**PROFESSIONAL SERVICES AGREEMENT BETWEEN**
**THE CITY OF DORAL**
**AND**
**4 SOUND GROUP, INC.**
**FOR**
**LED SCREEN FOR DRIVE-IN MOVIE EVENT SERIES**

**THIS AGREEMENT** is made between **4 SOUND GROUP, INC.**, an active, for-profit Florida Corporation, validly engaging business in the state of Florida (hereinafter the "Provider"), and the **CITY OF DORAL, FLORIDA**, a Florida municipal corporation, (hereinafter the "City").

## RECITALS

**WHEREAS**, in response to Invitation To Quote #2020-001, titled "Drive-in Movie Event Series" (the "ITQ"), the City of Doral (the "City") received eleven (11) responses with seven (7) submitting pricing virtually. Three (3) firms were deemed responsive with their submittals being on time and all requirements met; and

**WHEREAS**, upon review of submittals received, the submittal by 4 SOUND GROUP, INC. ("Provider") was deemed the lowest responsive and responsible; and

**WHEREAS**, the Mayor and City Councilmembers approved Resolution 20-211, awarding ITQ #2020-001 to Provider and authorizing the City Manager to negotiate and enter into an agreement with Provider for the provision of providing LED Screens services for the City of Doral Drive-in Movie Event Series, pursuant to the terms of the ITQ and Provider's Proposal; and

**WHEREAS**, the City and Provider, through mutual negotiation, have agreed on the terms and conditions in this Agreement for the provision of services.

## AGREEMENT

**NOW, THEREFORE**, in consideration of the aforementioned recitals, which are incorporated herein and made a part hereof by this reference, the mutual covenants and conditions contained herein, and other good and valuable consideration, the sufficiency of which is acknowledged by the Parties, Provider and the City agree as follows.

1. **Scope of Services/Deliverables.**

   1.1 The Provider shall furnish the professional services to the City as outlined in the ITQ found in Exhibit "A," which is attached to this Agreement and incorporated herein and made a part hereof by this reference.

   1.2 The "Scope of Services" includes a Project Schedule for the Project which includes a breakdown of tasks, timeline, and deliverables to the City.

2. **Term/Commencement Date.**

2.1 This initial Agreement shall become effective upon execution by both parties and shall remain in effect for six (6) months from the date of execution of Agreement, unless earlier terminated in accordance with Paragraph 8.

2.2 Provider agrees that time is of the essence and Provider shall complete each deliverable for the Project within the timeframes set forth in the Project Schedule, unless extended by the City Manager.

3. **Compensation and Payment.**

3.1 The Provider shall be compensated in the following manner:

An amount not to exceed **$47,000.00** for the City's Monthly Drive-In Movie event series (October 2020- February 2021) as further detailed in the Scope of Services and Proposal in Exhibit "C", regardless of the number of hours or length of time necessary for Provider to complete the Scope of Services. Provider shall maintain same pricing for events as provided in their Proposal. The City reserves the right to reduce or add services as needed for city events and is not obligated to use the entire not to exceed amount per fiscal year. Provider shall not be entitled to any additional payment for any expenses incurred in completion of the Scope of Services. A breakdown of costs used to derive the lump sum amount, including but not limited to hourly rates, estimated travel expenses and other applicable rates, is specified in the Scope of Services. Upon completion of the work, Provider shall submit its bill[s] for payment in a form approved by the City. The bill[s] shall identify the services completed and the amount charged.

3.2 The City shall pay Provider in accordance with the Florida Prompt Payment Act.

3.3 If a dispute should occur regarding an invoice submitted, the City Manager may withhold payment of the disputed amount and may pay to the Provider the undisputed portion of the invoice. Upon written request of the Finance Director, the Provider shall provide written documentation to justify the invoice. Any compensation disputes shall be decided by the City Manager whose decision shall be final.

4. **Sub-Providers.**

4.1 The Provider shall be responsible for all payments to any subcontractors and shall maintain responsibility for all work related to the Project.

4.2 Any subcontractors used on the Project must have the prior written approval of the City Manager or his designee.

5. **City's Responsibilities.**

5.1 Arrange for access to and make all provisions for Provider to enter upon real property as required for Provider to perform services as may be requested in writing by the Provider (if applicable).

6. **Provider's Responsibilities.**

6.1 The Provider shall exercise the same degree of care, skill and diligence in the performance of the Project as is ordinarily provided by LED Screen provider under similar circumstances. If at any time during the term of this Agreement or within one year from the completion of the Project, it is determined that the Provider's deliverables are incorrect, defective or fail to conform to the Scope of Services of the Project, upon written notification from the City Manager, the Provider shall at Providers sole expense, immediately correct the work. The City in no way assumes or shares any responsibility or liability of the Provider or Sub Provider under this agreement.

7. **Termination.**

7.1 The City Manager without cause may terminate this Agreement upon thirty (30) days written notice to the Provider, or immediately with cause.

7.2 Upon receipt of the City's written notice of termination, Provider shall not perform any services.

7.3 In the event of termination by the City, the Provider shall be paid for all services rendered and accepted by the City Manager up to the date of termination.

7.4 If the Provider wishes to terminate this Agreement prior to the end of the term, they must provide the City with one-hundred and twenty (120) days written notice. Failure to provide the City with one-hundred and twenty (120) days written notice may result in the Provider being unable to do business with the City in the future.

8. **Insurance.**

8.1 The Provider shall secure and maintain throughout the duration of this Agreement insurance of such type and in such amounts as required by Exhibit "B". The insurance carrier shall be qualified to do business in the State of Florida and have agents upon whom service of process may be made in the State of Florida.

8.2 Certificates of Insurance shall be provided to the City at the time of execution of this Agreement and certified copies provided if requested. Each policy certificate shall be endorsed with a provision that not less than

thirty (30) calendar days' written notice shall be provided to the City before any policy or coverage is cancelled or restricted, or in accordance to policy provisions. The City further reserves the right to solicit additional coverage, or require higher limits of liability as needed, and depending on the nature of scope, or level of exposure.

9. **Nondiscrimination.**

9.1 During the term of this Agreement, Provider shall not discriminate against any of its employees or applicants for employment because of their race, color, religion, sex, or national origin, and to abide by all Federal and State laws regarding nondiscrimination

10. **Attorneys' Fees and Waiver of Jury Trial.**

10.1 In the event of any litigation arising out of this Agreement, each party shall be responsible for their attorneys' fees and costs, including the fees and expenses of any paralegals, law clerks and legal assistants, and including fees and expenses charged for representation at both the trial and appellate levels.

10.2 In the event of any litigation arising out of this Agreement, each party hereby knowingly, irrevocably, voluntarily, and intentionally waives its right to trial by jury.

11. **Indemnification.**

11.1 Provider shall defend, indemnify, and hold harmless the City, its officers, agents and employees, from and against any and all demands, claims, losses, suits, liabilities, causes of action, judgment or damages, arising out of, related to, or any way connected with Provider's performance or non-performance of any provision of this Agreement including, but not limited to, liabilities arising from Agreements between the Provider and third parties made pursuant to this Agreement. Provider shall reimburse the City for all its expenses including reasonable attorneys' fees and costs incurred in and about the defense of any such claim or investigation and for any judgment or damages arising out of, related to, or in any way connected with Provider's performance or non-performance of this Agreement. This section shall be interpreted and construed in a manner to comply with any applicable Florida Statutes, including without limitation Sections 725.06 and 725.08, Fla. Stat., if applicable.

11.2 The provisions of this section shall survive termination of this Agreement.

11.3 Ten dollars ($10) of the payments made by the City constitute separate, distinct, and independent consideration for the granting of this indemnification, the receipt and sufficiency of which is voluntary and knowingly acknowledged by the Provider.

12. **Notices/Authorized Representatives.**

12.1 Any notices required by this Agreement shall be in writing and shall be deemed to have been properly given if transmitted by hand-delivery, by registered or certified mail with postage prepaid return receipt requested, or by a private postal service, addressed to the parties (or their successors) at the following addresses:

For the City:
Albert P. Childress
City Manager
City of Doral, Florida
8401 NW 53rd Terrace
Doral, Florida 33166

With a Copy to:
Luis Figueredo, Esq.
City Attorney
City of Doral, Florida
8401 NW 53rd Terrace
Doral, Florida 33166

For the Provider:
Jose Joaquin Gonzalez
President-Owner
4 Sound Group
7475 NW 7th Street
Miami, FL 33126

13. **Governing Law**.

13.1 This Agreement shall be construed in accordance with and governed by the laws of the State of Florida. Exclusive venue for any litigation arising out of this Agreement shall be in Miami-Dade County, Florida, or the Southern District of Florida.

14. **Entire Agreement/Modification/Amendment.**

14.1 This writing contains the entire Agreement together with the accompanying exhibits represents the parties and supersedes any prior oral or written representations. No representations were made or relied upon by either party, other than those that are expressly set forth herein.

14.2 No agent, employee, or other representative of either party is empowered to modify or amend the terms of this Agreement, unless executed with the same formality as this document.

15. **Ownership and Access to Records and Audits.**

15.1 All records, books, documents, maps, data, deliverables, papers and financial information (the "Records") that result from the Provider

providing services to the City under this Agreement shall be the property of the City.

15.2 The City Manager or his designee shall, during the term of this Agreement and for a period of three (3) years from the date of termination of this Agreement, have access to and the right to examine and audit any Records of the Provider involving transactions related to this Agreement.

15.3 The City may cancel this Agreement for refusal by the Provider to allow access by the City Manager or his designee to any Records pertaining to work performed under this Agreement that are subject to the provisions of Chapter 119, Florida Statutes.

16. **Nonassignability.**

16.1 This Agreement shall not be assignable by Provider unless such assignment is first approved by the City Manager. The City is relying upon the apparent qualifications and personal expertise of the Provider, and such firm's familiarity with the City's area, circumstances, and desires.

17. **Severability.**

17.1 If any term or provision of this Agreement shall to any extent be held invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each remaining term and provision of this Agreement shall be valid and be enforceable to the fullest extent permitted by law.

18. **Independent Contractor.**

18.1 The Provider and its employees, volunteers and agents shall be and remain independent contractor and not agents or employees of the City with respect to all of the acts and services performed by and under the terms of this Agreement. This Agreement shall not in any way be construed to create a partnership, association or any other kind of joint undertaking, enterprise or venture between the parties.

19. **Representations and Warranties of Provider.**

19.1 Provider hereby warrants and represents, at all times during the Term of this Agreement, inclusive of any renewals thereof, that:

19.1.1 Provider, and its employees and/or subcontractors, shall maintain in good standing all required licenses, certifications and permits required under federal, state and local laws necessary to perform the Services hereunder;

19.1.2 Provider is a corporation duly organized, validly existing and in good standing under the laws of the State of Florida and duly

registered, validly doing business and in good standing under the laws of the State of Florida;

19.1.3 The execution, delivery and performance of this Agreement by Provider has been duly authorized and no consent of any other person or entity to such execution, delivery and performance is required to render this Agreement a valid and binding instrument enforceable against Provider in accordance with its terms; and

19.1.4 Provider has the required knowledge, expertise, and experience to perform the Services and carry out its obligations under this Agreement in a professional and first-class manner.

20. **Compliance with Laws.**

20.1 The Provider shall comply with all applicable laws, ordinances, rules, regulations, and lawful orders of public authorities relating to the services.

21. **Non-collusion.**

21.1 Provider certifies that it has not divulged, discussed or compared his/her/its quote with other individuals and/or entities that provided quotes to the City for the Services and has not colluded with any other individual or entity whatsoever.

22. **Truth in Negotiating Certificate.**

22.1 Provider hereby certifies, covenants, and warrants that wage rates and other factual unit costs supporting the compensation for the Services that may be offered pursuant to this Agreement are accurate, complete, and current. Provider further agrees that the Fee provided shall be adjusted to exclude any significant sums by which the City determines the agreement price was increased due to inaccurate, incomplete, or non-current wage rates and other factual unit costs. All such agreement adjustments shall be made within one (1) year following the end of the Term or any Extension term.

23. **Waiver**

23.1 The failure of either party to this Agreement to object to or to take affirmative action with respect to any conduct of the other which is in violation of the terms of this Agreement shall not be construed as a waiver of the violation or breach, or of any future violation, breach or wrongful conduct.

24. **Survival of Provisions**

24.1 Any terms or conditions of either this Agreement that require acts beyond the date of the term of the Agreement, shall survive termination of the

Agreement, shall remain in full force and effect unless and until the terms or conditions are completed and shall be fully enforceable by either party.

25. **Prohibition of Contingency Fees.**

25.1 The Provider warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Provider, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person(s), company, corporation, individual or firm, other than a bona fide employee working solely for the Provider, any fee, commission, percentage, gift, or any other consideration, contingent upon or resulting from the award or making of this Agreement.

26. Force Majeure.

26.1 It is understood that performance of any act by the City or Provider hereunder may be delayed or suspended at any time while, but only so long as, either party is hindered in or prevented from performance by acts of God, the elements, war, rebellion, strikes, lockouts or any cause beyond the reasonable control of such party, provided however, the City shall have the right to provide substitute service from third parties or City forces as may be necessary to meet City needs, and, in such event, the City shall withhold payment due Contractor for such period of time, if any. If the condition of force majeure exceeds a period of fourteen (14) days, the Town may, at its option and discretion, cancel or renegotiate the Agreement

27. Counterparts

27.1 This Agreement may be executed in several counterparts, each of which shall be deemed an original and such counterpart shall constitute one and the same instrument.

**[THIS SPACE INTENTIONALLY LEFT BLANK. SIGNATURES TO FOLLOW.]**

**IN WITNESS WHEREOF,** the parties execute this Agreement on the respective dates under each signature:

Attest:

Connie Diaz, City Clerk

**CITY OF DORAL**

By: _____
Albert P. Childress, City Manager

Date: Oct. 22, 2020

Approved As To Form and Legal Sufficiency for the Use
And Reliance of the City of Doral Only:

Luis Figueredo, Esq.
City Attorney

**4 SOUND GROUP, INC.**

By: Jose Joaquin Gonzalez
Its: President-Owner

Date: 10/21/2020

# Exhibit "A"
# Scope of Services

# Scope of Services

## 1.0 Purpose

The purpose of this Contract is to enter into an agreement with 4Sound Group INC, to provide services for the City's Monthly Drive-In Movie event series (October 2020- February 2021). The dimensions of LED Screens for each event shall be, at a minimum, as follow:

- 36' width x 18' height (actual screen size)
  **(4 times - October, November, January, February)**

- 40' width x 20' height (actual screen size)
  **(1 time - December – Holiday screening)**

Provider's services shall include, but is not limited to, the coordination and preparation of the necessary LED Screen, FM Transmitter (minimum 5 mile radius) and any Lighting components of the events; the installation and implementation of the aforementioned components; generator; permitting documents; support measures in this area before/during/after each event, and coordination with the City of Doral Parks & Recreation Department to achieve a high-quality event. Furthermore, it shall include all details, a detailed breakdown of materials, labor/services, and travel determined to be necessary by the vendor in providing the goods and services.

## 1.1 Scope of Work

1.1.1 Provider shall include all services outlined below as part of the Drive-in Movie event and be included in the total proposed cost.

i. Outdoor LED screen meeting sizes requested (36'x 18') for events on October, November, January, and February & (40' x 18') for the event in December. All screens must have the proper ground support.
ii. Auxiliary/Playback device (DVD Player, Video software, Laptop etc.) to transmit movie to screen.
iii. FM Transmitter for Radio Stereo Station (minimum 5-mile radius).
iv. All drawings, specifications and calculations needed for permitting & inspections.
v. 36 kW (45 kVA) Ultra-silent power generator and all necessary equipment needed to power the LED Screen including proper electrical hook-ups, cable ramps, sound & lights, monitor mixing towers, flying hardware, misc. cabling etc.
vi. Any Lighting components needed for screen
vii. AV Labor/Personnel to set up, operate and tear down equipment 11
viii. Structure Representative to oversee LED structure and make final decisions regarding safety during inclement weather.
ix. Installation and implementation of the aforementioned components; support measures in this area before/during/after each event, and coordination with the City of Doral Parks & Recreation Department.

1.1.2 Provider must include copies of all required licenses as well as any additional required supporting documents.

1.1.3 The Provider shall be prepared for inspection at a time agreed upon between the Provider, City of Doral Parks and Recreation Department staff and Fire Chief or Designee. On event day, the Provider agrees to have the LED Screen completely set up no later than 5:00 PM. Setup may begin the same day of the event as early as 7:00 AM.

**1.2 Performance Evaluation**

Throughout the contract period, and on or before each event, The Provider performance will be heavily monitored and closely scrutinized by City staff. The Provider will be evaluated by the City Manager or his/her designee. If the Provider performance fails to meet the standards specified within the agreement and receives an unacceptable rating, the City may without cause and without prejudice to any other right or remedy, terminate the contract whenever the City determines that such termination is in the best interest of the City. The Provider receiving an unacceptable rating will be notified by certified mail. Contract termination shall be served by written notice by the City Manager.

**1.3 Contract Alterations**

The City reserves the right to delete, add or revise items and services under this agreement. Deletions may be made at the sole discretion of the City at any time during the contract period. Items added or revised must be mutually agreed upon in writing by Provider and the City Manager his/her designee.

**1.4 Cancellation**

Order will be subject to immediate cancellation if either product or service does not comply with specifications as stated herein or fails to meet the City's performance standards.

The City Manager without cause may terminate this Agreement upon thirty (30) days written notice to the Provider, or immediately with cause. Upon receipt of the City's written notice of termination, Provider shall not perform any services. In the event of termination by the City, the Provider shall be paid for all services rendered and accepted by the City Manager up to the date of termination.

If the Provider wishes to terminate this Agreement prior to the end of the term, they must provide the City with one-hundred and twenty (120) days written notice. Failure to provide the City with one-hundred and twenty (120) days written notice may result in the Provider being unable to do business with the City in the future.

**1.5 Assignment**

Neither party to the Contract shall assign the Contract or subcontract it as a whole or in part thereof without the written consent of the other, nor shall the Provider assign any monies due or to become due to him hereunder, without the previous written consent of the contracting City Manager.

## 1.6 Subcontracting

It is the intention of this Contract not to subcontract any work. However, if the Provider must subcontract, he/she may not subcontract any more than 20% of the services under this Contract for any reason. The City discourages subcontracting practices for any substantial portion of the requested services in this Contract. If Provider is subcontracting, they must receive written approval from the City of Doral prior to subcontracting work. The City of Doral reserves the right to reject a request from the Provider for subcontracting any work from a subProvider who has previously failed in the proper performance of an award or failed to deliver on time contract of a similar nature, or who is not in a position to perform properly under this Contract. Changing subProviders for the duration of this contract is prohibited unless changes are approved by the City Manager. The City reserves the right to reject any request to change subProviders.

## 1.7 Purchasing Agreements with other Government Agencies

At the option of the Provider, the use of this Contract may be extended to other governmental agencies, including the State of Florida, its agencies, political subdivisions, counties and cities. Each governmental agency allowed by the Provider to use this Contract shall do so independent of any other governmental entity. Each agency shall be responsible for its own purchases and shall be liable only for goods or services ordered, received and accepted. No agency receives any liability by virtue of this Contract.

## 1.8 Compliance with Occupational Health & Safety

The Provider certifies that all materials, equipment, etc., contained in this Contract meets all O.S.H.A. requirements. The Provider further certifies, that, if the materials, equipment, etc., delivered is subsequently found to be deficient in any O.S.H.A. requirement in effect on the date of use, all costs necessary to bring the materials equipment, etc., into compliance with the aforementioned requirements shall be borne by the Provider.

The Provider shall comply with all applicable Federal, State and Local laws regarding "Occupational Environmental Safety and Health". This shall include but not be limited to compliance with the U.S. Department of Labor-Occupational Safety and health and the Florida State Department of Labor Divisions of Safety Standards and regulations. Upon request the Provider shall provide the City with a copy of their written safety program pertaining to the subject of the contract, if such a program is required by law.

The Provider shall be solely and completely responsible for conditions of the job site, including safety of all persons, (including employees) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall confirm to the U.S. Department of Labor (OSHA), Florida Department of Labor, and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Provider's failure to thoroughly familiarize himself/herself with the aforementioned provisions shall not relieve him/her from compliance with the obligations and penalties set forth therein.

The City reserves the right to make safety inspections at any time the Provider is within the City limits to ensure safety rules are not being violated.

**1.9 References**

The City may conduct an investigation of references including a record check of consumer affairs complaints. Proposer's submission of a RFP constitutes acknowledgment of the process and consent to investigate. City is the sole judge in determining Proposer's qualifications.

**1.10 Background Information**

The City reserves the right, to require a Proposer to submit such evidence of his/her qualifications as it may deem necessary, and may consider any evidence available to it as to the financial, technical and other qualifications and abilities of a Proposer, including past performance (experience) with the City.

**1.11 Method of Ordering**

Services shall be ordered via individual purchase order. Invoices must be submitted against each individual purchase order.

**1.12 F.O.B. Point**

Services provided under this contract shall be F.O.B. destination. All costs for transporting equipment, material and/or labor shall be borne by the Provider.

**1.13 Debris**

The Provider shall be responsible for the prompt removal of all debris which results from this service.

**1.14 Protection of Property**

The Provider shall at all times guard against damage or loss to the property of the City of Doral and shall be held responsible for replacing or repairing any such loss or damage. The City of Doral may withhold payment or make such deductions, as deemed necessary, to ensure reimbursement or replacement for loss or damage to property through negligence of the Provider or his/her agents.

**1.15 Provider Responsibility**

The Provider shall be responsible for the protection of property in the areas in the adjacent vicinity of the project; and for the protection of his own equipment, supplies, materials and work, against any damage resulting from the elements (such as flooding, rainstorms, wind damage, or other acts of God) or vandalism.

**1.16 Safety Regulations**

Equipment must meet all State and Federal safety regulations for grounding of electrical equipment.

# Exhibit "B"
# Insurance Requirements

**MINIMUM INSURANCE REQUIREMENT**

Successful Proposer shall maintain, at their sole expense and during the term of this agreement, insurance requirements in accordance to:

**Commercial General Liability**

| | |
|---|---|
| A. Limits of Liability | |
| Bodily Injury & Property Damage Liability | |
| Each Occurrence | $1,000,000.00 |
| Policy Aggregate | $1,000,000.00 |
| Personal & Adv. Injury Liability | $1,000,000.00 |
| Products/Completed Operations | $1,000,000.00 |

B. Endorsements Required
City of Doral listed as an additional insured
Primary Insurance Clause Endorsement
Contingent and Contractual Liability
Premises and Operations Liability

| | |
|---|---|
| **Combined Automobile Liability** (Required) | $300,000.00 |
| Owned, Scheduled Autos, including | |
| Hired, Non-Owned Autos and food trucks | |
| City of Doral listed as an additional insured | |

**Workers Compensation**

*(Required by Florida Statute for more than 4 employees. Proof is required)*

| | |
|---|---|
| Employer's Liability – Statutory Requirements - State of Florida | |
| Limits of Liability | |
| Bodily injury caused by an accident; each accident | $100,000.00 |
| Bodily injury caused by disease; each employee | $100,000.00 |
| Bodily injury caused by disease; policy limit | $500,000.00 |

# Exhibit "C"
# 4 SOUND GROUP, INC.
# Proposal

4SOUND
(305) 267. 3437
7475 NW 7 Street • Miami, FL 33126
www.4soundgroup.com

# ITQ NO. 2020-001

# Led Screens, Structures, FM transmitter, Generator Services

# City of Doral

# MIAMI-DADE COUNTY

MIAMI-DADE COUNTY
DEPARTMENT OF PLANNING AND ZONING
PERMANENT CERTIFICATE OF USE

CERT NO: 2019020411
EC: 52 TWP: 53 RNG: 40 PROCESS NO: U2019002129
OLIO: 3030520020950 ZONE: BU1A
FEE: $346.11

AILING ADDRESS/CONTACT PERSON:
4 SOUND GROUP, INC.
6500 W FLAGLER ST B208
MIAMI, FL 33144-

CORP NAME/D/B/A AND ADDRESS:
4 SOUND GROUP
4 SOUND GROUP, LLC.
7475 NW 7 ST

USINESS USE: OTHER COMMERCIAL (MISCELLANEOUS)
SE SPECIFICS: EQUIPMENT RENTALS
ONDITIONS:
DRY USE; NO HAZARDOUS MATERIAL LIQUID OR WAS
TE GENERATION.
EGAL DESCRIPTION: 53 54 40 .45 AC
WOOD FARMS PB 43-49
ATE OF CU ISSUANCE: 1/ 2/2019
HIS CERTIFICATE M U S T B E P O S T E D ON PREMISES.

HIS CERTIFICATE OF USE IS VALID FOR AN UNLIMITED TIME OR AS INDICATED ELOW PROVIDED THERE ARE NO CHANGES IN THE USE, BUSINESS NAME OR WNERSHIP. ALSO, THERE MAY BE NO EXPANSIONS, ALTERATIONS OR ADDITIONS TO HE APPROVED USE. ALL CHANGES LISTED ABOVE WILL REQUIRE ISSUANCE OF A EW CERTIFICATE OF USE.

HIS CERTIFICATE OF USE DOES NOT RELIEVE THE APPLICANT FROM COMPLIANCE ITH ANY FEDERAL, STATE, OR LOCAL REGULATIONS. YOU ARE ALSO REQUIRED TO LLOW ZONING INSPECTIONS AT ANY REASONABLE TIME BY REPRESENTATIVES OF HE DEPARTMENT. FOR MORE INFORMATION, PLEASE CONTACT THE ZONING PERMIT ECTION AT (786) 315-2666. IN ADDITION TO THE ZONING PERMIT SECTION, PPLICANT MUST ALSO CONTACT THE BUILDING DEPARTMENT AT (786) 315-2100 OR OCCUPANCY REQUIREMENTS AND LOCAL BUSINESS TAX RECEIPT AT 305) 270-4949.

1/ 2/2019 15:26 MORAZAN 27190102005O TCPM939J CENTRAL 346.11




# Detail by Entity Name

Florida Profit Corporation
4 SOUND GROUP, INC.

**Filing Information**

| | |
|---|---|
| **Document Number** | P05000018722 |
| **FEI/EIN Number** | 20-2289036 |
| **Date Filed** | 02/04/2005 |
| **State** | FL |
| **Status** | ACTIVE |
| **Last Event** | AMENDMENT |
| **Event Date Filed** | 08/24/2016 |
| **Event Effective Date** | NONE |

**Principal Address**

7475 NW 7th STREET
MIAMI, FL 33126

Changed: 04/25/2016

**Mailing Address**

7475 NW 7th STREET
MIAMI, FL 33126

Changed: 04/25/2016

**Registered Agent Name & Address**

GONZALEZ, JOSE J
2330 NW 102 AVE.
BAY # 3
DORAL, FL 33172

Address Changed: 06/22/2010

**Officer/Director Detail**

**Name & Address**

Title D

GONZALEZ, JOSE J
7475 NW 7TH ST
MIAMI, FL 33126

**Annual Reports**

| Report Year | Filed Date |
|---|---|
| 2018 | 03/21/2018 |
| 2019 | 04/03/2019 |
| 2020 | 05/21/2020 |

**Document Images**

| | |
|---|---|
| 05/21/2020 -- ANNUAL REPORT | View image in PDF format |
| 04/03/2019 -- ANNUAL REPORT | View image in PDF format |
| 03/21/2018 -- ANNUAL REPORT | View image in PDF format |
| 03/16/2017 -- ANNUAL REPORT | View image in PDF format |
| 08/24/2016 -- Amendment | View image in PDF format |
| 04/25/2016 -- ANNUAL REPORT | View image in PDF format |
| 03/25/2015 -- ANNUAL REPORT | View image in PDF format |
| 03/27/2014 -- ANNUAL REPORT | View image in PDF format |
| 03/26/2013 -- ANNUAL REPORT | View image in PDF format |
| 03/31/2012 -- ANNUAL REPORT | View image in PDF format |
| 03/18/2011 -- ANNUAL REPORT | View image in PDF format |
| 06/22/2010 -- ANNUAL REPORT | View image in PDF format |
| 04/29/2009 -- ANNUAL REPORT | View image in PDF format |
| 03/11/2008 -- ANNUAL REPORT | View image in PDF format |
| 04/26/2007 -- ANNUAL REPORT | View image in PDF format |
| 04/07/2006 -- ANNUAL REPORT | View image in PDF format |
| 02/04/2005 -- Domestic Profit | View image in PDF format |

ACORD®

# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 09/17/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

| PRODUCER | CONTACT NAME: Adriana L Clavijo Mauri |
|---|---|
| Excellence Insurance, LLC<br>3801 SW 107th Ave<br>Miami FL 33165 | PHONE (A/C, No, Ext): (305) 226-3900 FAX (A/C, No): (305) 226-3997<br>E-MAIL ADDRESS: certificates@aaunderwriters |

| INSURER(S) AFFORDING COVERAGE | | NAIC # |
|---|---|---|
| INSURER A : | Century Surety Company | 36951 |
| INSURER B : | Progressive Express Insurance Company | 10193 |
| INSURER C : | Ascendant Commercial Insurance Incorporated | 13683 |
| INSURER D : | | |
| INSURER E : | | |
| INSURER F : | | |

INSURED
4 Sound Group, Inc
7475 NW 7 Street
Miami FL 33126-

**COVERAGES** **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | TYPE OF INSURANCE | ADDL INSD | SUBR WVD | POLICY NUMBER | POLICY EFF (MM/DD/YYYY) | POLICY EXP (MM/DD/YYYY) | LIMITS | |
|---|---|---|---|---|---|---|---|---|
| A | [X] COMMERCIAL GENERAL LIABILITY<br>[ ] CLAIMS-MADE [X] OCCUR<br>[X] Blanket Additional Insurance<br>[X] Blanket Waiver of Subrogation<br>GEN'L AGGREGATE LIMIT APPLIES PER<br>[X] POLICY [ ] PRO-JECT [ ] LOC<br>[X] OTHER Primary and Non Contribu | Y | | CCP-913457 | 07/01/2020 | 07/01/2021 | EACH OCCURRENCE<br>DAMAGE TO RENTED PREMISES (Ea occurrence)<br>MED EXP (Any one person)<br>PERSONAL & ADV INJURY<br>GENERAL AGGREGATE<br>PRODUCTS - COMP/OP AGG<br>$ | $ 2,000,000<br>$ 100,000<br>$ 5,000<br>$ 2,000,000<br>$ 2,000,000<br>$ 2,000,000<br>$ |
| B | AUTOMOBILE LIABILITY<br>ANY AUTO<br>OWNED AUTOS ONLY [ ]<br>HIRED AUTOS ONLY [ ]<br>[X] SCHEDULED AUTOS<br>NON-OWNED AUTOS ONLY [ ]<br>[X] PIP $ 10,000 | | | 02149332-4 | 04/08/2020 | 04/08/2021 | COMBINED SINGLE LIMIT (Ea accident)<br>BODILY INJURY (Per person)<br>BODILY INJURY (Per accident)<br>PROPERTY DAMAGE (Per accident)<br>$ | $<br>$ 100,000<br>$ 300,000<br>$ 50,000<br>$ |
| | [ ] UMBRELLA LIAB [ ] OCCUR<br>[ ] EXCESS LIAB [ ] CLAIMS-MADE<br>[ ] DED [ ] RETENTION $ | | | | | | EACH OCCURRENCE<br>AGGREGATE<br>$ | $<br>$<br>$ |
| C | WORKERS COMPENSATION AND EMPLOYERS' LIABILITY<br>ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [N]<br>If yes, describe under DESCRIPTION OF OPERATIONS below | N/A | | WC-73381-1 | 11/22/2019 | 11/22/2020 | [X] PER STATUTE [ ] OTH-ER<br>E L EACH ACCIDENT<br>E.L. DISEASE - EA EMPLOYEE<br>E L DISEASE - POLICY LIMIT | <br>$ $1,000,000<br>$ $1,000,000<br>$ $1,000,000 |

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Certificate Holder is named as Additional Insured with respect to General Liability policy. at least thirty (30) days days written notice according with the policy provisions.

**CERTIFICATE HOLDER**

City of Doral
Building Department
8401 NW 53rd Terrace 2nd floor,
Doral, FL 33166

**CANCELLATION**

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

# INVITATION TO QUOTE

1. **PURPOSE**

The City of Doral is seeking Quotes from qualified vendors to provide services for the City's Monthly Drive-In Movie event series (October 2020- February 2021).

The Screen Sizes being requested are:

- 36' width x 18' height (actual screen size) **(4 times - October, November, January, February)**
- 40' width x 20' height (actual screen size) **(1 time - December – Holiday screening).**

Services include, but is not limited to, the coordination and preparation of the necessary LED Screen, FM Transmitter (minimum 5 mile radius) and any Lighting components of the events; the installation and implementation of the aforementioned components; generator; permitting documents; support measures in this area before/during/after each event, and coordination with the City of Doral Parks & Recreation Department to achieve a high-quality event.

2. **INSTRUCTIONS**

The Bidder shall furnish necessary resources and services required to complete the project, in accordance with the scope of work and project specifications and drawings hereby incorporated and made a part of this ITQ and the contract documents, for the prices listed below.

Please provide a Total Proposed Price reflecting all project costs to successfully complete the project. Work requirements will be specified in individual purchase orders issued the City of Doral

3. **TOTAL COST**

Quotes shall include all details, a detailed breakdown of materials, labor/services, and travel determined to be necessary by the vendor in providing the goods and services. Prices shall reflect all discounts consistent with the cooperative's contract award to vendor. Vendor shall identify the cooperative name and contract award number on the quote.

4. **VENDOR AGREEMENT**

Any contract or agreement resulting from this Invitation to Quote shall be executed as a Professional Services Agreement between the city and the bidder.

5. **LEGAL REQUIREMENTS**

Bidders are advised that this Invitation to Quote is subject to all requirements contained in all applicable Federal and State Statutes, City Ordinances, and to the Standard Terms and Conditions and the purchasing policies and guidelines of the City of Doral. Where a conflict may exist between this solicitation and any statute, policy or guideline, the higher authority shall prevail.

**6. MINIMUM INSURANCE REQUIREMENT**

Commercial General Liability

A. Limits of Liability

Bodily Injury & Property Damage Liability

| | |
|---|---|
| Each Occurrence | $1,000,000.00 |
| Policy Aggregate | $1,000,000.00 |
| Personal & Adv. Injury Liability | $1,000,000.00 |
| Products/Completed Operations | $1,000,000.00 |

B. Endorsements Required

City of Doral listed as an additional insured

Primary Insurance Clause Endorsement

Contingent and Contractual Liability

Premises and Operations Liability

Combined Automobile Liability (Required) $300,000.00

Owned, Scheduled Autos, including

Hired, Non-Owned Autos and food trucks

City of Doral listed as an additional insured

Workers Compensation (Required by Florida Statute for more than 4 employees. Proof is required)

Employer's Liability – Statutory Requirements - State of Florida

Limits of Liability

| | |
|---|---|
| Bodily injury caused by an accident; each accident | $100,000.00 |
| Bodily injury caused by disease; each employee | $100,000.00 |
| Bodily injury caused by disease; policy limit | $500,000.00 |

**7. EVALUTATION AND AWARD**

Proposals submitted will be evaluated to ensure all items requested as outlined in sections above are included and that bidders meet minimum requirements. Award will be made to the lowest, most responsive, responsible bidder.

**8. REFERENCES**

Bidders shall provide three (3) references where they have provided and performed similar work as being requested in this ITQ within the last two (2) years. Reference list shall include information as identified in the template below. Government references encouraged, but not required.

| | |
|---|---|
| Type of Project: | Calle 8 Festival |
| Company Name: | Kiwanis Club of Little Havana |
| Address: | 1400 SW 1st |

| | |
|---|---|
| City, State, Zip Code: | MIAMI FL 33135 |
| Contact Person: | TERESA CALLAVA |
| Email Address: | TCALLAVA@KIWANISLITTLEHAVANA.ORG |
| Telephone Number: | 305 - 644-8888, EXT 4 |
| Dates of Service: | 03/10/2019 |
| Date of Project Completion: | 03/10/2019 |
| | |
| Type of Project: | COLONIA HOLIDAY PARTY |
| Company Name: | WOW MKT6 |
| Address: | 800 DOUGLAS RD. LA PUERTA DEL SOL, SUITE 105 |
| City, State, Zip Code: | CORAL GABLES, FL 33134 |
| Contact Person: | YOLY SOLANO |
| Email Address: | YOLY@WOWMKT6.COM |
| Telephone Number: | 305-273-8373 EXT 101 |
| Dates of Service: | 12/06/2019 - 12/08/2019 |
| Date of Project Completion: | 12/09/2019 |
| | |
| Type of Project: | PRODUCTION FOR GILBERTO SANTA ROSA |
| Company Name: | LOUD AND LIVE |
| Address: | 2301 NW 87TH AVE |
| City, State, Zip Code: | DORAL, FL 33172 |
| Contact Person: | SARIBEL SOSA |
| Email Address: | SDELBUSTO@LOUDLIVE.COM |
| Telephone Number: | 305-456-5444 EXT 429 |
| Dates of Service: | 03/01/2020 |
| Date of Project Completion: | 03/01/2020 |

# City of Doral

## ITQ No. 2020-001 Drive-in Movie Event Series
## Collision Repair and Body Work Services
## Addendum No. 1

# PRICING FORM

**1. INVITATION TO QUOTE REQUIREMENTS - DRIVE-IN MOVIE EVENT SERIES**

i. Quotes for service shall include all the services listed above under "Purpose" section covered under the Drive-in Movie event series.

ii. Bidders shall have a record of performance and operation within Florida for a three-year (3) period immediately preceding this Invitation to Quote (ITQ).

iii. Bidders shall be required to have a valid Certificate of Insurance meeting the limits set forth by the City of Doral. The City of Doral must be listed as additionally insured. The Certificate of Insurance will be submitted after being awarded and must be approved by the City prior to entering into an agreement with the Bidder.

iv. Bidders shall have sufficient financial support, equipment and organization to ensure that they can satisfactorily execute the services if awarded a Contract under the terms and conditions herein stated.

v. Bidder must be fully licensed to perform the work described herein and shall comply with all applicable Federal/State Statutes and local codes and ordinances. Bidder must have at least one of the following licenses active at time of bid submittal:
   - State of Florida General Contractor License
   - Miami-Dade County General Contractor License
   - State of Florida Building Contractor License
   - Miami-Dade County Building Contractor License
   - Miami Dade County Specialty License for Miscellaneous Metals

**2. INFORMATON TO INCLUDE IN QUOTE**

a. <u>Proposal submitted shall include all services outlined below as part of the Drive-in Movie event and be included in the total proposed cost.</u>
   i. Outdoor LED screen meeting sizes requested (36'x 18') & (40' x 18'). All screens must have the proper ground support.
   ii. Auxiliary/Playback device (DVD Player, Video software, Laptop etc.) to transmit movie to screen.
   iii. FM Transmitter for Radio Stereo Station (minimum 5-mile radius).
   iv. All drawings, specifications and calculations needed for permitting & inspections.

v. 36 kW (45 kVA) Ultra-silent power generator and all necessary equipment needed to power the LED Screen including proper electrical hook-ups, cable ramps, sound & lights, monitor mixing towers, flying hardware, misc. cabling etc.
vi. Any Lighting components needed for screen
vii. AV Labor/Personnel to set up, operate and tear down equipment
viii. Structure Representative to oversee LED structure and make final decisions regarding safety during inclement weather.
ix. Installation and implementation of the aforementioned components; support measures in this area before/during/after each event, and coordination with the City of Doral Parks & Recreation Department.
x. Quote shall not include tax as the City is Sales Tax-Exempt.

b. Bidder must include copies of all required licenses as well as any additional required supporting documents.

**3. PRICE PROPOSAL SIGNATURE**

The information in this Invitation to Quote is to be utilized solely for preparing the proposal response to this ITQ and does not constitute a commitment by City of Doral to procure any product or service in any volume.

| Item No. | Description | Unit of Measure | Price |
|---|---|---|---|
| 1 | Rental of **36' width x 18' height** (actual screen size) to include labor and all components identified in Sections 9 & 10. **(4 times – (1) October, (1) November, (1) January, (1) February)** | LUMP SUM | $ 38420.00 |
| 2 | Rental of **40' width x 20' height** (actual screen size) to include labor and all components identified in Sections 9 & 10. **(1 time - December – Holiday screening** | LUMP SUM | 11005.00 |
| | | **TOTAL** | $ 49425.00 |

NOTE: DUE TO THE SIZE & HEIGHT OF THE LED SCREEN, WE HIGHLY RECOMMEND TO INSTALL 4 GROUND SUPPORT TOWERS. SAFETY IS OUR PRIORITY.

| | |
|---|---|
| Name: | Yuliet Lopez |
| Title: | OFFICE MANAGER |
| Date: | 09/21/2020 |
| Signature: | |

# 4SOUND

Quote

(305) 267.3437
7475 NW 7 Street • Miami, FL 33126
www.4soundgroup.com
info@4soundgroup.com

Quotation Date 9/16/2020

Date of Event 10/23/2020

Name / Address

City Of Doral
8401 NW 53 Terrace
Doral, FL 33166

Terms 50% Due at Acceptance

| Qty | Description | Total |
|---|---|---|
| | ITQ NO. 2020-001 | |
| | DRIVE IN MOVIES EVENT SERIES<br>(1 time October, 1 time November, 1 time January, 1 time February) | |
| 1 | 36 X 18 Aurora, 6mm OUTDOOR LED SCREEN | 48,400.00T |
| 242 | Aurora 1.7X1.7, 6mm LED Pannel | 0.00T |
| 1 | MAGNIMAGE 550 LED PROCESSOR (((((((FREE))))))))))))) | 0.00T |
| 1 | MACBOOK PRO W/ PRO VIDEO SOFTWARE ((((((FREE)))))))))) | 0.00T |
| 1 | LED STRUCTURE | 12,640.00T |
| 4 | Applied Electronic GS-35 12" Truss Tower: Max Weight Rating - 2000 lbs. at 35' | 0.00T |
| 16 | 8 Ft Applied Electronic PRT Truss | 0.00T |
| 4 | CM-1TON Chain Motor | 0.00T |
| 1 | ULTRA SILENT MQ 45 KVA POWER GENERATOR W/ DIESEL AND DELIVERY | 2,000.00T |
| 1 | 250 AMP POWER DISTRO,W/ FEEDER CABLES (((FREE)))) | 0.00T |
| 1 | RVR Blues 30NV FM MONO/MPX/STEREOExciter 10 KHZ | 600.00T |
| | SUBTOTAL | 63,640.00 |
| | SPECIAL DISCOUNT ON THE EQUIPMENT | -32,820.00 |
| | LABOR FOR 4 DAYS | |
| 1 | 4SOUND-AUDIO VISUAL TECH | 1,600.00T |
| 6 | ASSISTANT FOR SET UP AND BREAKDOWN | 6,000.00T |
| | DELIVERY & PICK UP ((((FREE))) | 0.00T |

| | |
|---|---|
| Subtotal | $38,420.00 |
| Sales Tax (0.0%) | $0.00 |
| Total | $38,420.00 |

4SOUND
(305) 267.3437
7475 NW 7 Street • Miami, FL 33126
www.4soundgroup.com
info@4soundgroup.com

# Quote

Quotation Date 9/17/2020

Date of Event 12/11/2020

Name / Address

City Of Doral
8401 NW 53 Terrace
Doral, FL 33166

Terms 50% Due at Acceptance

| Qty | Description | Total |
|---|---|---|
| | ITQ NO. 2020-001 | |
| | DRIVE IN MOVIES EVENT SERIES<br>(1 time in December) | |
| 1 | 40 X 20 Aurora, 6mm OUTDOOR LED SCREEN | 14,400.00T |
| 288 | Aurora 1.7X1.7, 6mm LED Pannel | 0.00T |
| 1 | MAGNIMAGE 550 LED PROCESSOR (((((FREE))))))))) | 0.00T |
| 1 | MACBOOK PRO W/ PRO VIDEO SOFTWARE ((((((((((FREE)))))))))) | 0.00T |
| 1 | LED STRUCTURE | 3,160.00T |
| 4 | Applied Electronic GS-35 12" Truss Tower: Max Weight Rating - 2000 lbs. at 35' | 0.00T |
| 16 | 8 Ft Applied Electronic PRT Truss | 0.00T |
| 4 | CM-1TONS CHAIN MOTOR | 0.00T |
| 1 | ULTRA SILENT MQ 45 KVA POWER GENERATOR W/ DIESEL AND DELIVERY | 500.00T |
| 1 | 250 AMP POWER DISTRO,W/ FEEDER CABLES (((FREE)))) | 0.00T |
| 1 | RVR Blues 30NV FM MONO/MPX/STEREOExciter 10 KHZ | 150.00T |
| | SUBTOTAL | 18,210.00 |
| | SPECIAL DISCOUNT ON THE EQUIPMENT | -9,105.00 |
| | LABOR FOR ONE DAY | |
| 1 | 4SOUND-AUDIO VISUAL TECH | 400.00T |
| 6 | ASSISTANT FOR SET UP AND BREAKDOWN | 1,500.00T |
| | DELIVERY & PICK UP ((((FREE))) | 0.00T |

| | |
|---|---|
| Subtotal | $11,005.00 |
| Sales Tax (0.0%) | $0.00 |
| Total | $11,005.00 |

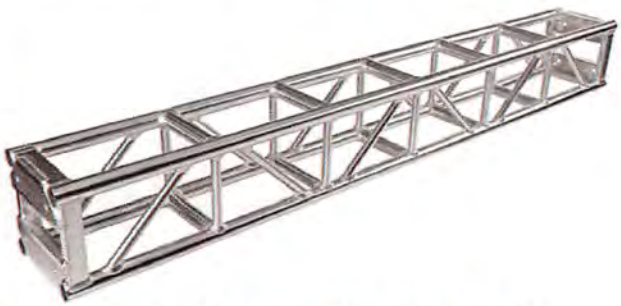
Applied Truss and Electronics

# SPECIALTY TRUSS
# 12"x12" Heavy Duty Box

## PLATED FEATURES

Highly Polished Aluminum Tubing
1.9" OD 6061-T6 Aluminum Tube Schd #40
0.145" Wall Thickness
1.05" OD Aluminum Bracing
Fabricated By Certified Welders
Custom Lengths & Corners Available
Powder Coating Available

Applied Electronics Heavy Duty 12" Box Truss is manufactured with schedule 40, 1.9" OD x 0.145" wall main chords and 1.05" OD x 0.125" wall diagonal bracing. All components are 6061-T6 aluminum tubing and 5/8" grade 8 bolts are included for assembly of the truss elements. Heavy Duty 12" truss, combined with the matching corner blocks, can be used to construct a grid.



**PLATED ALLOWABLE LOAD DATA**


| SPAN (ft.) | LOAD (#/ft.) | LOAD (#) | MAX. DEFL. (in.) | LOAD (#) | MAX. DEFL. (in.) |
|---|---|---|---|---|---|
| 10 | 380 | 3800 | 0.250 | 1600 | 0.202 |
| 20 | 114 | 2280 | 0.940 | 900 | 0.660 |
| 30 | 44 | 1320 | 1.730 | 770 | 1.630 |
| 40 | 20 | 800 | 2.781 | 420 | 2.312 |

*Connection: 5/8" Dia. x 2" Grade 8 Bolts*

**Weight Load Certified By Structural Engineer **SINGLE USE****

## PLATED ORDERING INFORMATION

| Item No. | Dimensions | Weight |
|---|---|---|
| 9-12-120 | 12" x 12" x 10' | 63 lbs. |
| 9-12-096 | 12" x 12" x 8' | 55 lbs. |
| 9-12-060 | 12" x 12" x 5' | 39 lbs. |
| 9-12-030 | 12" x 12" x 2.5' | 24 lbs. |
| 9-12-004 | 4-Way Corner | 22 lbs. |
| 9-12-005 | 5-Way Corner | 25 lbs. |
| 9-12-006 | 6-Way Corner | 28 lbs. |

## SPIGOTED FEATURES

Highly Polished Aluminum Tubing
1.9" OD 6061-T6 Aluminum Tube Schd #80
0.200" Wall Thickness
1.05" OD Aluminum Bracing
Steel Spigots and Pins
Fabricated By Certified Welders
Custom Lengths & Corners Available
Powder Coating Available

## SPIGOTED ORDERING INFORMATION

| Item No. | Dimensions | Weight |
|---|---|---|
| 13-11-120 | 12" x 12" x 10' | 81 lbs. |
| 13-11-096 | 12" x 12" x 8' | 65 lbs. |
| 13-11-060 | 12" x 12" x 5' | 39 lbs. |
| 13-11-030 | 12" x 12" x 2.5' | 30 lbs. est |
| 13-11-002 | 2-Way Corner | 30 lbs. est |
| 13-11-004 | 4-Way Corner | 35 lbs. est |
| 13-11-005 | 5-Way Corner | 40 lbs. est |

**SPIGOTED ALLOWABLE LOAD DATA**


| SPAN (ft.) | LOAD (#/ft.) | LOAD (#) | MAX. DEFL. (in.) | LOAD (#) | MAX. DEFL. (in.) |
|---|---|---|---|---|---|
| 10 | 355 | 3550 | 0.167 | 2500 | 0.192 |
| 20 | 165 | 3300 | 0.691 | 1800 | 0.641 |
| 30 | 84 | 2520 | 1.688 | 1275 | 1.361 |
| 40 | 44 | 1760 | 3.204 | 875 | 2.466 |

*Connection: Steel Spigots and 3/4" x 2-1/2" Clevis Pins*

**Weight Load Certified By Structural Engineer **SINGLE USE****

CLARK | REDER
ENGINEERING

3/23/2015

Applied Electronics
722 Blue Crab Road
Newport News, VA 23606
Attn: Max A. Wilson

4 Sound Roof Certification
CRE Project # 15.415.10

Dear Max,

We have completed our analysis for the above referenced project for conformance to the structural provisions of the 2012 International Building Code. The enclosed calculations are a representation of our analysis and results. The engineering seal on this cover letter shall apply to all calculations contained herein.

Analysis was performed on a ground support roof structure. The structure is approximately 43ft wide, 34ft deep and 31ft in height. Stage left and right of the roof grid are (2) sound bays extending approximately 15 feet. Self-weight, rigging and wind loads were the only loads considered in this analysis. Each member of the truss structures has been determined as adequate under the intended loads. Clark Reder Engineering Inc. should be consulted before applying loads in excess of those stated for design. Attached to this letter are load and ballast tables for your use.

Please note that a high wind action plan is included with this report and shall be strictly adhered to for the duration of any event.

We trust this information is suitable for your needs at this time. If you have any questions, please do not hesitate to contact our office.

Regards,
**Clark-Reder Engineering, Inc.**


03/23/2015

Andrew L. Savage, E.I.T. — 03/23/2015

Jeffrey M. Reder, P.E.
FL Registration No.: 68622

CLARK | REDER
ENGINEERING

# GENERAL STRUCTURAL NOTES

## CODES AND REFERENCE

1. 2012 INTERNATIONAL BUILDING CODE
2. ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
3. ASCE 37-02 DESIGN LOADS ON STRUCTURES UNDER CONSTRUCTION
4. ANSI E1.21-2013 ENTERTAINMENT TECHNOLOGY, "TEMPORARY STRUCTURES USED FOR TECHNICAL PRODUCTION OF OUTDOOR ENTERTAINMENT EVENTS"
5. ANSI E1.2-2012 ENTERTAINMENT TECHNOLOGY, "DESIGN, MANUFACTURE AND USE OF ALUMINUM TRUSSES AND TOWERS"
6. ALUMINUM DESIGN MANUAL, 2010 EDITION

## DESIGN LOADS

1. DEAD LOAD: SELFWEIGHT OF STRUCTURE
2. RIGGING LOADS: SEE ATTACHED LOAD TABLES
3. WIND LOAD:
   - A. DESIGN WIND SPEED: 67 MPH* (BARE STRUCTURE – NO SIDEWALL SCRIM)
   - B. DESIGN WIND SPEED: 30 MPH (WITH SIDEWALL SCRIM – SEE HIGH WIND ACTION PLAN)
   - C. EXPOSURE: C
   - D. IMPORTANCE FACTOR: 1.0
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.

## 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.

## BALLAST

1. BALLAST SHALL BE INSTALLED PER THE ENGINEERING DRAWINGS. DEVIATIONS IN WEIGHT OR PLACEMENT SHALL BE APPROVED IN WRITING BY THE ENGINEER OF RECORD.
2. BALLAST SHALL NOT BE INSTALLED ON SLOPING GROUND, GRAVEL OR ICE UNLESS PRECAUTIONS ARE TAKEN TO PREVENT SLIDING OF THE BALLAST.
3. DUE TO VARIABILITY IN BALLAST MATERIALS AND GROUND SURFACES, IT IS RECOMMENDED THAT A HORIZONTAL PULL TEST BE PERFORMED TO VERIFY THAT SITE CONDITIONS MEET DESIGN ASSUMPTIONS. TO PERFORM THE HORIZONTAL PULL TEST, MEASURE THE FORCE REQUIRED TO SLIDE THE BALLAST ON A GROUND SURFACE REPRESENTATIVE OF THE GROUND SURFACE BALLAST WILL BE PLACED ON WHEN THE ROOF SYSTEM IS IN USE. FOR BALLAST ON CONCRETE GROUND SURFACE, THE FORCE REQUIRED TO SLIDE THE BALLAST SHALL BE 400 POUNDS FOR EVERY 1,000 POUNDS OF BALLAST. FOR BALLAST ON RUBBER MATS ON CONCRETE GROUND SURFACE, THE

FORCE REQUIRED TO SLIDE THE BALLAST SHALL BE 750 POUNDS FOR EVERY 1,000 POUNDS OF BALLAST. IF BALLAST SLIDES WITH LESS THAN THE REQUIRED FORCE, DOCUMENT TEST RESULTS AND CONTACT CLARK REDER ENGINEERING TO DETERMINE APPROPRIATE BALLAST PLAN.

4. BALLAST VALUES FOR "CONCRETE BALLAST ON RUBBER MATS ON CONCRETE SURFACE", IF PROVIDED, ASSUME USE OF RUBBER MATS SHOWN ON THE ATTACHED CUT SHEET. OTHER RUBBER MATS TESTED BY CLARK REDER ENGINEERING DID NOT PERFORM ADEQUATELY AND DO NOT PROVIDE SUFFICIENT SLIDING RESISTANCE.

## GROUND ANCHORS

1. ALL DETAILING, FABRICATION, AND ERECTION SHALL CONFORM TO THESE GENERAL NOTES AND ACCOMPANYING DRAWINGS AND SPECIFICATIONS.
2. GROUND ANCHORS:
   - A. GROUND ANCHORS SHALL BE MANUFACTURED BY FORESIGHT PRODUCTS OR TIGHTER INTERNATIONAL, OR EQUAL.
   - B. ANCHORS SHALL BE SET AND LOCKED ACCORDING TO MANUFACTURERS INSTALLATION PROCEDURE.
   - C. DURING INSTALLATION, ALL ANCHORS SHALL BE PROOF TESTED TO 1.5 TIMES THE REQUIRED ANCHORING FORCE.

## RIGGING

1. ALL POINTS SHALL BE DEAD HUNG POINTS.
2. ALL RIGGING SHALL BE HUNG FROM PANEL POINTS (LOCATIONS ON THE TRUSS CHORDS BRACED BOTH VERTICALLY AND HORIZONTALLY) UNLESS SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD.
3. BRIDLES SHALL NOT BE USED UNLESS SPECIFICALLY ALLOWED BY THE ENGINEER OF RECORD.

## ALUMINUM

1. ALUMINUM SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE ON THE DRAWINGS:
   - A. MEMBER ALLOY: 6005-T5 OR 6061-T6 OR 6005A-T6
   - B. CHANNELS, PLATES AND SHEETS: 6061-T6
   - C. WELD FILLER ALLOW: 4043, 5356, OR 5556
2. ALL DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO THE ALUMINUM ASSOCIATION ALUMINUM DESIGN MANUAL, CURRENT EDITION.
3. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY LATEST EDITION.
4. FIELD CONNECTIONS SHALL BE BOLTED UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS.
5. ALUMINUM TRUSS TO ALUMINUM TRUSS CONNECTION BOLTS: 5/8" DIAMETER GRADE 8 BOLTS

## 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 AND 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.

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# OPERATIONS MANAGEMENT PLAN

## IMPLEMENTATION OF PLAN

1. PRIOR TO EACH INSTALLATION, THE STAGE OWNER 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 GUY WIRES AND BALLAST ASSEMBLIES DAILY TO VERIFY LINES ARE TENSIONED AND BALLAST HAS NOT MOVED.
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 LIAISON 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. NOTED WIND SPEEDS ARE 3-SECOND GUSTS IN ACCORDANCE WITH ASCE 7
6. **WHEN THE ROOF SYSTEM IS UNATTENDED OR NOT IN USE**: THE GRID SHALL BE LOWERED TO THE GROUND AND SECURED.
7. **WHEN WIND SPEEDS ARE EXPECTED TO EXCEED 20 MPH**: A TEAM OF QUALIFIED PERSONNEL SHALL BE PUT ON ALERT. ALL NECESSARY PERSONNEL SHALL BE IN PLACE AND PUT ON STANDBY.
8. **WHEN WIND SPEEDS ARE EXPECTED TO EXCEED 30 MPH**: ALL SCRIM SHALL BE REMOVED FROM THE SYSTEM. ALL VIDEO WALLS AND LARGE SPEAKER CLUSTERS SHALL BE LOWERED TO THE GROUND AND SECURED. LOWERING OF SCRIM OR EQUIPMENT SHALL BE DONE FROM THE GROUND BY MEANS OF REMOTELY ACTIVATED EQUIPMENT SUCH AS MOTORS OR MECHANICAL RELEASES.
9. **WHEN WIND SPEEDS ARE EXPECTED TO EXCEED 40 MPH**: ALL SHOW OPERATIONS SHALL CEASE AND THE IMMEDIATE AREA SHALL BE EVACUATED. LOWER ROOF IF TIME PERMITS AND WIND SPEEDS ARE BELOW 15 MPH.
10. **AT WINDS SPEEDS IN EXCESS OF 50 MPH**, ALL PERSONNEL SHOULD MAINTAIN SAFE DISTANCE FROM THE ROOF SYSTEM.
11. 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.

12. FAILURE TO FOLLOW THE HIGH WIND ACTION PLAN MAY RESULT IN COLLAPSE OF THE ROOF SYSTEM, DAMAGE TO EQUIPMENT AND INJURY TO PERSONS.

## SNOW/RAIN REMOVAL

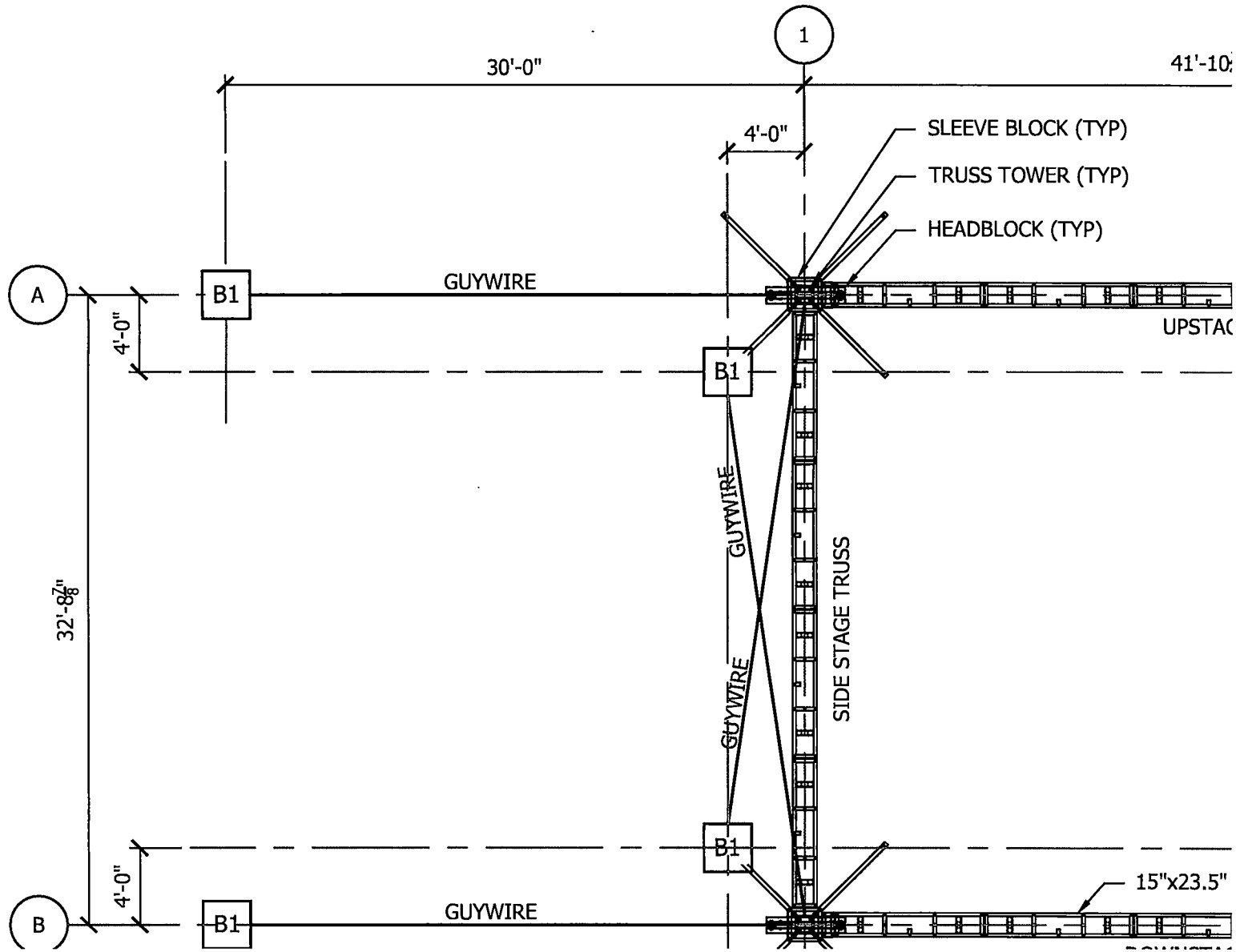
1. THE ROOF SKIN HAS NOT BEEN DESIGNED TO SUPPORT PONDED WATER OR SNOW. REMOVE ANY AND ALL SUCH ACCUMULATIONS.

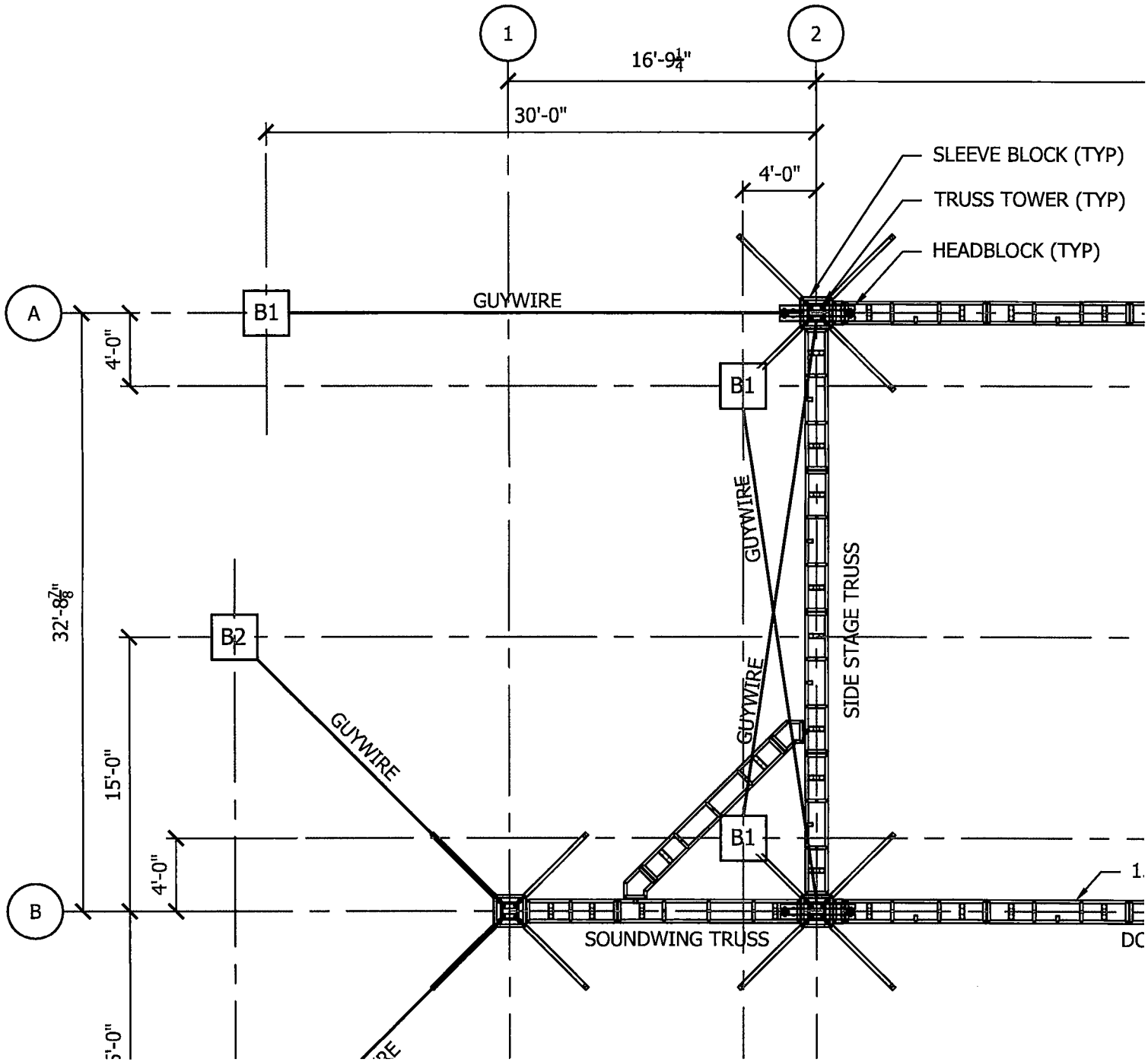
## SEISMIC LOADS

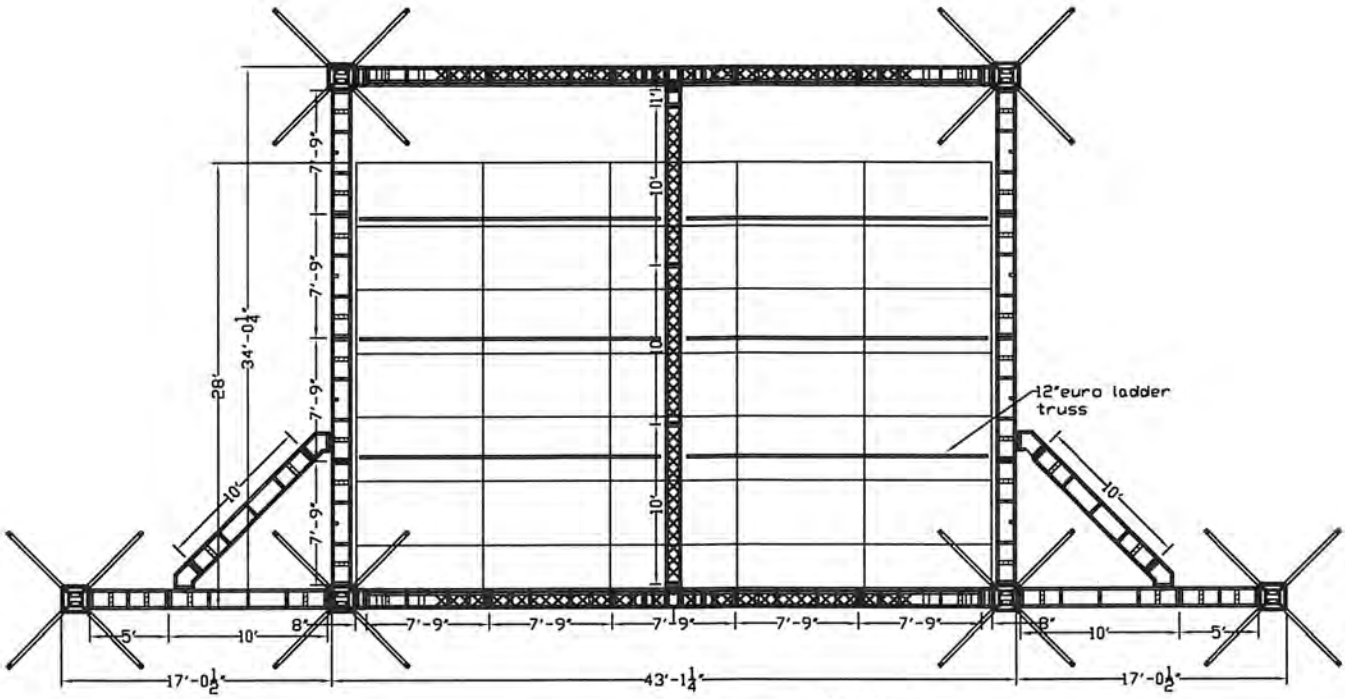
1. IN THE EVENT OF AN EARTHQUAKE, THE EVENT SHALL BE SUSPENDED UNTIL SUCH TIME THAT THE ROOF STRUCTURE HAS BEEN INSPECTED BY A COMPETENT PERSON ON SITE.

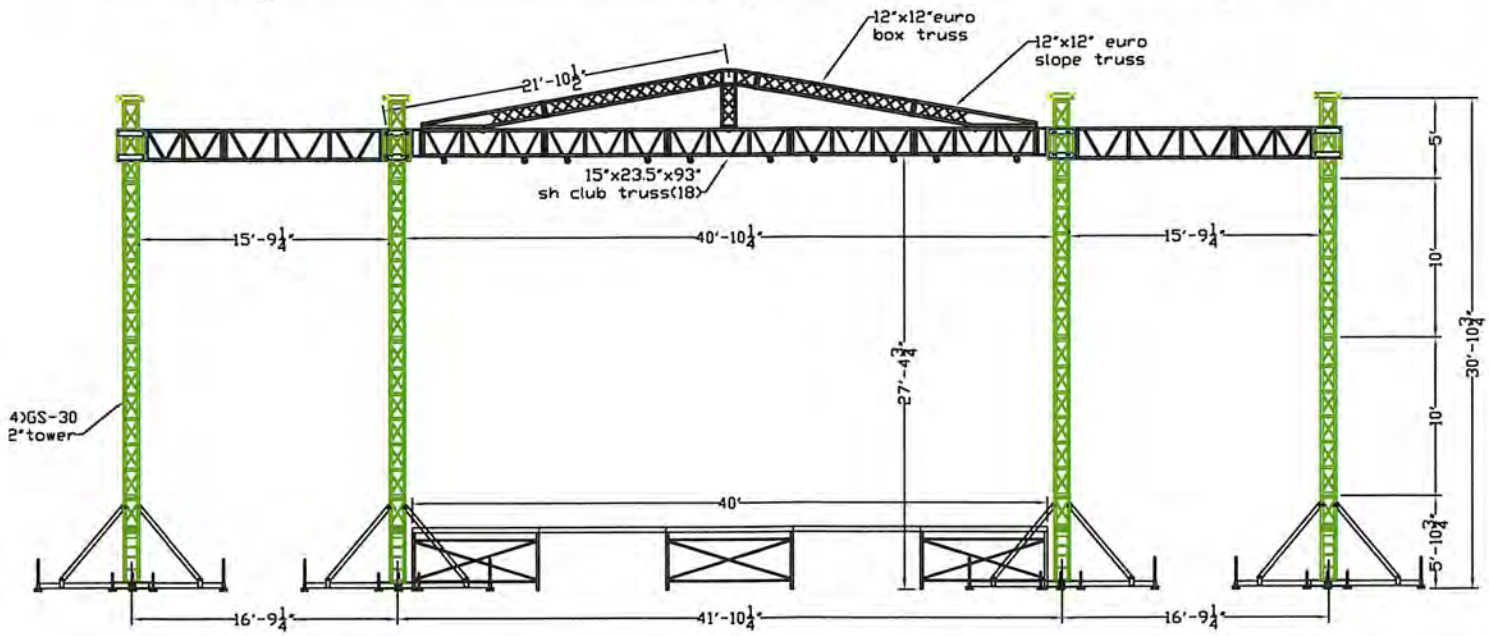
## ROOF HOISTING

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. GUY WIRES SHALL BE INSTALLED IMMEDIATELY AFTER ROOF HAS BEEN HOISTED TO TRIM HEIGHT.


1
30'-0"
41'-10
4'-0"
SLEEVE BLOCK (TYP)
TRUSS TOWER (TYP)
HEADBLOCK (TYP)
A
B1
GUYWIRE
4'-0"
UPSTAC
B1
GUYWIRE
GUYWIRE
SIDE STAGE TRUSS
32'-8 7/8"
B1
4'-0"
15"x23.5"
B
B1
GUYWIRE

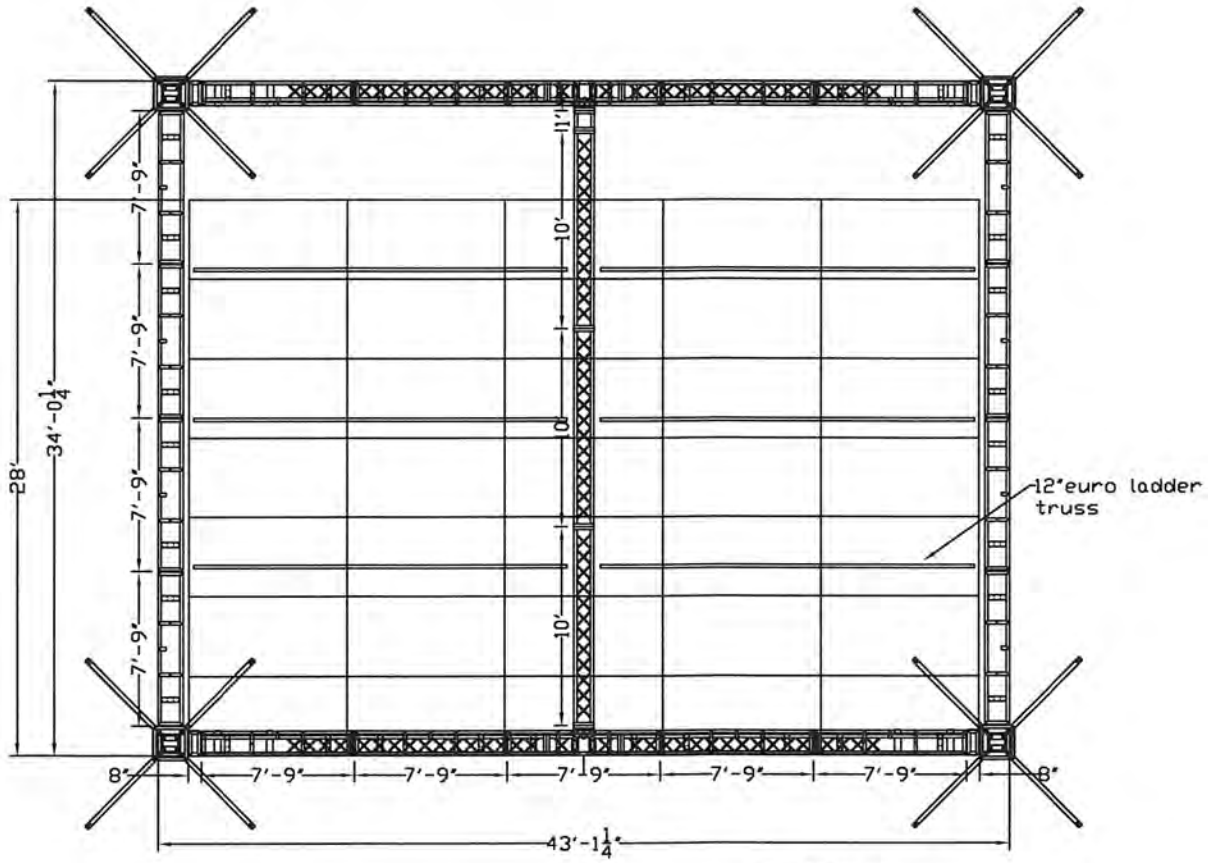

1
2
16'-9¼"
30'-0"
4'-0"
SLEEVE BLOCK (TYP)
TRUSS TOWER (TYP)
HEADBLOCK (TYP)
A
B1
GUYWIRE
4'-0"
B1
GUYWIRE
32'-8⅞"
B2
GUYWIRE
SIDE STAGE TRUSS
GUYWIRE
15'-0"
B1
4'-0"
B
SOUNDWING TRUSS

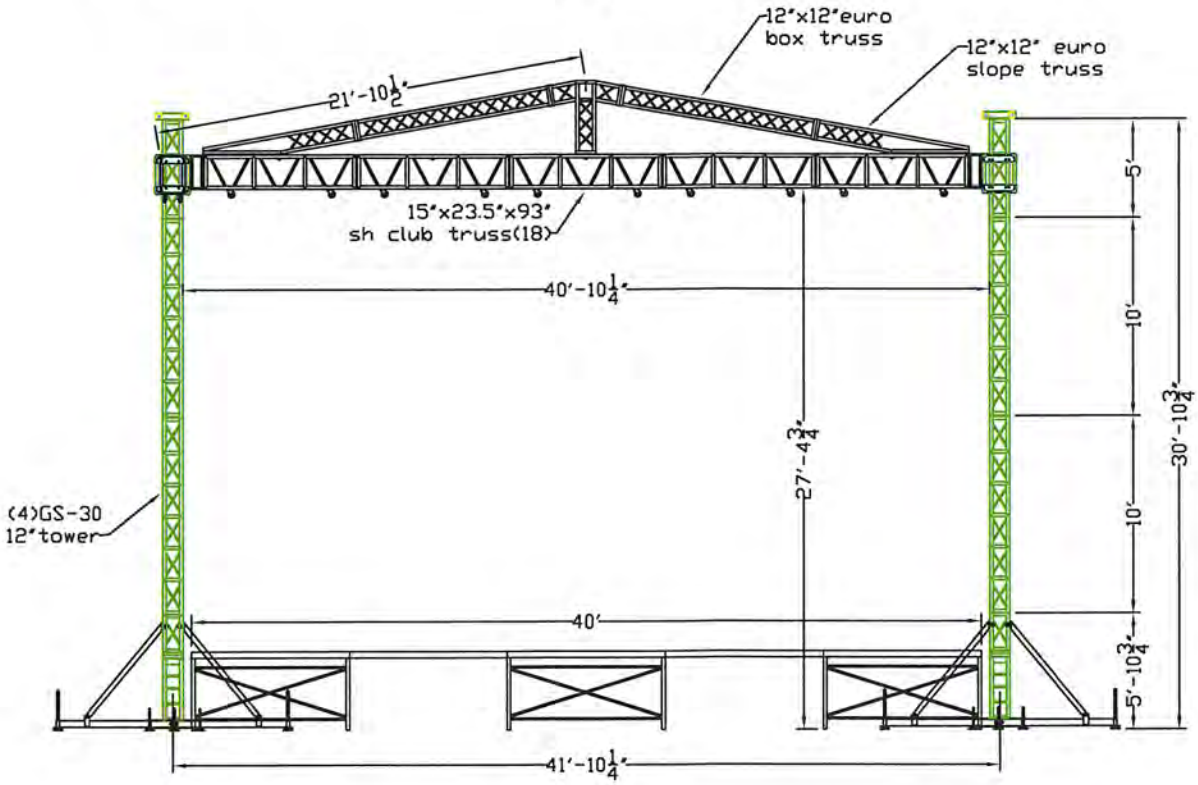



| | | | |
|---|---|---|---|
| Applied Electronics<br>Newport News, VA Made in USA | | | |
| MATERIAL AS NOTED | SCALE | DRAWN BY | GEM |
| 4 Sound<br>40' x 35' Peaked roof system, w/ sound wings | | | |
| DATE<br>09-01-14 | APPROVED BY | NO.<br>000 | DRAWING NUMBER<br>202938-sw |

APPROVED FOR PRODUCTION
SIGNATURE _____
DATE _____

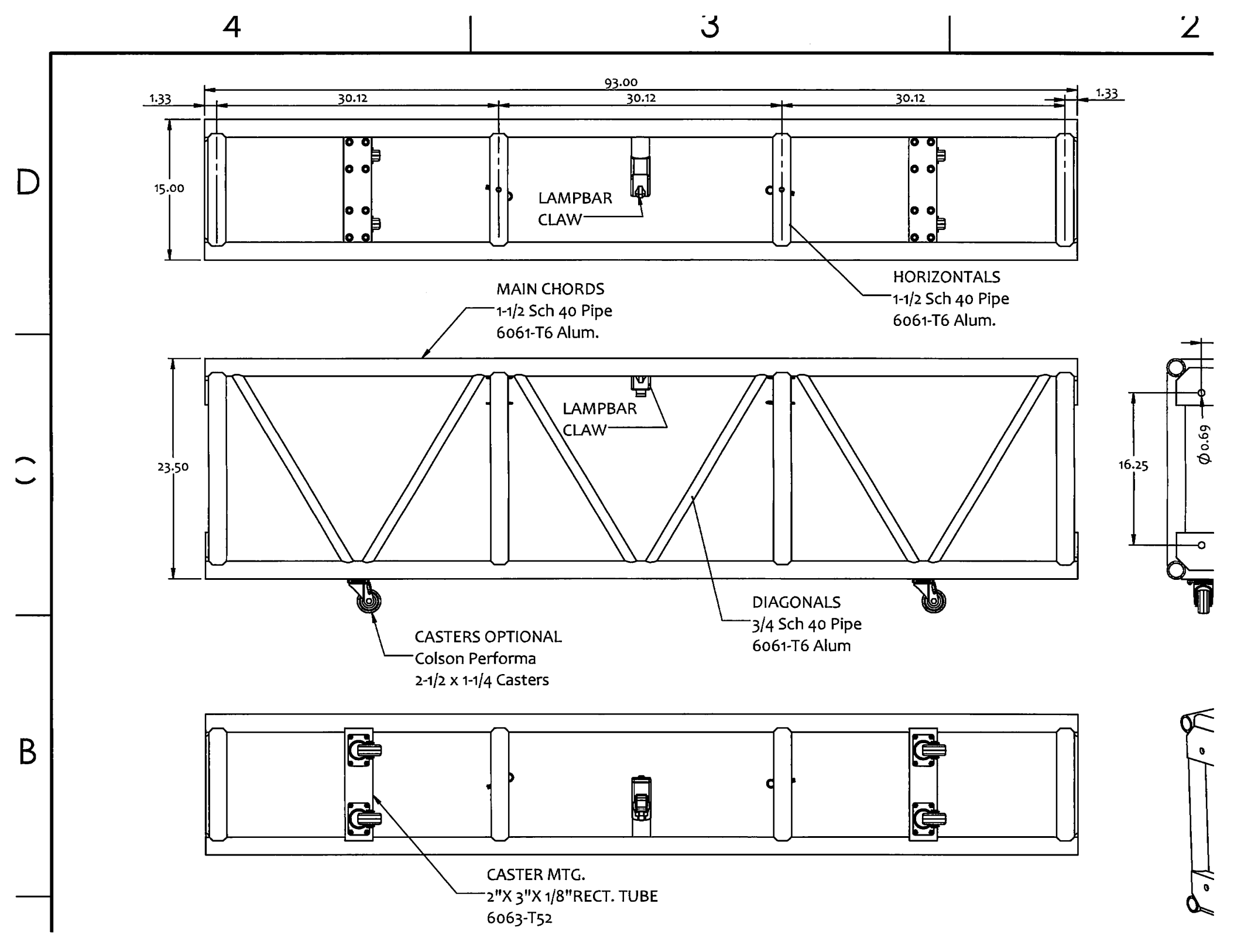



Applied Electronics
Newport News, VA Made in USA

| MATERIAL AS NOTED | SCALE | DRAWN BY GEM |
|---|---|---|
| 4 Sound 40" x 35' Peaked roof system, 12" tower truss | | |
| DATE 02-15-13 | APPROVED BY | WO# 000 |
| | | DRAWING NUMBER 202938 |

APPROVED FOR PRODUCTION BY: _____
DATE: _____


4
3
2
D
B
93.00
1.33
30.12
30.12
30.12
1.33
15.00
LAMPBAR
CLAW
HORIZONTALS
1-1/2 Sch 40 Pipe
6061-T6 Alum.
MAIN CHORDS
1-1/2 Sch 40 Pipe
6061-T6 Alum.
23.50
LAMPBAR
CLAW
16.25
ϕ0.69
DIAGONALS
3/4 Sch 40 Pipe
6061-T6 Alum
CASTERS OPTIONAL
Colson Performa
2-1/2 x 1-1/4 Casters
CASTER MTG.
2"X 3"X 1/8"RECT. TUBE
6063-T52

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# 4 Sounds Roof Certification

## Codes and Referenced Standards

- 2012 International Building Code
- Aluminum Design Manual, 2010 ed.
- American Institute of Steel Construction, Steel Construction Manual 14th Edition
- American Society of Civil Engineers 7-10 (ASCE 7-10) *"Minimum Design Loads for Buildings and Other Structures"*
- American Society of Civil Engineers 37-02 (ASC 37-02) *"Design Loads on Structures During Construction"*
- ANSI E 1.21-2006 *"Temporary Ground-Supported Overhead Structures Used To Cover Stage Areas and Support Equipment in the Production of Outdoor Entertainment Events"*
- ANSI E 1.2-2012 *"Manufacture and Use of Aluminum Trusses and Towers"*

## Project Description

This project is a temporary ground support roof system that is approximately 43ft wide, 34ft deep and 31ft to top of towers. The roof is pitched and supported by sloping 12in x 12in euro box truss spanning cross stage on the extreme upstage and downstage perimeter. Sloping ladder truss is used to support the roof spanning cross stage in 3 spans between the up and down stage perimeter. The main grid is bolt plate 20.5in x 20.5in HD Box Truss.

A second configuration of the roof will be the one described above in addition to (2) sound winds extending approximately ' stage left and right. In this configuration, a 10ft stick of truss will be grappled around midspan of the sound wing and at roug a 45 degree angle, connect back to the main grid.

## Analysis Assumptions/Design Criteria

- The roof is assumed to be supporting a roof skin as well as scrim on the back upstage face
- Both sound wings will be fully scrimmed

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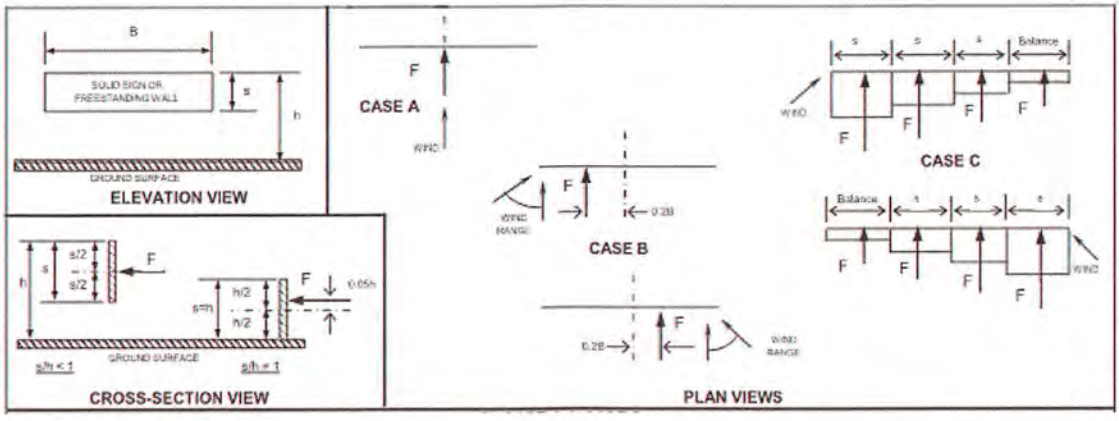
# Wind Loads on Solid Freestanding Walls & Solid Signs (ASCE 7-10)

*This Mathcad sheet calculates the wind pressures on a sign or scrim in accordance with figure 29.4-1 of ASCE 7-10.*




## Wind Velocity Pressure

*The velocity pressure below is calculated for two separate cases. The first case calculates a velocity pressure for an ultimate basic wind speed of 115 mph reduced in accordance with ASCE37-02. The second case calculates a velocity pressure for a lower wind speed which is applicable while the High Wind Action Plan (HWAP) is in place. The risk category is II. The forces calculated using the ultimate wind speed will be multiplied 0.6 below to determine the service wind forces used in allowable stress design. Since the HWAP wind speed is service wind speed, the wind forces for the HWAP wind speed will not be reduced by 0.6 making the ultimate and service wind forces the same.*

### Exposure Category B (Exposure Category C for HWAP)

Ultimate basic wind speed: $V_{uw} := 115$ mph

Service HWAP wind speed: $V_{hwap} := 30$ mph

*The ultimate basic wind speed of 115 mph is equivalent to a service wind speed of 89.1 mph. When the service wind speed is reduced in accordance with ASCE 37-02, the effective wind speed on the sign is 66.8 mph.*

Mean roof height: $h_{mean} := 30ft$

Gust effect factor: $G_w := 0.85$

Velocity pressure exposure coefficient: $K_z := 0.7$ $K_{z\_hwap} := .98$

Topographic factor: $K_{zt} := 1.0$

Wind directionality factor: $K_d := 0.85$

Reduction coefficient: $red := 0.75$ *per ASCE 37-02 reduction for structures installed for less than 6 weeks*

ASCE 37-02 Reduction Factor

***6.2.1 Design Velocity***

The design wind speed shall be taken as the following factor multiplied by the basic wind speed in ASCE 7-95:

| Construction Period | Factor |
|---|---|
| less than 6 weeks | 0.75 |
| 6 weeks to 1 year | 0.8 |
| 1 to 2 years | 0.85 |
| 2 to 5 years | 0.9 |

Ultimate wind velocity pressure: $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot (red \cdot V_{uw})^2 \cdot psf$ $q_z = 11.331 \cdot psf$

Service HWAP wind velocity pressure: $q_{z\_hwap} := 0.00256 \cdot K_{z\_hwap} \cdot K_{zt} \cdot K_d \cdot V_{hwap}^2 \cdot psf$ $q_{z\_hwap} = 1.919 \cdot psf$

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## Figure 29.4-1 - Solid Freestanding Walls & Solid Signs (ASCE 7-10)

### Sign Dimensions

Sign Width: $B_{sign} := 502in$

Top of sign height: $h_{sign} := 330in$

Vertical dimension of sign: $s_{sign} := 330in$

Aspect ratio, B/s: $B\_over\_s := \frac{B_{sign}}{s_{sign}} = 1.521$

Clearance ratio, s/h: $s\_over\_h := \frac{s_{sign}}{h_{sign}} = 1$

### Case A & B

Force coefficient: $C_{f\_AB} := 1.43$

Case A & B sign ultimate wind pressures

$p_{u\_sign\_AB} := q_z \cdot C_{f\_AB} \cdot G_w$ $\quad p_{u\_sign\_AB} = 13.773 \cdot psf$

$p_{u\_sign\_AB\_hwap} := q_{z\_hwap} \cdot C_{f\_AB} \cdot G_w$ $\quad p_{u\_sign\_AB\_hwap} = 2.333 \cdot psf$

Case A & B sign service wind pressures

$p_{s\_sign\_AB} := 0.6 \cdot p_{u\_sign\_AB}$ $\quad p_{s\_sign\_AB} = 8.264 \cdot psf$

$p_{s\_sign\_AB\_hwap} := p_{u\_sign\_AB\_hwap}$ $\quad p_{s\_sign\_AB\_hwap} = 2.333 \cdot psf$

Case A & B ultimate total sign wind load:

$P_{u\_sign\_AB} := p_{u\_sign\_AB} \cdot B_{sign} \cdot s_{sign}$ $\quad P_{u\_sign\_AB} = 15.845 \cdot kip$

$P_{u\_sign\_AB\_hwap} := p_{u\_sign\_AB\_hwap} \cdot B_{sign} \cdot s_{sign}$ $\quad P_{u\_sign\_AB\_hwap} = 2.684 \cdot kip$

Case A & B ultimate total sign wind load:

$P_{s\_sign\_AB} := 0.6 \cdot P_{u\_sign\_AB}$ $\quad P_{s\_sign\_AB} = 9.507 \cdot kip$

$P_{s\_sign\_AB\_hwap} := P_{u\_sign\_AB\_hwap}$ $\quad P_{s\_sign\_AB\_hwap} = 2.684 \cdot kip$

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## Figure 27.4-5 - Pitched Free Roofs on Open Buildings

| Roof Angle, θ | Load Case | Wind Direction, γ = 0°, 180° | | | |
|---|---|---|---|---|---|
| | | Clear Wind Flow | | ~~Obstructed Wind Flow~~ | |
| | | $C_{NW}$ | $C_{NL}$ | $C_{NW}$ | $C_{NL}$ |
| 7.5° | A | 1.1 | -0.3 | -1.6 | -1 |
| | B | 0.2 | -1.2 | -0.9 | -1.7 |
| 15° | A | 1.1 | -0.4 | -1.2 | -1 |
| | B | 0.1 | -1.1 | -0.6 | -1.6 |
| 22.5° | A | 1.1 | 0.1 | -1.2 | -1.2 |
| | B | -0.1 | -0.8 | -0.8 | -1.7 |
| 30° | A | 1.3 | 0.3 | -0.7 | -0.7 |
| | B | -0.1 | -0.9 | -0.2 | -1.1 |
| 37.5° | A | 1.3 | 0.6 | -0.6 | -0.6 |
| | B | -0.2 | -0.6 | -0.3 | -0.9 |
| 45° | A | 1.1 | 0.9 | -0.5 | -0.5 |
| | B | -0.3 | -0.5 | -0.3 | -0.7 |

Horizontal length of slope

$$L_{slope} := 2m + 16in = 7.895\,ft$$

Vertical height of slope

$$h_{slope} := 15ft - 9ft = 6\,ft$$

Roof Angle

$$\theta_{roof} := \operatorname{atan}\left(\frac{h_{slope}}{L_{slope}}\right) = 37.234\cdot deg$$

Net Pressure Coefficients

$C_{nwa} := 1.1$ $C_{nla} := -0.3$

$C_{nwb} := 0.2$ $C_{nlb} := -1.2$

$C_{nud} := 0.8$

*Coeff for wind parallel to ridge, typically upstage/downstage for pitched roofs. Acts both pos. & neg. Conservative to apply at this level to entire roof surface. May be reduced using Figure 27.4-7 (ASCE 7-10)*

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### Ultimate wind pressure

$p_{u\_roof\_nwa} := q_z \cdot G_w \cdot C_{nwa} = 10.595 \cdot psf$

$p_{u\_roof\_nla} := q_z \cdot G_w \cdot C_{nla} = -2.889 \cdot psf$

$p_{u\_roof\_nwb} := q_z \cdot G_w \cdot C_{nwb} = 1.926 \cdot psf$

$p_{u\_roof\_nlb} := q_z \cdot G_w \cdot C_{nlb} = -11.558 \cdot psf$

$p_{u\_roof\_nud} := q_z \cdot G_w \cdot C_{nud} = 7.705 \cdot psf$

$p_{u\_roof\_nwa\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{nwa} = 1.794 \cdot psf$

$p_{u\_roof\_nla\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{nla} = -0.489 \cdot psf$

$p_{u\_roof\_nwb\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{nwb} = 0.326 \cdot psf$

$p_{u\_roof\_nlb\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{nlb} = -1.958 \cdot psf$

$p_{u\_roof\_nud\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{nud} = 1.305 \cdot psf$

### Service wind pressure

$p_{s\_roof\_nwa} := 0.6 \cdot p_{u\_roof\_nwa} = 6.357 \cdot psf$

$p_{s\_roof\_nla} := 0.6 \cdot p_{u\_roof\_nla} = -1.734 \cdot psf$

$p_{s\_roof\_nwb} := 0.6 \cdot p_{u\_roof\_nwb} = 1.156 \cdot psf$

$p_{s\_roof\_nlb} := 0.6 \cdot p_{u\_roof\_nlb} = -6.935 \cdot psf$

$p_{s\_roof\_nud} := 0.6 \cdot p_{u\_roof\_nud} = 4.623 \cdot psf$

$p_{s\_roof\_nwa\_hwap} := p_{u\_roof\_nwa\_hwap} = 1.794 \cdot psf$

$p_{s\_roof\_nla\_hwap} := p_{u\_roof\_nla\_hwap} = -0.489 \cdot psf$

$p_{s\_roof\_nwb\_hwap} := p_{u\_roof\_nwb\_hwap} = 0.326 \cdot psf$

$p_{s\_roof\_nlb\_hwap} := p_{u\_roof\_nlb\_hwap} = -1.958 \cdot psf$

$p_{s\_roof\_nud\_hwap} := p_{u\_roof\_nud\_hwap} = 1.305 \cdot psf$

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**Figure 29.5-3 - Trussed Towers**

12" LD Truss

$$\varepsilon_{tr.12} := \frac{2\cdot(2in\cdot 10ft) + 7\cdot(1in\cdot 8in) + 2\cdot(2in\cdot 8in) + 6\cdot\left[1in\cdot\sqrt{(1.414\cdot 8in)^2\cdot 2}\right]}{12in\cdot 10ft} = 46.11\cdot\%$$

$$C_{f.tr.12} := \left(4.0\cdot\varepsilon_{tr.12}^{\ 2} - 5.9\cdot\varepsilon_{tr.12} + 4.0\right)\cdot\min\left(0.51\cdot\varepsilon_{tr.12}^{\ 2} + 0.57, 1.0\right) = 1.445$$

20.5" MD Truss

$$\varepsilon_{tr.20} := \frac{2\cdot(2in\cdot 10ft) + 2\cdot(2in\cdot 16.5in) + 4\cdot(1in\cdot 16.5in) + 6\cdot\left[1in\cdot\sqrt{(1.414\cdot 16.5in)^2\cdot 2}\right]}{20.5in\cdot 10ft} = 32.926\cdot\%$$

$$C_{f.tr.20} := \left(4.0\cdot\varepsilon_{tr.20}^{\ 2} - 5.9\cdot\varepsilon_{tr.20} + 4.0\right)\cdot\min\left(0.51\cdot\varepsilon_{tr.20}^{\ 2} + 0.57, 1.0\right) = 1.558$$

26x30 PRT
empty & full

$$\varepsilon_{tr.prt\_e} := \frac{2\cdot(2in\cdot 93in) + 4\cdot(2in\cdot 22in) + 6\cdot(1in\cdot 25in)}{26in\cdot 93in} = 28.867\cdot\%$$

$$\varepsilon_{tr.prt\_f} := \varepsilon_{tr.prt\_e} + \frac{6\cdot(0.80\cdot 7.5in\cdot 20.5in)}{26in\cdot 93in} = 59.388\cdot\%$$

*Profile area of parcan assumed to be 80% of outside dimensions*

$$C_{f.tr.prt\_e} := \left(4.0\cdot\varepsilon_{tr.prt\_e}^{\ 2} - 5.9\cdot\varepsilon_{tr.prt\_e} + 4.0\right)\cdot\min\left(0.51\cdot\varepsilon_{tr.prt\_e}^{\ 2} + 0.57, 1.0\right) = 1.611$$

$$C_{f.tr.prt\_f} := \left(4.0\cdot\varepsilon_{tr.prt\_f}^{\ 2} - 5.9\cdot\varepsilon_{tr.prt\_f} + 4.0\right)\cdot\min\left(0.51\cdot\varepsilon_{tr.prt\_f}^{\ 2} + 0.57, 1.0\right) = 1.43$$

20"x30" HD Truss

$$\varepsilon_{tr.30} := \frac{2\cdot(2in\cdot 10ft) + 4\cdot(2in\cdot 26in) + 2\cdot(1in\cdot 26in) + 6\cdot(1in\cdot 29in)}{30in\cdot 10ft} = 0.254$$

$$C_{f.tr.30} := \left(4.0\cdot\varepsilon_{tr.30}^{\ 2} - 5.9\cdot\varepsilon_{tr.30} + 4.0\right)\cdot\min\left(0.51\cdot\varepsilon_{tr.30}^{\ 2} + 0.57, 1.0\right) = 1.664$$

G2 Truss

$$\varepsilon_{tr.G2} := \frac{2\cdot(4in\cdot 17ft) + 5\cdot(2in\cdot 52in) + 4\cdot(2in\cdot 68in)}{17ft\cdot 5ft} = 22.026\cdot\%$$

$$C_{f.tr.G2} := 4.0\cdot\varepsilon_{tr.G2}^{\ 2} - 5.9\cdot\varepsilon_{tr.G2} + 4.0 = 2.895$$

*No reduction allowed for truss containing square members*

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Ultimate wind load on truss

$p_{u\_tr.12} := q_z \cdot G_w \cdot C_{f.tr.12} \cdot \epsilon_{tr.12} = 6.418 \cdot psf$

$p_{u\_tr.20} := q_z \cdot G_w \cdot C_{f.tr.20} \cdot \epsilon_{tr.20} = 4.94 \cdot psf$

$p_{u\_tr.12\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{f.tr.12} \cdot \epsilon_{tr.12} = 1.087 \cdot psf$

$p_{u\_tr.20\_hwap} := q_{z\_hwap} \cdot G_w \cdot C_{f.tr.20} \cdot \epsilon_{tr.20} = 0.837 \cdot psf$

Service wind load on truss

$p_{s\_tr.12} := 0.6 \cdot p_{u\_tr.12} = 3.851 \cdot psf$ $\quad plf_{s\_tr.12} := p_{s\_tr.12} \cdot 12in = 3.851 \cdot plf$

$p_{s\_tr.20} := 0.6 \cdot p_{u\_tr.20} = 2.964 \cdot psf$ $\quad plf_{s\_tr.20} := p_{s\_tr.20} \cdot 20.5in = 5.063 \cdot plf$

$p_{s\_tr.12\_hwap} := p_{u\_tr.12\_hwap} = 1.087 \cdot psf$ $\quad plf_{s\_tr.12\_hwap} := p_{s\_tr.12\_hwap} \cdot 12in = 1.087 \cdot plf$

$p_{s\_tr.20\_hwap} := p_{u\_tr.20\_hwap} = 0.837 \cdot psf$ $\quad plf_{s\_tr.20\_hwap} := p_{s\_tr.20\_hwap} \cdot 20.5in = 1.429 \cdot plf$

## SH PRT Truss Capacity - 15in x 23.5in

6061-T6
Material Properties
*(under .375in thickness)*

$F_{tu} := 38ksi$ $\quad F_{ty} := 35ksi$ $\quad F_{cy} := 35ksi$ $\quad F_{su} := 24ksi$ $\quad F_{sy} := 0.6 \cdot F_{ty} = 21 \cdot ksi$

$F_{tuw} := 24ksi$ $\quad F_{tyw} := 15ksi$ $\quad F_{cyw} := 15ksi$ $\quad F_{suw} := 15ksi$ $\quad F_{syw} := 0.6 \cdot F_{tyw} = 9 \cdot ksi$

Buckling constants
Non-HAZ
*(From table 1-1)*

$B_c := 39.4ksi$ $\quad D_c := 0.246ksi$ $\quad C_c := 66$

$B_p := 45ksi$ $\quad D_p := 0.3ksi$ $\quad C_p := 61$

$B_t := 43.2ksi$ $\quad D_t := 1.558ksi$ $\quad C_t := 141$

$B_{br} := 66.8ksi$ $\quad D_{br} := 0.666ksi$ $\quad C_{br} := 67$

$B_{tb} := 64.8ksi$ $\quad D_{tb} := 4.458ksi$ $\quad C_{tb} := 55$

$B_s := 27.2ksi$ $\quad D_s := 0.141ksi$ $\quad C_s := 79$

Buckling constants
HAZ
*(From table 1-2)*

$B_{cw} := 16.8ksi$ $\quad D_{cw} := 0.084ksi$ $\quad C_{cw} := 133$

$B_{pw} := 19.9ksi$ $\quad D_{pw} := 0.108ksi$ $\quad C_{pw} := 123$

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$B_{tw} := 19.5ksi$ $D_{tw} := .654ksi$ $C_{tw} := 390$

$B_{brw} := 26.4ksi$ $D_{brw} := 0.165ksi$ $C_{brw} := 106$

$B_{tbw} := 29.2ksi$ $D_{tbw} := 1.539ksi$ $C_{tbw} := 121$

$B_{sw} := 12ksi$ $D_{sw} := 0.051ksi$ $C_{sw} := 158$

## Shape properties

### Chords - 1 1/2in Sch 40

$D_{ch} := 1.9in$ $t_{ch} := 0.145in$ $ID_{ch} := D_{ch} - 2 \cdot t_{ch} = 1.61 \cdot in$ $c_{ch} := \frac{D_{ch}}{2} = 0.95 \cdot in$

$A_{ch} := \frac{\pi \cdot \left( D_{ch}^{2} - ID_{ch}^{2} \right)}{4} = 0.799 \cdot in^{2}$ $I_{ch} := \frac{\pi \cdot \left( D_{ch}^{4} - ID_{ch}^{4} \right)}{64} = 0.31 \cdot in^{4}$

$S_{ch} := \frac{I_{ch}}{c_{ch}} = 0.326 \cdot in^{3}$ $r_{ch} := \sqrt{\frac{I_{ch}}{A_{ch}}} = 0.623 \cdot in$ $Rb_{ch} := \frac{D_{ch}}{2} - \frac{t_{ch}}{2} = 0.878 \cdot in$

$R_{b\_t.ch} := \frac{Rb_{ch}}{t_{ch}} = 6.052$ $wt_{ch} := A_{ch} \cdot \gamma_a = 0.938 \cdot plf$ $D\_t_{ch} := \frac{D_{ch}}{t_{ch}}$

### Diagonals - 3/4in Sch 40

$D_{diag} := 1.05in$ $t_{diag} := 0.113in$ $ID_{diag} := D_{diag} - 2 \cdot t_{diag} = 0.824 \cdot in$ $c_{diag} := \frac{D_{diag}}{2} = 0.525 \cdot in$

$A_{diag} := \frac{\pi \cdot \left( D_{diag}^{2} - ID_{diag}^{2} \right)}{4} = 0.333 \cdot in^{2}$ $I_{diag} := \frac{\pi \cdot \left( D_{diag}^{4} - ID_{diag}^{4} \right)}{64} = 0.037 \cdot in^{4}$

$S_{diag} := \frac{I_{diag}}{c_{diag}} = 0.071 \cdot in^{3}$ $r_{diag} := \sqrt{\frac{I_{diag}}{A_{diag}}} = 0.334 \cdot in$ $Rb_{diag} := \frac{D_{diag}}{2} - \frac{t_{diag}}{2} = 0.469 \cdot in$

$R_{b\_t.diag} := \frac{Rb_{diag}}{t_{diag}} = 4.146$ $wt_{diag} := A_{diag} \cdot \gamma_a = 0.39 \cdot plf$ $D\_t_{diag} := \frac{D_{diag}}{t_{diag}}$

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## Chords

### Compression

### Axial Compression E.3

Effective length factor $k := .9$

Unbraced length $L_{b.ch} := 30.12in$

Slenderness $kL\_r_{ch} := \frac{k \cdot L_{b.ch}}{r_{ch}} = 43.54$

E.3 Axial Compression

$$F_{E3.haz} := ksi \cdot \begin{cases} \left(8.7 - .043 \cdot kL\_r_{ch}\right) & \text{if } kL\_r_{ch} \le 133 \\ \frac{51352}{kL\_r_{ch}^{2}} & \text{otherwise} \end{cases} = 6.828 \cdot ksi$$

### Elements - Uniform compression B.5.4.5

Slenderness

$S_{B545} := R_{b\_t.ch} = 6.052$

$$F_{B545.haz} := ksi \cdot \begin{cases} 9.1 & \text{if } S_{B545} \le 46.4 \\ \left(11.8 - .396 \cdot \sqrt{S_{B545}}\right) & \text{if } 46.4 < S_{B545} < 390 \\ \frac{3776}{S_{B545} \cdot \left(1 + \frac{\sqrt{S_{B545}}}{35}\right)^{2}} & \text{otherwise} \end{cases}$$

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$F_{B545.haz} = 9.1 \cdot ksi$

Allowable Compressive stress
*(Occurs at HAZ for B.5.4.5 and nonHAZ for E.3)*

$F_{ac.ch} := \min\left(F_{E3.haz}, F_{B545.haz}\right) = 6.828 \cdot ksi$

Compression capacity

$C_{ch} := F_{ac.ch} \cdot A_{ch} = 5.459 \cdot kip$

Tension

$F_{D2a.non} := 21.2ksi$ $F_{D2a.haz} := 9.1ksi$

Allowable Tension
*(Occurs at HAZ)*

$F_{at.ch} := F_{D2a.haz} = 9.1 \cdot ksi$

Tension Capacity

$T_{ch} := F_{at.ch} \cdot A_{ch} = 7.275 \cdot kip$

**Diagonals**

Compression Capacity

Unbraced length

$L_{b.diag} := 23.25in$

$kL\_r_{diag} := \dfrac{1.0 \cdot L_{b.diag}}{r_{diag}} = 69.678$

E.3 Axial Compression

$$F_{E3.haz} := ksi \cdot \begin{cases} \left(8.7 - .043 \cdot kL\_r_{diag}\right) & \text{if } kL\_r_{diag} \le 133 \\ \dfrac{51352}{kL\_r_{diag}^{2}} & \text{otherwise} \end{cases} = 5.704 \cdot ksi$$

$$F_{E3.non} := ksi \cdot \begin{cases} \left(20.3 - .127 kL\_r_{diag}\right) & \text{if } kL\_r_{diag} \le 66 \\ \dfrac{51352}{kL\_r_{diag}^{2}} & \text{otherwise} \end{cases} = 10.577 \cdot ksi$$

B.5.4.5 Elements - Uniform Compression

$$F_{B545.haz} := ksi \cdot \begin{cases} 9.1 & \text{if } R_{b\_t.diag} \le 46.4 \\ \left(11.8 - .396 \cdot \sqrt{R_{b\_t.diag}}\right) & \text{if } 46.4 < R_{b\_t.diag} < 390 \\ \dfrac{3776}{R_{b\_t.diag} \cdot \left(1 + \dfrac{\sqrt{R_{b\_t.diag}}}{35}\right)^{2}} & \text{otherwise} \end{cases} = 9.1 \cdot ksi$$

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$$F_{B545.non} := ksi \cdot \begin{cases} 21.2 & \text{if } R_{b\_t.diag} \le 27.6 \\ \left(26.2 - .944 \cdot \sqrt{R_{b\_t.diag}}\right) & \text{if } 27.6 < R_{b\_t.diag} < 141 \\ \dfrac{3776}{R_{b\_t.diag} \cdot \left(1 + \dfrac{\sqrt{R_{b\_t.diag}}}{35}\right)^2} & \text{otherwise} \end{cases} = 21.2 \cdot ksi$$

Allowable Compressive stress
*(Occurs at HAZ for B.5.4.5 and nonHAZ for E.3)*

$$F_{ac.diag} := \min\left(F_{E3.non}, F_{B545.haz}\right) = 9.1 \cdot ksi$$

Compression capacity

$$C_{diag} := F_{ac.diag} \cdot A_{diag} = 3.027 \cdot kip$$

Tension

$$F_{D2a.non} := 21.2ksi \qquad F_{D2a.haz} := 9.1ksi$$

Allowable Tension
*(Occurs at HAZ)*

$$F_{at.diag} := F_{D2a.haz} = 9.1 \cdot ksi$$

Tension Capacity

$$T_{diag} := F_{at.diag} \cdot A_{diag} = 3.027 \cdot kip$$

Weld of Diagonal to Chord

Filler shear ultimate (4043):

$$F_{suf} := 11.5ksi$$

Safety factor

$$n_u := 1.95$$

Angle of diagonal to horizontal:

$$\theta_{diag} := 59.1 \cdot deg$$

Length of weld

$$a_w := 0.5 \cdot \frac{D_{diag}}{\sin\left(\theta_{diag}\right)} = 0.612 \cdot in \qquad b_w := 0.5 \cdot D_{diag} = 0.525 \cdot in$$

$$L_{weld} := \pi \sqrt{2 \cdot \left(a_w^{\,2} + b_w^{\,2}\right) - \frac{\left(a_w - b_w\right)^2}{2}} = 3.577 \cdot in$$

Size of weld

$$S_{weld} := \frac{3}{16} in$$

Effective throat of fillet weld

$$E_{weld} := S_{weld} \frac{\sqrt{2}}{2} \qquad E_{weld} = 0.1326 \cdot in$$

Weld shear stress

$$F_{sw} := \min\left(F_{suf} \cdot E_{weld}, F_{suw} \cdot S_{weld}, F_{tuw} \cdot S_{weld}\right)$$

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$$F_{sw} = 1.525 \cdot \frac{kip}{in}$$

Allowable shear force in fillet weld

$$V_{w.diag} := \frac{F_{sw} \cdot L_{weld}}{n_u} \qquad V_{w.diag} = 2.797 \cdot kip$$

Allowable stress in diag governed by weld

$$F_{w.diag} := \frac{V_{w.diag}}{A_{diag}} = 8.407 \cdot ksi$$

## Global Truss Properties

Truss center of chord to center of chord depth: $d_{tr} := 23.5 \cdot in - D_{ch} = 21.6 \cdot in$

Truss center of chord to center of chord width: $b_{tr} := 23.5 \cdot in - D_{ch} = 21.6 \cdot in$

Area of truss: $A_{tr} := 4 \cdot A_{ch}$ $\qquad A_{tr} = 3.198 \cdot in^2$

Moment of inertia of truss: $I_{tr} := 4 \cdot \left[ I_{ch} + A_{ch} \cdot \left( \frac{d_{tr}}{2} \right)^2 \right]$ $\qquad I_{tr} = 374.234 \cdot in^4$

Radius of gyration of truss: $r_{tr} := \sqrt{\frac{I_{tr}}{A_{tr}}}$ $\qquad r_{tr} = 10.818 \cdot in$

Modulus of Elasticity of truss: $E_{tr} := 10100 \cdot ksi$

## Truss Allowable Capacity

*The allowable moment and shear capacity of the truss will be determined from the capacities determined above.*

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$\theta_d := 59.1\text{deg}$

$P_{chord\_min} := \min(T_{ch}, C_{ch}) = 5.459 \cdot \text{kip}$

$d_{tr} := 20.5\text{in} - D_{ch} = 18.6 \cdot \text{in}$

Allowable truss moment capacity: $M_{truss} := 2 \cdot d_{tr} \cdot P_{chord\_min}$ $M_{truss} = 16.921 \cdot \text{ft} \cdot \text{kip}$

Minimum axial force in diagonal: $P_{diag\_min} := \min(T_{diag}, C_{diag}, V_{w.diag})$ $P_{diag\_min} = 2.797 \cdot \text{kip}$

Allowable truss shear capacity: $V_{truss} := 2 \cdot \sin(\theta_d) \cdot P_{diag\_min}$ $V_{truss} = 4.799 \cdot \text{kip}$

Weight of angle: $wt_{pl} := .368\text{kg} \cdot \text{g} = 0.811 \cdot \text{lbf}$

Truss selfweight: $wt_{truss} := \frac{66\text{lbf}}{120 \cdot \text{in}}$ $wt_{truss} = 6.6 \cdot \text{plf}$

## Allowable Loads Due to Moment

Uniform Load: $w_{mUDL}(L) := -\frac{L^2 \cdot wt_{truss} - 8 \cdot M_{truss}}{L^2}$

Center Point Load: $P_{mCPL}(L) := \frac{4 \cdot \left(M_{truss} - \frac{L^2 \cdot wt_{truss}}{8}\right)}{L}$

Third Point Loads: $P_{m3p}(L) := \frac{3 \cdot \left(M_{truss} - \frac{L^2 \cdot wt_{truss}}{8}\right)}{L}$

Quarter Point Loads: $P_{mQp}(L) := \frac{2 \cdot \left(M_{truss} - \frac{L^2 \cdot wt_{truss}}{8}\right)}{L}$

Fifth Point Loads: $P_{m5p}(L) := \frac{5 \cdot \left(M_{truss} - \frac{L^2 \cdot wt_{truss}}{8}\right)}{3 \cdot L}$

## Allowable Loads Due to Shear

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Uniform Load: $w_{vUDL}(L) := \frac{2 \cdot V_{truss} - L \cdot wt_{truss}}{L}$

Center Point Load: $P_{vCPL}(L) := 2 \cdot V_{truss} - L \cdot wt_{truss}$

Third Point Loads: $P_{v3p}(L) := V_{truss} - \frac{1}{2} \cdot wt_{truss} \cdot L$

Quarter Point Loads: $P_{vQp}(L) := \frac{2 \cdot V_{truss}}{3} - \frac{L \cdot wt_{truss}}{3}$

Fifth Point Loads: $P_{v5p}(L) := \frac{V_{truss}}{2} - \frac{L \cdot wt_{truss}}{4}$

## Allowable Loads Due to Deflection

*The deflection will be limited to L/180.*

Uniform Load: $w_{\Delta UDL}(L) := -\frac{1.0e\text{-}41 \cdot \left(1.0e41 \cdot L^4 \cdot wt_{truss} - 7.769308e46 \cdot I_{tr} \cdot ksi \cdot \Delta(L)\right)}{L^4}$

Center Point Load: $P_{\Delta CPL}(L) := \frac{4.29730473043047e\text{-}22 \cdot \left(6.217e24 \cdot I_{tr} \cdot ksi - 1.4428e21 \cdot L^3 \cdot wt_{truss}\right)}{L^2}$

Third Point Loads: $P_{\Delta 3p}(L) := \frac{1.71e\text{-}21 \cdot \left(9.067e23 \cdot I_{tr} \cdot ksi - 2.10416e20 \cdot L^3 \cdot wt_{truss}\right)}{L^2}$

Quarter Point Loads: $P_{\Delta Qp}(L) := \frac{0.0034722 \cdot \left(323200.0 \cdot I_{tr} \cdot ksi - 75.0 \cdot L^3 \cdot wt_{truss}\right)}{L^2}$

Fifth Point Loads: $P_{\Delta 5p}(L) := \frac{8.595e\text{-}21 \cdot \left(1.0362e23 \cdot I_{tr} \cdot ksi - 2.40476e19 \cdot L^3 \cdot wt_{truss}\right)}{L^2}$

## Allowable Loads Based on Minimum Allowable Values - @ 10' intervals up to 50'

*The following loads have been reduced to 0.85 capacity per ANSI.*

$L := 10 \cdot ft, 20 \cdot ft .. 60 \cdot ft$

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Uniform load: $w_{UDL}(L) := \min\left(0.85\,w_{mUDL}(L), 0.85\,w_{vUDL}(L), w_{\Delta UDL}(L)\right)$

Center point load: $P_{CPL}(L) := \min\left(0.85\,P_{mCPL}(L), 0.85\,P_{vCPL}(L), P_{\Delta CPL}(L)\right)$

3rd point load: $P_{3rd}(L) := \min\left(0.85\,P_{m3p}(L), 0.85\,P_{v3p}(L), P_{\Delta 3p}(L)\right)$

Quarter point load: $P_{4th}(L) := \min\left(0.85\,P_{mQp}(L), 0.85\,P_{vQp}(L), P_{\Delta Qp}(L)\right)$

5th point load: $P_{5th}(L) := \min\left(0.85\,P_{m5p}(L), 0.85\,P_{v5p}(L), P_{\Delta 5p}(L)\right)$

**Corresponding deflections:**

Uniform load: $\Delta_{UDL}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{5 \cdot w_{UDL}(L) \cdot L^4}{384 \cdot E_a \cdot I_{tr}}$

Center point load: $\Delta_{CPL}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.021 \cdot P_{CPL}(L) \cdot L^3}{E_a \cdot I_{tr}}$

3rd point load: $\Delta_{3rd}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.036 \cdot P_{3rd}(L) \cdot L^3}{E_a \cdot I_{tr}}$

Quarter point load: $\Delta_{4th}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.05 \cdot P_{4th}(L) \cdot L^3}{E_a \cdot I_{tr}}$

5th point load: $\Delta_{5th}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.063 \cdot P_{5th}(L) \cdot L^3}{E_a \cdot I_{tr}}$

**Allowable Loads**

| $\Delta_{UDL}(L) =$ | $\Delta_{CPL}(L) =$ | $\Delta_{3rd}(L) =$ | $\Delta_{4th}(L) =$ | $\Delta_{5th}(L) =$ |
|---|---|---|---|---|
| 0.049 ·in | 0.055 ·in | 0.067 ·in | 0.062 ·in | 0.059 ·in |
| 0.275 | 0.223 | 0.285 | 0.264 | 0.277 |

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| | | | | |
|---|---|---|---|---|
| 0.621 | 0.507 | 0.643 | 0.598 | 0.626 |
| 1.111 | 0.915 | 1.148 | 1.071 | 1.119 |
| 1.749 | 1.458 | 1.805 | 1.689 | 1.761 |
| 2.542 | 2.149 | 2.617 | 2.461 | 2.558 |

| $w_{UDL}(L) =$ | | $P_{CPL}(L) =$ | | $P_{3rd}(L) =$ | | $P_{4th}(L) =$ | | $P_{5th}(L) =$ | |
|---|---|---|---|---|---|---|---|---|---|
| 810 | ·plf | 5.725 | ·kip | 4.051 | ·kip | 2.701 | ·kip | 2.026 | ·kip |
| 282 | | 2.821 | | 2.115 | | 1.41 | | 1.175 | |
| 122 | | 1.834 | | 1.375 | | 0.917 | | 0.764 | |
| 66 | | 1.326 | | 0.995 | | 0.663 | | 0.553 | |
| 40 | | 1.01 | | 0.758 | | 0.505 | | 0.421 | |
| 26 | | 0.791 | | 0.593 | | 0.395 | | 0.329 | |

## Allowable Loads Based on Minimum Allowable Values - @ 10' intervals up to 50'

*The following loads have not been reduced.*

$L := 10 \cdot ft, 20 \cdot ft .. 60 \cdot ft$

Uniform load: $w_{UDL}(L) := \min\left(w_{mUDL}(L), w_{vUDL}(L), w_{\Delta UDL}(L)\right)$

Center point load: $P_{CPL}(L) := \min\left(P_{mCPL}(L), P_{vCPL}(L), P_{\Delta CPL}(L)\right)$

3rd point load: $P_{3rd}(L) := \min\left(P_{m3p}(L), P_{v3p}(L), P_{\Delta 3p}(L)\right)$

Quarter point load: $P_{4th}(L) := \min\left(P_{mQp}(L), P_{vQp}(L), P_{\Delta Qp}(L)\right)$

5th point load: $P_{5th}(L) := \min\left(P_{m5p}(L), P_{v5p}(L), P_{\Delta 5p}(L)\right)$

### Corresponding deflections:

Uniform load: $\Delta_{UDL}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{5 \cdot w_{UDL}(L) \cdot L^4}{384 \cdot E_a \cdot I_{tr}}$

Center point load: $\Delta_{CPL}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.021 \cdot P_{CPL}(L) \cdot L^3}{E_a \cdot I_{tr}}$

3rd point load: $\Delta_{3rd}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.036 \cdot P_{3rd}(L) \cdot L^3}{E_a \cdot I_{tr}}$

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Quarter point load: $\Delta_{4th}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.05 \cdot P_{4th}(L) \cdot L^3}{E_a \cdot I_{tr}}$

5th point load: $\Delta_{5th}(L) := \frac{5 \cdot wt_{truss} \cdot L^4}{384 \cdot E_a \cdot I_{tr}} + \frac{0.063 \cdot P_{5th}(L) \cdot L^3}{E_a \cdot I_{tr}}$

## Allowable Loads

| $\Delta_{UDL}(L)$ = | $\Delta_{CPL}(L)$ = | $\Delta_{3rd}(L)$ = | $\Delta_{4th}(L)$ = | $\Delta_{5th}(L)$ = |
|---|---|---|---|---|
| 0.057 ·in | 0.065 ·in | 0.079 ·in | 0.073 ·in | 0.069 ·in |
| 0.322 | 0.261 | 0.334 | 0.31 | 0.325 |
| 0.725 | 0.591 | 0.751 | 0.698 | 0.731 |
| 1.289 | 1.059 | 1.333 | 1.242 | 1.299 |
| 2.015 | 1.672 | 2.08 | 1.944 | 2.029 |
| 2.901 | 2.438 | 2.989 | 2.805 | 2.92 |

| $w_{UDL}(L)$ = | $P_{CPL}(L)$ = | $P_{3rd}(L)$ = | $P_{4th}(L)$ = | $P_{5th}(L)$ = |
|---|---|---|---|---|
| 953 ·plf | 6.736 ·kip | 4.766 ·kip | 3.178 ·kip | 2.383 ·kip |
| 332 | 3.318 | 2.489 | 1.659 | 1.383 |
| 144 | 2.157 | 1.618 | 1.079 | 0.899 |
| 78 | 1.56 | 1.17 | 0.78 | 0.65 |
| 48 | 1.189 | 0.892 | 0.594 | 0.495 |
| 31 | 0.93 | 0.698 | 0.465 | 0.388 |

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## Reduction of rigging due to wind

$p_{s\_roof\_nwa\_hwap} := p_{u\_roof\_nwa\_hwap} = 1.794 \cdot psf$

$p_{s\_roof\_nud\_hwap} := p_{u\_roof\_nud\_hwap} = 1.305 \cdot psf$

$p_{s\_sign\_AB\_hwap} = 2.333 \cdot psf$

Allowable moments

$$M_{a.cs} := \frac{66plf \cdot (40ft)^2}{8} = 13.2 \cdot kip \cdot ft$$

$$M_{a.ss} := \frac{122plf \cdot (30ft)^2}{8} = 13.725 \cdot kip \cdot ft$$

$$M_{ax.sw} := \frac{282plf \cdot (20ft)^2}{8} = 14.1 \cdot kip \cdot ft$$

$$M_{ay.sw} := .25 \cdot M_{ax.sw}$$

Moments due to wind

cross stage span

$$span_{cs} := 43ft + 1.24in$$

side stage span

$$span_{ss} := 34ft + .25in$$

$$M_{r.cs} := \frac{p_{u\_roof\_nud\_hwap} \cdot \left( \frac{span_{cs}}{2} \cdot \frac{span_{ss}}{2} \right) \cdot span_{cs}}{4} = 5.156 \cdot kip \cdot ft$$

$$M_{r.ss} := \frac{p_{s\_roof\_nwa\_hwap} \cdot span_{ss} \cdot span_{ss}^2}{8} = 8.833 \cdot kip \cdot ft$$

Allowable rigging

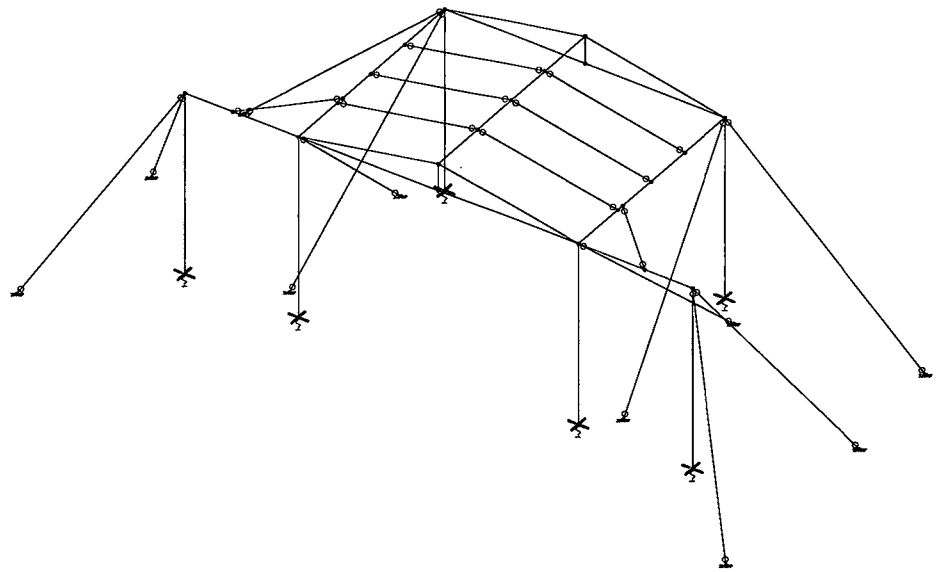
$$w_{cs} := 35plf$$

$$w_{ss} := 30plf$$

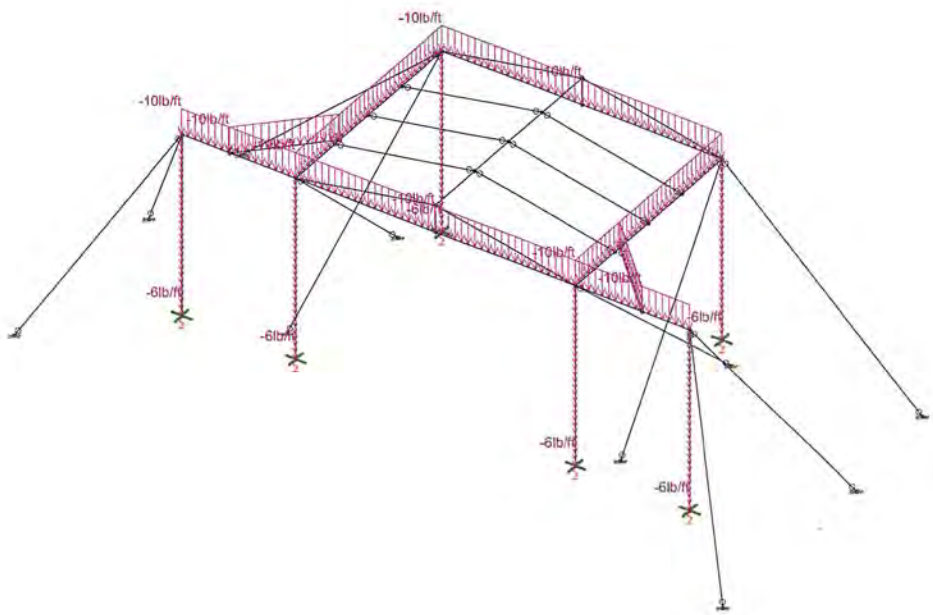
Utilization of truss

$$util_{cs} := \frac{M_{r.cs} + \frac{w_{cs} \cdot span_{cs}^2}{8}}{M_{a.cs}} = 1.006$$

$$util_{ss} := \frac{M_{r.ss} + \frac{w_{ss} \cdot span_{ss}^2}{8}}{M_{a.ss}} = 0.96$$

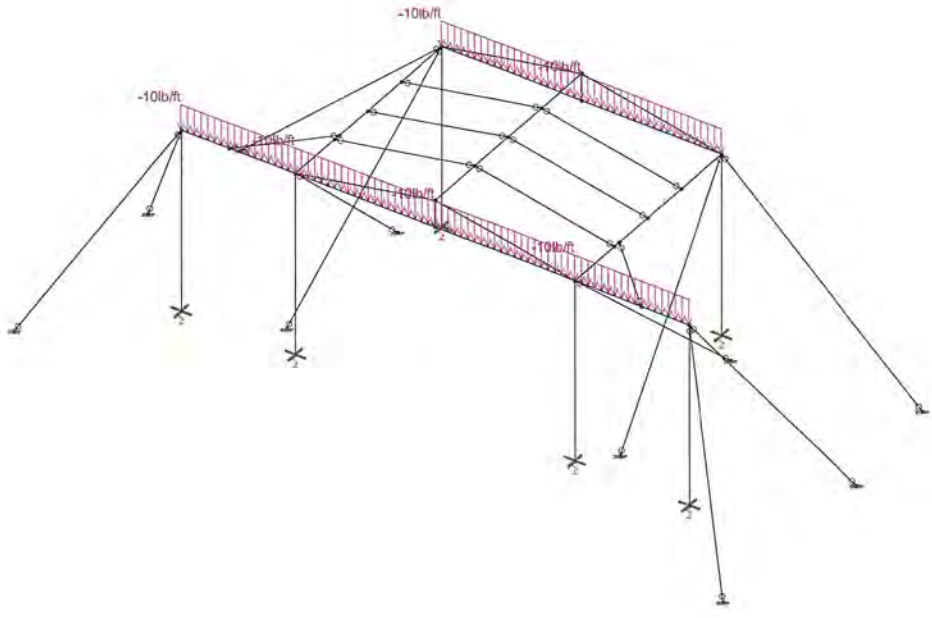


| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification<br>Roof Structure | SK - 1 |
| ALS | | Mar 23, 2015 at 11:57 AM |
| 15.410.10 | | 4 sound roof certification.r3d |



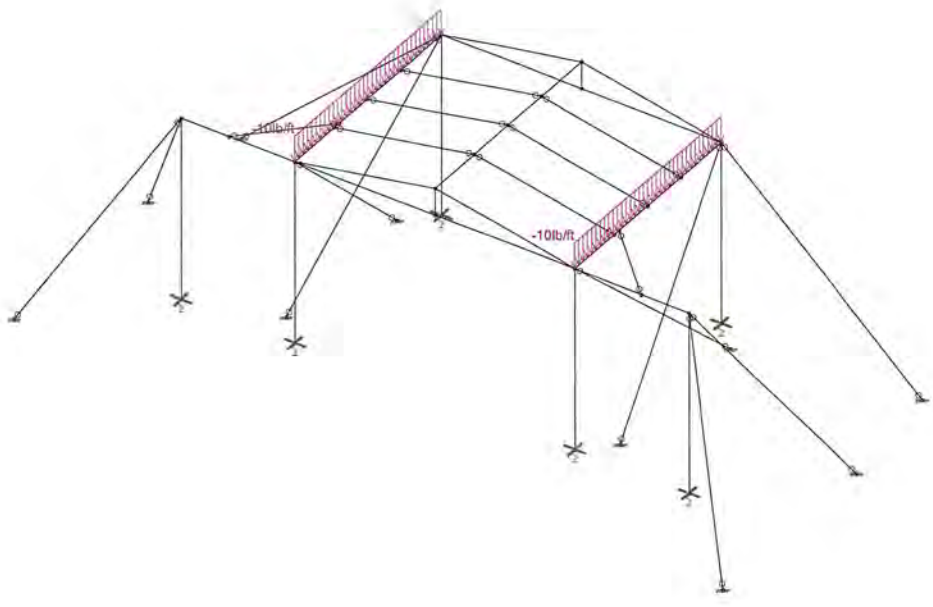

Loads: BLC 1, Dead Load

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 2 |
| ALS | | Mar 23, 2015 at 11:58 AM |
| 15.410.10 | Dead Load | 4 sound roof certification.r3d |



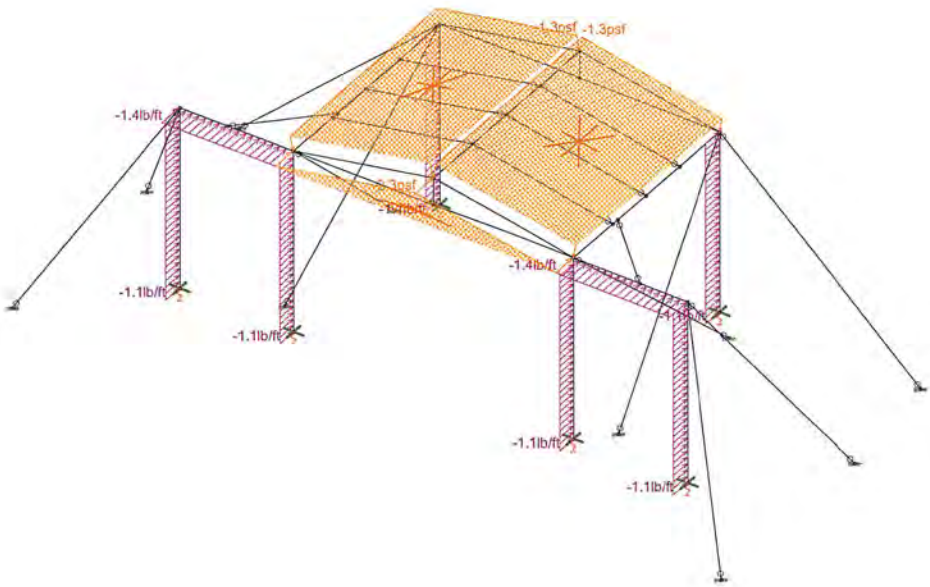

Loads: BLC 2, Rigging Cross stage

| | | |
|---|---|---|
| Clark Reder Engineering | | SK - 3 |
| ALS | 4 Sound Roof Certification | Mar 23, 2015 at 11:58 AM |
| 15.410.10 | Cross Stage Rigging | 4 sound roof certification.r3d |



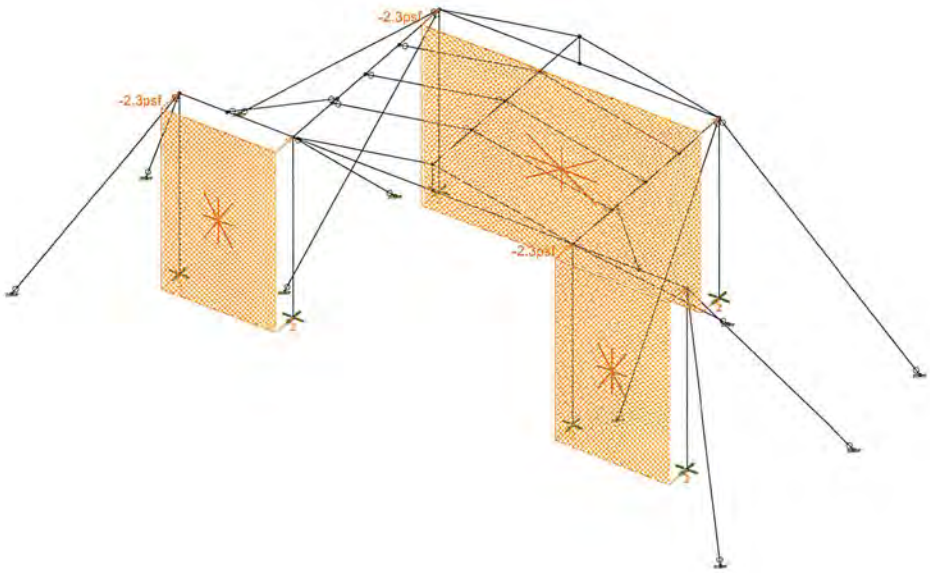

Loads: BLC 3, Rigging Up/Downstage

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification<br>Side Stage Rigging | SK - 4 |
| ALS | | Mar 23, 2015 at 11:58 AM |
| 15.410.10 | | 4 sound roof certification.r3d |



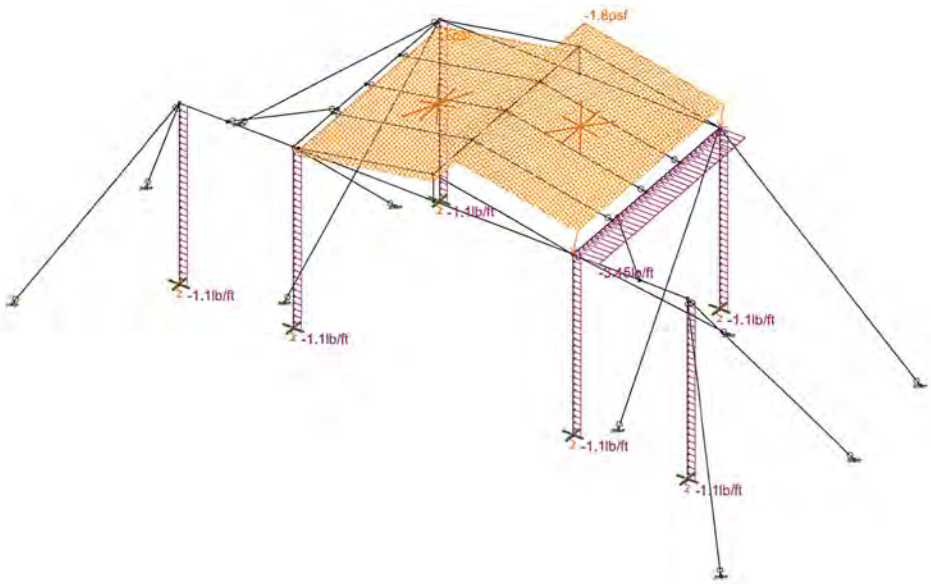

Loads: BLC 4, Wind -Z HWAP

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 5 |
| ALS | | Mar 23, 2015 at 11:59 AM |
| 15.410.10 | Wind -Z HWAP | 4 sound roof certification.r3d |



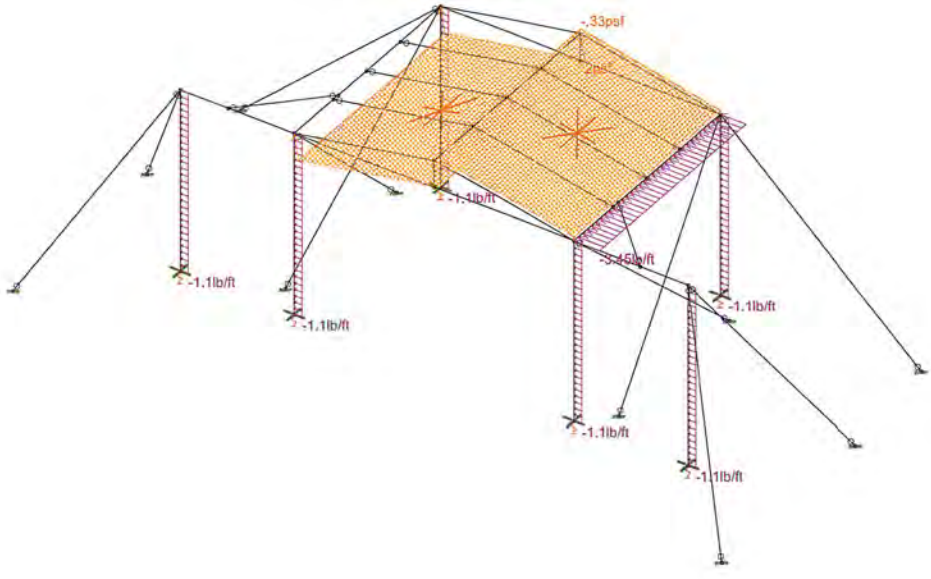

Loads: BLC 10, Scrim

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 6 |
| ALS | | Mar 23, 2015 at 11:59 AM |
| 15.410.10 | Scrim -Z HWAP | 4 sound roof certification.r3d |



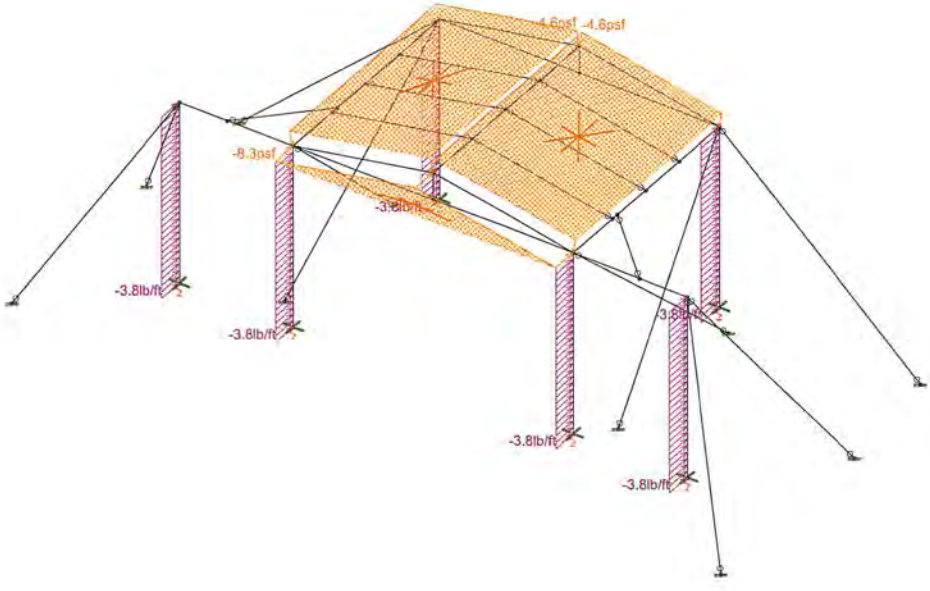

Loads: BLC 5, Wind -X HWAP A

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 7 |
| ALS | | Mar 23, 2015 at 12:00 PM |
| 15.410.10 | Wind -X HWAP A | 4 sound roof certification.r3d |



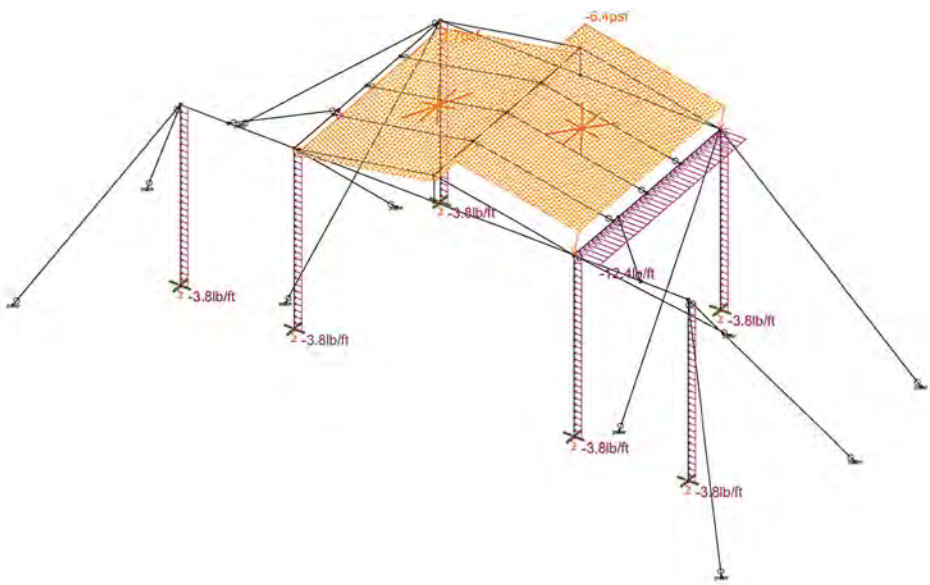

Loads: BLC 6, Wind -X HWAP B

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 8 |
| ALS | | Mar 23, 2015 at 12:00 PM |
| 15.410.10 | Wind -X HWAP B | 4 sound roof certification.r3d |



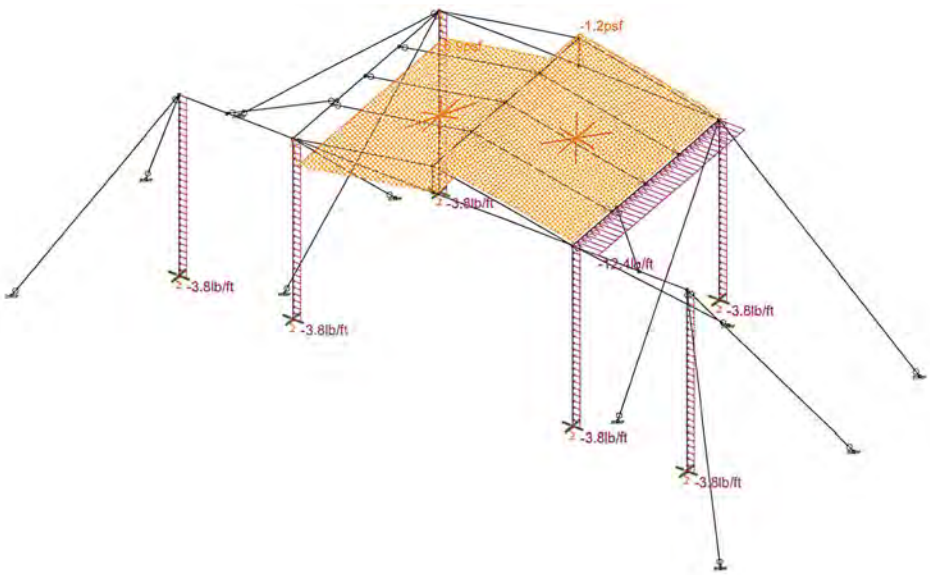

Loads: BLC 7, Wind -Z 67

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 9 |
| ALS | | Mar 23, 2015 at 12:00 PM |
| 15.410.10 | Wind -Z 66.8 | 4 sound roof certification.r3d |




Loads: BLC 8, Wind -X 67 A

| | | |
|---|---|---|
| Clark Reder Engineering | 4 Sound Roof Certification | SK - 10 |
| ALS | | Mar 23, 2015 at 12:01 PM |
| 15.410.10 | Wind -X 66.8 A | 4 sound roof certification.r3d |




Loads: BLC 9, Wind -X 67 B

| | | |
|---|---|---|
| Clark Reder Engineering | | SK - 11 |
| ALS | 4 Sound Roof Certification | Mar 23, 2015 at 12:01 PM |
| 15.410.10 | Wind -X 66.8 B | 4 sound roof certification.r3d |

## Basic Load Cases

| | BLC Description | Category | X Grav... | Y Grav... | Z Grav... | Joint | Point | Distrib... | Area(M... | Surfac... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dead Load | None | | | | | | 16 | | |
| 2 | Rigging Cross stage | None | | | | | | 6 | | |
| 3 | Rigging Up/Downstage | None | | | | | | 2 | | |
| 4 | Wind -Z HWAP | None | | | | | | 8 | 3 | |
| 5 | Wind -X HWAP A | None | | | | | | 7 | 2 | |
| 6 | Wind -X HWAP B | None | | | | | | 7 | 2 | |
| 7 | Wind -Z 67 | None | | | | | | 6 | 3 | |
| 8 | Wind -X 67 A | None | | | | | | 7 | 2 | |
| 9 | Wind -X 67 B | None | | | | | | 7 | 2 | |
| 10 | Scrim | None | | | | | | | 3 | |
| 11 | BLC 4 Transient Area Loads | None | | | | | | 659 | | |
| 12 | BLC 5 Transient Area Loads | None | | | | | | 618 | | |
| 13 | BLC 6 Transient Area Loads | None | | | | | | 618 | | |
| 14 | BLC 7 Transient Area Loads | None | | | | | | 659 | | |
| 15 | BLC 8 Transient Area Loads | None | | | | | | 618 | | |
| 16 | BLC 9 Transient Area Loads | None | | | | | | 618 | | |
| 17 | BLC 10 Transient Area Loads | None | | | | | | 240 | | |

## Load Combinations

| | Description | Sol... | PDelta | SRSS | B... | Fac... | B... | Fa... | B... | Fa... | B... | Factor | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dead Load | Yes | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | Dead Load + Rigging | Yes | | | 1 | 1 | 2 | 21 | 3 | 8 | | | | | | | | | | | | | | | | |
| 3 | DL + Rigging + Wind -Z HWAP | Yes | | | 1 | 1 | 2 | 12 | 3 | 4 | 4 | 1 | | | | | | | | | | | | | | |
| 4 | DL + Rigging + Wind -X HWAP A | Yes | | | 1 | 1 | 2 | 12 | 3 | 4 | 5 | 1 | | | | | | | | | | | | | | |
| 5 | DL + Rigging + Wind -X HWAP B | Yes | | | 1 | 1 | 2 | 12 | 3 | 4 | 6 | 1 | | | | | | | | | | | | | | |
| 6 | DL + Wind -Z HWAP | Yes | | | 1 | 1 | 4 | 1.5 | | | | | | | | | | | | | | | | | | |
| 7 | DL + Wind -X HWAP A | Yes | | | 1 | 1 | 5 | 1.5 | | | | | | | | | | | | | | | | | | |
| 8 | DL + Wind -X HWAP B | Yes | | | 1 | 1 | 6 | 1.5 | | | | | | | | | | | | | | | | | | |
| 9 | DL + Wind -Z 66.8 | Yes | | | 1 | 1 | 7 | 1.5 | | | | | | | | | | | | | | | | | | |
| 10 | DL + Wind -X 66.8 A | Yes | | | 1 | 1 | 8 | 1.5 | | | | | | | | | | | | | | | | | | |
| 11 | DL + Wind -X 66.8 B | Yes | | | 1 | 1 | 9 | 1.5 | | | | | | | | | | | | | | | | | | |
| 12 | DL + Wind -Z HWAP + Scrim | Yes | | | 1 | 1 | | | | | 4 | 1.5 | | | 10 | 1.5 | | | | | | | | | | |

## Joint Reactions

| | LC | Joint Label | X [lb] | Y [lb] | Z [lb] | MX [k-ft] | MY [k-ft] | MZ [k-ft] |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | N1 | 3.668 | 725.654 | -17.499 | 0 | 0 | 0 |
| 2 | 1 | N2 | -3.668 | 725.654 | -17.499 | 0 | 0 | 0 |
| 3 | 1 | N3 | 8.534 | 559.273 | 17.53 | 0 | 0 | 0 |
| 4 | 1 | N4 | -8.534 | 559.273 | 17.53 | 0 | 0 | 0 |
| 5 | 1 | N5 | -4.973 | 266.747 | -.032 | 0 | 0 | 0 |
| 6 | 1 | N6 | 4.973 | 266.747 | -.032 | 0 | 0 | 0 |
| 7 | 1 | N26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 1 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 1 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 1 | N29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 1 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 1 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 1 | N32 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 1 | N33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 1 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 1 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 1 | Totals: | 0 | 3103.348 | 0 | | | |
| 18 | 1 | COG (in): | X: 251.125 | Y: 277.363 | Z: -141.74 | | | |

## Joint Reactions (Continued)

| | LC | Joint Label | X [lb] | Y [lb] | Z [lb] | MX [k-ft] | MY [k-ft] | MZ [k-ft] |
|---|---|---|---|---|---|---|---|---|
| 19 | 2 | N1 | 88.564 | 8743.053 | -129.32 | 0 | 0 | 0 |
| 20 | 2 | N2 | -88.564 | 8743.053 | -129.32 | 0 | 0 | 0 |
| 21 | 2 | N3 | 186.587 | 6264.794 | 129.543 | 0 | 0 | 0 |
| 22 | 2 | N4 | -186.587 | 6264.794 | 129.543 | 0 | 0 | 0 |
| 23 | 2 | N5 | -62.272 | 1533.619 | -.223 | 0 | 0 | 0 |
| 24 | 2 | N6 | 62.272 | 1533.619 | -.223 | 0 | 0 | 0 |
| 25 | 2 | N26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 2 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | 2 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 2 | N29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | 2 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 2 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | 2 | N32 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 2 | N33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33 | 2 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | 2 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 | 2 | Totals: | 0 | 33082.931 | 0 | | | |
| 36 | 2 | COG (in): | X: 251.125 | Y: 325.062 | Z: -148.937 | | | |
| 37 | 3 | N1 | 59.402 | 5657.049 | -65.01 | 0 | 0 | 0 |
| 38 | 3 | N2 | -59.402 | 5657.049 | -65.01 | 0 | 0 | 0 |
| 39 | 3 | N3 | 121.876 | 4288.775 | 128.347 | 0 | 0 | 0 |
| 40 | 3 | N4 | -121.876 | 4288.778 | 128.347 | 0 | 0 | 0 |
| 41 | 3 | N5 | -37.878 | 1043.526 | 14.981 | 0 | 0 | 0 |
| 42 | 3 | N6 | 37.878 | 1043.526 | 14.981 | 0 | 0 | 0 |
| 43 | 3 | N26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 44 | 3 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 | 3 | N28 | 12.645 | -86.932 | 90.949 | 0 | 0 | 0 |
| 46 | 3 | N29 | -12.644 | -86.929 | 90.946 | 0 | 0 | 0 |
| 47 | 3 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48 | 3 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49 | 3 | N32 | 44.115 | -80.877 | 44.115 | 0 | 0 | 0 |
| 50 | 3 | N33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 51 | 3 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 52 | 3 | N35 | -44.115 | -80.877 | 44.115 | 0 | 0 | 0 |
| 53 | 3 | Totals: | 0 | 21643.089 | 426.76 | | | |
| 54 | 3 | COG (in): | X: 251.125 | Y: 324.481 | Z: -151.546 | | | |
| 55 | 4 | N1 | 89.785 | 5231.36 | -72.345 | 0 | 0 | 0 |
| 56 | 4 | N2 | -20.949 | 5687.431 | -101.802 | 0 | 0 | 0 |
| 57 | 4 | N3 | 151.447 | 3780.415 | 66.558 | 0 | 0 | 0 |
| 58 | 4 | N4 | -80.854 | 4285.101 | 102.077 | 0 | 0 | 0 |
| 59 | 4 | N5 | -4.222 | 1305.527 | -.174 | 0 | 0 | 0 |
| 60 | 4 | N6 | 69.326 | 1019.703 | -.14 | 0 | 0 | 0 |
| 61 | 4 | N26 | 190.028 | -174.193 | 0 | 0 | 0 | 0 |
| 62 | 4 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63 | 4 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64 | 4 | N29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 | 4 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66 | 4 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67 | 4 | N32 | 107.585 | -197.238 | 107.585 | 0 | 0 | 0 |
| 68 | 4 | N33 | 101.757 | -186.554 | -101.757 | 0 | 0 | 0 |
| 69 | 4 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 4 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 | 4 | Totals: | 603.902 | 20751.552 | 0 | | | |
| 72 | 4 | COG (in): | X: 260.669 | Y: 323.186 | Z: -149.636 | | | |
| 73 | 5 | N1 | 80.803 | 4694.708 | -45.584 | 0 | 0 | 0 |
| 74 | 5 | N2 | -12.091 | 5159.798 | -77.996 | 0 | 0 | 0 |
| 75 | 5 | N3 | 136.605 | 3267.106 | 39.044 | 0 | 0 | 0 |

## Joint Reactions (Continued)

| | LC | Joint Label | X [lb] | Y [lb] | Z [lb] | MX [k-ft] | MY [k-ft] | MZ [k-ft] |
|---|---|---|---|---|---|---|---|---|
| 76 | 5 | N4 | -70.036 | 3779.393 | 72.353 | 0 | 0 | 0 |
| 77 | 5 | N5 | -2.626 | 1341.67 | -.121 | 0 | 0 | 0 |
| 78 | 5 | N6 | 67.627 | 1043.621 | -.074 | 0 | 0 | 0 |
| 79 | 5 | N26 | 191.786 | -175.804 | 0 | 0 | 0 | 0 |
| 80 | 5 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81 | 5 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 82 | 5 | N29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 83 | 5 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 84 | 5 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 85 | 5 | N32 | 114.123 | -209.226 | 114.123 | 0 | 0 | 0 |
| 86 | 5 | N33 | 101.746 | -186.534 | -101.746 | 0 | 0 | 0 |
| 87 | 5 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 88 | 5 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89 | 5 | Totals: | 607.937 | 18714.732 | 0 | | | |
| 90 | 5 | COG (in): | X: 261.846 | Y: 319.765 | Z: -144.591 | | | |
| 91 | 6 | N1 | 15.128 | 1415.121 | -23.35 | 0 | 0 | 0 |
| 92 | 6 | N2 | -15.128 | 1415.12 | -23.35 | 0 | 0 | 0 |
| 93 | 6 | N3 | 25.946 | 1430.319 | 81.376 | 0 | 0 | 0 |
| 94 | 6 | N4 | -25.946 | 1430.324 | 81.377 | 0 | 0 | 0 |
| 95 | 6 | N5 | -6.52 | 309.834 | 22.587 | 0 | 0 | 0 |
| 96 | 6 | N6 | 6.52 | 309.833 | 22.587 | 0 | 0 | 0 |
| 97 | 6 | N26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 98 | 6 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 99 | 6 | N28 | 27.364 | -188.124 | 196.818 | 0 | 0 | 0 |
| 100 | 6 | N29 | -27.363 | -188.12 | 196.813 | 0 | 0 | 0 |
| 101 | 6 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 102 | 6 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 103 | 6 | N32 | 42.64 | -78.174 | 42.64 | 0 | 0 | 0 |
| 104 | 6 | N33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105 | 6 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 106 | 6 | N35 | -42.64 | -78.174 | 42.64 | 0 | 0 | 0 |
| 107 | 6 | Totals: | 0 | 5777.96 | 640.139 | | | |
| 108 | 6 | COG (in): | X: 251.125 | Y: 313.128 | Z: -166.853 | | | |
| 109 | 7 | N1 | 49.558 | 758.921 | -9.518 | 0 | 0 | 0 |
| 110 | 7 | N2 | 31.791 | 1416.257 | -61.639 | 0 | 0 | 0 |
| 111 | 7 | N3 | 53.004 | 629.064 | 13.031 | 0 | 0 | 0 |
| 112 | 7 | N4 | 17.959 | 1468.22 | 58.465 | 0 | 0 | 0 |
| 113 | 7 | N5 | 34.849 | 806.938 | -.118 | 0 | 0 | 0 |
| 114 | 7 | N6 | 43.38 | 287.254 | -.026 | 0 | 0 | 0 |
| 115 | 7 | N26 | 340.445 | -312.074 | 0 | 0 | 0 | 0 |
| 116 | 7 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 117 | 7 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 118 | 7 | N29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 119 | 7 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 7 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121 | 7 | N32 | 167.337 | -306.785 | 167.337 | 0 | 0 | 0 |
| 122 | 7 | N33 | 167.531 | -307.14 | -167.531 | 0 | 0 | 0 |
| 123 | 7 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 124 | 7 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 125 | 7 | Totals: | 905.854 | 4440.654 | 0 | | | |
| 126 | 7 | COG (in): | X: 318.025 | Y: 300.631 | Z: -158.078 | | | |
| 127 | 8 | N1 | 34.611 | 29.958 | 34.026 | 0 | 0 | 0 |
| 128 | 8 | N2 | 42.908 | 707.465 | -22.982 | 0 | 0 | 0 |
| 129 | 8 | N3 | 40.869 | 0 | -25.166 | 0 | 0 | 0 |
| 130 | 8 | N4 | 43.883 | 725.8 | 15.863 | 0 | 0 | 0 |
| 131 | 8 | N5 | 34.89 | 819.494 | -.034 | 0 | 0 | 0 |
| 132 | 8 | N6 | 39.709 | 320.949 | .078 | 0 | 0 | 0 |

## Joint Reactions (Continued)

| | LC | Joint Label | X [lb] | Y [lb] | Z [lb] | MX [k-ft] | MY [k-ft] | MZ [k-ft] |
|---|---|---|---|---|---|---|---|---|
| 133 | 8 | N26 | 373.756 | -342.61 | 0 | 0 | 0 | 0 |
| 134 | 8 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135 | 8 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 136 | 8 | N29 | -17.359 | -119.343 | 124.858 | 0 | 0 | 0 |
| 137 | 8 | N30 | -12.028 | -82.696 | -86.517 | 0 | 0 | 0 |
| 138 | 8 | N31 | 13.363 | -91.868 | -96.114 | 0 | 0 | 0 |
| 139 | 8 | N32 | 186.646 | -342.184 | 186.646 | 0 | 0 | 0 |
| 140 | 8 | N33 | 130.659 | -239.541 | -130.659 | 0 | 0 | 0 |
| 141 | 8 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 142 | 8 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 143 | 8 | Totals: | 911.906 | 1385.424 | 0 | | | |
| 144 | 8 | COG (in): | X: 468.355 | Y: 181.559 | Z: -74.467 | | | |
| 145 | 9 | N1 | 44.383 | 3170.656 | -45.389 | 0 | 0 | 0 |
| 146 | 9 | N2 | -44.381 | 3170.659 | -45.389 | 0 | 0 | 0 |
| 147 | 9 | N3 | 70.2 | 3572.314 | 235.797 | 0 | 0 | 0 |
| 148 | 9 | N4 | -70.2 | 3572.297 | 235.797 | 0 | 0 | 0 |
| 149 | 9 | N5 | -10.995 | 335.029 | 78.088 | 0 | 0 | 0 |
| 150 | 9 | N6 | 10.996 | 335.032 | 78.088 | 0 | 0 | 0 |
| 151 | 9 | N26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 152 | 9 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153 | 9 | N28 | 88.053 | -605.367 | 633.343 | 0 | 0 | 0 |
| 154 | 9 | N29 | -88.056 | -605.383 | 633.359 | 0 | 0 | 0 |
| 155 | 9 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 156 | 9 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 157 | 9 | N32 | 103.057 | -188.938 | 103.057 | 0 | 0 | 0 |
| 158 | 9 | N33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 159 | 9 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 9 | N35 | -103.058 | -188.939 | 103.058 | 0 | 0 | 0 |
| 161 | 9 | Totals: | 0 | 12567.359 | 2009.809 | | | |
| 162 | 9 | COG (in): | X: 251.125 | Y: 335.546 | Z: -182.595 | | | |
| 163 | 10 | N1 | 160.371 | 879.292 | 11.201 | 0 | 0 | 0 |
| 164 | 10 | N2 | 115.249 | 3186.35 | -171.83 | 0 | 0 | 0 |
| 165 | 10 | N3 | 160.908 | 835.726 | 5.637 | 0 | 0 | 0 |
| 166 | 10 | N4 | 78.921 | 3816.458 | 166.271 | 0 | 0 | 0 |
| 167 | 10 | N5 | 130.205 | 2189.179 | -.335 | 0 | 0 | 0 |
| 168 | 10 | N6 | 135.293 | 327.82 | -.011 | 0 | 0 | 0 |
| 169 | 10 | N26 | 1216.152 | -1114.806 | 0 | 0 | 0 | 0 |
| 170 | 10 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 171 | 10 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |
| 172 | 10 | N29 | 0 | 0 | 0 | 0 | 0 | 0 |
| 173 | 10 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 174 | 10 | N31 | 1.089 | -7.484 | -7.829 | 0 | 0 | 0 |
| 175 | 10 | N32 | 591.443 | -1084.312 | 591.443 | 0 | 0 | 0 |
| 176 | 10 | N33 | 594.545 | -1090 | -594.545 | 0 | 0 | 0 |
| 177 | 10 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 178 | 10 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 179 | 10 | Totals: | 3184.176 | 7938.223 | 0 | | | |
| 180 | 10 | COG (in): | X: 382.923 | Y: 324.421 | Z: -174.783 | | | |
| 181 | 11 | N1 | 105.986 | 0 | 158.016 | 0 | 0 | 0 |
| 182 | 11 | N2 | 189.144 | 451.359 | -32.754 | 0 | 0 | 0 |
| 183 | 11 | N3 | 156.811 | 0 | -132.896 | 0 | 0 | 0 |
| 184 | 11 | N4 | 203.584 | 1488.204 | 17.469 | 0 | 0 | 0 |
| 185 | 11 | N5 | 140.198 | 2683.484 | -.041 | 0 | 0 | 0 |
| 186 | 11 | N6 | 59.86 | 0 | .375 | 0 | 0 | 0 |
| 187 | 11 | N26 | 1689.289 | -1548.515 | 0 | 0 | 0 | 0 |
| 188 | 11 | N27 | -351.4 | -322.117 | 0 | 0 | 0 | 0 |
| 189 | 11 | N28 | 0 | 0 | 0 | 0 | 0 | 0 |

## Joint Reactions (Continued)

| | LC | Joint Label | X [lb] | Y [lb] | Z [lb] | MX [k-ft] | MY [k-ft] | MZ [k-ft] |
|---|---|---|---|---|---|---|---|---|
| 190 | 11 | N29 | -205.505 | -1412.844 | 1478.134 | 0 | 0 | 0 |
| 191 | 11 | N30 | -188.661 | -1297.043 | -1356.982 | 0 | 0 | 0 |
| 192 | 11 | N31 | 52.329 | -359.762 | -376.387 | 0 | 0 | 0 |
| 193 | 11 | N32 | 788.803 | -1446.14 | 788.803 | 0 | 0 | 0 |
| 194 | 11 | N33 | 543.738 | -996.852 | -543.738 | 0 | 0 | 0 |
| 195 | 11 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 196 | 11 | N35 | 0 | 0 | 0 | 0 | 0 | 0 |
| 197 | 11 | Totals: | 3184.176 | -2760.225 | 0 | | | |
| 198 | 11 | COG (in): | X: -127.918 | Y: 441.491 | Z: -256.988 | | | |
| 199 | 12 | N1 | 13.28 | 1508.608 | 346.83 | 0 | 0 | 0 |
| 200 | 12 | N2 | -13.281 | 1508.607 | 346.831 | 0 | 0 | 0 |
| 201 | 12 | N3 | 26.508 | 2848.911 | 826.557 | 0 | 0 | 0 |
| 202 | 12 | N4 | -26.508 | 2848.916 | 826.557 | 0 | 0 | 0 |
| 203 | 12 | N5 | -.891 | 1280.487 | 415.277 | 0 | 0 | 0 |
| 204 | 12 | N6 | .891 | 1280.486 | 415.277 | 0 | 0 | 0 |
| 205 | 12 | N26 | 0 | 0 | 0 | 0 | 0 | 0 |
| 206 | 12 | N27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 207 | 12 | N28 | 242.315 | -1665.917 | 1742.903 | 0 | 0 | 0 |
| 208 | 12 | N29 | -242.315 | -1665.913 | 1742.898 | 0 | 0 | 0 |
| 209 | 12 | N30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 210 | 12 | N31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 211 | 12 | N32 | 590.789 | -1083.113 | 590.789 | 0 | 0 | 0 |
| 212 | 12 | N33 | 0 | 0 | 0 | 0 | 0 | 0 |
| 213 | 12 | N34 | 0 | 0 | 0 | 0 | 0 | 0 |
| 214 | 12 | N35 | -590.789 | -1083.113 | 590.789 | 0 | 0 | 0 |
| 215 | 12 | Totals: | 0 | 5777.96 | 7844.71 | | | |
| 216 | 12 | COG (in): | X: 251.125 | Y: 313.128 | Z: -166.853 | | | |

This spreadsheet will take RISA ballast joint reaction results as input and will output the maximum ballast requirement for each location.

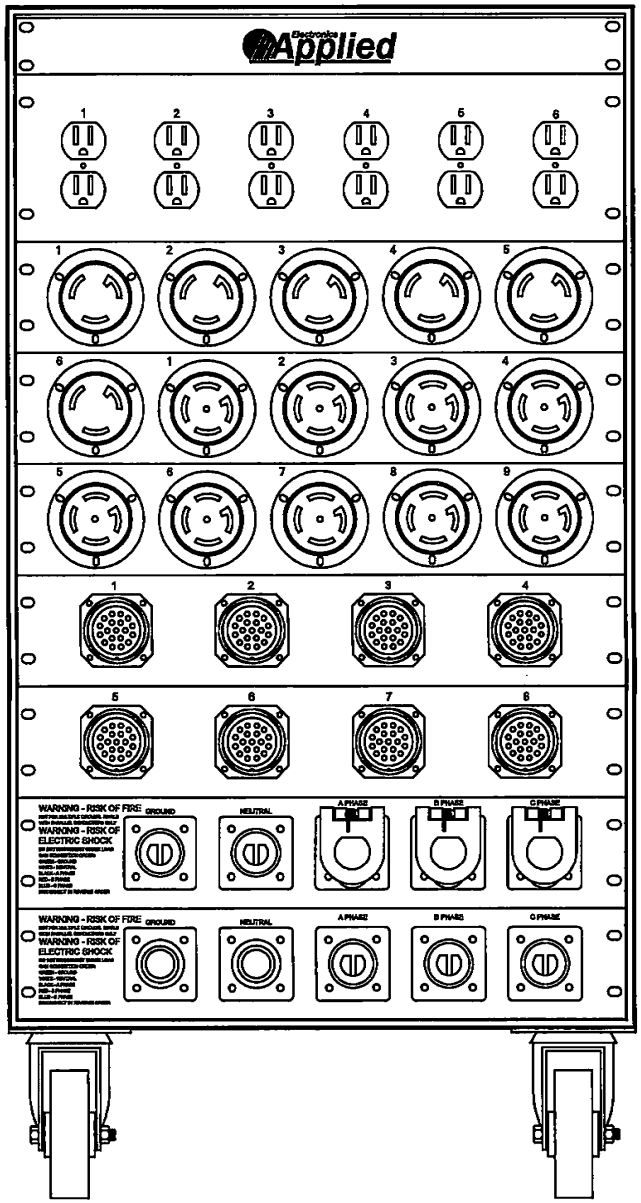
1. RISA Load Combinations must include the appropriate FOS against overturning
2. RISA joint reactions must be listed by combination
2. Select only ballast locations and "Exclude" everything else from results
3. Copy LC, Joint Label, X, Y, Z columns & headers from RISA and paste in the bluehighlighted cell
4. Sort results by Joint Label
5. Select all rows with "COG" in column B, right click and select "Delete"
6. Check that the friction values in yellow highlighted cells are correct. Do not adjust any other cells.
7. Select the blue highlighted cell and press Ctrl+Shift+B
8. To iterate, do not delete entire rows containing "COG". Only delete cells A-J of rows containing "COG", and choose "shift cells up".

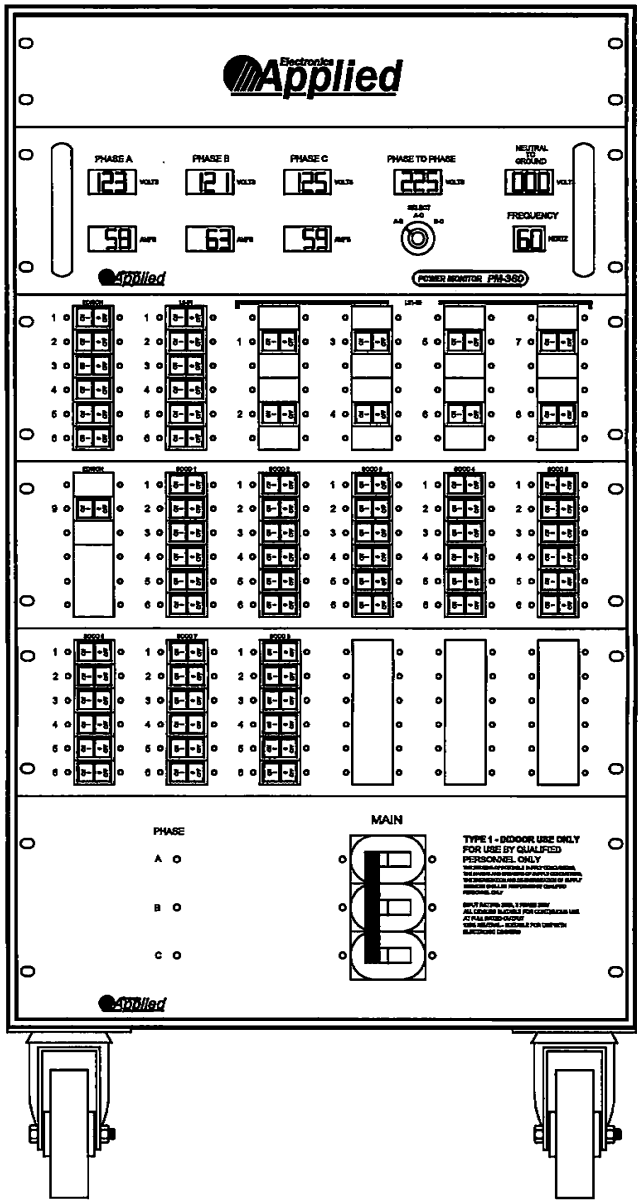
| | | | | | | | | Friction Values | |
|---|---|---|---|---|---|---|---|---|---|
| LC | Joint Label | X [k] | Y [k] | Z [k] | Horiz | Vert | Tens | 0.4 | 0.75 |
| 6 | N26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | N26 | 336.388 | -308.356 | 0 | 336.388 | -308.356 | 456.3336 | 1149.326 | 756.8733 |
| 8 | N26 | 354.138 | -324.627 | 0 | 354.138 | -324.627 | 480.4128 | 1209.972 | 796.811 |
| 9 | N26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | N26 | 1195.083 | -1095.49 | 0 | 1195.083 | -1095.49 | 1621.211 | 4083.2 | 2688.936 |
| 11 | N26 | 1555.541 | -1425.91 | 0 | 1555.541 | -1425.91 | 2110.197 | 5314.765 | 3499.967 |
| 12 | N26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | N27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | N27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | N27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | N27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | N27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | N27 | -243.333 | -223.055 | 0 | 243.333 | -223.055 | 330.0977 | 831.3875 | 547.499 |
| 12 | N27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | N28 | 6.119 | -42.071 | 44.015 | 44.4383 | -42.071 | 61.19421 | 153.1667 | 101.3221 |
| 7 | N28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | N28 | 0.252 | -1.733 | 1.813 | 1.83043 | -1.733 | 2.520667 | 6.309074 | 4.173573 |
| 9 | N28 | 91.304 | -627.712 | 656.72 | 663.0366 | -627.712 | 913.0388 | 2285.304 | 1511.761 |
| 10 | N28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | N28 | 13.723 | -94.348 | 98.708 | 99.65736 | -94.348 | 137.2339 | 343.4914 | 227.2245 |
| 12 | N28 | 174.71 | -1201.13 | 1256.636 | 1268.723 | -1201.13 | 1747.103 | 4372.936 | 2892.759 |
| 6 | N29 | -6.119 | -42.071 | 44.015 | 44.4383 | -42.071 | 61.19421 | 153.1667 | 101.3221 |
| 7 | N29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | N29 | -23.005 | -158.156 | 165.465 | 167.0566 | -158.156 | 230.0461 | 575.7974 | 380.8981 |
| 9 | N29 | -91.306 | -627.729 | 656.738 | 663.0547 | -627.729 | 913.0637 | 2285.366 | 1511.802 |
| 10 | N29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | N29 | -229.824 | -1580.04 | 1653.056 | 1668.956 | -1580.04 | 2298.246 | 5752.428 | 3805.313 |
| 12 | N29 | -174.71 | -1201.13 | 1256.636 | 1268.723 | -1201.13 | 1747.103 | 4372.936 | 2892.759 |
| 6 | N30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | N30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | N30 | -23.168 | -159.28 | -166.64 | 168.2428 | -159.28 | 231.6803 | 579.887 | 383.6038 |
| 9 | N30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | N30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | N30 | -229.709 | -1579.25 | -1652.23 | 1668.123 | -1579.25 | 2297.099 | 5749.557 | 3803.414 |
| 12 | N30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | N30A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | N30A | 337.484 | -309.36 | 0 | 337.484 | -309.36 | 457.8199 | 1153.07 | 759.3387 |
| 8 | N30A | 359.11 | -329.184 | 0 | 359.11 | -329.184 | 487.1572 | 1226.959 | 807.9973 |
| 9 | N30A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | N30A | 1198.94 | -1099.03 | 0 | 1198.94 | -1099.03 | 1626.444 | 4096.378 | 2697.615 |
| 11 | N30A | 1571.788 | -1440.81 | 0 | 1571.788 | -1440.81 | 2132.238 | 5370.276 | 3536.523 |
| 12 | N30A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | N31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | N31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | N31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | N31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | N31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | N31 | 13.8 | -94.875 | -99.26 | 100.2147 | -94.875 | 138.0009 | 345.4118 | 228.4946 |
| 12 | N31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | N31A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Node | Tens | 0.4 | 0.75 |
|---|---|---|---|
| N26 | 2110 | 5315 | 3500 |
| N27 | 330 | 831 | 547 |
| N28 | 1747 | 4373 | 2893 |
| N29 | 2298 | 5752 | 3805 |
| N30 | 2297 | 5750 | 3803 |
| N30A | 2132 | 5370 | 3537 |
| N31 | 138 | 345 | 228 |
| N31A | 351 | 884 | 582 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |

| Ballast Location | Required Guywire & Earth Anchor SWL | Ballast on Concrete | Concrete Ballast on Rubber Mats on Concrete Ground Surface OR Staked to Prevent Sliding |
|---|---|---|---|

REVISIONS






| | | |
|---|---|---|
| DRAWN | J. LENARD | DATE 7/25/13 |
| CHECK | | |
| DESIGN | | |
| APPROVAL | | |
| APPROVAL | | |

APPLIED ELECTRONICS
722 BLUE CRAB RD., NEWPORT NEWS, VA 23606

TITLE
4 Sound 250A
Soco/TL Distro

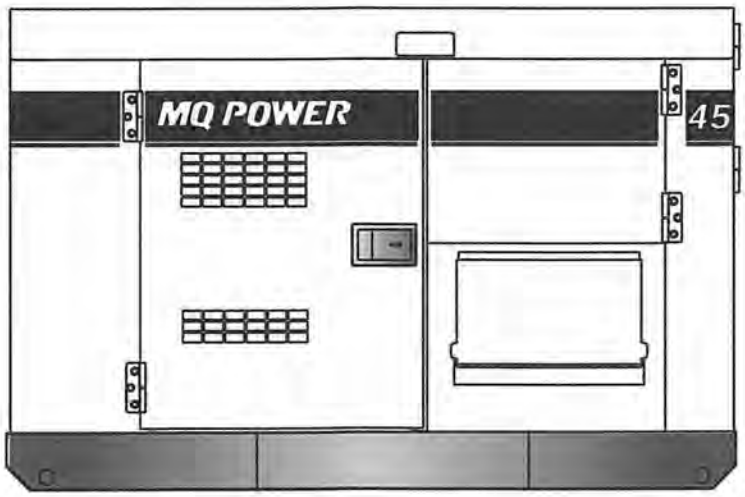
SIZE | CODE IDENT. | DWG NO.
QUOTE# 36323

SCALE FULL | SHEET 1 OF 1

# DCA45SSI
## WhisperWatt™ Generator

# WhisperWatt™ 45

**Prime Rating:** 36 kW (45 kVA)
**Standby Rating:** 40 kW (50 kVA)
60 Hertz




## Standard Features

- **Heavy duty, 4-cycle, diesel engine** provides maximum reliability.
- **Brushless alternator** reduces service and maintenance requirements and meets temperature rise standards for Class H insulation systems.
- **Open delta alternator design** provides virtually unlimited excitation for maximum motor starting capability.
- **Automatic voltage regulator** (AVR) provides precise regulation.
- **Electronic Governor Control (Crystal Sync)** maintains frequency to within ±0.25% from no load to full load.
- **Full load acceptance** of standby nameplate rating in one step (NFPA 110, para 5-13.2.6).
- **Sound attenuated, weather resistant, steel housing** provides operation at 65 dB(A) at 23 feet. Fully lockable enclosure allows safe unattended operation.
- **Internal fuel tank** with direct reading fuel gauges are standard.
- **Seven-stage powder coat paint** provides durability and weather protection.
- **Fuel/water separator** removes condensation from fuel for extended engine life. Panel mounted alarm light included.
- **Complete engine analog instrumentation** includes DC ammeter, oil pressure gauge, water temp. gauge, fuel level gauge, tachometer/hour meter, preheat indicator, emergency shutdown monitors, and keyed start switch.
- **Automatic start/stop control —** automatically starts the generator set during a commercial power failure when used in conjunction with a transfer switch.
- **Complete generator analog instrumentation** includes voltage regulator control, ammeter phase selector switch, voltmeter phase selector switch, AC voltmeter, AC ammeter, frequency meter, panel light, and circuit breaker.
- **Automatic safety shutdown system** monitors the water temperature, engine oil pressure, overspeed and overcrank. Warning lights indicate abnormal conditions.
- **Complete power panel.** Fully covered; three-phase terminals and single phase receptacles allow fast and convenient hookup for most applications including temporary power boxes, tools and lighting equipment. All are NEMA standard.
- **Simultaneous single and three phase power.**
- **Voltage selector switch** allows easy to change voltages as your applications require.
- **EPA emissions certified** Interim Tier 4 emissions compliant.

# DCA45SSI
## WhisperWatt™ Generator

## Specifications

| Generator Specifications | |
|---|---|
| Design | Revolving field, self-ventilated drip-proof, single bearing |
| No. of Poles | 4-pole |
| Excitation | Brushless with AVR |
| Standby Output | 40 kW (50 kVA) |
| Prime Output | 36 kW (45 kVA) |
| Generator RPM | 1800 |
| Voltage — 3Ø | 208, 220, 240, 416, 440, 480V Switchable |
| Voltage — 1Ø | 120, 127, 139, 240, 254, 277V Switchable |
| Armature Connection | Star with neutral / Zig Zag |
| Voltage Regulation (No load to full load) | ±0.5% |
| Power Factor | 1.0 |
| Frequency | 60 Hz |
| Frequency Regulation: No Load to Full Load | Isochronous under varying loads from no load to 100% rated Load |
| Frequency Regulation: Steady State | ±0.25% of mean value for constant loads from no load to full load |
| Insulation | Class H |
| Sound Level dB(A) Full load at 23 feet | 65 |

| Engine Specifications | |
|---|---|
| Make / Model | Isuzu / BU-4JJ1T |
| Emissions | EPA Interim Tier 4 Certified |
| Starting System | Electric |
| Design | 4-cycle, water cooled, direct injection, turbocharged |
| Displacement | 183.0 in³ (2999 cc) |
| No. cylinders | 4 |
| Bore x Stroke (mm) | 95.4 x 104.9 |
| Gross Engine Power Output | 67.1 hp (50.0 kW) |
| BMEP | 136 psi (940 kPa) |
| Piston Speed | 1237 ft/min (6.29 m/s) |
| Compression Ratio | 17.5 : 1 |
| Engine Speed | 1800 rpm |
| Overspeed Limit | 2100 rpm |
| Oil Capacity | 3.96 gallons (15.0 liters) |
| Battery | 12V 72Ah x 1 |

| Fuel System | | |
|---|---|---|
| Maximum Fuel Flow (per hour) | 16 gallons (61 liters) | |
| Maximum Inlet Restriction (Hg) | 5.9 in. (150 mm) | |
| Fuel Tank Capacity | 26.5 gallons (100.0 liters) | |
| **Fuel Consumption** | **gph** | **lph** |
| At full load | 2.8 | 10.6 |
| At 3/4 load | 2.1 | 8.0 |
| At 1/2 load | 1.5 | 5.6 |
| At 1/4 load | 0.9 | 3.4 |

| Cooling System | |
|---|---|
| Fan Load | 0.94 HP (0.7 KW) |
| Coolant Capacity (with radiator) | 2.96 gallons (11.2 liters) |
| Coolant Flow Rate (per minute) | 15.4 gallons (58.5 liters) |
| Heat Rejection to Coolant (per minute) | 1640 Btu (1.73 MJ) |
| Heat Rejection to Room (per minute) | 379 Btu (0.40 MJ) |
| Maximum Coolant Friction Head | 6.1 psi (42 kPa) |
| Maximum Coolant Static Head | 21 feet (6.4 meters) |
| Ambient Temperature Rating | 104°F (40°C) |

| Air | |
|---|---|
| Combustion Air | 99 cfm (2.8 m³/min) |
| Maximum Air Cleaner Restriction | 25 in. H²O (6.25 kPa) |
| Alternator Cooling Air | 526 cfm (14.9 m³/min) |
| Radiator Cooling Air | 2330 cfm (66.0 m³/min) |

| Exhaust System | |
|---|---|
| Gas Flow (full load) | 233 cfm (6.6 m³/min) |
| Gas Temperature | 896 °F (480 °C) |
| Maximum Back Pressure | 53.2 in. H²O (13.3 kPa) |

| Amperage | |
|---|---|
| **Rated Voltage** | **Maximum Amps** |
| 1Ø 120 Volt | 100 Amps (4 wire) |
| 1Ø 240 Volt | 50 Amps (4 wire) |
| 3Ø 240 Volt | 108 Amps |
| 3Ø 480 Volt | 54 Amps |
| Main Line Circuit Breaker Rating | 110 Amps |
| Over Current Relay Trip Set Point | 54 Amps |

## Warranty*

**Isuzu Engine**

12 months from date of purchase with unlimited hours or 24 months from date of purchase with 2000 hours (whichever occurs first).

**Generator**

24 months from date of purchase or 2000 hours (whichever occurs first).

**Trailer**

12 months excluding normal wear items.

*Refer to the express written, one-year limited warranty sheet for additional information.

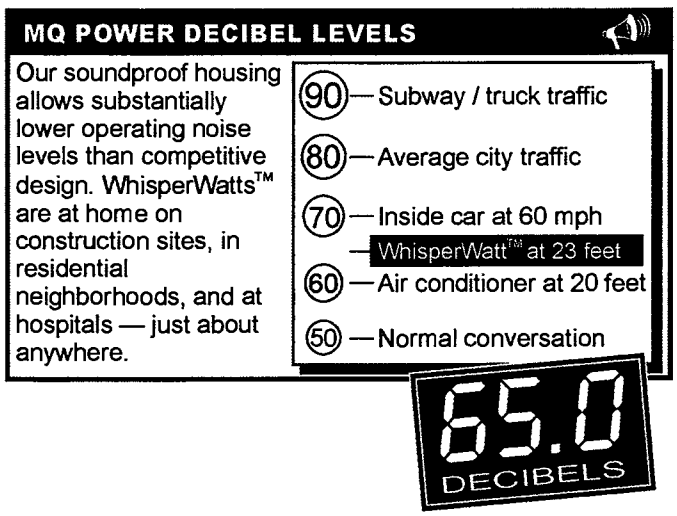
Generator is not intended for use in enclosed areas or where free flow of air is restricted.

Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device.

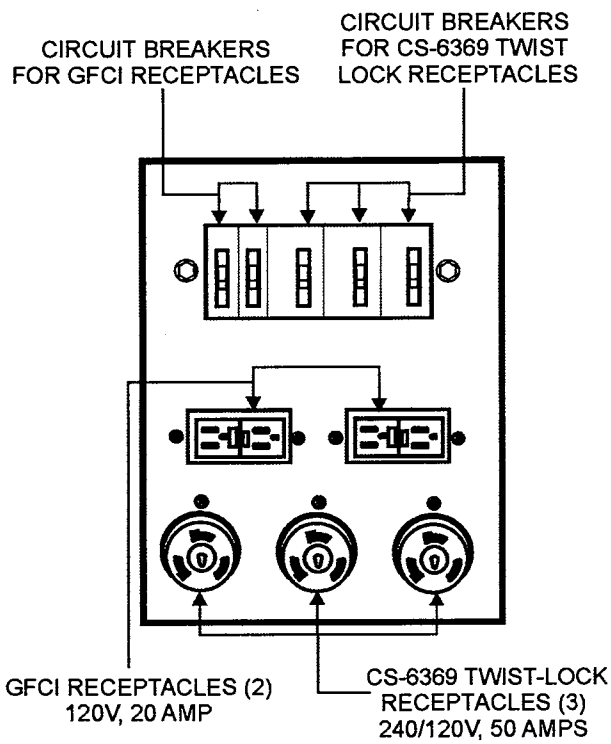
***Specifications are subject to change without notice.***

# DCA45SSI

## WhisperWatt™ Generator




## Generator Output Panel




## Optional Generator Features

- ❑ **Battery Charger** — provides fully automatic and self-adjusting charging to the generator's battery system.
- ❑ **Special Batteries** — long life batteries provide extra engine cranking power.
- ❑ **Low Coolant Level Shutdown** — provides protection from critically low coolant levels. Includes control panel warning light.
- ❑ **Jacket Water Heater** — for easy starting in cold weather climates.
- ❑ **Spring Isolators** — provides extra vibration protection for standby applications.
- ❑ **Trailer Mounted Package** — highway legal trailer with electric or hydraulic brakes with tandem axle configuration.

## Optional Control Features

- ❑ **Emergency Stop Switch.**
- ❑ **Audible Alarm** — alerts operator of abnormal conditions.

## Optional Fuel Cell Features

- ❑ **Trailer fuel tank** — a second fuel cell located in the trailer allows for extended run time.
- ❑ **Sub-base fuel cells (double wall)** — Additional fuel cell for extended runtime operation. Contains a leak sensor, low fuel level switch, and a secondary containment tank. UL142 listed.
  - ❑ 12 hours of minimum run time.
  - ❑ 24 hours of minimum run time.

## Optional Distribution Devices

- ❑ **Cam-Lock connectors.**
- ❑ **Pin & Sleeve Connectors.**
- ❑ **AC Output Cable.**

# DCA45USI

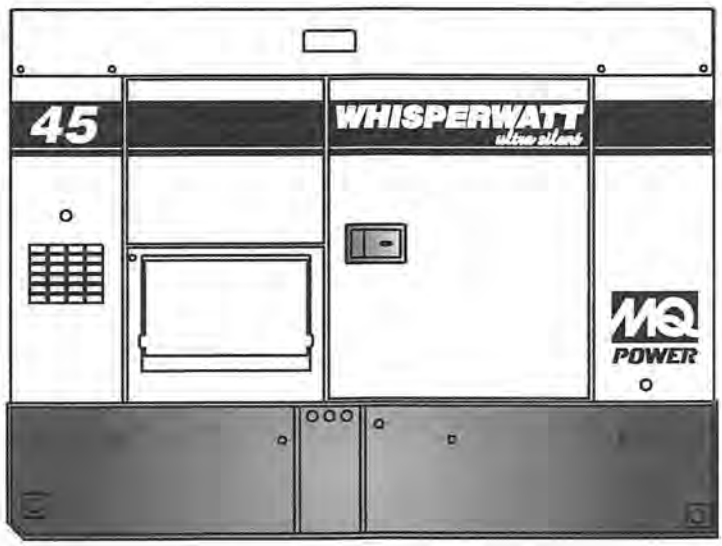
## *MQ POWER Series Generator*

## WhisperWatt™

**Prime Rating** — 36 kW (45 kVA)

**Standby Rating** — 40 kW (50 kVA)

Three-Phase, 60 Hertz, 0.8 PF




### STANDARD FEATURES

- Heavy duty, 4-cycle, direct injection, diesel engine provides maximum reliability.
- Brushless alternator reduces service and maintenance requirements and meets temperature rise standards for Class H insulation systems.
- Open delta excitation design provides virtually unlimited excitation for maximum motor starting capability.
- Automatic voltage regulator (AVR) provides precise regulation.
- Electronic Governor Control (Crystal Sync) — maintains frequency to within ±0.25% from no load to full load.
- Full load acceptance of standby nameplate rating in one step (NFPA 110, para 5-13.2.6).
- Sound attenuated, weather resistant, steel housing provides operation at 58 dB(A) at 23 feet. Fully lockable enclosure allows safe unattended operation.
- Internal fuel tank with direct reading of fuel gauge.
- Seven stage powder coat paint system provides durability and weather protection.
- Fuel/water separator removes condensation from fuel for extended engine life. Panel mounted alarm light included.
- Complete engine analog instrumentation includes DC ammeter, oil pressure gauge, water temp. gauge, fuel level gauge, tachometer/hour meter, preheat indicator, emergency shutdown monitors.
- Automatic start/stop control — automatically starts the generator set during a commercial power failure when used in conjunction with a transfer switch.
- Complete generator analog instrumentation includes voltage regulator control, ammeter phase selector switch, voltmeter phase selector switch, AC voltmeter, AC ammeter, frequency meter, panel light, and circuit breaker.
- Automatic safety shutdown system monitors the water temperature, engine oil pressure, overspeed and overcrank. Warning lights indicate abnormal conditions.
- Complete power panel. Fully covered; three-phase terminals and single phase receptacles allow fast and convenient hookup for most applications including temporary power boxes, tools and lighting equipment. The GFCI receptacles are NEMA 5-20, and the auxililary outputs use CS6369 twist-lock receptacles.
- Simultaneous single and three phase power.
- Voltage selector switch offers the operator a wide range of voltages that are manually selectable. Fine tuning of the output voltage can be accomplished by adjusting the voltage regulator control knob to obtain the desired voltage.
- EPA emissions certified - Interim Tier 4 emissions compliant.

# DCA45USI

## *MQ POWER Series Generator*

## SPECIFICATIONS

| *Generator Specifications* | | |
|---|---|---|
| Design | Revolving field, self-ventilated Drip-proof, single bearing | |
| Armature Connection | Star with Neutral | Zig Zag |
| Phase | 3 | Single |
| Standby Output | 40 KW (50 KVA) | 27.6 KW |
| Prime Output | 36 KW (45 KVA) | 26 KW |
| 3Ø Voltage (L-L/L-N) Voltage Selector Switch at 3Ø 240/139 | 208Y/120, 220Y/127, 240Y/139 | N/A |
| 3Ø Voltage (L-L/L-N) Voltage Selector Switch at 3Ø 480/277 | 416Y/240, 440Y/254, 480Y/277 | N/A |
| 1Ø Voltage (L-L/L-N) (Voltage Selector Switch at 1Ø 240/120) | N/A | 240/120 |
| Power Factor | 0.8 | 1.0 |
| Voltage Regulation (No load to full load) | ±0.5% | |
| Generator RPM | 1800 | |
| Frequency | 60 Hz | |
| No. of Poles | 4 | |
| Excitation | Brushless with AVR | |
| Frequency | 60 Hz | |
| Frequency Regulation: No Load to Full Load | Isochronous under varying loads from no load to 100% rated load | |
| Frequency Regulation: Steady State | ±0.25% of mean value for constant loads from no load to full load. | |
| Insulation | Class H | |
| Sound Level dB(A) Full load at 23 feet | 58 | |

| *Engine Specifications* | |
|---|---|
| Make / Model | Isuzu / BU-4JJ1T |
| Emissions | EPA Interim Tier 4 Certified |
| Starting System | Electric |
| Design | 4-cycle, water cooled, direct injection, turbocharged |
| Displacement | 183.0 in³ (2999 cc) |
| No. cylinders | 4 |
| Bore x Stroke (mm) | 95.4 x 104.9 |
| Gross Engine Power Output | 67.1 bhp (50 kW) |
| BMEP | 136 psi (940 kPa) |
| Piston Speed | 1237 ft./min. (6.29 m/s) |
| Compression Ratio | 17.5:1 |
| Engine Speed | 1800 rpm |
| Overspeed Limit | 2100 rpm |
| Oil Capacity | 3.96 gallons (15 liters) |
| Battery | 12V 72Ah x 1 |

| *Fuel System* | | |
|---|---|---|
| Recommended Fuel | ASTM-D975-No.1 & No.2-D | |
| Maximum Fuel Flow (per hour) | 16 gallons (61 liters) | |
| Maximum Inlet Restriction (Hg) | 5.9 in. (150 mm) | |
| Fuel Tank Capacity | 79.2 gallons (300 liters) | |
| **Fuel Consumption** | **gph** | **lph** |
| At full load | 2.7 | 10.4 |
| At 3/4 load | 2.1 | 8.0 |
| At 1/2 load | 1.5 | 5.6 |
| At 1/4 load | 0.9 | 3.4 |

| *Cooling System* | |
|---|---|
| Fan Load | 0.54 hp (0.7 kW) |
| Coolant Capacity (with radiator) | 3.15 gallons (12 liters) |
| Coolant Flow Rate (per minute) | 15.4 gallons (58.5 liters) |
| Heat Rejection to Coolant (per minute) | 1640 Btu (1.73 MJ) |
| Heat Rejection to Room (per minute) | 379 Btu (0.40 MJ) |
| Maximum Coolant Friction Head | 6.1 psi (42 kPa) |
| Maximum Coolant Static Head | 21 feet (6.4 meters) |
| Ambient Temperature Rating | 104°F (40°C) |

| *Air* | |
|---|---|
| Combustion Air | 99 cfm (2.8 m³/min) |
| Maximum Air Cleaner Restriction | 25 in. $H_2O$ (6.25 kPa) |
| Alternator Cooling Air | 526 cfm (14.9 m³/min) |
| Radiator Cooling Air | 1472 cfm (41.7 m³/min) |

| *Exhaust System* | |
|---|---|
| Gas Flow (full load) | 233 cfm (6.6 m³/min) |
| Gas Temperature | 896°F (480°C) |
| Maximum Back Pressure | 53.2 in. $H_2O$ (13.3 kPa) |

| *Amperage* | |
|---|---|
| **Rated Voltage** | **Maximum Amps** |
| 1Ø 120 Volt | 100 Amps (4 wire) 108A x 2 (Zigzag) |
| 1Ø 240 Volt | 50 Amps (4 wire) 108A (Zigzag) |
| 3Ø 240 Volt | 108 Amps |
| 3Ø 480 Volt | 54 Amps |
| Main Line Circuit Breaker Rating | 110 Amps |
| Over Current Relay Trip Set Point 480V Mode Only | 54 Amps |

## WARRANTY*

### Isuzu Engine

12 months from date of purchase with unlimited hours or 24 months from date of purchase with 2000 hours (whichever comes first).

### Generator

24 months from date of purchase or 2000 hours (whichever occurs first).

### Trailer

12 months excluding normal wear items.

*Refer to the express written, one-year limited warranty sheet for additional information.

### *NOTICE*

Generator is not intended for use in enclosed areas or where free flow of air is restricted.

Backfeed to a utility system can cause electrocution, shock and/or property damage. **DO NOT** connect to any building's electrical system except through an approved device.

Specifications are subject to change without notice.

# DCA45USI

## *MQ POWER Series Generator*

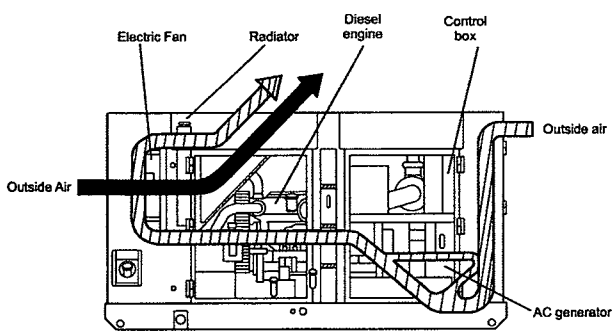
**MQ POWER DECIBEL LEVELS**

Our soundproof housing allows substantially lower operating noise levels than competitive designs. WhisperWatts are at home on construction sites, in residential neighborhoods, and at hospitals — just about anywhere.

- 90 — Subway / truck traffic
- 80 — Average city traffic
- 70 — Inside car at 60 mph
- 60 — Air conditioner at 20 feet — Ultra-Silent at 23 feet
- 50 — Normal conversation

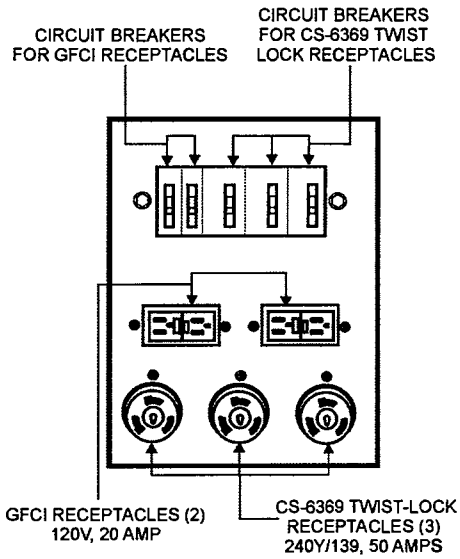

## ULTRA-SILENT FEATURES

- **Low Noise Muffler** — Large capacity low noise muffler minimizes exhaust sound.
- **Soundproof Casing** — The new design divides the cabinet into three sections, separating the engine, muffler and radiator for more efficient cooling and reduces noise from the engine and fans.
- **New Cooling System** — An advanced design uses two separate air intake systems to cool the generator. The engine fan draws air in to cool the engine and generator housing while a second electric fan directly cools the radiator. With less air being drawn into the generator through each fan, considerably less noise is produced through the top of the generator.
- **Environmental Design** — Constructed using an integrated environmental skid and fuel tank. This design fully contains fuel leakage and any liquid that might leak from the engine such as lube oil or radiator coolant. All potentially hazardous liquids are contained without contaminating the surrounding area.




Flow of Cooling Air

## GENERATOR OUTPUT PANEL




## OPTIONAL GENERATOR FEATURES

- **Battery Charger** — provides fully automatic and self-adjusting charging to the generator's battery system.
- **Jacket Water Heater** — for easy starting in cold weather climates.
- **Special Batteries** — long life batteries provide extra engine cranking power.
- **Low Coolant Level Shutdown** — provides protection from critically low coolant levels. Includes control panel warning light.
- **Spring Isolaters** — provides extra vibration protection for standby applications.
- **Trailer Mounted Package** — meets National Highway Traffic Safety Administration (NHTSA) regulations. Trailer is equipped with electronic or surge brakes with double or triple axle configuration.

## OPTIONAL CONTROL FEATURES

- **Emergency Stop Switch** — when manually activated shuts down generator in the event of an emergency.
- **Audible alarm** — alerts operator of abnormal conditions

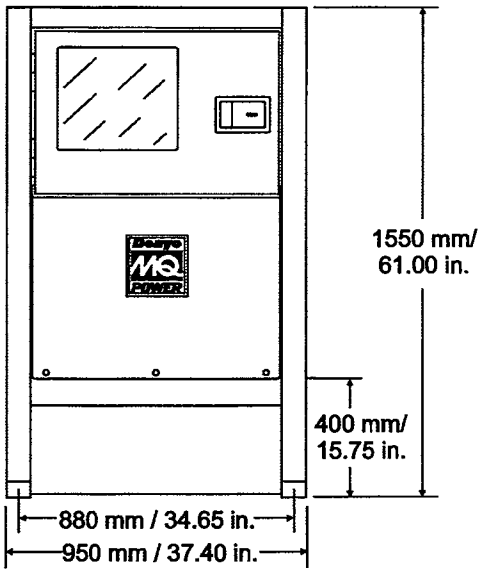
## OPTIONAL OUTPUT CONNECTIONS

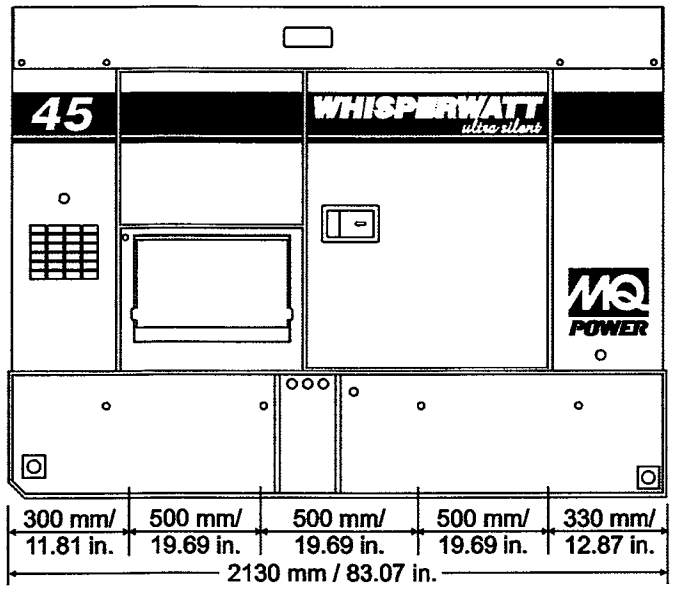
- **Cam-Lok Connectors** — provides quick disconnect alternative to bolt-on connectors.
- **Pin and Sleeve Connectors** — provides industry standard connectors for all voltage requirements.
- **Output Cable** — available in any custom length and size configuration.

# DCA45USI

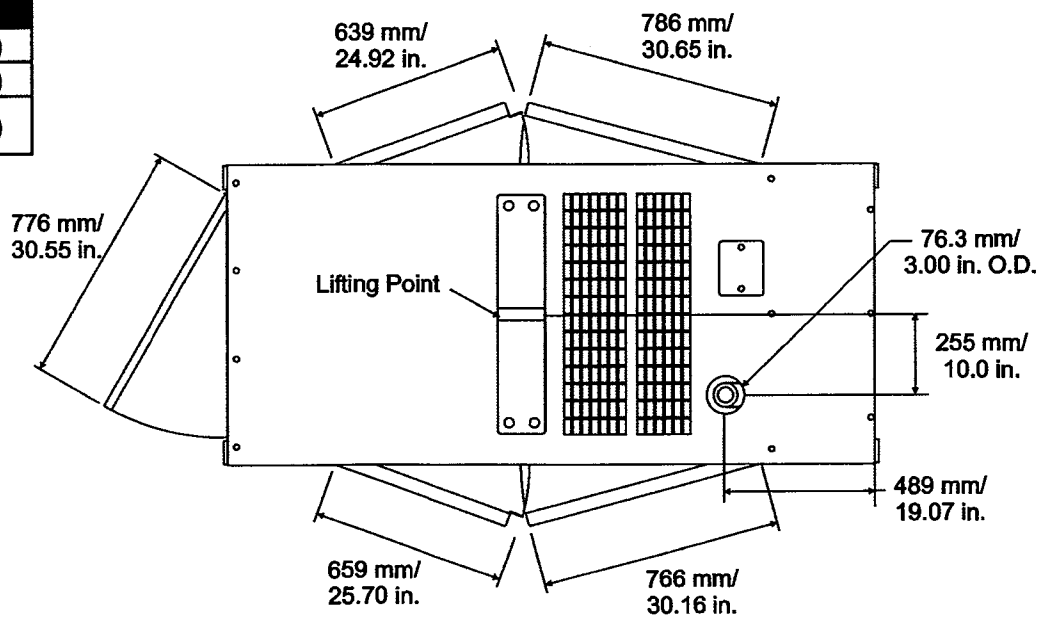
## *MQ POWER Series Generator*

### DIMENSIONS




| *Weight* | |
|---|---|
| Dry Weight | 2,888 lbs. (1,310 kg) |
| Wet Weight | 3,499 lbs. (1,587 kg) |
| Max. Lifting Point Capacity | 6,960 lbs. (3,157 kg) |




***Generator can be placed on a MQ Power Model TRLR70 Tandem Axle Trailer***

***Manufactured by Denyo Co.***

***Your Multiquip dealer is:***

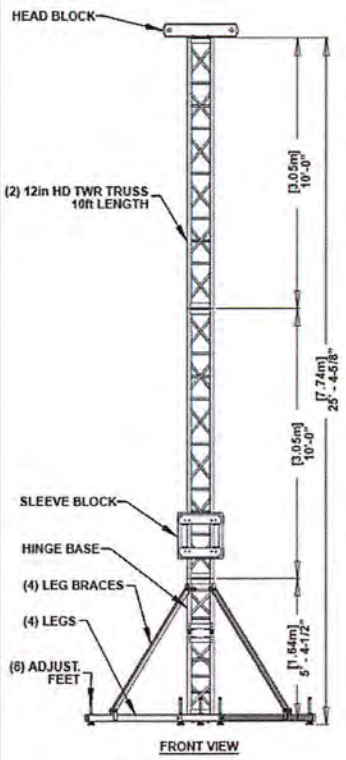

DCA45USI2 Rev. #10 (01/10/11)

**MULTIQUIP**
POST OFFICE BOX 6254
CARSON, CA 90749
310-537-3700 • 800-883-2551
FAX: 310-604-3831
E-MAIL: sales@multiquip.com
WEBSITE: www.multiquip.com

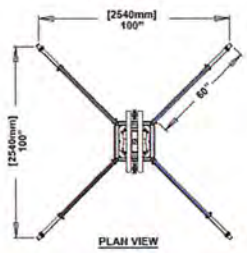
Electronics Applied

# GROUND SUPPORT TOWER SYSTEMS


Applied Electronics GS Towers are constructed from heavy duty, schedule 80, 6061-T6 aluminum tube and are available in 12", 16" or 20.5" tower truss. These towers provide the support structure for roof systems, video walls, sound reinforcement and lighting grids where heaver load ratings are required. They can be supplied with sleeve blocks and accessories for most rigging applications.




FRONT VIEW




PLAN VIEW

## FEATURES

Modular Design For Fast Assembly And Easy Transport
Adjustable Leveling Pads
Lowers To 6" For Easy Loading
Three Way Custom Sleeve Blocks
Tower Truss Sections Available In 12", 16" or 20.5"
Highly Polished Aluminum Tubing
1.9" OD 6061-T6 Aluminum Tube Schd #80
0.200" Wall Thickness
1.05" OD Aluminum Bracing

## ORDERING INFORMATION

Item No. 1-25-012 (25' Height With 12" Tower Truss)
GS-25, 12" Tower Truss: Maximum Weight Rating - 2000 lbs. at 25'

Item No. 1-35-012 (35' Maximum Height With 12" Tower Truss)
GS-35 12" Tower Truss: Maximum Weight Rating - 2000 lbs. at 35'

Item No. 1-45-016 (45' Maximum Height With 16" Tower Truss)
GS-45 16" Tower Truss: Maximum Weight Rating - 3000 lbs. at 45'

Item No. 1-55-205 (55' Maximum Height With 20.5" Tower Truss)
GS-55 20.5" Tower Truss: Maximum Weight Rating - 4000 lbs. at 55'

## COMPONENTS

5' Hinged Base Section
Head Block
Sleeve Block
10' Tower Truss Sections
4 Outriggers
Guy Wires (Required For Outdoor Use)

## OPTIONS

CM Hoists
Complete Motor Control Packages
Tower Lifting Arm
Guy Wire Packages
Custom Length Tower Sections

Item No. 10-12-120


## GUY WIRE PACKAGE ORDERING INFORMATION

| Item No. | Tower Height One Pkg Per Tower | Weight |
|---|---|---|
| 14-25-000 | 25' Towers | 100 lbs. |
| 14-35-000 | 35' Towers | 110 lbs. |
| 14-45-000 | 45' Towers | 140 lbs. |
| 14-55-000 | 55' Towers | 160 lbs. |

## TOWER TRUSS ORDERING INFORMATION

| Item No. | Dimensions | Weight |
|---|---|---|
| 10-12-120 | 12" x 12" x 10' | 82 lbs. |
| 10-12-096 | 12" x 12" x 8' | 48 lbs. |
| 10-12-060 | 12" x 12" x 5' | 35 lbs. |
| 10-16-120 | 16" x 16" x 10' | 96 lbs. |
| 10-16-096 | 16" x 16" x 8' | 76 lbs. |
| 10-16-060 | 16" x 16" x 5' | 28 lbs. |
| 10-20-120 | 20.5" x 20.5" x 10' | 95 lbs. |
| 10-20-096 | 20.5" x 20.5" x 8' | 85 lbs. |
| 10-20-060 | 20.5" x 20.5" x 5' | 75 lbs. |



Phone 800-883-0008 / 757-591-9371 Fax 757-591-9514 www.appliednn.com Proudly Made in USA

# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 09/17/2020

**THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.**

**IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).**

| | |
|---|---|
| **PRODUCER**<br>Excellence Insurance, LLC<br>3801 SW 107th Ave<br><br>Miami FL 33165 | **CONTACT NAME:** Adriana L Clavijo Mauri<br>**PHONE (A/C, No, Ext):** (305) 226-3900 **FAX (A/C, No):** (305) 226-3997<br>**E-MAIL ADDRESS:** certificates@aaunderwriters |
| **INSURED**<br>4 Sound Group, Inc<br>7475 NW 7 Street<br><br>Miami FL 33126- | **INSURER(S) AFFORDING COVERAGE** / **NAIC #**<br>**INSURER A :** Century Surety Company 36951<br>**INSURER B :** Progressive Express Insurance Company 10193<br>**INSURER C :** Ascendant Commercial Insurance Incorporated 13683<br>**INSURER D :**<br>**INSURER E :**<br>**INSURER F :** |

**COVERAGES** **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | TYPE OF INSURANCE | ADDL INSD | SUBR WVD | POLICY NUMBER | POLICY EFF (MM/DD/YYYY) | POLICY EXP (MM/DD/YYYY) | LIMITS | |
|---|---|---|---|---|---|---|---|---|
| A | [X] COMMERCIAL GENERAL LIABILITY<br>[ ] CLAIMS-MADE [X] OCCUR<br>[X] Blanket Additional Insurance<br>[X] Blanket Waiver of Subrogation<br>GEN'L AGGREGATE LIMIT APPLIES PER:<br>[X] POLICY [ ] PRO-JECT [ ] LOC<br>[X] OTHER: Primary and Non Contribu | Y | | CCP-913457 | 07/01/2020 | 07/01/2021 | EACH OCCURRENCE<br>DAMAGE TO RENTED PREMISES (Ea occurrence)<br>MED EXP (Any one person)<br>PERSONAL & ADV INJURY<br>GENERAL AGGREGATE<br>PRODUCTS - COMP/OP AGG<br>$ | $ 2,000,000<br>$ 100,000<br>$ 5,000<br>$ 2,000,000<br>$ 2,000,000<br>$ 2,000,000<br>$ |
| B | AUTOMOBILE LIABILITY<br>[ ] ANY AUTO<br>[ ] OWNED AUTOS ONLY [X] SCHEDULED AUTOS<br>[ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY<br>[X] PIP $ 10,000 | | | 02149332-4 | 04/08/2020 | 04/08/2021 | COMBINED SINGLE LIMIT (Ea accident)<br>BODILY INJURY (Per person)<br>BODILY INJURY (Per accident)<br>PROPERTY DAMAGE (Per accident)<br>$ | $<br>$ 100,000<br>$ 300,000<br>$ 50,000<br>$ |
| | [ ] UMBRELLA LIAB [ ] OCCUR<br>[ ] EXCESS LIAB [ ] CLAIMS-MADE<br>[ ] DED [ ] RETENTION $ | | | | | | EACH OCCURRENCE<br>AGGREGATE<br>$ | $<br>$<br>$ |
| C | WORKERS COMPENSATION AND EMPLOYERS' LIABILITY<br>ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [N]<br>If yes, describe under DESCRIPTION OF OPERATIONS below | N/A | | WC-73381-1 | 11/22/2019 | 11/22/2020 | [X] PER STATUTE [ ] OTH-ER<br>E.L. EACH ACCIDENT<br>E.L. DISEASE - EA EMPLOYEE<br>E.L. DISEASE - POLICY LIMIT | <br>$ $1,000,000<br>$ $1,000,000<br>$ $1,000,000 |

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)**

Certificate Holder is named as Additional Insured with respect to General Liability policy. at least thirty (30) days days written notice according with the policy provisions.

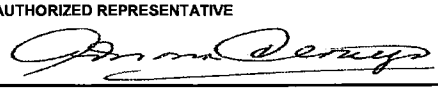
**CERTIFICATE HOLDER**

City of Doral
Building Department
8401 NW 53rd Terrace 2nd floor,
Doral, FL 33166

**CANCELLATION**

**SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.**

**AUTHORIZED REPRESENTATIVE**



**RESOLUTION No. 20-211**

**A RESOLUTION OF THE MAYOR AND THE CITY COUNCIL OF THE CITY OF DORAL, FLORIDA, APPROVING THE AWARD OF INVITATION TO QUOTE #2020-001 "DRIVE-IN MOVIE EVENT SERIES" FOR THE CITY OF DORAL PARKS AND RECREATION DEPARTMENT TO THE TOP RANKED FIRM; AUTHORIZING THE CITY MANAGER TO NEGOTIATE AND ENTER INTO AN AGREEMENT WITH 4SOUND GROUP FOR A PERIOD OF SIX (6) MONTHS IN AN AMOUNT NOT TO EXCEED BUDGETED FUNDS; AUTHORIZING THE CITY MANAGER TO NEGOTIATE AND ENTER INTO AN AGREEMENT WITH THE NEXT HIGHEST RANKED FIRM SUCCESSIVELY IF AN AGREEMENT CANNOT BE REACHED WITH THE TOP RANKED FIRM; PROVIDING FOR IMPLEMENTATION; AND PROVIDING FOR AN EFFECTIVE DATE**

**WHEREAS**, Due to COVID-19 restrictions, traditional in-person events are not allowed, and instead staff has launched a new Drive-in Movie series to offer the community an enjoyable outdoor movie experience while complying with COVID restrictions and keeping the public safe; and

**WHEREAS**, On July 22, 2020 the Mayor and City Councilmembers approved Resolution No. 20-128 allowing services to offer a Drive-in Movie Event Series for the community spanning the months of July 2020-September 2020. These events were successfully executed and were well received by the community with each movie reaching maximum capacity at 200 cars; and

**WHEREAS**, On September 15, 2020, Invitation to Quote #2020-001 was advertised for the provision of providing LED Screen Services for Drive-in Movies for the remaining five (5) movies which will be held between October 2020 and February 2021; and

**WHEREAS**, eleven (11) firms expressed interest in the solicitation with seven (7) submitting pricing virtually. Three (3) firms were deemed responsive with their submittals being on time and all requirements met; and

**WHEREAS**, after review of submittals received, the submittal by 4Sound Group was deemed to be the lowest responsive and responsible; and

**WHEREAS,** Staff respectfully requests approval from the Mayor and City Councilmembers to award Invitation to Quote # 2020-001 to the top ranked firm and authorize the City Manager to negotiate and enter into an agreement with 4Sound Group for a term of six (6) months for the provision of providing LED Screen Services for the Drive-In Movie Event Series for an amount not to exceed budgeted funds. Staff further requests approval to authorize the City Manager to negotiate and enter into an agreement with the next highest ranked firm successively if an agreement cannot be reached with 4Sound Group. Funding for this project will come from Parks & Recreation Account 001.90005.500440.

**NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF DORAL, FLORIDA, AS FOLLOWS:**

**Section 1. Recitals.** The above recitals are confirmed, adopted, and incorporated herein and made a part hereof by this reference.

**Section 2. Approval & Authorization.** The Mayor and City Councilmembers hereby approve the award of Invitation to Quote #2020-001 to the top ranked firm and authorize the City Manager to enter into an agreement with 4Sound Group for a term of six (6) months for the provision of providing LED Screen Services for the Drive-In Movie Event Series in an amount not to exceed budgeted funds. The Mayor and City Councilmembers further approve and authorize the City Manager to negotiate and enter into an agreement with the next highest ranked firm successively if an agreement cannot be reached with 4Sound Group. The agreement is subject to approval by the City Attorney as to form and legal sufficiency and on such other terms and conditions as

may be appropriate to protect and further the interest of the City. This Authorization does not create or confer any rights to 4Sound Group or any of the other ranked firms.

**Section 3. Implementation.** The City Manager and the City Attorney are hereby authorized to take such action as may be necessary to implement the provisions of this Resolution.

**Section 4. Effective Date.** This resolution shall take effect immediately upon adoption.

The foregoing Resolution was offered by Councilmember Mariaca who moved its adoption. The motion was seconded by Councilmember Cabrera and upon being put to a vote, the vote was as follows:

| | |
|---|---|
| Mayor Juan Carlos Bermudez | Yes |
| Vice Mayor Christi Fraga | Yes |
| Councilwoman Digna Cabral | Yes |
| Councilman Pete Cabrera | Yes |
| Councilwoman Claudia Mariaca | Yes |

PASSED AND ADOPTED this 14 day of October, 2020.

JUAN CARLOS BERMUDEZ, MAYOR

ATTEST:

CONNIE DIAZ, MMC
CITY CLERK

APPROVED AS TO FORM AND LEGAL SUFFICIENCY
FOR THE USE AND RELIANCE OF THE CITY OF DORAL ONLY:

LUIS FIGUEREDO, ESQ.
CITY ATTORNEY