATELY 300 mm TO 450 mm.

CM-12 CURING AND PROTECTION:

- A. APPLY THE COMPOUND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AS SOON AS WATER SHEEN HAS DISAPPEARED FROM THE CONCRETE SURFACE AND AFTER FINISHING OPERATIONS. THE APPLICATION RATE SHALL NOT BE LESS THAN 1 LITER/5 SQUARE METERS.
B. DO NOT USE CURING COMPOUND ON ANY SURFACE WHERE CONCRETE OR OTHER MATERIAL WILL BE BONDED, UNLESS THE CURING COMPOUND WILL NOT PREVENT BOND OR UNLESS MEASURES ARE TAKEN TO COMPLETELY REMOVE THE CURING COMPOUND FROM AREAS TO RECEIVE BONDED APPLICATIONS.
C. IMMEDIATELY AFTER PLACEMENT, PROTECT CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY.
D. PROTECT CONCRETE DURING THE CURING PERIOD SUCH THAT THE CONCRETE TEMPERATURE DOES NOT FALL BELOW THE REQUIREMENTS SHOWN IN THE COLD WEATHER CONCRETING SECTION.
E. DO NOT ALLOW WINDY CONDITIONS TO CAUSE EXCESSIVE OR ACCELERATED DRYING OF THE FOUNDATION BEFORE BACKFILL IF PLACED OVER THE FOUNDATION.

CM-13 TOP OF BASE SHALL BE FINISHED WITH ROUGH TROWEL FINISH OR ROLLER BUG. TOP OF PEDESTAL SHALL BE FINISHED WITH TROWEL AND BROOM FINISH.

MASS CONCRETING:

- MC-1 THE FOLLOWING REQUIREMENTS SHALL BE MET WHEN CONCRETE PLACEMENT IS CONSIDERED TO BE MASS CONCRETE. THE OTHER REQUIREMENTS OF THESE DESIGN DOCUMENTS SHALL BE MET UNLESS MORE STRINGENT REQUIREMENTS FOUND IN THIS SECTION CONTROL.
MC-2 MASS CONCRETING PRECAUTIONS SHALL BE REQUIRED WHEN THE MINIMUM CROSS-SECTIONAL DIMENSION APPROACHES OR EXCEEDS 750 mm OR WHEN CEMENT CONTENTS ABOVE 356 kg/m³ ARE USED.
MC-3 SUBMIT BRAND NAMES, MANUFACTURER'S CERTIFICATIONS, AND TEST DATA ON HEAT OF HYDRATION.
MC-4 DO NOT USE CSA A3001 TYPE HE CEMENT.
MC-5 DO NOT USE CALCIUM CHLORIDE OR OTHER ACCELERATING ADMIXTURES UNLESS SPECIFICALLY PERMITTED.
MC-6 UNLESS OTHERWISE PERMITTED OR SPECIFIED, THE TEMPERATURE OF CONCRETE AT THE POINT OF PLACEMENT SHALL NOT BE LESS THAN 5 °C. CONCRETE PLACED IN COLD WEATHER SHALL MEET THE REQUIREMENTS OF THE COLD WEATHER CONCRETING SECTION.
MC-7 PLACE CONCRETE IN LAYERS NOT MORE THAN 450 mm THICK. EXTEND VIBRATOR HEADS INTO PREVIOUSLY PLACED LAYER OF PLASTIC CONCRETE.
MC-8 DURING PROTECTION FROM FREEZING AND MOISTURE LOSS, AS REQUIRED BY THE COLD WEATHER CONCRETING AND THE EXECUTION OF CONCRETE MIXING AND PLACEMENT SECTIONS, DO NOT USE STEAM OR OTHER CURING METHODS THAT WILL ADD HEAT TO THE CONCRETE.
MC-9 KEEP FORMS AND EXPOSED CONCRETE CONTINUOUSLY WET DURING THE CURING PERIOD WHENEVER THE SURROUNDING AIR TEMPERATURE IS ABOVE 32 °C.
MC-10 UNLESS OTHERWISE SPECIFIED, COOL THE CONCRETE GRADUALLY SO THAT THE DROP IN CONCRETE SURFACE TEMPERATURE DURING AND AT THE CONCLUSION OF THE SPECIFIED CURING PERIOD DOES NOT EXCEED 11 °C IN ANY 24 HOUR PERIOD.
MC-11 BASE AND PEDESTAL CONCRETE MIX DESIGN THAT IS CONSIDERED MASS CONCRETE SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER. MIX DESIGN SHALL BE DESIGNED WITH PLACEMENT SPECIFICATIONS TO ENSURE MAXIMUM CONCRETE TEMPERATURE AT THE CORE OF THE FOUNDATION BASE DOES NOT EXCEED 70 °C AND MAXIMUM TEMPERATURE RANGE FROM THE CORE OF THE BASE TO THE BASE SURFACE DOES NOT HAVE A TEMPERATURE DIFFERENTIAL IN EXCESS OF 20 °C.

HOT WEATHER CONCRETING:

- HW-1 THE RECOMMENDATIONS OF ACI 305 SHALL BE FOLLOWED FOR CONDITIONS OF HOT WEATHER CONCRETING.
HW-2 THE TEMPERATURE OF THE CONCRETE AS PLACED SHALL NOT EXCEED THE ALLOWABLE PLACEMENT TEMPERATURE AS NOTED IN THE FOUNDATION ENGINEER-APPROVED CONCRETE MIX DESIGN OR AS DETERMINED BY INTERNAL CONCRETE TEMPERATURE MONITORING DATA WITH THE APPROVAL OF THE FOUNDATION ENGINEER.

A. TEMPERATURE MONITORING PROCEDURE, IF USED, SHALL BE DETERMINED BY THE FOUNDATION ENGINEER OF RECORD.

HW-3 LOSS OF SLUMP, FLASH SET, OR COLD JOINTS WILL NOT BE ACCEPTABLE.

HW-4 OBTAIN ACCEPTANCE OF HOT WEATHER CONCRETING PROCEDURE.

HW-5 WHEN TEMPERATURE OF STEEL REINFORCEMENT, EMBEDMENTS, OR FORMS IS GREATER THAN 48 °C, FOG STEEL REINFORCEMENT EMBEDMENTS, AND FORMS WITH WATER IMMEDIATELY BEFORE PLACING CONCRETE. REMOVE STANDING WATER BEFORE PLACING CONCRETE.

COLD WEATHER CONCRETING:

- CW-1 THE RECOMMENDATIONS OF CSA A23.1 SHALL BE FOLLOWED FOR CONDITIONS OF COLD WEATHER CONCRETING.
CW-2 WHEN THE AIR TEMPERATURE IS AT OR BELOW 5 °C OR WHEN THERE IS THE PROBABILITY OF THE AIR TEMPERATURE FALLING BELOW 5 °C WITHIN 24 HOURS OF PLACING CONCRETE, THE TEMPERATURE OF THE CONCRETE SHALL BE PLACED AND MAINTAINED BETWEEN 10 °C AND 20 °C.
CW-3 THESE MINIMUM REQUIREMENTS MAY BE TERMINATED WHEN TEMPERATURES ABOVE 10 °C OCCUR DURING MORE THAN HALF OF ANY 24 HOUR DURATION.
CW-4 MAINTAIN CONCRETE PROTECTION TO PREVENT FREEZING OF THE CONCRETE. REMOVE PROTECTION IN SUCH A MANNER THAT THE MAXIMUM DECREASE IN TEMPERATURE MEASURED AT THE SURFACE OF THE CONCRETE IN A 24 HOUR PERIOD SHALL NOT EXCEED 12 °C.
CW-5 WHEN THE SURFACE TEMPERATURE OF THE CONCRETE IS WITHIN 10 °C OF THE AMBIENT OR SURROUNDING TEMPERATURE, PROTECTION MEASURES MAY BE REMOVED.
CW-6 THE TEMPERATURE OF THE CONCRETE AS PLACED SHALL NOT EXCEED THE ALLOWABLE PLACEMENT TEMPERATURE AS NOTED IN THE FOUNDATION ENGINEER-APPROVED CONCRETE MIX DESIGN OR AS DETERMINED BY INTERNAL CONCRETE TEMPERATURE MONITORING DATA WITH THE APPROVAL OF THE FOUNDATION ENGINEER.

A. TEMPERATURE MONITORING PROCEDURE, IF USED, SHALL BE DETERMINED BY THE FOUNDATION ENGINEER OF RECORD.

CW-7 DO NOT PLACE CONCRETE AROUND THE EMBEDMENT RING UNLESS THE EMBEDMENT RING IS AT A TEMPERATURE ABOVE FREEZING.
CW-8 DURING PERIODS NOT DEFINED AS COLD WEATHER, BUT WHEN FREEZING TEMPERATURES MAY OCCUR, PROTECT CONCRETE SURFACES AGAINST FREEZING FOR THE FIRST 24 HOURS AFTER PLACING.
CW-9 THE TEMPERATURE OF THE CONCRETE AT THE POINT OF MIXING (TYPICALLY AT THE BATCH PLANT) SHALL BE WITHIN 8 °C ABOVE THE TEMPERATURE OF THE CONCRETE AT THE POINT OF PLACEMENT.
CW-10 THE CONCRETE TEMPERATURE AT THE SURFACE SHALL BE MONITORED AND RECORDED AT LEAST TWICE DAILY FOR THREE DAYS MINIMUM AFTER CONCRETE PLACEMENT.
CW-11 TO SUPPORT THE CONSTRUCTION SEQUENCE, ONE (1) ADDITIONAL CONCRETE CYLINDER PER 100 CU. METERS OF CONCRETE PLACED IN THE FOUNDATION BASE AND ONE (1) ADDITIONAL CONCRETE CYLINDER PER FOUNDATION PEDESTAL SHALL BE FIELD-CURED UNDER THE SAME CURING CONDITIONS AS THE FOUNDATION CONCRETE FOR EACH OF THE TESTING INTERVALS DESCRIBED BELOW. THE FIELD-CURED CYLINDERS AND THE CORRESPONDING LAB-CURED CYLINDERS SHALL BE TESTED AT THE FOLLOWING INTERVALS TO DETERMINE THE ADEQUACY OF THE IN-PLACE CONCRETE TO SUPPORT THE CONSTRUCTION SEQUENCE AS WELL AS TO ESTABLISH A CORRELATION BETWEEN THE FIELD-CURED AND LAB-CURED CONCRETE STRENGTHS:

A. TEMPERATURE MONITORING PROCEDURE, IF USED, SHALL BE DETERMINED BY THE FOUNDATION ENGINEER OF RECORD.

CW-7 DO NOT PLACE CONCRETE AROUND THE EMBEDMENT RING UNLESS THE EMBEDMENT RING IS AT A TEMPERATURE ABOVE FREEZING.

CW-8 DURING PERIODS NOT DEFINED AS COLD WEATHER, BUT WHEN FREEZING TEMPERATURES MAY OCCUR, PROTECT CONCRETE SURFACES AGAINST FREEZING FOR THE FIRST 24 HOURS AFTER PLACING.

CW-9 THE TEMPERATURE OF THE CONCRETE AT THE POINT OF MIXING (TYPICALLY AT THE BATCH PLANT) SHALL BE WITHIN 8 °C ABOVE THE TEMPERATURE OF THE CONCRETE AT THE POINT OF PLACEMENT.

CW-10 THE CONCRETE TEMPERATURE AT THE SURFACE SHALL BE MONITORED AND RECORDED AT LEAST TWICE DAILY FOR THREE DAYS MINIMUM AFTER CONCRETE PLACEMENT.

CW-11 TO SUPPORT THE CONSTRUCTION SEQUENCE, ONE (1) ADDITIONAL CONCRETE CYLINDER PER 100 CU. METERS OF CONCRETE PLACED IN THE FOUNDATION BASE AND ONE (1) ADDITIONAL CONCRETE CYLINDER PER FOUNDATION PEDESTAL SHALL BE FIELD-CURED UNDER THE SAME CURING CONDITIONS AS THE FOUNDATION CONCRETE FOR EACH OF THE TESTING INTERVALS DESCRIBED BELOW. THE FIELD-CURED CYLINDERS AND THE CORRESPONDING LAB-CURED CYLINDERS SHALL BE TESTED AT THE FOLLOWING INTERVALS TO DETERMINE THE ADEQUACY OF THE IN-PLACE CONCRETE TO SUPPORT THE CONSTRUCTION SEQUENCE AS WELL AS TO ESTABLISH A CORRELATION BETWEEN THE FIELD-CURED AND LAB-CURED CONCRETE STRENGTHS:

A. TOWER ERECTION OCCURS LESS THAN 28 DAYS AFTER FOUNDATION CONCRETE PLACEMENT IS COMPLETE:

- 1. PRIOR TO FOUNDATION BACKFILL PLACEMENT.
2. PRIOR TO POST-TENSIONING ANCHOR BOLTS.
3. PRIOR TO ERECTION OF NACELLE AND ROTOR.

B. TOWER ERECTION OCCURRING MORE THAN 28 DAYS AFTER FOUNDATION CONCRETE PLACEMENT IS COMPLETE:

- 1. PRIOR TO FOUNDATION BACKFILL PLACEMENT.

WET WEATHER CONCRETING:

WW-1 DO NOT BEGIN TO PLACE CONCRETE WHILE RAIN, SLEET, OR SNOW IS FALLING UNLESS ADEQUATE PROTECTION IS PROVIDED AND ACCEPTANCE OF PROTECTION IS OBTAINED.

WW-2 DO NOT ALLOW RAIN WATER TO INCREASE MIXING WATER OR DAMAGE THE SURFACE OF THE CONCRETE.

MATERIAL STORAGE AND HANDLING:

MS-1 STORE CEMENTITIOUS MATERIALS IN DRY, WEATHER-TIGHT BUILDINGS, BINS, OR SILOS THAT WILL EXCLUDE CONTAMINANTS.

MS-2 STORE AND HANDLE AGGREGATE IN A MANNER THAT WILL AVOID SEGREGATION AND PREVENT CONTAMINATION WITH OTHER MATERIALS OR OTHER SIZES OF AGGREGATES. STORE AGGREGATES IN LOCATIONS THAT WILL PERMIT THEM TO DRAIN FREELY. DO NOT USE AGGREGATES THAT CONTAIN FROZEN LUMPS.

MS-3 PROTECT MIXING WATER AND ICE FROM CONTAMINATION DURING STORAGE AND DELIVERY.

MS-4 PROTECT STORED ADMIXTURES AGAINST CONTAMINATION, EVAPORATION, OR DAMAGE. PROVIDE AGITATION EQUIPMENT FOR ADMIXTURES USED IN THE FORM OF SUSPENSIONS OR NONSTABLE SOLUTIONS TO ENSURE UNIFORM DISTRIBUTION OF THE INGREDIENTS. PROTECT LIQUID ADMIXTURES FROM FREEZING AND FROM TEMPERATURE CHANGES THAT WOULD ADVERSELY AFFECT THEIR CHARACTERISTICS.

MS-5 PREVENT BENDING, COATING WITH EARTH, OIL, OR OTHER MATERIAL, OR OTHERWISE DAMAGING THE REINFORCEMENT.

EXECUTION OF TOWER ERECTION:

TE-1 ANCHOR BOLT POST-TENSIONING, AND BASE AND MID-TOWER SECTIONS CAN BE ERECTED WHEN THE FOUNDATION BASE AND PEDESTAL CONCRETE COMPRESSIVE STRENGTHS HAVE REACHED A MINIMUM OF 70% OF THE 28-DAY REQUIREMENTS.

TE-2 FULL TURBINE TOWER, NACELLE, AND BLADES CAN BE ERECTED WHEN THE FOUNDATION BASE AND PEDESTAL CONCRETE COMPRESSIVE STRENGTHS HAVE REACHED A MINIMUM OF 90% OF THE 28-DAY REQUIREMENTS.

TE-3 THE FULL 28-DAY FOUNDATION BASE AND PEDESTAL CONCRETE COMPRESSIVE STRENGTHS ARE REQUIRED PRIOR TO TURBINE OPERATION.

TE-4 THE PROJECT FOUNDATION ENGINEER SHALL BE NOTIFIED OF THE NUMBER OF TOWER SECTIONS TO BE ERECTED PRIOR TO GROUT PLACEMENT IN ORDER TO DETERMINE THE SIZE, NUMBER, AND LOCATIONS OF SHIMS WHEN USED TO SUPPORT THE TOWER.

TE-5 SHIMS USED TO SUPPORT THE TOWER DURING GROUT PLACEMENT SHALL BE MADE OF ASTM-APPROVED STEEL OR OF AN APPROVED MATERIAL THAT APPROPRIATE SIMULATES THE MODULUS OF ELASTICITY OF THE GROUT.

GROUT:

G-1 GROUT: NON-FERROUS, NON-SHRINK GROUT WITH THE SPECIFIED STRENGTH REQUIRED BELOW:

- A. 28-DAY STRENGTH: 60 MPa.
B. MINIMUM GROUT STRENGTH REQUIRED PRIOR TO ANCHOR BOLT POST-TENSION: 34 MPa.
C. MINIMUM GROUT STRENGTH REQUIRED PRIOR TO FULL ERECTION OF TOWER SECTIONS, TURBINE, AND BLADES: 54 MPa.

G-2 CEMENT-BASED OR EPOXY GROUTS ARE ACCEPTABLE WITH APPROVAL BY STRUCTURAL ENGINEER. SUBMIT PROPOSED PRODUCT DATA SHEET FOR APPROVAL BY FOUNDATION STRUCTURAL ENGINEER.

A. WHEN AN EPOXY GROUT IS USED, A WAX BOND BREAKER MUST BE USED BETWEEN THE GROUT AND THE TOWER FLANGE IN ORDER TO PREVENT THE EPOXY GROUT FROM BONDING TO THE TOWER FLANGE.

B. WHEN AN EPOXY GROUT IS USED, WAIT A MINIMUM OF 48 HOURS TO POST-TENSION THE ANCHOR BOLTS AFTER THE EPOXY GROUT WAS PLACED IN ORDER TO AVOID POTENTIAL ISSUES WITH COLD CREEP.

G-3 THE 28-DAY GROUT STRENGTH IS REQUIRED PRIOR TO TURBINE OPERATION.

G-4 THE CONTRACTOR MAY USE A GROUT THAT REACHES THE REQUIRED GROUT STRENGTH PRIOR TO 28-DAYS AT THEIR DISCRETION TO FACILITATE TOWER AND TURBINE ERECTION.

G-5 CONSULT THE GROUT MANUFACTURER OF THE FOUNDATION ENGINEER-APPROVED GROUT PRODUCT CONCERNING THE USE OR NEED FOR EXPANSION JOINTS AS WELL AS PROPER HOT AND COLD WEATHER USE OF THE PRODUCT.

REINFORCEMENT:

R-1 REINFORCING STEEL: CAN/CSA-G30.18 (GRADE 400 U.N.O.).

R-2 REINFORCEMENT DETAILING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF CSA A23.1 AND A23.3.

R-3 MINIMUM DIAMETER OF BENDS IN REINFORCEMENT SHALL CONFORM TO THE FOLLOWING (UNLESS NOTED OTHERWISE):

Table with 2 columns: BAR SIZE, MINIMUM INSIDE BEND DIAMETER. Rows include 10, 15, 20, 25, 30, 35, 45, 55 mm bar sizes and their corresponding bend diameters.

R-4 SPACING OF REINFORCEMENT MAY BE ADJUSTED TO ACCOMMODATE CONDUIT INTERFERENCES AND CLEARANCE ISSUES AROUND THE ANCHOR BOLT ASSEMBLY. REINFORCEMENT SPACING SHALL NOT EXCEED 500 mm. OVER A 600 mm WIDTH AND SHALL MAINTAIN A MINIMUM CLEAR SPACE BETWEEN PARALLEL REINFORCEMENT OF 40 mm. THE TOTAL NUMBER OF BARS SHALL BE PROVIDED AS SHOWN ON THESE DESIGN DRAWINGS.

R-5 NO WELDING OF REINFORCING BARS OR TORCHING TO BEND REINFORCING BARS SHALL BE ALLOWED WITHOUT THE SPECIFIC APPROVAL OF THE STRUCTURAL ENGINEER.

R-6 REINFORCEMENT INSTALLER/FABRICATOR IS RESPONSIBLE FOR THE DESIGN AND PLACEMENT OF REINFORCING SUPPORT CHAIRS/DOBIES, ETC.

R-7 WHEN CONCRETE IS PLACED, REINFORCEMENT SHALL BE FREE OF MATERIALS DELETERIOUS TO BOND.

METALS:

M-1 EMBEDMENT RING:

- A. THICKNESS: 1-1/4" (32 mm).
B. MATERIAL: ASTM A36 GRADE 36, OR ASTM A36M GRADE 250, OR CSA G40.21, 300W.

M-2 ANCHOR BOLTS:

- A. NOMINAL DIAMETER: 32 mm (#10).
B. GRADE: 75 (WILLIAMS FORM BRAND OR APPROVED EQUIVALENT).
C. ANCHOR BOLTS SHALL HAVE A MINIMUM CHARPY VALUE OF 27 JOULES AT -40° C PER GE'S SPECIFICATIONS.
D. POST-TENSION: 371 kN, WITH +20 kN, -0 KIPS TOLERANCE.
E. MINIMUM REQUIRED LENGTH: 2620 mm.
F. ENCASED IN PVC PIPE SLEEVE MEETING ASTM D2241 OR EQUIVALENT, PVC LENGTH: 2150 mm.
G. HEX NUTS: WILLIAMS FORM BRAND OR APPROVED EQUIVALENT.
H. HARDENED WASHERS: WILLIAMS FORM BRAND OR APPROVED EQUIVALENT.
I. ANCHOR BOLTS SHALL BE INSTALLED WITH A MINIMUM PROJECTION OF 250 mm (CONTRACTOR TO VERIFY) ABOVE TOWER FLANGE. THIS DIMENSION SHALL BE INCREASED AS REQUIRED TO SUIT POST-TENSIONING INSTALLATION AND REQUIRED MAINTENANCE.
J. ANCHOR BOLTS SHALL BE INSTALLED WITH MINIMUM 15 mm AND MAXIMUM 50 mm PROJECTION BELOW NUT. CONTRACTOR SHALL USE NECESSARY METHODS TO RESTRAIN EMBEDMENT PLATE NUT FROM TURNING DURING CONCRETE VIBRATION.
K. NO WELDING OF ANCHOR BOLTS IS ALLOWED.

REQUIRED SUBMITTALS:

RS-1 CONCRETE SUPPLIER SHALL SUBMIT A STRUCTURAL MIX DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER IN THE PROJECT STATE FOR APPROVAL PER MINIMUM REQUIREMENTS OF THESE DESIGN DRAWINGS.

RS-2 CONCRETE MIX DESIGN SUBMITTAL TO INCLUDE THE FOLLOWING INFORMATION:

- A. AGGREGATES: TYPES, PIT OR QUARRY LOCATIONS, SHIPPING LOCATIONS, PRODUCERS' NAMES, GRADATIONS, SPECIFIC GRAVITIES, AND TEST RESULTS LESS THAN ONE (1) YEAR OLD.
B. TEST FOR DELETERIOUS AGGREGATE MATERIALS PER CSA 1.1.

C. TEST FOR DELETERIOUS AGGREGATE EXPANSION PER CSA A23.2-25. ALTERNATIVELY, OTHER CSA TESTING METHODS MAY BE USED, UPON ENGINEER APPROVAL, WHICH ESTABLISHES THAT THE AGGREGATES BEING PROPOSED FOR USE WILL NOT CAUSE DELETERIOUS EXPANSION DUE TO ALKALI SILICA REACTIVITY (ASR).

D. PROPORTIONS OF ALL MATERIALS.

E. CEMENTITIOUS MATERIALS: TYPES, MANUFACTURING LOCATIONS, SHIPPING LOCATIONS, AND CERTIFICATES SHOWING COMPLIANCE WITH CSA A3001.

F. BRAND, TYPE, PRODUCERS, MANUFACTURER'S TECHNICAL DATA SHEETS, AND CERTIFICATION DATA OF ALL ADMIXTURES TO BE USED.

G. SOURCE OF SUPPLY OF MIXING WATER AND ICE.

H. 28-DAY COMPRESSIVE STRENGTH TEST RESULTS OF TRIAL MIXES SHALL DEMONSTRATE SUFFICIENT MARGIN IN EXCESS OF THE SPECIFIED DESIGN STRENGTH TO ENSURE PROJECT FIELD CONDITIONS WILL NOT PREVENT THE CONCRETE FROM REACHING THE SPECIFIED DESIGN STRENGTH.

I. SLUMP TESTED ACCORDING TO CSA A23.2-5C AND SHALL BE WITHIN 19 mm OF THE MAXIMUM SPECIFIED.

J. AIR CONTENT TESTED ACCORDING TO CSA A23.2-4C OR A23.2-7C AND SHALL BE WITHIN 0.5% OF THE REQUIRED AVERAGE AIR CONTENT.

K. TEMPERATURE TESTED ACCORDING TO CSA A23.2-17C AND SHALL BE WITHIN 6 °C OF THE INTENDED MAXIMUM TEMPERATURE OF THE CONCRETE AS MIXED AND DELIVERED.

L. SHRINKAGE TEST RESULTS (IF AVAILABLE).

M. STANDARD DEVIATION VALUE FOR CONCRETE PRODUCTION FACILITY (IF AVAILABLE).

RS-3 WHEN THE PROJECT SITE IS EXPECTED TO ENDURE TEMPERATURES BELOW 0 °C, SUBMIT A COLD WEATHER CONCRETING PROCEDURE TO BE APPROVED BY THE PROJECT STRUCTURAL ENGINEER.

A. SUBMIT PROPOSED METHOD OF MEASURING CONCRETE SURFACE TEMPERATURE.

RS-4 SUBMIT A HOT WEATHER CONCRETING PROCEDURE TO BE APPROVED BY THE PROJECT STRUCTURAL ENGINEER.

A. SUBMIT PROPOSED METHOD OF MEASURING CONCRETE SURFACE TEMPERATURE.

RS-5 SUBMIT A WET WEATHER CONCRETING PROCEDURE TO BE APPROVED BY THE PROJECT STRUCTURAL ENGINEER.

RS-6 PRODUCT TECHNICAL DATA INCLUDING:

- A. ACKNOWLEDGMENT THAT PRODUCT SUBMITTED MEETS THE REQUIREMENTS OF THE STANDARD REFERENCED.
B. MANUFACTURER'S INSTALLATION INSTRUCTIONS.

RS-7 REINFORCING STEEL:

A. SUBMIT STEEL REINFORCEMENT MILL CERTIFICATES WITH PLANT CERTIFICATION.

B. SHOP DRAWINGS SHALL SHOW GRADE, SIZES, NUMBER, CONFIGURATION, SPACING, LOCATION, AND ALL FABRICATION AND PLACEMENT DETAILS. PLACEMENT DETAILS SHALL INCLUDE INSTALLATION OF TOP REINFORCING MAT AROUND ANCHOR BOLT CAGE.

C. SUBMIT A LIST OF SPLICES AND REQUEST TO USE SPLICES NOT INDICATED ON THESE DESIGN DRAWINGS.

D. SUBMIT REQUEST AND PROCEDURE TO FIELD BEND OR STRAIGHTEN REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE.

E. SHOP DRAWINGS SHALL PROVIDE SUFFICIENT DETAIL TO PERMIT INSTALLATION OF REINFORCEMENT WITHOUT REFERENCING THE CONTRACT DRAWINGS.

F. SUBMIT A REQUEST TO RELOCATE ANY REINFORCEMENT THAT EXCEEDS SPECIFIED PLACEMENT TOLERANCES.

G. OBTAIN APPROVAL OF SHOP DRAWINGS BY STRUCTURAL ENGINEER BEFORE FABRICATION.

RS-8 ANCHOR BOLTS:

A. SUBMIT ANCHOR BOLTS AND ASSOCIATED HARDWARE FOR APPROVAL.

B. SUBMIT MILL CERTIFICATES FOR ANCHOR BOLTS INDICATING YIELD AND ULTIMATE STRENGTHS.

C. SUBMIT A POST-TENSIONING PROCEDURE FOR APPROVAL. PROCEDURE SHALL INCLUDE THE POST-TENSIONING METHOD TO BE USED, AND DEFINED SEQUENCE OF POST-TENSIONING BOLTS. PROCEDURE SUBMITTED SHALL PROVIDE NECESSARY ACCURACY TO MEET POST-TENSION TOLERANCES DEFINED ON THESE DRAWING.

1. TENSION THE ANCHOR BOLTS USING HYDRAULIC JACKS EQUIPPED WITH A PRESSURE GAUGE CALIBRATED TO THE JACK WITHIN AN ACCURACY OR PLUS OR MINUS 2%.

2. CALIBRATE THE GAUGE OR DYNAMOMETER IMMEDIATELY BEFORE USE ON PROJECT.

3. THE PRESSURE GAUGE SHALL HAVE GRADUATIONS NO LARGER THAN 700 kPa.

4. JACKING FORCE REQUIRED TO PRODUCE THE PRESTRESSING FORCE AND CALCULATED ELONGATION SHALL BE STATED IN POST-TENSIONING PROCEDURE.

5. DURING POST-TENSIONING, VISUALLY VERIFY THAT THE PRESTRESSING FORCE IS ADEQUATE BY COMPARING THE MEASURED ELONGATIONS TO THE CALCULATED ELONGATIONS WITHIN 1.5 mm.

D. SUBMIT A CALIBRATION PROCEDURE AND TESTING PROCEDURE PROPOSED FOR APPROVAL.

E. SUBMIT ANCHOR BOLT TEST DATA SHOWING TENSION VALUES. A MINIMUM OF SIX (6) ANCHOR BOLTS SHALL BE TESTED.

RS-9 EMBEDMENT PLATE:

A. SUBMIT MILL CERTIFICATES FOR EMBEDMENT PLATE INDICATING THE MINIMUM YIELD STRENGTH OF THE MATERIALS.

B. SHOW WELD OR SPLICE DETAIL FOR CONNECTING PLATE SEGMENTS.

RS-10 TEMPLATE PLATE: REFER TO NOTES ON EMBEDMENT RING DETAIL.

RS-11 SUBMIT A GROUT PRODUCT TO BE APPROVED BY PROJECT ENGINEER.

RS-12 SUBMIT A GROUTING PROCEDURE TO BE APPROVED BY THE STRUCTURAL ENGINEER.

RS-13 SUBMIT TECHNICAL DATA SHEET OF JOINT SEALANT PRODUCT TO BE USED FOR SEALING THE JOINT BETWEEN THE GROUT AND THE TOWER FLANGE.

CWE Consultants, ULC
1050 Britannia Road East, Unit 24
Mississauga, ON L4W4N9, Canada
Phone (289) 742-0035
www.CWEconsultants.com

BOREA CONSTRUCTION
JERICHO WIND PROJECT
LAMBTON COUNTY, ONTARIO, CANADA
SPECIFICATIONS SHEET 2

GE 1.6-100 NAMTS 79.7m HH
IEC TC IIIB GE 48.7 CWE/STW
WIND TURBINE

Table with 2 columns: ISSUED FOR CONSTRUCTION, DESCRIPTION. Includes rows for DESIGNED BY, CHECKED BY, PROJECT #, FILENAME, SCALE, SHEET, and REV.

Table with 2 columns: DATE, REV. Includes rows for 12/6/2013, 0, and 12/6/2013.

Table with 2 columns: SHEET, REV. Includes rows for S-11 and 0.



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C:\PROJECTS\BOREA CONSTRUCTION\6-PACK PROJECT\JERICHO WIND PROJECT (CANADA, GE 1.6-100 80M HH)\DRAWINGS\AUTOCAD\JERICHO DRAWING SET.DWG

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RS-14 THE STRUCTURAL ENGINEER REVIEW OF THE SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF THE ACCURACY CONTAINED WITHIN EVERY DOCUMENT SUBMITTED.

RS-15 A SPECIFICATION OF THE INTENDED STRUCTURAL BACKFILL MATERIAL SHALL BE SUBMITTED TO THE GEOTECHNICAL ENGINEER OF RECORD FOR REVIEW AND APPROVAL.

INSTALLATION TOLERANCES:

ALL CONCRETE CONSTRUCTION TOLERANCES SHALL CONFORM TO ALL REQUIREMENTS OF CSA A23.1 AND CSA A23.4, EXCEPT AS MODIFIED BY THESE DESIGN DRAWINGS.

IT-1 OVERALL BASE HEIGHT AND BASE TOP REINFORCEMENT TOLERANCE: +25 mm, -12 mm.

IT-2 TEMPLATE AND EMBEDMENT RING LOCATION IN PLAN: +/- 12 mm.

IT-3 CLEAR COVER TOLERANCES: +/- 12 mm.

IT-4 EMBEDMENT RING ELEVATION DIMENSION FROM SUBGRADE (OR MUDMAT): +/- 12 mm.

IT-5 PEDESTAL DIAMETER: -12 mm, +50 mm.

IT-6 BASE DIAMETER: -25 mm, +75 mm.

IT-7 ANCHOR BOLT PLUMBNESS TOLERANCE: 1/4 DEGREE MAXIMUM.

TESTING/INSPECTION REQUIREMENTS:

TI-1 CONTRACTOR SHALL HIRE QUALIFIED TESTING AGENCY TO PERFORM TESTING ON SOILS, CONCRETE AND GROUT AS SPECIFIED IN THIS DESIGN DOCUMENT.

TI-2 CONTRACTOR SHALL SUBMIT ALL TESTING DATA TO ENGINEER AT END OF PROJECT. STRUCTURAL ENGINEER SHALL BE CONTACTED IN WRITING IF ANY OF THE TESTS PERFORMED DO NOT MEET THE SPECIFICATION OF THIS DOCUMENT.

TI-3 CONCRETE TESTING SHALL BE PERFORMED RANDOMLY AND IN ACCORDANCE WITH THE FOLLOWING:

A. OBTAIN CONCRETE SAMPLES IN ACCORDANCE WITH CSA A23.2-3C. OBTAIN AT LEAST ONE (1) COMPOSITE SAMPLE FOR EACH 100 CU. METERS IN THE BASE AND A MINIMUM OF ONE SAMPLE FOR EACH PEDESTAL.

B. DETERMINE SLUMP OF EACH COMPOSITE SAMPLE TAKEN IN ACCORDANCE WITH CSA A23.2-5C.

C. DETERMINE TEMPERATURE OF EACH COMPOSITE SAMPLE TAKEN IN ACCORDANCE WITH CSA A23.2-17C.

D. DETERMINE AIR CONTENT OF EACH COMPOSITE SAMPLE USING CSA A23.2-4C OR CSA A23.2-7C.

E. TESTING AGENCY SHALL PERFORM CONCRETE COMPRESSIVE STRENGTH TESTS ACCORDING TO CSA A23.2-9C.

1. IF 100 mm X 200 mm OR 150 mm X 300 mm CYLINDERS ARE BEING USED, CONCRETE CYLINDERS SHALL BE TESTED AT THE FOLLOWING TIME INTERVALS:

i. ONE (1) AT 3-DAYS.

ii. ONE (1) AT 7-DAYS.

iii. TWO (2) AT 14-DAYS.

iv. TWO (2) AT 28-DAYS.

v. TWO (2) SPARE CYLINDERS (TO BE TESTED ONLY IF NEEDED).

2. TESTING AGENCY SHALL PROVIDE AIR AND SLUMP TESTING FOR FIRST THREE (3) TRUCKLOADS DELIVERED EACH DAY TO ENSURE BATCH PLANT CONCRETE IS WITHIN THESE SPECIFICATIONS.

F. THE STRENGTH LEVEL OF CONCRETE WILL BE CONSIDERED SATISFACTORY WHEN:

1. THE AVERAGES OF ALL SETS OF THREE CONSECUTIVE COMPRESSIVE STRENGTH TEST RESULTS MOLDED AND CURED IN ACCORDANCE WITH THE REQUIREMENTS OF CSA A23.2-9C EQUAL OR EXCEED F'C.

2. NO INDIVIDUAL STRENGTH TEST RESULT FALLS BELOW F'C BY MORE THAN 3.5 MPa WHEN F'C IS 35 MPa OR LESS, OR BY MORE THAN 0.10F'C WHEN F'C IS MORE THAN 35 MPa.

H. THERE IS NO TESTING REQUIREMENT FOR THE LEAN (MUD MAT) CONCRETE.

TI-4 GROUT TESTING SHALL BE PERFORMED ACCORDING TO THE FOLLOWING:

A. FOR EPOXY GROUTS, COMPRESSIVE STRENGTH SHALL BE TESTED IN ACCORDANCE WITH ASTM C579.

B. FOR CEMENT-BASED GROUTS, COMPRESSIVE STRENGTH SHALL BE TESTED IN ACCORDANCE WITH CSA A23.2-1B.

C. TESTING AGENCY SHALL SAMPLE GROUT FOR COMPRESSIVE STRENGTH TESTS ACCORDING TO CSA A23.2-1B EXCEPT AS MODIFIED IN THIS SECTION. GROUT CUBES SHALL BE TESTED AT THE FOLLOWING TIME INTERVALS:

1. WHEN A CEMENT-BASED GROUT IS USED:

i. ONE (1) MIN. PRIOR TO ANCHOR BOLT POST-TENSIONING.

ii. ONE (1) MIN. PRIOR TO ERECTION OF NACELLE AND ROTOR.

iii. THREE (3) MIN. PRIOR TO TURBINE OPERATION.

iv. THREE (3) MIN. SPARE CUBES (TO BE TESTED ONLY IF NEEDED).

2. WHEN AN EPOXY-BASED GROUT IS USED:

i. THREE (3) MIN. TO BE TESTED AT INTERVALS DETERMINED AT THE CONTRACTOR'S DISCRETION PRIOR TO ANCHOR BOLT POST-TENSIONING AND ERECTION OF NACELLE AND ROTOR.

ii. SIX (6) MIN. PRIOR TO TURBINE OPERATION, BUT TESTED NO SOONER THAN SEVEN (7) DAYS AFTER GROUT PLACEMENT.

iii. SIX (6) MIN. SPARE CUBES (TO BE TESTED ONLY IF NEEDED), BUT TESTED NO SOONER THAN SEVEN (7) DAYS AFTER GROUT PLACEMENT.

3. GROUT CUBES MUST ACHIEVE THE STRENGTH SPECIFIED IN THESE DRAWINGS PRIOR TO THESE ERECTION STEPS.

TI-5 AT ANY LOCATION WHERE STRUCTURAL BACKFILL IS REQUIRED UNDER THE FOUNDATION, THE TESTING AGENCY SHALL TEST COMPACTION PERCENT AND MOISTURE CONTENT AT EACH LIFT IN ACCORDANCE WITH THESE DRAWING SPECIFICATIONS.

ANCHOR BOLT POST-TENSION MAINTENANCE (BY OWNER):

AB-1 THE FOLLOWING ON-GOING ANCHOR BOLT POST-TENSION MAINTENANCE SCHEDULE AND PROCEDURE SHALL BE FOLLOWED:

A. RANDOMLY CHECK THE POST-TENSION ON 10% OF THE BOLTS ON EACH TURBINE FOUNDATION; CHECK AN EQUAL NUMBER OF BOLTS ON THE INSIDE AND OUTSIDE OF THE TOWER. THE ANCHOR BOLT POST-TENSION VALUES AT EACH TURBINE FOUNDATION SHALL BE CHECKED AT THE FOLLOWING INTERVALS:

1. SIX (6) MONTHS AFTER TURBINE OPERATION BEGINS.

2. YEARS 1-5: ANNUALLY.

3. OVER 5 YEARS: EVERY 2 YEARS.

B. PASSING IS ACHIEVED WHEN ALL POST-TENSION VALUES ON THE ANCHOR BOLTS EXCEED 90% OF THE ORIGINAL POST-TENSION VALUE. A HYDRAULIC JACK SHALL BE USED TO PULL EACH OF THE SELECTED ANCHOR BOLTS TO THE 90% VALUE. WHEN PULLING BOLTS TO THIS POST-TENSION, THERE SHALL BE NO GAPS BETWEEN THE NUTS AND WASHERS, AND THE NUT SHALL NOT BE ABLE TO BE TURNED BY HAND. IF ANY INDIVIDUAL BOLT PER TURBINE FAILS BY LIFTING OFF THE WASHER AND ALLOWING THE NUT TO BE TURNED BY HAND, THE REMAINING 90% OF BOLTS ON THAT PARTICULAR TURBINE FOUNDATION SHALL BE CHECKED. IF THE 90% POST-TENSION VALUE IS NOT MET ON ANY PARTICULAR BOLT, THAT FAILING BOLT SHALL BE POST-TENSIONED TO 100% OF THE ORIGINAL REQUIRED POST-TENSION.

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C:\PROJECTS\BOREA CONSTRUCTION\6-PACK PROJECT\JERICHO WIND PROJECT (CANADA, GE 1.6-100 80M HH)\DRAWINGS\AUTOCAD\JERICHO DRAWING SET.DWG

CWE Consultants, ULC

1050 Britannia Road East, Unit 24
Mississauga, ON L4W4N9, Canada
Phone (289) 742-0035
www.CWEconsultants.com

BOREA CONSTRUCTION
JERICHO WIND PROJECT
LAMBTON COUNTY,
ONTARIO, CANADA

GE 1.6-100 NAMTS 79.7m HH
IEC TC IIIB GE 48.7 CWE/STW
WIND TURBINE
SPECIFICATIONS SHEET 3

REV.	DATE	ISSUED FOR CONSTRUCTION	DESCRIPTION
0	12/6/2013		

DESIGNED BY L ZHOU
CHECKED BY G WU

PROJECT # 130107



FILENAME:
JERICHO DRAWING SET

SCALE: AS SHOWN

SHEET S-12
REV. 0

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TURBINE ID	EASTING (m)	NORTHING (m)	ANTICIPATED NET SLS BEARING CAPACITY (kPa)	ANTICIPATED FACTORED NET ULS BEARING CAPACITY (kPa)	DISTANCE TO RAISE TURBINE FOUNDATION BEARING ELEVATION (m), SEE NOTE 2	18300 mm DIAMETER FOUNDATION	18750 mm DIAMETER FOUNDATION	19050 mm DIAMETER FOUNDATION	COMMENTS
1	422934	4782626	225	385	0.99			X	
2	425395	4782628	215	325	0.00			X	
3	425072	4782306	180	275	0.01			X	SEE NOTE 3
4	426390	4782888	-	2,000	0.00			X	
6	427880	4783009	375	525	0.00			X	
7	429900	4783065						X	
8	431218	4782647	105	170	1.17			X	DEEP FOUNDATION REQUIRED, SITE ON HOLD, SEE NOTE 3
9	432948	4782666	105	160	0.55			X	SEE NOTE 3
10	432980	4782332	95	160	0.61			X	POTENTIAL OVEREXCAVATION REQUIRED, SEE NOTES 1 AND 3
11	423300	4781540	170	250	0.00			X	
12	423455	4781110	235	350	0.00			X	
13	425096	4781354	215	325	0.00			X	
14	425407	4780588	200	300	0.00			X	
15	425432	4779689	200	300	0.00			X	
16	425427	4779324	235	350	0.00			X	
17	425438	4779000	220	325	0.00			X	
18	424671	4777622	200	300	0.00			X	
19	426319	4781538	300	450	0.00			X	SEE NOTE 3
20	427625	4781512	340	500	0.00			X	
21	426904	4779457	270	400	0.00			X	
22	427490	4779351	235	350	0.00			X	SEE NOTE 3
23	426912	4779123	300	450	0.00			X	
24	427496	4778951	335	500	0.00			X	SEE NOTE 3
25	426702	4778723	315	475	0.48			X	SEE NOTE 3
26	426793	4777497	255	385	0.00			X	SEE NOTE 3
27	429702	4781114	335	500	0.00			X	SEE NOTE 3
28	428834	4780429	-	2,500	0.00			X	
29	429082	4779472	300	425	0.00			X	
30	428966	4779176	270	400	0.00			X	SEE NOTE 3
32	432946	4780524	90	150	0.50			X	
33	433468	4780620						X	TURBINE LOCATION REMOVED
34	433305	4778809	185	275	0.00			X	
35	423023	4774153	200	300	0.70			X	
36	423163	4773804	190	285	0.00			X	
37	422709	4773370	200	300	0.00			X	
38	422315	4772336	135	200	0.00			X	
39	424752	4775510	160	240	0.00			X	
40	424739	4774511	220	325	0.00			X	
41	425265	4774348	155	230	0.00			X	
42	425195	4773894	170	260	0.00			X	
43	424568	4773358	200	300	0.00			X	
44	425250	4771778	135	200	0.00			X	
45	427315	4775969	135	200	0.00			X	
46	427344	4775093	325	490	1.07			X	SEE NOTE 3
47	427230	4774277	190	275	0.00			X	
48	426991	4773869	140	225	0.00			X	
49	426878	4773491	220	325	0.57			X	
50	426937	4773188	220	330	0.62			X	
51	426974	4772870	200	300	0.00			X	
52	426800	4772226	190	280	0.00			X	
53	426701	4771707	200	300	0.00			X	
54	427078	4771459	135	200	0.00			X	
56	429249	4775281	135	200	0.00			X	
57	429070	4774660	160	240	0.00			X	
58	428800	4774175	240	360	0.07			X	SEE NOTE 3
59	429249	4773282	175	300	1.98			X	POTENTIAL OVEREXCAVATION REQUIRED, SEE NOTES 1 AND 3
60	428729	4772001	200	300	0.00			X	
61	428870	4771602	190	285	0.00			X	
62	428396	4771388	200	300	0.00			X	
63	429171	4771190	200	300	0.00			X	
64	429434	4770999	185	275	0.00			X	
65	431622	4776681	175	260	0.00			X	
66	430977	4775907	240	360	0.00			X	
67	431368	4775755	285	425	0.00			X	
68	430927	4775519	300	450	0.00			X	
69	431033	4775239	135	200	0.00			X	
70	431153	4774338	150	225	0.00			X	
71	431413	4773975	285	425	0.00			X	
72	431241	4773292	250	375	0.00			X	
73	431190	4771673	165	250	0.00			X	
74	431458	4771501	200	300	0.00			X	
75	430375	4770394	150	225	0.00			X	
76	430783	4770250	200	300	0.00			X	
78	433148	4776918	210	320	0.00			X	
79	433468	4776776	230	345	0.00			X	
80	433011	4775171	270	400	0.00			X	
81	433464	4775119	285	425	0.00			X	
82	433893	4775152	285	425	0.00			X	
83	433198	4773791	270	400	0.00			X	
84	433120	4773447	200	300	0.00			X	
85	433574	4773553	335	500	0.00			X	
86	432842	4771321	165	260	0.00			X	
88	423333	4771025	175	260	0.00			X	
89	423570	4770500	185	275	0.00			X	
90	424258	4770677	200	300	0.00			X	
91	425041	4770310	135	230	0.00			X	
92	425439	4770368	200	300	0.00			X	
94	430779	4768868	150	275	0.00			X	
96	423842	4769183	200	300	0.57			X	
97	423840	4768848	185	280	0.79			X	
102	433049	4766446	350	525	0.00			X	
103	433371	4766165	300	450	0.00			X	
104	423276	4765200	135	230	0.90			X	
105	421483	4763567	180	270	0.26			X	
106	426830	4763362	175	260	0.00			X	
107	433424	4776577	185	300	0.00			X	
108	432869	4771130	210	325	0.00			X	
109	429142	4769404	170	260	0.00			X	
112	429214	4773348	200	325	0.00			X	SEE NOTE 3
TOTAL						0	1	96	97

NOTES:

- REFER TO THE GEOTECHNICAL DATA SPECIFICATION SECTION ON SHEET S-7 FOR EXCAVATION, SUBGRADE PREPARATION, AND BACKFILL REQUIREMENTS FOR THE TURBINE FOUNDATIONS.
- MOUND SOIL OF A DEPTH EQUAL TO THE AMOUNT THE FOUNDATION WAS RAISED OVER THE ENTIRE FOOTPRINT OF THE TURBINE FOUNDATION IN ORDER TO MAINTAIN THE MINIMUM SPECIFIED BACKFILL DEPTH AND SLOPE AT THE FOUNDATION EDGE AS SHOWN ON SHEETS S-2, S-5, AND S-8.
- THESE DESIGNATED TURBINES ARE LOCATED WITHIN ABCA FLOODPLAIN AND MUST HAVE ADEQUATE SCOUR PROTECTION TO PREVENT EROSION OF THE BACKFILL MATERIAL. REFER TO THE 4/30/2014 VERSION OF THE CWE SCOUR ANALYSIS AND PROTECTION REPORT FOR DETAILED SCOUR PROTECTION PLAN.

CWE Consultants, ULC

1050 Britannia Road East, Unit 24
Mississauga, ON L4W4N9, Canada
Phone (289) 742-0035
www.CWEconsultants.com

BOREA CONSTRUCTION
JERICHO WIND PROJECT
LAMBTON COUNTY,
ONTARIO, CANADA

GE 1.6-100 NAMTS 79.7m HH
IEC TC IIB GE 48.7 CWE/STW
WIND TURBINE
TURBINE LOCATIONS AND SIZED
TABLE

REV.	DATE	DESCRIPTION
4	4/30/2014	REVISION
3	3/26/2014	REVISION
2	2/20/2014	REVISION
1	1/16/2014	REVISION
0	12/6/2013	ISSUED FOR CONSTRUCTION

DESIGNED BY L ZHOU
CHECKED BY G WU

PROJECT # 130107

FILENAME:
JERICHO DRAWING SET

SCALE: AS SHOWN

SHEET S-13
REV. 4



CWE CERTIFIES THAT:

- THE FOUNDATION DESIGN HAS TAKEN INTO ACCOUNT REGULATORY FLOOD (VELOCITY AND DEPTH OF FLOW) AND SITE (SOIL TYPE, BEARING CAPACITY ETC.) CONDITIONS ENCOUNTERED AT THE SPECIFIC LOCATION OF THE TURBINE AS PER THE JERICHO WIND ENERGY CENTRE FLOODPLAIN ANALYSIS, AECOM 2014;
- THE FOUNDATIONS ARE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURES AND/OR IMPACT LOADING THAT WOULD DEVELOP UNDER WATER LEVELS EQUIVALENT TO THE REGULATORY STORM IDENTIFIED IN THE JERICHO WIND ENERGY CENTRE FLOODPLAIN ANALYSIS, AECOM 2014; AND,
- ALL OPERATION AND MAINTENANCE REQUIREMENTS TO BE MET IN ORDER TO ENSURE THE EFFECTIVE PERFORMANCE OF THE FLOOD PROOFING MEASURES OVER THE DESIGN LIFE OF THE STRUCTURE HAVE BEEN IDENTIFIED.

4/30/2014 5:11:23 PM