

REINFORCE TOWER, KOZK

PROJECT NO.: 180830-027
MISSOURI STATE UNIVERSITY
1891.0-FT GUYED TOWER
KOZK FORDLAND
905 STATE HIGHWAY FF
FORDLAND, MISSOURI 65602
(37°10'11.0"N, 92°56'31.0"W)
(WEBSTER COUNTY)



TOWER CONSULTANTS, INC.
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KOZK
SPRINGFIELD, MO

1891'-0 GUYED
TOWER

ERECTION
DRAWINGS

2	3/9/18	WEB	UPDATED INDEX
1	1/17/18	WEB	UPDATED INDEX
0	11/3/17	WEB	RELEASED FOR JOB USE
No.	Date	By	Revision

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Sheet No.:
Project No.: 17.289.002
Drawn By: WEB
Checked By: MBB
Scale: VARIES Date: 11-3-17

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VICINITY MAP		PROJECT INFORMATION		SHEET INDEX	
		<p>APPLICANT: MISSOURI STATE UNIVERSITY 901 S NATIONAL AVENUE FORDLAND, MO 65897 PH: 417-836-5101</p> <p>LAND OWNER: MISSOURI STATE UNIVERSITY</p> <p>EMERGENCY CONTACT: BRENT MOORE MISSOURI STATE UNIVERSITY PH: 417-836-3504</p> <p>JURISDICTION: WEBSTER COUNTY, MISSOURI</p>		T-1 = TITLE SHEET G-1 = GENERAL NOTES G-2 (REV 01) = MODIFICATION DESCRIPTION E-1 = TOWER ELEVATION DRAWING E-2 = TOWER ELEVATION DRAWING E-3 = TOWER ELEVATION DRAWING E-4 = CROSS SECTION E-5 = DIAGONAL REPLACEMENT E-6 (REV 02) = SPLIT PIPE REINFORCING E-7 = HORIZONTAL REINFORCEMENT E-8 = GUY WIRE REPLACEMENT E-9 = TENSION CHART E-10 = POST MODIFICATION CHECKLIST	
		CONTRACTOR LIST		LEGEND A = DETAIL ▼ = SECTION CL OR CL = CENTERLINE PL = PLATE PL = PROPERTY LINE Δ = REVISION	
		<p>TOWER CONTRACTOR: Tower Consultants, Inc. 15 Surrey Ct. Columbia, SC 29212 (803) 407-8489</p>			
<p>TOWER DESIGNED FOR A WIND SPEED OF 90-MPH WITH NO ICE & 30-MPH WITH 1" OF RADIAL ICE PER EIA/TIA-222-G STANDARD.</p>		PROJECT DESCRIPTION			
		<p>MISSOURI STATE UNIVERSITY IS PROPOSING TO PERFORM A TOWER MODIFICATION IN ORDER TO COMPLY WITH ANSI/TIA-222-G STANDARD WITH PROPOSED LOADING ON THE EXISTING 1891.0-FT GUYED TOWER.</p>			

GENERAL NOTES

GENERAL

- ALL METHODS, MATERIALS, AND WORKMANSHIP SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE.
- ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS WITH A MINIMUM OF 10 YEARS EXPERIENCE IN TOWER AND FOUNDATION CONSTRUCTION.
- ALL DIMENSIONS, MATERIALS, AND DETAILS OF THE EXISTING STRUCTURES ARE INCLUDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY ALL RELEVANT INFORMATION PRIOR TO CONSTRUCTION OR FABRICATION AND NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY VARIANCE OR DISCREPANCIES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
- DIMENSIONS AND ELEVATIONS GIVEN FOR THE NEW CONSTRUCTION MUST ALSO BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND ERECTION TO ASSURE PROPER FIT AND ALIGNMENT OF THE STRUCTURAL COMPONENTS IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS.
- ANY SUBSTITUTIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- ANY MANUFACTURED DESIGN ELEMENTS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. THESE DESIGN ELEMENTS MUST BE STAMPED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE THE WORK IS BEING PERFORMED. IF REQUIRED CONTRACTOR TO PREPARE PERMIT DRAWING SET SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE THE WORK IS BEING PERFORMED. ALL PERMITS, LICENSES, APPROVALS AND OTHER REQUIREMENTS FOR CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS.

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS. ALL INSTALLATION PROCEDURES, SAFEGUARDS AND MEANS AND METHODS OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

9. A DETAILED RIGGING PLAN SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE OWNER FOR APPROVAL. THE RIGGING PLAN SHALL INCLUDE AS A MINIMUM: BRIEF TOWER DESCRIPTION, HOIST MODEL AND CAPACITY, DATA, WIRE ROPE SIZE AND CONSTRUCTION, SHEAVE/BLOCK DIAMETER AND CAPACITY, CHOKER SIZE AND CAPACITY, RIGGING DETAILS TO THE TOWER, PLANNED LIFT WEIGHTS, GIN POLE SIZE AND CAPACITY AND A DIAGRAM LOCATING KEY RIGGING COMPONENTS.

APPLICABLE CODES AND STANDARDS

- ANSI/TIA/EIA: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
- IBC: INTERNATIONAL BUILDING CODE, LATEST EDITION.
- ASTM: STANDARDS FOR BUILDING CODES, LATEST EDITION.
- ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, LATEST EDITION.
- ACI 315: AMERICAN CONCRETE INSTITUTE, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT, LATEST EDITION.
- CSRI: CONCRETE STEEL REINFORCING INSTITUTE, MANUAL OF STANDARD PRACTICE, LATEST EDITION.
- AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
- AWS: AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, LATEST EDITION.

STEEL AND FABRICATION

- ALL STEEL FABRICATION TO BE DONE BY AN AISC CERTIFIED FABRICATION FACILITY IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
- ALL STEEL TO BE ASTM A572 GR.50 (50KSI MIN YIELD STRENGTH) U.N.O.; BOLTS TO BE ASTM A325 WITH ANCO LOCKNUTS U.N.O.
- ALL MATERIAL TO BE HOT DIPPED GALVANIZED PER ASTM A123 OR ASTM A153.

4. BOLT HOLE DIAMETER SHALL NOT BE MORE THAN $\frac{1}{16}$ " LARGER THAN NOMINAL BOLT DIAMETER AND SHALL BE PUNCHED OR DRILLED U.N.O.

WELDING

- ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE. ALL WELDS TO BE INSPECTED FOR STRUCTURAL SOUNDNESS AND DOCUMENTED.
- ALL ELECTRODES TO BE E70 LOW HYDROGEN TYPE.
- MINIMUM WELD SIZE TO BE 0.3125 INCH FILLET WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- ALL WELDED CONNECTIONS TO BE SEAL WELDED FOR GALVANIZING.

FIELD INSTALLATION

- ALL GALVANIZED SURFACE THAT ARE SCRATCHED OR DAMAGED SHALL BE REPAIRED USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.
- A490 BOLTS SHALL BE SPRAY PAINTED WITH A COAT OF COLD GALVANIZING PRIOR TO INSTALLATION FOLLOWED BY A COAT OF A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT AFTER INSTALLATION.
- HARDWARE INTERFERING WITH THE INSTALLATION OF REINFORCING MATERIAL SHALL BE TEMPORARILY MOVED AND REINSTALLED AFTER THE COMPLETION OF THE WORK.
- WHEN FIELD WELDING IS REQUIRED THE STEEL SHALL BE CLEANED OF ALL PAINT AND GALVANIZING TO A BARE METAL. AS SPECIFIED PER AWS D1.1. PREHEATING AND POST HEATING MAY BE REQUIRED.
- WELDED AREAS ARE TO BE TOUCHED UP USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.

TIGHTENING OF BOLTS AND NUTS

1. ALL HIGH STRENGTH BOLTS TO BE TIGHTENED TO THE SNUG TIGHT CONDITION AS SPECIFIED IN THE CURRENT EDITION OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". BOLTS REQUIRING FULL PRETENSION TO BE TIGHTENED BY "THE TURN OF THE NUT METHOD" U.N.O.

FOUNDATIONS


- CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND UTILITIES IN THE AREA WHERE THE WORK IS TO BE PERFORMED.
- DRILLED SHAFT INSTALLED IN ACCORDANCE WITH ACI-336 (LATEST EDITION).

CONCRETE

- ALL CONCRETE FOR FOUNDATIONS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. AFTER 28 DAYS.
- THE CONCRETE MIX SHALL NOT CONTAIN LESS THAN $5\frac{1}{2}$ SACKS OF CEMENT (ASTM C 150 TYPE II) PER CUBIC YARD.
- THE CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF $\frac{7}{8}$ ".
- THE CONCRETE MIX SHALL PRODUCE A MAXIMUM SLUMP OF 5" ±1".
- THE CONCRETE MIX SHALL HAVE A TOTAL AIR CONTENT OF 5%, WITH A TOLERANCE OF PLUS OR MINUS 1.5%. AIR-ENTRAINING ADMIXTURES SHALL CONFORM TO ASTM C 260.
- THE CONCRETE MIX SHALL HAVE A MAXIMUM WATER-CEMENT RATIO OF 0.45. WATER REDUCING OR ACCELERATING ADMIXTURES SHALL CONFORM TO ASTM C 494.
- THE CONCRETE SHALL NOT CONTAIN CALCIUM CHLORIDE OR ANY OTHER ADMIXTURE CONTAINING CHLORIDE OTHER THAN NATURAL IMPURITIES.
- FORM WORK SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.
- ALL CONCRETE SHALL BE PLACED IN A MONOLITHIC POUR UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
- PROVIDE CHAMFERS AT ALL EXPOSED CORNERS OF CONCRETE.
- CONCRETE WORK UNDER EXTREME WEATHER CONDITIONS SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.

STEEL REINFORCEMENT (REBAR)

- ALL REINFORCING STEEL TO BE GRADE 60 DEFORMED BILLET STEEL PER ASTM A615.
- REINFORCEMENT SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE ACI 315 AND CSRI. SUPPORT REINFORCING AS REQUIRED BY CSRI TO PREVENT DISPLACEMENT UPON CONCRETE POURING.
- MAINTAIN ALL CLEARANCES NOTED ON THE DRAWINGS. WHERE NO DIMENSIONS ARE NOTED, USE THE ACI RECOMMENDED CLEARANCES.
- FOR CONCRETE POURED AGAINST SOIL, THE MINIMUM COVER FOR ALL REINFORCING BARS SHALL BE 3".
- TIE BARS SECURELY WITH #16 ANNEALED WIRE AND SUPPORT AS REQUIRED.
- ALL WELDED WIRE FABRIC TO BE PER ASTM A185. ALL BARS AND WIRE SHALL BE FREE OF RUST, MILL SCALE, DIRT, OR OTHER FOREIGN MATERIAL PRIOR TO CASTING CONCRETE.
- PROVIDE MINIMUM LAP SPLICES OF 36 BAR DIAMETERS UNLESS NOTED OTHERWISE.
- FIELD BENDING OF REINFORCEMENT BARS IS NOT PERMITTED. DO NOT WELD REINFORCING BARS.

0	11/3/17	WEB	RELEASED FOR JOB USE
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 <div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8891 4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5189 fx: 425-778-5103 www.tower-tci.com</div>			KOZK
			1891'-0 GUYED TOWER
			SPRINGFIELD, MO
			GENERAL NOTES
			G-1
			Sheet No.:
			Project No.: 17.289.002
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MODIFICATION DESCRIPTION:

1. THIS DRAWING IS FOR JOB USE.
2. UPGRADES APPLY TO ALL THREE FACES OF THE TOWER.
3. A TEMPORARY BRACE MUST BE INSTALLED THAT IS OF EQUIVALENT OR GREATER CAPACITY THAN THE MEMBER BEING REPLACED. THE TEMPORARY BRACE SHALL BE PLACED ADJACENT TO THE MEMBER BEING REPLACED SUCH THAT IT WILL TAKE THE LOAD AFTER THE EXISTING MEMBER IS REMOVED.
- A TEMPORARY FRAME IS REQUIRED ABOVE AND BELOW GUY LEVELS DURING DIAGONAL REPLACEMENT.
4. REPLACE THE EXISTING SOLID ROD DIAGONAL MEMBERS WITH A NEW HIGHER CAPACITY MEMBER AT THE FOLLOWING LOCATIONS (SEE E-5):

50.5' - 60.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
80.5' - 100.5'	(2 BAYS)	1"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A490X BOLTS
100.5' - 110.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
130.5' - 160.5'	(3 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
570.5' - 590.5'	(2 BAYS)	1¼"ϕ S.R., ASTM A572-50, ¾"ϕ A490X BOLTS
590.5' - 630.5'	(4 BAYS)	1"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A490X BOLTS
630.5' - 650.5'	(2 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
770.5' - 800.5'	(3 BAYS)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
800.5' - 830.5'	(3 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
980.5' - 990.5'	(1 BAY)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
1010.5' - 1020.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
1180.5' - 1190.5'	(1 BAY)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
1230.5' - 1240.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS

5. REINFORCE THE EXISTING LEGS BY ADDING SPLIT PIPE REINFORCING AT THE FOLLOWING LOCATIONS (SEE E-6)

0.0' - 60.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
60.5' - 150.5'	(3 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
150.5' - 210.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
210.5' - 390.5'	(6 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
390.5' - 420.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
420.5' - 450.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
450.5' - 600.5'	(5 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
600.5' - 810.5'	(7 SECTIONS)	HALF HSS 5.0" O.D. x 0.5625" WALL, FY=70KSI MIN.
810.5' - 1020.5'	(7 SECTIONS)	HALF HSS 4.75" O.D. x 0.5" WALL, FY=70KSI MIN.



6. REINFORCE THE EXISTING DOUBLE ANGLE HORIZONTAL MEMBERS BY ADDING A SINGLE ANGLE MEMBER BETWEEN THE DOUBLE ANGLES AT THE FOLLOWING LOCATIONS (SEE E-7):

590.5'	(1 LEVEL)	L3½x2½x3⁄8, 5⁄8"ϕ A325X BOLTS
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7. REPLACE GUY LEVEL 6 AND ADJUST THE GUY WIRE INITIAL TENSION USING THE TANGENT INTERCEPT METHOD TO THE VALUES LISTED IN THE CHART BELOW. REUSE EXISTING GROUNDING AND HFD (SEE E-8 & E-9):

GUY LEVEL	EXISTING GUY PROPERTIES			RECOMMENDED GUY PROPERTIES		
	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION
9 th (top)	Outer Anchor	1-7/16"Ø BS	7.62%	Outer Anchor	1-7/16"Ø BS	11.0%
8 th		1-9/16"Ø BS	8.44%		1-9/16"Ø BS	11.0%
7 th		1-5/16"Ø BS	10.22%		1-5/16"Ø BS	10.0%
6 th	Middle Anchor	1-3/8"Ø BS	9.67%	Middle Anchor	1-3/8"Ø HSS	8.0%
5 th		1-1/4"Ø BS	10.52%		1-1/4"Ø BS	9.0%
4 th		1-1/8"Ø BS	12.08%		1-1/8"Ø BS	9.0%
3 rd	Inner Anchor	1-3/16"Ø BS	9.34%	Inner Anchor	1-3/16"Ø BS	8.0%
2 nd		1-1/16"Ø BS	12.30%		1-1/16"Ø BS	9.0%
1 st (bot)		1-1/16"Ø BS	12.62%		1-1/16"Ø BS	12.0%

NOTE: VALUES SHOWN ABOVE ARE VALID AT 60 DEGREES FAHRENHEIT; A P&T CHART WITH TEMPERATURE CORRECTIONS WILL BE REQUIRED FOR FIELD ADJUSTMENTS

8. ALL MATERIAL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE TO ASTM SPECIFICATIONS.
9. ALL REINFORCING MATERIAL SHALL BE PAINTED IN THE FIELD TO MATCH THE EXISTING COLOR SCHEME OF THE TOWER.
10. THE MODIFICATION MATERIAL AND INSTALLATION DRAWINGS CONTAINED HEREIN ARE BASED ON THE ASSUMPTION THAT THE TOWER HAS BEEN PROPERLY INSTALLED AND MAINTAINED, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- A. PROPER ALIGNMENT AND PLUMBNESS.
B. CORRECT GUY TENSIONS.
C. CORRECT BOLT TIGHTNESS.
D. NO SIGNIFICANT DETERIORATION OR DAMAGE TO ANY COMPONENT.

11. ALL MATERIAL REQUIRED BY SHEETS E-1 THROUGH E-8 FURNISHED TO CONTRACTOR BY TCI. FOR PRICING PLEASE CONTACT:

RON DOZSA
425-778-5169

DESIGN INFORMATION:

1. THIS DRAWING PACKAGE IS BASED ON TOWER CONSULTANTS ANALYSIS REPORT 17.289.001, DATED MAY 19, 2017.
2. THE TOWER IS DESIGNED FOR THE EXISTING AND PROPOSED LOADING AS LISTED IN THE REPORT REFERENCED ABOVE.


ANTENNA WORK:

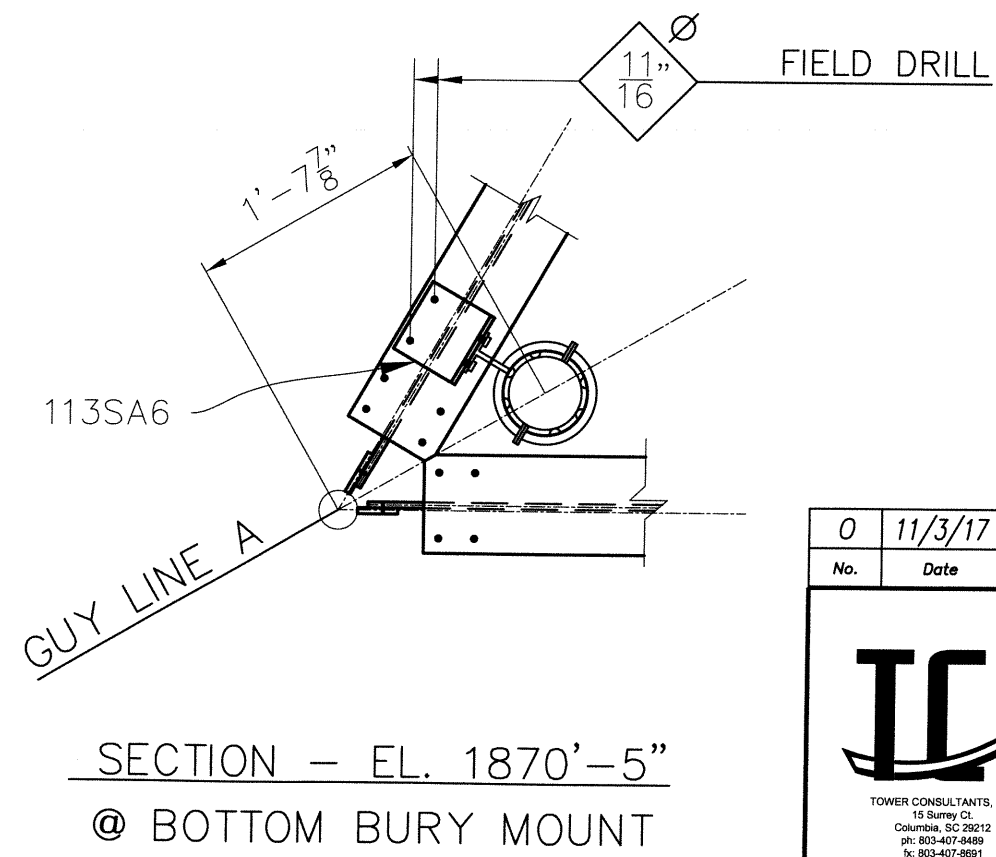
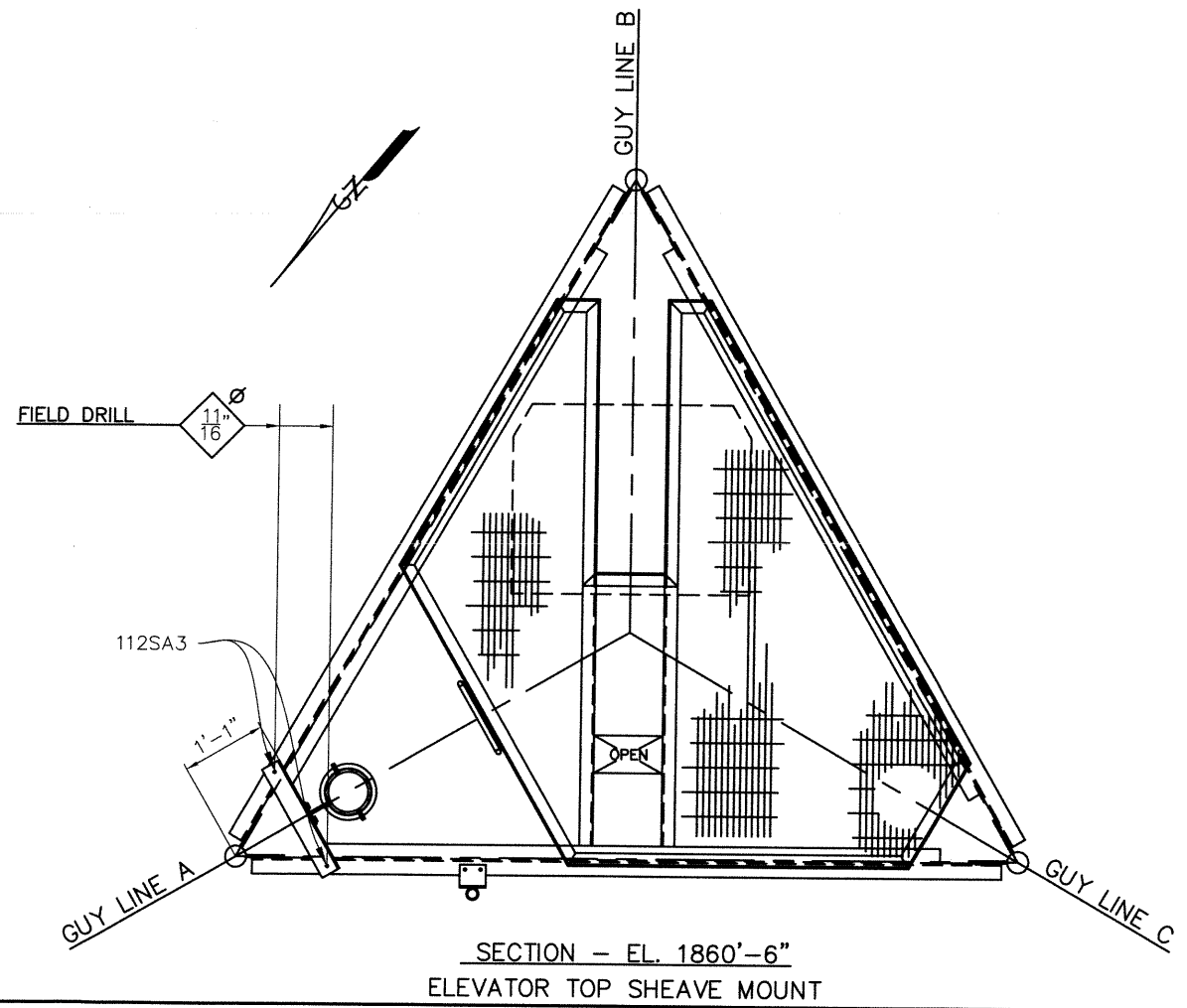
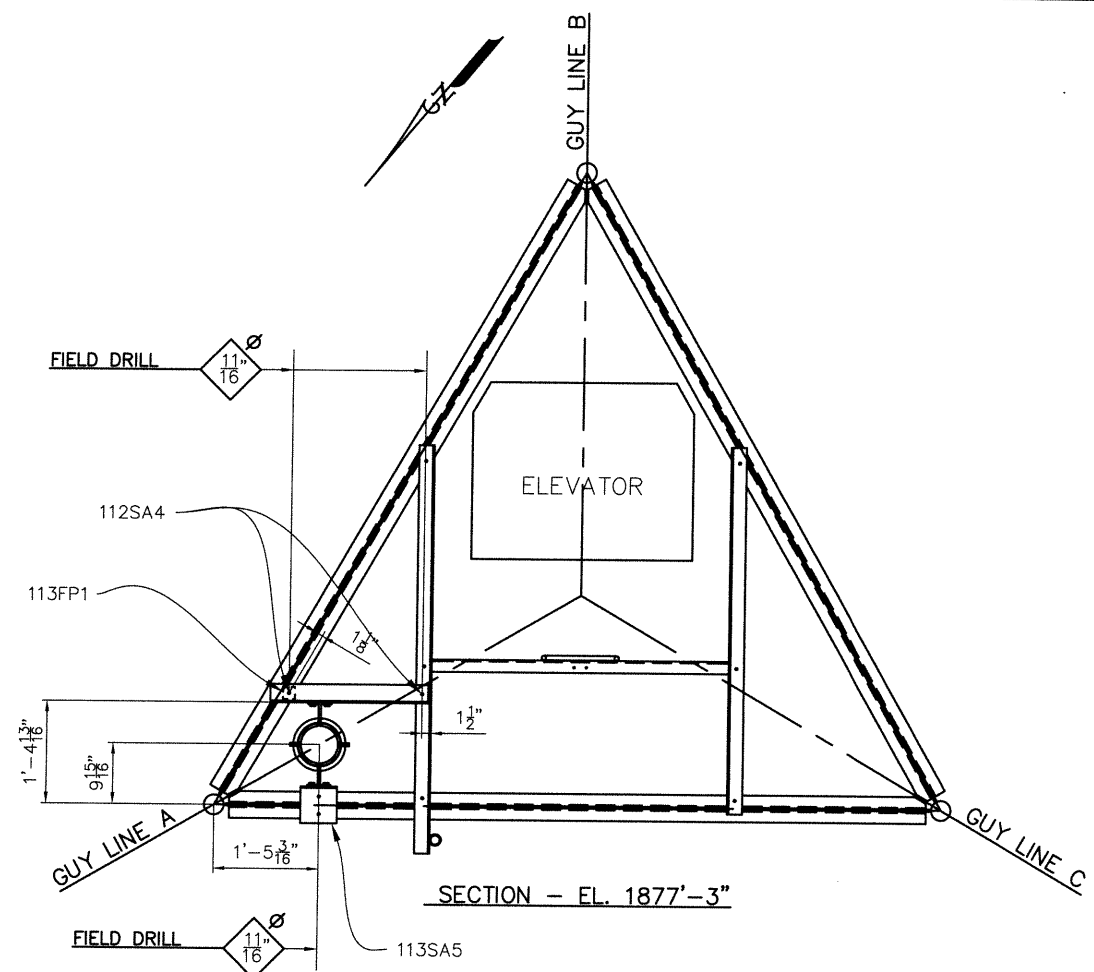
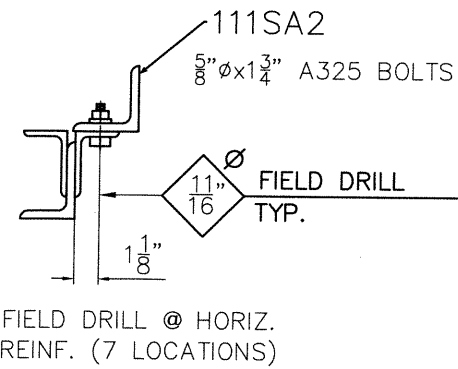
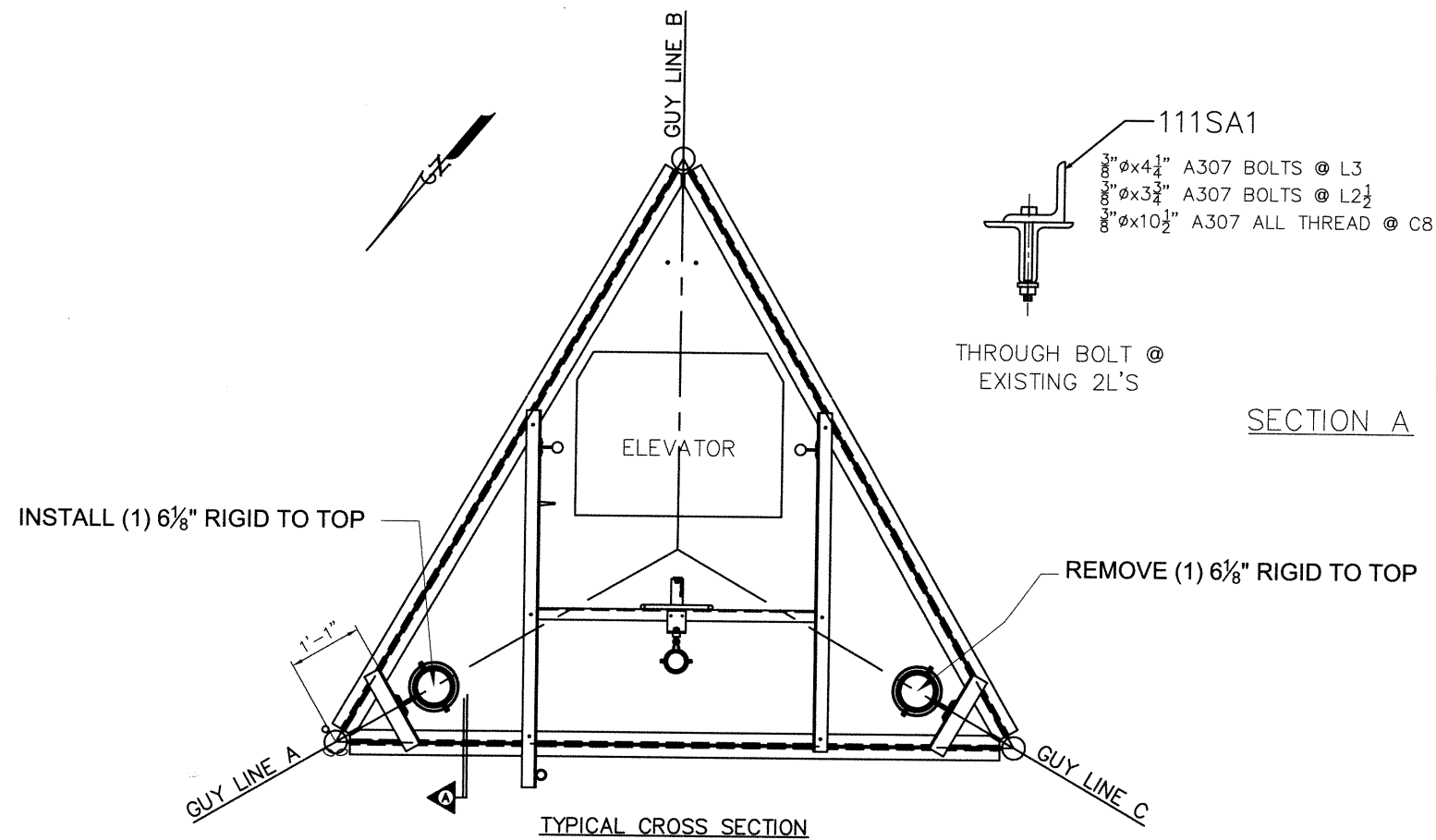
1. REMOVE THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):


0' - TOP 6⅛" RIGID LINE

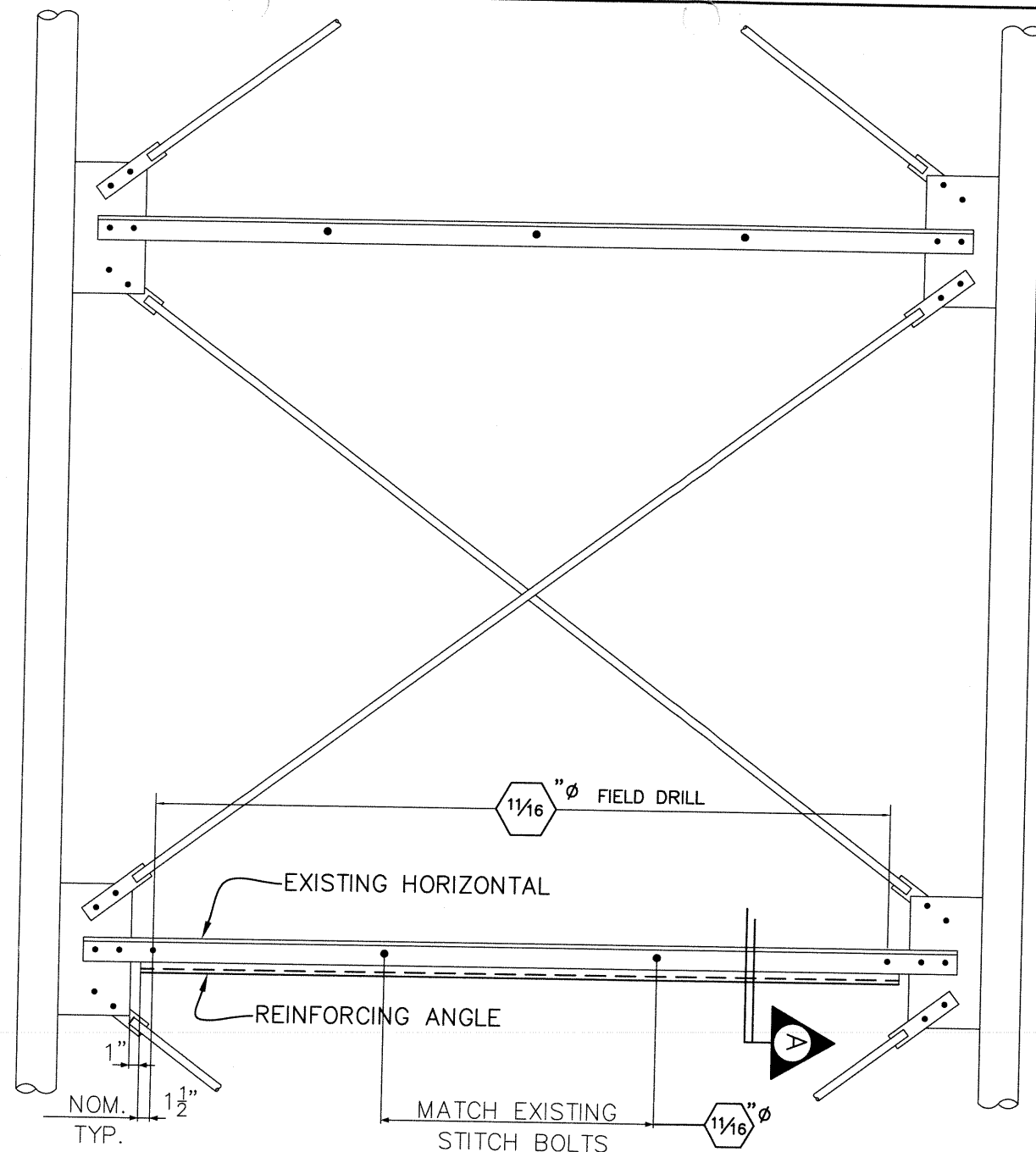
2. INSTALL THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):

0' - TOP 6⅛" RIGID LINE

1	3/9/18	WEB	REVISED SPLIT PIPE
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TYPICAL STRUT REINFORCING
(TYPICAL 3 SIDES)

HORIZONTAL REINFORCEMENT			
ELEVATION	LEVELS	REINFORCING ANGLE	BOLTS*
590.5'	1	(3) 104S1	5/8"Ø A325X x 2-1/4"

*ALL BOLTS REQUIRE (1) HARDENED WASHER AND (1) ANCO LOCKNUT EACH

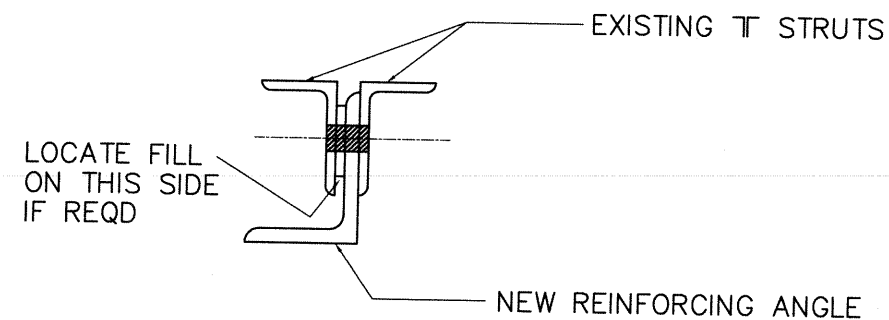
PROCEDURE TO REINFORCE DOUBLE ANGLE STRUTS

A. DOUBLE ANGLE STRUTS

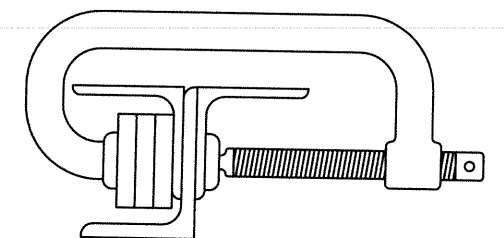
1. CLAMP STRUT WITH "C" CLAMPS AND SHIMS (TACKED OR FASTENED TO THE CLAMP). USE ONE (1) CLAMP PER STITCH BOLT (LOCATED NEAR STITCH BOLT). SEE DETAIL "1" OTHER STYLE CLAMPS ARE PERMITTED PROVIDED STRUT ANGLES ARE RESTRAINED FROM MOVING HORIZONTALLY.
2. REMOVE STITCH BOLTS AND SPACERS FROM THE STRUT TO BE REINFORCED.
3. IMMEDIATELY INSERT REINFORCING ANGLE BETWEEN THE DOUBLE ANGLES, INSERT STITCH BOLTS AND TIGHTEN.
4. FIELD DRILL HOLES FOR END BOLTS AT 1 1/2" FROM EACH END OF THE REINFORCING ANGLE.
5. COAT ALL FIELD DRILLED HOLES WITH A ZINC RICH TWO PART EPOXY.
6. INSERT END BOLTS AND TIGHTEN.

B. OPERATIONAL CONSTRAINTS

1. NO TOWER MEMBER IS TO BE REINFORCED WHEN A WIND VELOCITY GREATER THAN 15 MPH EXISTS OR WHEN A WIND VELOCITY OF GREATER THAN 15 MPH IS PREDICTED DURING THE OPERATION OF REINFORCING THE TOWER MEMBER.
2. REINFORCE THE STRUTS ONE AT A TIME. ONLY REINFORCE STRUTS WHEN "C" CLAMPS ARE INSTALLED.
3. THE ABOVE PROCEDURES TO BE FOLLOWED WITHOUT VARIATION.




SECTION A



DETAIL 1

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 <p>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691</p> <p>4208 198th St. SW., Suite 208 Seattle, WA 98036 ph: 425-778-5169 fx: 425-778-5103</p> <p>www.tower-tci.com</p>	KOZK	Sheet No.: E-7
	1891'-0 GUYED TOWER	Project No.: 17.289.002
	SPRINGFIELD, MO	Drawn By: WEB
	HORIZONTAL REINFORCING	Checked By: MBB/JY
		Date: 11/3/17
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POST-MODIFICATION CHECKLIST			
REQUIRED	SECTION	REPORT ITEM	BRIEF DESCRIPTION (SEE ENG-SOW-10007)
PRE-CONSTRUCTION			
X	6.1.1	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT
NA	6.1.2	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE THE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.3	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.4	FABRICATOR CERTIFIED WELD INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE TESTING AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.1.5	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL WITH A YIELD STRENGTH GREATER THAN 36 KSI AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.6	FABRICATOR NDE INSPECTION	A VISUAL OBSERVATION OF A PORTION OF THE EXISTING STRUCTURE (AS NOTED ON THESE DRAWINGS) IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.7	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	A VISUAL OBSERVATION OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.1.8	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
CONSTRUCTION			
X	6.2.1	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.2	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.3	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.4	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.5	BASE PLATE GROUT VERIFICATION	A LETTER FROM THE GENERAL CONTRACTOR SHALL BE PROVIDED TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES FOR INCLUSION IN THE MI REPORT.
NA	6.2.6	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.7	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.8	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES.
X	6.2.9	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE FOR INCLUSION IN THE MI REPORT.
X	6.2.10	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
POST-CONSTRUCTION			
X	6.3.1	MI INSPECTOR REDLINE OR RECORD DRAWNG(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
NA	6.3.2	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.3.3	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A TOWER CONSULTANT, INC. (TCI) ENGINEERING OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, TCI SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF TCI CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CUSTOMER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH THE CUSTOMERS APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

TCI RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.


VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - FOUNDATION MODIFICATIONS
 - FINAL INSTALLED CONDITION
- POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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 <div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691 4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5189 fx: 425-778-5103 www.tower-tci.com</div>		KOZK 1891'-0 GUYED TOWER SPRINGFIELD, MO POST MODIFICATION CHECKLIST	<div>E-10</div> <div>Sheet No.:</div> <div>Project No.: 17.289.002</div> <div>Drawn By: WEB</div> <div>Checked By: MBB</div> <div>Date: 11/3/17</div> <div><small>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</small></div>


REINFORCE TOWER, KOZK

PROJECT NO.: 180830-027
MISSOURI STATE UNIVERSITY
1891.0-FT GUYED TOWER
KOZK FORDLAND
905 STATE HIGHWAY FF
FORDLAND, MISSOURI 65602
(37°10'11.0"N, 92°56'31.0"W)
(WEBSTER COUNTY)



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VICINITY MAP		PROJECT INFORMATION		SHEET INDEX	
		APPLICANT: MISSOURI STATE UNIVERSITY 901 S NATIONAL AVENUE FORDLAND, MO 65897 PH: 417-836-5101		T-1 = TITLE SHEET	
		LAND OWNER: MISSOURI STATE UNIVERSITY		G-1 = GENERAL NOTES	
		EMERGENCY CONTACT: BRENT MOORE MISSOURI STATE UNIVERSITY PH: 417-836-3504		G-2 (REV 01) = MODIFICATION DESCRIPTION	
		JURISDICTION: WEBSTER COUNTY, MISSOURI		E-1 = TOWER ELEVATION DRAWING	
		CONTRACTOR LIST		E-2 = TOWER ELEVATION DRAWING	
		TOWER CONTRACTOR: Tower Consultants, Inc. 15 Surrey Ct. Columbia, SC 29212 (803) 407-8489		E-3 = TOWER ELEVATION DRAWING	
				E-4 = CROSS SECTION	
				E-5 = DIAGONAL REPLACEMENT	
				E-6 (REV 02) = SPLIT PIPE REINFORCING	
				E-7 = HORIZONTAL REINFORCEMENT	
				E-8 = GUY WIRE REPLACEMENT	
				E-9 = TENSION CHART	
				E-10 = POST MODIFICATION CHECKLIST	
				LEGEND	
				A ▼ = DETAIL	
				CL OR CL = SECTION	
				CL = CENTERLINE	
				PL = PLATE	
				PL = PROPERTY LINE	
				Δ = REVISION	
TOWER DESIGNED FOR A WIND SPEED OF 90-MPH WITH NO ICE & 30-MPH WITH 1" OF RADIAL ICE PER EIA/TIA-222-G STANDARD.		PROJECT DESCRIPTION			
		MISSOURI STATE UNIVERSITY IS PROPOSING TO PERFORM A TOWER MODIFICATION IN ORDER TO COMPLY WITH ANSI/TIA-222-G STANDARD WITH PROPOSED LOADING ON THE EXISTING 1891.0-FT GUYED TOWER.			

KOZK

1891.0-FT GUYED TOWER

2

3/9/18

WEB

UPDATED INDEX

1

1/17/18

WEB

UPDATED INDEX

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Scale: VARIES

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KOZK
SPRINGFIELD, MO

1891'-0 GUYED
TOWER

ERECTION
DRAWINGS

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GENERAL NOTES

GENERAL

1. ALL METHODS, MATERIALS, AND WORKMANSHIP SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE.
2. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS WITH A MINIMUM OF 10 YEARS EXPERIENCE IN TOWER AND FOUNDATION CONSTRUCTION.
3. ALL DIMENSIONS, MATERIALS, AND DETAILS OF THE EXISTING STRUCTURES ARE INCLUDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY ALL RELEVANT INFORMATION PRIOR TO CONSTRUCTION OR FABRICATION AND NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY VARIANCE OR DISCREPANCIES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.

4. DIMENSIONS AND ELEVATIONS GIVEN FOR THE NEW CONSTRUCTION MUST ALSO BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND ERECTION TO ASSURE PROPER FIT AND ALIGNMENT OF THE STRUCTURAL COMPONENTS IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS.

5. ANY SUBSTITUTIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

6. ANY MANUFACTURED DESIGN ELEMENTS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. THESE DESIGN ELEMENTS MUST BE STAMPED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE THE WORK IS BEING PERFORMED. IF REQUIRED CONTRACTOR TO PREPARE PERMIT DRAWING SET SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE THE WORK IS BEING PERFORMED. ALL PERMITS, LICENSES, APPROVALS AND OTHER REQUIREMENTS FOR CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

7. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS.

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS. ALL INSTALLATION PROCEDURES, SAFEGUARDS AND MEANS AND METHODS OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

9. A DETAILED RIGGING PLAN SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE OWNER FOR APPROVAL. THE RIGGING PLAN SHALL INCLUDE AS A MINIMUM: BRIEF TOWER DESCRIPTION, HOIST MODEL AND CAPACITY, DATA, WIRE ROPE SIZE AND CONSTRUCTION, SHEAVE/BLOCK DIAMETER AND CAPACITY, CHOKER SIZE AND CAPACITY, RIGGING DETAILS TO THE TOWER, PLANNED LIFT WEIGHTS, GIN POLE SIZE AND CAPACITY AND A DIAGRAM LOCATING KEY RIGGING COMPONENTS.

APPLICABLE CODES AND STANDARDS

1. ANSI/TIA/EIA: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. IBC: INTERNATIONAL BUILDING CODE, LATEST EDITION.
3. ASTM: STANDARDS FOR BUILDING CODES, LATEST EDITION.
4. ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, LATEST EDITION.
5. ACI 315: AMERICAN CONCRETE INSTITUTE, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT, LATEST EDITION.
6. CSRI: CONCRETE STEEL REINFORCING INSTITUTE, MANUAL OF STANDARD PRACTICE, LATEST EDITION.
7. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
8. AWS: AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, LATEST EDITION.

STEEL AND FABRICATION

1. ALL STEEL FABRICATION TO BE DONE BY AN AISC CERTIFIED FABRICATION FACILITY IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. ALL STEEL TO BE ASTM A572 GR.50 (50KSI MIN YIELD STRENGTH) U.N.O.; BOLTS TO BE ASTM A325 WITH ANCO LOCKNUTS U.N.O.
3. ALL MATERIAL TO BE HOT DIPPED GALVANIZED PER ASTM A123 OR ASTM A153.

4. BOLT HOLE DIAMETER SHALL NOT BE MORE THAN $\frac{1}{16}$ " LARGER THAN NOMINAL BOLT DIAMETER AND SHALL BE PUNCHED OR DRILLED U.N.O.

WELDING

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE. ALL WELDS TO BE INSPECTED FOR STRUCTURAL SOUNDNESS AND DOCUMENTED.
2. ALL ELECTRODES TO BE E70 LOW HYDROGEN TYPE.
3. MINIMUM WELD SIZE TO BE 0.3125 INCH FILLET WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
4. ALL WELDED CONNECTIONS TO BE SEAL WELDED FOR GALVANIZING.

FIELD INSTALLATION

1. ALL GALVANIZED SURFACE THAT ARE SCRATCHED OR DAMAGED SHALL BE REPAIRED USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.
2. A490 BOLTS SHALL BE SPRAY PAINTED WITH A COAT OF COLD GALVANIZING PRIOR TO INSTALLATION FOLLOWED BY A COAT OF A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT AFTER INSTALLATION.
3. HARDWARE INTERFERING WITH THE INSTALLATION OF REINFORCING MATERIAL SHALL BE TEMPORARILY MOVED AND REINSTALLED AFTER THE COMPLETION OF THE WORK.
4. WHEN FIELD WELDING IS REQUIRED THE STEEL SHALL BE CLEANED OF ALL PAINT AND GALVANIZING TO A BARE METAL. AS SPECIFIED PER AWS D1.1. PREHEATING AND POST HEATING MAY BE REQUIRED.
5. WELDED AREAS ARE TO BE TOUCHED UP USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.

TIGHTENING OF BOLTS AND NUTS

1. ALL HIGH STRENGTH BOLTS TO BE TIGHTENED TO THE SNUG TIGHT CONDITION AS SPECIFIED IN THE CURRENT EDITION OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". BOLTS REQUIRING FULL PRETENSION TO BE TIGHTENED BY "THE TURN OF THE NUT METHOD" U.N.O.

FOUNDATIONS


1. CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND UTILITIES IN THE AREA WHERE THE WORK IS TO BE PERFORMED.
2. DRILLED SHAFT INSTALLED IN ACCORDANCE WITH ACI-336 (LATEST EDITION).

CONCRETE

1. ALL CONCRETE FOR FOUNDATIONS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. AFTER 28 DAYS.
2. THE CONCRETE MIX SHALL NOT CONTAIN LESS THAN $5\frac{1}{2}$ SACKS OF CEMENT (ASTM C 150 TYPE II) PER CUBIC YARD.
3. THE CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF $\frac{7}{8}$ ".
4. THE CONCRETE MIX SHALL PRODUCE A MAXIMUM SLUMP OF 5" ±1".
5. THE CONCRETE MIX SHALL HAVE A TOTAL AIR CONTENT OF 5%, WITH A TOLERANCE OF PLUS OR MINUS 1.5%. AIR-ENTRAINING ADMIXTURES SHALL CONFORM TO ASTM C 260.
6. THE CONCRETE MIX SHALL HAVE A MAXIMUM WATER-CEMENT RATIO OF 0.45. WATER REDUCING OR ACCELERATING ADMIXTURES SHALL CONFORM TO ASTM C 494.
7. THE CONCRETE SHALL NOT CONTAIN CALCIUM CHLORIDE OR ANY OTHER ADMIXTURE CONTAINING CHLORIDE OTHER THAN NATURAL IMPURITIES.
8. FORM WORK SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.
9. ALL CONCRETE SHALL BE PLACED IN A MONOLITHIC POUR UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
10. PROVIDE CHAMFERS AT ALL EXPOSED CORNERS OF CONCRETE.
11. CONCRETE WORK UNDER EXTREME WEATHER CONDITIONS SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.

STEEL REINFORCEMENT (REBAR)

1. ALL REINFORCING STEEL TO BE GRADE 60 DEFORMED BILLET STEEL PER ASTM A615.
2. REINFORCEMENT SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE ACI 315 AND CSRI. SUPPORT REINFORCING AS REQUIRED BY CSRI TO PREVENT DISPLACEMENT UPON CONCRETE POURING.
3. MAINTAIN ALL CLEARANCES NOTED ON THE DRAWINGS. WHERE NO DIMENSIONS ARE NOTED, USE THE ACI RECOMMENDED CLEARANCES.
4. FOR CONCRETE POURED AGAINST SOIL, THE MINIMUM COVER FOR ALL REINFORCING BARS SHALL BE 3".
5. TIE BARS SECURELY WITH #16 ANNEALED WIRE AND SUPPORT AS REQUIRED.
6. ALL WELDED WIRE FABRIC TO BE PER ASTM A185. ALL BARS AND WIRE SHALL BE FREE OF RUST, MILL SCALE, DIRT, OR OTHER FOREIGN MATERIAL PRIOR TO CASTING CONCRETE.
7. PROVIDE MINIMUM LAP SPLICES OF 36 BAR DIAMETERS UNLESS NOTED OTHERWISE.
8. FIELD BENDING OF REINFORCEMENT BARS IS NOT PERMITTED. DO NOT WELD REINFORCING BARS.

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<div></div> <div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691 4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5189 fx: 425-778-5103 www.tower-tci.com</div>			KOZK	
			1891'-0 GUYED TOWER	
			SPRINGFIELD, MO	
			GENERAL NOTES	
			G-1	
			Sheet No.:	
Project No.: 17.289.002				
Drawn By: WEB				
Checked By: MBB/JY				
Date: 11/3/17				
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MODIFICATION DESCRIPTION:

1. THIS DRAWING IS FOR JOB USE.
2. UPGRADES APPLY TO ALL THREE FACES OF THE TOWER.
3. A TEMPORARY BRACE MUST BE INSTALLED THAT IS OF EQUIVALENT OR GREATER CAPACITY THAN THE MEMBER BEING REPLACED. THE TEMPORARY BRACE SHALL BE PLACED ADJACENT TO THE MEMBER BEING REPLACED SUCH THAT IT WILL TAKE THE LOAD AFTER THE EXISTING MEMBER IS REMOVED.
A TEMPORARY FRAME IS REQUIRED ABOVE AND BELOW GUY LEVELS DURING DIAGONAL REPLACEMENT.
4. REPLACE THE EXISTING SOLID ROD DIAGONAL MEMBERS WITH A NEW HIGHER CAPACITY MEMBER AT THE FOLLOWING LOCATIONS (SEE E-5):

50.5' - 60.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
80.5' - 100.5'	(2 BAYS)	1"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A490X BOLTS
100.5' - 110.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
130.5' - 160.5'	(3 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
570.5' - 590.5'	(2 BAYS)	1¼"ϕ S.R., ASTM A572-50, ¾"ϕ A490X BOLTS
590.5' - 630.5'	(4 BAYS)	1"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A490X BOLTS
630.5' - 650.5'	(2 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
770.5' - 800.5'	(3 BAYS)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
800.5' - 830.5'	(3 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
980.5' - 990.5'	(1 BAY)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
1010.5' - 1020.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
1180.5' - 1190.5'	(1 BAY)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
1230.5' - 1240.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS

5. REINFORCE THE EXISTING LEGS BY ADDING SPLIT PIPE REINFORCING AT THE FOLLOWING LOCATIONS (SEE E-6)

0.0' - 60.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
60.5' - 150.5'	(3 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
150.5' - 210.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
210.5' - 390.5'	(6 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
390.5' - 420.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
420.5' - 450.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
450.5' - 600.5'	(5 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
600.5' - 810.5'	(7 SECTIONS)	HALF HSS 5.0" O.D. x 0.5625" WALL, FY=70KSI MIN.
810.5' - 1020.5'	(7 SECTIONS)	HALF HSS 4.75" O.D. x 0.5" WALL, FY=70KSI MIN.



6. REINFORCE THE EXISTING DOUBLE ANGLE HORIZONTAL MEMBERS BY ADDING A SINGLE ANGLE MEMBER BETWEEN THE DOUBLE ANGLES AT THE FOLLOWING LOCATIONS (SEE E-7):

590.5'	(1 LEVEL)	L3½x2½x¾, 5⁄8"ϕ A325X BOLTS
--------	-----------	-----------------------------

7. REPLACE GUY LEVEL 6 AND ADJUST THE GUY WIRE INITIAL TENSION USING THE TANGENT INTERCEPT METHOD TO THE VALUES LISTED IN THE CHART BELOW. REUSE EXISTING GROUNDING AND HFD (SEE E-8 & E-9):

GUY LEVEL	EXISTING GUY PROPERTIES			RECOMMENDED GUY PROPERTIES		
	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION
9 th (top)	Outer Anchor	1-7/16"Ø BS	7.62%	Outer Anchor	1-7/16"Ø BS	11.0%
8 th		1-9/16"Ø BS	8.44%		1-9/16"Ø BS	11.0%
7 th		1-5/16"Ø BS	10.22%		1-5/16"Ø BS	10.0%
6 th	Middle Anchor	1-3/8"Ø BS	9.67%	Middle Anchor	1-3/8"Ø HSS	8.0%
5 th		1-1/4"Ø BS	10.52%		1-1/4"Ø BS	9.0%
4 th		1-1/8"Ø BS	12.08%		1-1/8"Ø BS	9.0%
3 rd	Inner Anchor	1-3/16"Ø BS	9.34%	Inner Anchor	1-3/16"Ø BS	8.0%
2 nd		1-1/16"Ø BS	12.30%		1-1/16"Ø BS	9.0%
1 st (bot)		1-1/16"Ø BS	12.62%		1-1/16"Ø BS	12.0%

NOTE: VALUES SHOWN ABOVE ARE VALID AT 60 DEGREES FAHRENHEIT; A P&T CHART WITH TEMPERATURE CORRECTIONS WILL BE REQUIRED FOR FIELD ADJUSTMENTS

8. ALL MATERIAL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE TO ASTM SPECIFICATIONS.
9. ALL REINFORCING MATERIAL SHALL BE PAINTED IN THE FIELD TO MATCH THE EXISTING COLOR SCHEME OF THE TOWER.
10. THE MODIFICATION MATERIAL AND INSTALLATION DRAWINGS CONTAINED HEREIN ARE BASED ON THE ASSUMPTION THAT THE TOWER HAS BEEN PROPERLY INSTALLED AND MAINTAINED, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

A. PROPER ALIGNMENT AND PLUMBNESS.
B. CORRECT GUY TENSIONS.
C. CORRECT BOLT TIGHTNESS.
D. NO SIGNIFICANT DETERIORATION OR DAMAGE TO ANY COMPONENT.

11. ALL MATERIAL REQUIRED BY SHEETS E-1 THROUGH E-8 FURNISHED TO CONTRACTOR BY TCI. FOR PRICING PLEASE CONTACT:

RON DOZSA
425-778-5169

DESIGN INFORMATION:

1. THIS DRAWING PACKAGE IS BASED ON TOWER CONSULTANTS ANALYSIS REPORT 17.289.001, DATED MAY 19, 2017.
2. THE TOWER IS DESIGNED FOR THE EXISTING AND PROPOSED LOADING AS LISTED IN THE REPORT REFERENCED ABOVE.


ANTENNA WORK:

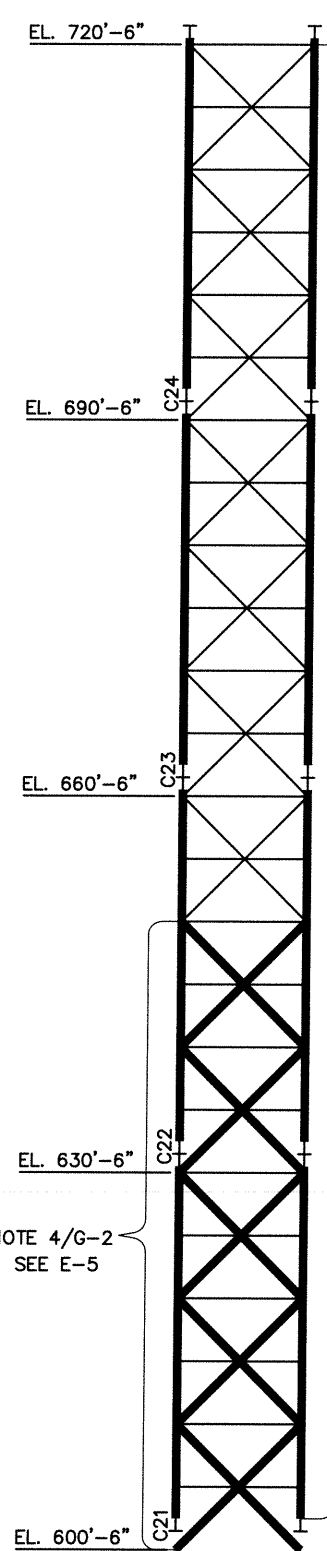
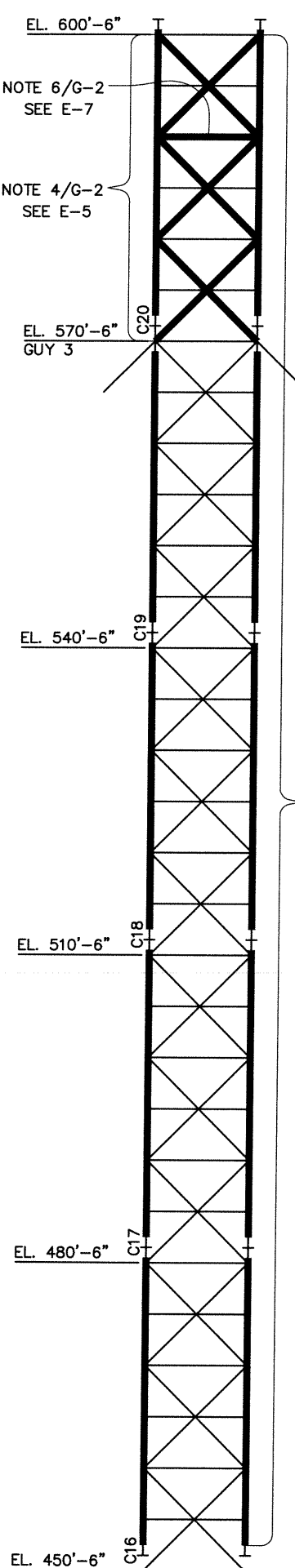
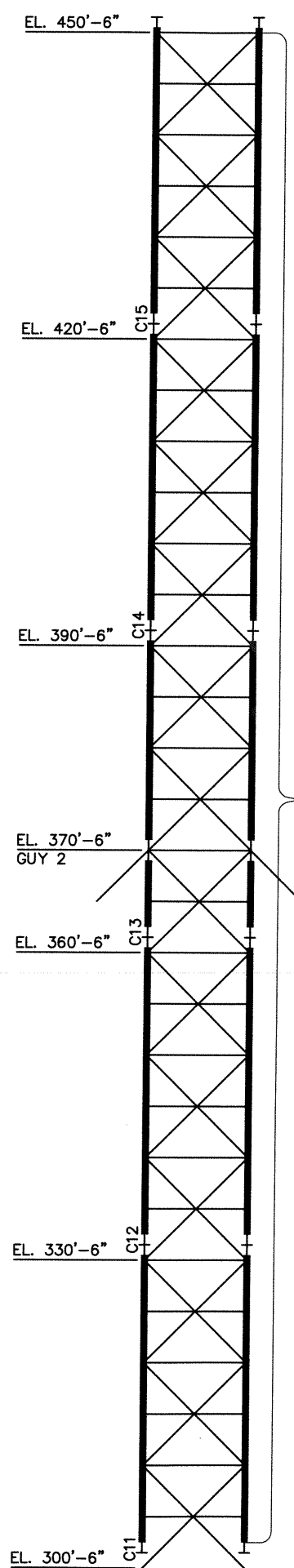
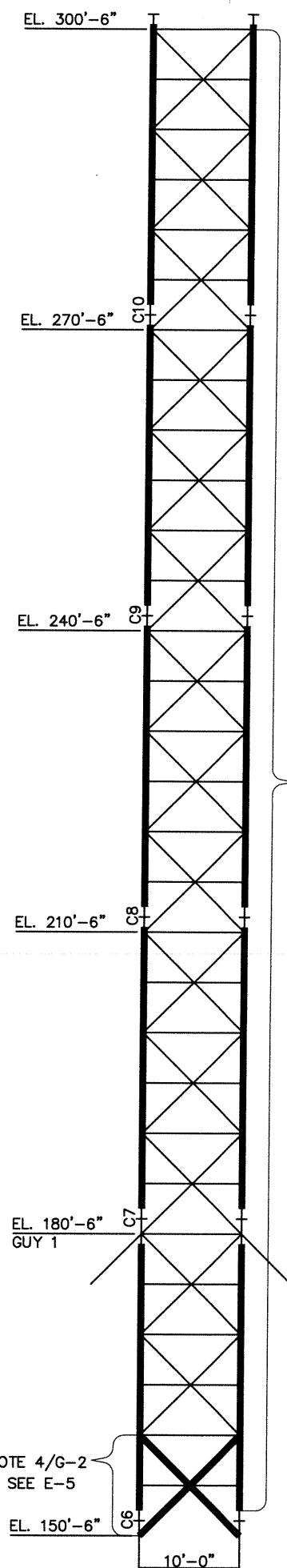
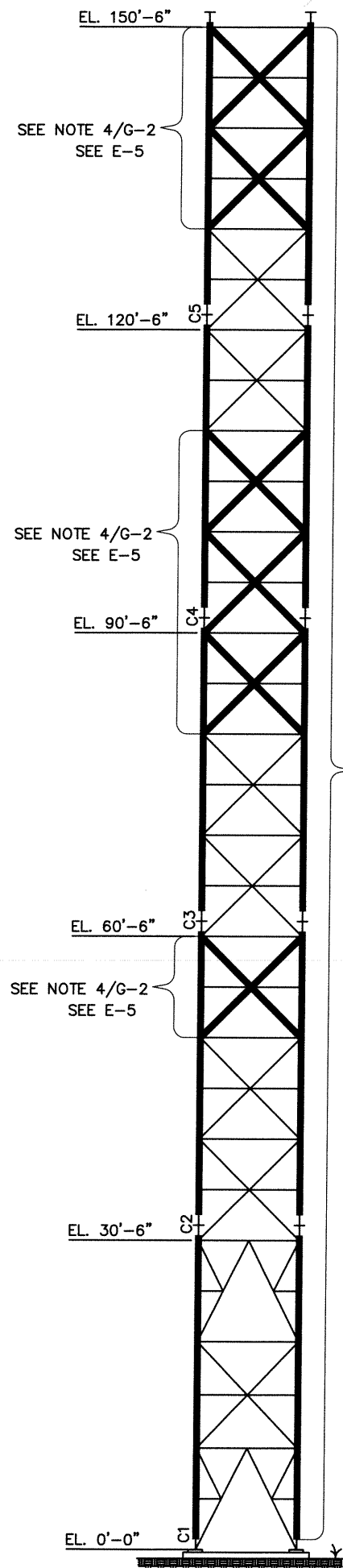
1. REMOVE THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):

0' - TOP 6⅛" RIGID LINE

2. INSTALL THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):

0' - TOP 6⅛" RIGID LINE

1	3/9/18	WEB	REVISED SPLIT PIPE
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		1891'-0 GUYED TOWER	
		SPRINGFIELD, MO	
		MODIFICATION DESCRIPTION	
		Sheet No.: G-2 Project No.: 17.289.002 Drawn By: WEB Checked By: MBB/JY Date: 11/3/17 <small>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</small>	



SEE NOTE 5/G-2
SEE E-6


SEE NOTE 4/G-2
SEE E-5

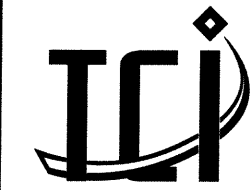
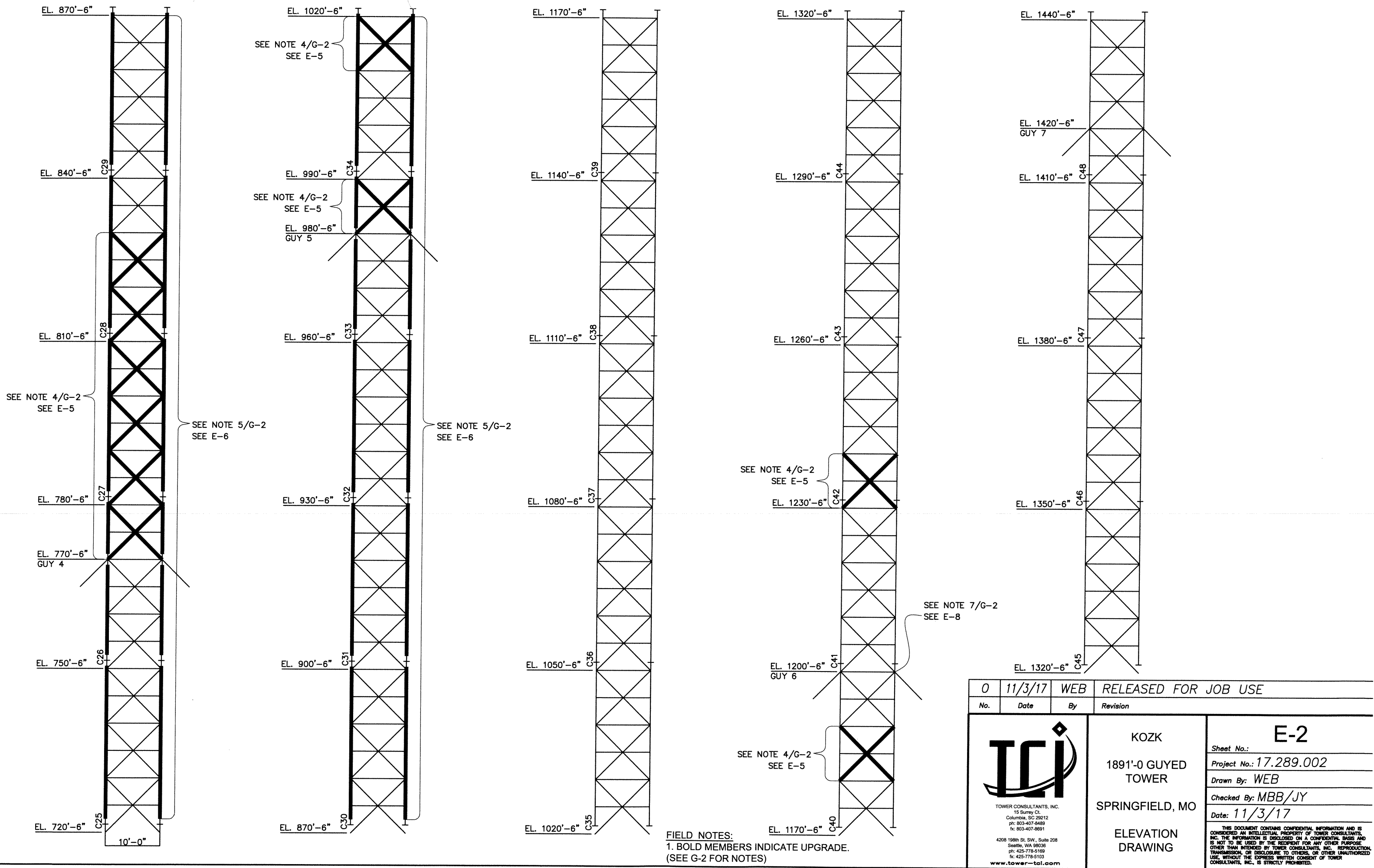
SEE NOTE 5/G-2
SEE E-6

SEE NOTE 5/G-2
SEE E-6

SEE NOTE 5/G-2
SEE E-6

FIELD NOTES:
1. BOLD MEMBERS INDICATE UPGRADE.
(SEE G-2 FOR NOTES)

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		<div><p>E-1</p><p>Sheet No.:</p><p>Project No.: 17.289.002</p><p>Drawn By: WEB</p><p>Checked By: MBB/JY</p><p>Date: 11/3/17</p><p>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</p></div>	

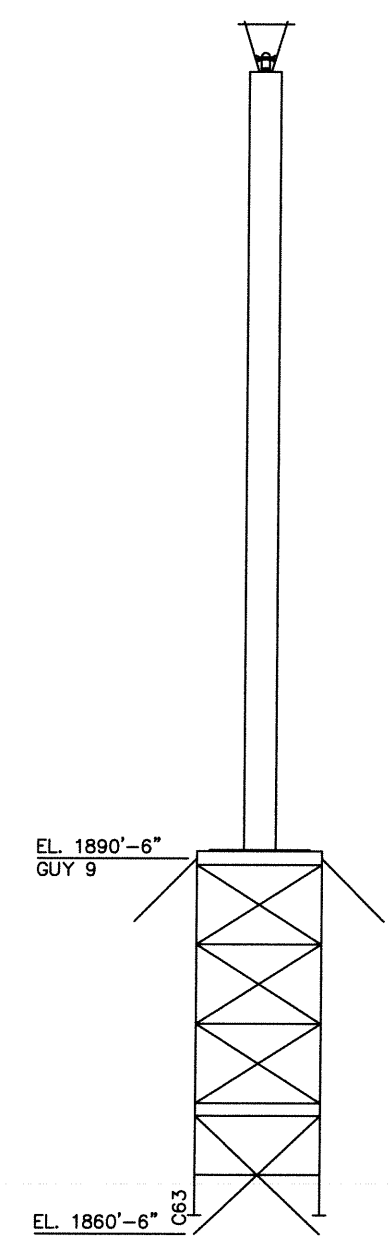
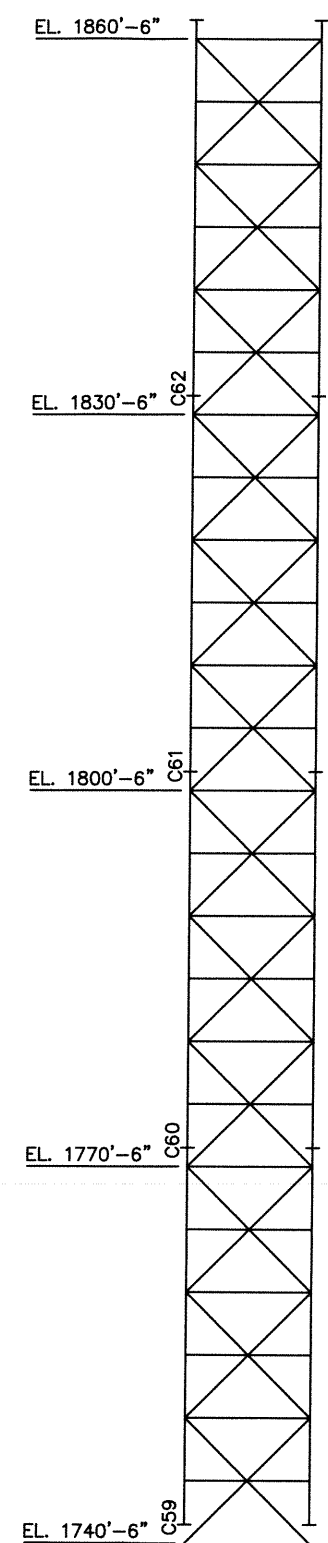
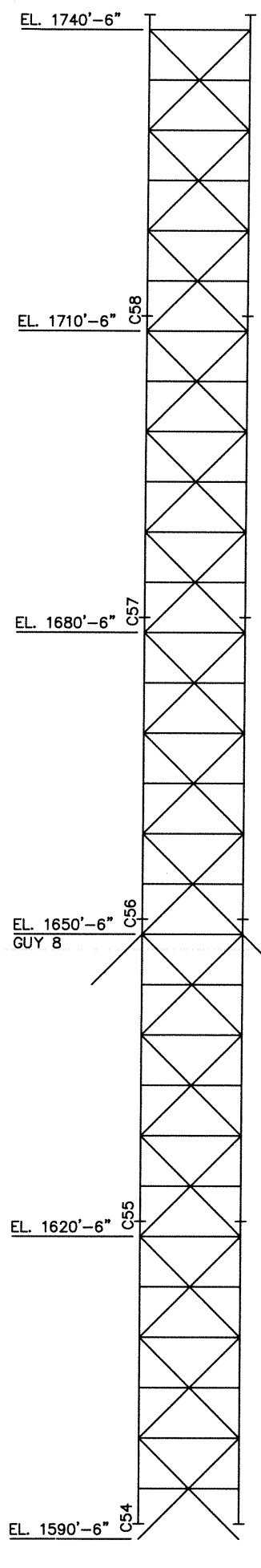
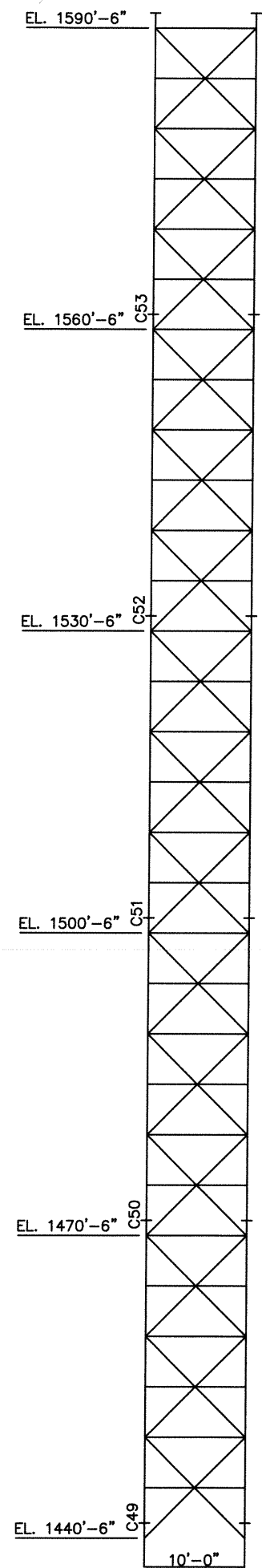


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KOZK
1891'-0 GUYED
TOWER
SPRINGFIELD, MO
ELEVATION
DRAWING

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FIELD NOTES:
1. BOLD MEMBERS INDICATE UPGRADE.
(SEE G-2 FOR NOTES)

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1891'-0 GUYED
TOWER

SPRINGFIELD, MO

ELEVATION
DRAWING

Sheet No.: **E-3**

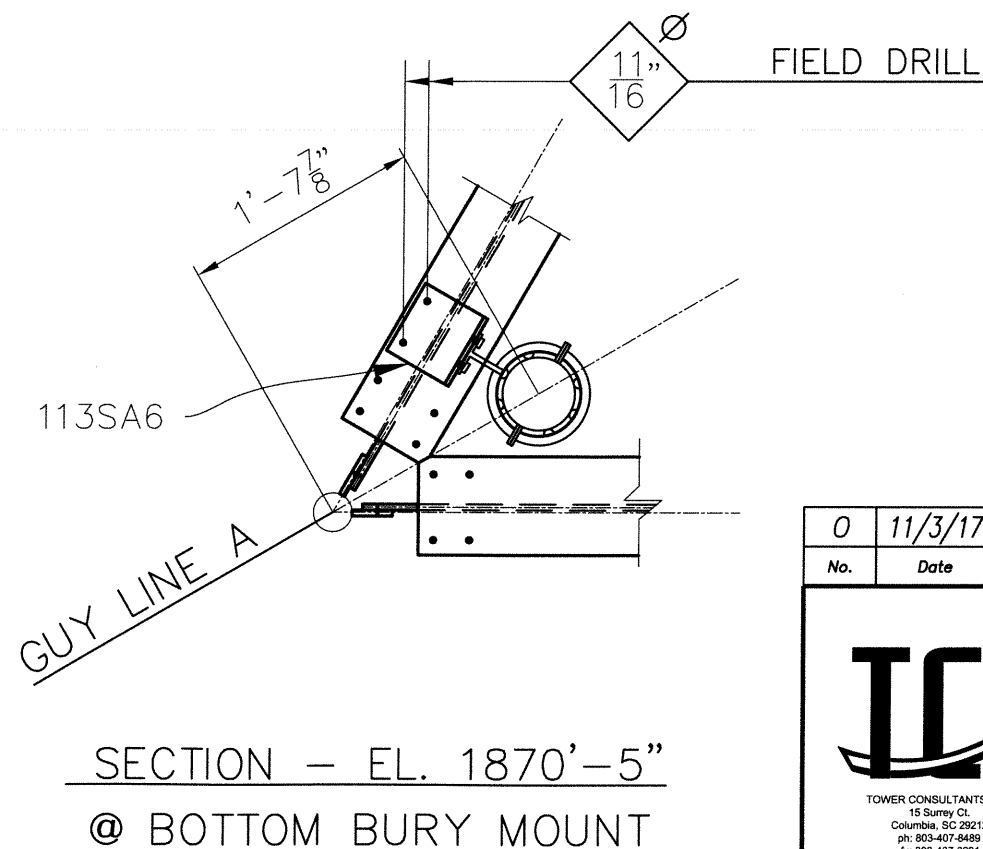
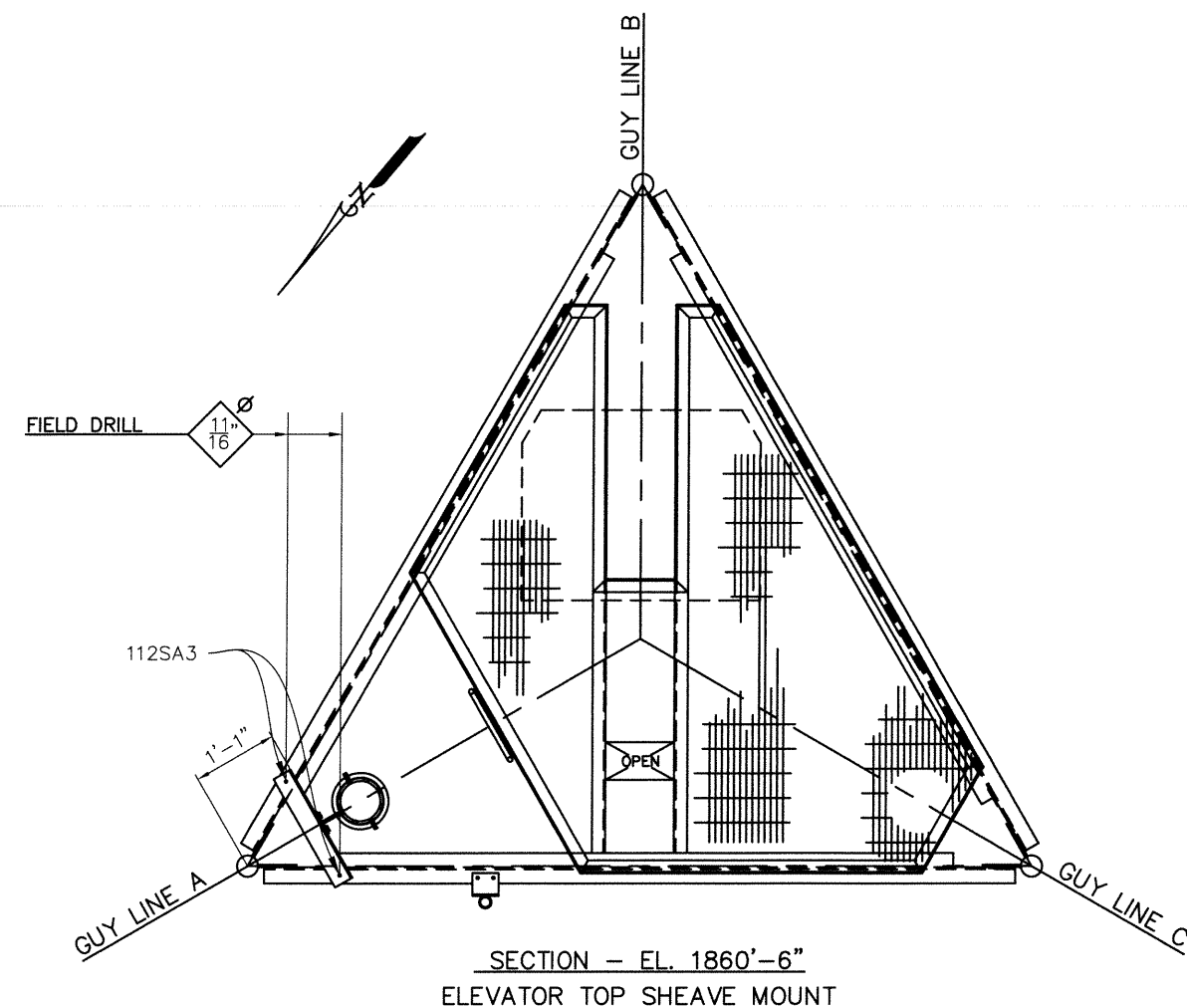
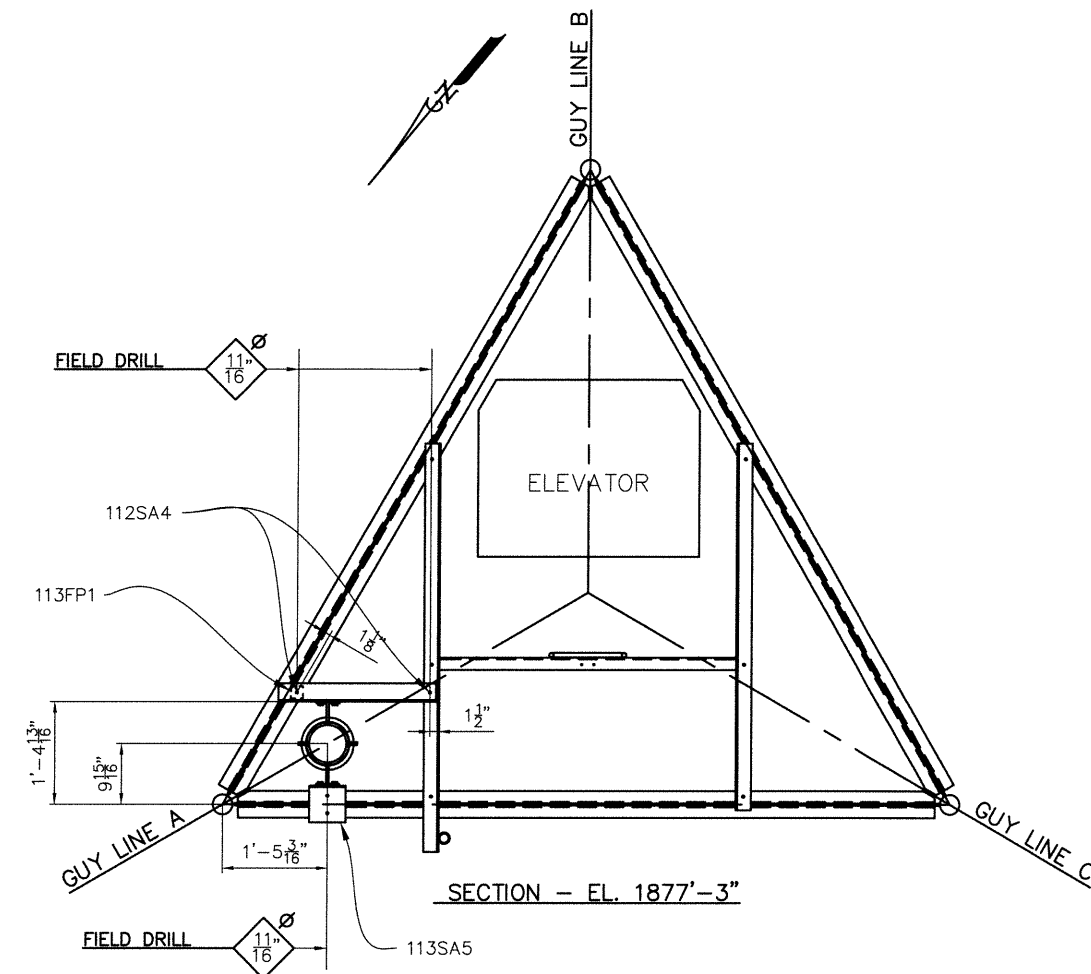
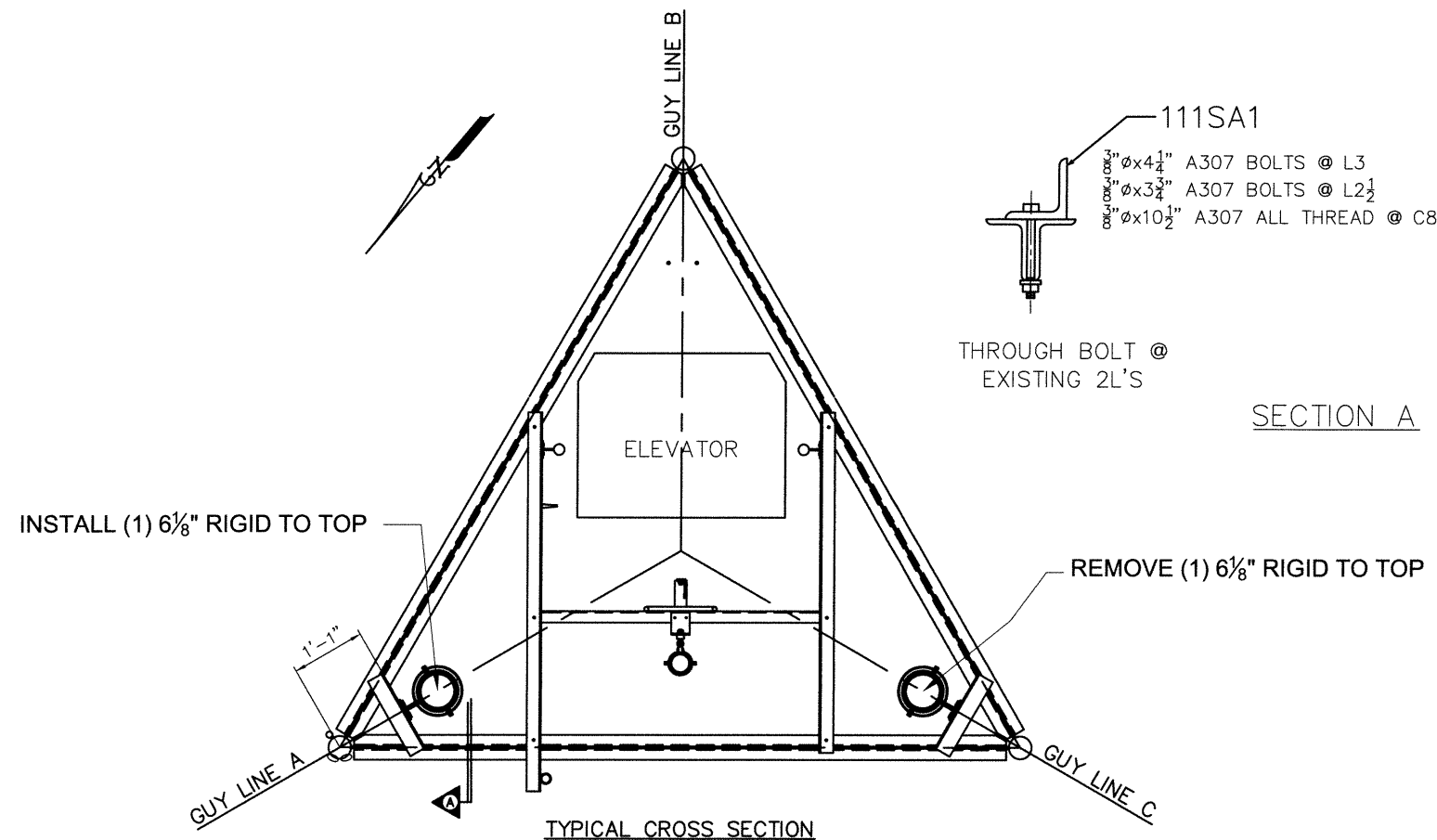
Project No.: **17.289.002**


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Date: **11/3/17**

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<div> <p>KOZK</p> <p>1891'-0 GUYED TOWER</p> <p>SPRINGFIELD, MO</p> <p>CROSS SECTION</p> </div>			<p>E-4</p> <p>Sheet No.:</p> <p>Project No.: 17.289.002</p> <p>Drawn By: WEB</p> <p>Checked By: MBB</p> <p>Date: 11/3/17</p> <p>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</p>

CHOKER AROUND LEG
PLACED AS CLOSE AS
POSSIBLE TO LEG GUSSET
(PROVIDE SOFTENERS AND
BLOCKING AS REQD TO
PREVENT CHAFE AND
SLIPPAGE.)

TENSION ROD
TO BE REPLACED

REPLACE EXTG
MID-BAY BOLTS

EXISTING
TOWER LEG

EXISTING
STRUT

STEEL CABLE
MIN. 10 TON
CAPACITY

TURNBUCKLE OR
COME-A LONG
MIN. 10 TON
CAPACITY

EXISTING
STRUT

EXISTING
TOWER LEG

NOTE: FRAME IS REQUIRED
IF DIAGONAL IS REPLACED
ABOVE OR BELOW A GUY
WIRE.

NOTE:
FRAME TO BE PROVIDED
BY THE ERECTOR AND
APPROVED BY TCI

DIAGONAL REPLACEMENT

ELEVATION	BAYS	NEW DIAGONAL	END BOLTS*	MID-BAY BOLTS*	REAMING REQD
50.5' - 60.5'	1	101X3	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
80.5' - 100.5'	2	100X2	5/8"Ø A490X x 2	5/8"Ø A325X x 3	NO
100.5' - 110.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
130.5' - 150.5'	2	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
150.5' - 160.5'	1	101X4	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
570.5' - 580.5'	1	102X6	3/4"Ø A490X x 2-1/2	5/8"Ø A325X x 3	NO
580.5' - 590.5'	1	103X8	3/4"Ø A490X x 2-1/2	5/8"Ø A325X x 3	NO
590.5' - 630.5'	4	100X2	5/8"Ø A490X x 2	5/8"Ø A325X x 3	NO
630.5' - 650.5'	2	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
770.5' - 780.5'	1	102X5	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
780.5' - 800.5'	2	103X7	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
800.5' - 830.5'	3	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
980.5' - 990.5'	1	102X5	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
1010.5' - 1020.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
1180.5' - 1190.5'	1	103X7	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
1230.5' - 1240.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO

* ALL BOLTS REQUIRE (1) HARDENED WASHER AND (1) ANCO LOCKNUT EACH

TYP ELEVATION VIEW OF DIAGONAL REPLACEMENT
(TYP 3 SIDES)

NOTES FOR TEMPORARY BRACING DURING DIAGONAL REPLACEMENT:

1. ALL STRESS IN THE BAR DIAGONAL SHALL BE REMOVED BY THE USE OF A COME-A-LONG OR BY A TURNBUCKLE AS SHOWN IN THE ABOVE DIAGRAM BEFORE THE BAR DIAGONAL IS REPLACED WITH THE NEW MEMBER. THE RIGGING, INCLUDING COME-A-LONG OR TURNBUCKLE, CABLE SLING, ECT., SHALL HAVE A MINIMUM STRENGTH OF 20,000 LBS.
2. ONLY ONE DIAGONAL PER PANEL SHALL BE REPLACED AT A TIME, AND ALL BOLTS PROPERLY INSTALLED BEFORE PROCEEDING TO THE REPLACEMENT OF THE OTHER DIAGONAL IN THAT PANEL.
3. COAT ALL REAMED HOLES WITH A ZINC RICH TWO PART EPOXY AS REQUIRED.
4. A490 BOLTS SHALL BE COATED WITH A ZINC RICH TWO PART EPOXY MASTIC SUCH AS CARBOLINE CARBOMASTIC 15 OR EQUIVALENT.

RESTRICTIONS

- NO TOWER MEMBER IS TO BE REPLACED WHEN A WIND VELOCITY GREATER THAN 20 MPH EXISTS OR WHEN A WIND VELOCITY OF GREATER THAN 20 MPH IS PREDICTED DURING THE PROCEDURE.
- THE ABOVE PROCEDURES MUST BE FOLLOWED WITHOUT VARIATION UNLESS APPROVED BY THE ENGINEER ON RECORD.
- IF A DIAGONAL REPLACEMENT OCCURS ABOVE OR BELOW A GUY LEVEL, A TEMPORARY FRAME IS REQUIRED, ALONG WITH THE ABOVE PROCEDURE. THE TEMPORARY FRAME SHOULD BE PROVIDED BY THE ERECTOR AND APPROVED BY TCI BEFORE REPLACEMENT IS DONE. USE (2) COME-A-LONGS WHEN TEMPORARY FRAME IS IMPEDED BY EXISTING EQUIPMENT.

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<div><div><div><div><div><div>TCI</div></div></div><div><div><div></div><div><div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691</div></div></div><div><div><div>4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5189 fx: 425-778-5103 www.tower-tci.com</div></div></div></div></div><div><div>KOZK 1891'-0 GUYED TOWER SPRINGFIELD, MO DIAGONAL REPLACEMENT</div></div><div><div>Sheet No.: Project No.: 17.289.002 Drawn By: WEB Checked By: MBB/JY Date: 11/3/17</div><div><small>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</small></div></div></div></div>			

GENERAL NOTES

GENERAL

1. ALL METHODS, MATERIALS, AND WORKMANSHIP SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE.
2. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS WITH A MINIMUM OF 10 YEARS EXPERIENCE IN TOWER AND FOUNDATION CONSTRUCTION.
3. ALL DIMENSIONS, MATERIALS, AND DETAILS OF THE EXISTING STRUCTURES ARE INCLUDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY ALL RELEVANT INFORMATION PRIOR TO CONSTRUCTION OR FABRICATION AND NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY VARIANCE OR DISCREPANCIES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
4. DIMENSIONS AND ELEVATIONS GIVEN FOR THE NEW CONSTRUCTION MUST ALSO BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND ERECTION TO ASSURE PROPER FIT AND ALIGNMENT OF THE STRUCTURAL COMPONENTS IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS.
5. ANY SUBSTITUTIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

6. ANY MANUFACTURED DESIGN ELEMENTS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. THESE DESIGN ELEMENTS MUST BE STAMPED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE THE WORK IS BEING PERFORMED. IF REQUIRED CONTRACTOR TO PREPARE PERMIT DRAWING SET SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE THE WORK IS BEING PERFORMED. ALL PERMITS, LICENSES, APPROVALS AND OTHER REQUIREMENTS FOR CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

7. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS.

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS. ALL INSTALLATION PROCEDURES, SAFEGUARDS AND MEANS AND METHODS OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

9. A DETAILED RIGGING PLAN SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE OWNER FOR APPROVAL. THE RIGGING PLAN SHALL INCLUDE AS A MINIMUM: BRIEF TOWER DESCRIPTION, HOIST MODEL AND CAPACITY, DATA, WIRE ROPE SIZE AND CONSTRUCTION, SHEAVE/BLOCK DIAMETER AND CAPACITY, CHOKER SIZE AND CAPACITY, RIGGING DETAILS TO THE TOWER, PLANNED LIFT WEIGHTS, GIN POLE SIZE AND CAPACITY AND A DIAGRAM LOCATING KEY RIGGING COMPONENTS.

APPLICABLE CODES AND STANDARDS

1. ANSI/TIA/EIA: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. IBC: INTERNATIONAL BUILDING CODE, LATEST EDITION.
3. ASTM: STANDARDS FOR BUILDING CODES, LATEST EDITION.
4. ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, LATEST EDITION.
5. ACI 315: AMERICAN CONCRETE INSTITUTE, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT, LATEST EDITION.
6. CSRI: CONCRETE STEEL REINFORCING INSTITUTE, MANUAL OF STANDARD PRACTICE, LATEST EDITION.
7. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
8. AWS: AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, LATEST EDITION.

STEEL AND FABRICATION

1. ALL STEEL FABRICATION TO BE DONE BY AN AISC CERTIFIED FABRICATION FACILITY IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. ALL STEEL TO BE ASTM A572 GR.50 (50KSI MIN YIELD STRENGTH) U.N.O.; BOLTS TO BE ASTM A325 WITH ANCO LOCKNUTS U.N.O.
3. ALL MATERIAL TO BE HOT DIPPED GALVANIZED PER ASTM A123 OR ASTM A153.

4. BOLT HOLE DIAMETER SHALL NOT BE MORE THAN $\frac{1}{16}$ " LARGER THAN NOMINAL BOLT DIAMETER AND SHALL BE PUNCHED OR DRILLED U.N.O.

WELDING

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE. ALL WELDS TO BE INSPECTED FOR STRUCTURAL SOUNDNESS AND DOCUMENTED.
2. ALL ELECTRODES TO BE E70 LOW HYDROGEN TYPE.
3. MINIMUM WELD SIZE TO BE 0.3125 INCH FILLET WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
4. ALL WELDED CONNECTIONS TO BE SEAL WELDED FOR GALVANIZING.

FIELD INSTALLATION

1. ALL GALVANIZED SURFACE THAT ARE SCRATCHED OR DAMAGED SHALL BE REPAIRED USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.
2. A490 BOLTS SHALL BE SPRAY PAINTED WITH A COAT OF COLD GALVANIZING PRIOR TO INSTALLATION FOLLOWED BY A COAT OF A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT AFTER INSTALLATION.
3. HARDWARE INTERFERING WITH THE INSTALLATION OF REINFORCING MATERIAL SHALL BE TEMPORARILY MOVED AND REINSTALLED AFTER THE COMPLETION OF THE WORK.
4. WHEN FIELD WELDING IS REQUIRED THE STEEL SHALL BE CLEANED OF ALL PAINT AND GALVANIZING TO A BARE METAL. AS SPECIFIED PER AWS D1.1. PREHEATING AND POST HEATING MAY BE REQUIRED.
5. WELDED AREAS ARE TO BE TOUCHED UP USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.

TIGHTENING OF BOLTS AND NUTS

1. ALL HIGH STRENGTH BOLTS TO BE TIGHTENED TO THE SNUG TIGHT CONDITION AS SPECIFIED IN THE CURRENT EDITION OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". BOLTS REQUIRING FULL PRETENSION TO BE TIGHTENED BY "THE TURN OF THE NUT METHOD" U.N.O.

FOUNDATIONS


1. CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND UTILITIES IN THE AREA WHERE THE WORK IS TO BE PERFORMED.
2. DRILLED SHAFT INSTALLED IN ACCORDANCE WITH ACI-336 (LATEST EDITION).

CONCRETE

1. ALL CONCRETE FOR FOUNDATIONS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. AFTER 28 DAYS.
2. THE CONCRETE MIX SHALL NOT CONTAIN LESS THAN $5\frac{1}{2}$ SACKS OF CEMENT (ASTM C 150 TYPE II) PER CUBIC YARD.
3. THE CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF $\frac{7}{8}$ ".
4. THE CONCRETE MIX SHALL PRODUCE A MAXIMUM SLUMP OF 5" ±1".
5. THE CONCRETE MIX SHALL HAVE A TOTAL AIR CONTENT OF 5%, WITH A TOLERANCE OF PLUS OR MINUS 1.5%. AIR-ENTRAINING ADMIXTURES SHALL CONFORM TO ASTM C 260.
6. THE CONCRETE MIX SHALL HAVE A MAXIMUM WATER-CEMENT RATIO OF 0.45. WATER REDUCING OR ACCELERATING ADMIXTURES SHALL CONFORM TO ASTM C 494.
7. THE CONCRETE SHALL NOT CONTAIN CALCIUM CHLORIDE OR ANY OTHER ADMIXTURE CONTAINING CHLORIDE OTHER THAN NATURAL IMPURITIES.
8. FORM WORK SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.
9. ALL CONCRETE SHALL BE PLACED IN A MONOLITHIC POUR UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
10. PROVIDE CHAMFERS AT ALL EXPOSED CORNERS OF CONCRETE.
11. CONCRETE WORK UNDER EXTREME WEATHER CONDITIONS SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.

STEEL REINFORCEMENT (REBAR)

1. ALL REINFORCING STEEL TO BE GRADE 60 DEFORMED BILLET STEEL PER ASTM A615.
2. REINFORCEMENT SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE ACI 315 AND CSRI. SUPPORT REINFORCING AS REQUIRED BY CSRI TO PREVENT DISPLACEMENT UPON CONCRETE POURING.
3. MAINTAIN ALL CLEARANCES NOTED ON THE DRAWINGS. WHERE NO DIMENSIONS ARE NOTED, USE THE ACI RECOMMENDED CLEARANCES.
4. FOR CONCRETE POURED AGAINST SOIL, THE MINIMUM COVER FOR ALL REINFORCING BARS SHALL BE 3".
5. TIE BARS SECURELY WITH #16 ANNEALED WIRE AND SUPPORT AS REQUIRED.
6. ALL WELDED WIRE FABRIC TO BE PER ASTM A185. ALL BARS AND WIRE SHALL BE FREE OF RUST, MILL SCALE, DIRT, OR OTHER FOREIGN MATERIAL PRIOR TO CASTING CONCRETE.
7. PROVIDE MINIMUM LAP SPLICES OF 36 BAR DIAMETERS UNLESS NOTED OTHERWISE.
8. FIELD BENDING OF REINFORCEMENT BARS IS NOT PERMITTED. DO NOT WELD REINFORCING BARS.

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 <div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691 4208 198th St. SW., Suite 208 Seattle, WA 98036 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com</div>		KOZK 1891'-0 GUYED TOWER SPRINGFIELD, MO GENERAL NOTES	<div>G-1</div> <div>Sheet No.:</div>
			<div>Project No.: 17.289.002</div> <div>Drawn By: WEB</div>
			<div>Checked By: MBB/JY</div> <div>Date: 11/3/17</div>
			<div>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC.. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</div>

MODIFICATION DESCRIPTION:

1. THIS DRAWING IS FOR JOB USE.
2. UPGRADES APPLY TO ALL THREE FACES OF THE TOWER.
3. A TEMPORARY BRACE MUST BE INSTALLED THAT IS OF EQUIVALENT OR GREATER CAPACITY THAN THE MEMBER BEING REPLACED. THE TEMPORARY BRACE SHALL BE PLACED ADJACENT TO THE MEMBER BEING REPLACED SUCH THAT IT WILL TAKE THE LOAD AFTER THE EXISTING MEMBER IS REMOVED.
- A TEMPORARY FRAME IS REQUIRED ABOVE AND BELOW GUY LEVELS DURING DIAGONAL REPLACEMENT.
4. REPLACE THE EXISTING SOLID ROD DIAGONAL MEMBERS WITH A NEW HIGHER CAPACITY MEMBER AT THE FOLLOWING LOCATIONS (SEE E-5):

50.5' - 60.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
80.5' - 100.5'	(2 BAYS)	1"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A490X BOLTS
100.5' - 110.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
130.5' - 160.5'	(3 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
570.5' - 590.5'	(2 BAYS)	1¼"ϕ S.R., ASTM A572-50, ¾"ϕ A490X BOLTS
590.5' - 630.5'	(4 BAYS)	1"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A490X BOLTS
630.5' - 650.5'	(2 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
770.5' - 800.5'	(3 BAYS)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
800.5' - 830.5'	(3 BAYS)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
980.5' - 990.5'	(1 BAY)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
1010.5' - 1020.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS
1180.5' - 1190.5'	(1 BAY)	1"ϕ S.R., ASTM A572-50, ¾"ϕ A325X BOLTS
1230.5' - 1240.5'	(1 BAY)	7⁄8"ϕ S.R., ASTM A572-50, 5⁄8"ϕ A325X BOLTS

5. REINFORCE THE EXISTING LEGS BY ADDING SPLIT PIPE REINFORCING AT THE FOLLOWING LOCATIONS (SEE E-6)

0.0' - 60.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
60.5' - 150.5'	(3 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
150.5' - 210.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
210.5' - 390.5'	(6 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
390.5' - 420.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
420.5' - 450.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
450.5' - 600.5'	(5 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
600.5' - 810.5'	(7 SECTIONS)	HALF HSS 5.0" O.D. x 0.5625" WALL, FY=70KSI MIN.
810.5' - 1020.5'	(7 SECTIONS)	HALF HSS 4.75" O.D. x 0.5" WALL, FY=70KSI MIN.



6. REINFORCE THE EXISTING DOUBLE ANGLE HORIZONTAL MEMBERS BY ADDING A SINGLE ANGLE MEMBER BETWEEN THE DOUBLE ANGLES AT THE FOLLOWING LOCATIONS (SEE E-7):

590.5'	(1 LEVEL)	L3½x2½x¾, 5⁄8"ϕ A325X BOLTS
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7. REPLACE GUY LEVEL 6 AND ADJUST THE GUY WIRE INITIAL TENSION USING THE TANGENT INTERCEPT METHOD TO THE VALUES LISTED IN THE CHART BELOW. REUSE EXISTING GROUNDING AND HFD (SEE E-8 & E-9):

GUY LEVEL	EXISTING GUY PROPERTIES			RECOMMENDED GUY PROPERTIES		
	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION
9 th (top)	Outer Anchor	1-7/16"Ø BS	7.62%	Outer Anchor	1-7/16"Ø BS	11.0%
8 th		1-9/16"Ø BS	8.44%		1-9/16"Ø BS	11.0%
7 th		1-5/16"Ø BS	10.22%		1-5/16"Ø BS	10.0%
6 th	Middle Anchor	1-3/8"Ø BS	9.67%	Middle Anchor	1-3/8"Ø HSS	8.0%
5 th		1-1/4"Ø BS	10.52%		1-1/4"Ø BS	9.0%
4 th		1-1/8"Ø BS	12.08%		1-1/8"Ø BS	9.0%
3 rd	Inner Anchor	1-3/16"Ø BS	9.34%	Inner Anchor	1-3/16"Ø BS	8.0%
2 nd		1-1/16"Ø BS	12.30%		1-1/16"Ø BS	9.0%
1 st (bot)		1-1/16"Ø BS	12.62%		1-1/16"Ø BS	12.0%

NOTE: VALUES SHOWN ABOVE ARE VALID AT 60 DEGREES FAHRENHEIT; A P&T CHART WITH TEMPERATURE CORRECTIONS WILL BE REQUIRED FOR FIELD ADJUSTMENTS

8. ALL MATERIAL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE TO ASTM SPECIFICATIONS.
9. ALL REINFORCING MATERIAL SHALL BE PAINTED IN THE FIELD TO MATCH THE EXISTING COLOR SCHEME OF THE TOWER.
10. THE MODIFICATION MATERIAL AND INSTALLATION DRAWINGS CONTAINED HEREIN ARE BASED ON THE ASSUMPTION THAT THE TOWER HAS BEEN PROPERLY INSTALLED AND MAINTAINED, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- A. PROPER ALIGNMENT AND PLUMBNESS.
B. CORRECT GUY TENSIONS.
C. CORRECT BOLT TIGHTNESS.
D. NO SIGNIFICANT DETERIORATION OR DAMAGE TO ANY COMPONENT.

11. ALL MATERIAL REQUIRED BY SHEETS E-1 THROUGH E-8 FURNISHED TO CONTRACTOR BY TCI. FOR PRICING PLEASE CONTACT:


RON DOZSA
425-778-5169

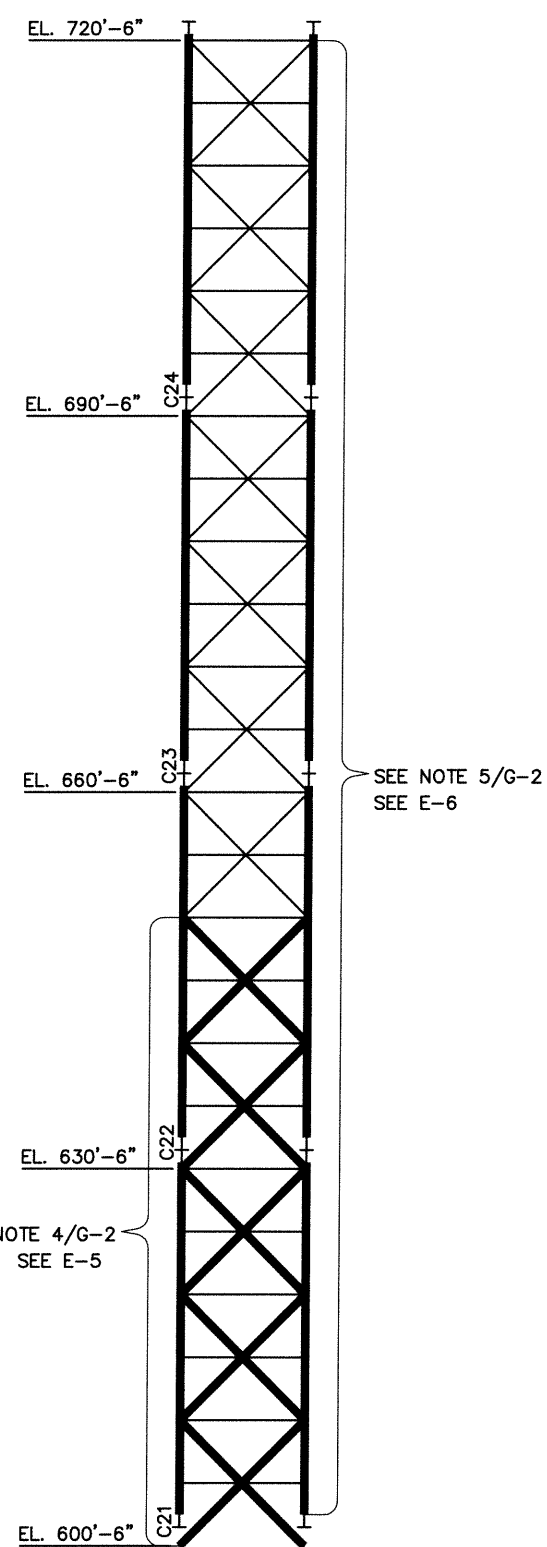
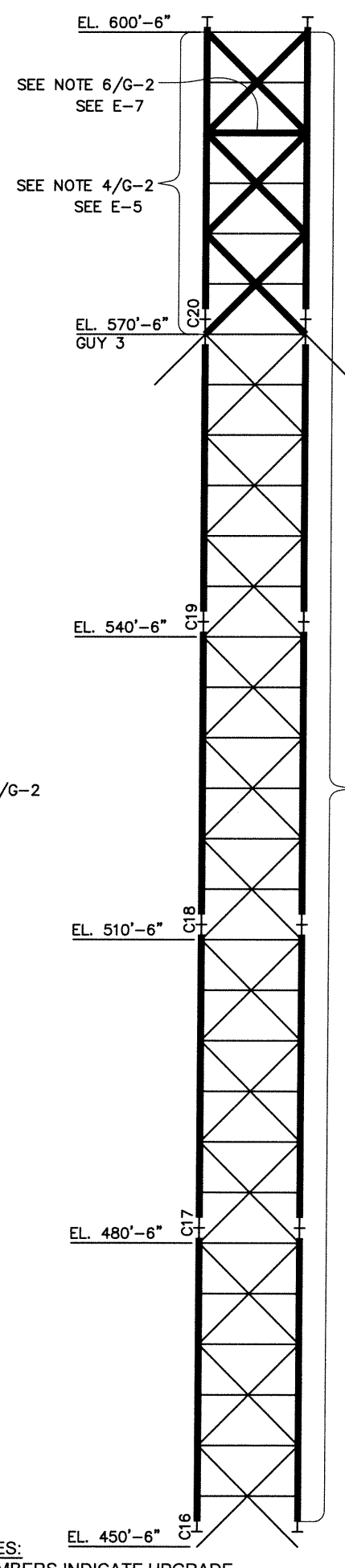
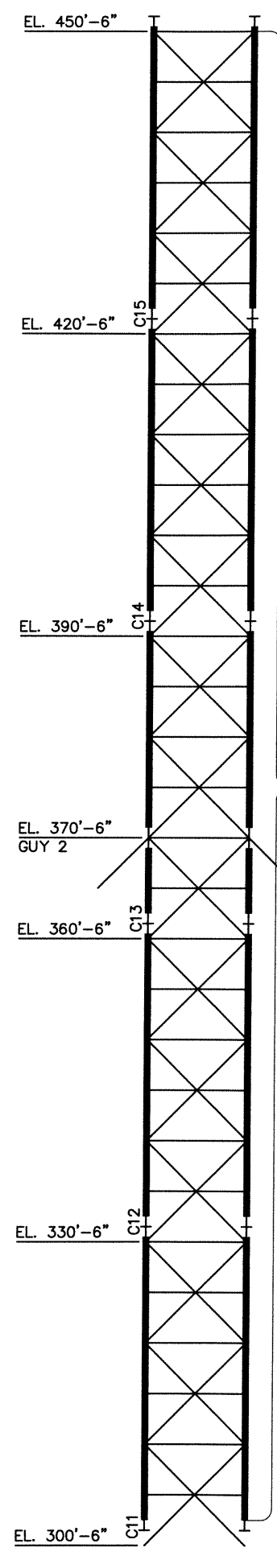
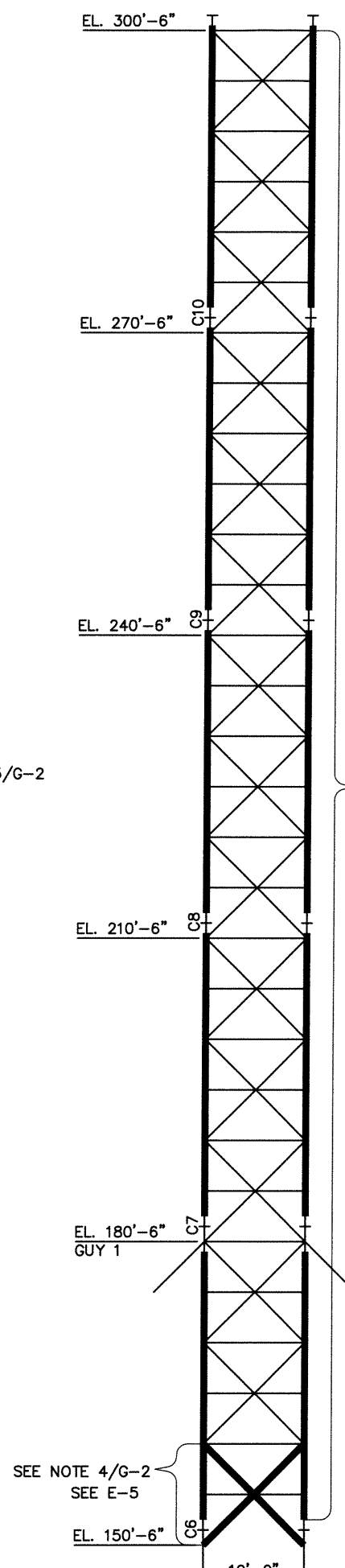
DESIGN INFORMATION:

1. THIS DRAWING PACKAGE IS BASED ON TOWER CONSULTANTS ANALYSIS REPORT 17.289.001, DATED MAY 19, 2017.
2. THE TOWER IS DESIGNED FOR THE EXISTING AND PROPOSED LOADING AS LISTED IN THE REPORT REFERENCED ABOVE.


ANTENNA WORK:

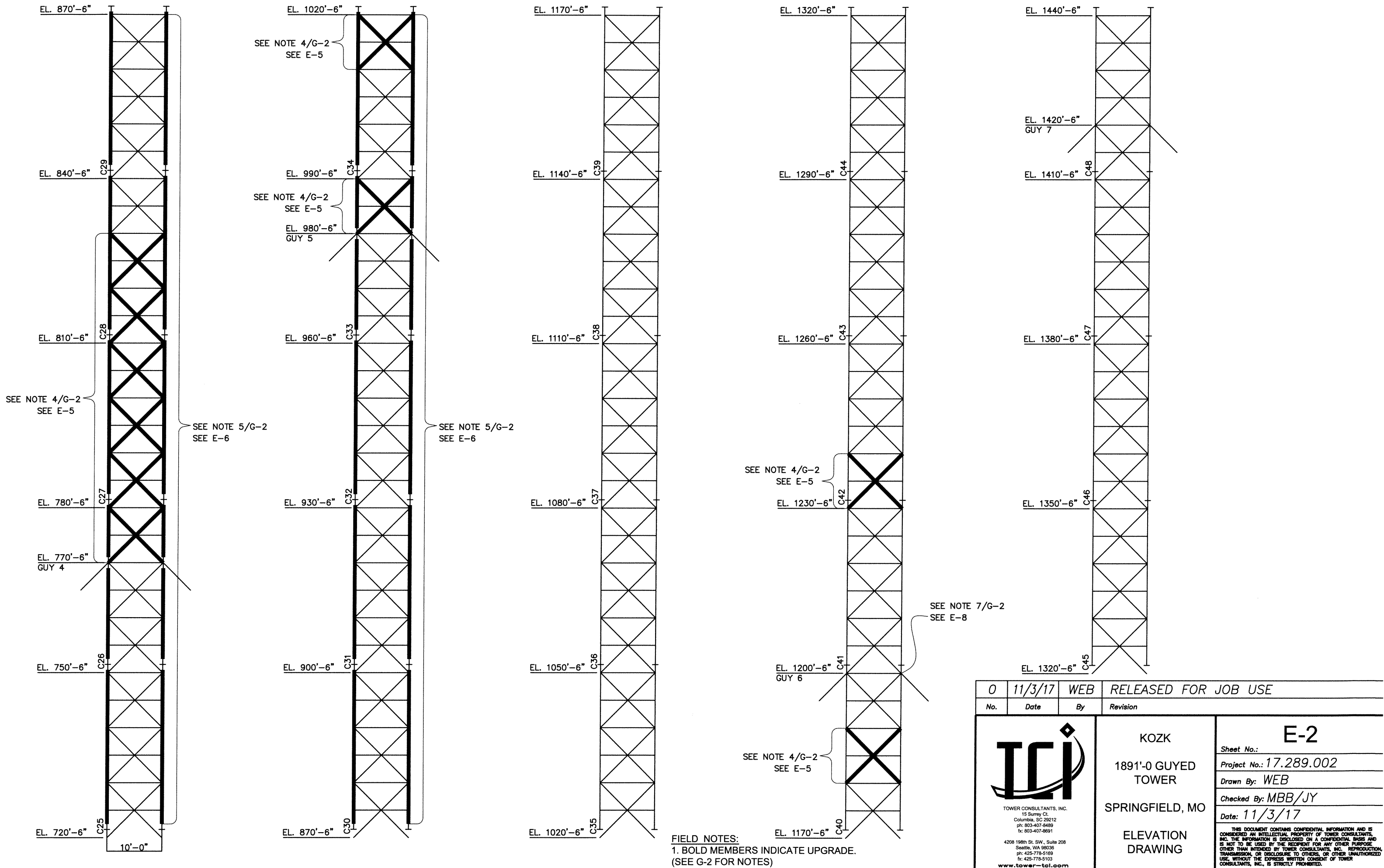
1. REMOVE THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):
- 0' - TOP 6⅛" RIGID LINE
2. INSTALL THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):
- 0' - TOP 6⅛" RIGID LINE

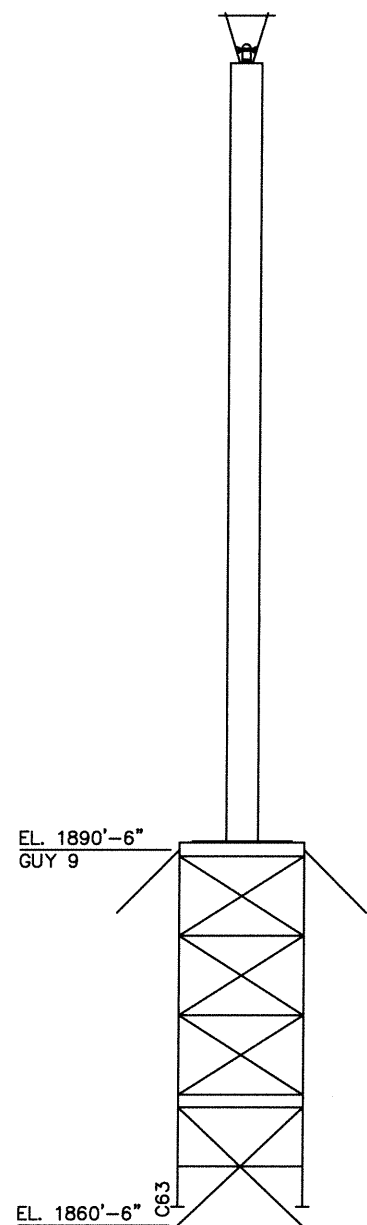
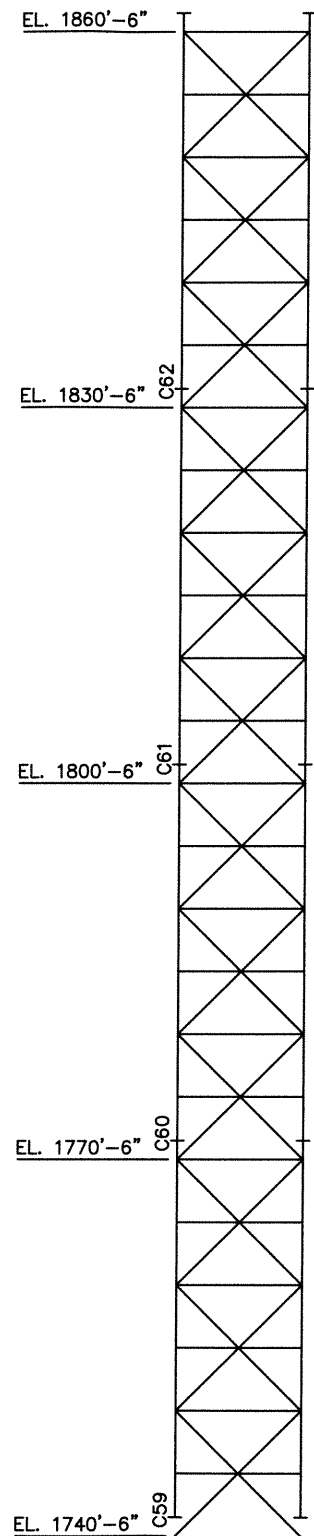
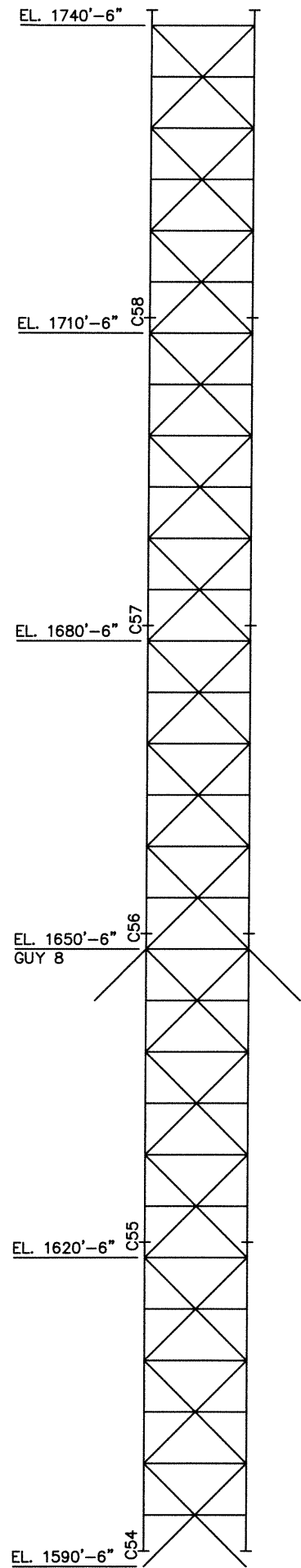
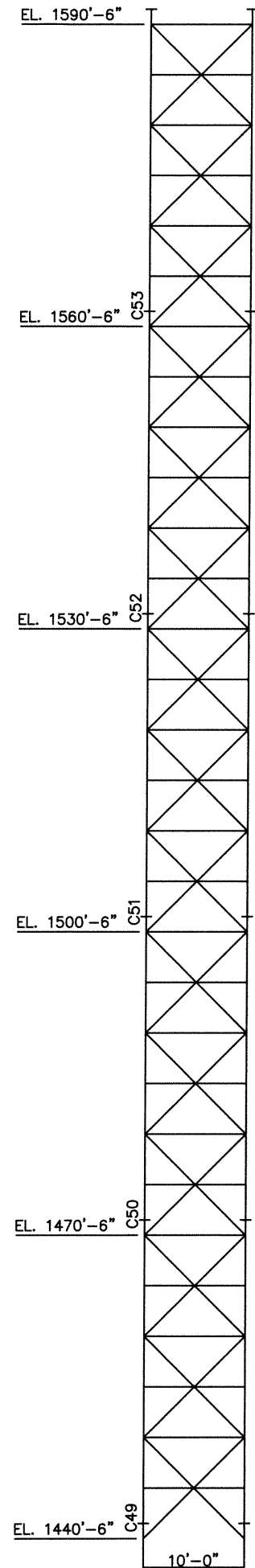
1	3/9/18	WEB	REVISED SPLIT PIPE
0	11/3/17	WEB	RELEASED FOR JOB USE
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 <div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691 4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com</div>		KOZK 1891'-0 GUYED TOWER SPRINGFIELD, MO MODIFICATION DESCRIPTION	Sheet No.: G-2
			Project No.: 17.289.002
			Drawn By: WEB
			Checked By: MBB/JY
			Date: 11/3/17
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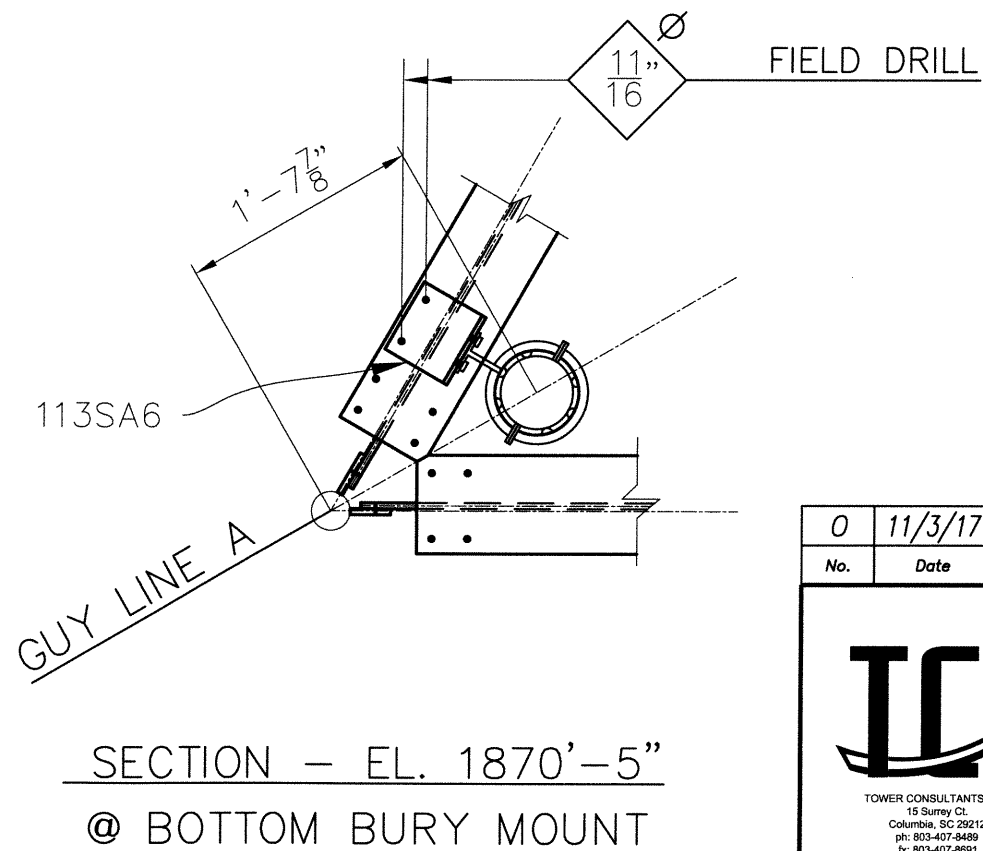
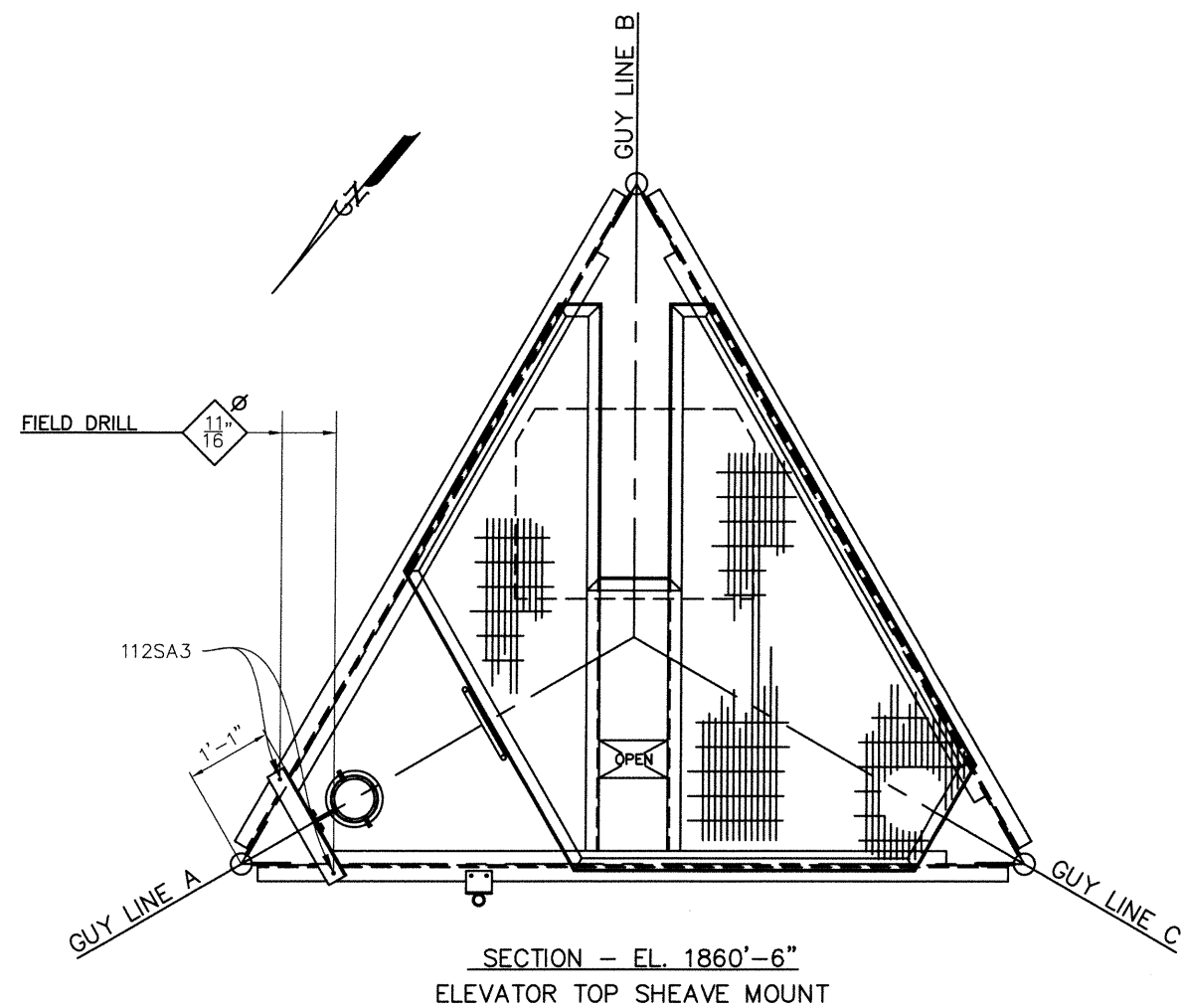
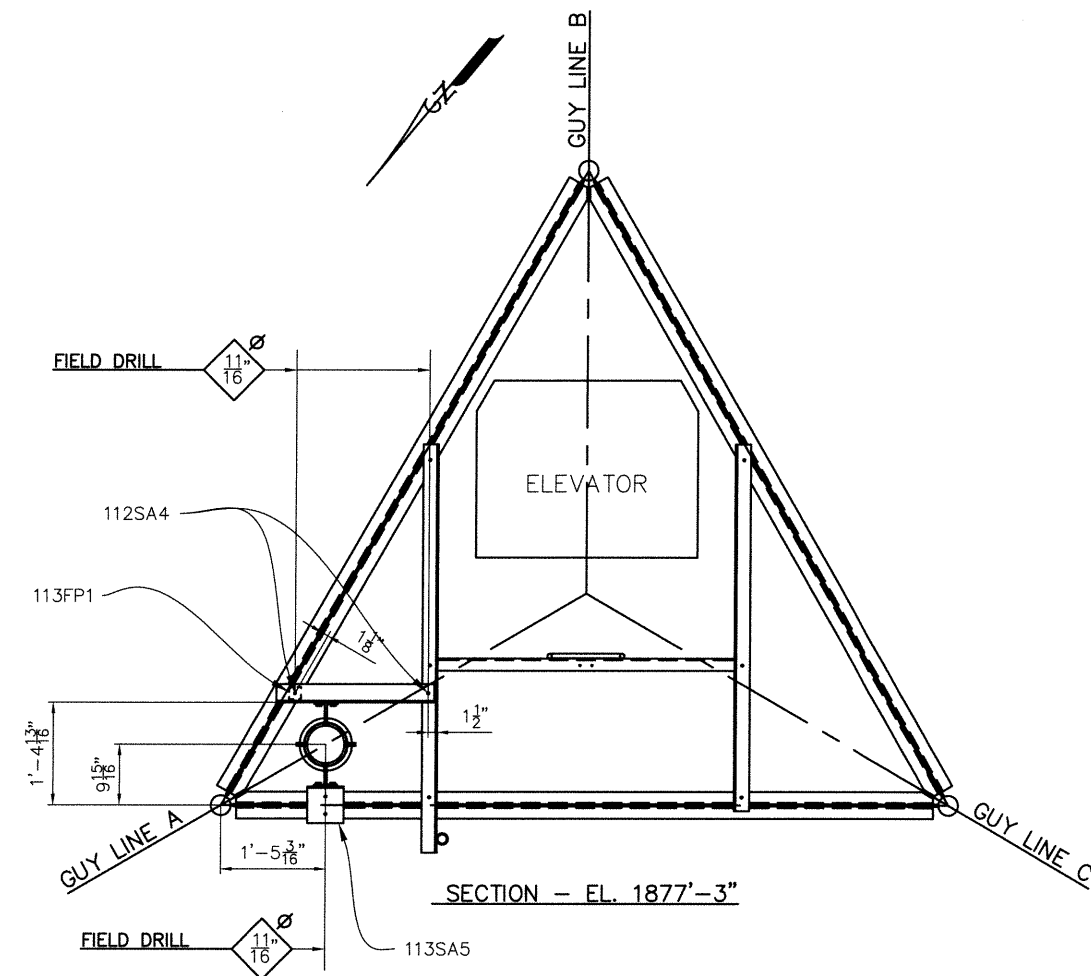
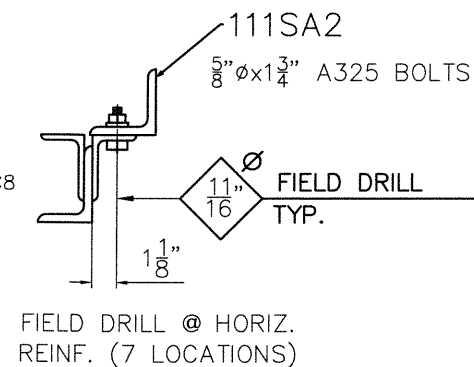
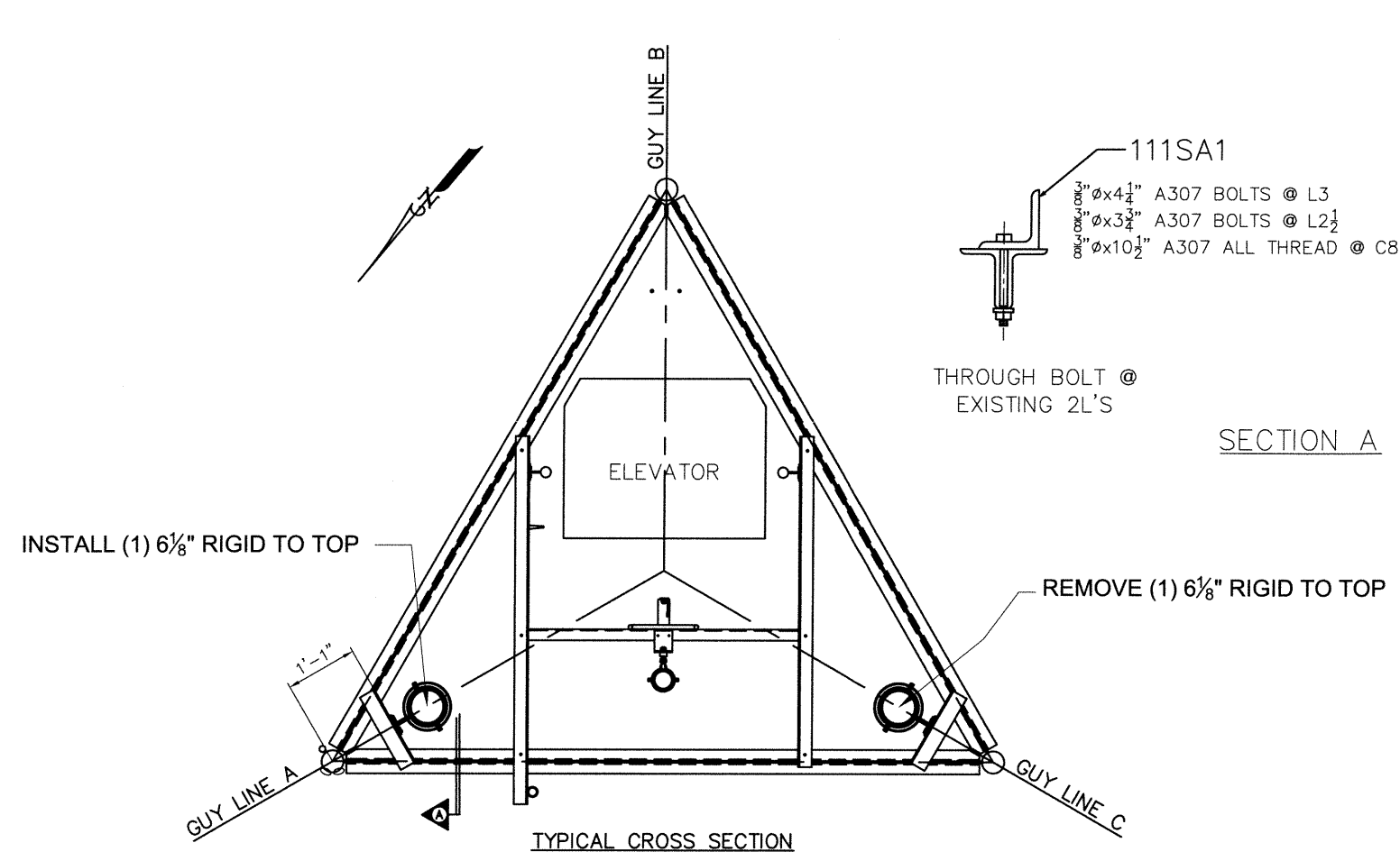
 <p>TOWER CONSULTANTS, INC. 15 Sunny Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691</p> <p>4208 198th St. SW., Suite 208 Seattle, WA 98036 ph: 425-778-5189 fx: 425-778-5103</p> <p>www.towercsl.com</p>	<p>KOZK</p> <p>1891'-0 GUYED TOWER</p> <p>SPRINGFIELD, MO</p> <p>ELEVATION DRAWING</p>	<p>E-1</p>
		<p>Sheet No.:</p>
		<p>Project No.: 17.289.002</p>
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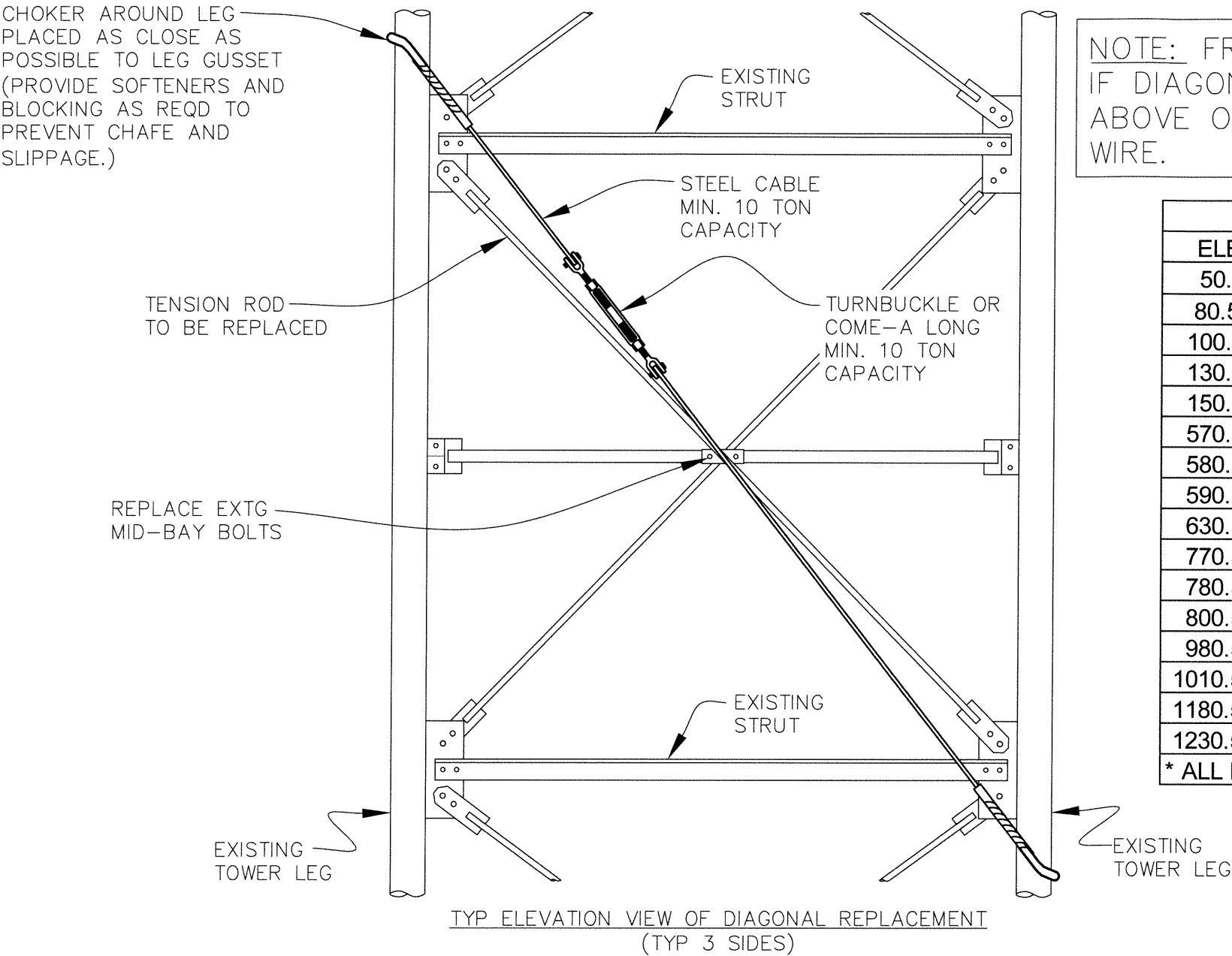
FIELD NOTES:
1. BOLD MEMBERS INDICATE UPGRADE.
(SEE G-2 FOR NOTES)

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		E-3	
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<div><p>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691</p><p>4208 198th St. SW., Suite 208 Seattle, WA 98036 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com</p></div>	<div><p>KOZK</p><p>1891'-0 GUYED TOWER</p><p>SPRINGFIELD, MO</p><p>CROSS SECTION</p></div>	E-4
		Sheet No.: 17.289.002
		Drawn By: WEB
		Checked By: MBB
		Date: 11/3/17
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NOTE: FRAME IS REQUIRED IF DIAGONAL IS REPLACED ABOVE OR BELOW A GUY WIRE.


NOTE: FRAME TO BE PROVIDED BY THE ERECTOR AND APPROVED BY TCI

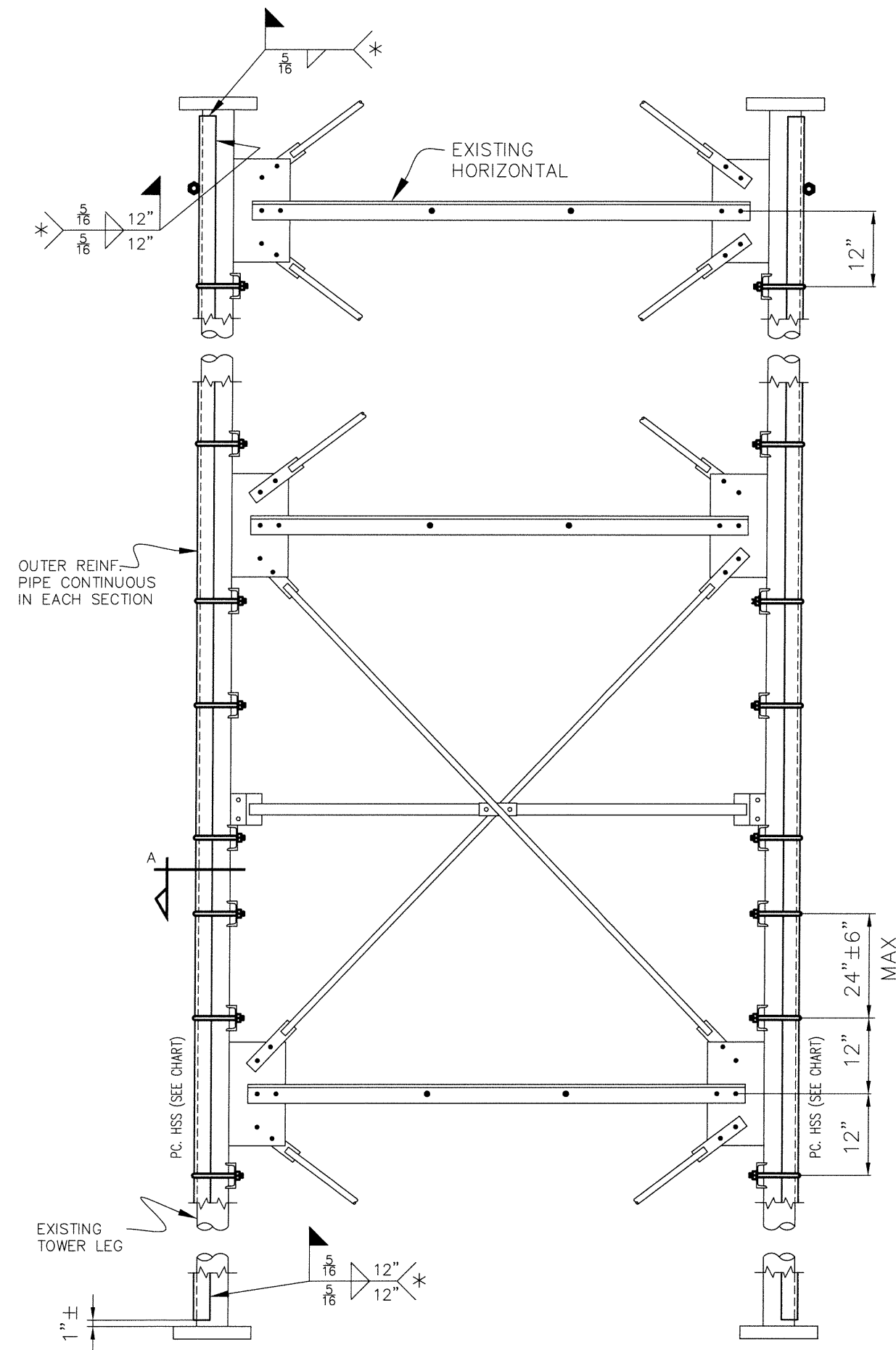
DIAGONAL REPLACEMENT					
ELEVATION	BAYS	NEW DIAGONAL	END BOLTS*	MID-BAY BOLTS*	REAMING REQD
50.5' - 60.5'	1	101X3	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
80.5' - 100.5'	2	100X2	5/8"Ø A490X x 2	5/8"Ø A325X x 3	NO
100.5' - 110.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
130.5' - 150.5'	2	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
150.5' - 160.5'	1	101X4	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
570.5' - 580.5'	1	102X6	3/4"Ø A490X x 2-1/2	5/8"Ø A325X x 3	NO
580.5' - 590.5'	1	103X8	3/4"Ø A490X x 2-1/2	5/8"Ø A325X x 3	NO
590.5' - 630.5'	4	100X2	5/8"Ø A490X x 2	5/8"Ø A325X x 3	NO
630.5' - 650.5'	2	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
770.5' - 780.5'	1	102X5	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
780.5' - 800.5'	2	103X7	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
800.5' - 830.5'	3	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
980.5' - 990.5'	1	102X5	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
1010.5' - 1020.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
1180.5' - 1190.5'	1	103X7	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
1230.5' - 1240.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
* ALL BOLTS REQUIRE (1) HARDENED WASHER AND (1) ANCO LOCKNUT EACH					

- NOTES FOR TEMPORARY BRACING DURING DIAGONAL REPLACEMENT:
1. ALL STRESS IN THE BAR DIAGONAL SHALL BE REMOVED BY THE USE OF A COME-A-LONG OR BY A TURNBUCKLE AS SHOWN IN THE ABOVE DIAGRAM BEFORE THE BAR DIAGONAL IS REPLACED WITH THE NEW MEMBER. THE RIGGING, INCLUDING COME-A-LONG OR TURNBUCKLE, CABLE SLING, ECT., SHALL HAVE A MINIMUM STRENGTH OF 20,000 LBS.
 2. ONLY ONE DIAGONAL PER PANEL SHALL BE REPLACED AT A TIME, AND ALL BOLTS PROPERLY INSTALLED BEFORE PROCEEDING TO THE REPLACEMENT OF THE OTHER DIAGONAL IN THAT PANEL.
 3. COAT ALL REAMED HOLES WITH A ZINC RICH TWO PART EPOXY AS REQUIRED.
 4. A490 BOLTS SHALL BE COATED WITH A ZINC RICH TWO PART EPOXY MASTIC SUCH AS CARBOLINE CARBOMASTIC 15 OR EQUIVALENT.

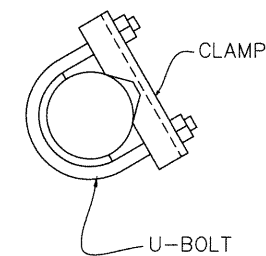
RESTRICTIONS

- NO TOWER MEMBER IS TO BE REPLACED WHEN A WIND VELOCITY GREATER THAN 20 MPH EXISTS OR WHEN A WIND VELOCITY OF GREATER THAN 20 MPH IS PREDICTED DURING THE PROCEDURE.
- THE ABOVE PROCEDURES MUST BE FOLLOWED WITHOUT VARIATION UNLESS APPROVED BY THE ENGINEER ON RECORD.
- IF A DIAGONAL REPLACEMENT OCCURS ABOVE OR BELOW A GUY LEVEL, A TEMPORARY FRAME IS REQUIRED, ALONG WITH THE ABOVE PROCEDURE. THE TEMPORARY FRAME SHOULD BE PROVIDED BY THE ERECTOR AND APPROVED BY TCI BEFORE REPLACEMENT IS DONE. USE (2) COME-A-LONGS WHEN TEMPORARY FRAME IS IMPEDED BY EXISTING EQUIPMENT.

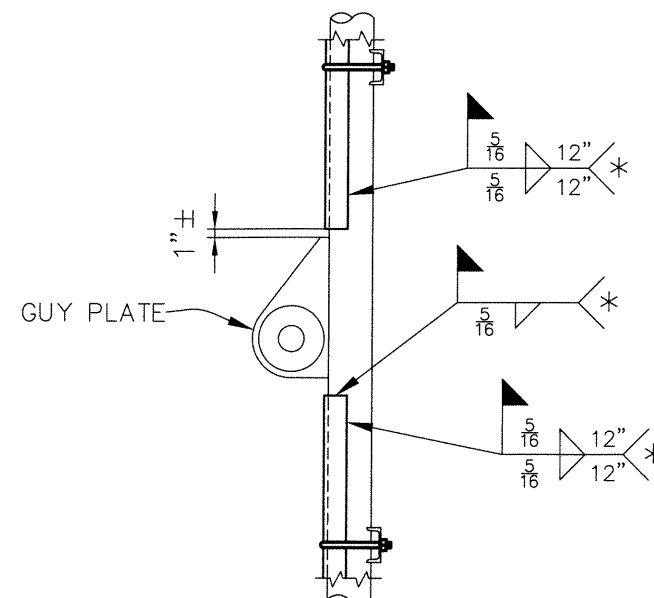
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		KOZK	
TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691		1891'-0 GUYED TOWER	
4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com		SPRINGFIELD, MO	
DIAGONAL REPLACEMENT		E-5	
		Sheet No.:	
		Project No.: 17.289.002	
		Drawn By: WEB	
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TYPICAL SPLIT PIPE REINFORCING
(TYP 3 SIDES)



SECTION A




SPLIT PIPE REINF. @ GUY PLATES

2

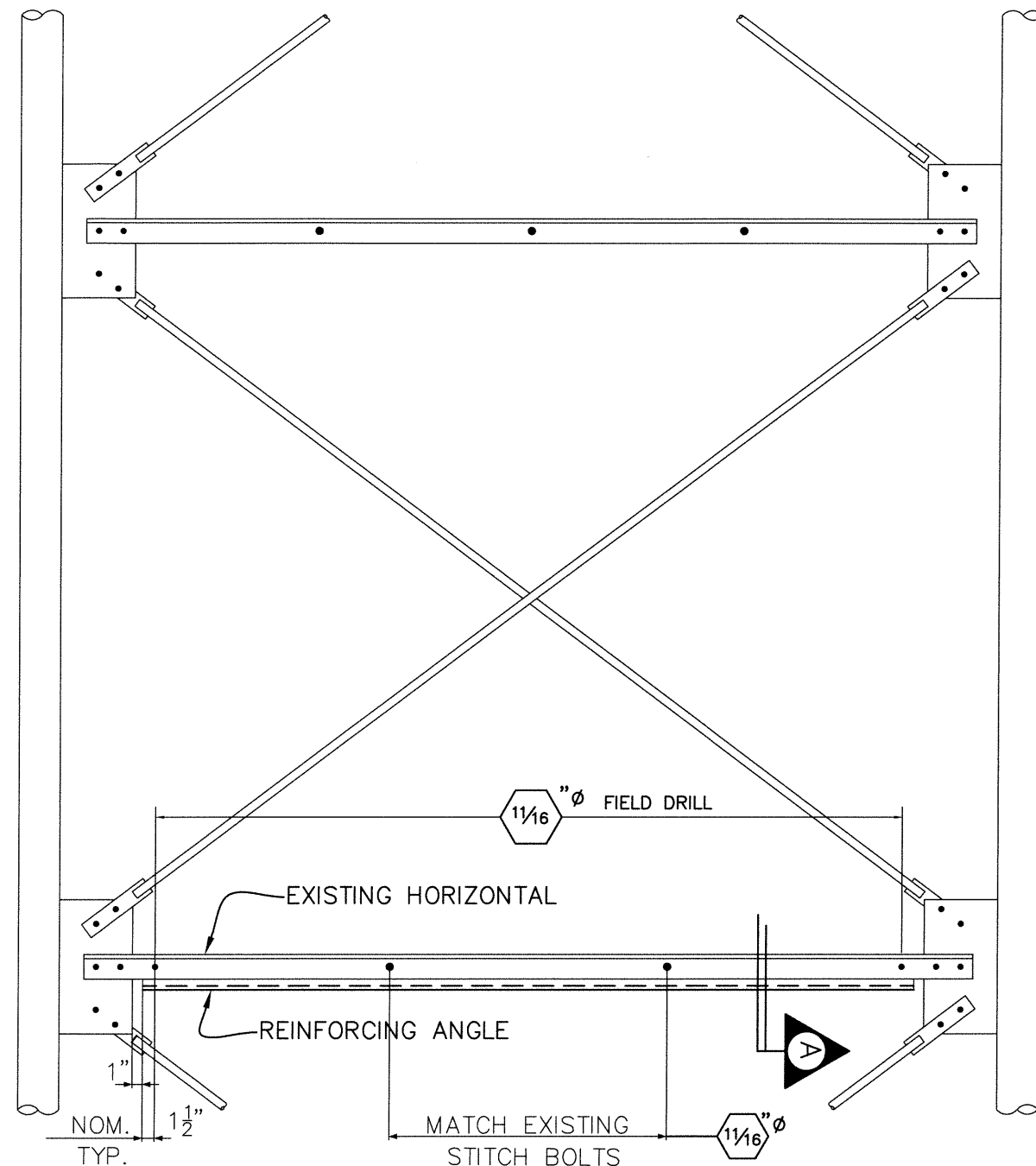
SPLIT PIPE				
ELEVATION	SECTIONS	REINFORCING PIPE	U-BOLTS	CLAMP
0.0' - 30.5'	1	105M6	108UB60 (C/C 6-3/4")	108M19
30.5' - 60.5'	1	105M1	108UB60 (C/C 6-3/4")	108M19
60.5' - 90.5'	1	107M15	108UB50 (C/C 5-3/4")	108M20
90.5' - 150.5'	2	105M2	108UB50 (C/C 5-3/4")	108M20
150.5' - 180.5'	1	106M7	108UB60 (C/C 6-3/4")	108M19
180.5' - 210.5'	1	105M1	108UB60 (C/C 6-3/4")	108M19
210.5' - 270.5'	2	105M2	108UB50 (C/C 5-3/4")	108M20
270.5' - 300.5'	1	107M15	108UB50 (C/C 5-3/4")	108M20
300.5' - 360.5'	2	105M2	108UB50 (C/C 5-3/4")	108M20
360.5' - 390.5'	1	106M8, 106M9	108UB50 (C/C 5-3/4")	108M20
390.5' - 420.5'	1	105M3	108UB50 (C/C 5-3/4")	108M20
420.5' - 450.5'	1	105M2	108UB50 (C/C 5-3/4")	108M20
450.5' - 480.5'	1	107M16	108UB50 (C/C 5-3/4")	108M20
480.5' - 540.5'	2	105M3	108UB50 (C/C 5-3/4")	108M20
540.5' - 570.5'	1	106M10	108UB50 (C/C 5-3/4")	108M20
570.5' - 600.5'	1	105M3	108UB50 (C/C 5-3/4")	108M20
600.5' - 660.5'	2	105M4	108UB50 (C/C 5-3/4")	108M20
660.5' - 690.5'	1	107M17	108UB50 (C/C 5-3/4")	108M20
690.5' - 750.5'	2	105M4	108UB50 (C/C 5-3/4")	108M20
750.5' - 780.5'	1	106M11, 106M12	108UB50 (C/C 5-3/4")	108M20
780.5' - 810.5'	1	105M4	108UB50 (C/C 5-3/4")	108M20
810.5' - 870.5'	2	105M5	108UB50 (C/C 5-3/4")	108M20
870.5' - 900.5'	1	107M18	108UB50 (C/C 5-3/4")	108M20
900.5' - 960.5'	2	105M5	108UB50 (C/C 5-3/4")	108M20
960.5' - 990.5'	1	107M13, 107M14	108UB50 (C/C 5-3/4")	108M20
990.5' - 1020.5'	1	105M5	108UB50 (C/C 5-3/4")	108M20

*APPLY HEAVY COAT OF ZINC RICH
TWO PART EPOXY PAINT AFTER
WELDING

2	3/9/18	WEB	REVISED U-BOLT & CLAMP INFO
1	1/17/18	WEB	REVISED SPLIT PIPE CLEARANCE
0	11/3/17	WEB	RELEASED FOR JOB USE
No.	Date	By	Revision

 <p>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691</p> <p>4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com</p>	<p>KOZK</p> <p>1891'-0 GUYED TOWER</p> <p>SPRINGFIELD, MO</p> <p>SPLIT PIPE REINFORCING</p>	<p>Sheet No.:</p>
		<p>Project No.: 17.289.002</p>
		<p>Drawn By: WEB</p>
		<p>Checked By: MBB/JY</p>
		<p>Date: 11/3/17</p>

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TYPICAL STRUT REINFORCING
(TYPICAL 3 SIDES)

HORIZONTAL REINFORCEMENT			
ELEVATION	LEVELS	REINFORCING ANGLE	BOLTS*
590.5'	1	(3) 104S1	5/8"Ø A325X x 2-1/4"

*ALL BOLTS REQUIRE (1) HARDENED WASHER AND (1) ANCO LOCKNUT EACH

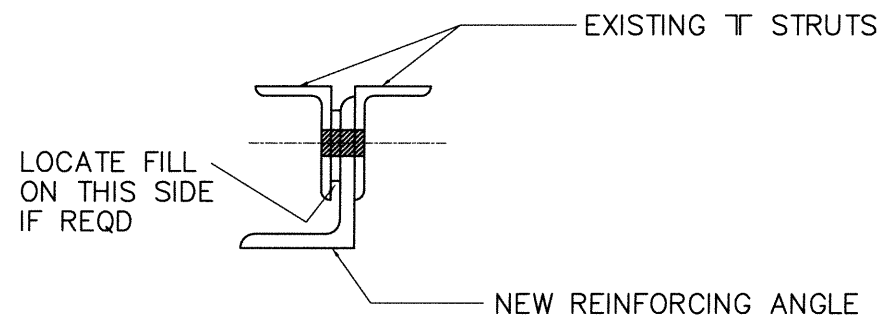
PROCEDURE TO REINFORCE DOUBLE ANGLE STRUTS

A. DOUBLE ANGLE STRUTS

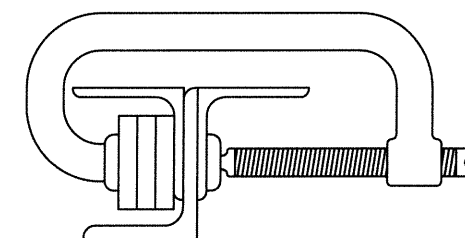
1. CLAMP STRUT WITH "C" CLAMPS AND SHIMS (TACKED OR FASTENED TO THE CLAMP). USE ONE (1) CLAMP PER STITCH BOLT (LOCATED NEAR STITCH BOLT). SEE DETAIL "1" OTHER STYLE CLAMPS ARE PERMITTED PROVIDED STRUT ANGLES ARE RESTRAINED FROM MOVING HORIZONTALLY.
2. REMOVE STITCH BOLTS AND SPACERS FROM THE STRUT TO BE REINFORCED.
3. IMMEDIATELY INSERT REINFORCING ANGLE BETWEEN THE DOUBLE ANGLES, INSERT STITCH BOLTS AND TIGHTEN.
4. FIELD DRILL HOLES FOR END BOLTS AT 1 1/2" FROM EACH END OF THE REINFORCING ANGLE.
5. COAT ALL FIELD DRILLED HOLES WITH A ZINC RICH TWO PART EPOXY.
6. INSERT END BOLTS AND TIGHTEN.

B. OPERATIONAL CONSTRAINTS

1. NO TOWER MEMBER IS TO BE REINFORCED WHEN A WIND VELOCITY GREATER THAN 15 MPH EXISTS OR WHEN A WIND VELOCITY OF GREATER THAN 15 MPH IS PREDICTED DURING THE OPERATION OF REINFORCING THE TOWER MEMBER.
2. REINFORCE THE STRUTS ONE AT A TIME. ONLY REINFORCE STRUTS WHEN "C" CLAMPS ARE INSTALLED.
3. THE ABOVE PROCEDURES TO BE FOLLOWED WITHOUT VARIATION.




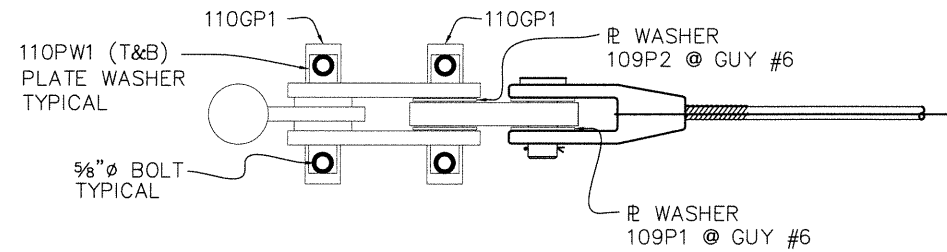
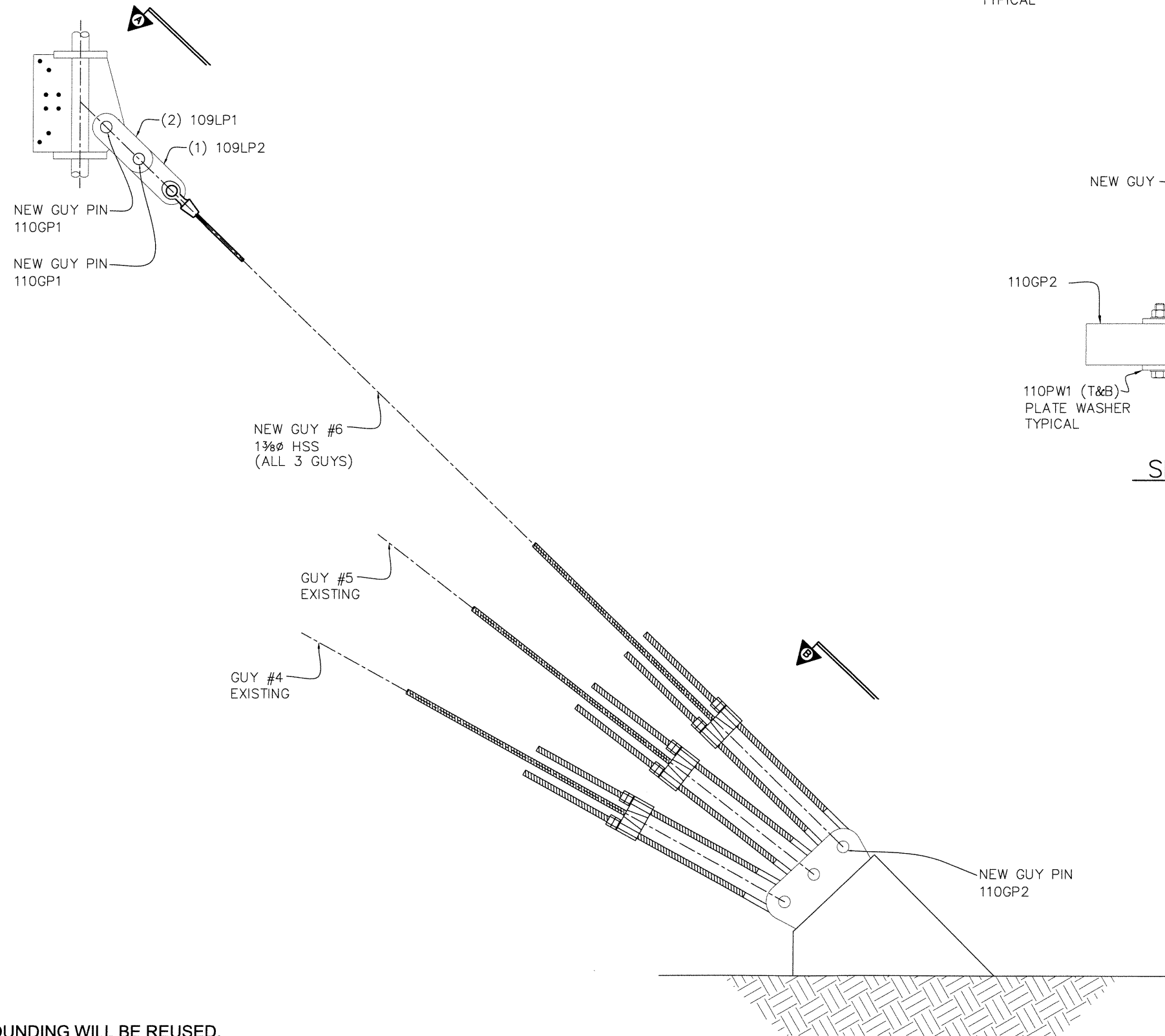
SECTION A



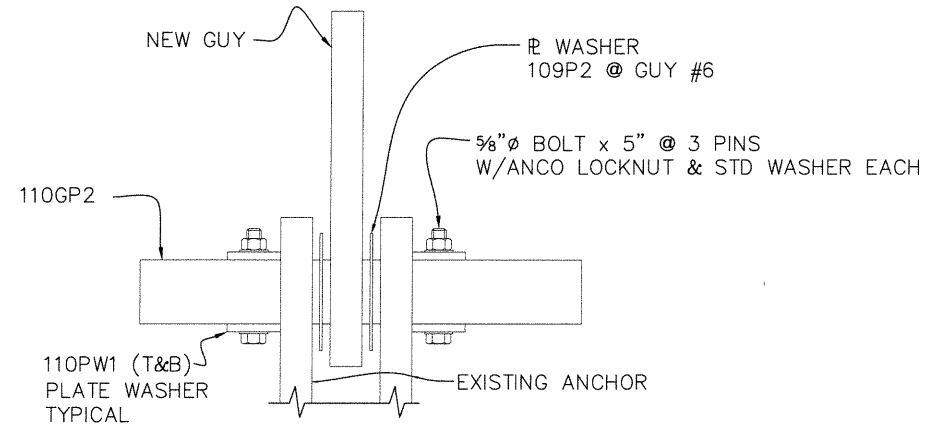
DETAIL 1

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	1891'-0 GUYED TOWER	Sheet No.: 17.289.002
	SPRINGFIELD, MO	Project No.: 17.289.002
	HORIZONTAL REINFORCING	Drawn By: WEB
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SECTION A



SECTION B

NOTE:
1. EXISTING GROUNDING WILL BE REUSED.
2. EXISTING HFD WILL BE REUSED.

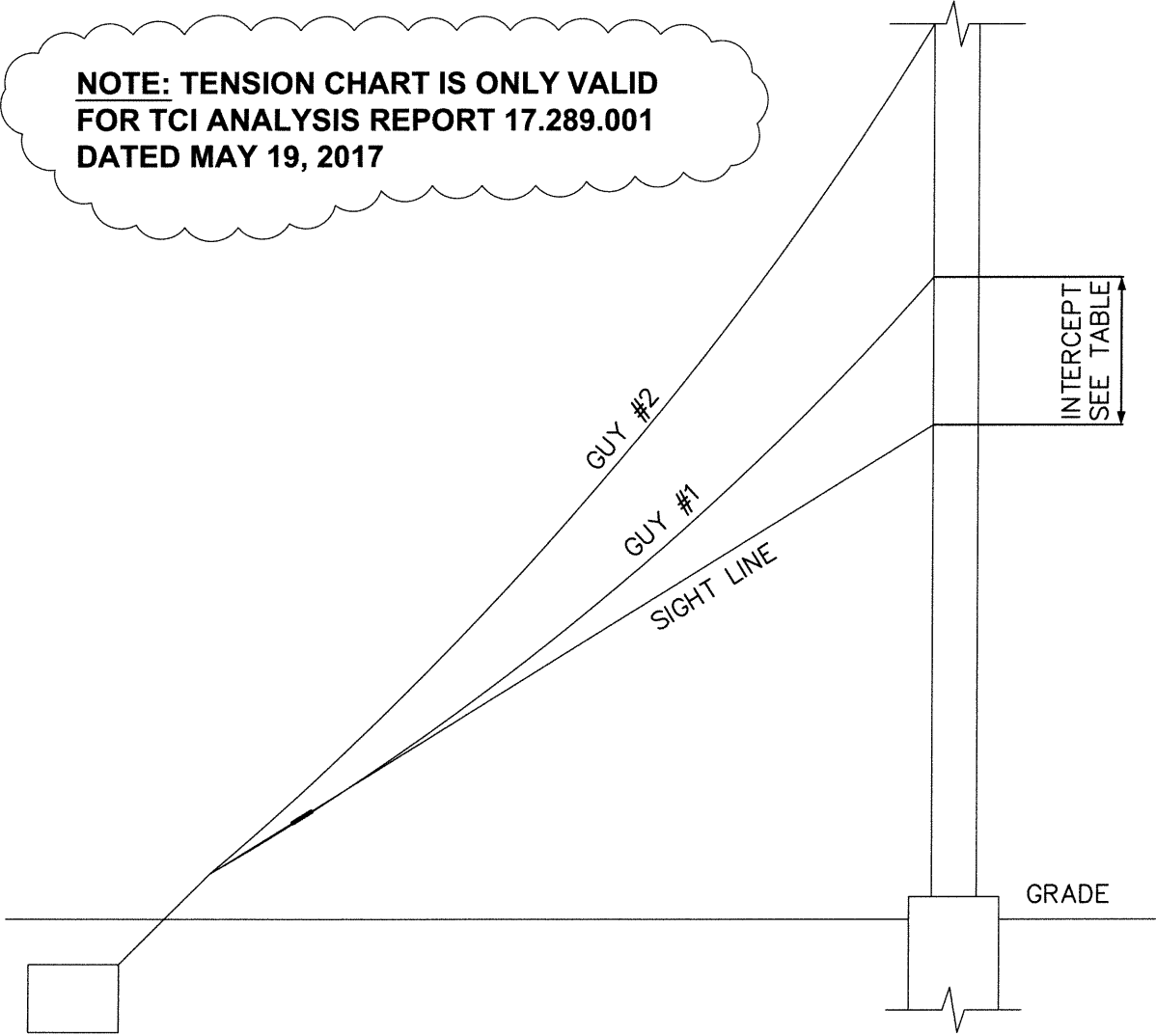
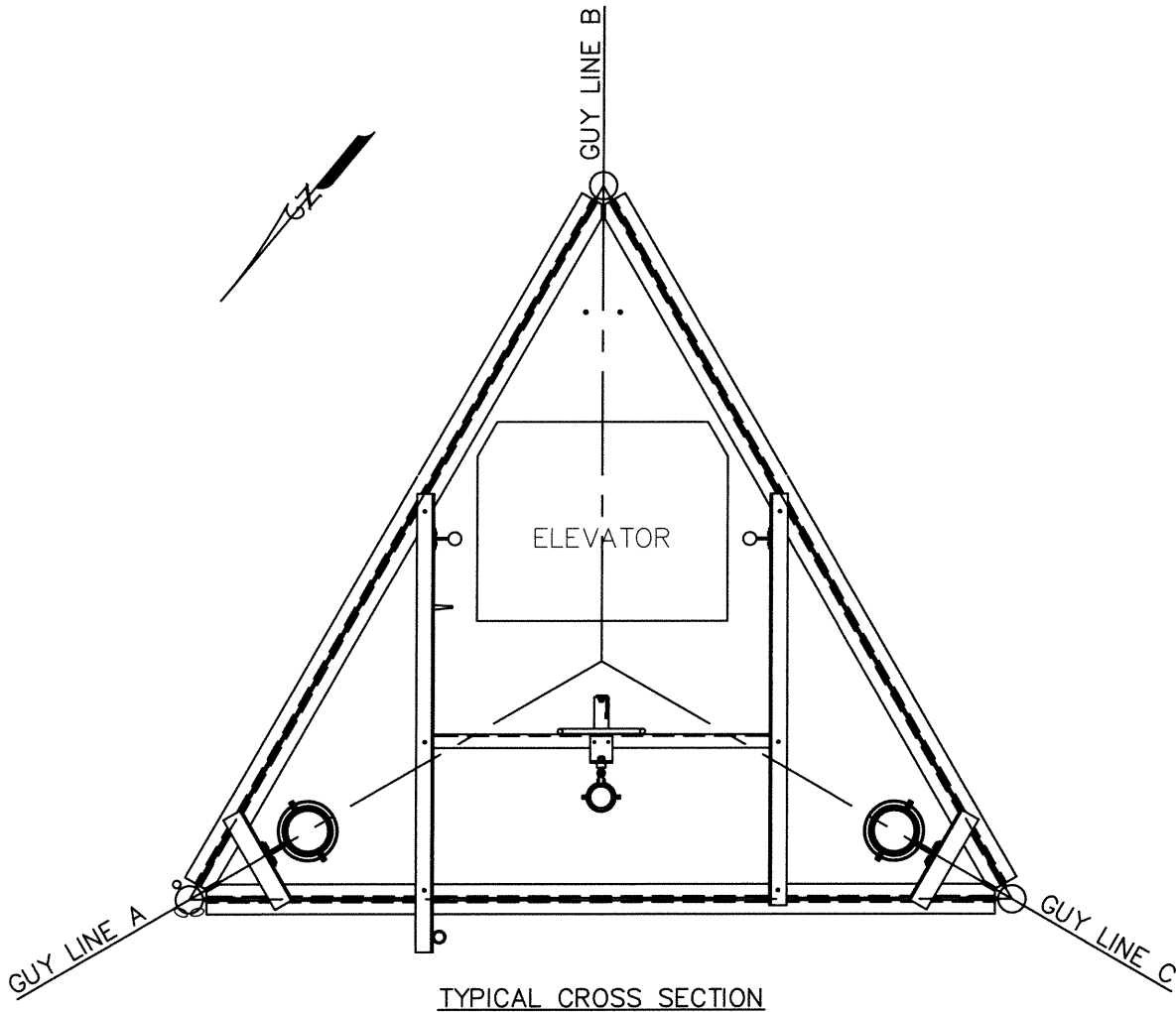
ANCHOR

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4208 198th St. SW., Suite 208 Seattle, WA 98036 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com		SPRINGFIELD, MO	
		GUY WIRE REPLACEMENT	
		E-8	
		Sheet No.:	
		Project No.: 17.289.002	
		Drawn By: WEB	
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Guy Wire Initial Tension (kips)												
Guy Level	Guy Elevation (ft)	Guy Size		Temp. (F)								
				30	40	50	60	70	80	90	100	110
9	1890.5	1-7/16" BS		28.34	28.13	27.92	27.72	27.52	27.32	27.13	26.93	26.74
8	1650.5	1-9/16" BS		33.84	33.55	33.28	33.00	32.73	32.46	32.20	31.94	31.69
7	1420.5	1-5/16" BS		21.76	21.57	21.38	21.20	21.02	20.84	20.67	20.50	20.33
6	1200.5	1-3/8" HSS		21.97	21.73	21.51	21.28	21.06	20.84	20.63	20.42	20.22
5	980.5	1-1/4" BS		17.95	17.72	17.50	17.28	17.07	16.86	16.66	16.46	16.27
4	770.5	1-1/8" BS		14.70	14.47	14.25	14.04	13.84	13.64	13.44	13.25	13.07
3	570.5	1-3/16" BS		14.67	14.36	14.06	13.76	13.47	13.20	12.93	12.66	12.41
2	370.5	1-1/16" BS		13.69	13.25	12.83	12.42	12.03	11.65	11.29	10.95	10.63
1	180.5	1-1/16" BS		18.86	18.08	17.31	16.56	15.84	15.14	14.48	13.89	13.30


Guy Wire Intercept (ft)												
Guy Level	Guy Elevation (ft)	Guy Size	Transit Distance	Temp. (F)								
				30	40	50	60	70	80	90	100	110
9	1890.5	1-7/16" BS	10'	334.34	336.49	338.63	340.77	342.91	345.05	347.18	349.31	351.44
8	1650.5	1-9/16" BS	10'	283.35	285.45	287.55	289.66	291.75	293.85	295.94	298.03	300.12
7	1420.5	1-5/16" BS	10'	263.29	265.35	267.40	269.44	271.48	273.52	275.54	277.57	279.58
6	1200.5	1-3/8" HSS	10'	175.38	177.05	178.73	180.41	182.08	183.76	185.43	187.10	188.77
5	980.5	1-1/4" BS	10'	142.52	144.18	145.84	147.49	149.14	150.79	152.44	154.08	155.72
4	770.5	1-1/8" BS	10'	114.42	116.06	117.70	119.34	120.98	122.61	124.23	125.85	127.46
3	570.5	1-3/16" BS	10'	47.93	48.91	49.89	50.89	51.89	52.91	53.93	54.96	56.00
2	370.5	1-1/16" BS	10'	27.33	28.19	29.08	29.99	30.93	31.88	32.85	33.82	34.80
1	180.5	1-1/16" BS	10'	14.14	14.75	15.39	16.07	16.79	17.55	18.34	19.15	19.93

Adjust the guy wire intercept/tension based on the measurements of the guy wire in the B-line (Southeast) direction.



ELEVATION VIEW

- NOTES:**
1. DURING THE INITIAL GUY TENSIONING PROCEDURES AND AT THE TIME OF INSPECTION, THE GUY TENSIONS AND/OR INTERCEPTS SHOULD BE IN ACCORDANCE WITH THE VALUES SHOWN ABOVE. USE THE TEMPERATURE WHICH ACTUALLY EXISTS AT THE TIME THE TENSION IS BEING CHECKED. FOR TEMPERATURES OTHER THAN THOSE SHOWN ABOVE, INTERPOLATE OR EXTRAPOLATE OTHER VALUES.
 2. TOWER PLUMBING AND INITIAL TENSIONING OF GUYS SHOULD BE DONE ONLY IN CALM WEATHER AND WITH NO ICE ON GUYS.
 3. INTERCEPTS AND TENSIONS ARE USED FOR GUY DIRECTION "B".
 4. GUY #1 IS BOTTOM GUY; GUY #2 IS NEXT, ETC.
 5. USE GUY SCOPE FOR DETERMINING GUY INTERCEPTS.
 6. TENSION AND/OR INTERCEPT TOLERANCES \pm 5%.
 7. AFTER RETENSIONING FINAL SET OF GUYS GO BACK AND RECHECK ALL LEVELS, AND RETENSION WHERE REQUIRED.
 8. PLUMB AND TWIST TO BE VERIFIED, RECORDED, AND IF REQUIRED ADJUSTED TO BE IN CONFORMANCE WITH ANSI/TIA-222-G.

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			1891'-0 GUYED TOWER	
			SPRINGFIELD, MO	
			TENSION CHART	
			E-9	
			Sheet No.:	
			Project No.: 17.289.002	
			Drawn By: WEB	
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POST-MODIFICATION CHECKLIST			
REQUIRED	SECTION	REPORT ITEM	BRIEF DESCRIPTION (SEE ENG-SOW-10007)
PRE-CONSTRUCTION			
X	6.1.1	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT
NA	6.1.2	EOR APPROVED SHOP DRAWNGS	FABRICATION DRAWNGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE THE APPROVED SHOP DRAWNGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.3	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.4	FABRICATOR CERTIFIED WELD INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWNGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE TESTING AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.1.5	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL WITH A YIELD STRENGTH GREATER THAN 36 KSI AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.6	FABRICATOR NDE INSPECTION	A VISUAL OBSERVATION OF A PORTION OF THE EXISTING STRUCTURE (AS NOTED ON THESE DRAWNGS) IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.7	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	A VISUAL OBSERVATION OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.1.8	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
CONSTRUCTION			
X	6.2.1	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWNGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.2	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.3	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.4	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.5	BASE PLATE GROUT VERIFICATION	A LETTER FROM THE GENERAL CONTRACTOR SHALL BE PROVIDED TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES FOR INCLUSION IN THE MI REPORT.
NA	6.2.6	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.7	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.8	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES.
X	6.2.9	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE FOR INCLUSION IN THE MI REPORT.
X	6.2.10	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWNGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
POST-CONSTRUCTION			
X	6.3.1	MI INSPECTOR REDLINE OR RECORD DRAWNG(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
NA	6.3.2	POST-INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.3.3	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWNGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A TOWER CONSULTANT, INC. (TCI) ENGINEERING OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, TCI SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF TCI CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CUSTOMER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH THE CUSTOMERS APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

TCI RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.


VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - FOUNDATION MODIFICATIONS
 - FINAL INSTALLED CONDITION
- POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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 <div>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691 4208 198th St. SW, Suite 208 Seattle, WA 98036 ph: 425-778-5189 fx: 425-778-5103 www.tower-tci.com</div>		KOZK	E-10
		1891'-0 GUYED TOWER	Sheet No.:
		SPRINGFIELD, MO	Project No.: 17.289.002
		POST MODIFICATION CHECKLIST	Drawn By: WEB
			Checked By: MBB
			Date: 11/3/17
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REINFORCE TOWER, KOZK

PROJECT NO.: 180830-027
MISSOURI STATE UNIVERSITY
1891.0-FT GUYED TOWER
KOZK FORDLAND
905 STATE HIGHWAY FF
FORDLAND, MISSOURI 65602
(37°10'11.0"N, 92°56'31.0"W)
(WEBSTER COUNTY)



TOWER CONSULTANTS, INC.
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KOZK
SPRINGFIELD, MO

1891'-0 GUYED
TOWER

ERECTION
DRAWINGS

2	3/8/18	WEB	UPDATED INDEX
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VICINITY MAP		PROJECT INFORMATION		SHEET INDEX	
		<p>APPLICANT: MISSOURI STATE UNIVERSITY 901 S NATIONAL AVENUE FORDLAND, MO 65897 PH: 417-836-5101</p> <p>LAND OWNER: MISSOURI STATE UNIVERSITY</p> <p>EMERGENCY CONTACT: BRENT MOORE MISSOURI STATE UNIVERSITY PH: 417-836-3504</p> <p>JURISDICTION: WEBSTER COUNTY, MISSOURI</p>		T-1 = TITLE SHEET G-1 = GENERAL NOTES G-2 (REV 01) = MODIFICATION DESCRIPTION E-1 = TOWER ELEVATION DRAWING E-2 = TOWER ELEVATION DRAWING E-3 = TOWER ELEVATION DRAWING E-4 = CROSS SECTION E-5 = DIAGONAL REPLACEMENT E-6 (REV 02) = SPLIT PIPE REINFORCING E-7 = HORIZONTAL REINFORCEMENT E-8 = GUY WIRE REPLACEMENT E-9 = TENSION CHART E-10 = POST MODIFICATION CHECKLIST	
		CONTRACTOR LIST		LEGEND A = DETAIL ▼ = SECTION CL OR CL = CENTERLINE PL = PLATE P = PROPERTY LINE Δ = REVISION	
		<p>TOWER CONTRACTOR: Tower Consultants, Inc. 15 Surrey Ct. Columbia, SC 29212 (803) 407-8489</p>			
<p>TOWER DESIGNED FOR A WIND SPEED OF 90-MPH WITH NO ICE & 30-MPH WITH 1" OF RADIAL ICE PER EIA/TIA-222-G STANDARD.</p>		PROJECT DESCRIPTION			
		<p>MISSOURI STATE UNIVERSITY IS PROPOSING TO PERFORM A TOWER MODIFICATION IN ORDER TO COMPLY WITH ANSI/TIA-222-G STANDARD WITH PROPOSED LOADING ON THE EXISTING 1891.0-FT GUYED TOWER.</p>			

GENERAL NOTES

GENERAL

1. ALL METHODS, MATERIALS, AND WORKMANSHIP SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE.
2. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS WITH A MINIMUM OF 10 YEARS EXPERIENCE IN TOWER AND FOUNDATION CONSTRUCTION.
3. ALL DIMENSIONS, MATERIALS, AND DETAILS OF THE EXISTING STRUCTURES ARE INCLUDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY ALL RELEVANT INFORMATION PRIOR TO CONSTRUCTION OR FABRICATION AND NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY VARIANCE OR DISCREPANCIES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
4. DIMENSIONS AND ELEVATIONS GIVEN FOR THE NEW CONSTRUCTION MUST ALSO BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND ERECTION TO ASSURE PROPER FIT AND ALIGNMENT OF THE STRUCTURAL COMPONENTS IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS.
5. ANY SUBSTITUTIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

6. ANY MANUFACTURED DESIGN ELEMENTS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. THESE DESIGN ELEMENTS MUST BE STAMPED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE THE WORK IS BEING PERFORMED. IF REQUIRED CONTRACTOR TO PREPARE PERMIT DRAWING SET SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE THE WORK IS BEING PERFORMED. ALL PERMITS, LICENSES, APPROVALS AND OTHER REQUIREMENTS FOR CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

7. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS.

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS. ALL INSTALLATION PROCEDURES, SAFEGUARDS AND MEANS AND METHODS OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

9. A DETAILED RIGGING PLAN SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE OWNER FOR APPROVAL. THE RIGGING PLAN SHALL INCLUDE AS A MINIMUM: BRIEF TOWER DESCRIPTION, HOIST MODEL AND CAPACITY, DATA, WIRE ROPE SIZE AND CONSTRUCTION, SHEAVE/BLOCK DIAMETER AND CAPACITY, CHOKER SIZE AND CAPACITY, RIGGING DETAILS TO THE TOWER, PLANNED LIFT WEIGHTS, GIN POLE SIZE AND CAPACITY AND A DIAGRAM LOCATING KEY RIGGING COMPONENTS.

APPLICABLE CODES AND STANDARDS

1. ANSI/TIA/EIA: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. IBC: INTERNATIONAL BUILDING CODE, LATEST EDITION.
3. ASTM: STANDARDS FOR BUILDING CODES, LATEST EDITION.
4. ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, LATEST EDITION.
5. ACI 315: AMERICAN CONCRETE INSTITUTE, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT, LATEST EDITION.
6. CSRI: CONCRETE STEEL REINFORCING INSTITUTE, MANUAL OF STANDARD PRACTICE, LATEST EDITION.
7. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
8. AWS: AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, LATEST EDITION.

STEEL AND FABRICATION

1. ALL STEEL FABRICATION TO BE DONE BY AN AISC CERTIFIED FABRICATION FACILITY IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. ALL STEEL TO BE ASTM A572 GR.50 (50KSI MIN YIELD STRENGTH) U.N.O.; BOLTS TO BE ASTM A325 WITH ANCO LOCKNUTS U.N.O.
3. ALL MATERIAL TO BE HOT DIPPED GALVANIZED PER ASTM A123 OR ASTM A153.

4. BOLT HOLE DIAMETER SHALL NOT BE MORE THAN $\frac{1}{16}$ " LARGER THAN NOMINAL BOLT DIAMETER AND SHALL BE PUNCHED OR DRILLED U.N.O.

WELDING

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE. ALL WELDS TO BE INSPECTED FOR STRUCTURAL SOUNDNESS AND DOCUMENTED.
2. ALL ELECTRODES TO BE E70 LOW HYDROGEN TYPE.
3. MINIMUM WELD SIZE TO BE 0.3125 INCH FILLET WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
4. ALL WELDED CONNECTIONS TO BE SEAL WELDED FOR GALVANIZING.

FIELD INSTALLATION

1. ALL GALVANIZED SURFACE THAT ARE SCRATCHED OR DAMAGED SHALL BE REPAIRED USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.
2. A490 BOLTS SHALL BE SPRAY PAINTED WITH A COAT OF COLD GALVANIZING PRIOR TO INSTALLATION FOLLOWED BY A COAT OF A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT AFTER INSTALLATION.
3. HARDWARE INTERFERING WITH THE INSTALLATION OF REINFORCING MATERIAL SHALL BE TEMPORARILY MOVED AND REINSTALLED AFTER THE COMPLETION OF THE WORK.
4. WHEN FIELD WELDING IS REQUIRED THE STEEL SHALL BE CLEANED OF ALL PAINT AND GALVANIZING TO A BARE METAL. AS SPECIFIED PER AWS D1.1. PREHEATING AND POST HEATING MAY BE REQUIRED.
5. WELDED AREAS ARE TO BE TOUCHED UP USING A ZINC RICH TWO PART EPOXY SUCH AS CARBOLINE 15 OR EQUIVALENT.

TIGHTENING OF BOLTS AND NUTS

1. ALL HIGH STRENGTH BOLTS TO BE TIGHTENED TO THE SNUG TIGHT CONDITION AS SPECIFIED IN THE CURRENT EDITION OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". BOLTS REQUIRING FULL PRETENSION TO BE TIGHTENED BY "THE TURN OF THE NUT METHOD" U.N.O.

FOUNDATIONS


1. CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND UTILITIES IN THE AREA WHERE THE WORK IS TO BE PERFORMED.
2. DRILLED SHAFT INSTALLED IN ACCORDANCE WITH ACI-336 (LATEST EDITION).

CONCRETE

1. ALL CONCRETE FOR FOUNDATIONS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. AFTER 28 DAYS.
2. THE CONCRETE MIX SHALL NOT CONTAIN LESS THAN $5\frac{1}{2}$ SACKS OF CEMENT (ASTM C 150 TYPE II) PER CUBIC YARD.
3. THE CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF $\frac{7}{8}$ ".
4. THE CONCRETE MIX SHALL PRODUCE A MAXIMUM SLUMP OF 5" ±1".
5. THE CONCRETE MIX SHALL HAVE A TOTAL AIR CONTENT OF 5%, WITH A TOLERANCE OF PLUS OR MINUS 1.5%. AIR-ENTRAINING ADMIXTURES SHALL CONFORM TO ASTM C 260.
6. THE CONCRETE MIX SHALL HAVE A MAXIMUM WATER-CEMENT RATIO OF 0.45. WATER REDUCING OR ACCELERATING ADMIXTURES SHALL CONFORM TO ASTM C 494.
7. THE CONCRETE SHALL NOT CONTAIN CALCIUM CHLORIDE OR ANY OTHER ADMIXTURE CONTAINING CHLORIDE OTHER THAN NATURAL IMPURITIES.
8. FORM WORK SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.
9. ALL CONCRETE SHALL BE PLACED IN A MONOLITHIC POUR UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
10. PROVIDE CHAMFERS AT ALL EXPOSED CORNERS OF CONCRETE.
11. CONCRETE WORK UNDER EXTREME WEATHER CONDITIONS SHALL CONFORM TO ACI 318 (LATEST EDITION) SPECIFICATIONS.

STEEL REINFORCEMENT (REBAR)

1. ALL REINFORCING STEEL TO BE GRADE 60 DEFORMED BILLET STEEL PER ASTM A615.
2. REINFORCEMENT SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE ACI 315 AND CSRI. SUPPORT REINFORCING AS REQUIRED BY CSRI TO PREVENT DISPLACEMENT UPON CONCRETE POURING.
3. MAINTAIN ALL CLEARANCES NOTED ON THE DRAWINGS. WHERE NO DIMENSIONS ARE NOTED, USE THE ACI RECOMMENDED CLEARANCES.
4. FOR CONCRETE POURED AGAINST SOIL, THE MINIMUM COVER FOR ALL REINFORCING BARS SHALL BE 3".
5. TIE BARS SECURELY WITH #16 ANNEALED WIRE AND SUPPORT AS REQUIRED.
6. ALL WELDED WIRE FABRIC TO BE PER ASTM A185. ALL BARS AND WIRE SHALL BE FREE OF RUST, MILL SCALE, DIRT, OR OTHER FOREIGN MATERIAL PRIOR TO CASTING CONCRETE.
7. PROVIDE MINIMUM LAP SPLICES OF 36 BAR DIAMETERS UNLESS NOTED OTHERWISE.
8. FIELD BENDING OF REINFORCEMENT BARS IS NOT PERMITTED. DO NOT WELD REINFORCING BARS.

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MODIFICATION DESCRIPTION:

1. THIS DRAWING IS FOR JOB USE.
2. UPGRADES APPLY TO ALL THREE FACES OF THE TOWER.
3. A TEMPORARY BRACE MUST BE INSTALLED THAT IS OF EQUIVALENT OR GREATER CAPACITY THAN THE MEMBER BEING REPLACED. THE TEMPORARY BRACE SHALL BE PLACED ADJACENT TO THE MEMBER BEING REPLACED SUCH THAT IT WILL TAKE THE LOAD AFTER THE EXISTING MEMBER IS REMOVED.
- A TEMPORARY FRAME IS REQUIRED ABOVE AND BELOW GUY LEVELS DURING DIAGONAL REPLACEMENT.
4. REPLACE THE EXISTING SOLID ROD DIAGONAL MEMBERS WITH A NEW HIGHER CAPACITY MEMBER AT THE FOLLOWING LOCATIONS (SEE E-5):

50.5' - 60.5'	(1 BAY)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS
80.5' - 100.5'	(2 BAYS)	1" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A490X BOLTS
100.5' - 110.5'	(1 BAY)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS
130.5' - 160.5'	(3 BAYS)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS
570.5' - 590.5'	(2 BAYS)	1¼" ϕ S.R., ASTM A572-50, ¾" ϕ A490X BOLTS
590.5' - 630.5'	(4 BAYS)	1" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A490X BOLTS
630.5' - 650.5'	(2 BAYS)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS
770.5' - 800.5'	(3 BAYS)	1" ϕ S.R., ASTM A572-50, ¾" ϕ A325X BOLTS
800.5' - 830.5'	(3 BAYS)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS
980.5' - 990.5'	(1 BAY)	1" ϕ S.R., ASTM A572-50, ¾" ϕ A325X BOLTS
1010.5' - 1020.5'	(1 BAY)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS
1180.5' - 1190.5'	(1 BAY)	1" ϕ S.R., ASTM A572-50, ¾" ϕ A325X BOLTS
1230.5' - 1240.5'	(1 BAY)	7⁄8" ϕ S.R., ASTM A572-50, 5⁄8" ϕ A325X BOLTS

5. REINFORCE THE EXISTING LEGS BY ADDING SPLIT PIPE REINFORCING AT THE FOLLOWING LOCATIONS (SEE E-6)

0.0' - 60.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
60.5' - 150.5'	(3 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
150.5' - 210.5'	(2 SECTIONS)	HALF HSS 5.5" O.D. x 0.5" WALL, FY=50KSI MIN.
210.5' - 390.5'	(6 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
390.5' - 420.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
420.5' - 450.5'	(1 SECTION)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
450.5' - 600.5'	(5 SECTIONS)	HALF HSS 5.0" O.D. x 0.375" WALL, FY=50KSI MIN.
600.5' - 810.5'	(7 SECTIONS)	HALF HSS 5.0" O.D. x 0.5625" WALL, FY=70KSI MIN.
810.5' - 1020.5'	(7 SECTIONS)	HALF HSS 4.75" O.D. x 0.5" WALL, FY=70KSI MIN.



6. REINFORCE THE EXISTING DOUBLE ANGLE HORIZONTAL MEMBERS BY ADDING A SINGLE ANGLE MEMBER BETWEEN THE DOUBLE ANGLES AT THE FOLLOWING LOCATIONS (SEE E-7):

590.5'	(1 LEVEL)	L3½x2½x¾, 5⁄8" ϕ A325X BOLTS
--------	-----------	------------------------------

7. REPLACE GUY LEVEL 6 AND ADJUST THE GUY WIRE INITIAL TENSION USING THE TANGENT INTERCEPT METHOD TO THE VALUES LISTED IN THE CHART BELOW. REUSE EXISTING GROUNDING AND HFD (SEE E-8 & E-9):

GUY LEVEL	EXISTING GUY PROPERTIES			RECOMMENDED GUY PROPERTIES		
	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION	GUY ANCHOR	GUY SIZES	% OF ULT. TENSION
9 th (top)	Outer Anchor	1-7⁄16"Ø BS	7.62%	Outer Anchor	1-7⁄16"Ø BS	11.0%
8 th		1-9⁄16"Ø BS	8.44%		1-9⁄16"Ø BS	11.0%
7 th		1-5⁄16"Ø BS	10.22%		1-5⁄16"Ø BS	10.0%
6 th	Middle Anchor	1-3⁄8"Ø BS	9.67%	Middle Anchor	1-3⁄8"Ø HSS	8.0%
5 th		1-1⁄4"Ø BS	10.52%		1-1⁄4"Ø BS	9.0%
4 th		1-1⁄8"Ø BS	12.08%		1-1⁄8"Ø BS	9.0%
3 rd	Inner Anchor	1-3⁄16"Ø BS	9.34%	Inner Anchor	1-3⁄16"Ø BS	8.0%
2 nd		1-1⁄16"Ø BS	12.30%		1-1⁄16"Ø BS	9.0%
1 st (bot)		1-1⁄16"Ø BS	12.62%		1-1⁄16"Ø BS	12.0%

NOTE: VALUES SHOWN ABOVE ARE VALID AT 60 DEGREES FAHRENHEIT; A P&T CHART WITH TEMPERATURE CORRECTIONS WILL BE REQUIRED FOR FIELD ADJUSTMENTS

8. ALL MATERIAL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE TO ASTM SPECIFICATIONS.

9. ALL REINFORCING MATERIAL SHALL BE PAINTED IN THE FIELD TO MATCH THE EXISTING COLOR SCHEME OF THE TOWER.

10. THE MODIFICATION MATERIAL AND INSTALLATION DRAWINGS CONTAINED HEREIN ARE BASED ON THE ASSUMPTION THAT THE TOWER HAS BEEN PROPERLY INSTALLED AND MAINTAINED, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- A. PROPER ALIGNMENT AND PLUMBNESS.
B. CORRECT GUY TENSIONS.
C. CORRECT BOLT TIGHTNESS.
D. NO SIGNIFICANT DETERIORATION OR DAMAGE TO ANY COMPONENT.

11. ALL MATERIAL REQUIRED BY SHEETS E-1 THROUGH E-8 FURNISHED TO CONTRACTOR BY TCI. FOR PRICING PLEASE CONTACT:

RON DOZSA
425-778-5169

DESIGN INFORMATION:

1. THIS DRAWING PACKAGE IS BASED ON TOWER CONSULTANTS ANALYSIS REPORT 17.289.001, DATED MAY 19, 2017.
2. THE TOWER IS DESIGNED FOR THE EXISTING AND PROPOSED LOADING AS LISTED IN THE REPORT REFERENCED ABOVE.


ANTENNA WORK:

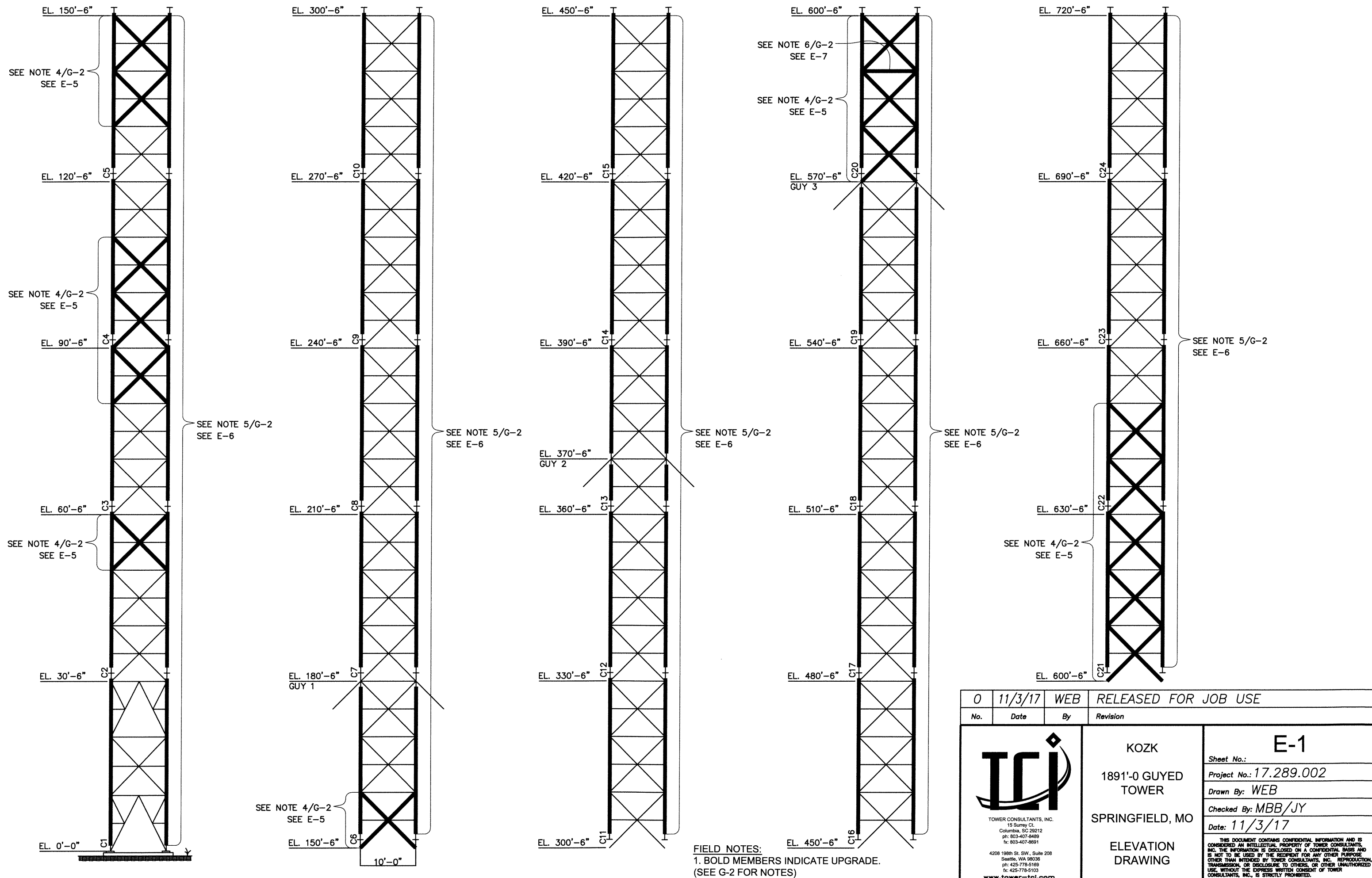
1. REMOVE THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):

0' - TOP 6⅛" RIGID LINE

2. INSTALL THE FOLLOWING LINES (SEE CROSS SECTION ON E-4):

0' - TOP 6⅛" RIGID LINE

1	3/9/18	WEB	REVISED SPLIT PIPE
0	11/3/17	WEB	RELEASED FOR JOB USE
No.	Date	By	Revision
<div><div><div><p>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691</p><p>4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5169 fx: 425-778-5103</p><p>www.tower-tci.com</p></div><div><div>KOZK</div><div>1891'-0 GUYED TOWER</div><div>SPRINGFIELD, MO</div><div>MODIFICATION DESCRIPTION</div></div><div><div>G-2</div><div>Sheet No.:</div><div>Project No.: 17.289.002</div><div>Drawn By: WEB</div><div>Checked By: MBB/JY</div><div>Date: 11/3/17</div><div><p>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</p></div></div></div></div>			



FIELD NOTES:
1. BOLD MEMBERS INDICATE UPGRADE.
(SEE G-2 FOR NOTES)

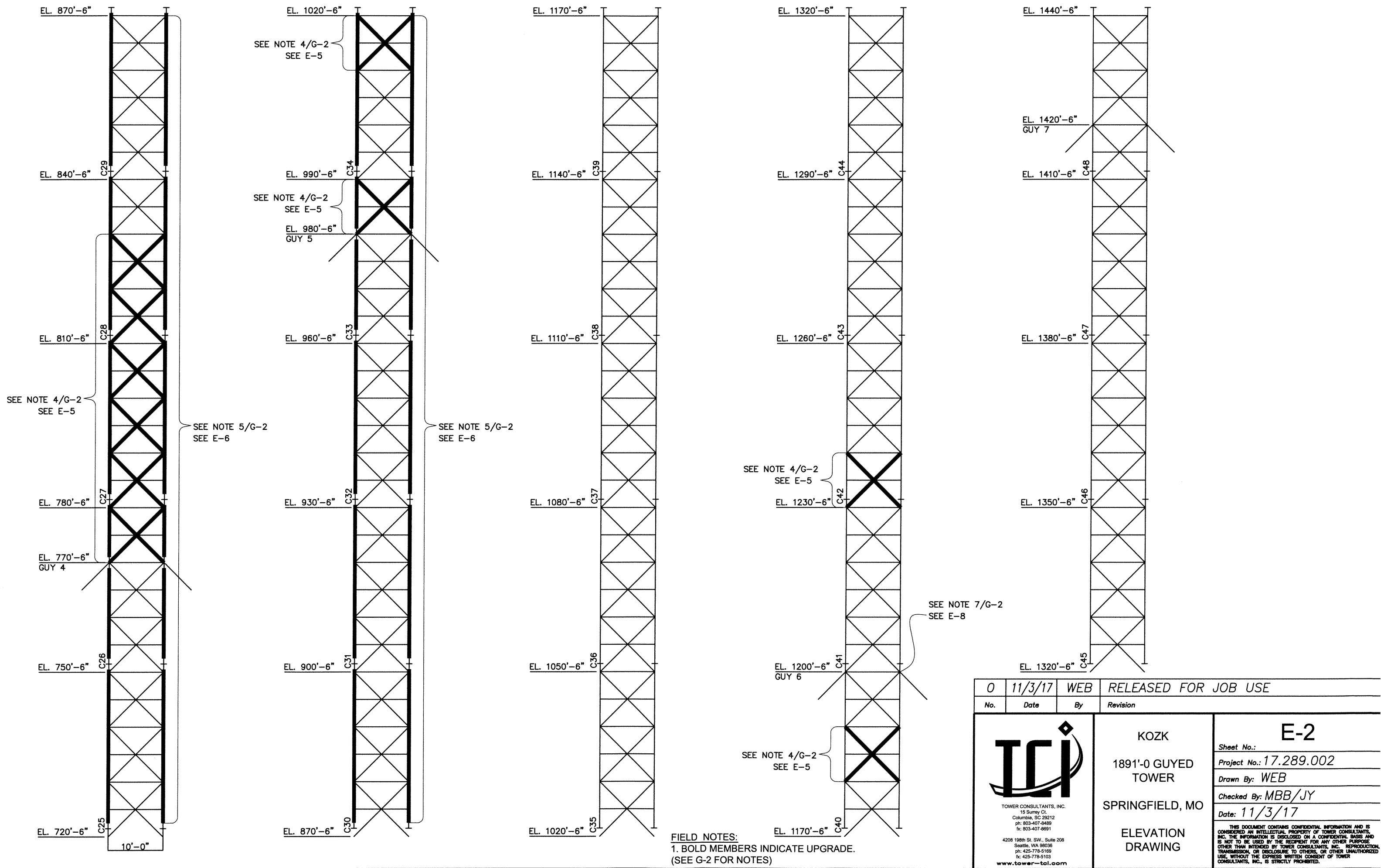


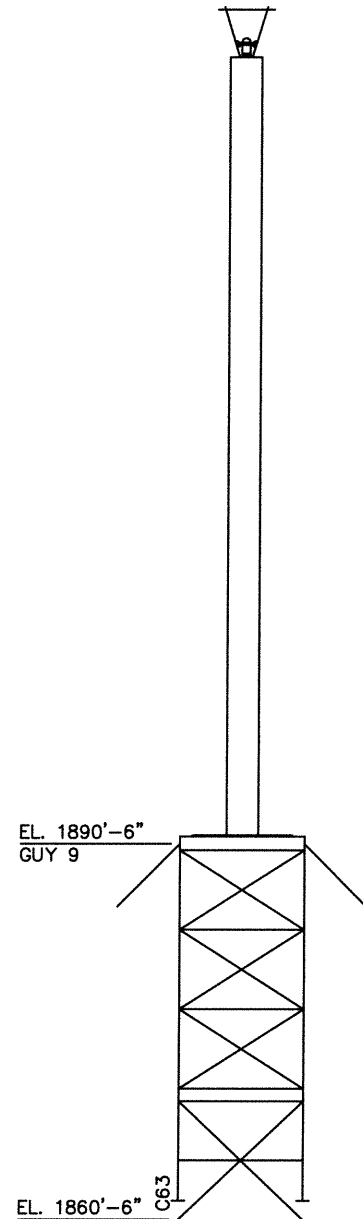
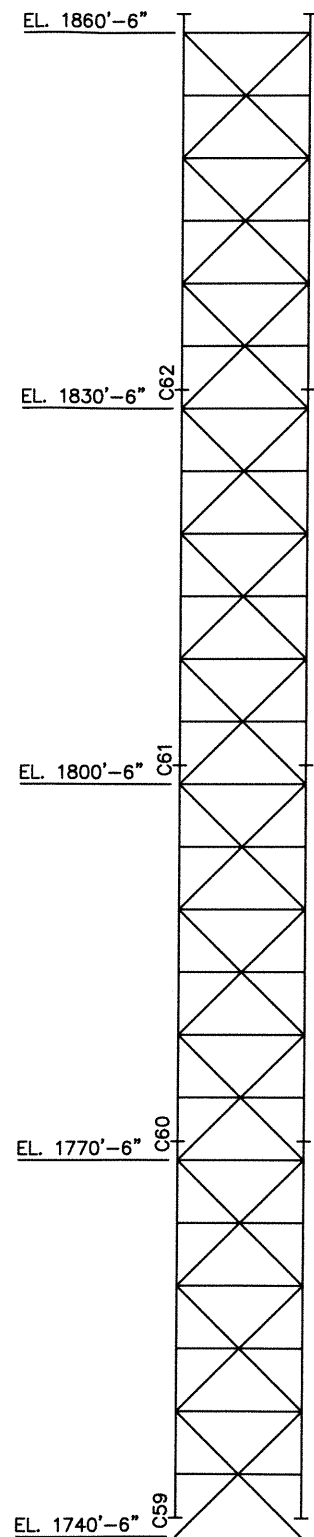
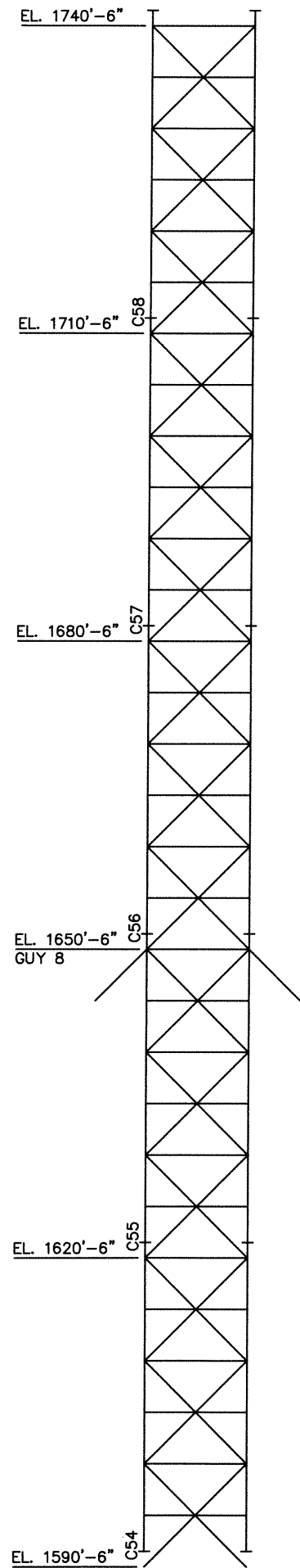
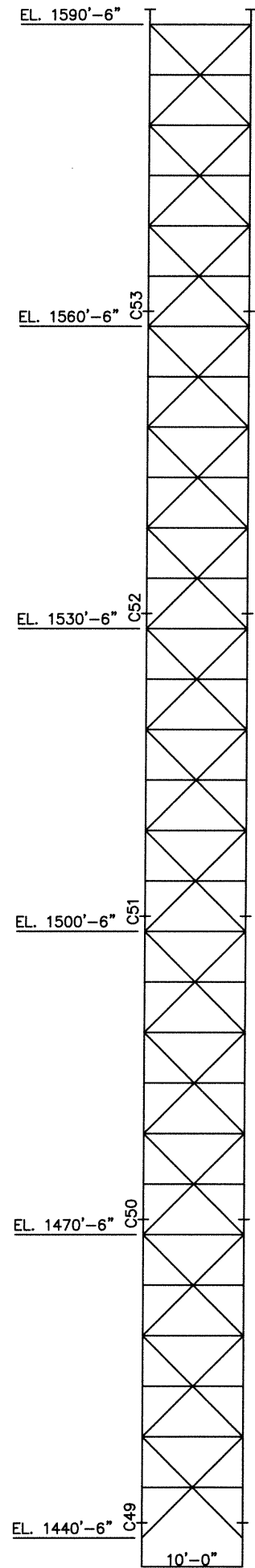
TOWER CONSULTANTS, INC.
15 Sunny Ct.
Columbia, SC 29212
ph: 803-407-8489
fx: 803-407-8691
4208 198th St. SW, Suite 208
Seattle, WA 98136
ph: 425-778-5169
fx: 425-778-5103
www.tower-tci.com

KOZK
1891'-0 GUYED
TOWER
SPRINGFIELD, MO
ELEVATION
DRAWING


E-1	
Sheet No.:	
Project No.:	17.289.002
Drawn By:	WEB
Checked By:	MBB/JY
Date:	11/3/17
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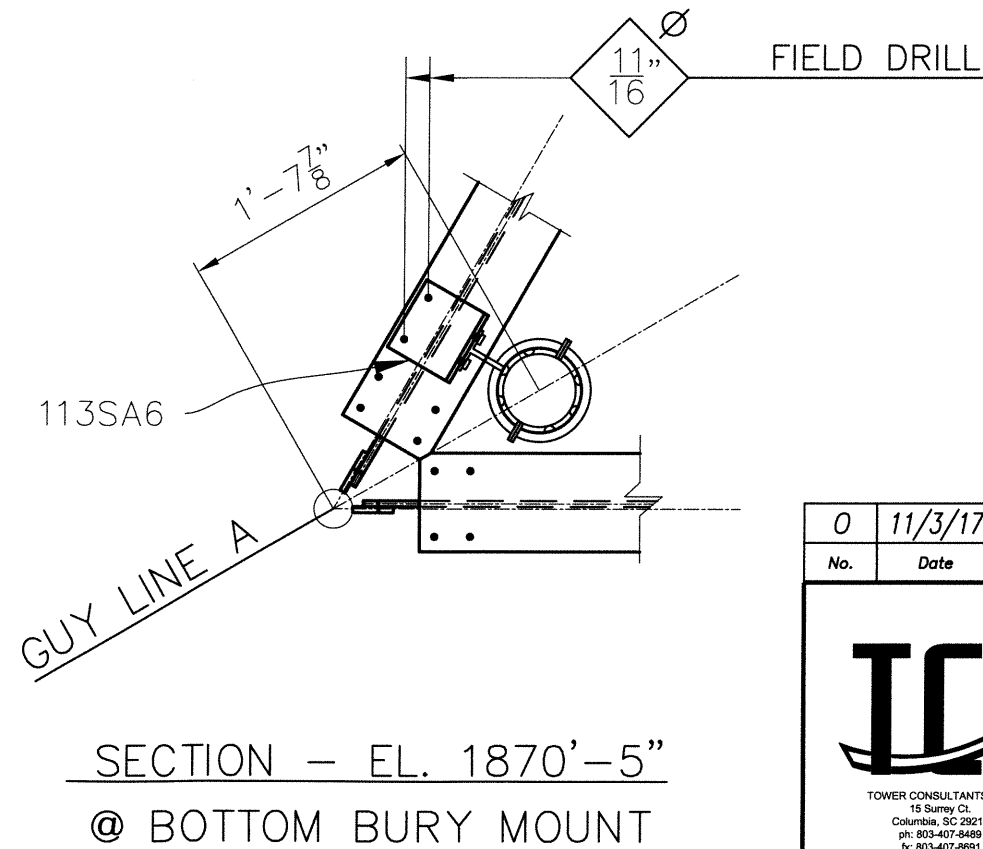
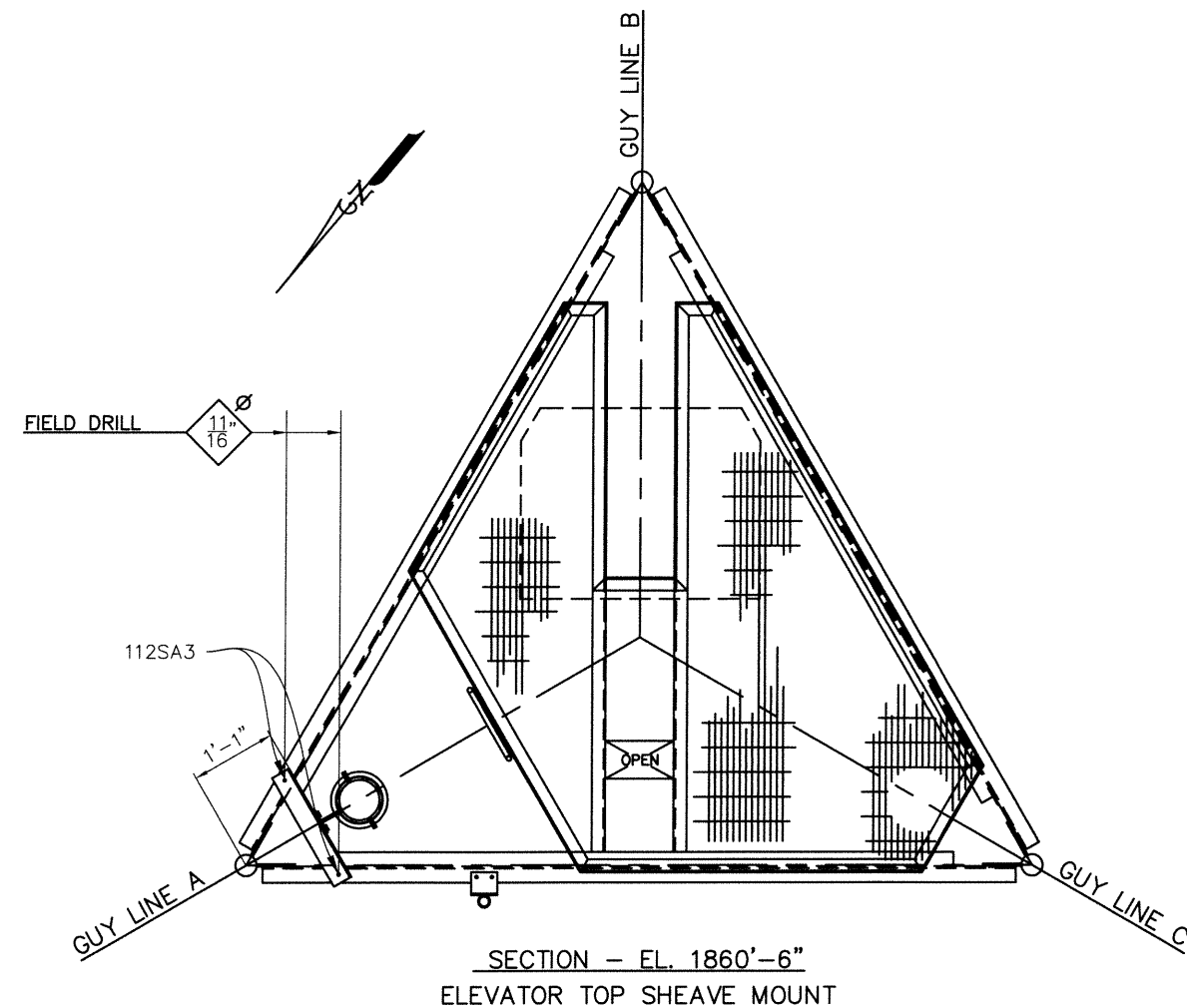
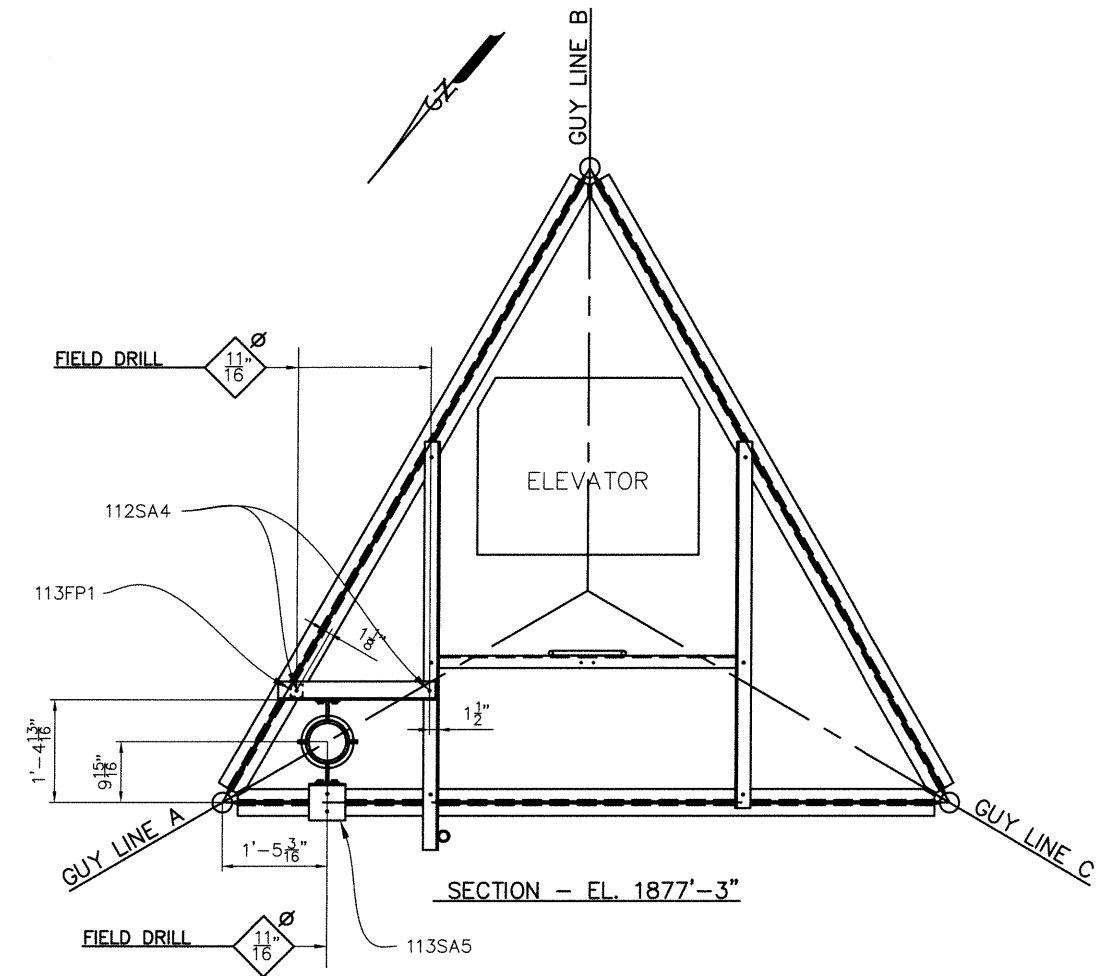
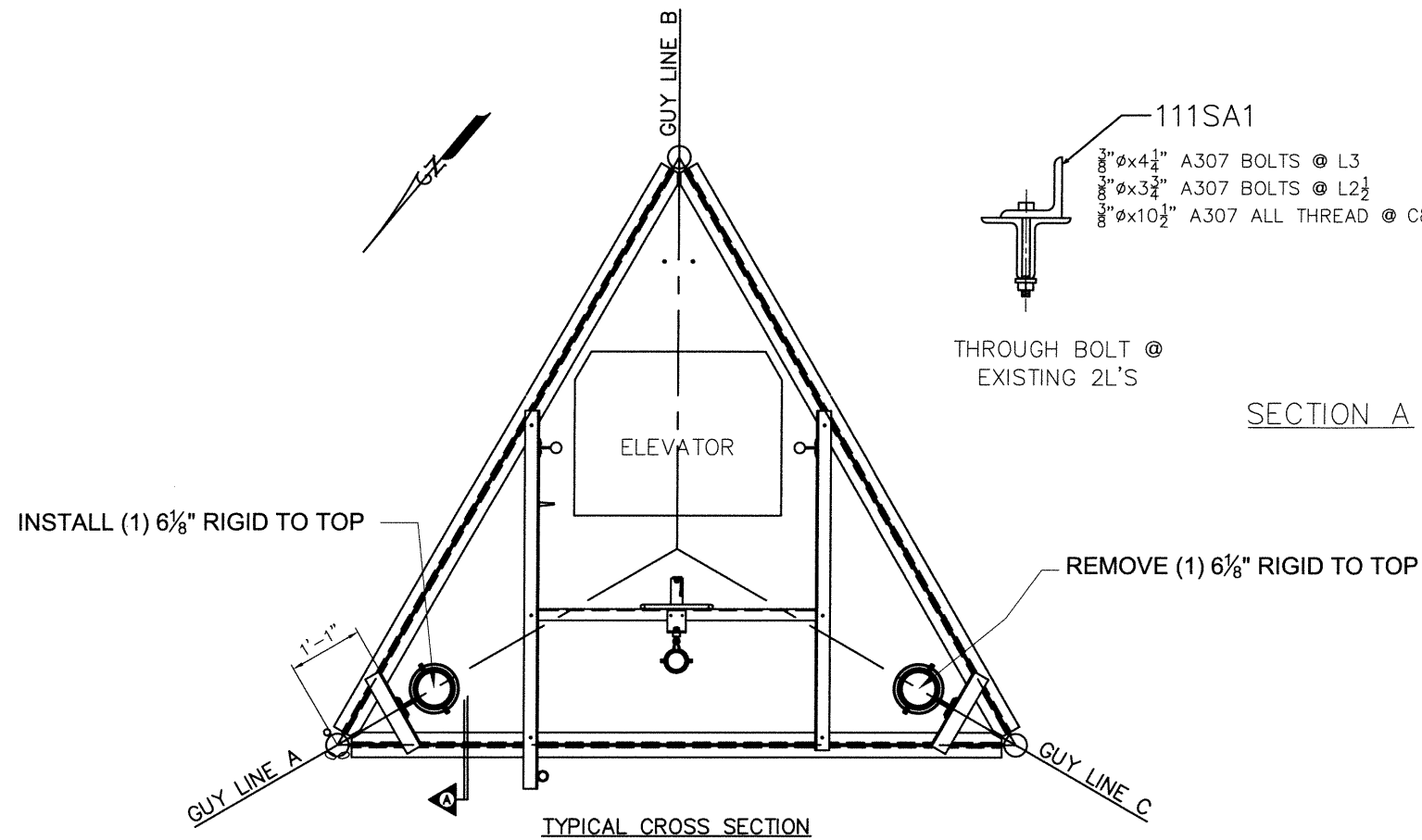
0	11/3/17	WEB	RELEASED FOR JOB USE
No.	Date	By	Revision




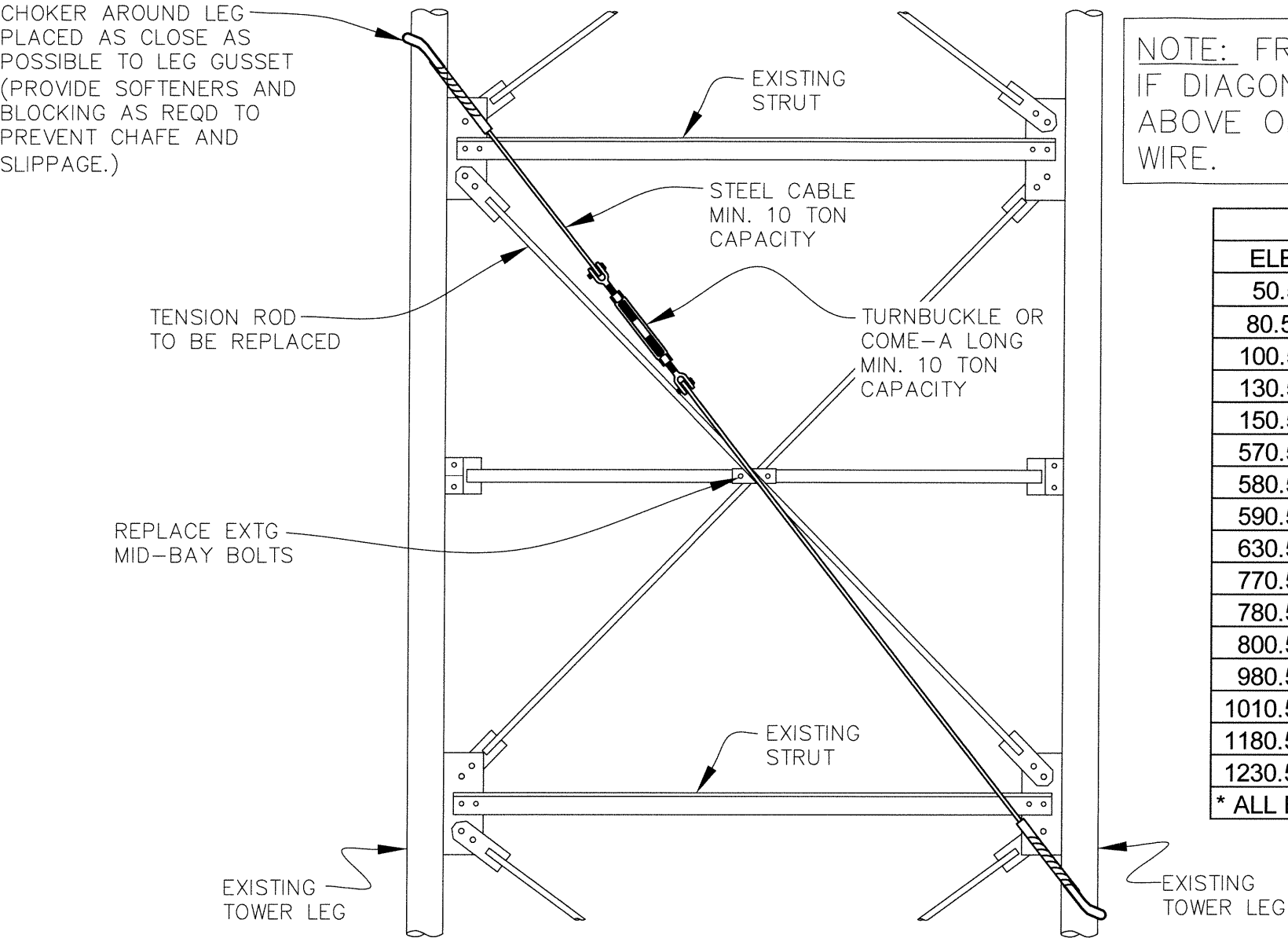


FIELD NOTES:
1. BOLD MEMBERS INDICATE UPGRADE.
(SEE G-2 FOR NOTES)

0	11/3/17	WEB	RELEASED FOR JOB USE
No.	Date	By	Revision
<div><div><div><div><div><div><div></div><div>TOWER CONSULTANTS, INC.</div></div><div><div><div></div><div>15 Surrey Ct.</div><div>Columbia, SC 29212</div><div>ph: 803-407-8489</div><div>fx: 803-407-8691</div></div></div><div><div><div></div><div>4208 188th St. SW., Suite 208</div><div>Seattle, WA 98036</div><div>ph: 425-778-5169</div><div>fx: 425-778-5103</div></div><div>www.tower-tci.com</div></div></div></div><div><div>KOZK</div><div>1891'-0 GUYED TOWER</div><div>SPRINGFIELD, MO</div><div>ELEVATION DRAWING</div></div><div><div>Sheet No.: E-3</div><div>Project No.: 17.289.002</div><div>Drawn By: WEB</div><div>Checked By: MBB/JY</div><div>Date: 11/3/17</div><div><small>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE, OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</small></div></div></div></div></div>			



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		E-4	
		Sheet No.: 17.289.002	
		Project No.: 17.289.002	
		Drawn By: WEB	
Checked By: MBB			
Date: 11/3/17			
1891'-0 GUYED TOWER		SPRINGFIELD, MO	
CROSS SECTION		THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.	



NOTE: FRAME IS REQUIRED IF DIAGONAL IS REPLACED ABOVE OR BELOW A GUY WIRE.

NOTE: FRAME TO BE PROVIDED BY THE ERECTOR AND APPROVED BY TCI


DIAGONAL REPLACEMENT					
ELEVATION	BAYS	NEW DIAGONAL	END BOLTS*	MID-BAY BOLTS*	REAMING REQD
50.5' - 60.5'	1	101X3	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
80.5' - 100.5'	2	100X2	5/8"Ø A490X x 2	5/8"Ø A325X x 3	NO
100.5' - 110.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
130.5' - 150.5'	2	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
150.5' - 160.5'	1	101X4	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
570.5' - 580.5'	1	102X6	3/4"Ø A490X x 2-1/2	5/8"Ø A325X x 3	NO
580.5' - 590.5'	1	103X8	3/4"Ø A490X x 2-1/2	5/8"Ø A325X x 3	NO
590.5' - 630.5'	4	100X2	5/8"Ø A490X x 2	5/8"Ø A325X x 3	NO
630.5' - 650.5'	2	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
770.5' - 780.5'	1	102X5	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
780.5' - 800.5'	2	103X7	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
800.5' - 830.5'	3	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
980.5' - 990.5'	1	102X5	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
1010.5' - 1020.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
1180.5' - 1190.5'	1	103X7	3/4"Ø A325X x 2-1/4	5/8"Ø A325X x 3	NO
1230.5' - 1240.5'	1	100X1	5/8"Ø A325X x 2	5/8"Ø A325X x 3	NO
* ALL BOLTS REQUIRE (1) HARDENED WASHER AND (1) ANCO LOCKNUT EACH					

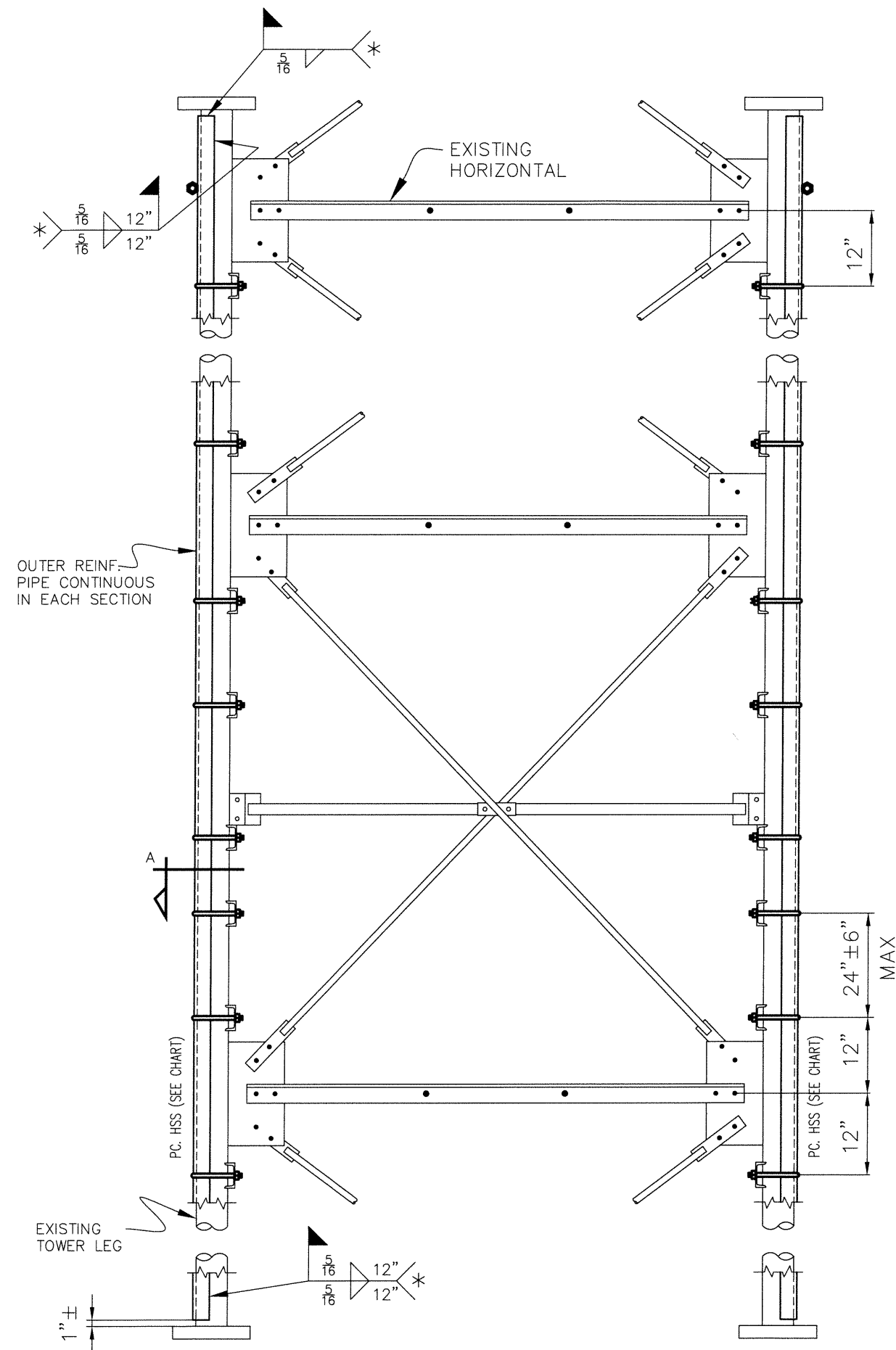
NOTES FOR TEMPORARY BRACING DURING DIAGONAL REPLACEMENT:

1. ALL STRESS IN THE BAR DIAGONAL SHALL BE REMOVED BY THE USE OF A COME-A-LONG OR BY A TURNBUCKLE AS SHOWN IN THE ABOVE DIAGRAM BEFORE THE BAR DIAGONAL IS REPLACED WITH THE NEW MEMBER. THE RIGGING, INCLUDING COME-A-LONG OR TURNBUCKLE, CABLE SLING, ECT., SHALL HAVE A MINIMUM STRENGTH OF 20,000 LBS.
2. ONLY ONE DIAGONAL PER PANEL SHALL BE REPLACED AT A TIME, AND ALL BOLTS PROPERLY INSTALLED BEFORE PROCEEDING TO THE REPLACEMENT OF THE OTHER DIAGONAL IN THAT PANEL.
3. COAT ALL REAMED HOLES WITH A ZINC RICH TWO PART EPOXY AS REQUIRED.
4. A490 BOLTS SHALL BE COATED WITH A ZINC RICH TWO PART EPOXY MASTIC SUCH AS CARBOLINE CARBOMASTIC 15 OR EQUIVALENT.

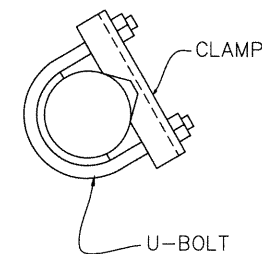
RESTRICTIONS

- NO TOWER MEMBER IS TO BE REPLACED WHEN A WIND VELOCITY GREATER THAN 20 MPH EXISTS OR WHEN A WIND VELOCITY OF GREATER THAN 20 MPH IS PREDICTED DURING THE PROCEDURE.
- THE ABOVE PROCEDURES MUST BE FOLLOWED WITHOUT VARIATION UNLESS APPROVED BY THE ENGINEER ON RECORD.
- IF A DIAGONAL REPLACEMENT OCCURS ABOVE OR BELOW A GUY LEVEL, A TEMPORARY FRAME IS REQUIRED, ALONG WITH THE ABOVE PROCEDURE. THE TEMPORARY FRAME SHOULD BE PROVIDED BY THE ERECTOR AND APPROVED BY TCI BEFORE REPLACEMENT IS DONE. USE (2) COME-A-LONGS WHEN TEMPORARY FRAME IS IMPEDED BY EXISTING EQUIPMENT.

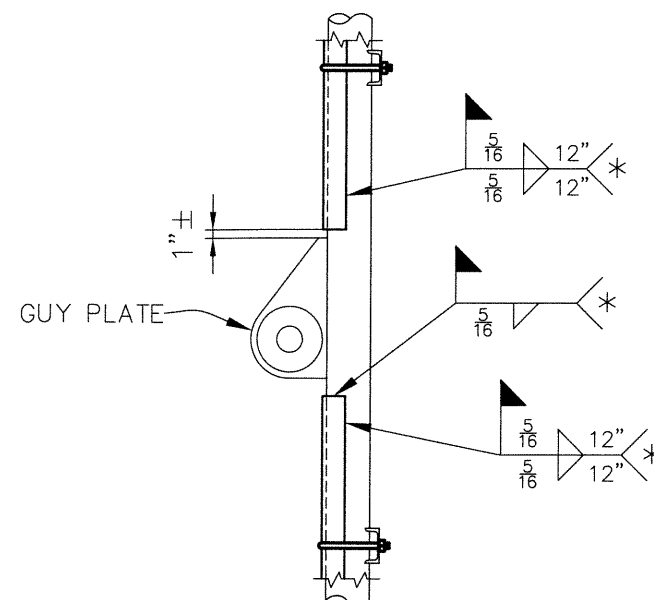
0	11/3/17	WEB	RELEASED FOR JOB USE
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		KOZK	
TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8691		1891'-0 GUYED TOWER	
4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com		SPRINGFIELD, MO	
		DIAGONAL REPLACEMENT	
		E-5	
		Sheet No.:	
		Project No.: 17.289.002	
		Drawn By: WEB	
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TYPICAL SPLIT PIPE REINFORCING
(TYP 3 SIDES)



SECTION A




SPLIT PIPE REINF. @ GUY PLATES

2

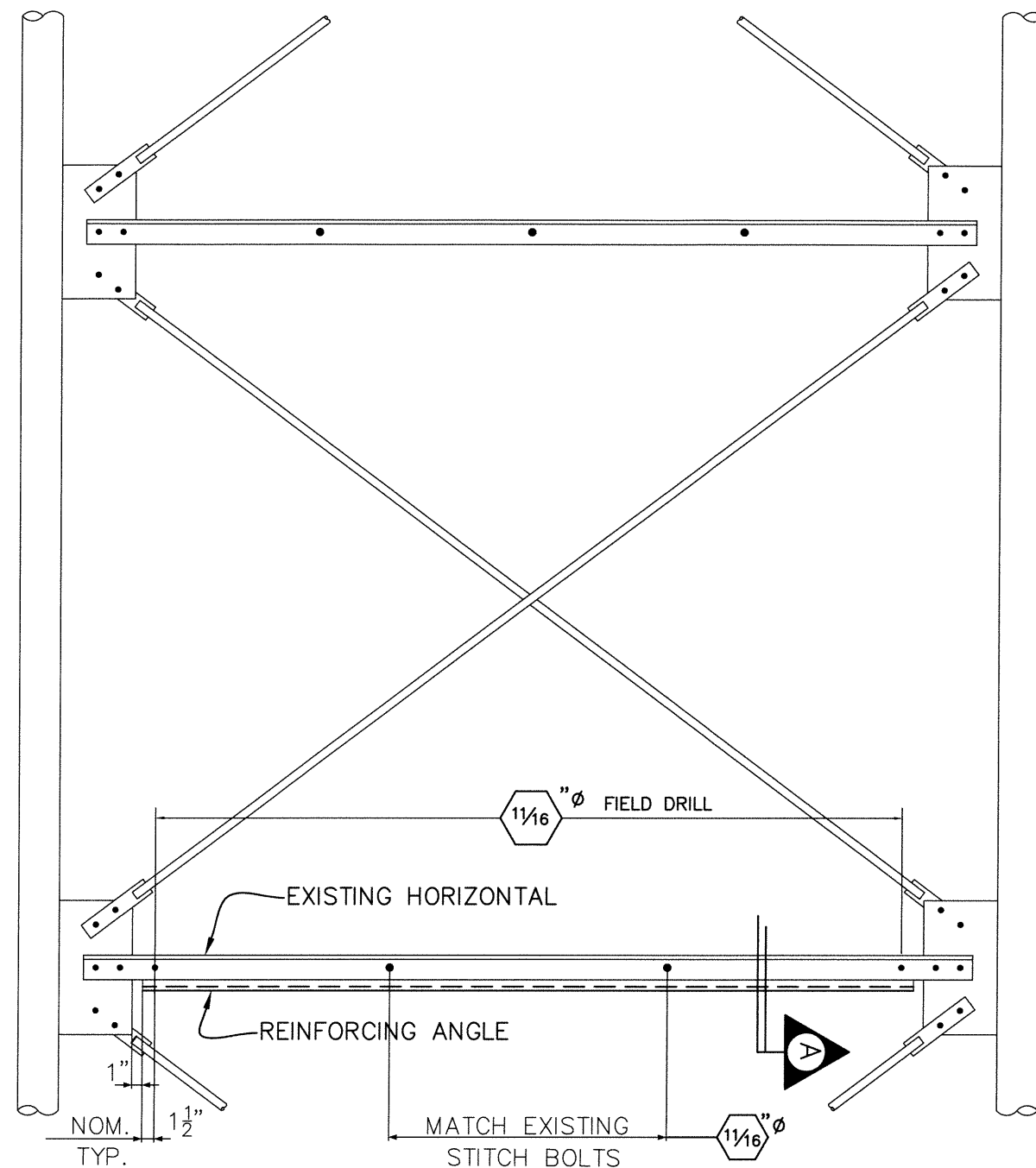
SPLIT PIPE				
ELEVATION	SECTIONS	REINFORCING PIPE	U-BOLTS	CLAMP
0.0' - 30.5'	1	105M6	108UB60 (C/C 6-3/4")	108M19
30.5' - 60.5'	1	105M1	108UB60 (C/C 6-3/4")	108M19
60.5' - 90.5'	1	107M15	108UB50 (C/C 5-3/4")	108M20
90.5' - 150.5'	2	105M2	108UB50 (C/C 5-3/4")	108M20
150.5' - 180.5'	1	106M7	108UB60 (C/C 6-3/4")	108M19
180.5' - 210.5'	1	105M1	108UB60 (C/C 6-3/4")	108M19
210.5' - 270.5'	2	105M2	108UB50 (C/C 5-3/4")	108M20
270.5' - 300.5'	1	107M15	108UB50 (C/C 5-3/4")	108M20
300.5' - 360.5'	2	105M2	108UB50 (C/C 5-3/4")	108M20
360.5' - 390.5'	1	106M8, 106M9	108UB50 (C/C 5-3/4")	108M20
390.5' - 420.5'	1	105M3	108UB50 (C/C 5-3/4")	108M20
420.5' - 450.5'	1	105M2	108UB50 (C/C 5-3/4")	108M20
450.5' - 480.5'	1	107M16	108UB50 (C/C 5-3/4")	108M20
480.5' - 540.5'	2	105M3	108UB50 (C/C 5-3/4")	108M20
540.5' - 570.5'	1	106M10	108UB50 (C/C 5-3/4")	108M20
570.5' - 600.5'	1	105M3	108UB50 (C/C 5-3/4")	108M20
600.5' - 660.5'	2	105M4	108UB50 (C/C 5-3/4")	108M20
660.5' - 690.5'	1	107M17	108UB50 (C/C 5-3/4")	108M20
690.5' - 750.5'	2	105M4	108UB50 (C/C 5-3/4")	108M20
750.5' - 780.5'	1	106M11, 106M12	108UB50 (C/C 5-3/4")	108M20
780.5' - 810.5'	1	105M4	108UB50 (C/C 5-3/4")	108M20
810.5' - 870.5'	2	105M5	108UB50 (C/C 5-3/4")	108M20
870.5' - 900.5'	1	107M18	108UB50 (C/C 5-3/4")	108M20
900.5' - 960.5'	2	105M5	108UB50 (C/C 5-3/4")	108M20
960.5' - 990.5'	1	107M13, 107M14	108UB50 (C/C 5-3/4")	108M20
990.5' - 1020.5'	1	105M5	108UB50 (C/C 5-3/4")	108M20

*APPLY HEAVY COAT OF ZINC RICH
TWO PART EPOXY PAINT AFTER
WELDING

2	3/9/18	WEB	REVISED U-BOLT & CLAMP INFO
1	1/17/18	WEB	REVISED SPLIT PIPE CLEARANCE
0	11/3/17	WEB	RELEASED FOR JOB USE
No.	Date	By	Revision

 <p>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8891</p> <p>4208 198th St. SW., Suite 208 Seattle, WA 98136 ph: 425-778-5189 fx: 425-778-5103 www.tower-tci.com</p>	<p>KOZK</p> <p>1891'-0 GUYED TOWER</p> <p>SPRINGFIELD, MO</p> <p>SPLIT PIPE REINFORCING</p>	<p>E-6</p> <p>Sheet No.:</p>
		<p>Project No.: 17.289.002</p>
		<p>Drawn By: WEB</p>
		<p>Checked By: MBB/JY</p> <p>Date: 11/3/17</p>

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TYPICAL STRUT REINFORCING
(TYPICAL 3 SIDES)

HORIZONTAL REINFORCEMENT			
ELEVATION	LEVELS	REINFORCING ANGLE	BOLTS*
590.5'	1	(3) 104S1	5/8"Ø A325X x 2-1/4"

*ALL BOLTS REQUIRE (1) HARDENED WASHER AND (1) ANCO LOCKNUT EACH

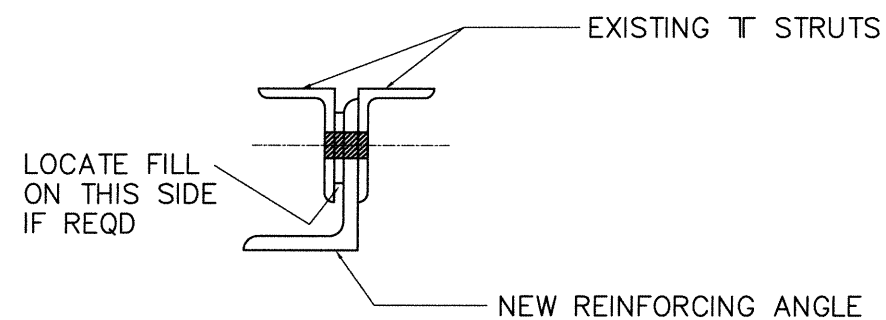
PROCEDURE TO REINFORCE DOUBLE ANGLE STRUTS

A. DOUBLE ANGLE STRUTS

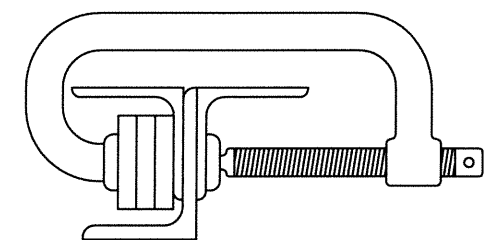
1. CLAMP STRUT WITH "C" CLAMPS AND SHIMS (TACKED OR FASTENED TO THE CLAMP). USE ONE (1) CLAMP PER STITCH BOLT (LOCATED NEAR STITCH BOLT). SEE DETAIL "1" OTHER STYLE CLAMPS ARE PERMITTED PROVIDED STRUT ANGLES ARE RESTRAINED FROM MOVING HORIZONTALLY.
2. REMOVE STITCH BOLTS AND SPACERS FROM THE STRUT TO BE REINFORCED.
3. IMMEDIATELY INSERT REINFORCING ANGLE BETWEEN THE DOUBLE ANGLES, INSERT STITCH BOLTS AND TIGHTEN.
4. FIELD DRILL HOLES FOR END BOLTS AT 1 1/2" FROM EACH END OF THE REINFORCING ANGLE.
5. COAT ALL FIELD DRILLED HOLES WITH A ZINC RICH TWO PART EPOXY.
6. INSERT END BOLTS AND TIGHTEN.

B. OPERATIONAL CONSTRAINTS


1. NO TOWER MEMBER IS TO BE REINFORCED WHEN A WIND VELOCITY GREATER THAN 15 MPH EXISTS OR WHEN A WIND VELOCITY OF GREATER THAN 15 MPH IS PREDICTED DURING THE OPERATION OF REINFORCING THE TOWER MEMBER.
2. REINFORCE THE STRUTS ONE AT A TIME. ONLY REINFORCE STRUTS WHEN "C" CLAMPS ARE INSTALLED.
3. THE ABOVE PROCEDURES TO BE FOLLOWED WITHOUT VARIATION.

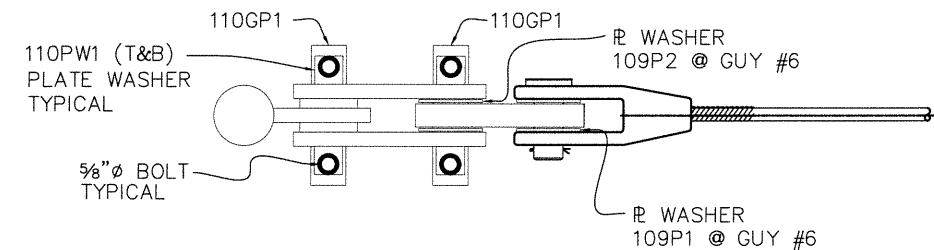
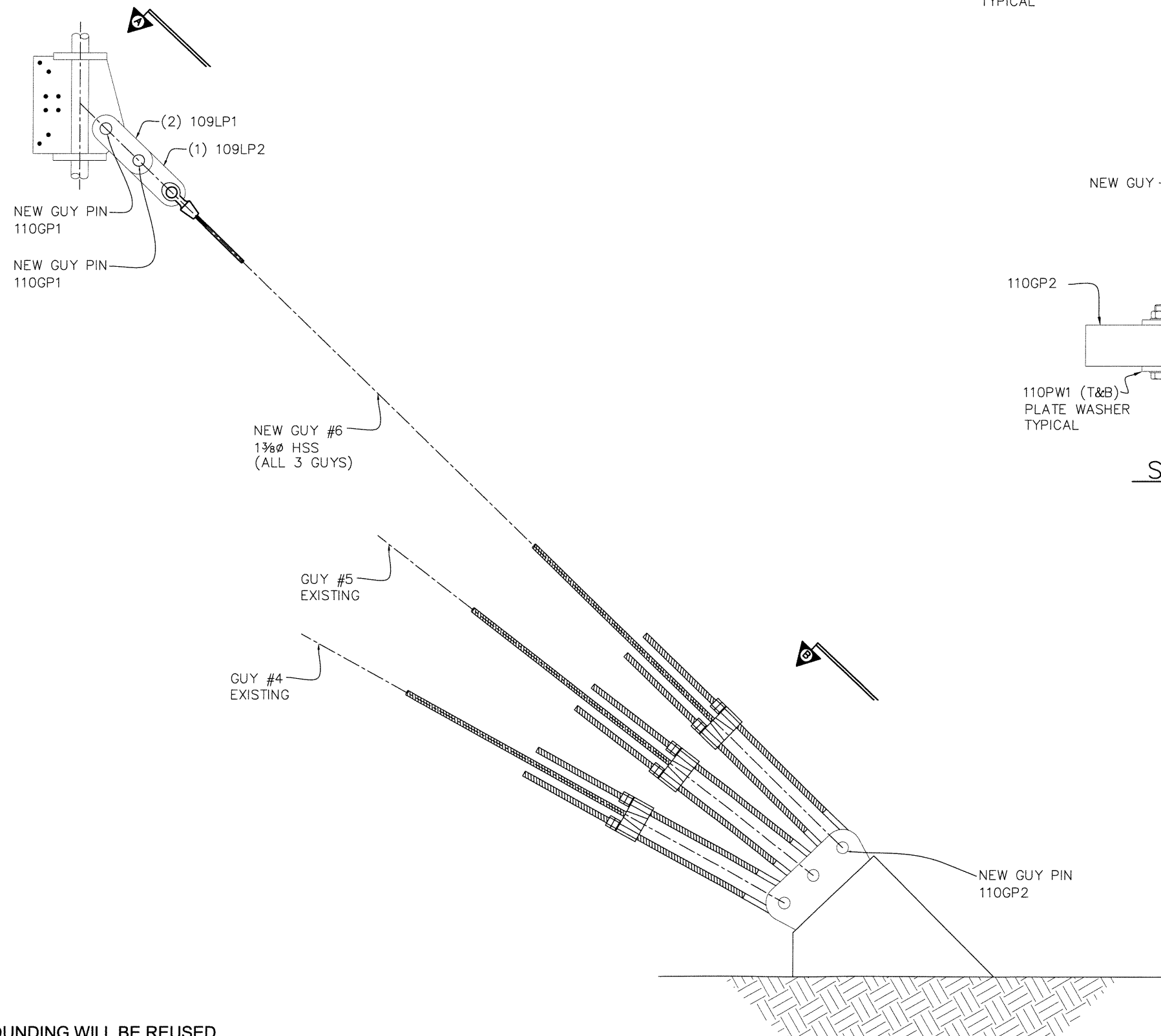


SECTION A

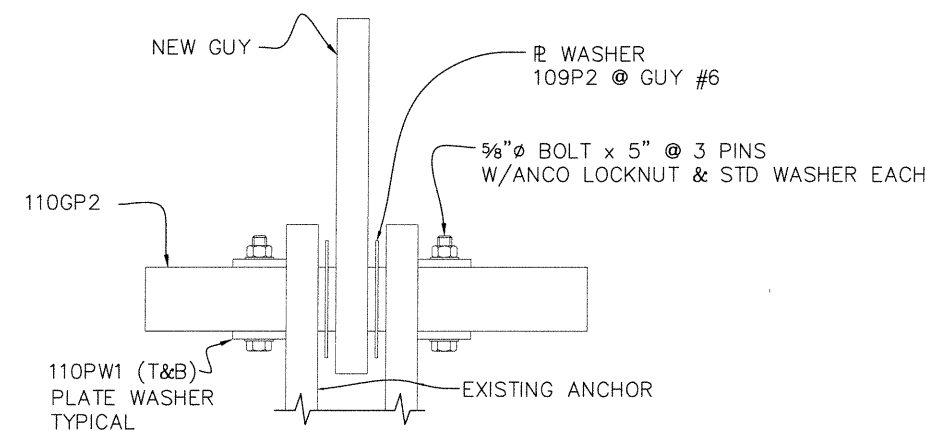


DETAIL 1

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<div>  <p>TOWER CONSULTANTS, INC. 15 Surrey Ct. Columbia, SC 29212 ph: 803-407-8489 fx: 803-407-8891</p> <p>4208 198th St. SW., Suite 208 Seattle, WA 98036 ph: 425-778-5169 fx: 425-778-5103 www.tower-tci.com</p> </div> <div> <p>KOZK</p> <p>1891'-0 GUYED TOWER</p> <p>SPRINGFIELD, MO</p> <p>HORIZONTAL REINFORCING</p> </div> <div> <p>E-7</p> <p>Sheet No.:</p> <p>Project No.: 17.289.002</p> <p>Drawn By: WEB</p> <p>Checked By: MBB/JY</p> <p>Date: 11/3/17</p> <p><small>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</small></p> </div>			



SECTION A




SECTION B

ANCHOR

NOTE:
1. EXISTING GROUNDING WILL BE REUSED.
2. EXISTING HFD WILL BE REUSED.

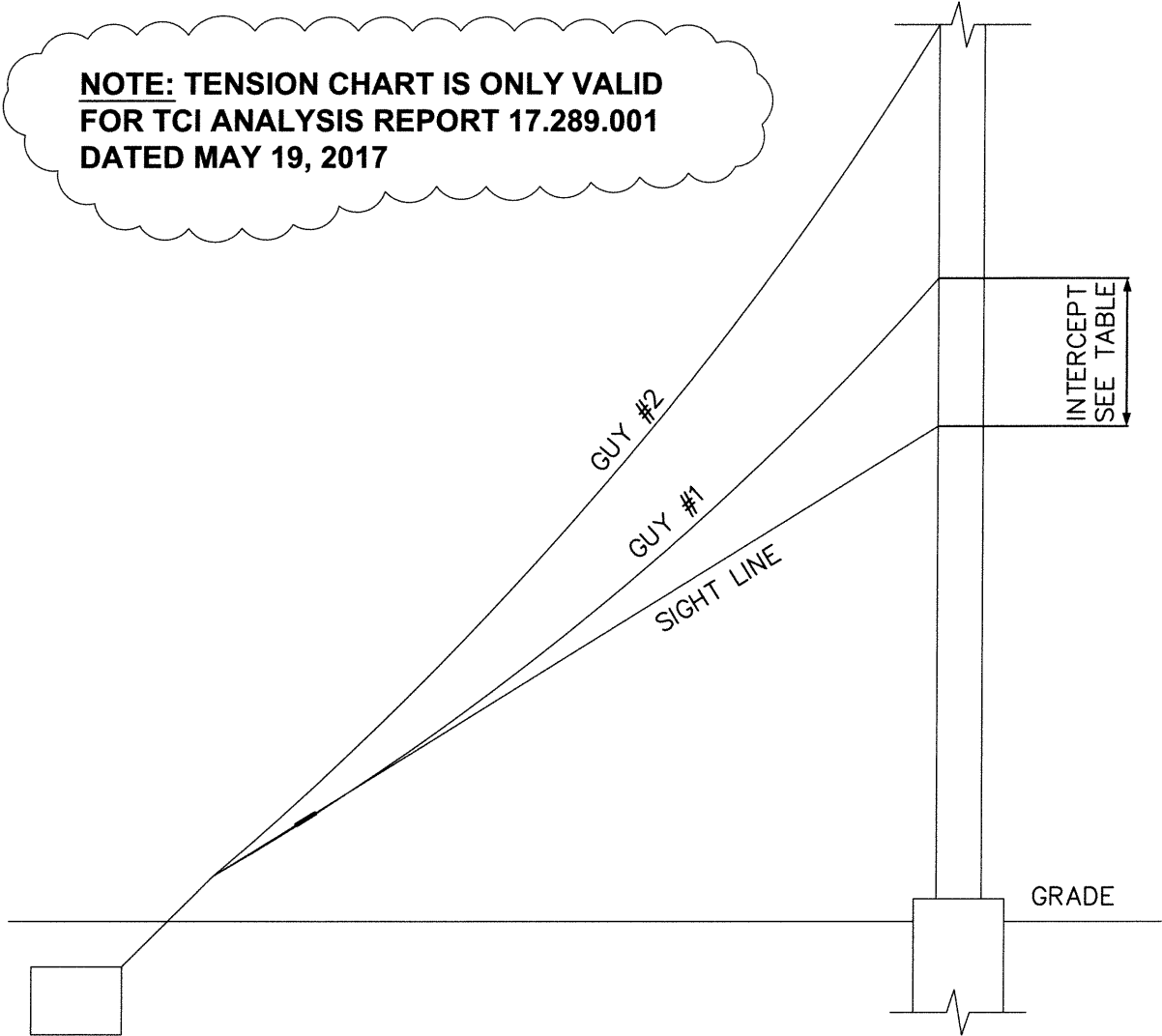
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	1891'-0 GUYED TOWER	Sheet No.: 17.289.002
	SPRINGFIELD, MO	Drawn By: WEB
	GUY WIRE REPLACEMENT	Checked By: MBB/JY
		Date: 11/3/17
		<p>THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION AND IS CONSIDERED AN INTELLECTUAL PROPERTY OF TOWER CONSULTANTS, INC. THE INFORMATION IS DISCLOSED ON A CONFIDENTIAL BASIS AND IS NOT TO BE USED BY THE RECIPIENT FOR ANY OTHER PURPOSE OTHER THAN INTENDED BY TOWER CONSULTANTS, INC. REPRODUCTION, TRANSMISSION, OR DISCLOSURE TO OTHERS, OR OTHER UNAUTHORIZED USE, WITHOUT THE EXPRESS WRITTEN CONSENT OF TOWER CONSULTANTS, INC., IS STRICTLY PROHIBITED.</p>

Guy Wire Initial Tension (kips)												
Guy Level	Guy Elevation (ft)	Guy Size		Temp. (F)								
				30	40	50	60	70	80	90	100	110
9	1890.5	1-7/16" BS		28.34	28.13	27.92	27.72	27.52	27.32	27.13	26.93	26.74
8	1650.5	1-9/16" BS		33.84	33.55	33.28	33.00	32.73	32.46	32.20	31.94	31.69
7	1420.5	1-5/16" BS		21.76	21.57	21.38	21.20	21.02	20.84	20.67	20.50	20.33
6	1200.5	1-3/8" HSS		21.97	21.73	21.51	21.28	21.06	20.84	20.63	20.42	20.22
5	980.5	1-1/4" BS		17.95	17.72	17.50	17.28	17.07	16.86	16.66	16.46	16.27
4	770.5	1-1/8" BS		14.70	14.47	14.25	14.04	13.84	13.64	13.44	13.25	13.07
3	570.5	1-3/16" BS		14.67	14.36	14.06	13.76	13.47	13.20	12.93	12.66	12.41
2	370.5	1-1/16" BS		13.69	13.25	12.83	12.42	12.03	11.65	11.29	10.95	10.63
1	180.5	1-1/16" BS		18.86	18.08	17.31	16.56	15.84	15.14	14.48	13.89	13.30

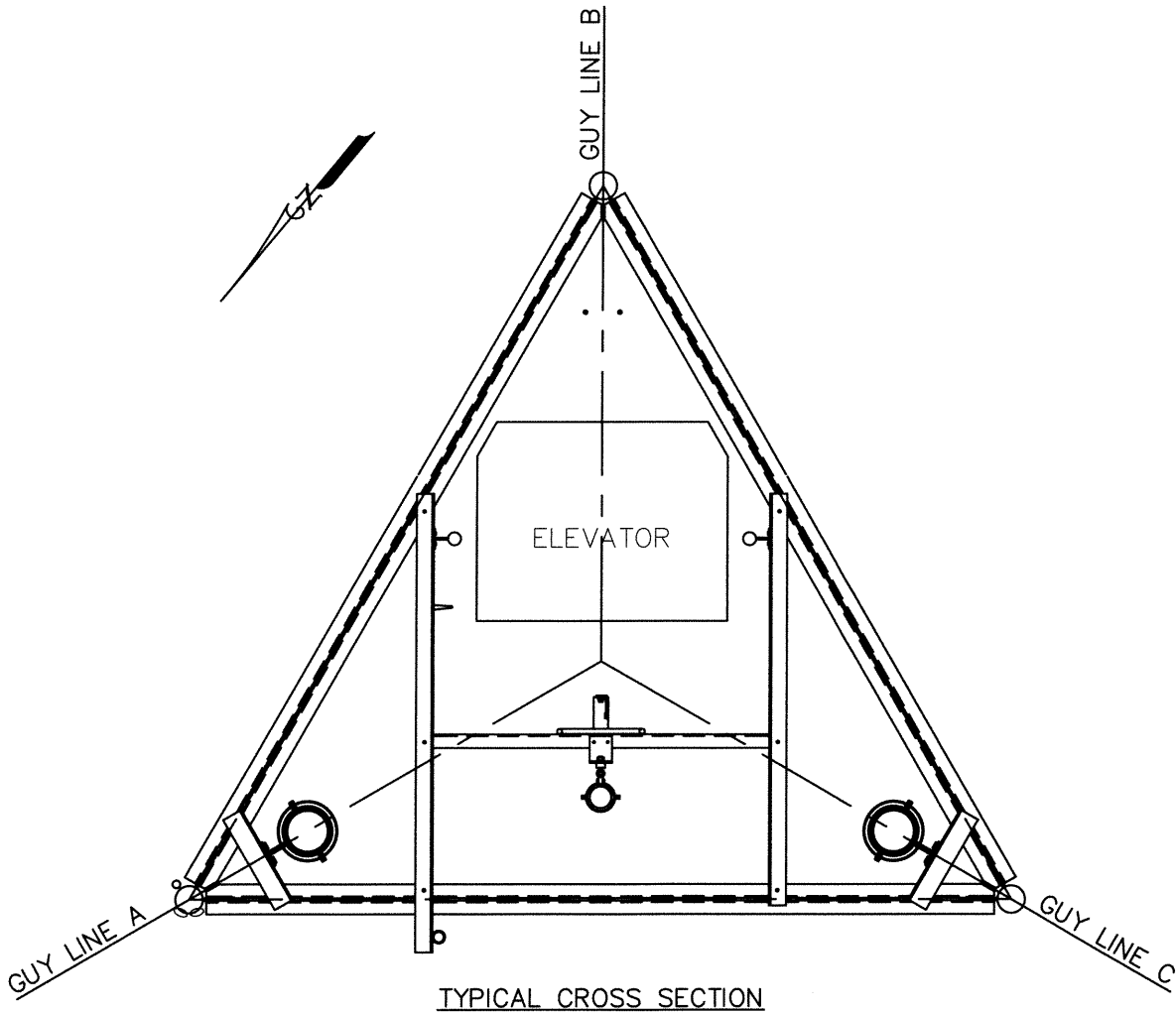
Guy Wire Intercept (ft)												
Guy Level	Guy Elevation (ft)	Guy Size	Transit Distance	Temp. (F)								
				30	40	50	60	70	80	90	100	110
9	1890.5	1-7/16" BS	10'	334.34	336.49	338.63	340.77	342.91	345.05	347.18	349.31	351.44
8	1650.5	1-9/16" BS	10'	283.35	285.45	287.55	289.66	291.75	293.85	295.94	298.03	300.12
7	1420.5	1-5/16" BS	10'	263.29	265.35	267.40	269.44	271.48	273.52	275.54	277.57	279.58
6	1200.5	1-3/8" HSS	10'	175.38	177.05	178.73	180.41	182.08	183.76	185.43	187.10	188.77
5	980.5	1-1/4" BS	10'	142.52	144.18	145.84	147.49	149.14	150.79	152.44	154.08	155.72
4	770.5	1-1/8" BS	10'	114.42	116.06	117.70	119.34	120.98	122.61	124.23	125.85	127.46
3	570.5	1-3/16" BS	10'	47.93	48.91	49.89	50.89	51.89	52.91	53.93	54.96	56.00
2	370.5	1-1/16" BS	10'	27.33	28.19	29.08	29.99	30.93	31.88	32.85	33.82	34.80
1	180.5	1-1/16" BS	10'	14.14	14.75	15.39	16.07	16.79	17.55	18.34	19.15	19.93

Adjust the guy wire intercept/tension based on the measurements of the guy wire in the B-line (Southeast) direction.




ELEVATION VIEW

- NOTES:**
1. DURING THE INITIAL GUY TENSIONING PROCEDURES AND AT THE TIME OF INSPECTION, THE GUY TENSIONS AND/OR INTERCEPTS SHOULD BE IN ACCORDANCE WITH THE VALUES SHOWN ABOVE. USE THE TEMPERATURE WHICH ACTUALLY EXISTS AT THE TIME THE TENSION IS BEING CHECKED. FOR TEMPERATURES OTHER THAN THOSE SHOWN ABOVE, INTERPOLATE OR EXTRAPOLATE OTHER VALUES.
 2. TOWER PLUMBING AND INITIAL TENSIONING OF GUYS SHOULD BE DONE ONLY IN CALM WEATHER AND WITH NO ICE ON GUYS.
 3. INTERCEPTS AND TENSIONS ARE USED FOR GUY DIRECTION "B".
 4. GUY #1 IS BOTTOM GUY; GUY #2 IS NEXT, ETC.
 5. USE GUY SCOPE FOR DETERMINING GUY INTERCEPTS.
 6. TENSION AND/OR INTERCEPT TOLERANCES \pm 5%.
 7. AFTER RETENSIONING FINAL SET OF GUYS GO BACK AND RECHECK ALL LEVELS, AND RETENSION WHERE REQUIRED.
 8. PLUMB AND TWIST TO BE VERIFIED, RECORDED, AND IF REQUIRED ADJUSTED TO BE IN CONFORMANCE WITH ANSI/TIA-222-G.



TYPICAL CROSS SECTION

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			1891'-0 GUYED TOWER	
			SPRINGFIELD, MO	
			TENSION CHART	
			E-9	
			Sheet No.:	
			Project No.: 17.289.002	
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POST-MODIFICATION CHECKLIST			
REQUIRED	SECTION	REPORT ITEM	BRIEF DESCRIPTION (SEE ENG-SOW-10007)
PRE-CONSTRUCTION			
X	6.1.1	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT
NA	6.1.2	EOR APPROVED SHOP DRAWNGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE THE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.3	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.4	FABRICATOR CERTIFIED WELD INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE TESTING AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.1.5	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL WITH A YIELD STRENGTH GREATER THAN 36 KSI AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.6	FABRICATOR NDE INSPECTION	A VISUAL OBSERVATION OF A PORTION OF THE EXISTING STRUCTURE (AS NOTED ON THESE DRAWINGS) IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.1.7	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	A VISUAL OBSERVATION OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.1.8	PACKING SLIPS	THE MATERIAL SHIPPING UST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
CONSTRUCTION			
X	6.2.1	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.2	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.3	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.4	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.5	BASE PLATE GROUT VERIFICATION	A LETTER FROM THE GENERAL CONTRACTOR SHALL BE PROVIDED TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES FOR INCLUSION IN THE MI REPORT.
NA	6.2.6	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.7	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	6.2.8	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICES.
X	6.2.9	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE FOR INCLUSION IN THE MI REPORT.
X	6.2.10	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWNGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
POST-CONSTRUCTION			
X	6.3.1	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
NA	6.3.2	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	6.3.3	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWNGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A TOWER CONSULTANT, INC. (TCI) ENGINEERING OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, TCI SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF TCI CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CUSTOMER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH THE CUSTOMERS APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

TCI RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - FOUNDATION MODIFICATIONS
 - FINAL INSTALLED CONDITION
- POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.



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KOZK
1891'-0 GUYED
TOWER
SPRINGFIELD, MO
POST
MODIFICATION
CHECKLIST

E-10

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