

SUBMITTALS

1. SUBMIT GRAIN SIZE ANALYSIS, NATURAL MOISTURE CONTENT AND STANDARD PROCTOR DRY DENSITY TEST DATA FOR COMMON FILL MATERIALS AND SUBBASE SOIL MATERIALS.
2. SUBMIT COMPACTION TEST RESULTS FOR ALL FILL SOIL PLACED AND INDICATE LOCATION OF TEST, DRY DENSITY AND MOISTURE CONTENT OF FILL.
3. SUBMIT CONCRETE MIX DESIGN TWO WEEKS PRIOR TO PLACEMENT OF CONCRETE. MIX DESIGN SHALL BE CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER.
4. SUBMIT MANUFACTURER'S PRODUCT DATA FOR ALL CONCRETE ADMIXTURES, GGBFS, AND CURING MEMBRANE.
5. SUBMIT MILL REPORTS FOR ALL REINFORCING STEEL.
6. SUBMIT CONCRETE CYLINDER TEST RESULTS.
7. SUBMIT PRODUCT DATA FOR ALL ANCHORS, HEAVY HEX NUTS, AND HARDENED STEEL WASHERS.
8. SUBMIT MILL CERTIFICATES FOR THE EMBEDDED STEEL RING.
9. SUBMIT CALIBRATION CERTIFICATION FOR DIRECT TENSIONING CENTER HOLE HYDRAULIC JACK. CERTIFICATION SHALL NOT BE DATED MORE THAN 60 DAYS PRIOR TO START OF TENSIONING PROCEDURES.
10. SUBMIT TENSION TEST DATA FOR ANCHOR BOLTS THAT WERE TESTED. TEST DATA SHALL INDICATE BOLT TENSION AND LOCATION OF BOLT
11. SUBMIT A MANUFACTURER'S PRODUCT DATA SHEET FOR GROUT.
12. A MINIMUM OF (4) COPIES OF THE ABOVE NOTED ITEMS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW. THE PURPOSE OF THE REVIEW WILL BE TO VERIFY CONFORMANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE REVIEW DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY OF ERRORS IN THE SUBMITTED DOCUMENTS.

TESTING AND INSPECTION REQUIREMENTS

1. PERFORM GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMIT ON FINES, AND PROCTOR TESTS ON SUBGRADE SOIL.
2. PERFORM A MINIMUM OF (4) COMPACTION TESTS ON SUBGRADE SOIL AND FILLS. SUBMITTED TESTS SHALL INDICATE DRY DENSITY, MOISTURE CONTENT AND PERCENT STANDARD PROCTOR MAXIMUM DRY DENSITY.
3. PERFORM 3, 7, 14, 21, AND 28-DAY LABORATORY STRENGTH TESTS ON CONCRETE. A MINIMUM OF (7) CYLINDERS SHALL BE CAST. REMAINING CYLINDERS WILL BE USED FOR BACK UP TESTS IF NEEDED.
4. PERFORM A MINIMUM OF (1) SLUMP TEST PER CONCRETE TRUCK.
5. PERFORM TENSION TESTS ON A MINIMUM OF 10% OF THE ANCHOR BOLTS USING A CENTER HOLE HYDRAULIC JACK.
6. PERFORM LABORATORY STRENGTH TEST ON NON-SHRINK GROUT. TEST SHALL BE PERFORMED BEFORE UPPER TOWER SECTIONS ARE SET.
7. SUBMIT A LIST OF TESTING AND INSPECTION COMPANIES TO BE USED ON THE PROJECT.
8. SUBMIT (4) COPIES OF THE TESTING AND INSPECTION RECORDS TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW OF CONFORMANCE WITH THE DRAWINGS AND SPECIFICATIONS.

ANCHOR BOLTS AND EMBEDMENT RING

1. ANCHOR BOLTS SHALL BE WILLIAMS ALL-THREAD GRADE 75 OR AN APPROVED EQUAL WITH HEAVY HEX NUTS.
2. ANCHOR BOLT SLEEVES SHALL BE PVC PIPE CLASS 125.
3. HARDENED STEEL WASHERS CONFORMING TO ASTN F436 SHALL BE PROVIDED UNDER ALL HEAVY HEX NUTS.
4. THE EMBEDDED RING AND TEMPLATE PLATE SHALL CONFORM TO ASTM A36. THE EMBEDDED RING SHALL BE ZINC-COATED IN ACCORDANCE WITH ASTM A-123 GRADE 100.
5. ANCHOR BOLTS SHALL BE PLACED IN PLAN WITHIN 1.5 MM OF SPECIFIED LOCATION AND SHALL BE PLUMB WITHIN 1/4 ONE DEGREE.
6. A TEMPLATE RING SHALL BE USED TO SET THE ANCHOR BOLTS AND INSURE THAT THE ANCHOR BOLTS ARE WITHIN TOLERANCE.
7. TEMPLATE AND EMBEDDED RING SHALL BE PLACED WITHIN 5 MM OF SPECIFIED LOCATION AND SHALL BE LEVEL TO WITHIN 1.5 MM.
8. ANCHOR BOLTS SHALL BE ADEQUATELY SECURED TO PREVENT MOVEMENT DURING PLACEMENT OF CONCRETE.
9. SEAL TOP OF PVC SLEEVE WITH POLYURETHANE SEALANT AROUND ANCHOR BOLT TO PREVENT WATER FROM ENTERING PVC SLEEVE PRIOR TO PLACEMENT OF GROUT.
10. ANCHOR BOLTS SHALL BE TENSIONED TO 420 KN AFTER SETTING THE LOWER TOWER SECTION. TENSIONING OF BOLTS SHALL BE DONE WITH A DIRECT TENSIONING CENTER HOLE HYDRAULIC JACK.
11. SEE THE TESTING AND INSPECTION SECTION FOR ANCHOR BOLT TENSION TEST REQUIREMENTS.

EXCAVATION AND BACKFILL

1. LEAN CONCRETE SHALL BE ASTM C150 TYPE II CEMENT WITH A 28-DAY STRENGTH OF 20MPA MINIMUM.
2. FILL SHALL BE WELL GRADED NATURAL SAND AND GRAVEL, FREE OF DELETERIOUS MATERIAL, ORGANIC MATTER OR PLASTIC FINES.
3. SCRAPE THE TOPSOIL FROM THE FOUNDATION AREA AND STORE ON SITE FOR FUTURE USE, SITE RESTORATION, OR FOR FILL MATERIAL IF SUITABLE.
4. EXCAVATE SOIL TO THE LIMITS OF EXCAVATION AS REQUIRED BY THE GEOTECHNICAL REPORT FOR THE PROJECT SITE.
5. IF NECESSARY, PROVIDE MOISTURE CONDITIONING FOR VERY DRY SOILS OR DEWATERING FOR OVERLY MOIST SOILS. WHERE DEWATERING IS REQUIRED, CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE GEOTECHNICAL ENGINEER.
6. OVER EXCAVATED SOIL SHALL BE REPLACED AND COMPACTED IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION REPORT FOR THE PROJECT SITE.
7. DO NOT PROCEED WITH ANY ADDITIONAL WORK UNTIL GEOTECHNICAL ENGINEER HAS REVIEWED THE EXCAVATION AND GIVEN APPROVAL TO PROCEED.
8. LEAN CONCRETE OR GRAVEL SUBBASE (AS INDICATED ON FOUNDATION DRAWINGS) SHALL BE PLACED. GRAVEL SUBBASE SHALL BE COMPACTED IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION REPORT.
9. PLACE BACKFILL MATERIAL AFTER FOOTING IS COMPLETE AND CONCRETE HAS ADEQUATELY CURED. COMPACT BACKFILL MATERIAL AS REQUIRED TO OBTAIN THE MINIMUM IN-SITU DENSITIES AS SHOWN ON THE FOUNDATION DRAWINGS. GRADE THE SITE IN ACCORDANCE WITH THE OWNER'S REQUIREMENTS. MINIMUM FILL THICKNESSES OVER THE FOUNDATION SHALL BE MAINTAINED.
- 10.

CONCRETE ACCESSORIES

1. THE FLOOR DRAIN PIPE SHALL BE 100 MM Ø SCHEDULE 40 PVC PIPE WITH A PLASTIC DRAIN GRATE.
2. GROUNDING GRIDS AND ELECTRICAL CONDUIT SHALL BE PLACED IN ACCORDANCE WITH VESTAS ELECTRICAL REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE LOCATION OF MISCELLANEOUS CONCRETE EMBEDMENTS PRIOR TO POURING CONCRETE. EMBEDMENTS SHALL BE PROPERLY SECURED TO PREVENT MOVEMENT DURING PLACEMENT OF CONCRETE.

CONCRETE AND REINFORCING STEEL

1. IF CAST-IN-PLACE CONCRETE WILL BE SUBJECT TO SEA BORNE CONDITIONS, IT SHALL BE DESIGNED, MIXED, TESTED AND PLACED SUCH THAT THE EFFECTS OF THE SEA BORNE CONDITIONS ARE MINIMIZED.
2. CONCRETE CONSTRUCTION SHALL BE IN CONFORMANCE WITH ACI 318-02 AND ALL APPLICABLE LOCAL BUILDING CODES.
3. SPECIFIED CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39.
4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. CEMENT SHALL CONFORM TO ASTM C150, TYPE II WITH A MODERATE SULFATE RESISTANCE.
5. THE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE 35 MPA
6. MINIMUM CEMENTICIOUS MATERIAL CONTENT SHALL BE 285 KG PER CUBIC YARD OF CONCRETE.
7. AGGREGATE SHALL CONFORM TO THE REQUIREMENTS OF ASTM C33 WITH A MAXIMUM SIZE OF 40 MM.
8. WATER REDUCING ADMIXTURES AND SUPERPLASTISIZERS MAY BE USED AS REQUIRED TO OBTAIN THE DESIRED PERFORMANCE. USE SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS. MAXIMUM WATER CEMENT RATIO SHALL BE 0.40.
9. PROVIDE CHAIRS AND STANDEES AS NECESSARY TO SUPPORT REBAR AND PREVENT MOVEMENT OF REBAR DURING PLACEMENT OF CONCRETE.
10. REINFORCEMENT SHALL BE PLACED AT LOCATIONS SPECIFIED WITHIN DIMENSIONAL TOLERANCES OF ACI 318-02
11. PLACE CONCRETE IN ACCORDANCE WITH ACI 318-02. SUCCESSIVE LIFTS (AS REQ'D) SHALL BE PLACED AS QUICKLY AS POSSIBLE TO INSURE PROPER CONSOLIDATION OF CONCRETE LAYERS.
12. CONCRETE SHALL BE CONSOLIDATED IN ACCORDANCE WITH ACI 318-02 TO PREVENT THE FORMATION OF JOINTS, HONEYCOMBS AND VOIDS
13. CONCRETE SHALL BE CURED IN ACCORDANCE WITH ACI 318-02. CURING MEMBRANES MEETING ASTM C-309, TYPE 1, CLASS A MAY BE USED. APPLY MEMBRANE AS SOON AS BLEEDING HAS STOPPED AND FREE WATER IS GONE FROM THE SURFACE OF THE CONCRETE.

NON-SHRINK GROUT

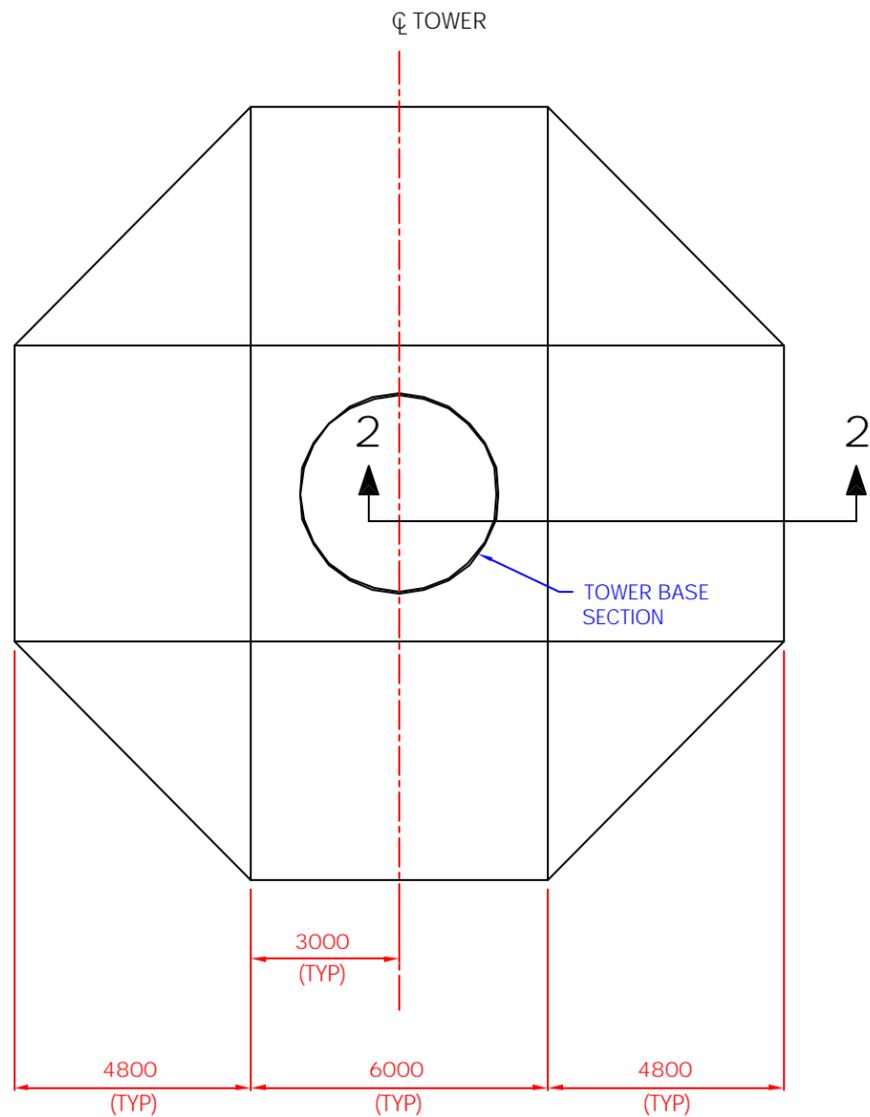
1. GROUT SHALL CONFORM TO ASTM C-1107, GRADE C WITH A MINIMUM 1 DAY STRENGTH OF 35 MPA.
2. GROUT SHALL BE MIXED, PLACED AND CURED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

GENERAL NOTES

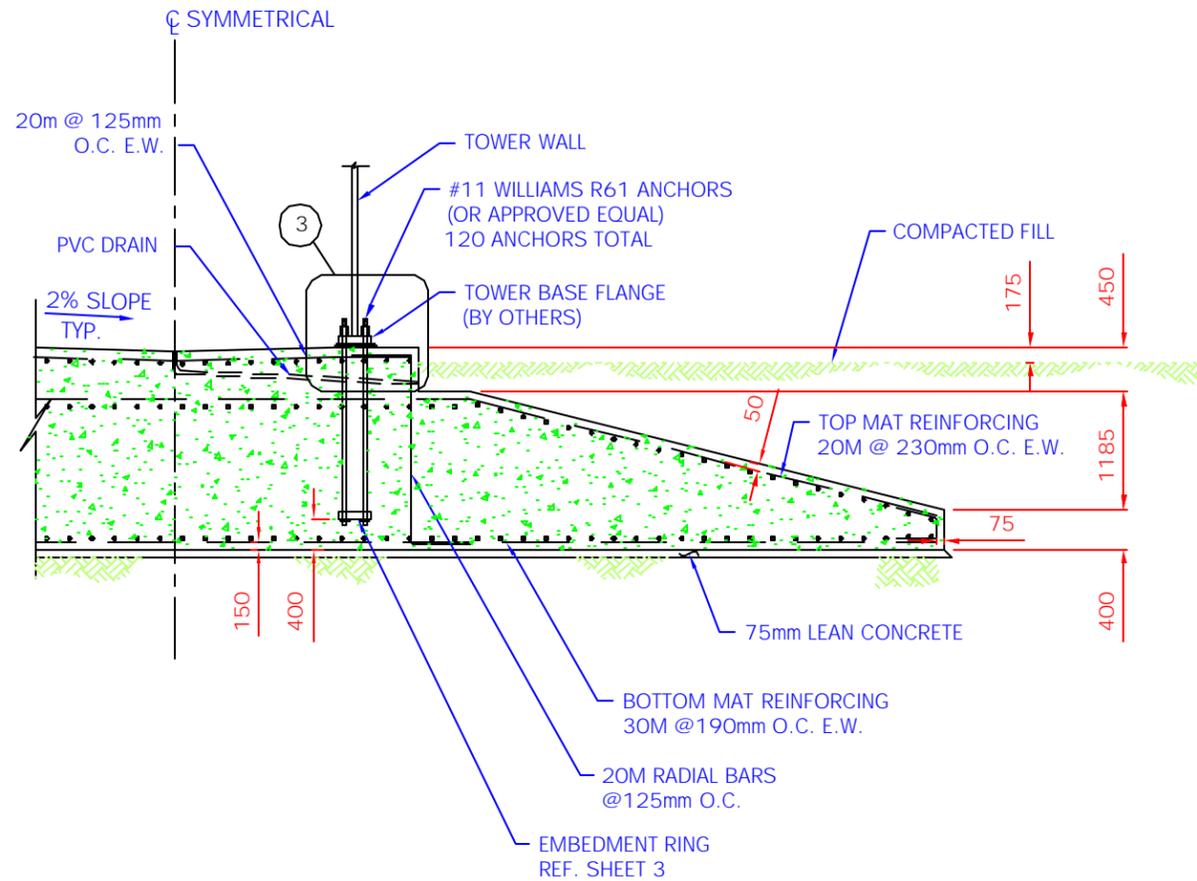
1. ALL CONSTRUCTION SHALL CONFORM TO LOCAL BUILDING CODES.
2. THE STRUCTURAL DRAWINGS SHALL BE UTILIZED IN CONJUNCTION WITH OTHER CONSULTANTS DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THESE DRAWINGS INTO THE CONSTRUCTION OF THE TOWER FOUNDATION.

NOT FOR  
CONSTRUCTION

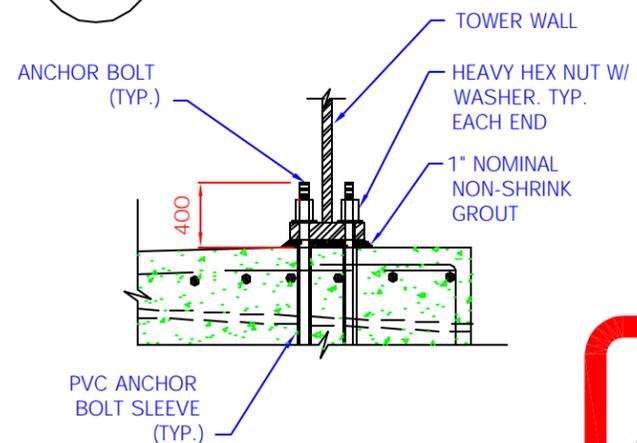
 <small>VESTAS - AMERICAN WIND TECHNOLOGY, INC. 111 SW COLUMBIA STREET, SUITE 480 PORTLAND, OR 97201 (503) 327-2000</small>	GENERAL NOTES		
	V80 1.8-MW 78-METER IEC IIA SPREAD FOOTING		
SIZE	11x17	DWG NO.	REV
SCALE	N.T.S	DATE	SHEET
		05/21/04	1 OF 3



1 TOWER FOUNDATION PLAN  
N.T.S.



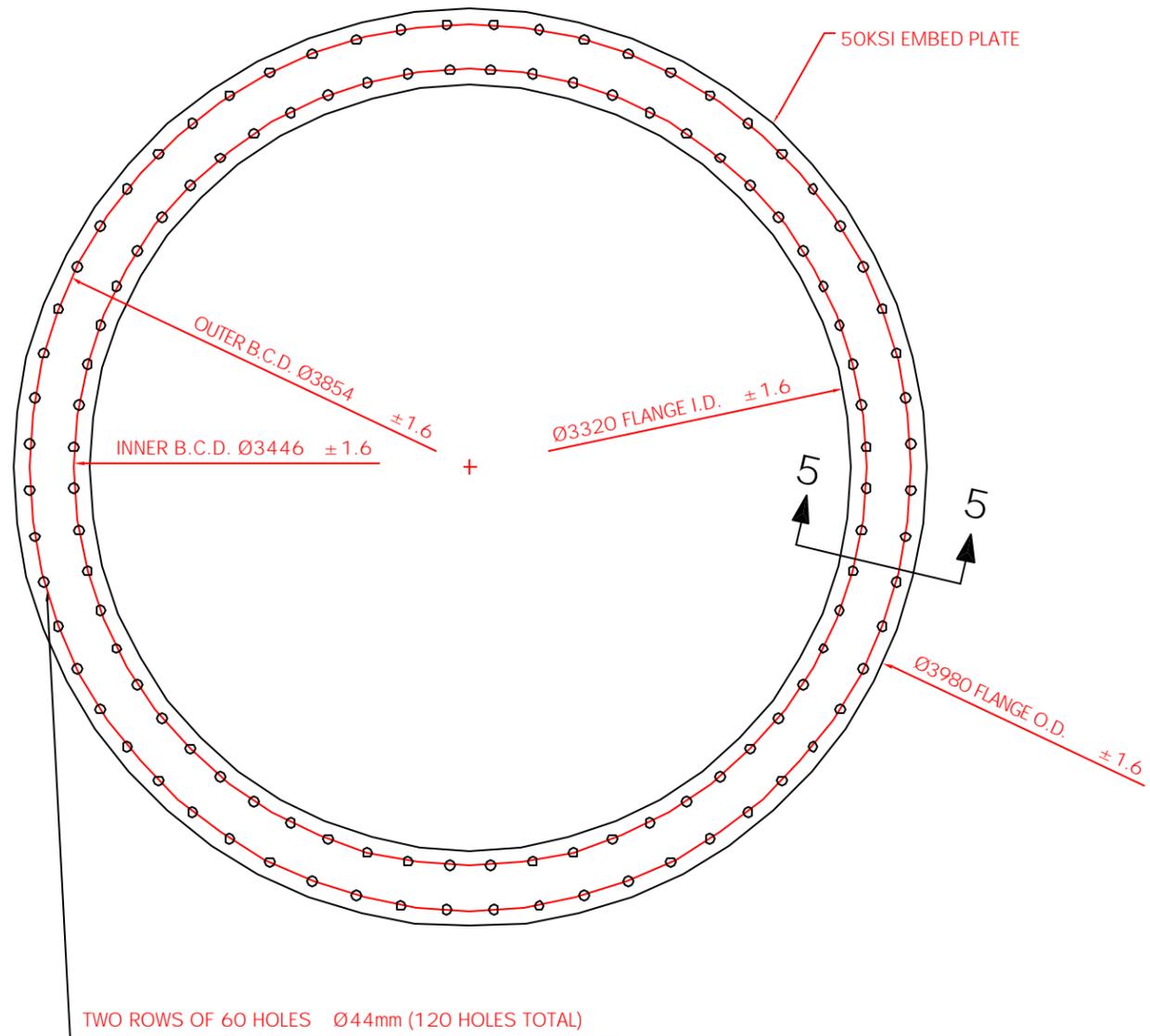
2 FOUNDATION SECTION  
N.T.S.



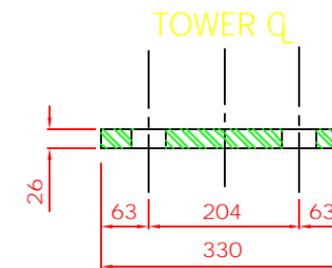
3 TOWER BASE DETAIL  
N.T.S.

**NOT FOR CONSTRUCTION**

 VESTAS - AMERICAN WIND TECHNOLOGY, INC. 111 SW COLUMBIA STREET, SUITE 480 PORTLAND, OR 97201 (503) 327-2000	FOUNDATION PLAN AND DETAILS		
	V80 1.8-MW 78-METER IEC IIA SPREAD FOOTING		
SIZE	11x17	DWG NO.	V8078IIASPREAD
SCALE	N.T.S.	DATE	05/21/04
		SHEET	2 OF 3



4 FOUNDATION EMBEDMENT RING  
N.T.S.



5 EMBEDMENT RING SECTION  
N.T.S.

**NOT FOR  
CONSTRUCTION**

 VESTAS - AMERICAN WIND TECHNOLOGY, INC. 111 SW COLUMBIA STREET, SUITE 480 PORTLAND, OR 97201 (503) 327-2000	EMBEDMENT RING		
	V80 1.8-MW 78-METER IEC IIA SPREAD FOOTING		
SIZE	11x17	DWG NO.	V8078IIASPREAD
SCALE	N.T.S.	DATE	5/21/04
ALL DIMENSIONS IN MILLIMETERS		SHEET	3 OF 3