

6/13/2012

Frequency City Sound & Lighting, Ltd.
946 Redway Ave.
Cincinnati, OH 45229-1914
Attn: Mike Volkerding

RE: 36x24 Temporary Stage and Roof

Dear Mike,

Per your request, we have reviewed the 24 x24 stage and roof that was visited on May 20, 2012 in Covington, KY. The stage is 40 in. tall and 24 ft wide by 24 ft deep, with 8 ft wide by 4 ft deep soundwings extending offstage on each side of the downstage edge. The steel roof structure is 24 ft wide by 24 ft deep and covers the main portion of the stage. The roof is trimmed at approximately 16.5 ft above the ground at the downstage edge of the roof. The towers are bolted to the stage and the tower bottoms are braced back to the stage in both horizontal directions. The tower tops are bolted to the cross-stage and upstage-downstage beams.

Our review indicates that the current method of attaching the roof to the stage, including additional bracing described in this report, provides stability adequate to resist winds of up to 40 mph. When wind speeds are expected to exceed 40 mph, the roof skin, upstage scrim, and all other accessories shall be removed. The bare structure, with no accessories attached, is capable of withstanding the wind speeds required by ASCE 7-10. A complete high wind action plan is provided with this report.

Allowable loading has been developed for this stage. The only components reviewed for live loads are the upstage beam and the downstage beam. All live loads shall be hung at truss panel points. Allowable loading is as follows:

- Upstage 24 ft beam
 - Maximum allowable live load of 500 pounds total
 - Point loads of up to 80 pounds
 - No more than 30 plf in any 10 ft span
- Downstage 24 ft beam
 - Maximum allowable live load of 750 pounds total
 - Point loads of up to 120 pounds
 - No more than 45 plf in any 10 ft span

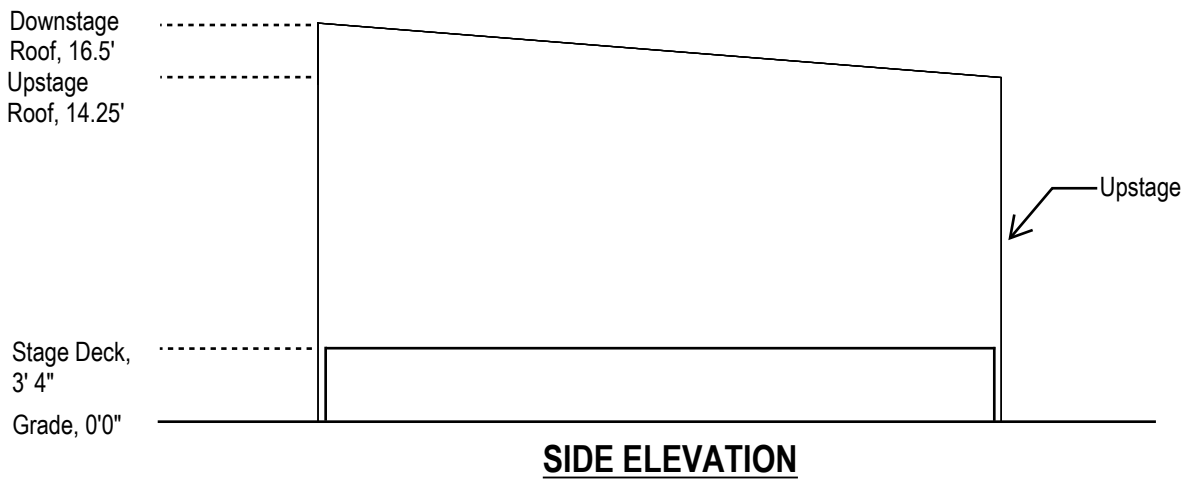
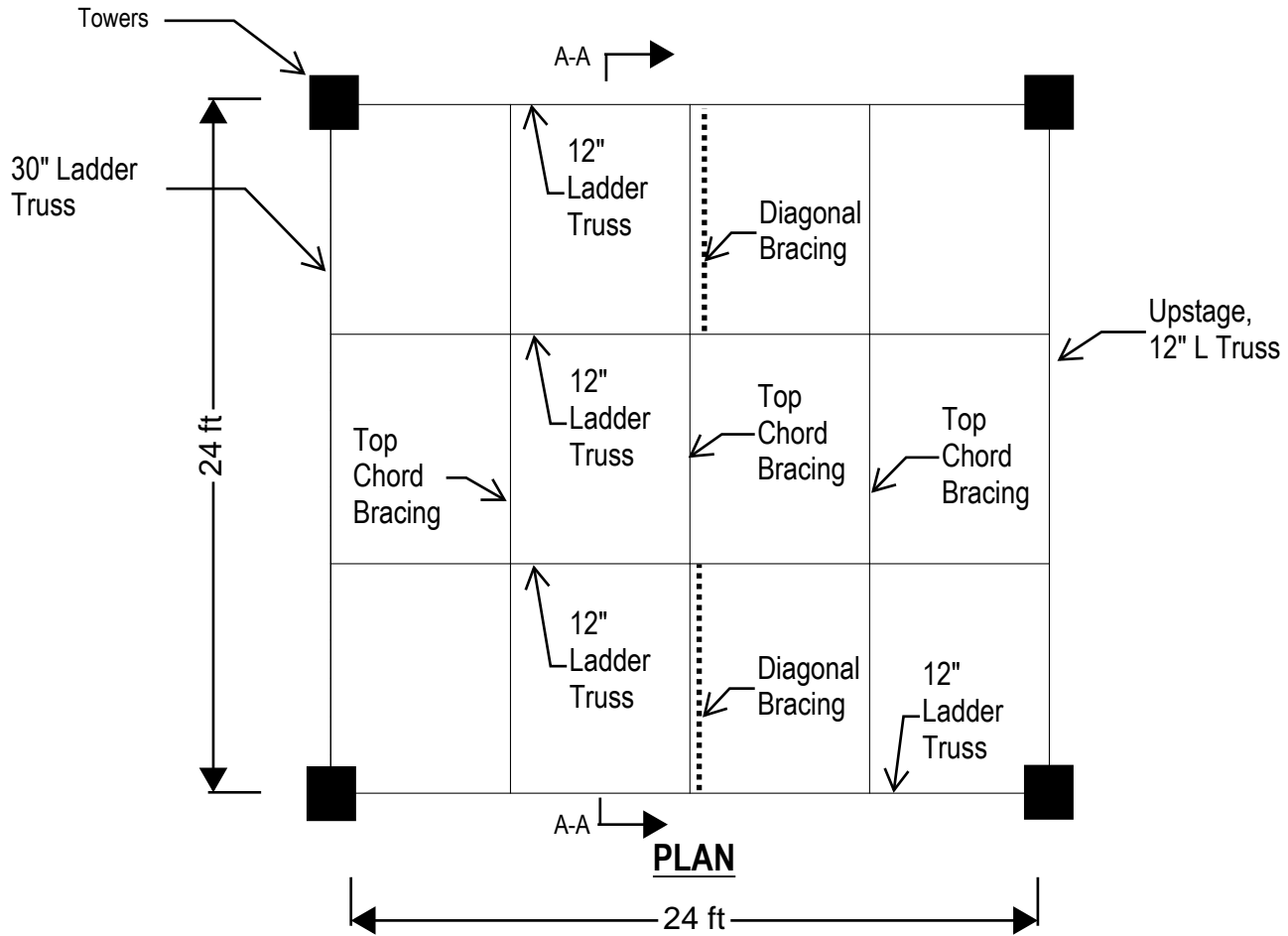
I trust this information is suitable for your needs. Please contact me with any questions or comments.

Regards,
Clark-Reder Engineering, Inc.

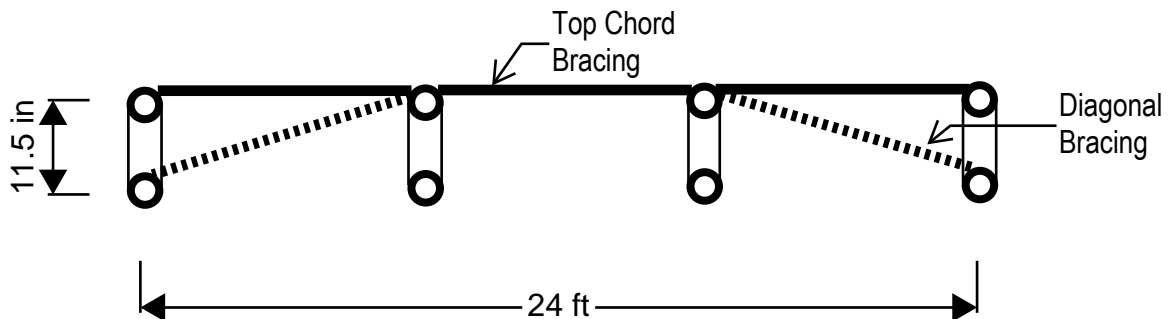
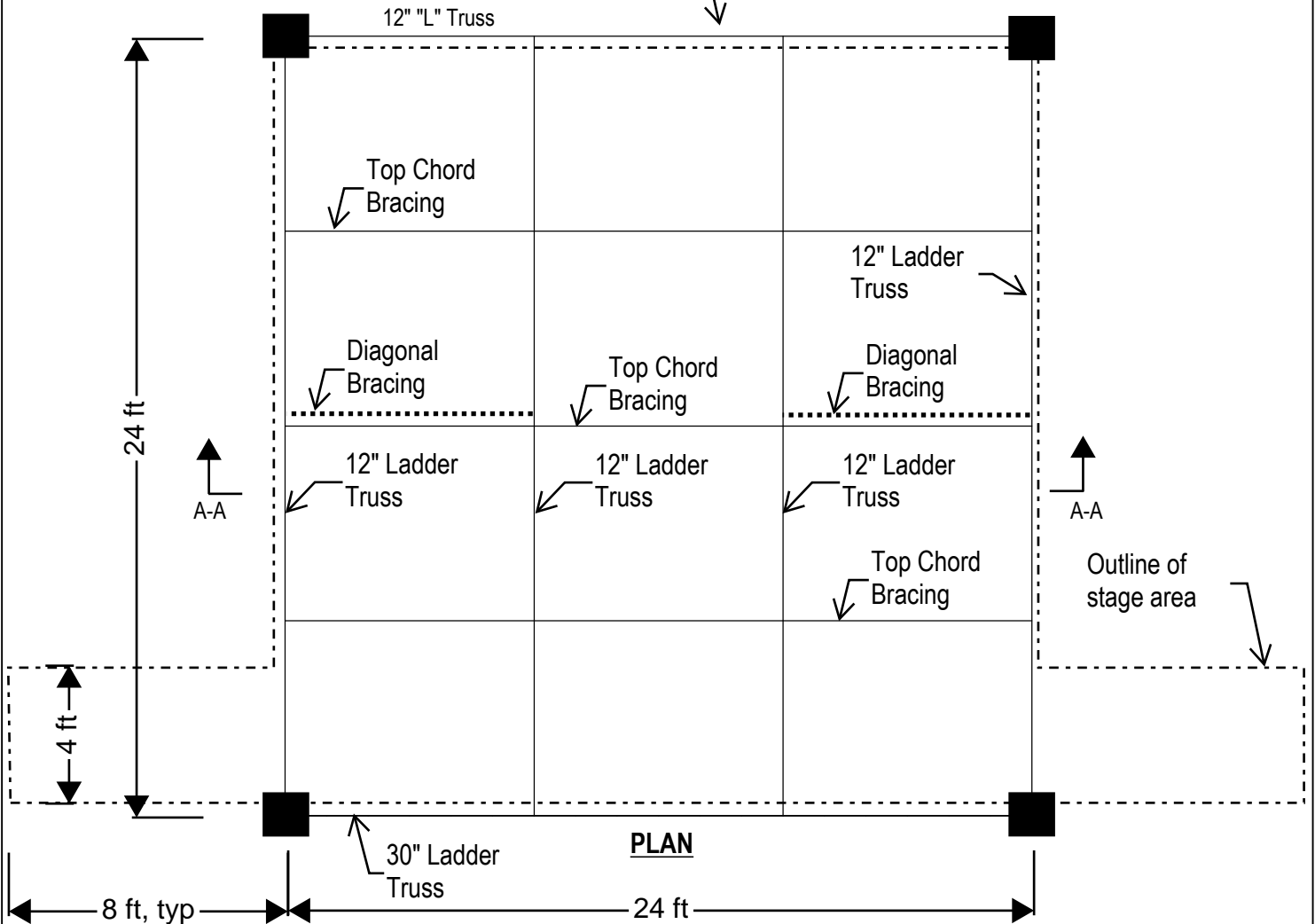


Daniel J. Clark, P.E.
IN Registration No. PE 11011355

Allen A Winzler, E.I.T.



Upstage ↘





OPERATIONS MANAGEMENT PLAN

IMPLEMENTATION OF PLAN

1. PRIOR TO EACH INSTALLATION, FREQUENCY CITY SOUND & LIGHTING SHALL DESIGNATE A RESPONSIBLE PERSON IN CHARGE OF IMPLEMENTING ALL PHASES OF THE OPERATIONS MANAGEMENT PLAN.
2. A MEETING SHALL BE HELD AT THE VENUE WITH THE PROMOTER, OWNER OR STAGE MANAGER TO DISCUSS THE HIGH WIND ACTION PLAN AND OTHER OPERATIONAL ITEMS.
3. THE METHOD OF INITIATING EVENT CANCELLATION MUST BE OUTLINED EXPLICITLY PRIOR TO THE EVENT ALLOWING FOR IMMEDIATE ACTION IF NECESSARY.
4. A COPY OF THIS PLAN SHOULD BE PROVIDED TO LOCAL POLICE OR FIRE DEPARTMENTS IN ORDER TO HELP USHER PATRONS IN THE EVENT OF AN EVACUATION.

DAILY OPERATIONS PLAN

1. CHECK WEATHER EACH MORNING AND PERIODICALLY THROUGHOUT THE DAY.
2. CHECK TOWER BASES DAILY TO ENSURE ALL REMAIN LEVEL AND PLUMB.
3. CHECK STAGE BRACING AND WHEEL CHOCKS DAILY TO ENSURE STAGE HAS NOT SHIFTED.
4. PROVIDE A DAILY LOG OF THE ABOVE CHECKS FOR EACH INSTALLATION.

HIGH WIND ACTION PLAN

1. THE HIGH WIND ACTION PLAN SHALL BE IN EFFECT FOR THE ENTIRETY OF THE EVENT. AN EVENT SHALL BE DEFINED AS STARTING AT THE INITIAL COMMENCEMENT OF THE STRUCTURE INSTALLATION AND ENDING ONCE THE STRUCTURE IS COMPLETELY DISMANTLED.
2. A COMPETENT RESPONSIBLE PERSON FROM THE VENUE OR RIGGING COMPANY SHALL BE PRESENT FOR THE DURATION OF THE EVENT TO IMPLEMENT THE HIGH WIND ACTION PLAN (SEE ABOVE).
3. A REGULAR LIASON WITH LOCAL AIRPORTS AND/OR WEATHER INFORMATION CENTERS SHALL BE MAINTAINED TO ASCERTAIN IF ANY SIGNIFICANT WEATHER EVENTS ARE EXPECTED IN THE IMMEDIATE VICINITY OF THE STRUCTURE
4. AN ANEMOMETER SHALL BE PLACED ON THE STRUCTURE TO MONITOR WIND SPEEDS. THE ANEMOMETER SHALL BE PLACED AT THE TOP OF A TOWER OR AN ADJACENT STRUCTURE AT A HEIGHT EQUIVALENT TO THE HEIGHT OF THE TOWER. THE ANEMOMETER SHALL BE LOCATED WITHIN 50 YARDS OF THE STRUCTURE.
5. **WHEN WIND SPEEDS ARE EXPECTED TO EXCEED 25 MPH:** A TEAM OF QUALIFIED PERSONNEL SHALL BE PUT ON ALERT. ALL NECESSARY PERSONNEL SHALL BE IN PLACE AND PUT ON STANDBY.
6. **WHEN WIND SPEEDS ARE EXPECTED TO EXCEED 40 MPH:** ALL SHOW OPERATIONS SHALL CEASE AND THE IMMEDIATE AREA SHALL BE EVACUATED. ALL ACCESSORIES, INCLUDING SCRIM, ROOF SKIN, AND LIVE LOADS SHALL BE REMOVED FROM THE SYSTEM. LOWER ROOF IF TIME PERMITS AND WIND SPEEDS ARE BELOW 10 MPH.
7. **AT WINDS SPEEDS IN EXCESS OF 50 MPH,** ALL PERSONNEL SHOULD MAINTAIN SAFE DISTANCE FROM THE ROOF SYSTEM AS COLLAPSE OF THE ROOF SYSTEM MAY OCCUR.
8. THE HIGH WIND ACTION PLAN SHALL BE POSTED AT A CONSPICUOUS AREA ON SITE. IT MUST BE AVAILABLE AT ALL TIMES TO VENUE OPERATORS AND CREW.

SNOW/RAIN REMOVAL

1. THE ROOF SKIN HAS NOT BEEN DESIGNED TO SUPPORTED PONDED WATER OR SNOW. REMOVE ANY AND ALL SUCH ACCUMULATIONS.

SEISMIC LOADS

1. IN THE EVENT OF AN EARTHQUAKE, THE EVENT SHALL BE SUSPENDED UNTIL SUCH TIME THAT THE ROOF STRUCTURE HAS BEEN INSPECTED BY A COMPETENT PERSON ON SITE.

ROOF HOISTING

1. ALL BALLAST SHALL BE IN PLACE PRIOR TO HOISTING ROOF SYSTEM.
2. ROOF SYSTEM SHALL NOT BE HOISTED IN WIND SPEEDS GREATER THAN 10 MPH.
3. TOWER BOLTS AND BRACING SHALL BE INSTALLED IMMEDIATELY AFTER HOISTING ROOF TO TRIM HEIGHT.



GENERAL STRUCTURAL NOTES

CODES AND REFERENCE

1. 2009 INTERNATIONAL BUILDING CODE
2. ASCE 7-05 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
3. ASCE 37-02 DESIGN LOADS ON STRUCTURES UNDER CONSTRUCTION
4. ANSI E1.21-2006 ENTERTAINMENT TECHNOLOGY, "TEMPORARY GROUND-SUPPORTED OVERHEAD STRUCTURES USED TO COVER THE STAGE AREAS AND SUPPORT EQUIPMENT IN THE PRODUCTION OF OUTDOOR ENTERTAINMENT EVENTS"
5. ANSI E1.2-2006 ENTERTAINMENT TECHNOLOGY, "DESIGN, MANUFACTURE AND USE OF ALUMINUM TRUSSES AND TOWERS"
6. ALUMINUM DESIGN MANUAL, 2005 EDITION
7. AISC STEEL MANUAL, 13TH EDITION

DESIGN LOADS

1. DEAD LOAD: SELFWEIGHT OF STRUCTURE
2. RIGGING LOADS: SEE ATTACHED LETTER WITH ALLOWABLE LOADING INSTRUCTIONS
3. WIND LOAD:
 - A. DESIGN WIND SPEED: 86.25 MPH* (BARE STRUCTURE – NO SIDEWALL SCRIM)
 - B. DESIGN WIND SPEED: 40 MPH (WITH ROOF SKIN AND UPSTAGE SCRIM – SEE HIGH WIND ACTION PLAN)
 - C. EXPOSURE: C
 - D. OCCUPANCY CATEGORY: 2
4. SEISMIC LOADS DO NOT CONTROL THE DESIGN OF THIS STRUCTURE.

*115 MPH WIND SPEED REQUIREMENT REDUCED IN ACCORDANCE WITH ASCE 37-02 DUE TO THE TEMPORARY NATURE OF STRUCTURE. FURTHER REDUCED ACCORDING TO ASCE 7-10 LOAD COMBINATIONS.

CONSTRUCTION AND SAFETY

1. ENGINEER SHALL NOT BE RESPONSIBLE FOR MEANS, METHODS, OR SEQUENCE OF CONSTRUCTION UNLESS SPECIFICALLY STATED ON THE DRAWINGS.
2. ENGINEER HAS DESIGNED THE STRUCTURES FOR THEIR FINAL AS-BUILT CONDITION. ENGINEER IS NOT RESPONSIBLE FOR TEMPORARY STABILITY OF STRUCTURES DURING ERECTION UNLESS SPECIFICALLY STATED ON THE DRAWINGS.
3. STRUCTURE HAS BEEN DESIGNED AS A TEMPORARY STRUCTURE THAT SHALL BE IN PLACE FOR LESS THAN 6 WEEKS.

FOUNDATIONS

1. THE STRUCTURE IS ASSUMED TO BE FOUNDED ON LEVEL GROUND (CONCRETE, ASPHALT, GRASS, ETC) WITH A MINIMUM NET ALLOWABLE BEARING CAPACITY OF 1500 PSF.
 1. BALLAST SHALL NOT BE INSTALLED ON SLOPING GROUND, GRAVEL OR ICE UNLESS PRECAUTIONS ARE TAKEN TO PREVENT SLIDING OF THE BALLAST.

RIGGING

1. ALL POINTS SHALL BE DEAD HUNG POINTS.
2. ALL SHALL BE HUNG FROM PANEL POINTS ONLY UNLESS SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD.
3. BRIDLES SHALL NOT BE USED UNLESS SPECIFICALLY ALLOWED BY THE ENGINEER OF RECORD.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE ON THE DRAWINGS:
 - A. ROLLED WIDE FLANGE SHAPES: ASTM A992, FY = 50 KSI
 - B. MISC PLATE, BAR, ANGLES AND CHANNELS: ASTM A36, FY = 36 KSI
 - C. PIPE SHAPES: ASTM A53, TYPE E OR S, GRADE B, FY = 35 KSI
 - D. HSS TUBES: ASTM A500 GR B, FY = 46 KSI
 - E. HSS ROUND: ASTM A500 GR B, FY = 42KSI
 - F. BOLTS OR SCAFFOLD CONNECTION PINS: SAE J429 GRADE 5 BOLTS (FY=92 KSI)
 - G. TRUSS TO TRUSS CONNECTION PINS: A449
2. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY LATEST EDITION.

SCAFFOLD UNITS

1. SCAFFOLD UNITS SHALL BE MODULAR SCAFFOLD BY LAYHER, MILLENNIUM, ETOBICOKE IRONWORKS, KWIKSTAGE OR APPROVED EQUAL.
2. MODIFICATIONS TO SCAFFOLD UNITS SHALL BE APPROVED BY THE ENGINEER OF RECORD PRIOR TO ERECTION.
3. ERECTION OF SCAFFOLD UNITS SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF THE CONTRACTOR OF RECORD (HOLDER OF PERMITS).
4. ALL MEMBERS SHALL BE INSTALLED SUCH THAT THE WEDGES ARE DRIVEN TIGHT AND COUPLER CLAMPS ARE INSTALLED TIGHT. NO LOOSE MEMBERS ARE ALLOWED.
5. VERTICAL SCAFFOLD LEGS SHALL HAVE A POSITIVE CONNECTION PIN OR BOLT INSTALLED AT EACH SPLICE LOCATION.
6. FIELD CONNECTIONS SHALL BE BOLTED OR CONNECTED WITH APPROVED SCAFFOLD CONNECTORS.

WIRE ROPE AND RIGGING ACCESSORIES

1. WIRE ROPE 3/8" OR LESS IN DIAMETER: 7X19 GAC, MEETING FEDERAL SPEC. RR-W-410E
2. WIRE ROPE 7/16" OR GREATER IN DIAMETER: 6X19 IWRC, MEETING FEDERAL SPEC. RR-W-410D, TYPE 1 CLASS 2
3. SHACKLES: GALVANIZED, SCREW PIN ANCHOR TYPE, ASTM A153
4. TURNBUCKLES: GALVANIZED, ASTM F-1145
5. FORGED WIRE ROPE CLIPS: GALVANIZED, MEETING FEDERAL SPEC. FF-C-450 TYPE I CLASS I
6. WIRE ROPE THIMBLES: GALVANIZED, MEETING FEDERAL SPEC. FF-T-276B TYPE II
7. RATCHET STRAPS
8. CHAIN PULLERS
9. POLYESTER OR STEEL CORE ROUND SLING

INSPECTIONS

1. ALL TRUSS UNITS, SCAFFOLD AND/OR OTHER RIGGING EQUIPMENT SHALL BE VISUALLY INSPECTED PRIOR TO ERECTION. DAMAGED OR CORRODED EQUIPMENT SHALL NOT BE USED. FIELD MODIFICATIONS SHALL BE APPROVED BY THE ENGINEER OF RECORD PRIOR TO INSTALLATION.