

# **STRUCTURAL REINFORCEMENT**

TIA-1019-A  
IT'S USE AND ROLE

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**INTRODUCTIONS**

- What is TIA-1019-A?
  - Not just a gin pole standard
  - Defines the construction loads, communication tools and construction considerations
  - Evolving
- ASSE 10.48-2015 (Means and Methods)  
American National Standard Construction and Demolition Operations  
  
Criteria for Safety Practices with the Construction, Demolition, Modification and Maintenance of Communication Structures
- TIA-322 (Design)  
Loading Criteria, Analysis, and Design Related to the Installation, Alteration and Maintenance of Communication Structures

**TIA-1019-A**

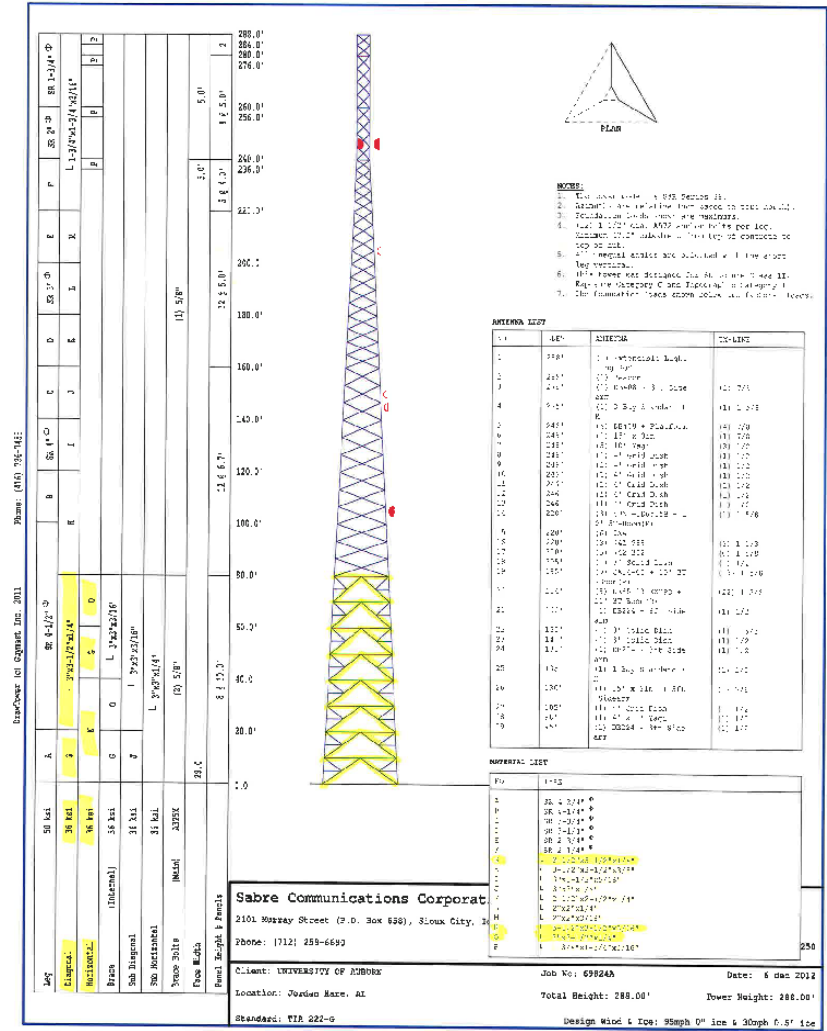
# Exercise:

- A Reanalysis is completed
- Modification of the structure

## The problem

- 288' Self Supporting Tower
- Replace members
  - Diagonals from 0' to 80'
  - Horizontals from 0' to 80'
- Improper Bid
- Educate client

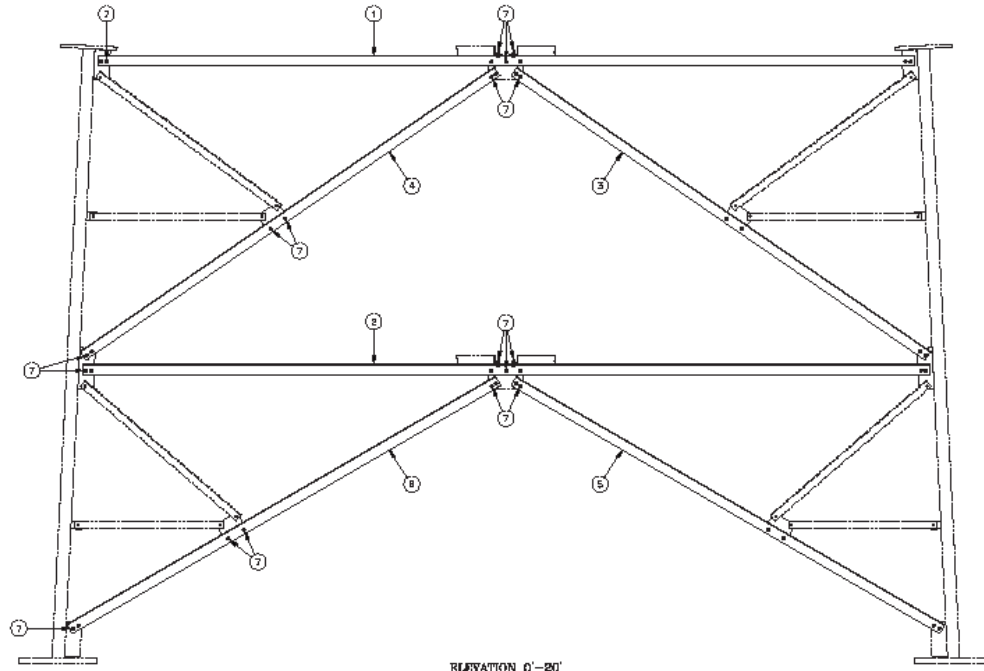
# THE PROCESS



**NOTE:**  
 CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO SABRE TOWER AND POLES PROJECT MANAGER IMMEDIATELY.

**NOTES:**  
 2. INSTALL HORIZONTAL AND DIAGONAL BRACES AS SHOWN.  
 3. ALL FIELD CUT/PUNCHED AND SCRATCHED/SCUFFED AREAS SHALL BE CLEANED AND TOUCHED UP WITH GING RICH PAINT.  
 4. ALL BOLTS ARE TO BE TIGHTENED PER ABC TURN-OF-THE-NUT METHOD.

SELF SUPPORTING TOWER MODIFICATION					
ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT	
1.	3		ANGLE, HORIZONTAL 4.7.4 X 3/8 X 25'-4 7/8"	608	
2.	3		ANGLE, HORIZONTAL 4.7.4 X 3/8 X 25'-4 7/8"	636	
3.	3		ANGLE, DIAGONAL 4.7.4 X 3/8 X 18'-3"	418	
4.	3		ANGLE, DIAGONAL 4.7.4 X 3/8 X 18'-3"	418	
5.	3		ANGLE, DIAGONAL 4.7.4 X 3/8 X 18'-0 1/2"	409	
6.	3		ANGLE, DIAGONAL 4.7.4 X 3/8 X 18'-0 1/2"	409	
7.	126		BOLT ASSEMBLY, 5/8 X 4 X 2 ANCH	58	
				TOTAL WEIGHT	3,354



ELEVATION C-C-20'

- THE CONTRACTOR CREATES THE RIGGING PLAN TO PERFORM THE MODIFICATION.
- Determine the class
- Engineer knows what Contractor knows how
  
- THE ORIGINAL ENGINEER MAY NOT BE ABLE OR WILLING TO DO THE TIA-1019 REVIEW. WHY?
  - DOES NOT WANT TO DO THIS TYPE OF WORK
    - INSURANCE RESTRICTION
  - DOES NOT HAVE THE KNOWLEDGE OR EXPERIENCE TO BE THE QUALIFIED ENGINEER
    - NEED TO UNDERSTAND FABRICATION AND INSTALLATION TOLERANCES.
    - MUST HAVE COMMUNICATION SKILLS
    - MUST UNDERSTAND THE STANDARDS

## **RESPONSIBILITIES**

## **QUALIFIED ENGINEER**

- PROVIDES A COST ESTIMATE TO THE CONTRACTOR TO REVIEW THE RIGGING PLAN
- DOES NOT CREATE THE RIGGING PLAN
- WORKS TO SUPPORT AND FACILITATE THE CONTRACTORS DISCUSSION WITH THE CLIENT IF NECESSARY.

**RIGGING PLAN**

## THE PROCESS

1. THE RIGGING PLAN IS CREATED
  - Contractor communicates the how
  - Sets expectations i.e. re-use, time, adaptability
  - This is something that has long occurred in the industry now we have a standard to rule it
2. QUALIFIED ENGINEER REVIEWS THE STRUCTURES **STATIC** STATES THAT ARE REPRESENTED IN THE RIGGING PLAN.
  - A REANALYSIS IS A STATIC REVIEW OF THE STRUCTURE.
  - NO DIFFERENCE JUST A DIFFERENT SET OF CONDITIONS.
  - THINK OF EACH STAGE OF THE RIGGING PLAN AS A PICTURE OF THE STRUCTURE

### PRIMARY QUESTION

WHAT HAPPENS TO THE STRUCTURE IF THE PLAN IS USED?

# RIGGING PLAN REVIEW



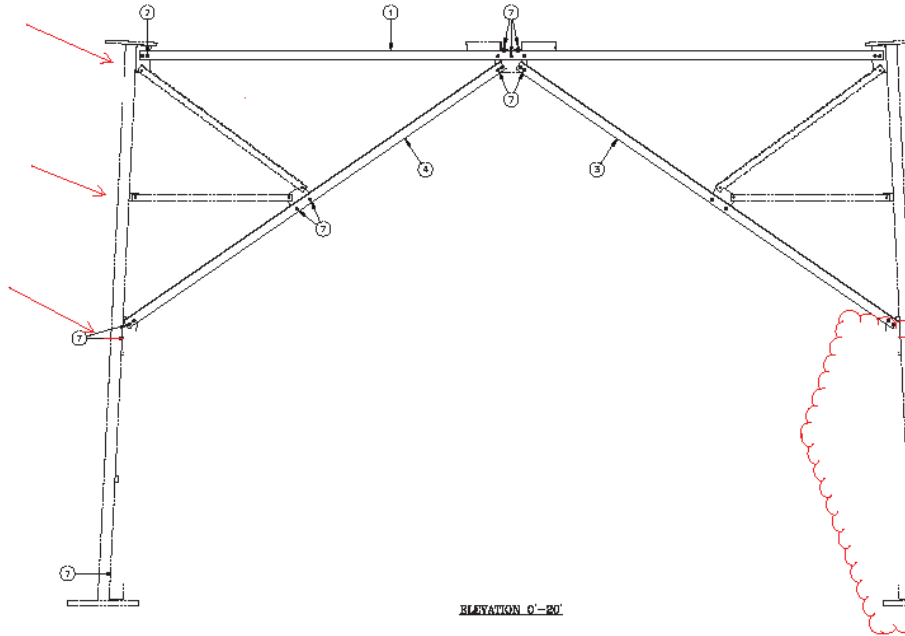
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**NOTES:**

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4. ALL BOLTS ARE TO BE TIGHTENED PER ASQC TURN-OF-THE-NUT METHOD.

SELF SUPPORTING TOWER MODIFICATION				
ITEM	QTY	PART NO.	DESCRIPTION	WEIGHT
1.	3		WIRE, HORIZONTAL, 4 X 4 X 2/8 X 25'-4 2/8"	800
2.	3		WIRE, HORIZONTAL, 4 X 4 X 3/8 X 25'-4 2/8"	630
3.	3		WIRE, DIAGONAL, 1/2 X 1/2 X 1/8 X 18'-3"	418
4.	3		WIRE, DIAGONAL, 1/2 X 1/2 X 3/8 X 18'-3"	418
5.	3		WIRE, DIAGONAL, 1/2 X 1/2 X 3/8 X 18'-0 1/8"	409
6.	3		WIRE, DIAGONAL, 1/2 X 1/2 X 3/8 X 18'-0 1/8"	409
7.	126		BOLT ASSEMBLY, 5/8 X 2 X 3 HEX	58
<b>TOTAL WEIGHT</b>				<b>3,631</b>

LEG SUPPORT POINTS



ELEVATION 0'-00"

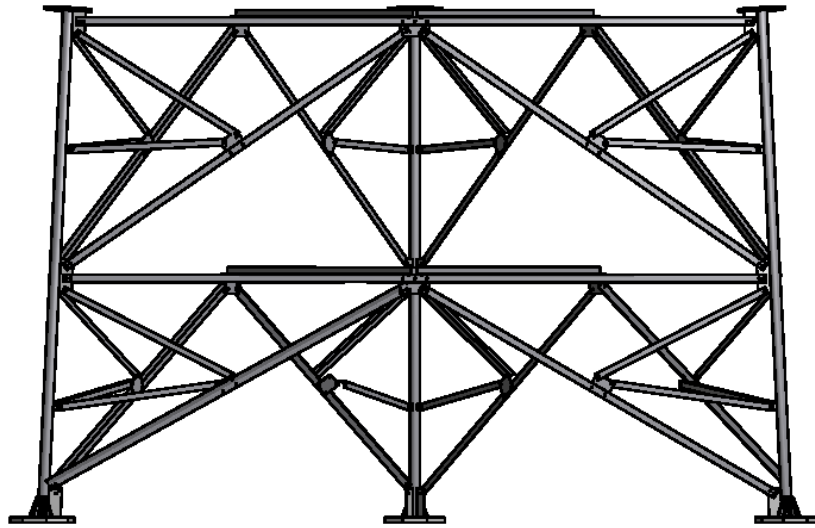
# RIGGING PLAN REVIEW

## WHAT WAS THE QUALIFIED ENGINEERS RESPONSE TO FIRST SUBMITTAL

- LEGS ARE NOT PROPERLY SUPPORTED
  - RESULTS IN VERY LARGE OVERSTRESS EVEN WITH SHORT DURATION WIND LOAD.
- DISCUSSION ABOUT POSSIBLE SOLUTIONS
  - THE ENGINEER IS PROVIDING INFORMATION ON STRUCTURAL REQUIREMENTS
  - EXAMPLE: THE LEGS REQUIRE BRACING DURING REPLACEMENT OF MEMBERS
- A REVISED RIGGING PLAN IS REQUIRED -

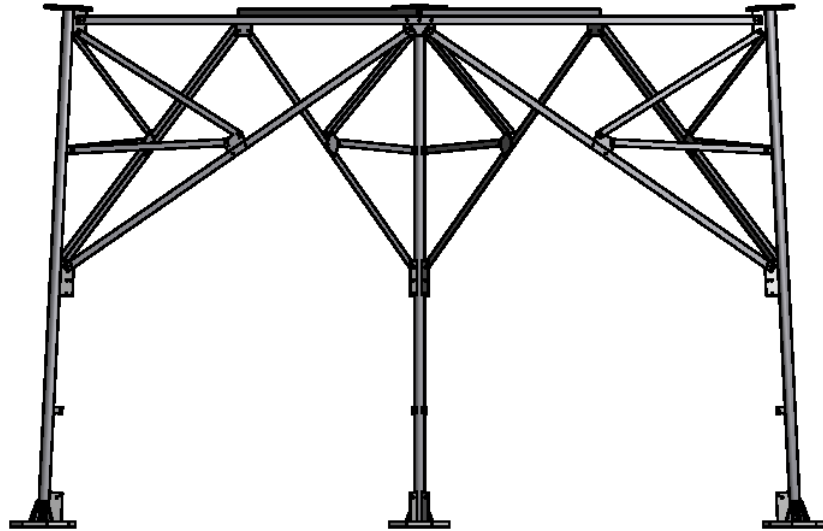
**FEED BACK**

EXISTING SECTION



**REVISED RIGGING PLAN**

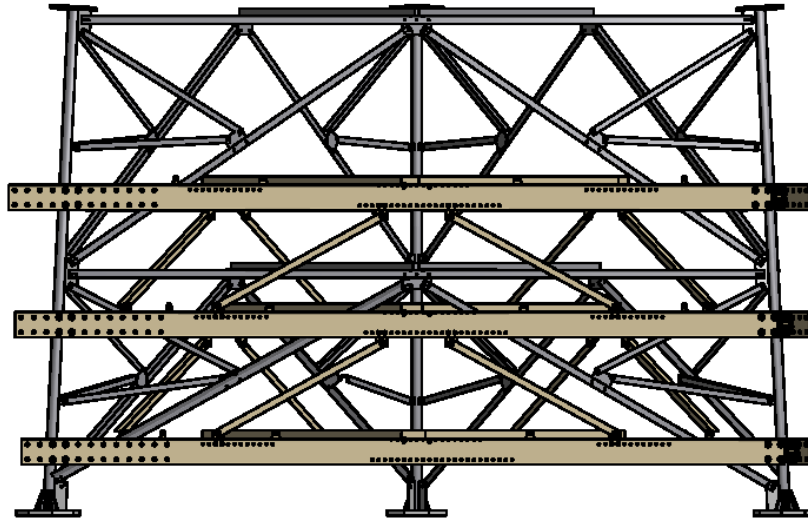
EXISTING SECTION WITHOUT BRACING



THE RIGGING PLAN MUST ENSURE THIS  
ARRANGEMENT DOES NOT HAPPEN

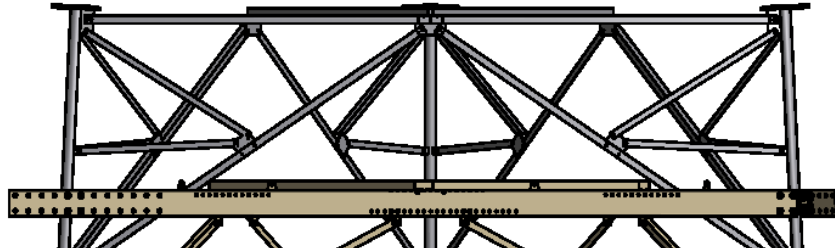
**REVISED RIGGING PLAN**

## EXISTING SECTION WITH REINFORCEMENT

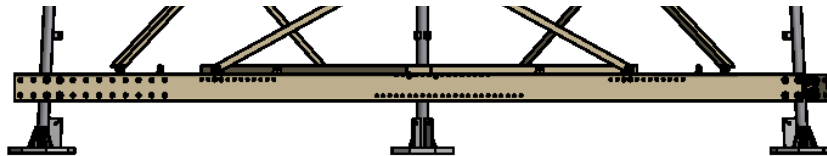


**REVISED RIGGING PLAN**

BRACING REMOVED AND REINFORCED



EACH OF THESE SLIDES REPRESENTS A  
STATIC CONDITION



READY FOR INSTALLATION OF NEW BRACING

**REVISED RIGGING PLAN**

## **SAUCE**

**S**top

**A**ssess

**U**nderstand

**C**ommunicate

**E**xecute

# **REVISED RIGGING PLAN**



**REVISED RIGGING PLAN**



- CONTRACTOR OWNS THE MEANS AND METHODS
- SHOULD PROVIDE FEEDBACK TO THE ENGINEER ABOUT THE OPERATION OF THE RIGGING PLAN

**MEANS AND METHODS**

IT IS IMPORTANT TO MONITOR THE STRUCTURE DURING THE IMPLEMENTATION OF THE RIGGING PLAN.

WHAT IS THE WIND DURATION PRESCRIBED?  
WHAT IS THE FORECAST?

COMPLIANCE WITH THE SPECIFIED TIME DURATION

A DISCUSSION WITH THE ENGINEER CAN PROVIDE INFORMATION TO THE CONTRACTOR ABOUT THE AREAS OF THE STRUCTURE THAT ARE CRITICAL. WHERE IS THE STRUCTURE VULNERABLE?

THIS DISCUSSION DOES NOT IMPLY THE ENGINEER IS PARTICIPATING IN THE CREATION OF THE RIGGING PLAN OR BECOMING RESPONSIBLE FOR THE MEANS AND METHODS.

**MONITORING**

DOES THE CONTRACTOR HAVE A RIGGING PLAN?

IS THE RIGGING PLAN COMPLIANT WITH TIA-1019-A OR CURRENT REVISIONS (A10.48 AND TIA-322)

RECOGNIZE THIS PROCESS AS ESSENTIAL

**OWNER RESPONSIBILITIES**

- MOST OWNERS REQUIRE COMPLIANCE WITH THE STANDARDS IN THEIR CONTRACTS
- OWNERS SEEK TO HAVE QUALITY WORK AND THIS STANDARD ALLOWS FOR WORK TO OCCUR IN A SAFE AND EFFICIENT MANNER
- MANY OWNERS FOLLOWING THIS STANDARD HAVE FOUND THAT THE WORK IS COMPLETED PROPERLY THE FIRST TIME

## **ISSUE RESOLUTION**

- OSHA IS VERY AWARE OF THE PROPER USE OF THIS STANDARD AND IT HAS BEEN USED IN CITATIONS WHEN NOT PROPERLY FOLLOWED
- PRIOR TO THIS STANDARD THERE WAS NO BRIDGE BETWEEN THE ENGINEER AND THE CONTRACTOR.

**ISSUE RESOLUTION**

- INFORMATION ABOUT TIA-1019-A
  - SEE THE PAN'S
  - WHITE PAPERS
- TIA-1019-A WILL BE REPLACED
  - A10.48 – MEANS AND METHODS
  - TIA-322 – CONSTRUCTION DESIGN
- MOUNT SPECIFICATION
  - TIA-222-H – ADDING MOUNT ANNEX

**FUTURE DEVELOPMENTS**



**800% OVERSTRESS MEN WORKING IN A SAFE MANNER TO COMPLETE THE FIRST TIME**

**QUESTIONS**