HELIXWIND

ATTENTION

THE FOUNDATION DESIGNS ARE IN ACCORDANCE WITH THE 2006 INTERNATIONAL BUILDING CODE (IBC 2006) AND ASCE 7-05, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES. THE TOWER AND FOUNDATION DESIGNS ARE FOR A HELIX WIND TURBINE BASED ON EXPOSURE TYPE "C", 100 MPH 3-SEC GUST WIND SPEED AND A SIMULTANEOUS 60 MPH 3-SEC GUST WIND SPEED AND 0.75-IN RADIAL ICE. THE FOUNDATION DESIGNS ARE BASED ON THE SOIL INFORMATION LISTED IN TABLE 1804.2 (IBC 2006) REFERENCED ON SHEET S-2. IT IS THE RESPONSIBILITY OF THE OWNER TO VERIFY BY GEOTECHNICAL INVESTIGATION THAT ACTUAL SITE SOIL PARAMETERS MEET OR EXCEED THOSE SHOWN IN THE REFERENCED TABLE. IF CONDITIONS OTHER THAN THOSE DESCRIBED IN THE REFERENCED TABLE ARE ENCOUNTERED, A FOUNDATION ANALYSIS SHOULD BE PERFORMED TO DETERMINE THE STRUCTURAL ADEQUACY OF THE SUBSTRUCTURE.

INDEX OF SHEETS

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER G. PLY
72814
EXP. 06/30/10
CIVIL
STATE OF CALIFORNIA
February 17, 2009

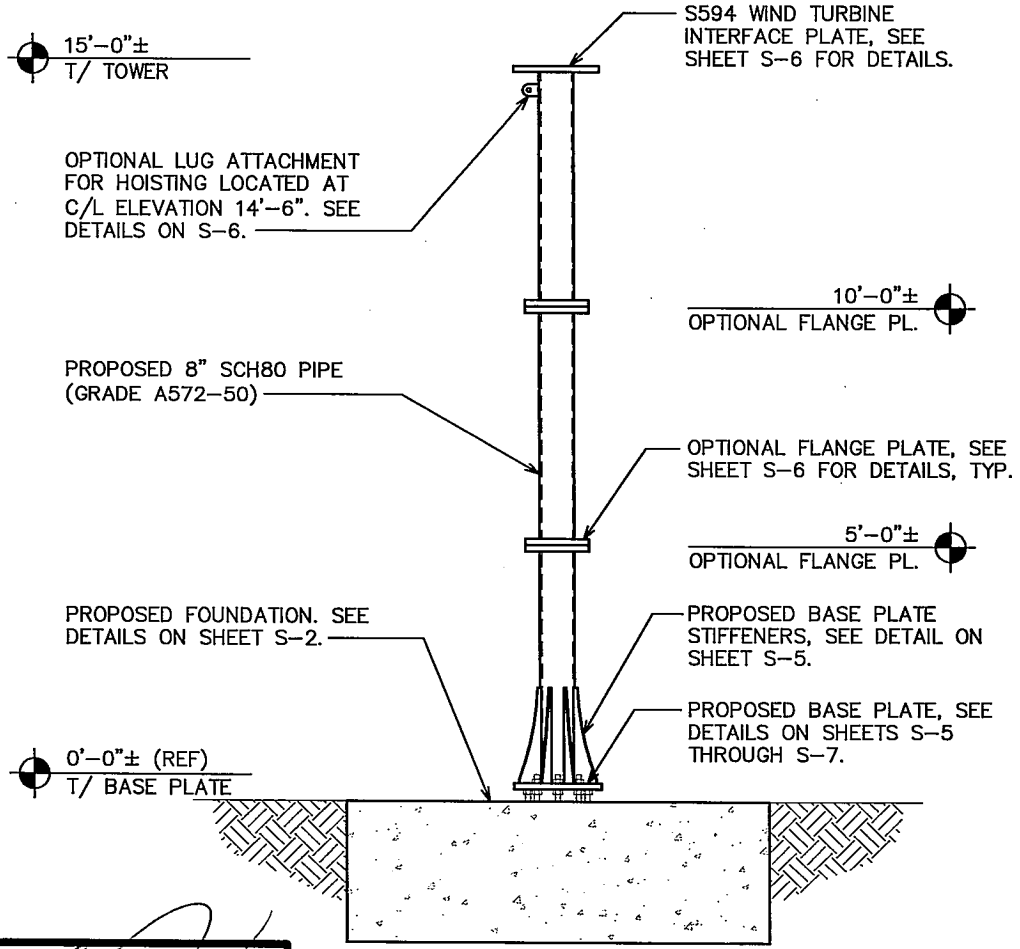
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
(919) 661-6351

PROJECT INFORMATION:
DESIGN DRAWINGS
15' MONOPOLE -
MODEL # S594
100 MPH DESIGN

HELIXWIND
1848 Commercial Street
San Diego, CA 92113
(619) 501-3932

DRAWN BY: JAB	CHECKED BY: REG

SHEET NUMBER:	REVISION:
T-1	6
	DATE 02-16-10
	TEP #: 080973



MATERIAL LIST

ITEM DESCRIPTION	QTY.	SIZE	SHEET #
8" SCH80 PIPE (GRADE A572–50)	1	15'–0"	S–1
1 7/16"ø (M36) ANCHOR BOLT ASSEMBLY	8	–	S–3
ANCHOR BOLT BOTTOM TEMPLATE PLATE	1	–	S–5
BASE PLATE (GRADE A572–50)	1	–	S–5
*OPTIONAL ITEMS NOT SHOWN			

NOTES:

1. RECOMMENDED MIN. LIFTING CABLE SIZE: 3/8"ø
2. TURBINE DESIGN SUMMARY*:
   - VERTICAL: 1.43 kips
   - SHEAR: 1.84 kips
   - BENDING MOMENT: 19.6 kip.–ft.
   - TORQUE: 4.53 kip.–ft.
   - * BASE LOADS AT 85 MPH – PROVIDED BY HELIX WIND
3. EQUIVALENT STEEL MATERIAL WITH fy=50 KSI ALLOWED.

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TOWER ELEVATION

SCALE: 1/4" = 1'–0"

0 4 8
SCALE IN FEET

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SHEET NUMBER: **S-1**

REVISION: 5
DATE 02-17-09
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TABLE 1804.2 ALLOWABLE FOUNDATION AND LATERAL PRESSURE (IBC 2006)**

SOIL CLASS	DESCRIPTION	ALLOWABLE FOUNDATION PRESSURE (PSF)	LATERAL BEARING (PSF/FT BELOW NATURAL GRADE)	LATERAL SLIDING		ASSUMED UNIT WEIGHT W/O WATER	ASSUMED INTERNAL ANGLE OF FRICTION
				COEFF. OF FRICTION	RESISTANCE (PSF)		
1	CRYSTALLINE BEDROCK	12,000	1,200	0.70	–	140	0°
2	SEDIMENTARY AND FOLIATED ROCK	4,000	400	0.35	–	130	0°
3	SANDY GRAVEL AND/OR GRAVEL (GW AND GP)	3,000	200	0.35	–	120	32°
4	SAND, SILTY SAND, CLAYEY SAND, SILTY GRAVEL, AND CLAYEY GRAVEL (SW,SP,SM,SC,GM AND GC)	2,000	150	0.25	–	100	26°
5	CLAY, SANDY CLAY, SILTY CLAY, CLAYEY SILT, SILT AND SANDY SILT (CL, ML, MH AND CH)	1,500	100	–	130	90	0°

**IT IS THE RESPONSIBILITY OF THE OWNER TO VERIFY BY GEOTECHNICAL INVESTIGATION THAT THE ACTUAL SITE SOIL PARAMETERS MEET OR EXCEED THOSE SHOWN IN THE REFERENCE TABLE ABOVE.

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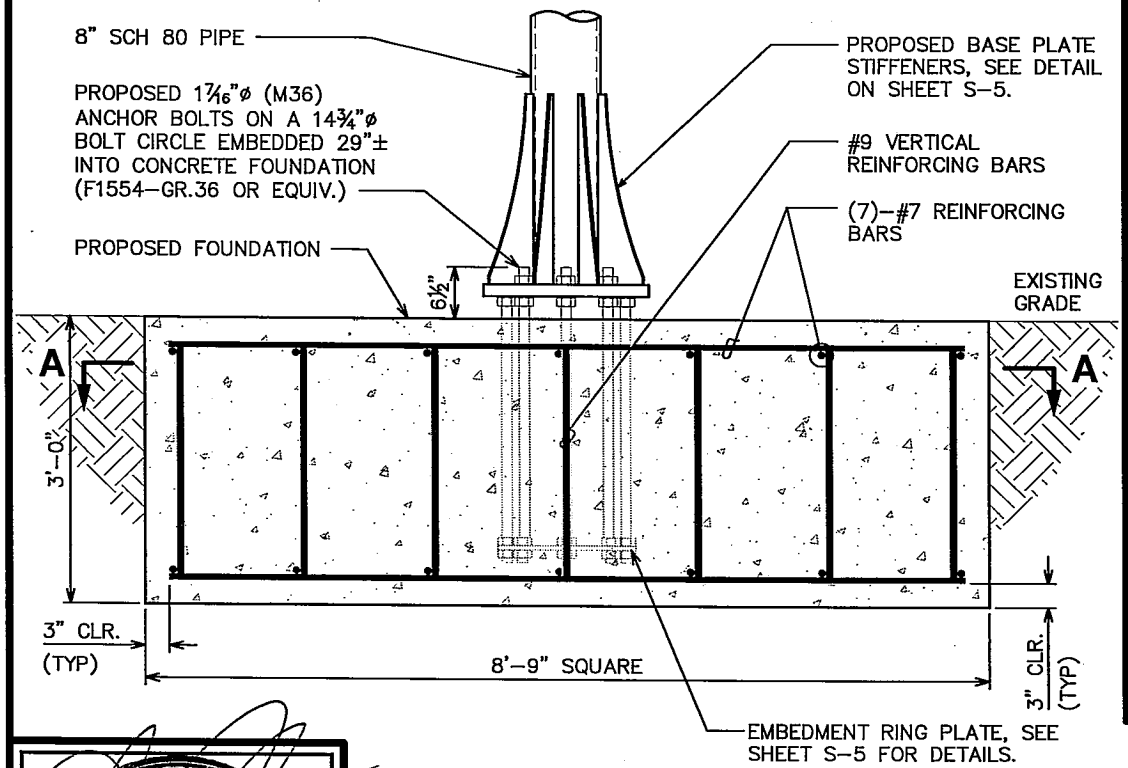
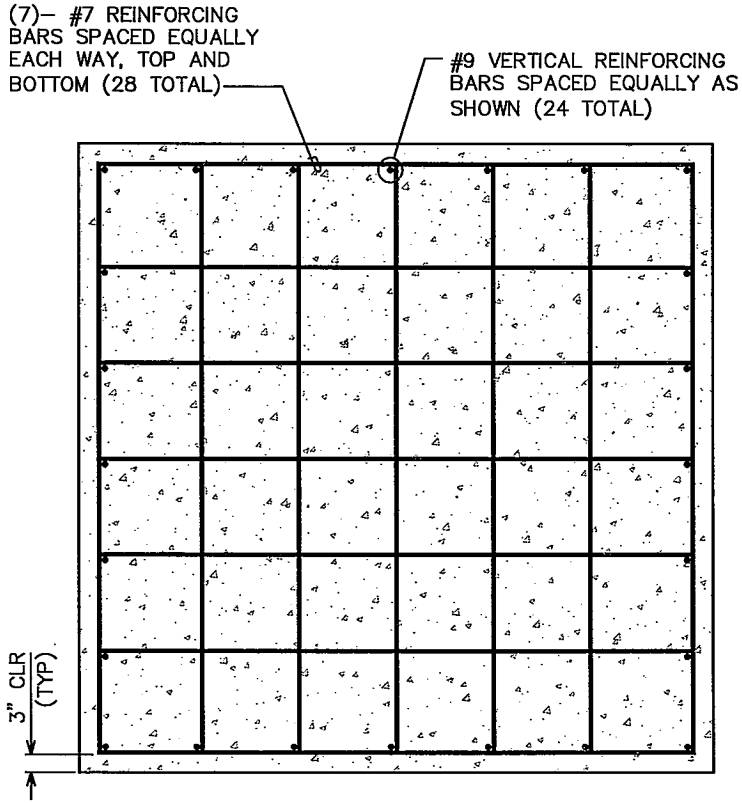
SHEET NUMBER: S-2	REVISION: 5
	DATE 02-17-09
	TEP #: 080973

NOTES:

1. THE FOUNDATION DESIGN IS BASED ON SOIL CLASS 5, AS SHOWN IN TABLE 1804.2 (IBC 2006). IT IS THE RESPONSIBILITY OF THE OWNER TO VERIFY BY GEOTECHNICAL INVESTIGATION THAT ACTUAL SITE SOIL PARAMETERS EQUAL OR EXCEED THOSE SHOWN IN THE REFERENCED TABLE. IF CONDITIONS OTHER THAN THOSE DESCRIBED IN THE REFERENCED TABLE ARE ENCOUNTERED A FOUNDATION ANALYSIS SHOULD BE PERFORMED TO DETERMINE THE STRUCTURAL ADEQUACY OF THE SUBSTRUCTURE.

2. IF THE FROST LINE IS KNOWN TO BE GREATER THAN THE FOUNDATION DEPTH OR THE WATER TABLE IS LESS THAN THE FOUNDATION DEPTH, THE DESIGN ENGINEER (TOWER ENGINEERING PROFESSIONALS, INC.) SHALL BE NOTIFIED PRIOR TO CONSTRUCTION AND A FOUNDATION ANALYSIS OR RE-DESIGN SHALL BE PERFORMED.



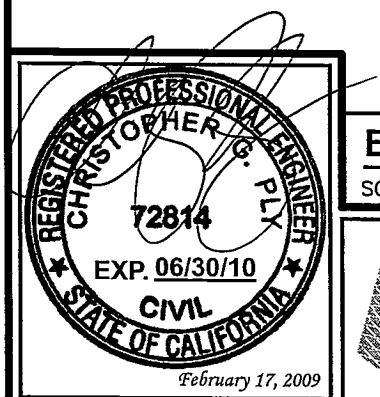


SECTION A-A

SCALE: ⅜" = 1'-0"

0 2 4

SCALE IN FEET



BLOCK FOUNDATION DETAILS

SCALE: ½" = 1'-0"

0 2 4

SCALE IN FEET

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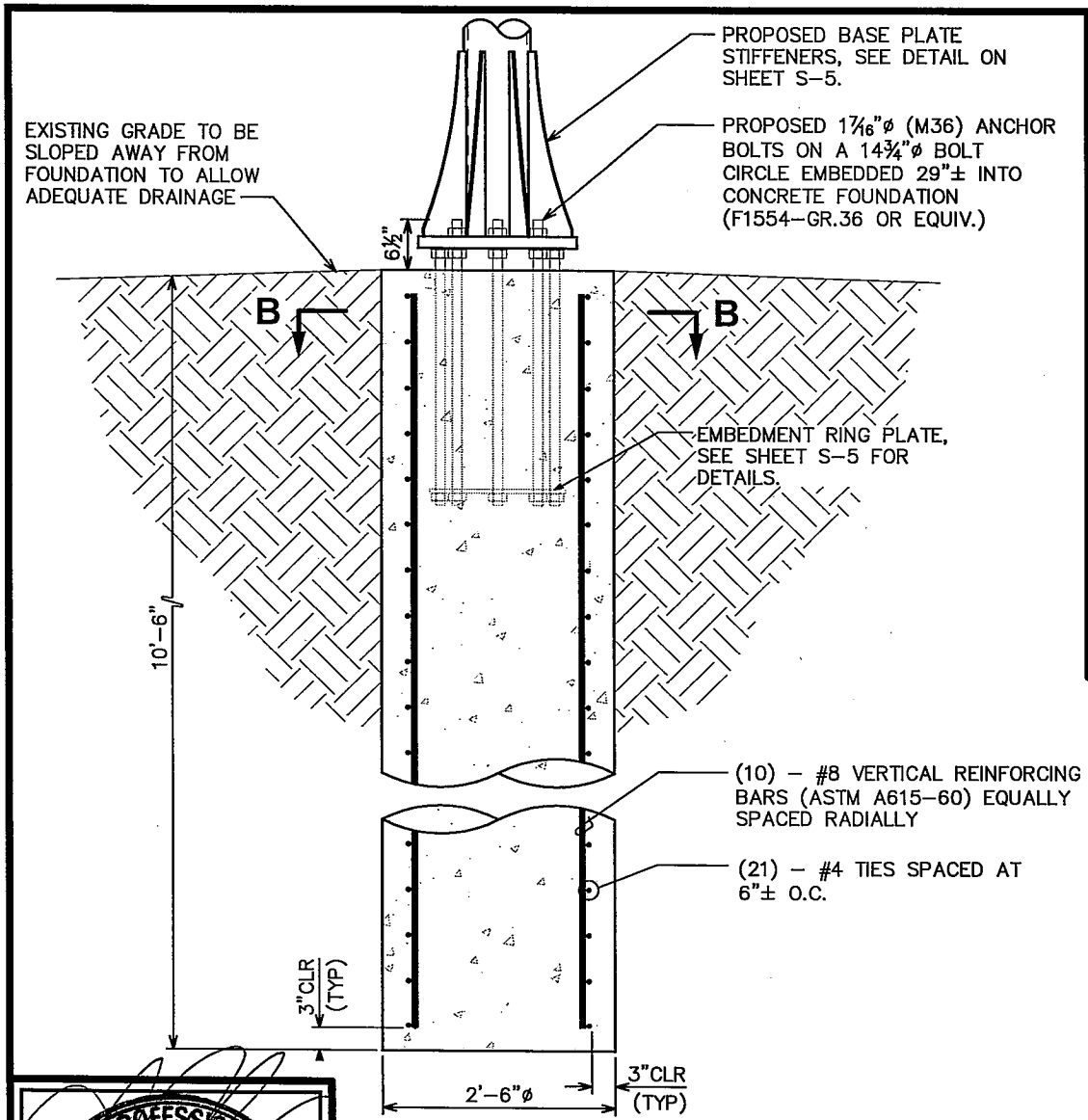

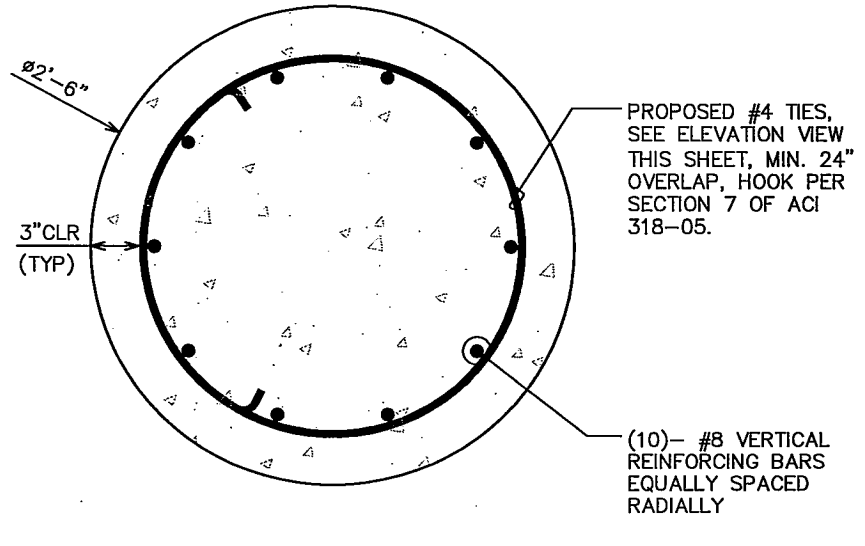

SECTION B-B

SCALE: 1" = 1'-0"

0 1 2

SCALE IN FEET

NOTES:

1. THE FOUNDATION DESIGNS ARE BASED ON SOIL CLASS 4, AS SHOWN IN TABLE 1804.2 (IBC 2006), (REFERENCED ON SHEET S-2). IT IS THE RESPONSIBILITY OF THE OWNER TO VERIFY BY GEOTECHNICAL INVESTIGATION THAT ACTUAL SITE SOIL PARAMETERS EQUAL OR EXCEED THOSE SHOWN IN THE REFERENCED TABLE. IF CONDITIONS OTHER THAN THOSE DESCRIBED IN THE REFERENCED TABLE ARE ENCOUNTERED A FOUNDATION ANALYSIS SHOULD BE PERFORMED TO DETERMINE THE STRUCTURAL ADEQUACY OF THE SUBSTRUCTURE.
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REGISTERED PROFESSIONAL ENGINEER
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ALTERNATE FOUNDATION DETAILS

SCALE: ½" = 1'-0"

0 2 4

SCALE IN FEET

TOWER ENGINEERING PROFESSIONALS
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PROJECT INFORMATION:
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15' MONOPOLE - MODEL # S594
100 MPH DESIGN

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SHEET NUMBER:	REVISION:
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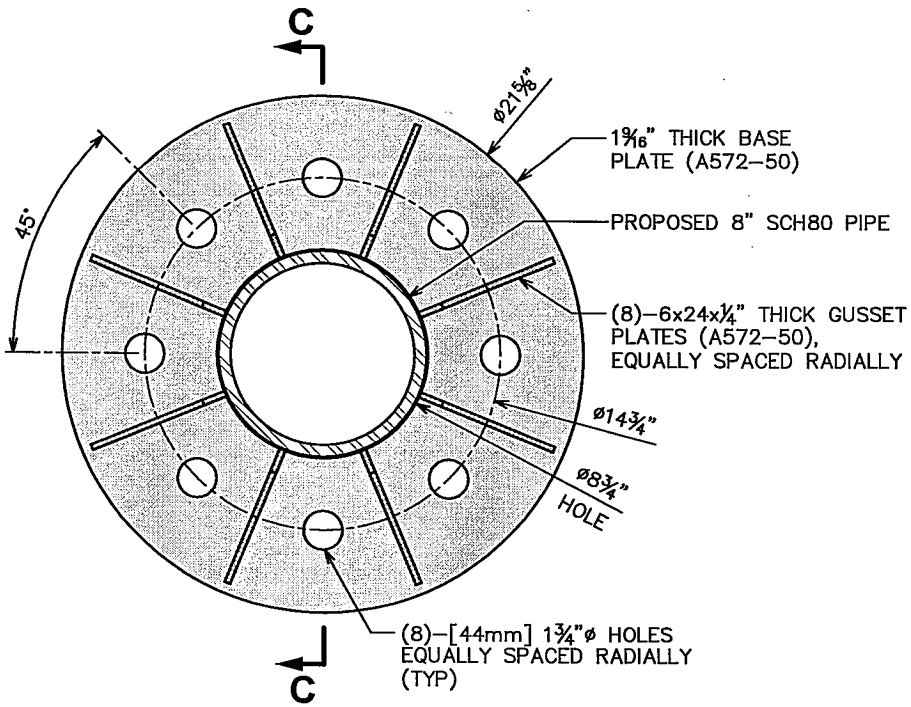
	DATE 02-17-09
	TEP #: 080973

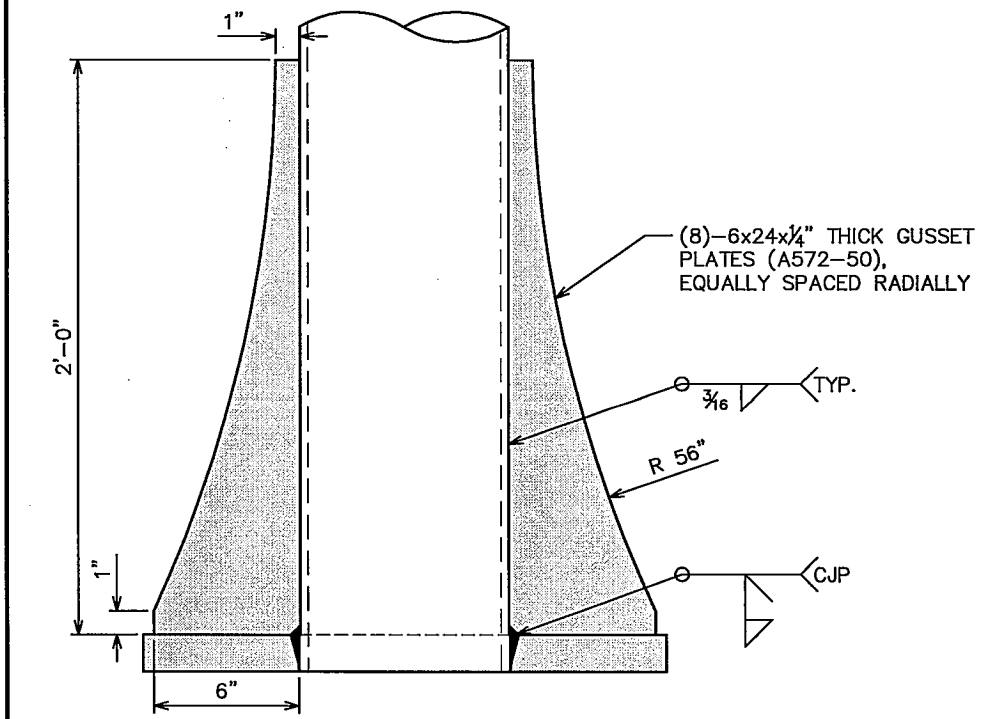
NOTE:

STIFFENER DESIGN BASED ON FEA FATIGUE ANALYSIS BY ATA ENGINEERING, INC., DATED JANUARY 28, 2009, ATA PROJECT NO. 59001, PROVIDED BY HELIX WIND.



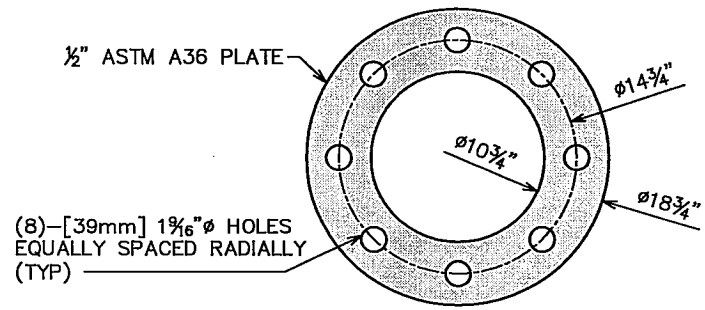
STANDARD BASE PLATE

SCALE: 1½" = 1'–0"



SECTION C-C

SCALE: 1½" = 1'–0"



EMBEDMENT RING PLATE

SCALE: 1" = 1'–0"

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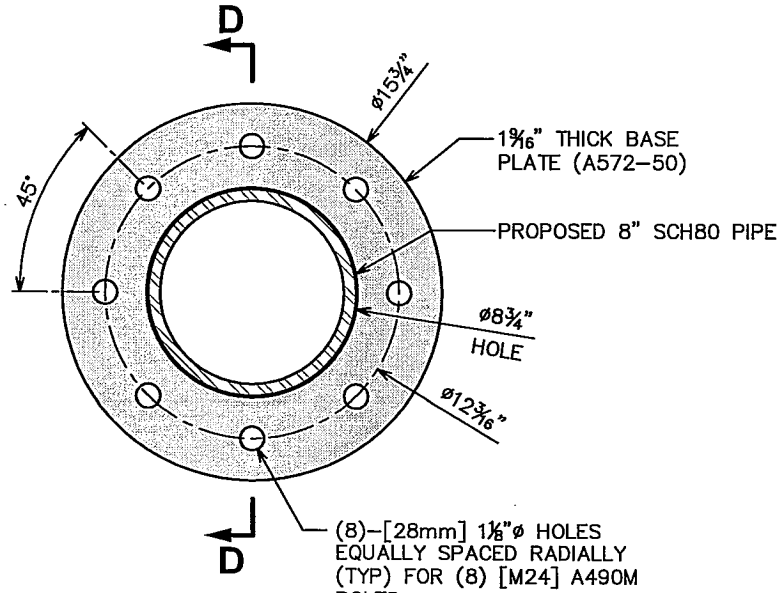
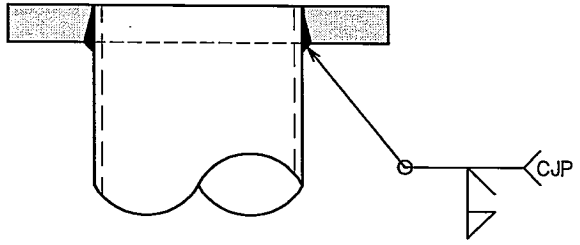


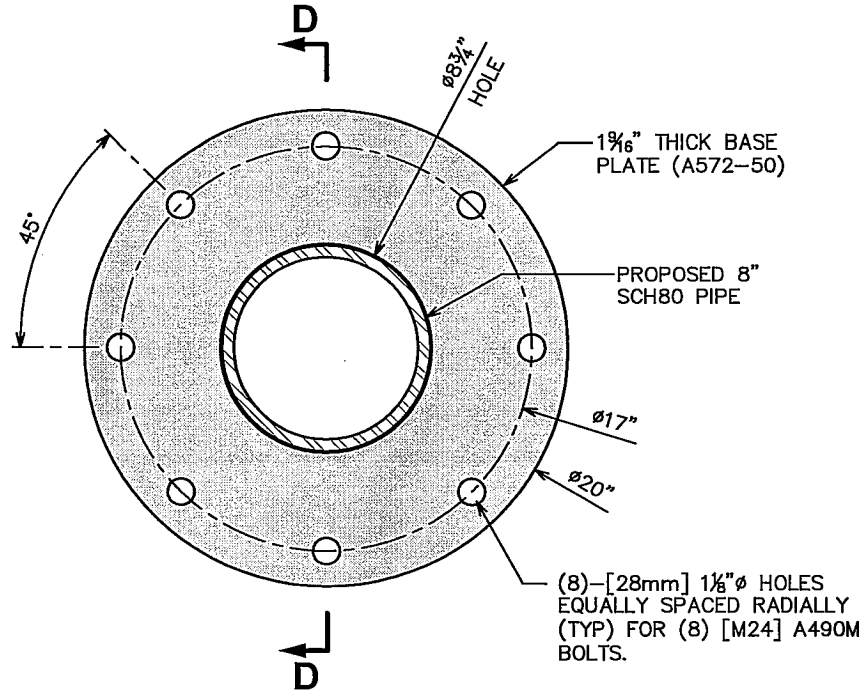
OPTIONAL FLANGE PLATE

SCALE: 1½" = 1'–0"



SECTION D-D

SCALE: 1½" = 1'–0"



TURBINE INTERFACE PLATE

SCALE: 1½" = 1'–0"

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MODEL # S594
100 MPH DESIGN

HELIX WIND
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DRAWN BY: JAB	CHECKED BY: REG
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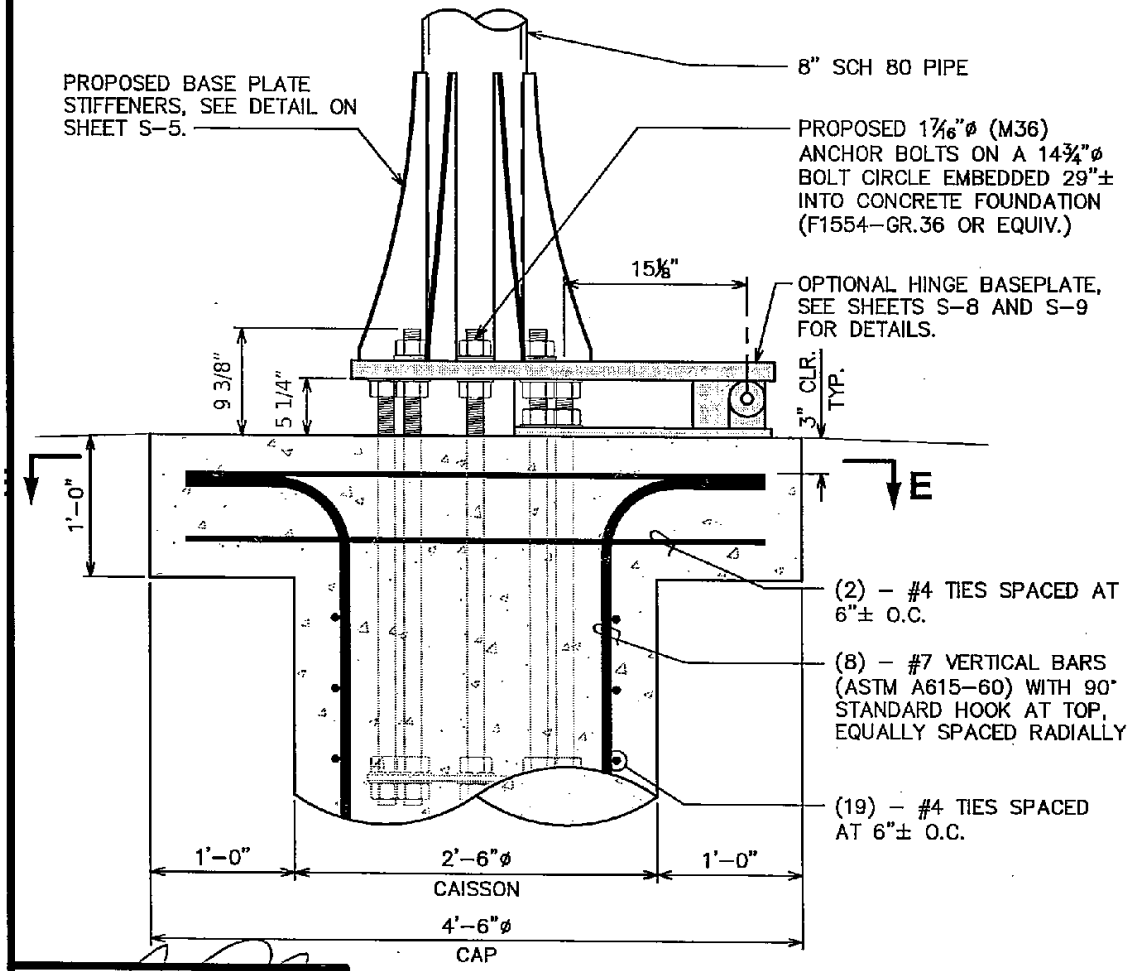
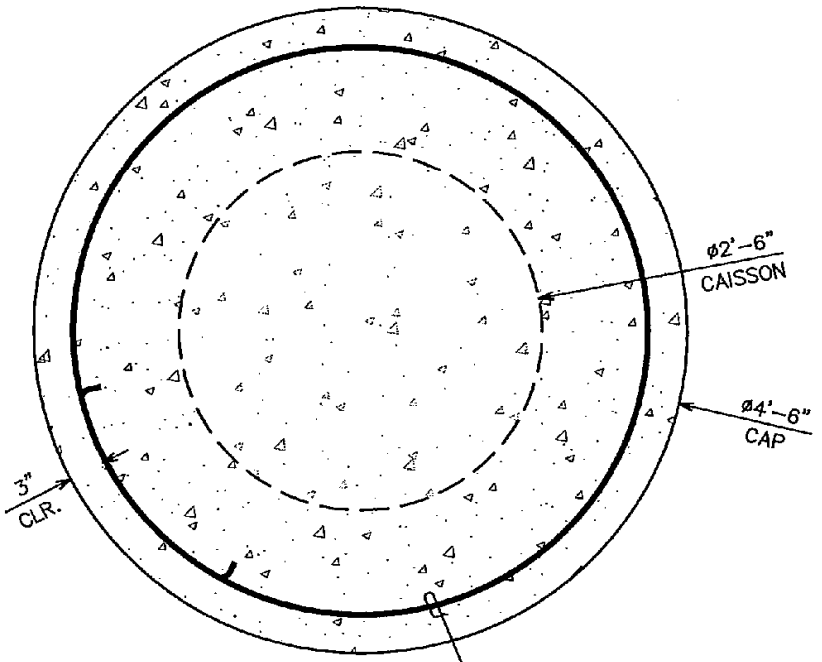
NOTE:

1. PROPOSED CAP IS ONLY REQUIRED ON CAISSON FOUNDATIONS IN CONJUNCTION WITH THE OPTIONAL HINGED BASE PLATE. SEE SHEETS S-4A THROUGH S-4D FOR CAISSON DETAILS.





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February 17, 2009

OPTIONAL HINGED BASE PLATE

SCALE: 3/4" = 1'-0"

SECTION E-E

SCALE: 3/4" = 1'-0"

0 1 2
SCALE IN FEET

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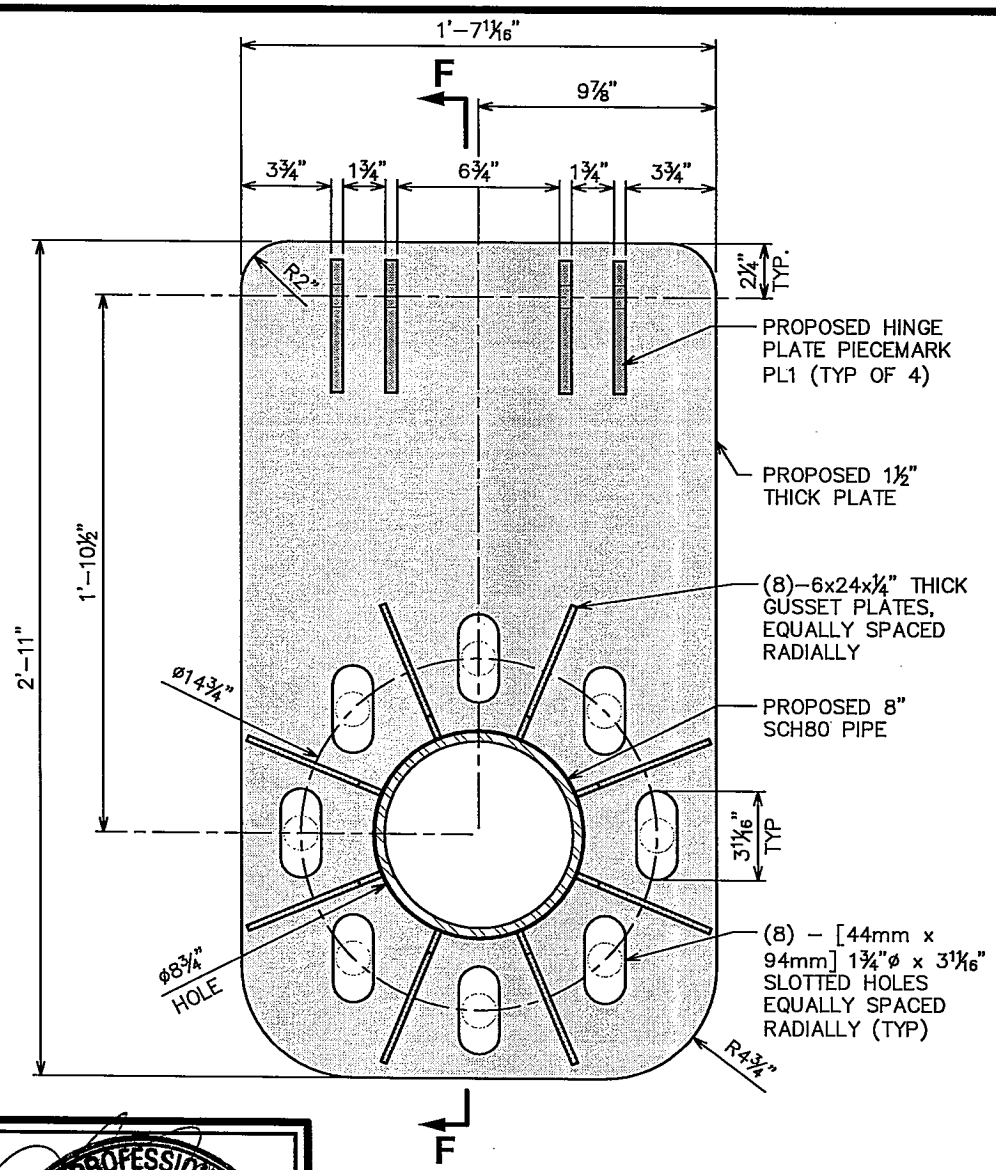

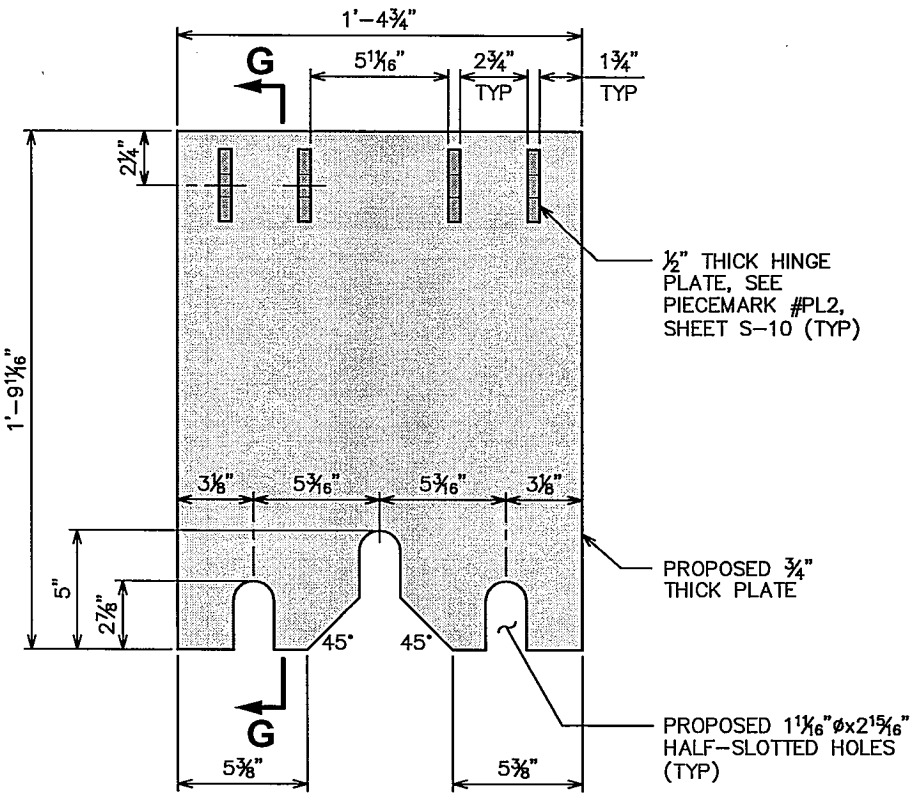

OPTIONAL HINGED BASE PLATE

SCALE: 1½" = 1'-0"

HINGE PLATE

SCALE: 1½" = 1'-0"

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NOTE:

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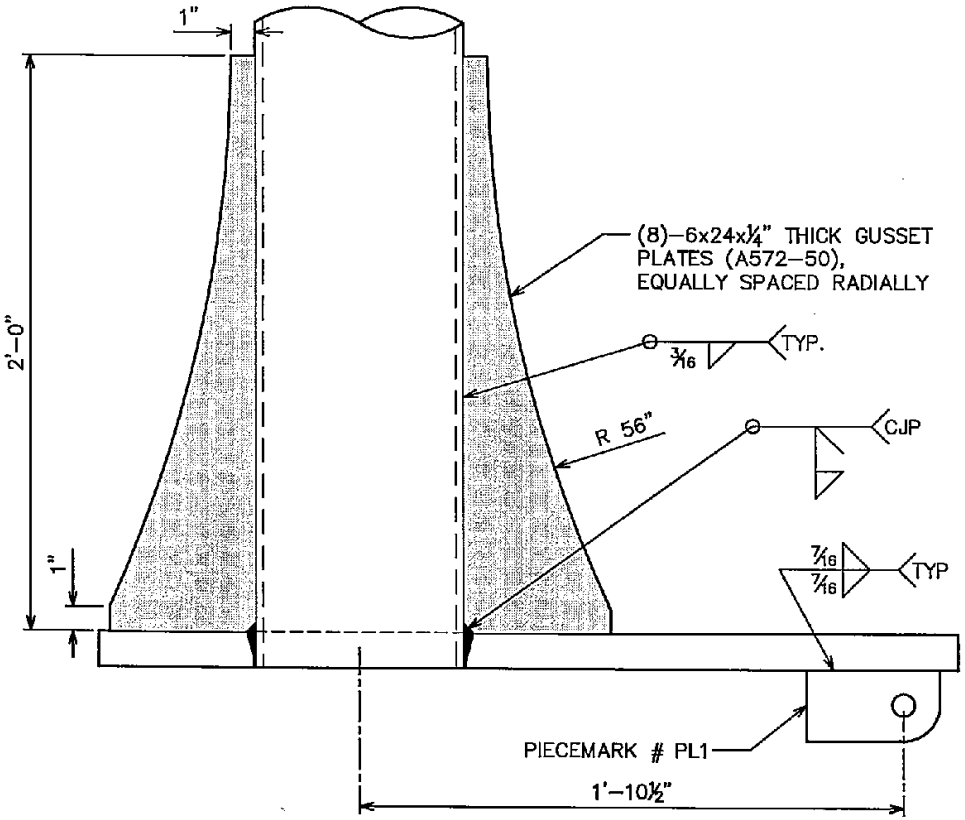
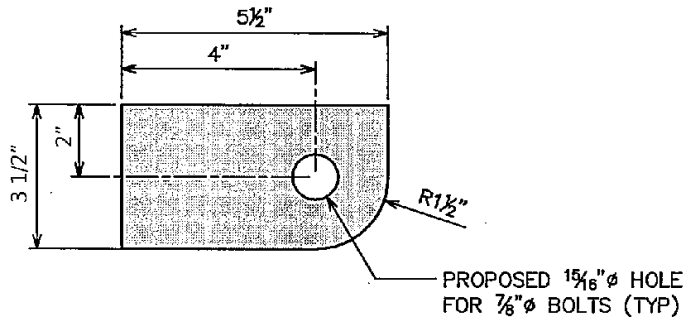
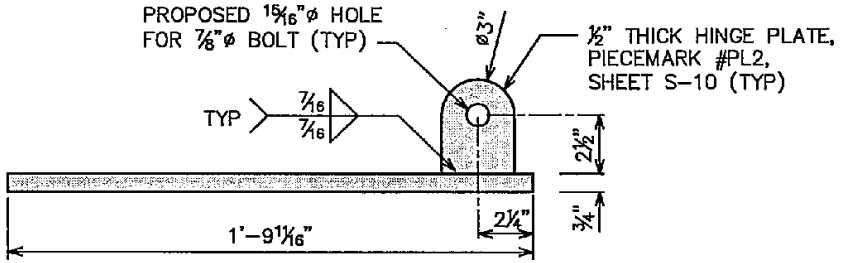




PIECEMARK # PL1

SCALE: 3" = 1'–0"



SECTION F-F

SCALE: 1½" = 1'–0"

SECTION G-G

SCALE: 1½" = 1'–0"

0 1 2
SCALE IN FEET

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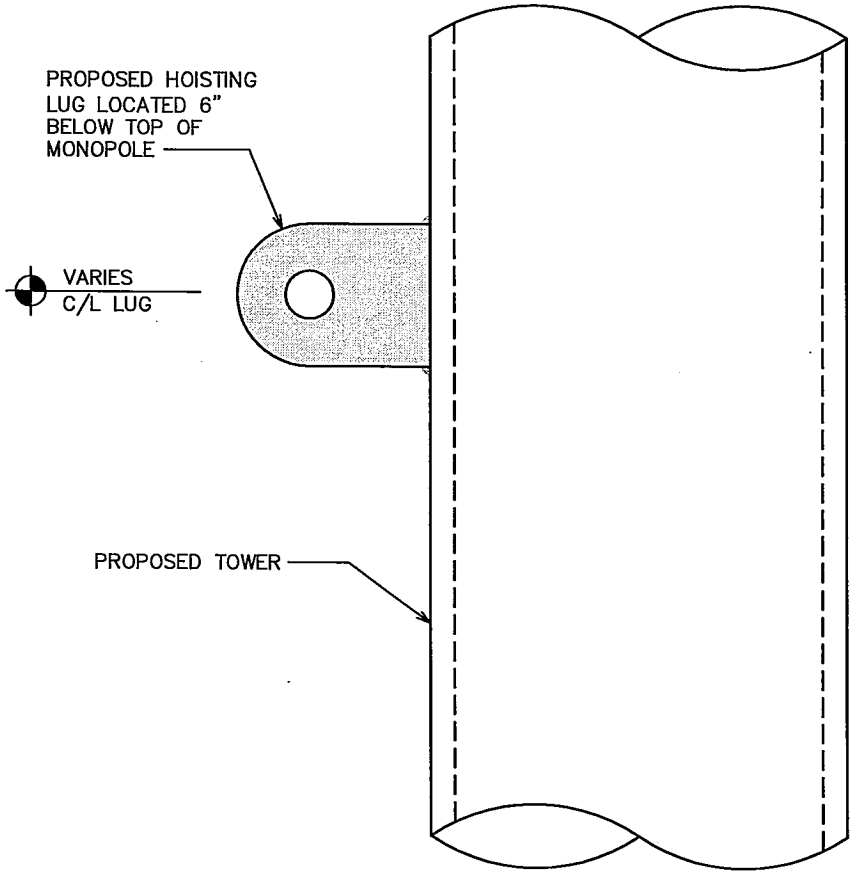
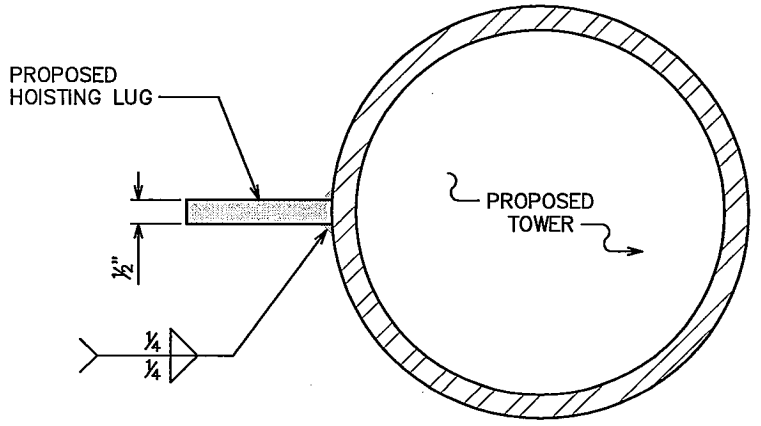


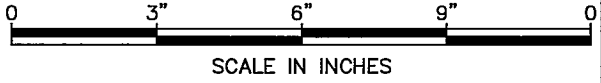
ELEVATION VIEW

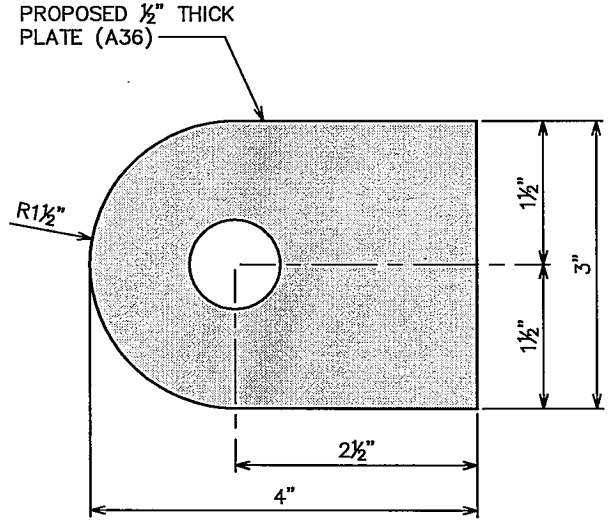
SCALE: 3" = 1'-0"



PLAN VIEW

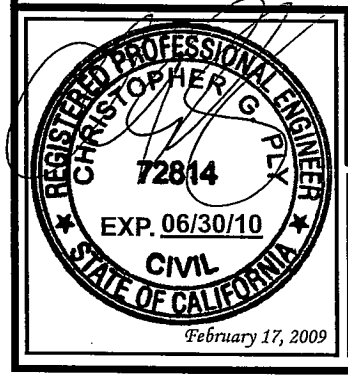
SCALE: 3" = 1'-0"





PIECEMARK #PL2

SCALE: 6" = 1'-0"



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GENERAL NOTES:

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE.

2. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE APPLICABLE STATE.

3. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.

4. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND IT'S COMPONENT PARTS DURING ERECTION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.

5. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.

7. THE CONTRACTOR IS RESPONSIBLE FOR INSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THIS PROJECT FROM ALL APPLICABLE GOVERNMENTAL AGENCIES. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.

8. THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL PIPES, DITCHES, AND OTHER DRAINAGE STRUCTURES FREE FROM OBSTRUCTION UNTIL WORK IS ACCEPTED BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED BY FAILURE TO MAINTAIN DRAINAGE STRUCTURE IN OPERABLE CONDITION.

9. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.

10. THE TOWER REACTIONS WERE OBTAINED AND THE FOUNDATIONS WERE DESIGNED IN ACCORDANCE WITH THE 2006 INTERNATIONAL BUILDING CODE (IBC) AND ASCE 7-05 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

REINFORCING STEEL NOTES:

1. THE REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-615, GRADE 60. IT SHALL BE DEFORMED AND SPLICES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED.

2. WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.

3. REINFORCING CAGES SHALL BE BRACED TO RETAIN PROPER DIMENSIONS DURING HANDLING AND THROUGHOUT PLACEMENT OF CONCRETE. WHEN TEMPORARY CASING IS UTILIZED, BRACING SHALL BE ADEQUATE TO RESIST FORCES OCCURRING FROM FLOWING CONCRETE DURING CASING EXTRACTION.

4. SPACERS SHALL BE ATTACHED INTERMITTENTLY THROUGHOUT THE ENTIRE LENGTH OF TIEBACK REINFORCING TO INSURE CONCENTRIC PLACEMENT OF CAGES IN EXCAVATIONS.

5. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 3" IF CAST IN PLACE AND 2" COVER IF FORMWORK IS USED AS DEFINED IN ACI 318 SECTION 7.7.1. APPROVED SPACERS SHALL BE USED TO INSURE APPROPRIATE COVER ON REINFORCEMENT.

CONCRETE NOTES:

1. WORK SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE ACI-318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."

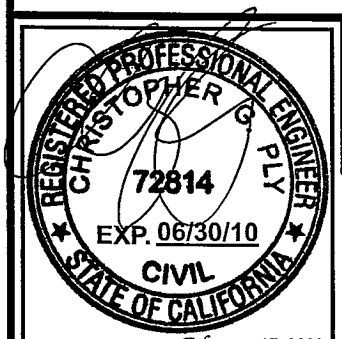
2. THE CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI IN 28-DAYS.

3. PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR RESISTANCE TO LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI-318 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE.

4. CONCRETE SHALL BE PLACED IN A MANNER THAT WILL PREVENT SEGREGATION OF CONCRETE MATERIALS, INFILTRATION OF WATER OR SOIL, AND OTHER OCCURRENCES THAT MAY DECREASE THE STRENGTH OR DURABILITY OF THE FOUNDATION.

5. FREE FALL CONCRETE MAY BE USED PROVIDED FALL IS VERTICAL DOWN WITHOUT HITTING THE SIDES OF THE EXCAVATION, FORMWORK, REINFORCING BARS, FORM TIES, CAGE BRACING, OR OTHER OBSTRUCTIONS. UNDER NO CIRCUMSTANCES SHALL CONCRETE FALL THROUGH WATER.

6. THE MAXIMUM SIZE OF THE AGGREGATE SHALL NOT EXCEED A SIZE SUITABLE FOR THE INSTALLATION METHOD UTILIZED OR 1/3-CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING. THE MAXIMUM SIZE MAY BE INCREASED TO 2/3-CLEAR DISTANCE PROVIDED WORKABILITY AND METHODS OF CONSOLIDATION SUCH AS VIBRATING WILL PREVENT HONEYCOMBS AND VOIDS.



February 17, 2009

TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
(919) 661-6351

PROJECT INFORMATION:
DESIGN DRAWINGS
15' MONOPOLE -
MODEL # S594
100 MPH DESIGN

HELIXWIND
1848 Commercial Street
San Diego, CA 92113
(619) 501-3932

DRAWN BY: JAB	CHECKED BY: REG
SHEET NUMBER: **S-11**	REVISION: **5**
	DATE 02-17-09
	TEP #: 080973

BOLT TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC – "TURN OF THE NUT" METHOD, USING THE CHART BELOW.

BOLT LENGTHS UP TO AND INCLUDING FOUR DIA.

⅜"	BOLTS UP TO AND INCLUDING 1.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
½"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅝"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
¾"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅞"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIA. BUT NOT EXCEEDING EIGHT DIA.

⅜"	BOLTS 1.75 TO 3.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
½"	BOLTS 2.25 TO 4.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅝"	BOLTS 2.75 TO 5.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
¾"	BOLTS 3.25 TO 6.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅞"	BOLTS 3.75 TO 7.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

8.2.1 TURN-OF-THE-NUT TIGHTENING

BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER G. PLY
72814
EXP. 06/30/10
CIVIL
STATE OF CALIFORNIA
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WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2006 "STRUCTURAL WELDING CODE – STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LETTER AND REPORT TO TOWER ENGINEERING PROFESSIONALS.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. WHEN THE TEMPERATURE IS BETWEEN 0°F AND 32°F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70°F DURING THE WELDING PROCESS.
6. DO NOT WELD ON WET OR FROST–COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. FOR ALL WELDING, USE E70XX ELECTRODES.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE INSTALLATION AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE A COLD–GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILLS.

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