

AGENDA
KEIZER CITY COUNCIL
REGULAR SESSION
Monday, August 5, 2019
7:00 p.m.
Robert L. Simon Council Chambers
Keizer, Oregon

1. **CALL TO ORDER**
2. **ROLL CALL**
3. **FLAG SALUTE**
4. **SPECIAL ORDERS OF BUSINESS**

5. **COMMITTEE REPORTS**

- a. Volunteer Coordinating Committee Recommendations for Appointment to Planning Commission and Keizer Public Arts Commission Youth Liaison

6. **PUBLIC TESTIMONY**

This time is provided for citizens to address the Council on any matters other than those on the agenda scheduled for public hearing.

7. **PUBLIC HEARINGS**

- a. Proposed Text Amendment to Keizer Development Code Section 2.125 (Activity Center Overlay Zone) to Allow Auto and Home Supply Stores (SIC 553) and Automotive Services, Except Repair (SIC 754) in Area D of the Keizer Station Plan boundary as "Flexible Space Uses"
- b. **RESOLUTION** – Authorization for Supplement Budget – General Administration Contingency
RESOLUTION – Authorization for Supplemental Budget – PEG Fund
RESOLUTION – Authorization for Supplemental Budget – Community Center Fund
RESOLUTION – Authorization for Supplemental Budget - Administrative Services Fund – Public Work Civic Center Facilities
RESOLUTION – Authorization for Supplemental Budget – Interfund Loan From Transportation Improvement Fund to Water Facility Fund

8. **ADMINISTRATIVE ACTION**

9. CONSENT CALENDAR

- a. RESOLUTION – Authorizing The City Manager to Award And Enter Into An Agreement With Salem Concrete Paving For Willamette Manor Sport Court Project
- b. RESOLUTION – Authorizing The City Manager to Award And Enter Into An Agreement With Wyckam LLC For Shade Sails For The Big Toy At Keizer Rapids Park
- c. RESOLUTION – Authorizing The City Manager To Purchase 2019 Ford F-250 Vehicle For The Parks Division Of The Public Works Department And Authorizing Disposition Of Surplus Property
- d. Approval of July 8, 2019 City Council Work Session Minutes
- e. Approval of July 15, 2019 City Council Regular Session Minutes

10. COUNCIL LIAISON REPORTS

11. OTHER BUSINESS

This time is provided to allow the Mayor, City Council members, or staff an opportunity to bring new or old matters before the Council that are not on tonight's agenda.

12. WRITTEN COMMUNICATIONS

To inform the Council of significant written communications.

13. AGENDA INPUT

August 12, 2019

6:00 p.m. – City Council Work Session

- Canceled

August 19, 2019

7:00 p.m. City Council Regular Session

September 3, 2019 (Tuesday)

7:00 p.m. City Council Regular Session

14. ADJOURNMENT

The City of Keizer is committed to providing equal access to all public meetings and information per the requirements of the ADA and Oregon Revised Statutes (ORS). The Keizer Civic Center is wheelchair accessible. If you require any service that furthers inclusivity to participate, please contact the Office of the City Recorder at least 48 business hours prior to the meeting by email at davist@keizer.org or phone at (503)390-3700 or (503)856-3412. Most regular City Council meetings are streamed live through the City's website and cable-cast on Comcast Channel 23 within the Keizer City limits. Thank you for your interest in the City of Keizer.

CITY COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND CITY COUNCIL MEMBERS

THROUGH: CHRIS EPPLEY
CITY MANAGERFROM: TRACY L. DAVIS, MMC
CITY RECORDERSUBJECT: VOLUNTEER COORDINATING COMMITTEE RECOMMENDATIONS FOR
APPOINTMENTS TO PLANNING COMMISSION AND KEIZER PUBLIC ARTS
COMMISSION YOUTH LIAISON**ISSUE:**

The Volunteer Coordinating Committee met on July 18, 2019 to review applications and interview candidates for openings on several committees. The Committee is recommending the following applicants for appointment:

- Planning Commission – **Matt Lawyer, Jeremy Grenz** and **Frank Hostler** for Positions #1, 2 and 3 respectively, terms beginning October 1, 2019 and expiring September 30, 2022.
- Youth Committee Liaison – **Anne Farris** to serve on the Public Arts Commission for the 2019-20 term beginning September 1, 2019 and expiring June 30, 2020.

RECOMMENDATION:

It is recommended the City Council accept the recommendations of the Volunteer Coordinating Committee and appoint the applicants as outlined above.

COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND CITY COUNCIL MEMBERS

THROUGH: CHRIS EPPLEY, CITY MANAGER
NATE BROWN, COMMUNITY DEVELOPMENT DIRECTOR

FROM: SHANE WITHAM, SENIOR PLANNER

SUBJECT: Proposed text amendment to Keizer Development Code Section 2.125 (Activity Center Overlay Zone) to allow *Auto and Home Supply Stores (SIC 553)* and *Automotive Services, Except Repair (SIC 754)* in Area D of the Keizer Station Plan boundary as “Flexible Space Uses.”

ATTACHMENTS:

- Section 2.125 Activity Center Overlay Zone (ACO) - draft

ISSUE:

Keizer Development Code (KDC) Section 2.125 establishes a list of restricted uses-- “Flexible Space Uses”-- to allow some (up to 30%) inclusion of retail/commercial uses in the underlying Industrial Business Park (IBP) zone of the Keizer Station Area D. This is intended to support the more intense employment types of uses.

In late May, representatives for the property owners of Area D met with staff to discuss allowed “Flexible Space Uses”. Due to ambiguity between the definitions, categories, and terminology used in the KDC and the Standard Industrial Classification (SIC) Manual, there was a question as to whether or not “*tire, battery, and accessory dealers*”, “*carwashes*”, and “*lubricating services*” could be included in the categorical umbrella of *Gasoline Service Stations (SIC 554)* which is already allowed as a “Flexible Space Use” in the KDC. Staff determined these additional uses would be allowed as part of a Gasoline Service Station, but **only if** they were owned and operated as ***accessory and secondary*** to the main use.

The representatives for Area D expressed a desire to preserve development options and requested these additional uses be allowed outright as separate uses. In order to facilitate the policy discussion, staff initiated a text amendment proposing to add the following categories as permitted “Flexible Space Uses” within Area D of the Keizer Station:

- ***Auto and Home Supply Stores (SIC 5531)*** – “*Tire, battery, and accessory dealers*”, “*Retail auto parts*”, “*Automobile air conditioning*”.
- ***Automotive Services, Except Repair (SIC 754)*** – which includes “*carwashes*”, “*truck washes*” “*Lubricating services*”, “*Do-it-yourself garages*”, “*Automobile inspection service*”, “*Road Service*”, “*Rustproofing service*”, “*towing service*”, “*undercoating service*”, “*window tinting*” and “*Wrecker service*”.

Planning Commission held a public hearing on July 10, 2019 to consider the proposed text amendment and voted 5-1 in favor of the change. The one dissenting vote cited concerns for local businesses as the reason for voting against the proposed change.

The proposal doesn't alter any other limitations or change the area allowed for Flexible Space Uses. Currently, the adopted Area D master plan authorizes 38,809 sq. ft. of commercial/retail uses within the "jug handle" area. Any change to this limitation would require a separate process of a master plan amendment. The policy question is whether broadening the intent of the Keizer Station Plan to include more auto oriented uses in the IBP zone is appropriate.

The Council may wish to restrict the uses listed in these two SIC categories limiting the change to just those requested by the property owner, namely: "Carwashes", "Automotive Tire Battery and Accessories", and "Automotive Lubricating Services".

POLICY DISCUSSION:

The policy issues to be considered are related to the types of uses Council feels are appropriate for inclusion in the "Flexible Space Uses" listed in the IBP zone. These uses would apply to all IBP zoned property. The issues relating to this proposal are as follows:

- Working with the property owner (Chemawa Station LLC) may facilitate development of Area D of the Keizer Station Plan (KSP). Up to this point there has not been development in this area. Allowing additional flexibility of uses would perhaps engender greater impetus/desirability for development.
- The proposal does not alter the percentage or inclusion of area allowed as Flexible Space—currently set as 38,809 sq. ft. in the "jug handle" area by the adopted master plan.
- The uses proposed can already be developed as *accessory* to Gasoline Service Stations—which is already allowed.
- Allowing more types of auto oriented uses departs from the original intent of allowing Flexible Space uses only as support for employment lands.
- Creating stand-alone auto oriented uses would perhaps compete with established businesses in established commercial areas—a citizen concern expressed in the past.
- Taking this action could be argued by critics as eroding the capacity of existing employment lands may negatively affect the City's future request to create additional employment lands.

RECOMMENDATION:

That the City Council: open the public hearing to consider the proposed text amendments, deliberate, determine the appropriate policy direction, and direct staff to prepare an ordinance with findings to adopt the proposed revisions.

COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND COUNCIL MEMBERS

THROUGH: CHRISTOPHER C. EPPLEY, CITY MANAGER

FROM: TIM WOOD, FINANCE DIRECTOR

SUBJECT: AUTHORIZATION FOR SUPPLEMENTAL BUDGET

ISSUE: Oregon Budget Law, when authorized by resolution of the governing body of a municipal corporation, provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial plan.

Administrative Services Fund – General Administration

The City participates in a “Retro Plan” agreement for its General and Auto liability insurance premiums. Under this plan, initial premium contributions are 75% of the base premium. The City is then responsible for claims up to a maximum exposure of 112.5% of the base premium. The City budgets the difference between the 75% base premium and the 112.5% maximum exposure as contingency to be used in the event a claim is received.

The supplemental budget is to transfer \$15,000 from Contingency to General Administration to provide appropriations for the retrospective liability insurance claim.

Peg Fund

The supplemental budget is to recognize and appropriate \$20,000 in additional working capital to provide for production equipment improvements that were in process but not completed by the end of the previous fiscal year.

Community Center Fund

The supplemental budget is to recognize and appropriate \$40,000 in additional working capital to provide for the community center carpet replacement project that was originally planned to occur during the previous fiscal year.

Administrative Services Fund - Civic Center Facilities

The supplemental budget is to recognize and appropriate \$25,000 in additional working capital to provide for the completion of the HVAC system upgrade that was not completed by the end of the previous fiscal year.

The supplemental budget is to transfer \$40,000 from Contingency to Administrative Services Fund – Civic Center Facilities appropriations to provide for the additional capital outlay.

RECOMMENDATION: Staff recommends the council open the public hearing and receive any public testimony. Once the public hearing is closed the council should adopt the attached resolutions authorizing the supplemental budgets as described above.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZATION FOR SUPPLEMENTAL BUDGET - GENERAL ADMINISTRATION - CONTINGENCY

WHEREAS ORS 294 provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial planning.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Keizer, that the following appropriations be made for fiscal year ending June 30, 2020:

	Adopted/ Amended Budget	Adjustment		Revised Budget
		Increase	Decrease	
Administrative Services Fund - General Administration				
General Administration	282,000	15,000		297,000
Contingency	86,000		15,000	71,000
To transfer appropriations from Contingency to General Administration to provide for a retrospective liability insurance payment.				

BE IT FURTHER RESOLVED that this resolution shall take effect immediately upon the date of its passage.

PASSED this ____ day of _____, 2019

SIGNED this ____ day of _____, 2019

Mayor

City Recorder

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZATION FOR SUPPLEMENTAL BUDGET - PEG Fund

WHEREAS ORS 294 provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial planning.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Keizer, that the following appropriations be made for fiscal year ending June 30, 2020:

	Adopted/ Amended Budget	Adjustment		Revised Budget
		Increase	Decrease	
PEG Fund				
Resources - Beginning Balance	330,400	20,000		350,400
Expenditures - Capital Outlay	50,000	20,000		70,000
To recognize and appropriate \$20,000 in additional working capital to provide for production equipment improvements that were in process but not completed by the end of the previous fiscal year.				

BE IT FURTHER RESOLVED that this resolution shall take effect immediately upon the date of its passage.

PASSED this ____ day of _____, 2019

SIGNED this ____ day of _____, 2019

Mayor

City Recorder

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZATION FOR SUPPLEMENTAL BUDGET - Community Center Fund

WHEREAS ORS 294 provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial planning.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Keizer, that the following appropriations be made for fiscal year ending June 30, 2020:

	Adopted/ Amended Budget	Adjustment		Revised Budget
		Increase	Decrease	
Community Center Fund				
Beginning Balance	149,700	40,000		189,700
Capital Outlay	50,000	40,000		90,000
To recognize and appropriate \$40,000 in additional working capital to provide for the community center carpet replacement project that was originally planned to occur during the previous fiscal year.				

BE IT FURTHER RESOLVED that this resolution shall take effect immediately upon the date of its passage.

PASSED this ____ day of _____, 2019

SIGNED this ____ day of _____, 2019

Mayor

City Recorder

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZATION FOR SUPPLEMENTAL BUDGET - Administrative Services Fund - Public Works Civic Center Facilities

WHEREAS ORS 294 provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial planning.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Keizer, that the following appropriations be made for fiscal year ending June 30, 2020:

	Adopted/ Amended Budget	Adjustment		Revised Budget
		Increase	Decrease	
Administrative Services Public Works Civic Center Facilities				
Beginning Balance	171,400	25,000		196,400
Capital Outlay	49,200	25,000		74,200
To recognize and appropriate \$25,000 in additional working capital to provide for the completion of the HVAC system upgrade that was not completed by the end of the previous fiscal year.				

BE IT FURTHER RESOLVED that this resolution shall take effect immediately upon the date of its passage.

PASSED this ____ day of _____, 2019

SIGNED this ____ day of _____, 2019

Mayor

City Recorder

COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND CITY COUNCIL MEMBERS

THROUGH: CHRISTOPHER C. EPPLEY, CITY MANAGER

FROM: TIM WOOD, FINANCE DIRECTOR

SUBJECT: AUTHORIZATION FOR A SUPPLEMENTAL BUDGET AND AN INTERFUND BORROWING – PARK IMPROVEMENT FUND TO THE PARK SERVICES FUND

ISSUE: At the time the 2019-20 Budget was adopted the total cost or funding source for the Keizer Rapids Park Big Toy Shade Sail project had not been identified.

FISCAL IMPACT: ORS 294.468 allows for an interfund capital loan for the purpose of financing the design, acquisition, construction, installation, or improvement of real or personal property. The loan must be repaid in full over a term not to exceed 10 years at an interest rate equal to the local government investment pool rate immediately prior to the adoption of the resolution authorizing the loan. The pool rate is currently 2.75%.

The Park Improvement Fund has approximately \$600,000 of cash on hand which will not be used during the current budget year and would be available to lend to the Park Services Fund. The Park Improvement Fund one other Interfund loan outstanding of approximately \$215,000 scheduled to be repaid by Fiscal Year 2020-21.

In lieu of an external borrowing the Park Improvement Fund could loan up to \$150,000 to the Park Services Fund resulting in a cost savings to the Park Services Fund of approximately \$2,000 to \$3,000 in interest expense per year.

RECOMMENDATION:

Staff recommends the City Council approve the attached Resolution authorizing a supplemental budget to provide for an interfund capital loan to the Park Services Fund from the Park Improvement Fund as described above.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

**AUTHORIZATION FOR SUPPLEMENTAL BUDGET - INTERFUND LOAN FROM
TRANSPORTATION IMPROVEMENT FUND TO WATER FACILITY FUND**

WHEREAS ORS 294 provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial planning.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Keizer, that the following appropriations be made for fiscal year ending June 30, 2020:

	Adopted/ Amended Budget	Adjustment		Revised Budget
		Increase	Decrease	
Park Improvement Fund				
Capital Outlay	600,000	-	150,000	450,000
Transfers Out	-	150,000		150,000
Park Services Fund				
Transfers In	360,800	150,000		510,800
Capital Outlay	503,000	150,000		653,000
To provide for an interfund capital loan from the Park Improvement Fund to the Park Services Fund.				

BE IT FURTHER RESOLVED that this resolution shall take effect immediately upon the date of its passage.

PASSED this ____ day of _____, 2019

SIGNED this ____ day of _____, 2019

Mayor

City Recorder

CITY COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND CITY COUNCIL MEMBERS

**THROUGH: CHRIS EPPLEY
CITY MANAGER**

**FROM: BILL LAWYER
PUBLIC WORKS DIRECTOR**

SUBJECT: TENNIS COURT REPLACEMENT

BACKGROUND:

Staff solicited quotes through the informal bidding process for the replacement of the existing tennis court at Willamette Manor Park. This project has been on the Parks and Recreation Advisory Board's priority list for many years and is made possible with the additional revenue the Parks Services fee provides.

A total of 3 companies were contacted for requests for quotes and only 1 provided a bid. The bid was received from Salem Concrete Paving in the amount of \$76,990.00

FISCAL IMPACT:

Funding for this project is allocated and available in the adopted FY 19-20 Parks Services Fund budget line 62.

RECOMMENDATION:

Staff recommends the City Council adopt the attached Resolution authorizing the City Manager to enter into a contract with the low responsive bidder, **Salem Concrete Paving** in the amount of **\$76,990.00** for the replacement of the tennis court at Willamette Manor Park.

Please contact me with any questions or concerns.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZING THE CITY MANAGER TO AWARD AND ENTER
 INTO AN AGREEMENT WITH SALEM CONCRETE PAVING
 FOR WILLAMETTE MANOR SPORT COURT PROJECT

WHEREAS, the City issued a request for bids and one bid for this project was received.

Salem Concrete Paving, Inc., was the only bid for a total amount of \$76,990.00;

WHEREAS, funds available to complete this project are in the 2019/20 Parks Services

Fund;

WHEREAS, a notice of intent to award the bid was sent to the bidder on July 25, 2019;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the City Manager is
 hereby authorized to award the contract to and enter into the attached agreement with Salem
 Concrete Paving, Inc., for a total cost of \$76,990.00 for the Willamette Manor Sport Court
 Project. Funding for this project is from the 2019/2020 Parks Services Fund.

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately
 upon the date of its passage.

PASSED this _____ day of _____, 2019.

SIGNED this _____ day of _____, 2019.

 Mayor

 City Recorder

EXHIBIT "C"
CONTRACT
FOR
WILLAMETTE MANOR SPORT COURT PROJECT

THIS AGREEMENT, made this ____ day of _____, 2019, by and between the City of Keizer, an Oregon municipal corporation, hereinafter called "Owner", and Salem Concrete Paving, Inc., hereinafter called "Contractor".

WITNESSETH THAT: In consideration of the mutual covenants and conditions hereinafter set forth, the Owner and Contractor hereby agree as follows:

1. WORK BY CONTRACTOR. The Contractor shall provide all labor and materials to provide the services described in Exhibit "A" (Scope of Services) attached hereto and by this reference incorporated herein.
2. TIME OF COMPLETION. Unless directed in writing otherwise, the Contractor shall commence the work covered by this Contract within ten (10) days of full execution of this Contract (weather permitting), and shall complete all aspects of the project no later than September 20, 2019.
3. CONTRACT SUM. The Contract Sum is Seventy-six Thousand, Nine Hundred Ninety and no/100s (\$76,990.00). See Exhibit "B" (Proposed Bid) attached hereto and by this reference incorporated herein.
4. PAYMENTS. Contractor may request a partial payment for the work performed each month. Such request shall be prepared by the Contractor and approved by Owner, provided that the Contractor is performing the overall job in a diligent manner. The payment request shall accurately and completely detail all work completed up to the date of the request.

When final completion of the work has been achieved, Contractor shall prepare for Owner's acceptance a final application for payment stating that to the best of Contractor's knowledge, and based on Owner's inspections, the work has reached final completion in accordance with the Contract Documents. Payment of the Contract Sum shall be made to Contractor within twenty (20) days after acceptance of the work by Owner and Contractor's submittal of the final application for payment. Such payment shall be conditioned, however, upon submission by the Contractor of evidence, satisfactory to the Owner that all claims for labor, material, and any other outstanding indebtedness in connection with this Contract have been paid in full.

If the work has been substantially completed and full completion thereof is materially delayed through no fault of the Contractor and the Public Works Director so certifies, the Owner shall, upon the certificate of the Public Works Director, and without terminating the Contract, make payment for the balance

due for that portion of the work fully complete and accepted, less a retained amount equal to five percent (5%) of the amount requested.

5. **PAYMENTS WITHHELD.** Owner may withhold, or on account of subsequently discovered evidence, nullify the whole or part of any estimate to such extent as may be necessary to protect the Owner from losses on account of:
 - a. Defective work not remedied within a reasonable time after written notice.
 - b. Claims filed or reasonable evidence indicating probable filing of claims.
 - c. Failure of the Contractor to make payments properly to subcontractors or for material or labor.
 - d. A reasonable doubt that the Contract can be completed for the balance then unpaid.
 - e. Damage to the site, adjacent public or private property, or to another contractor.
 - f. Failure of the Contractor to keep Contractor's work progressing in accordance with Contractor's time schedule.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

6. **CHANGES.** Contractor may request and/or Owner may order changes in the work or the timing or sequencing of performance of the work that impacts the Contract Unit Price or the Contract Time. All such changes in the work that affect Contract Time or Contract Unit Price shall be formalized in a Change Order. Acceptance of the Change Order and any adjustment in the Contract Unit Price and/or Contract Time must be signed by all parties.
7. **NOTICES.** Any written notices permitted or required by this Contract shall be deemed given when personally delivered, or three days after deposit in the United States mail, postage fully prepaid, addressed to the parties as set forth below or such other address as either party may provide to the other by notice given in accordance with this provision.

OWNER:

Bill Lawyer
Public Works Director
City of Keizer
930 Chemawa Road NE
PO Box 21000
Keizer, OR 97307

CONTRACTOR:

Salem Concrete Paving, Inc.
7355 22nd Avenue N.
Salem, Oregon

8. **LICENSES AND PERMITS.** The Contractor shall secure and pay for all fees and permits required for the project, if any. Contractor shall comply with all laws, ordinances and regulations, (Federal, State, or local) which may be applicable to the project to be conducted hereunder.

9. **RESPONSIBILITY OF PUBLIC WORKS DIRECTOR.** The term "Public Works Director" herein shall be Bill Lawyer, or his duly authorized representative. The Public Works Director shall have full authority to interpret the plans and specifications and shall determine the amount, quality, and acceptance of the work and supplies to be paid for under this Contract. It shall be the duty of the Public Works Director to enforce the specifications in a fair and unbiased manner, although he has the right to waive any term of the specifications if that term is found to be unreasonable and inconsistent with the general spirit of the specifications.
10. **WAIVER.** It is expressly understood and agreed that any waiver granted by the Public Works Director or the Owner of any term, provision or covenant of this Contract shall not constitute a precedent nor breach of the same of any other terms, provisions, or covenants of this Contract. Neither the acceptance of the work by Owner nor the payment of all or any part of the sum due the Contractor hereunder shall constitute a waiver, by the Owner, of any claim which the Owner may have against the Contractor.
11. **LIABILITY INSURANCE.** The Contractor shall procure and maintain ongoing and completed liability insurance as hereinafter specified at Contractor's own expense. All such insurance shall be subject to the approval of the Owner for adequacy of protection and shall include a provision preventing cancellation without ten (10) day's prior notice to the Owner in writing. Contractor must provide the Owner with a certificate of insurance and endorsement evidencing the insurance within five (5) days from Contractor's execution of this Contract. Contractor shall not commence work until the required evidence has been delivered to Owner. The endorsement must insure the City of Keizer as an additional insured. "The City of Keizer" includes its officers, agents, contractors, and employees. The liability insurance required is as follows:
- a. Contractor's General Public Liability and Property Damage Insurance issued to the Contractor and protecting him from all claims for personal injury including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under this Contract, whether such operations be by himself or by any subcontractor under him, or anyone directly or indirectly employed by the Contractor or by a subcontractor under him.

All such insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; a limit of liability of not less than \$2,000,000 for any such damages sustained by two or more persons in any one accident; a limit of liability of not less than \$1,000,000 for all damages arising out of injury or destruction of property, damages arising out of injury or destruction of property, (including property of the City) in any one accident; and a limit of liability of not less than \$2,000,000 for all damage arising out of injury to or destruction of property, including property of City, during the policy period.

- b. Automobile Liability Insurance with a limit of liability of not less than \$1,000,000 issued to Contractor and protecting him from all claims arising out of or in connection with any operations under this Contract, whether such operations be by himself or by any subcontractor under him, or anyone directly or indirectly employed by Contractor or by a subcontractor under him.

12. **WORKERS COMPENSATION INSURANCE.** The Contractor shall procure and maintain, at Contractor's own expense, during the life of this Contract, in accordance with the provision of the laws of the state of Oregon, Workman's Compensation Insurance for all of Contractor's employees at the site of the project and in case any work is sublet, the Contractor shall require such subcontractor similarly to provide Workman's Compensation Insurance for all of its employees unless such employees are covered by the protection afforded by the Contractor. Certificates evidencing the issuance of such insurance shall be filed with the Owner within five (5) days after execution of this Contract.

13. **INDEMNITY.** The Contractor shall indemnify the Owner, the Owner's agents and employees from and against all losses and all claims, demands, payments, suit actions, recoveries, and judgment of every nature and description brought or recovered against them by reason of any act or omission of the said Contractor, Contractor's agents, or employees, in the execution of the work or in guarding the same.

14. **PROTECTION OF WORK AND PROPERTY.** The Contractor shall continuously maintain adequate protection of all Contractor's work and materials from damage or theft and shall protect the Owner's property and all adjacent property from injury or loss arising in connection with the activities under this Contract. The Contractor shall make good any such damage, injury, or loss, except such as may be due to errors in the Contract documents or such as may be caused by agents or employees of the Owner.

The Contractor shall take, use, provide, and maintain all necessary precautions, safeguards, and protection to prevent accidents, or injury to persons or property on, about, or adjacent to the work site, warning against any hazards created by the work being done under this Contract. Contractor shall designate a responsible member of Contractor's organization on the work, whose duty shall be the prevention of accidents, and the name of the person so designated shall be reported to the Owner in writing. In any emergency affecting the safety of life, or of the work or adjoin property, the Contractor, without special instruction or authorization from the Owner, is hereby permitted to act, at Contractor's discretion, to prevent such threatened loss or injury, and Contractor must take such action if so instructed or authorized by the Owner. The Contractor shall also protect adjacent property as required by law.

Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical, and hospital care or other

needed care and attention, incident to sickness or injury, to the employees of such Contractor and sums of which the Contractor agrees to pay for such services and all moneys and sums which the Contractor has collected or deducted from the wages of personnel pursuant to any law, contract or agreement for the purpose of providing or paying for such services.

15. SAFETY MEASURES. Contractor agrees that Contractor, Contractor's employees, and subcontractors will comply with all OSHA regulations applicable to the work being performed. All traffic control measures must comply with the current edition of the Manual on Uniform Traffic Control Devices (MUTCD). Contractor agrees that all personnel must wear safety vests at all times and use safety cones as required.

16. INSPECTION. Owner and its representative shall at all times have access to the work during its construction, and shall be furnished with every reasonable facility for ascertaining that the stock and materials used and employed, and the workmanship are in accordance with the requirements and intentions of the specifications. All work done and all materials furnished shall be subject to inspection and approval.

The inspection of the work shall not relieve the Contractor of any of Contractor's obligations to fulfill the Contract in full and as prescribed. Defective work shall be made good and unsuitable material shall be rejected, notwithstanding that such defective work and material may have been previously overlooked and accepted on estimates for payment. No work shall be done at night without the prior written approval of Owner.

17. DEFECTIVE WORK OR MATERIAL. The Contractor shall promptly remove from the premises all work and materials condemned by Owner as failing to conform to the Contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute Contractor's own work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

18. LIENS. Contractor shall not permit any lien or claim to be filed or prosecuted against the City of Keizer, Oregon or the private property owner, in connection with this contract and agrees to assume responsibility should such lien or claim be filed. If at any time there shall be evidence of any lien or claim for which the Owner might become liable and which is chargeable to the Contractor, the Owner shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to provide complete indemnification against such lien or claim. In the event the Owner has already paid to the Contractor all sums due under this Contract or the balance remaining unpaid is insufficient to protect the Owner, the Contractor shall be liable to the Owner for any loss so sustained.

19. OWNER'S RIGHT TO TAKE OVER THE WORK. If the Contractor should be adjudged as bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed to take over its affairs, or if it should fail to prosecute its work with due diligence and carry the work forward in accordance with its work schedule and the time limits set forth in the Contract documents, or if it should fail to substantially perform one or more of the provisions of the Contract documents to be performed by it, the Owner may serve written notice on the Contractor stating its intention to exercise one of the remedies hereinafter set forth and the grounds upon which the Owner bases its right to exercise such remedy.

In any event, unless the matter complained of is satisfactorily corrected within ten (10) days after service of such notice, the Owner may, without prejudice to any other right or remedy, exercise one of the following such remedies, at once, having first obtained a certificate from the Public Works Director that sufficient cause exists to justify such action.

- a. The Owner may terminate the services of the Contractor, which termination shall take effect immediately upon service of notice thereof on the Contractor, whereupon Owner may itself take over the work, take possession of and use all materials, tools, equipment and appliances on the premises and prosecute the work to completion by such means as it shall deem best. In the event of such termination of its service, the Contractor shall not be entitled to any further payment under this Contract until the work is completed and accepted. If the Owner takes over the work and if the unpaid balance of the Contract price when the Owner takes over the work exceeds the cost of completing the work, including compensation for any damages or expenses incurred by Owner through the default of the Contractor, such excess shall be paid to the Contractor. In such event, if such costs, expenses and damages shall exceed such unpaid balance of the Contract price, the Contractor shall pay the difference to the Owner. Such costs, expenses, and damages shall be certified by the Public Works Director.
- b. The Owner may take control of the work and either make good the deficiencies of the Contractor itself or direct the activities of the Contractor in doing so, employing such additional help as the Owner deems advisable. In such event, the Owner shall be entitled to collect from the Contractor, or to deduct from any payment then or thereafter due the Contractor, the cost incurred by it through the default of the Contractor, provided the Public Works Director approves the amount thus charged to the Contractor.

The above remedies are in addition to any other remedies allowed by law or equity.

20. CONTRACTOR'S RIGHT TO STOP OR TERMINATE CONTRACT. If the work shall be stopped under an order of any court or other public authority for a period of no less than three (3) months through no act or fault of the Contractor or of

any one employed by it, then the Contractor may on seven (7) days written notice to the Owner stop work or terminate this Contractor and recover from the Owner payment for all work executed to the date of stoppage, any losses sustained from any plant or material, and a reasonable profit. If the Public Works Director shall fail to issue any certificate for payment within ten (10) days after it is due, or if the Owner shall fail to pay the Contractor within fifteen (15) days after its maturity and presentation to the Owner any sum certified by the Public Works Director, then the Contractor may, on seven (7) days written notice to Owner, terminate the Contract and recover from the Owner payment for all work executed to date, any losses sustained upon any plant for material, and a reasonable profit.

21. DELAYS AND EXTENSION OF TIME. If the Contractor is delayed at any time in the progress of the work by an act or neglect of the Owner, or any employee of Owner, or by any separate contractor employed by the Owner, or by changes ordered in the work, or by strike, lockouts, fire, unusual delay in transportation, unavoidable casualties, or any cause beyond the Contractor's control, or by delay authorized by the Public Works Director, or by any cause which the Public Works Director shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the Public Works Director may decide.

No such extensions shall be made for a delay occurring more than seven (7) days before claim therefore is made in writing to the Public Works Director. In the case of a continued cause of delay, only one claim is necessary. This section does not exclude the recovery of damages for delays by either party under other provisions in the Contract documents.

22. ACCEPTANCE. Final inspection and acceptance of the work shall be made by the Owner and local appointed authority. Such inspection shall be made as soon as practical after the Contractor has notified the Owner in writing that the work is ready for such inspection.

23. GUARANTEE. Contractor agrees to guarantee all work under this Contract for a period of one (1) year from the date of final acceptance thereof. If any unsatisfactory condition or damage develops within the time of this guarantee due to materials or workmanship which were defective, inferior, or not in accordance with the Contract, Contractors agrees, whenever notified by Owner, to immediately place such guaranteed work in a condition satisfactory to Owner and make repairs of all damage made necessary in the fulfillment of the guarantee. This provision shall survive termination of this Contract.

24. DISPUTE RESOLUTION.

- (a) Any dispute arising out of or in connection with this Agreement, which is not settled by mutual agreement of the Contractor and the Owner within sixty (60) days of notification in writing by either party, shall be submitted to an arbitrator mutually agreed upon by the parties. In the event the parties cannot agree on the arbitrator, then the arbitrator shall be appointed by the Presiding Judge (Civil) of the Circuit Court of the State of Oregon for the County of

Marion. The arbitrator shall be selected within thirty (30) days from the expiration of the sixty (60) day period following notification of the dispute. The arbitration, and any litigation arising out of or in connection with this Agreement, shall be conducted in Salem, Oregon, shall be governed by the laws of the State of Oregon, and shall be as speedy as reasonably possible. The applicable arbitration rules for the Marion County courts shall apply unless the parties agree in writing to other rules. The arbitrator shall render a decision within forty-five (45) days of the first meeting with the Contractor and the Owner. Insofar as the Contractor and the Owner legally may do so, they agree to be bound by the decision of the arbitrator.

- (b) Notwithstanding any dispute under this Agreement, whether before or during arbitration, the Contractor shall continue to perform its work pending resolution of a dispute, and the Owner shall make payments as required by the Agreement for undisputed portions of work.

25. **ASSIGNMENT.** Neither Owner nor Contractor shall assign its interest in this Contract without the written consent of the other except as to the assignment of proceeds. The terms and conditions of this Contract shall be binding upon both parties, their partners, successors, assigns and legal representatives. Neither party to this Contract shall assign the Contract as a whole without written consent of the other.

26. **INDEPENDENT CONTRACTOR STATUS.** The service or services to be performed under this Contract are those of an independent contractor as defined in ORS 670.600. Contractor represents and warrants that it is not an officer, employee or agent of the Owner. Contractor is not entitled to, and expressly waives all claim to City benefits including, but not limited to health, life, and disability insurance, overtime pay, paid leave, and retirement.

27. **GOVERNING LAW.** This Contract shall be governed by the laws of the State of Oregon.

28. **SEVERABILITY.** Any provision or part of this Contract held to be void or unenforceable under any law or regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor. Owner and Contractor agree that this Contract shall be amended to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

29. **COMPLIANCE.** The Contractor shall comply with and require its subcontractors to comply with all applicable provisions of Federal, State and local statutes, ordinance, orders, rules, regulations, and all other specifications and provisions as contained within these Contract documents.

30. **INCORPORATION; PRECEDENCE.** The Exhibits, if any, attached to this Contract are incorporated herein as if fully set forth in this Contract. If any

provision of any Exhibit conflicts with the provisions of this Contract, the terms of this Contract shall govern.

31. SIGNATURE. Facsimile or electronic transmission of any signed original document, and retransmission of any signed facsimile or electronic transmission, shall be the same as delivery of an original. At the request of either party, the parties shall confirm facsimile or electronic transmitted signatures by signing an original document.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed the day and year first above written.

CITY OF KEIZER

SALEM CONCRETE PAVING, INC.

By: _____
Christopher C. Eppley,
City Manager

By: _____
Brad Swinford,
President

APPROVED AS TO FORM:

Keizer City Attorney

Exhibit “A”

Scope of Services for Willamette Manor Sport Court

3800 5th Ave N Keizer, OR

(Court size 60' x 120')

General Specifications:

- Install a vapor barrier consisting of 6mm thick or greater visqueen plastic over the existing court with seams overlapping 2' and taped or tacked together.
- Use # 5 rebar each way 12" on center.
- Install keyway joints each way 15' on center.
- 3500 psi concrete to be a minimum of 5" thick poured over existing asphalt court. New slab to have a cross slope of 1%. Slab to be sloped east to west.
- Court to be lightly broom finished.
- Provide a 6' wide concrete ADA access ramp on west side of sports court connecting to the existing asphalt pathway.
- Work to be finished no later than September 20, 2019.
- Sports court will be closed and contractor is responsible for protecting the work area during construction.
- Meet insurance requirements and other conditions as outlined in attached contract document.

Notes:

DO NOT apply any curing compounds or sealers, only the use of water can be applied during cure time as needed. Concrete to be left as virgin concrete.

DO NOT use fiber mesh or other add mixtures in concrete.

Contractor to provide steel sheeting to protect the City's water meter and asphalt path leading to sports court.

Access could be challenging. Concrete pumper truck required.

EXHIBIT "B"

BID SHEET		
PROJECT: Willamette Manor Sport Court Project OWNER: CITY OF KEIZER		
DESCRIPTION		AMOUNT
Perform work described in Scope of Services for Willamette Manor Sport Court Project		
		\$ 76,990 ⁰⁰
TOTAL BID		\$

Company Name: SALEM CONCRETE PAVING INC.
 Company Address: 7355 22nd AVE N.
SALEM OR.
 Company Phone #: 503 463 8317
 Company Fax #: 503 393 9488

Contact Name: MIKE VOVES
 Email Address: MIKE@SLP-OREGON.COM
503-932-3817

Mike Voves
 Signature

MIKE VOVES
 Printed Name

CITY COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND CITY COUNCIL MEMBERS

**THROUGH: CHRIS EPPLEY
CITY MANAGER**

**FROM: BILL LAWYER
PUBLIC WORKS DIRECTOR**

SUBJECT: SHADE SAIL PROJECT AT THE BIG TOY

BACKGROUND:

Staff solicited quotes through the formal bidding process for the installation of shade sails at the Big Toy in Keizer Rapids Park. This project includes the support posts, foundations and five shade sails to be installed as shown in the attached contract document.

A portion of the funding, \$25,500.00, for this project came from a donation from the Keizer Parks Foundation. The remaining funding is from the Parks Services Fund.

Only one bid was received for the project with Wyckam LLC. submitting a bid for \$209,480.00.

FISCAL IMPACT:

Funding for this project is allocated and available in the adopted FY 19-20 Parks Services Fund budget line 62.

RECOMMENDATION:

Staff recommends the City Council adopt the attached Resolution authorizing the City Manager to enter into a contract with the low responsive bidder, **Wyckam LLC**. In the amount of \$209,480.00.

Please contact me with any questions or concerns.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZING THE CITY MANAGER TO AWARD AND ENTER
 INTO AN AGREEMENT WITH WYCKAM LLC FOR SHADE
 SAILS FOR THE BIG TOY AT KEIZER RAPIDS PARK

WHEREAS, the City issued a request for bids and one bid for this project was received.

Wyckam LLC submitted the only bid for a total amount of \$209,480.00;

WHEREAS, funds available to complete this project are in the 2019/20 Parks Services

Fund;

WHEREAS, a notice of intent to award the bid was sent to the bidder on June 19, 2019;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the City Manager is

hereby authorized to award the contract to and enter into the attached agreement with Wyckam

LLC for a total cost of \$209,480.00 for shade sails for the Big Toy at Keizer Rapids Park.

Funding for this project is from the 2019/2020 Parks Services Fund.

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately

upon the date of its passage.

PASSED this _____ day of _____, 2019.

SIGNED this _____ day of _____, 2019.

 Mayor

 City Recorder

CONTRACT
FOR
SHADE SAILS FOR THE BIG TOY AT KEIZER RAPIDS PARK

THIS AGREEMENT, made this ____ day of _____, 2019, by and between the City of Keizer, an Oregon municipal corporation, hereinafter called "Owner", and Wyckam LLC, an Oregon Limited Liability Company, hereinafter called "Contractor".

WITNESSETH THAT: In consideration of the mutual covenants and conditions hereinafter set forth, the Owner and Contractor hereby agree as follows:

1. **WORK BY CONTRACTOR.** The Contractor shall provide all labor and materials to provide the services described in Exhibit "A" (Scope of Services) attached hereto and by this reference incorporated herein.
2. **TIME OF COMPLETION.** The Contractor shall complete all aspects of the project no later than October 18, 2019. Work involving excavation and installation of the column posts shall not begin until September 4, 2019.
3. **BONDS.** Payment Bonds and Performance Bonds are required of Contractor at Contractor's own expense. Such bonds shall be issued by a surety licensed in the State of Oregon and must be acceptable to Owner. The bonds must equal the sum of the contract price.

The Contractor and all subcontractors must obtain or possess a valid Public Works Bond, filed with the Construction Contractors Board (CCB) before beginning any work on this project.

4. **PRECONSTRUCTION CONFERENCE.** Before any Work is started, a Preconstruction Conference attended by the Contractor, Public Works Director, and others as appropriate, will be held to establish a working understanding among the parties as to the Work and to discuss the procedures for handling submittals, processing applications for payment, and maintaining records. Contractor is required to request such Preconstruction Conference as soon as possible to prevent delays in the project.
5. **CONTRACT SUM.** The Contract Sum is Two Hundred Nine Thousand, Four Hundred Eighty and no/100 (\$209,480.00). See Exhibit "B" (Proposed Bid) attached hereto and by this reference incorporated herein.
6. **PAYMENTS.** Contractor may request partial payments as work progresses. Partial payment requests shall be submitted to the Public Works Director by the 10th calendar day of each month for processing. Payment requests shall accurately and completely detail all work completed since the last payment request up to the last day of the month. Any and all additional forms and documentation required by statute or this Agreement shall be submitted with the

pay request. No partial or final payments shall be made unless required certified payroll reports have been provided to Owner. Prior to final completion and acceptance of the work, partial payments will be in an amount equal to ninety-five percent (95%) of the amount requested. The remaining five percent (5%) shall be considered retainage of the amount requested until the work is completed and accepted.

When final completion and acceptance of the work has been achieved, Contractor shall prepare for Owner's acceptance a final application for payment stating that to the best of Contractor's knowledge, and based on Owner's inspections, the work has reached final completion in accordance with the Contract Documents. Payment of the Contract Sum shall be made to Contractor within twenty (20) days after acceptance of the work by Owner and Contractor's submittal of the final application for payment and the following submissions:

- A. Any and all additional forms and documentation required by statute or this Agreement;
- B. An affidavit declaring any indebtedness connected with the work, e.g. payrolls or invoices for materials or equipment, to have been paid, satisfied or to be paid with the proceeds of final payment, so as not to encumber the project property;
- C. A statement, under oath, that it has complied with all provisions of State law governing contractors on a public contract and it has complied with the provisions governing fair employment practices;
- D. A statement by each of Contractor's subcontractors, under oath, that each of the subcontractors has complied with all provisions of State law governing contractors on a public contract and has complied with the provisions governing fair employment practices;
- E. Release of any liens, conditioned on final payment being received;
- F. A report of any accidents or injuries experienced by Contractor or its Subcontractors at the worksite.
- G. All certified payroll reports.

If the work has been substantially completed and full completion thereof is materially delayed through no fault of the Contractor and the Public Works Director so certifies, the Owner shall, upon the certificate of the Public Works Director, and without terminating the Contract, make payment for the balance due for that portion of the work fully complete and accepted, less a retained amount equal to five percent (5%) of the amount requested.

7. **PAYMENTS WITHHELD.** Owner may withhold, or on account of subsequently discovered evidence, nullify the whole or part of any estimate to such extent as may be necessary to protect the Owner from losses on account of:
 - a. Defective work not remedied within a reasonable time after written notice.
 - b. Claims filed or reasonable evidence indicating probable filing of claims.
 - c. Failure of the Contractor to make payments properly to subcontractors or for material or labor.

- d. A reasonable doubt that the Contract can be completed for the balance then unpaid.
- e. Damage to the site, adjacent public or private property, or to another contractor.
- f. Failure of the Contractor to keep Contractor's work progressing in accordance with Contractor's time schedule.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

- 8. **CHANGES.** Contractor may request and/or Owner may order changes in the work or the timing or sequencing of performance of the work that impacts the Contract Price or the Contract Time. All such changes in the work that affect Contract Time or Contract Price shall be formalized in a Change Order. Acceptance of the Change Order and any adjustment in the Contract Price and/or Contract Time must be signed by all parties.
- 9. **NOTICES.** Any written notices permitted or required by this Contract shall be deemed given when personally delivered, or three days after deposit in the United States mail, postage fully prepaid, addressed to the parties as set forth below or such other address as either party may provide to the other by notice given in accordance with this provision.

OWNER:

Bill Lawyer
Public Works Director
City of Keizer
930 Chemawa Road NE
PO Box 21000
Keizer, OR 97307

CONTRACTOR:

Amy Poe
Member
Wyckam LLC
7304 NE M L King Jr. Blvd
Portland, OR 97211

- 10. **LICENSES AND PERMITS.** The Contractor shall obtain and maintain all licenses required for public works contracts in the State of Oregon and shall secure and pay for all fees for the required licenses. Owner shall obtain and maintain all permits required for the project, if any. Contractor shall comply with all laws, ordinances and regulations, (Federal, State, or local) which may be applicable to the project to be conducted hereunder.
- 11. **RESPONSIBILITY OF PUBLIC WORKS DIRECTOR.** The term "Public Works Director" herein shall be Bill Lawyer, or his duly authorized representative. The Public Works Director shall have full authority to interpret the plans and specifications and shall determine the amount, quality, and acceptance of the work and supplies to be paid for under this Contract. It shall be the duty of the Public Works Director to enforce the specifications in a fair and unbiased manner, although he has the right to waive any term of the specifications if that term is found to be unreasonable and inconsistent with the general spirit of the specifications.

12. **WAIVER.** It is expressly understood and agreed that any waiver granted by the Public Works Director or the Owner of any term, provision or covenant of this Contract shall not constitute a precedent nor breach of the same of any other terms, provisions, or covenants of this Contract. Neither the acceptance of the work by Owner nor the payment of all or any part of the sum due the Contractor hereunder shall constitute a waiver, by the Owner, of any claim which the Owner may have against the Contractor.

13. **LIABILITY INSURANCE.** The Contractor shall procure and maintain ongoing and completed liability insurance as hereinafter specified at Contractor's own expense. All such insurance shall be subject to the approval of the Owner for adequacy of protection and shall include a provision preventing cancellation without ten (10) day's prior notice to the Owner in writing. Contractor must provide the Owner with a certificate of insurance and endorsement evidencing the insurance within five (5) days from Contractor's execution of this Contract. Contractor shall not commence work until the required evidence has been delivered to Owner. The endorsement must insure the City of Keizer as an additional insured. "The City of Keizer" includes its officers, agents, contractors, and employees. The insurance requirement is to be in effect during the life of this Contract. The liability insurance required is as follows:

- a. Contractor's General Public Liability and Property Damage Insurance issued to the Contractor and protecting him from all claims for personal injury including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under this Contract, whether such operations be by himself or by any subcontractor under him, or anyone directly or indirectly employed by the Contractor or by a subcontractor under him.

All such insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; a limit of liability of not less than \$2,000,000 for any such damages sustained by two or more persons in any one accident; a limit of liability of not less than \$1,000,000 for all damages arising out of injury or destruction of property, damages arising out of injury or destruction of property, (including property of the City) in any one accident; and a limit of liability of not less than \$2,000,000 for all damage arising out of injury to or destruction of property, including property of City, during the policy period.

- b. Automobile Liability Insurance with a limit of liability of not less than \$1,000,000 issued to Contractor and protecting him from all claims arising out of or in connection with any operations under this Contract, whether such operations be by himself or by any subcontractor under him, or anyone directly or indirectly employed by Contractor or by a subcontractor under him.

14. **WORKERS COMPENSATION INSURANCE.** The Contractor shall procure and maintain, at Contractor's own expense, during the life of this Contract, in accordance with the provision of the laws of the state of Oregon, Workman's Compensation Insurance for all of Contractor's employees at the site of the project and in case any work is sublet, the Contractor shall require such subcontractor similarly to provide Workman's Compensation Insurance for all of its employees unless such employees are covered by the protection afforded by the Contractor. Certificates evidencing the issuance of such insurance shall be filed with the Owner within five (5) days after execution of this Contract.
15. **INDEMNITY.** The Contractor shall indemnify the Owner, the Owner's agents and employees from and against all losses and all claims, demands, payments, suit actions, recoveries, and judgment of every nature and description brought or recovered against them by reason of any act or omission of the said Contractor, Contractor's agents, or employees, in the execution of the work or in guarding the same.
16. **SUBCONTRACTS.** The Contractor shall have full responsibility under these conditions, general provisions, plans and specifications for any subcontracts which Contractor may let. Work not performed by Contractor with its own forces shall be performed by subcontractors. Contractor agrees to bind each subcontractor and material supplier (and require every subcontractor to so bind its subcontractors and material suppliers) to all the provisions of this Contract and the Contract Documents as they apply to the subcontractor's and material supplier's portions of the work. Contractor shall submit a certification to Owner that all subcontractors performing work will be registered with the Construction Contractors Board or licensed by the State Landscape Contractors Board in accordance with ORS 701.035 to 701.055 before the subcontractors commence work under the contract.
17. **CONTRACTOR PAYMENTS.** Contractor shall: (1) make payment promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the Work provided for in this Contract; (2) pay all contributions or amounts due the State Industrial Accident Fund and the State Unemployment Compensation Trust Fund from such Contractor or Subcontractor incurred in the performance of the Contract; (3) not permit any lien or claim to be filed or prosecuted against the Owner because of any labor or material furnished; and (4) pay to the Department of Revenue all sums withheld from employees.
- If Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the Contractor or a Subcontractor by any person in connection with the Project as such claim becomes due, the proper officer(s) representing the Owner may pay the claim and charge the amount of the payment against funds due or to become due Contractor under this Contract.
18. **PROTECTION OF WORK AND PROPERTY.** The Contractor shall continuously maintain adequate protection of all Contractor's work and materials from damage or theft and shall protect the Owner's property and all adjacent property from

injury or loss arising in connection with the activities under this Contract. The Contractor shall make good any such damage, injury, or loss, except such as may be due to errors in the Contract documents or such as may be caused by agents or employees of the Owner.

The Contractor shall take, use, provide, and maintain all necessary precautions, safeguards, and protection to prevent accidents, or injury to persons or property on, about, or adjacent to the work site, warning against any hazards created by the work being done under this Contract. Contractor shall designate a responsible member of Contractor's organization on the work, whose duty shall be the prevention of accidents, and the name of the person so designated shall be reported to the Owner in writing. In any emergency affecting the safety of life, or of the work or adjoin property, the Contractor, without special instruction or authorization from the Owner, is hereby permitted to act, at Contractor's discretion, to prevent such threatened loss or injury, and Contractor must take such action if so instructed or authorized by the Owner. The Contractor shall also protect adjacent property as required by law.

Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor and sums of which the Contractor agrees to pay for such services and all moneys and sums which the Contractor has collected or deducted from the wages of personnel pursuant to any law, contract or agreement for the purpose of providing or paying for such services.

19. **WORK HOURS.** Contractor must give notice to employees who work on this contract in writing, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week that the employees may be required to work. Furthermore, Contractor shall not employ any person performing work under this contract for more than ten hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it. Contractor shall pay all individuals performing work under this contract at least time-and-a-half pay for:

- a. All overtime in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; and
- b. All overtime in excess of 10 hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and
- c. All work performed on Saturday or Sunday and on any legal holiday specified in ORS 279C.540.

20. **PREVAILING WAGE.** Contractor must ensure that each worker in each trade or occupation employed in the performance of this Contract either by the

Contractor, Sub-contractor or other person doing or contracting to do the whole or any part of the work on this Contract, shall be paid not less than the applicable prevailing rate of wage set forth in the attached schedule pursuant to ORS 279C.840(4) & OAR 839-016-0033(1).

Contractor shall maintain all records and file all wage certification forms as required by Oregon Administrative Rules.

A. Prevailing Wage Requirements

a. Applicable Prevailing Wage Rates

- i. If this project is subject to the applicable Oregon Prevailing Wage Rate publication and any amendments, and/or the federal Davis Bacon Wage Rate Act (40 U.S.C. 3141 et seq.), in effect at the time of solicitation, the Contractor shall pay the wage rate and fringe benefits listed in the Bureau of Labor and Industries publication titled "January 1, 2019 Prevailing Wage Rates for Public Works Contracts in Oregon", which is incorporated herein by reference or can be accessed and downloaded at BOLI's website.
- ii. If the project is subject to the federal Davis Bacon Act, the current wage rate publication for Oregon can be accessed and downloaded at <http://www.dol.gov/whd/govcontracts/dbra.htm>. ORS.279C.838.
- iii. If the project is subject to the Davis-Bacon Act and if the state prevailing rate of wage is higher than the federal prevailing rate of wage that is in effect at the time a public agency enters into a contract with a contractor for the project, the contractor and every subcontractor on the project shall pay no less than the state prevailing rate of wage. ORS 279C.838.
- iv. All prevailing wage rates that apply to the project must be posted at the job site. Every contractor on the site is responsible for this posting. ORS 279C.840(4) & OAR 839-025-0033(1).
- v. All contracts and subcontracts for this project must include a provision that each worker in each trade or occupation employed in the performance of the contract either by the contractor, subcontractor or other person doing or contracting to do or contracting for the whole or any part of the work on the contract, must be paid not less than the applicable state prevailing rate of wage, or the applicable federal prevailing rate of wage, whichever is higher. ORS 279C.838.

b. Certified Payroll Filing Requirements

- i. Every employer on a covered project must file certified payroll records with the Owner. Certified statements for each week during which the Contractor or Subcontractor employs a worker upon the public work shall be submitted once a month, by the fifth business

day of the following month. Information submitted on certified statements may be used only to ensure compliance with the provisions of ORS 279C.845 to 279C.860.

c. Certified Payroll Form

- i. To help employers satisfy the filing requirement, Form WH-38 is included in each PWR rate book. BOLI does not require contractors to use this form, but contractors must supply all information the form requests and this information must be certified.

Employers using their own forms or reports can comply with the certification requirement by attaching and completing a copy of the certification from the WH-38 form to their filing.

Employers must submit the hours worked each day by each employee, his or her name, address, the pay rate, work classification, gross pay to the employee and the amount contributed to any third party fringe benefits (and the type of benefit provided).

To meet filing requirements, the employer must sign the certified payroll to confirm that the information is true and complete. Unsigned reports do not satisfy the filing requirement. Submitting false or incomplete information can be the basis for civil penalties or debarment.

The Contractor and subcontractors shall preserve the certified statements for a period of three (3) years from the completion of the contract.

d. Certified Payroll Retainage

- i. As required in ORS 279C.845, the Owner will retain 25% of any amount earned by the Contractor on the project until the Contractor has filed the certified statements required in ORS 279C.845. The Owner will pay to the Contractor the amount retained within 14 days after the Contractor files the required certified statements, regardless of whether a subcontractor has failed to file certified statements.
- ii. As required in ORS 279C.845, the Contractor shall retain 25% of any amount earned by a first tier subcontractor on the project until the first tier subcontractor has filed with the Owner the certified statements required in ORS 279C.845. Before paying any amount retained, the Contractor shall verify that the first tier subcontractor has filed the certified statement. Within 14 days after the first tier subcontractor files the required certified statement the Contractor shall pay the first tier subcontractor any amount retained.

21. **QUALIFYING EMPLOYEE DRUG TESTING PROGRAM.** Contractor represents and warrants that Contractor has in place at the time of the execution of this Contract, and shall maintain during the term of this Contract, a Qualifying Employee Drug Testing Program for its employees that includes, at a minimum a written employee drug testing policy, required drug testing for all new subject employees or, alternatively, required testing of all subject employees every 12 months on a random selection basis, and required testing of a subject employee when the Contractor has reasonable cause to believe the subject employee is under the influence of drugs.
22. **SAFETY MEASURES.** Contractor agrees that Contractor, Contractor's employees, and subcontractors will comply with all OSHA regulations applicable to the work being performed. Contractor agrees that all personnel must wear safety vests at all times.
23. **INSPECTION.** Owner and his representative shall at all times have access to the work during its construction, and shall be furnished with every reasonable facility for ascertaining that the stock and materials used and employed, and the workmanship are in accordance with the requirements and intentions of the specifications. All work done and all materials furnished shall be subject to inspection and approval.
- The inspection of the work shall not relieve the Contractor of any of Contractor's obligations to fulfill the Contract in full and as prescribed. Defective work shall be made good and unsuitable material shall be rejected, notwithstanding that such defective work and material may have been previously overlooked and accepted on estimates for payment. No work shall be done at night without the prior written approval of Owner.
24. **DEFECTIVE WORK OR MATERIAL.** The Contractor shall promptly remove from the premises all work and materials condemned by Owner as failing to conform to the Contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute Contractor's own work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.
25. **LIENS.** Contractor shall not permit any lien or claim to be filed or prosecuted against the City of Keizer, Oregon or the private property owner, in connection with this contract and agrees to assume responsibility should such lien or claim be filed. If at any time there shall be evidence of any lien or claim for which the Owner might become liable and which is chargeable to the Contractor, the Owner shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to provide complete indemnification against such lien or claim. In the event the Owner has already paid to the Contractor all sums due under this Contract or the balance remaining unpaid is insufficient to protect the Owner, the Contractor shall be liable to the Owner for any loss so sustained.

26. OWNER'S RIGHT TO TAKE OVER THE WORK. If the Contractor should be adjudged as bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed to take over its affairs, or if it should fail to prosecute its work with due diligence and carry the work forward in accordance with its work schedule and the time limits set forth in the Contract documents, or if it should fail to substantially perform one or more of the provisions of the Contract documents to be performed by it, the Owner may serve written notice on the Contractor and the surety of its payment and/or performance bond, stating its intention to exercise one of the remedies hereinafter set forth and the grounds upon which the Owner bases its right to exercise such remedy.

In any event, unless the matter complained of is satisfactorily corrected within ten (10) days after service of such notice, the Owner may, without prejudice to any other right or remedy, exercise one of the following such remedies, at once, having first obtained a certificate from the Public Works Director that sufficient cause exists to justify such action.

- a. The Owner may terminate the services of the Contractor, which termination shall take effect immediately upon service of notice thereof on the Contractor, whereupon Owner may itself take over the work, take possession of and use all materials, tools, equipment and appliances on the premises and prosecute the work to completion by such means as it shall deem best. In the event of such termination of its service, the Contractor shall not be entitled to any further payment under this Contract until the work is completed and accepted. If the Owner takes over the work and if the unpaid balance of the Contract price when the Owner takes over the work exceeds the cost of completing the work, including compensation for any damages or expenses incurred by Owner through the default of the Contractor, such excess shall be paid to the Contractor. In such event, if such costs, expenses and damages shall exceed such unpaid balance of the Contract price, the Contractor shall pay the difference to the Owner. Such costs, expenses, and damages shall be certified by the Public Works Director.
- b. The Owner may take control of the work and either make good the deficiencies of the Contractor itself or direct the activities of the Contractor in doing so, employing such additional help as the Owner deems advisable. In such event, the Owner shall be entitled to collect from the Contractor, or to deduct from any payment then or thereafter due the Contractor, the cost incurred by it through the default of the Contractor, provided the Public Works Director approves the amount thus charged to the Contractor.
- c. The Owner may require the surety on the Contractor's bond to take control of the work at once and see to it that all of the deficiencies of the Contractor are made good with due diligence. As between the Owner and the surety, the cost of making good such deficiencies shall all be borne by the surety. If the surety takes over the work, either upon instructions from

the Owner to do so or based upon the surety's choice, all provisions of the Contract documents shall govern in respect to the work done by the surety, the surety being substituted for the Contractor as to such provisions as to payment for the work and provisions of this section as to the right of the Owner to do the work itself or to take control of the work.

The above remedies are in addition to any other remedies allowed by law or equity.

27. OWNER'S RIGHT TO TERMINATE CONTRACT. Owner may terminate this Contract upon seven (7) days written notice to Contractor if Owner fails to receive funding, appropriations, limitations or other expenditure authority sufficient to allow Owner to pay for services under this Contract.

28. CONTRACTOR'S RIGHT TO STOP OR TERMINATE CONTRACT. If the work shall be stopped under an order of any court or other public authority for a period of no less than three (3) months through no act or fault of the Contractor or of any one employed by it, then the Contractor may on seven (7) days written notice to the Owner stop work or terminate this Contractor and recover from the Owner payment for all work executed to the date of stoppage, any losses sustained from any plant or material, and a reasonable profit. If the Public Works Director shall fail to issue any certificate for payment within ten (10) days after it is due, or if the Owner shall fail to pay the Contractor within fifteen (15) days after its maturity and presentation to the Owner any sum certified by the Public Works Director, then the Contractor may, on seven (7) days written notice to Owner, terminate the Contract and recover from the Owner payment for all work executed to date, any losses sustained upon any plant for material, and a reasonable profit.

29. DELAYS AND EXTENSION OF TIME. If the Contractor is delayed at any time in the progress of the work by an act or neglect of the Owner, or any employee of Owner, or by any separate contractor employed by the Owner, or by changes ordered in the work, or by strike, lockouts, fire, unusual delay in transportation, unavoidable casualties, or any cause beyond the Contractor's control, or by delay authorized by the Public Works Director, or by any cause which the Public Works Director shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the Public Works Director may decide.

No such extensions shall be made for a delay occurring more than seven (7) days before claim therefore is made in writing to the Public Works Director. In the case of a continued cause of delay, only one claim is necessary. This section does not exclude the recovery of damages for delays by either party under other provisions in the Contract documents.

30. ACCEPTANCE. Final inspection and acceptance of the work shall be made by the Owner and local appointed authority. Such inspection shall be made as soon as practical after the Contractor has notified the Owner in writing that the work is ready for such inspection.

31. **GUARANTEE.** Contractor agrees to guarantee all work under this Contract for a period of one (1) year from the date of final acceptance thereof. If any unsatisfactory condition or damage develops within the time of this guarantee due to materials or workmanship which were defective, inferior, or not in accordance with the Contract, Contractor agrees, whenever notified by Owner, to immediately place such guaranteed work in a condition satisfactory to Owner and make repairs of all damage made necessary in the fulfillment of the guarantee. This provision shall survive termination of this Contract.

32. **DISPUTE RESOLUTION.**

- (a) Any dispute arising out of or in connection with this Agreement, which is not settled by mutual agreement of the Contractor and the Owner within sixty (60) days of notification in writing by either party, shall be submitted to an arbitrator mutually agreed upon by the parties. In the event the parties cannot agree on the arbitrator, then the arbitrator shall be appointed by the Presiding Judge (Civil) of the Circuit Court of the State of Oregon for the County of Marion. The arbitrator shall be selected within thirty (30) days from the expiration of the sixty (60) day period following notification of the dispute. The arbitration, and any litigation arising out of or in connection with this Agreement, shall be conducted in Salem, Oregon, shall be governed by the laws of the State of Oregon, and shall be as speedy as reasonably possible. The applicable arbitration rules for the Marion County courts shall apply unless the parties agree in writing to other rules. The arbitrator shall render a decision within forty-five (45) days of the first meeting with the Contractor and the Owner. Insofar as the Contractor and the Owner legally may do so, they agree to be bound by the decision of the arbitrator.
- (b) Notwithstanding any dispute under this Agreement, whether before or during arbitration, the Contractor shall continue to perform its work pending resolution of a dispute, and the Owner shall make payments as required by the Agreement for undisputed portions of work.

33. **ASSIGNMENT.** Neither Owner nor Contractor shall assign its interest in this Contract without the written consent of the other except as to the assignment of proceeds. The terms and conditions of this Contract shall be binding upon both parties, their partners, successors, assigns and legal representatives. Neither party to this Contract shall assign the Contract as a whole without written consent of the other.

34. **INDEPENDENT CONTRACTOR STATUS.** The service or services to be performed under this Contract are those of an independent contractor as defined in ORS 670.600. Contractor represents and warrants that it is not an officer, employee or agent of the Owner. Contractor is not entitled to, and expressly waives all claim to City benefits including, but not limited to health, life, and disability insurance, overtime pay, paid leave, and retirement.

35. **GOVERNING LAW.** This Contract shall be governed by the laws of the State of Oregon.

36. SEVERABILITY. Any provision or part of this Contract held to be void or unenforceable under any law or regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor. Owner and Contractor agree that this Contract shall be amended to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

37. COMPLIANCE. The Contractor shall comply with and require its subcontractors to comply with all applicable provisions of Federal, State and local statutes, ordinance, orders, rules, regulations, and all other specifications and provisions as contained within these Contract documents.

38. INCORPORATION; PRECEDENCE. The Exhibits, if any, attached to this Contract are incorporated herein as if fully set forth in this Contract. If any provision of any Exhibit conflicts with the provisions of this Contract, the terms of this Contract shall govern.

39. SIGNATURE. Facsimile or electronic transmission of any signed original document, and retransmission of any signed facsimile or electronic transmission, shall be the same as delivery of an original. At the request of either party, the parties shall confirm facsimile or electronic transmitted signatures by signing an original document.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed the day and year first above written.

CITY OF KEIZER

WYCKAM LLC

By: _____
Christopher C. Eppley,
City Manager

By: _____
Amy Poe,
Member

APPROVED AS TO FORM:

Keizer City Attorney



City of Keizer - Public Works Department

930 Chemawa Rd. N.E., Keizer, OR 97303

PO Box 21000, Keizer, OR 97307

(503)390-3700 fax (503) 393-9437

www.keizer.org

Scope of Services

Exhibit "A"

Shade Sails for the Big Toy at Keizer Rapids Park

General Specifications

- All work involved for the project shall conform to the design specifications included.
- Column posts to be powder coated prior to installation. Powder coating thickness shall be 2-4 millimeters. Color to be tan or light brown to match existing Big Toy structure as close as possible within standard colors available by the contractor's supplier.
- Shade sail material shall be from monofilament yarn and have a minimum 10 year U.V warrantee. Colors to be selected from standard options offered by the contractor.
- The existing rubberized fall protection surface repairs around the column posts will be done by the City.
- Appropriate methods shall be used to prevent damage to the fall protection surface when moving and operating equipment on the surface. Methods may include steel plates, wood sheathing or other materials designed to spread the equipment loads and protect the fall protection surface from damage. Any damage caused by the contractor or its sub-contractors will be repaired at the contractor's expense.
- Plastic sheeting or other approved method shall be used to keep the spoils from the column foundation excavation off of the fall protection surface.
- All work involving excavation and installation of the column posts shall not begin until September 4th 2019.
- The Big Toy playground will be closed to the public during the column post installation process. Contractor will be responsible for securing the work area during construction.
- Meet insurance requirements and other conditions as outlined in attached contract document.

**Keizer Rapids
Big Toy Playground
Fabric Mesh Clad Shade Canopies
Keizer, Oregon**

Structural Load Report

March 2019

Wayne Rendely PE

OR PE # 64562

Expires: 12/31/2020

Prepared for:

Wyckam

7304 NE Martin Luther Blvd.
Portland, Oregon 97211

By:

Wayne Rendely

132 Columbia Street
Huntington Station, NY 11746
Tel.: 631-351-1843

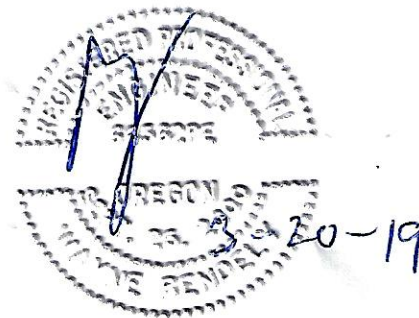


TABLE OF CONTENTS

Part 1	Introduction
Part 2	Structural Framing
Part 3	Model Sketches and General Arrangement Drawings
Part 4	Load Assumptions
Part 5	Non-Linear Finite Element Analysis and Design
Part 6	Spreadsheet Calculations & Spec Sheets

Part 1 Introduction

The purpose of this report is to document the analysis and design of a unique collection of five (5) fabric mesh shade canopies for temporary use in the Keizer Rapids Big toy Playground located at 1900 Chemwa Road North, Keizer, Oregon 97303. All of the assumptions of this report are based upon written and verbal information provided to me by others and it is my judgment that the information is accurate. The structures must conform to the specifications of this report in order for this certification to be valid.

Please Note: The shade panels are designed as low prestress fabric and low tensioned cables and designed for maximum wind gusts of 70 mph but the panels should be removed and the area evacuated or unoccupied if winds gusts of 50 to 55 mph are predicted or experienced. The columns support one, two or three panels and are designed such that the five (5) panels are either all on or all off.

Part 2 Structural Framing Plan

The collection of canopies use sixteen (16) steel cantilever columns of different lengths and sizes to support the five (5) panels. Four panels are 4 sided and one panel is 5 sided. All of the columns are vertical. Each corner of each panel ends with a membrane plate or delta ring that is then attached to the column via a link or turnbuckle. The fabric mech is attached to the perimeter catenary cables which are also under prestress tension. The column bases are fixed via cast in place anchor rods into the reinforced concrete piers or alternatively the steel columns can be cast directly into and as part of the concrete pier.

Part 3 Model Sketches and General Arrangement Drawings

The following pages contain sketches of the proposed structure and then drawings which are also printed separately as an 11 x 17 drawing set

MPanel InSite - Visualization

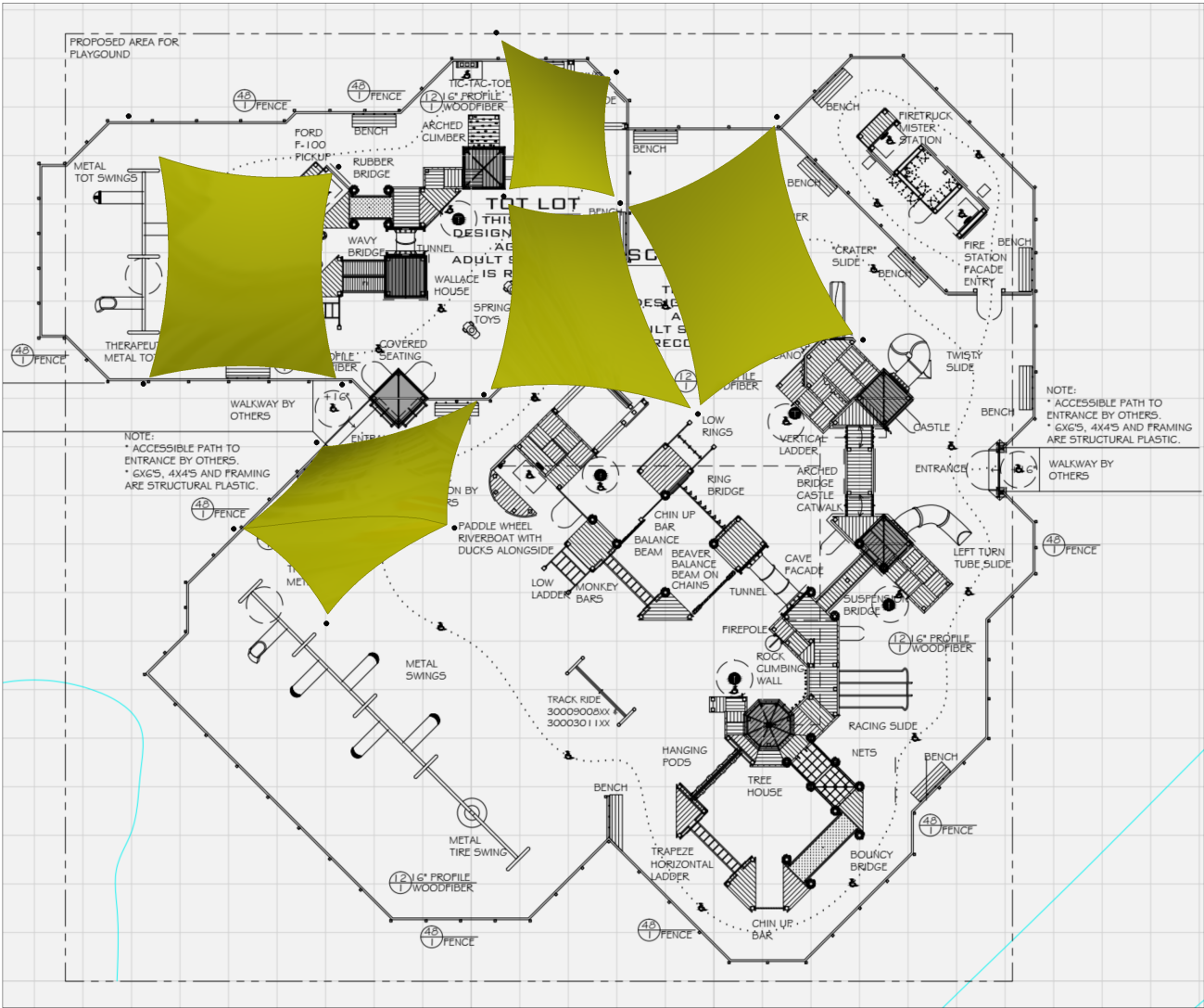
Client	Keizer
Project	Big Toy Shade Sails
Project #	0-0
Entered by	Amy Poe
Date	1/17/2019
Units	Feet and inches

Sail area	2256.1 Sq Feet
Sail count	5
Pole count	16
Edge length	498' 5.6"

Supplier	Wyckam OR CCB # 209673
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Model view



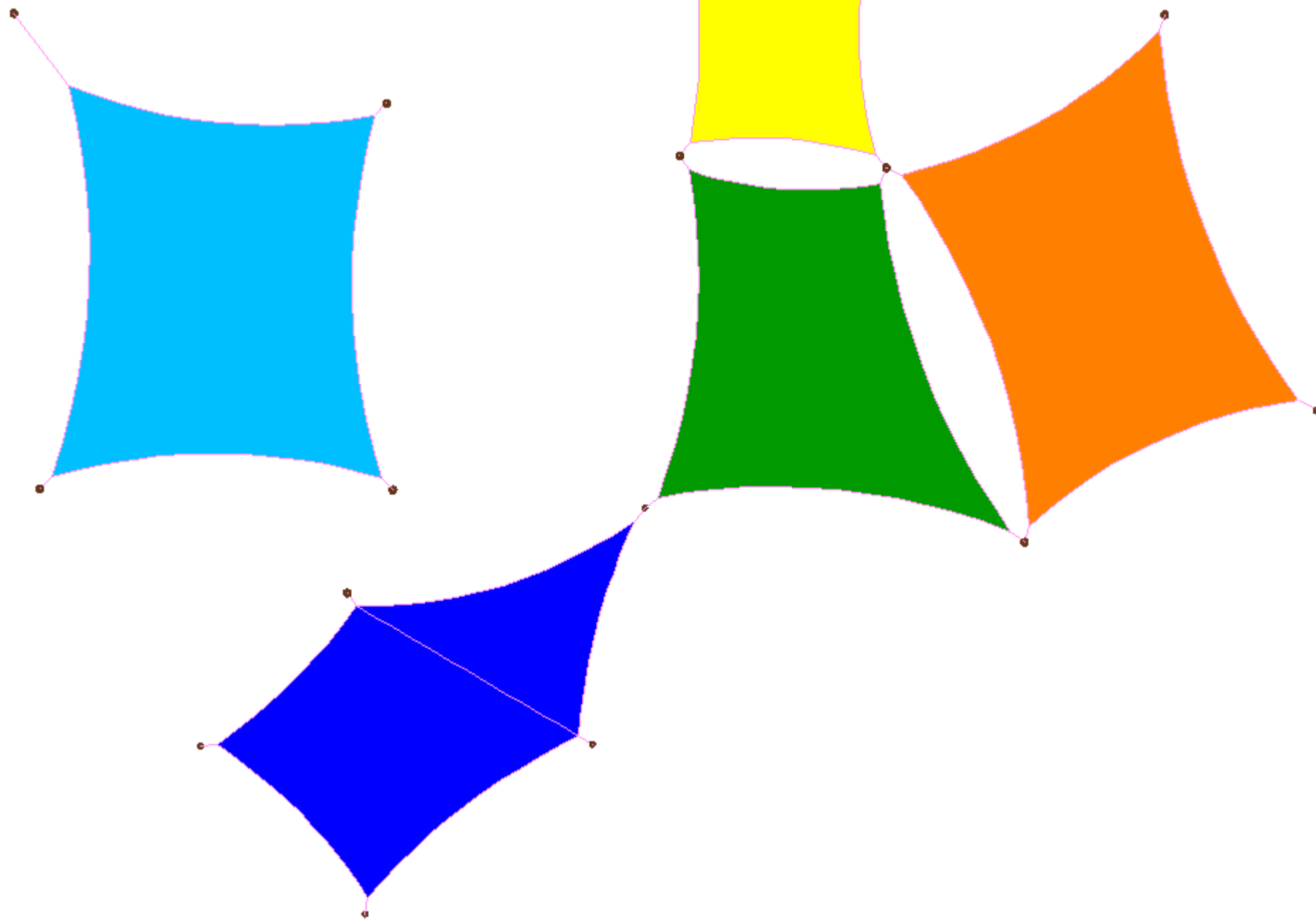
Project approval / Client acceptance

Signature

Date

Layer

-  SAIL 1
-  SAIL 2
-  SAIL 3
-  SAIL 4
-  SAIL 5

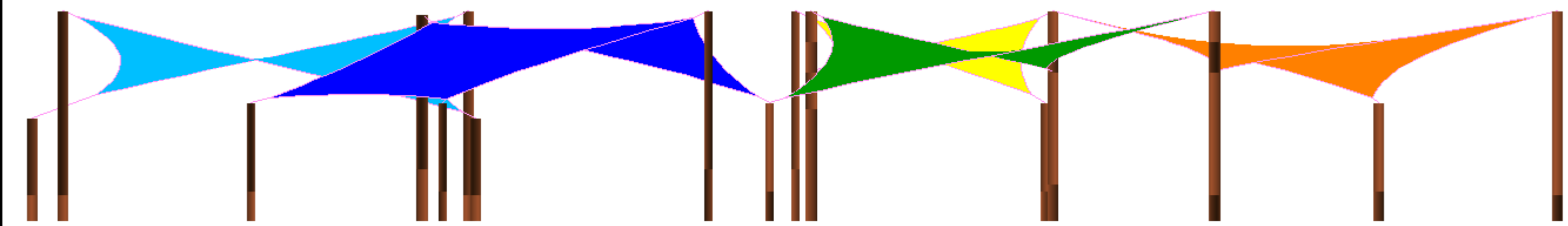


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- SAIL 2
- SAIL 3
- SAIL 4
- SAIL 5

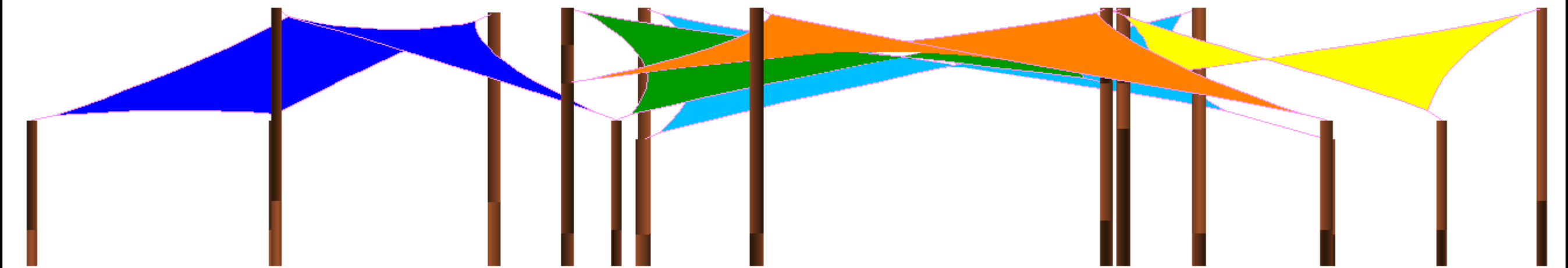
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- SAIL 3
- SAIL 4
- SAIL 5

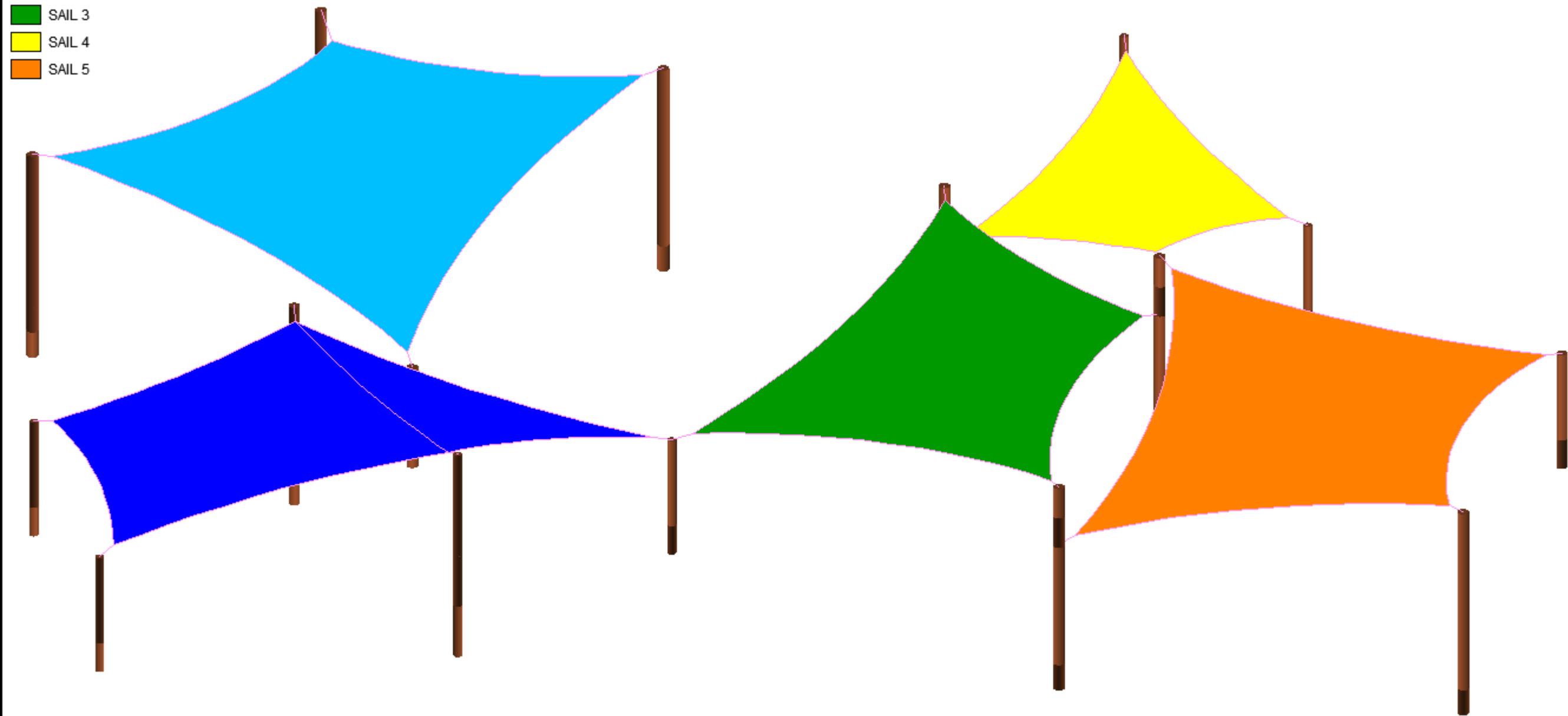
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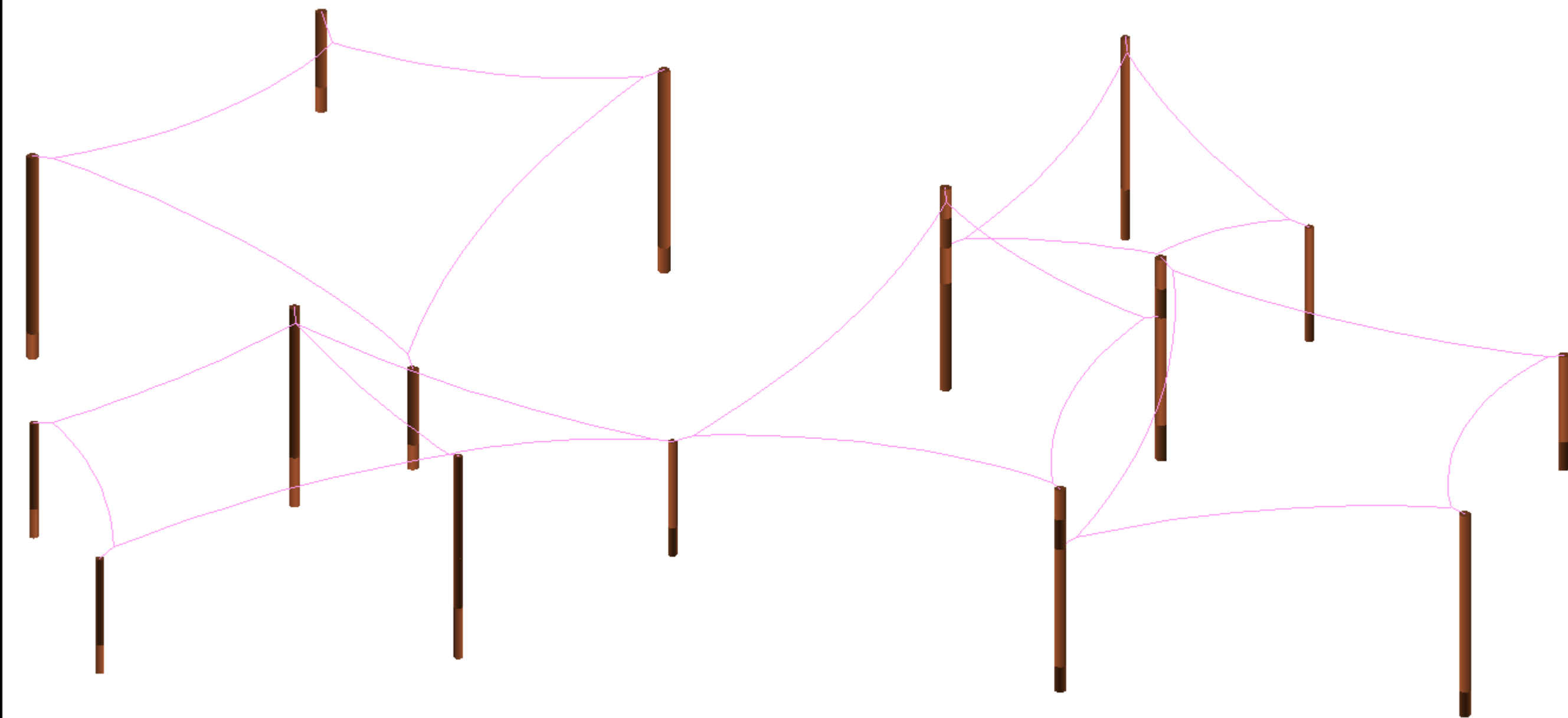


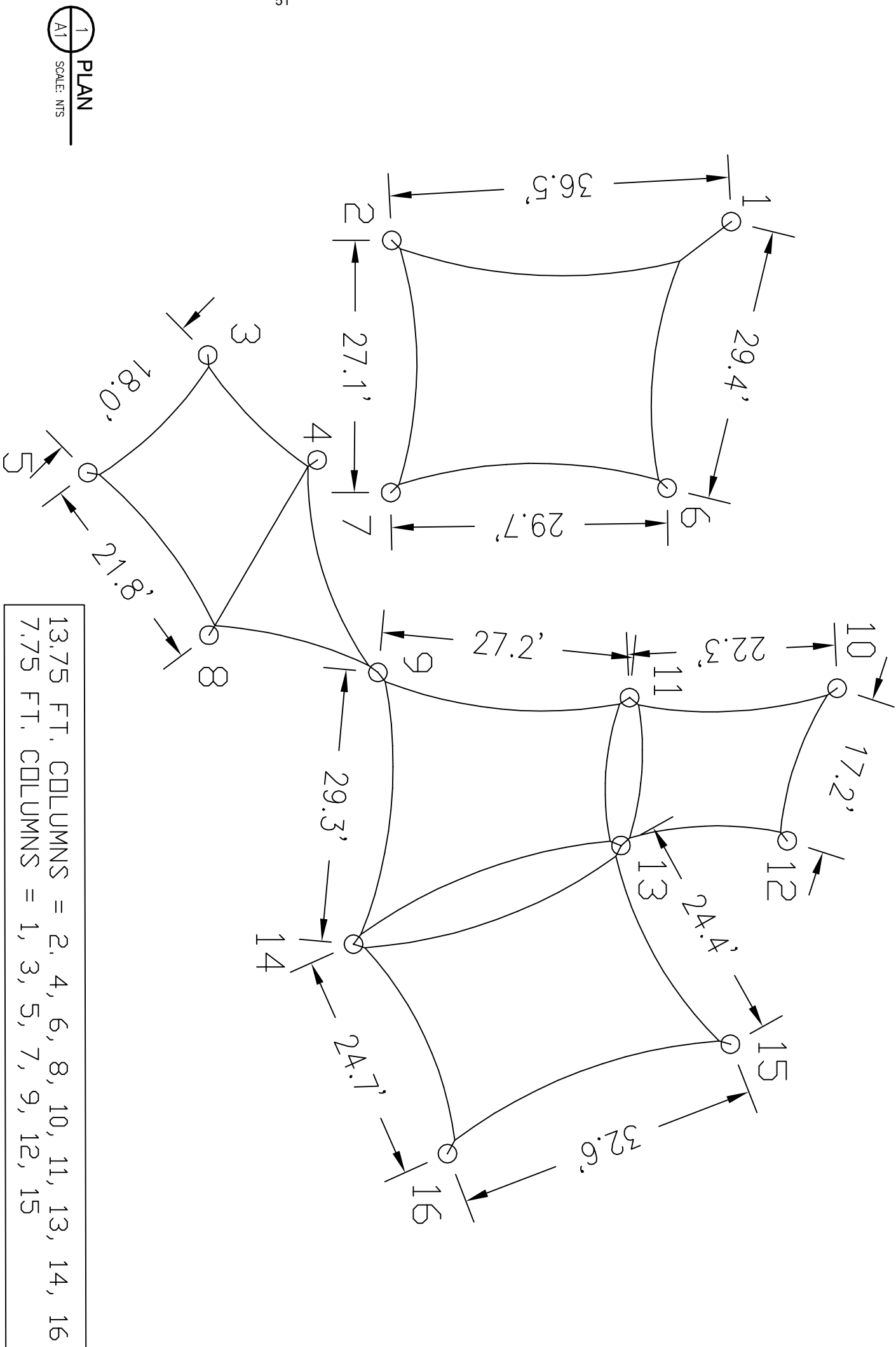
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- SAIL 2
- SAIL 3
- SAIL 4
- SAIL 5

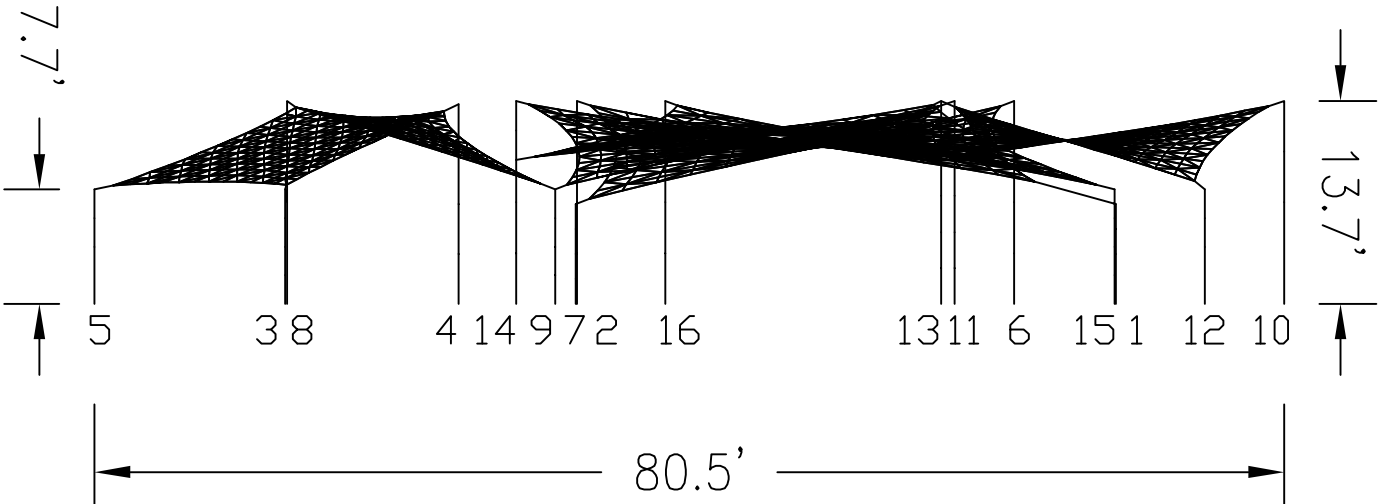
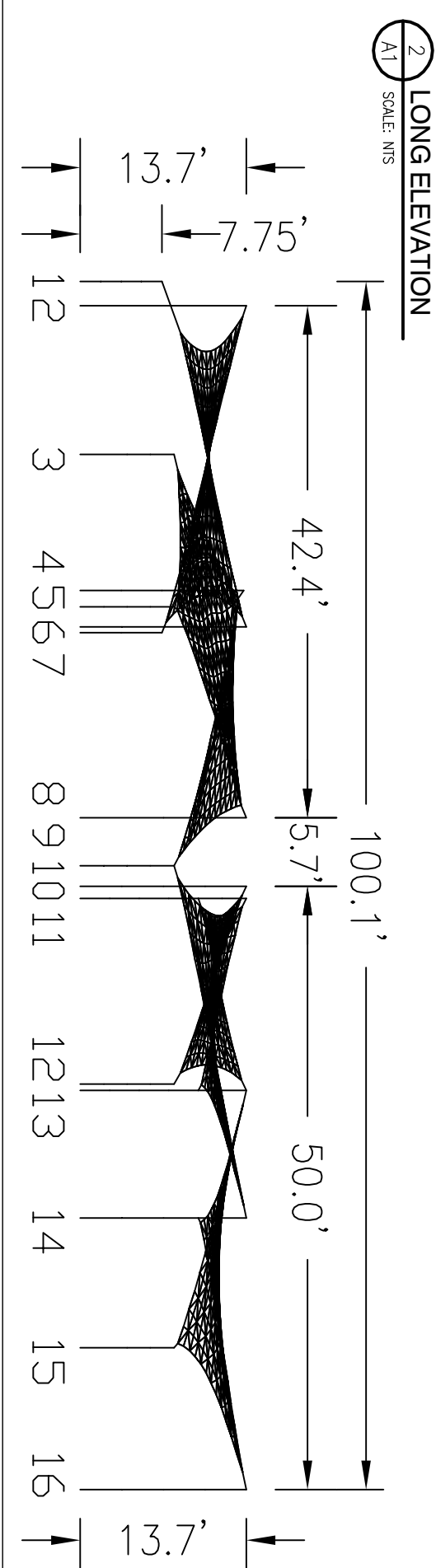
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51

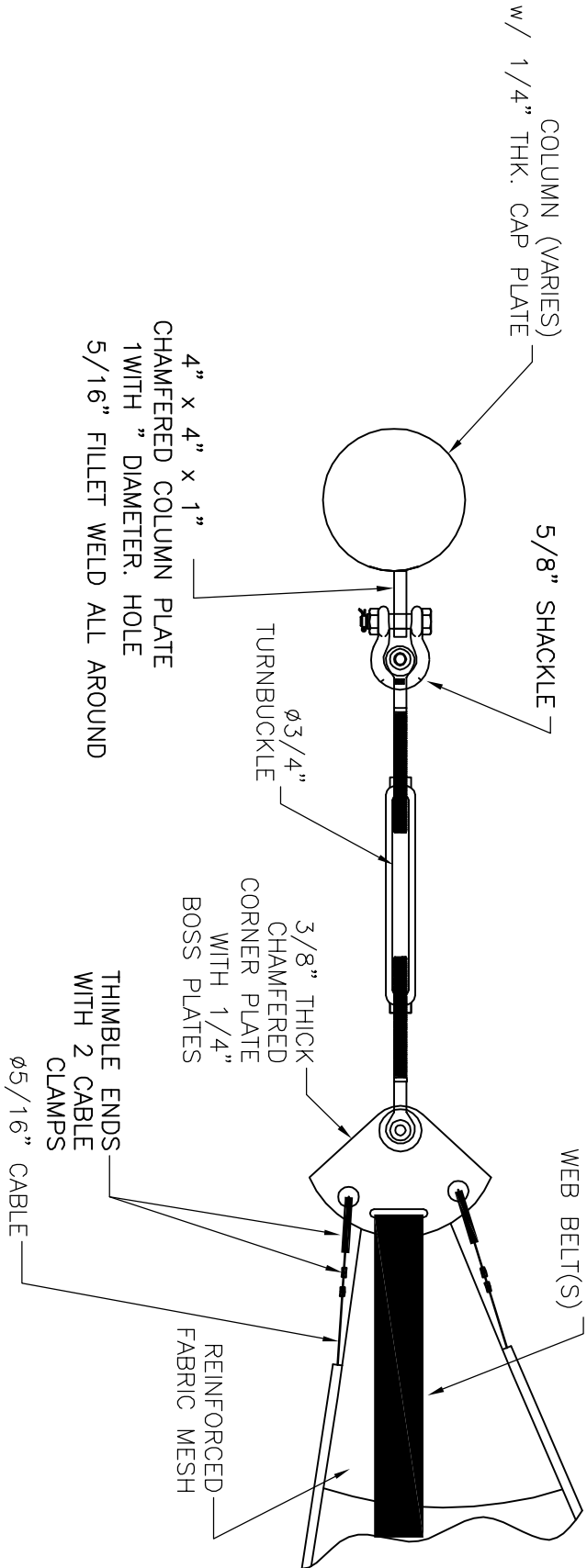


WAYNE RENDELY PE
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HUNTINGTON STATION, NY
OR PE # 64562
EXPIRES: 12/31/2020

ALL MEASUREMENTS ARE IN
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SPECIFIED OTHERWISE

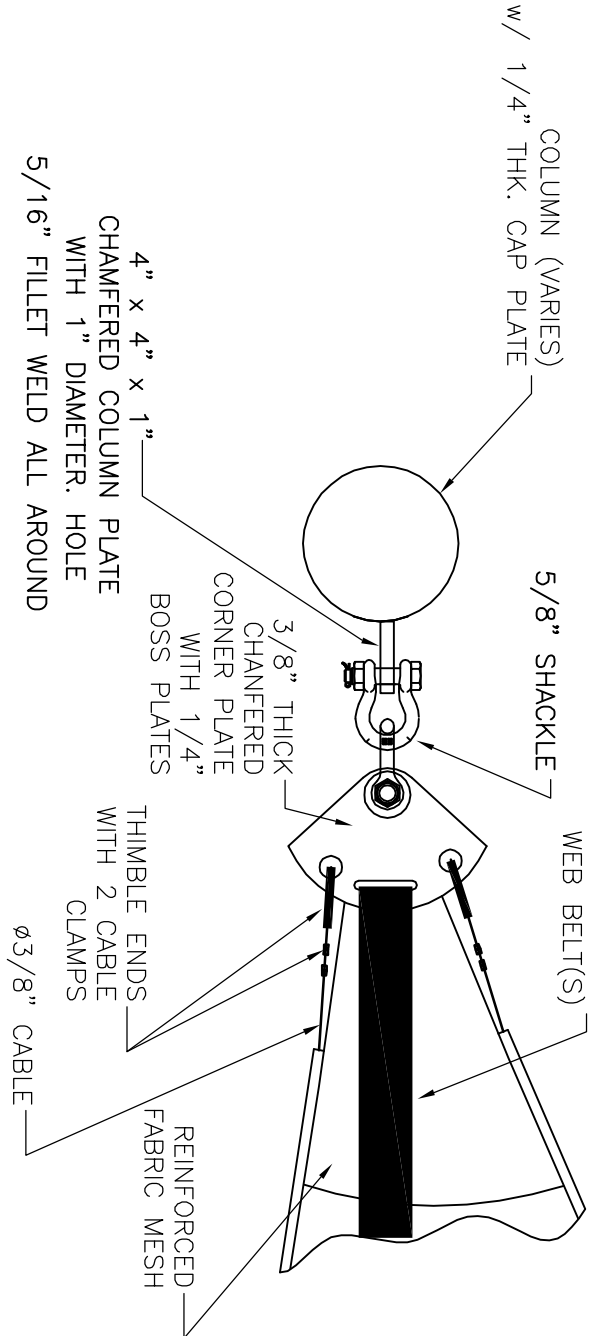
ORIGINAL DRAWING SIZE
IS 11" x 17"

WYCKAM 7304 NE MARTIN LUTHER BLVD. PORTLAND, OREGON 97211 TEL.: 503-729-6051		PROJECT: KEIZER RAPIDS BIG TOY PLAYGROUND SHADE SAIL CANOPIES 1900 CHEMWA ROAD NORTH KEIZER, OREGON 97303	
DRAWN BY: WRPE			
DATE: MARCH 2019			
SCALE: NTS		DESCRIPTION: PLAN & ELEVATIONS	
FILE NO. 000000		ENGINEER APPROVAL: DATE:	
LAYOUT:		CUSTOMER APPROVAL: DATE:	
		1 OF A1	



4 SHACKLE-TURNBUCKLE
A2 SCALE: SCALE = N.T.S.

SEE SHOP DRAWINGS



5 SHACKLE-SHACKLE
A2 SCALE: SCALE = N.T.S.

SEE SHOP DRAWINGS

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WYCKAM 7304 NE MARTIN LUTHER BLVD. PORTLAND, OREGON 97211 TEL.: 503-729-6051			
DRAWN BY: WRPE	PROJECT: KEIZER RAPIDS BIG TOY PLAYGROUND		
DATE: MARCH 2019	SHADE SAIL CANOPIES 1900 CHEMWA ROAD NORTH KEIZER, OREGON 97303		
SCALE: NTS	DESCRIPTION: SHADE SAIL DETAILS		
FILE NO. 000000	ENGINEER APPROVAL:	DATE:	1 OF 1
LAYOUT:	CUSTOMER APPROVAL:	DATE:	A2

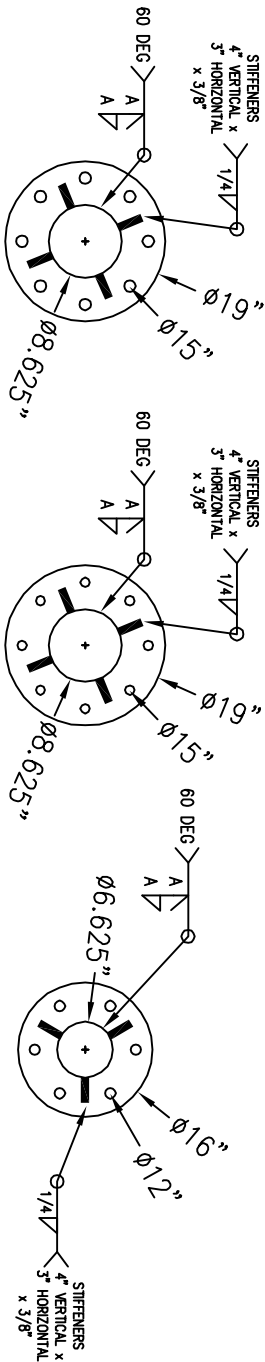
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ANCHOR & PIER DETAILS

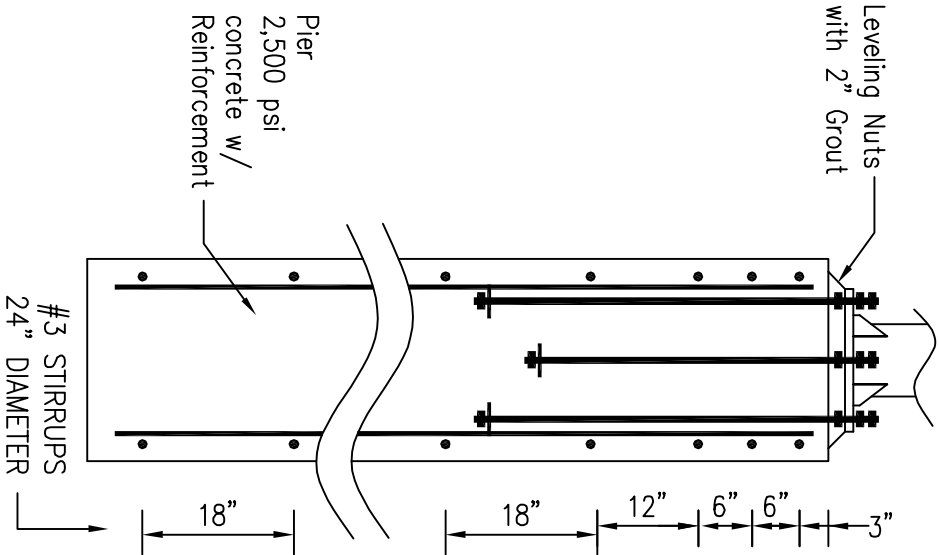
A4

SCALE: NTS

WELD SCHEDULE
60 DEGREE CHAMFER W/
60 DEGREE FILLET REINFORCEMENT
0.280" THICK TUBE – A = 3/16"
0.322" THICK TUBE – A = 1/4"
0.500" THICK TUBE – A = 3/8"



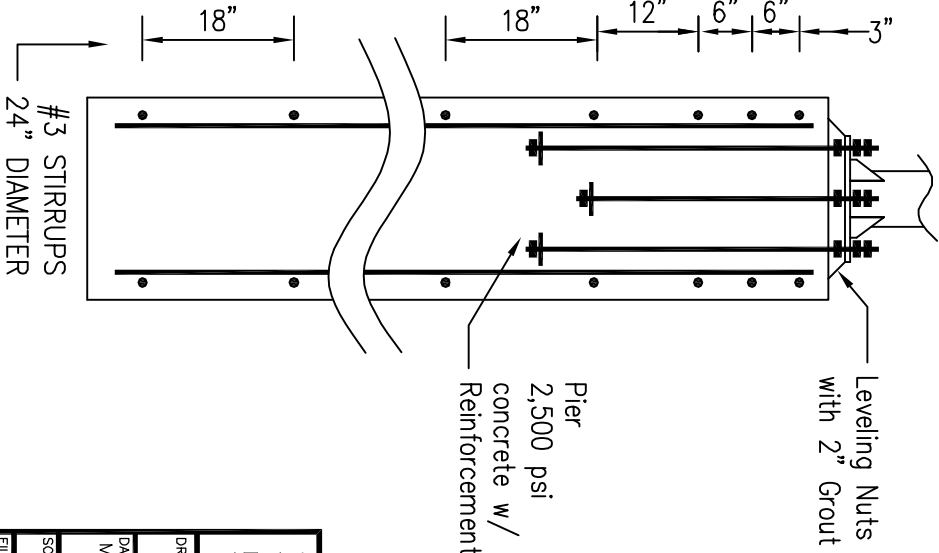
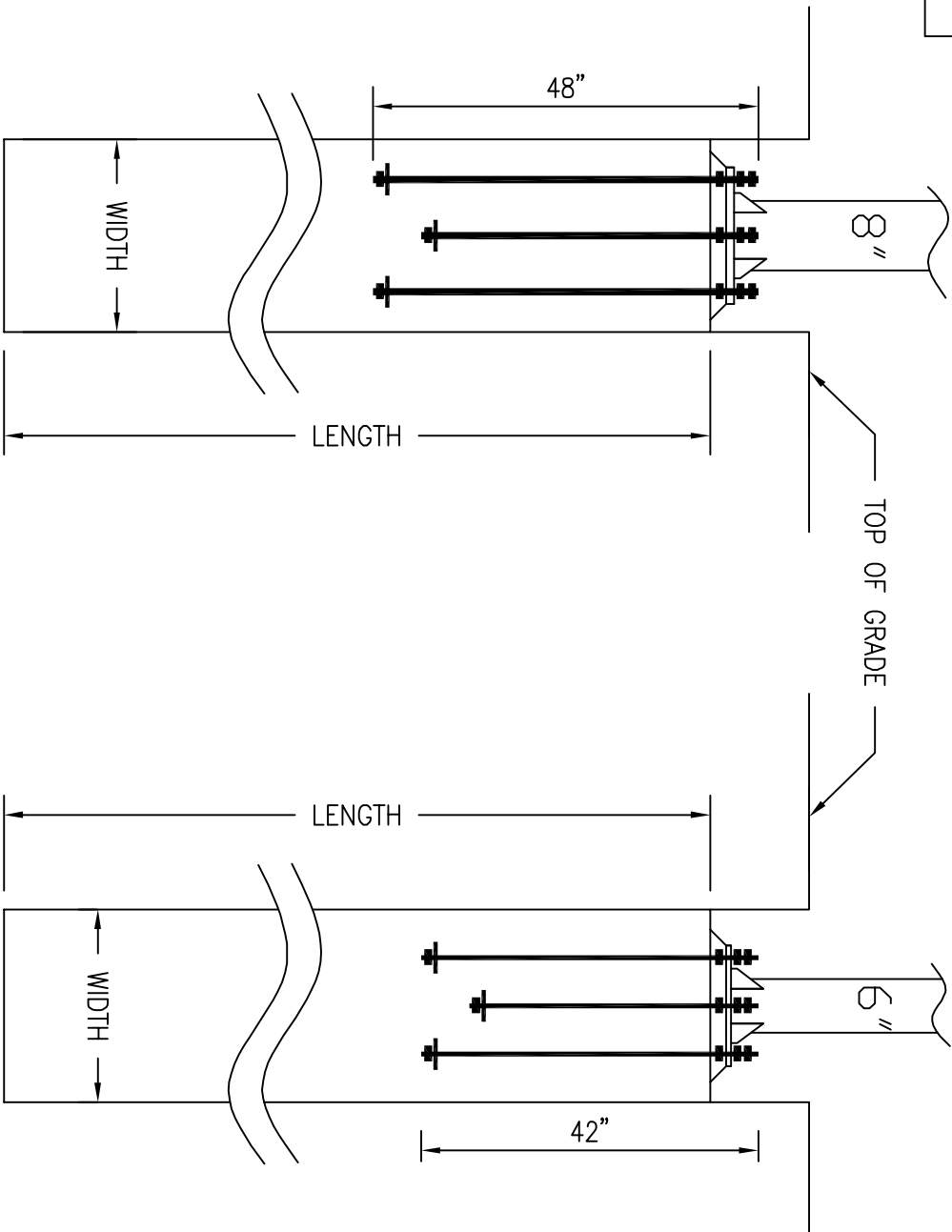
PIPE/PIER SIZE/REINFORCEMENT SCHEDULE		
6SCH40 (3, 5, 8, 9, 10, 12)		
8SCH40 (1, 2, 4, 6, 7, 11, 13, 15, 16)		
8SCH80 (14)		
	LENGTH x WIDTH	VERTICAL BARS
6SCH40	7 FEET x 36"	8 @ #5
8 SCH40	9 FEET x 36"	12 @ #5
8 SCH80	12 FEET x 36"	16 @ #5
(LENGTH ASSUMES CLASS 4 SOIL)		



8SCH80 (45 KSI STEEL)
8.625" x 0.500" COLUMNS
1.25" THICK (50 KSI BASEPLATE)
1.375" DIAMETER HOLES FOR
1.125" DIAMETER A193 B7
42" & 48" LONG ALTERNATING
ANCHOR RODS WITH
4"x4"x1/2" ANCHOR PLATES

8SCH40 (45 KSI STEEL)
8.625" x 0.322" COLUMNS
1" THICK (50 KSI BASEPLATE)
1.125" DIAMETER HOLES FOR
0.875" DIAMETER A193 B7
30" & 36" LONG ALTERNATING
ANCHOR RODS WITH
4"x4"x1/2" ANCHOR PLATES

6SCH40 (45 KSI STEEL)
6.625" x 0.280" COLUMNS
1" THICK (50 KSI BASEPLATE)
1.25" DIAMETER HOLES FOR
1" DIAMETER A193 B7
36" & 42" LONG ALTERNATING
ANCHOR RODS WITH
4"x4"x1/2" ANCHOR PLATES

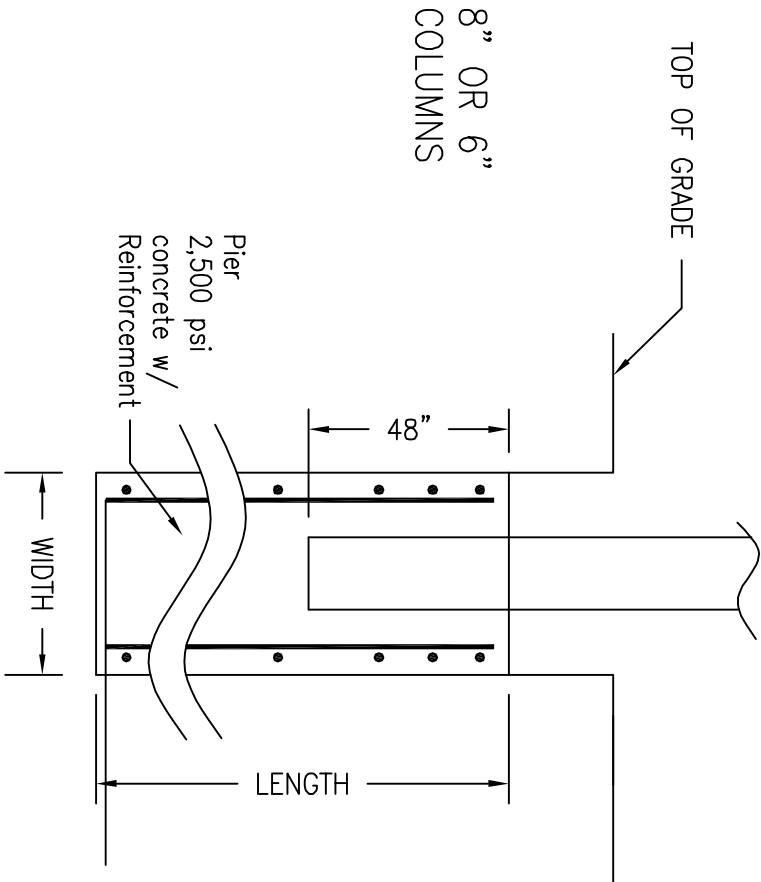


7

ALTERNATE ANCHOR DETAIL

A4

SCALE: NTS



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SCALE: NTS
DESCRIPTION: ANCHOR & PIER DETAILS
FILE NO: 000000
ENGINEER APPROVAL: DATE: 1 OF 1
LAYOUT: CUSTOMER APPROVAL: DATE: A3

Part 4 Load Assumptions

The load calculations were done with the aid of spreadsheet programs, a finite element analysis program called NDN and hand calculations. Loads consist of the following: prestress, dead, live, snow, wind and seismic loads as described below.

Prestress

The fabric prestress is assumed to be low which is 12 plf in both the warp and fill and the catenary cable prestress varies from approximately 300 to 600 lbs tension. The prestress tension in the links between the panels and the columns vary from 600 to 1,200 lbs.

Dead Load

The structure dead load is the actual material weights of the structure.

Live Loads

Live load of 5 is applicable for this type of structure.

Wind Loads

See calculation for ASCE 7-10 for Mean Recurring Interval of approximately 10 years of 70 mph and a design wind pressure of approximately 8 psf (ASD) at an elevation of 20 feet.

Seismic Loads

The structure is lightweight and wind load governs over seismic.

Load Combinations

1. DL + IP + P (All cases include Pre-Stress)
2. DL + Uplift
3. DL + Live
- 4-11 DL + Wind Load in 8 directions

ASCE 7-10

Wind Speed (3 sec. gust)

Use V=	Design	Actual
	LRFD 10 year 88 mph	ASD 10 year 70 mph

Use Kzt = **1.00** minimum = 1.00

$$qG = G \cdot K_z \cdot K_{zt} \cdot (I) \cdot 0.00256 \cdot (V)^2 \quad 1 < K_{zt} = (1 + K_1 \cdot K_2 \cdot K_3)^2$$

DESIGN WIND PRESSURE INCLUDING GUST G
and Directionality Kd (PSF)

	Exposure B		Exposure C		Exposure D	
G =	0.85		0.85		0.85	
Kd =	0.85		0.85		0.85	
Height	Pressure		Pressure		Pressure	
feet	psf		psf		psf	
	LRFD	ASD	LRFD	ASD	LRFD	ASD
0 - 15	8.2	4.9	12.2	7.3	14.8	8.9
20	8.9	5.3	12.9	7.7	15.5	9.3
25	9.5	5.7	13.5	8.1	16.0	9.6
30	10.0	6.0	14.0	8.4	16.6	10.0
40	10.9	6.5	14.9	8.9	17.5	10.5
50	11.6	7.0	15.6	9.4	18.2	10.9
60	12.2	7.3	16.2	9.7	18.8	11.3

Wayne Rendely P.E.
 132 Columbia Street Huntington Station,
 New York 11746-1220
 631-351-1843 tel. 631-351-0948 fax

RE: ASCE 7-93, 7-05, and 7-10 Design Wind Speeds
 ASCE 7-10 – Design Wind Speeds / Return Periods or MRI
 (MRI = Mean Recurrence Interval = 50, 25, 10, 5, 2 years etc.)

ASCE 7 - "Minimum Design Loads for Buildings and Other Structures" is referenced by the IBC 2012 for determining wind and snow loads but for temporary membrane (fabric) structures we read:

SECTION 3102 - MEMBRANE STRUCTURES

3102.1 General. The provisions of Sections 3102.1 through 3102.8 shall apply to air-supported, air-inflated, membrane covered cable and membrane-covered frame structures, collectively known as membrane structures, erected for a period of 180 days or longer. **Those erected for a shorter period of time shall comply with the International Fire Code.**

From the 2012 International Fire Code we read:

3103.9 Anchorage required. Tents or membrane structures and their appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather and prevent against collapsing. Documentation of structural stability shall be furnished to the fire code official on request. Commentary: Having secure anchorage to prevent damage or loss caused by wind or precipitation makes good economic sense. This section also gives the fire code official the authority to review and approve both plans and actual installations to ensure that the structures have been designed and erected using good engineering practices.

.....

Using good engineering practice and referring to the ASCE 7-10 we can use the maps and formulas for the Mean Recurring Intervals (MRI) to determine the wind speeds for a particular structure based on its use and service life. (50, 25, 10, 2 years) Using a 2 year return period for a structure with a service life of less than 6 months (one month, a week, a day) is conservative. The 2 year return period actual wind speed 3-second gust for most of the U.S. is approximately 62 mph.

The 1993 version of ASCE 7 used a 50 year return period map indicating the fastest mile (FM) expected once in 50 years that listed 70 mph as typical for a large portion of the center of the United States. This fastest mile then might be modified based on a greater or lesser importance of the structure and thus increasing or decreasing the expected return period to more or less than 50 years. The resulting fastest mile then was further modified for an expected gust that might occur for this fastest mile speed. The 70 mph fastest mile with an importance factor of 1.0 was modified to approximately an 85 mph gust. The design wind pressure was used to determine the stress in the members for review under allowable stress design (ASD)

The 1995 version of ASCE 7 used a 50 year return period map indicating the 3 second gust expected once in 50 years that listed 90 mph as typical for a large portion of the center of the United States. This 3 second gust then might be modified based on a greater or lesser importance of the structure and thus increasing or decreasing the expected return period to

more or less than 50 years. The design wind pressure was then calculated and increased by a factor of 1.6 when using strength design or Load Factor and Resistance Design (LRFD)

From ASCE 7-10 C26.5.1 Basic Wind Speed (page 508) “This 2010 edition of ASCE 7 departs from prior editions by providing several maps that are directly applicable for determining pressures for strength design approaches. Rather than using a single map with importance factors and a load factor for each building risk category, in this edition there are different maps for different categories of building occupancies.”.....ASCE7-10 uses “multiple-strength design maps in conjunction with a wind load factor of 1.0 instead of using a single map with an importance” (factors of 0.8, 1.0, 1.15 etc) “and a load factor of 1.6.....” The various actual wind speed maps for MRI of 10, 25, 50 and 100 years are found in Commentary Appendix C pages 584 thru 591 with typical wind speeds in the majority of the US listed as 76, 84, 90 and 96 mph. The basic wind speeds for use in design of Risk Category II, III and IV, and I are found on pages 247a thru 249b and correspond approximately to 50 year, 100 year and 25 year return periods. Risk Category of Buildings are:

II = Standard

III and IV = Substantial Risk to Human Life and Essential Buildings

I = low risk to human life

Temporary Structures are defined as being “in service for a limited time and have a limited exposure period for environmental loadings.” This would suggest using an MRI of 10 years or possibly 5 or 2 years. For ASCE 7-10 the design wind speed for most of the country for a 50 year MRI is 115 mph. This is an actual wind speed of 91 mph. { $(115/91)^2 = 1.6$ } The actual wind speeds for MRI's of 10, 5 and 2 years are 76, 70 and 62 mph. To be conservative we typically design a temporary structure for the 62 mph but for comparison a 1 year and a 6 month return period would calculate to 55 and 49 mph respectively and these have also been used. States like Kentucky are considering adopting a minimum actual wind speed of 45 mph for use in the design of tent anchorage.

ASCE 7-10 TABLE C26.5-6
page 540

DESIGN WIND SPEED (MPH)			ACTUAL MPH/ $(1.6)^{.5}$
ASCE 7-93 FASTEST MILE	ASCE 7-05 (3-SEC GUST)	ASCE 7-10 (3-SEC GUST)	ASCE 7-10 (3-SEC GUST)
71	85	110	87
76	90	115	91
85	100	126	100
90	105	133	105
95	110	139	110
104	120	152	120
114	130	164	130
123	140	177	140
128	145	183	145
133	150	190	150
152	170	215	170

ASCE 7-10

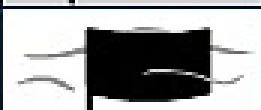
$$V_t / V_{50} = [0.36 + 0.1 \ln(12T)]$$

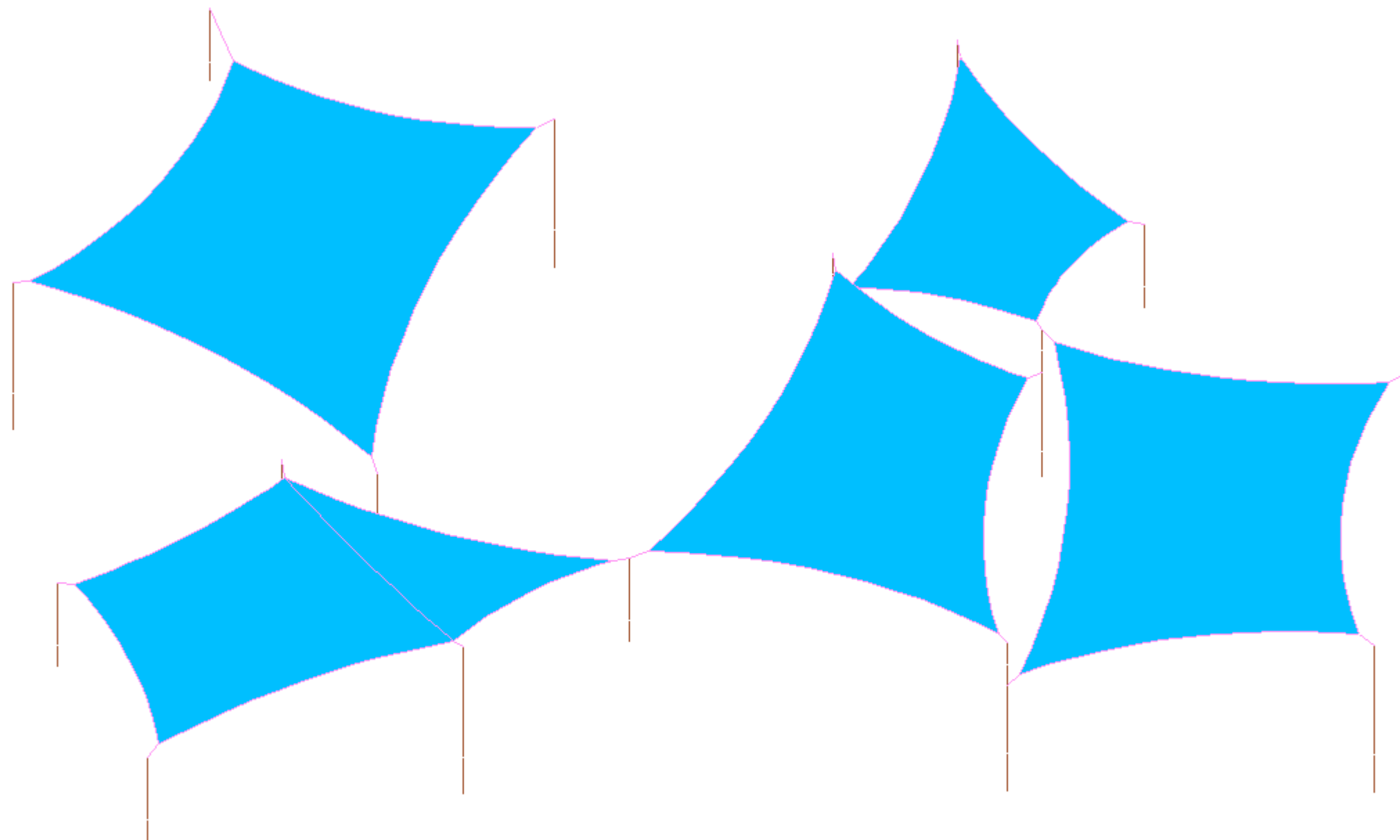
(C25.5-2) page 509

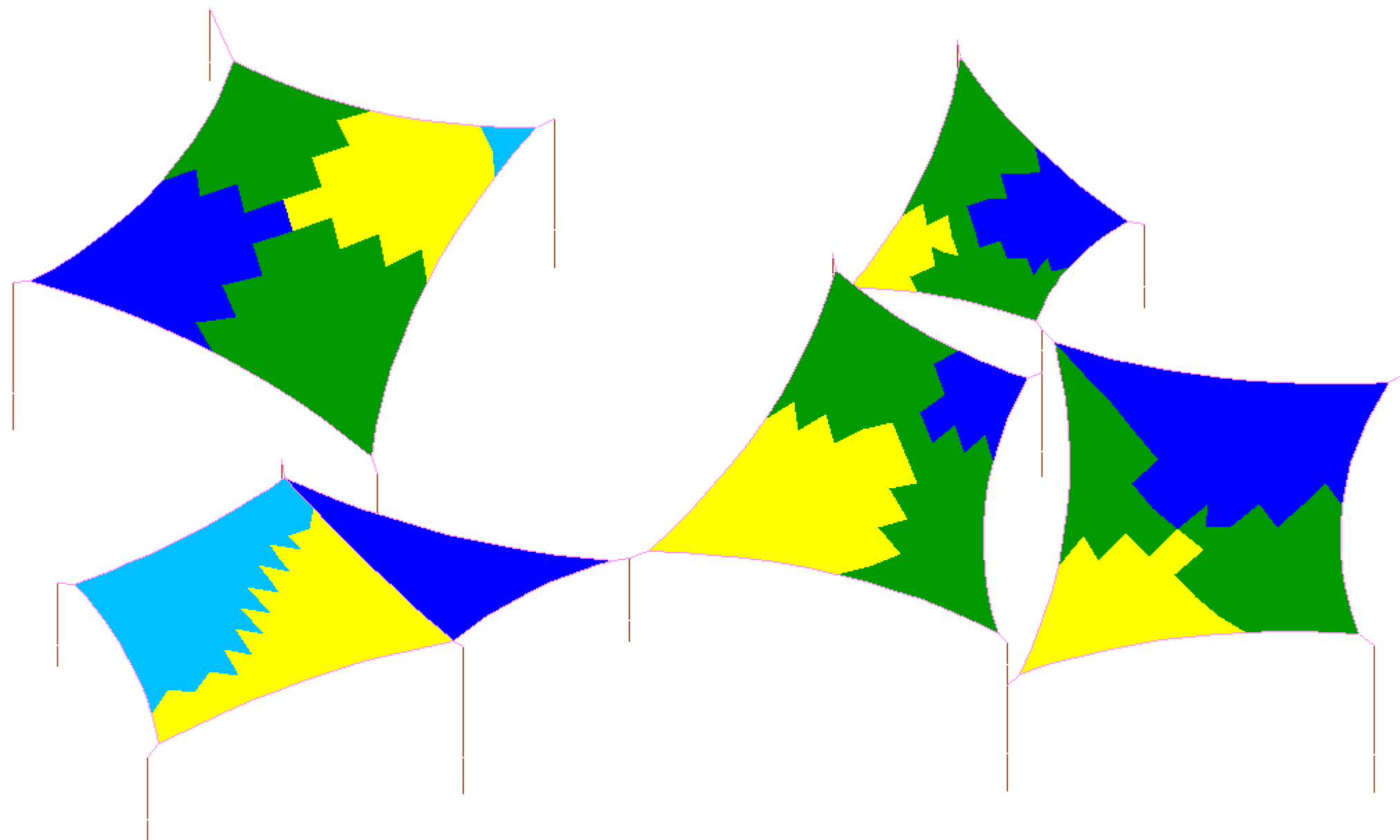
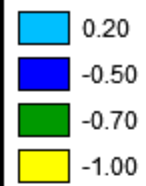
		Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt
	V50	years	years	years	years	years	years	years	years	years	years
	mph	500	200	100	50	25	10	5	2	1	0.5
V50	110	135	125	118	110	102	92	85	75	67	59
V50	115	141	131	123	115	107	96	88	78	70	62
V50	120	148	137	128	120	112	101	92	81	73	65
V50	125	154	142	134	125	116	105	96	85	76	67
V50	130	160	148	139	130	121	109	100	88	79	70
V50	135	166	154	144	135	126	113	104	92	82	73
V50	140	172	159	150	140	130	117	108	95	85	75
V50	145	178	165	155	145	135	122	112	98	88	78
V50	150	184	171	160	150	140	126	115	102	91	81
V50	155	191	176	166	155	144	130	119	105	94	84
V50	160	197	182	171	160	149	134	123	108	97	86
V50	165	203	188	176	165	154	138	127	112	100	89
V50	170	209	194	182	170	158	143	131	115	103	92
V50	175	215	199	187	175	163	147	135	119	106	94
V50	180	221	205	192	180	167	151	138	122	110	97

	Factored	Actual	T	T	T	T	T	T	T	T	T	T
	Speed	Speed	years	years	years	years	years	years	years	years	years	years
	mph	mph	500	200	100	50	25	10	5	2	1	0.5
V50	110	87	107	99	93	87	81	73	67	59	53	47
V50	115	91	112	103	97	91	85	76	70	62	55	49
V50	120	95	117	108	101	95	88	80	73	64	58	51
V50	125	99	122	112	106	99	92	83	76	67	60	53
V50	130	103	126	117	110	103	96	86	79	70	63	55
V50	135	107	131	121	114	107	99	90	82	72	65	58
V50	140	111	136	126	118	111	103	93	85	75	67	60
V50	145	115	141	130	123	115	107	96	88	78	70	62
V50	150	119	146	135	127	119	110	99	91	80	72	64
V50	155	123	151	139	131	122	114	103	94	83	75	66
V50	160	126	156	144	135	126	118	106	97	86	77	68
V50	165	130	160	148	139	130	121	109	100	88	79	70
V50	170	134	165	153	144	134	125	113	103	91	82	72
V50	175	138	170	157	148	138	129	116	106	94	84	75
V50	180	142	175	162	152	142	132	119	109	96	87	77

ASCE 7-05		Design Wind Pressure (G = 1.0 /// Kd = 1.0)									
Elevation	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph	Actual Wind Speed			90 mph	
0-15'	4.4	5.4	6.6	7.8	9.2	10.7				17.6	
20'	4.7	5.8	7.0	8.3	9.7	11.3				18.7	
25'	4.9	6.0	7.3	8.7	10.2	11.8				19.5	
30'	5.1	6.3	7.6	9.0	10.6	12.3				20.3	
ASCE 7-05		Design Wind Pressure (G = 0.85 /// Kd = 0.85)									Importance
											Factor = 0.59
Elevation	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph	75 mph	80 mph	85 mph	90 mph	90 Temp.
0-15'	3.2	3.9	4.8	5.7	6.6	7.7	8.8	10.1	11.4	12.7	7.5
20'	3.4	4.2	5.0	6.0	7.0	8.2	9.4	10.7	12.0	13.5	8.0
25'	3.5	4.3	5.3	6.3	7.3	8.5	9.8	11.1	12.6	14.1	8.3
30'	3.7	4.5	5.5	6.5	7.7	8.9	1.2	11.6	13.1	14.7	8.7

Beaufort number	Wind Speed (mph)	Seaman's term ⁶⁰		Effects on Land
0	Under 1	Calm		Calm; smoke rises vertically.
1	1-3	Light Air		Smoke drift indicates wind direction; vanes do not move.
2	4-7	Light Breeze		Wind felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze		Leaves, small twigs in constant motion; light flags extended.
4	13-18	Moderate Breeze		Dust, leaves and loose paper raised up; small branches move.
5	19-24	Fresh Breeze		Small trees begin to sway.
6	25-31	Strong Breeze		Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale		Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale		Twigs and small branches broken off trees.
9	47-54	Strong Gale		Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale		Seldom experienced on land; trees broken; structural damage occurs.
11	64-72	Storm		Very rarely experienced on land; usually with widespread damage.
12	73 or higher	Hurricane Force		Violence and destruction.

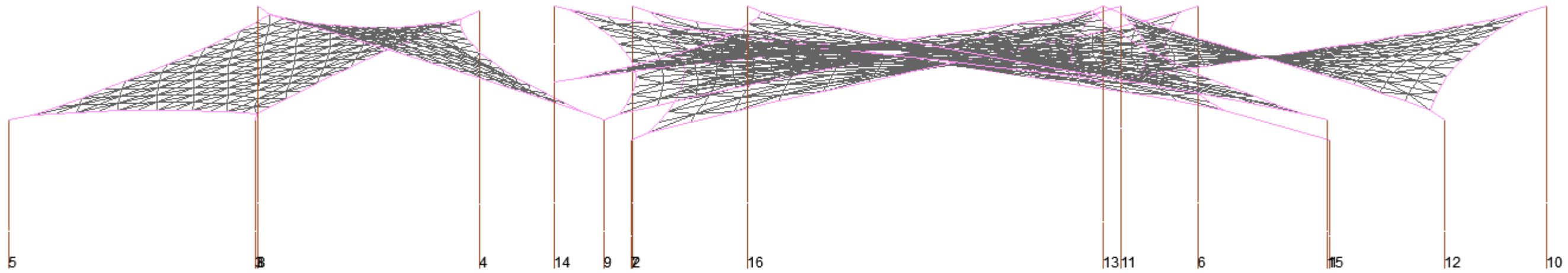


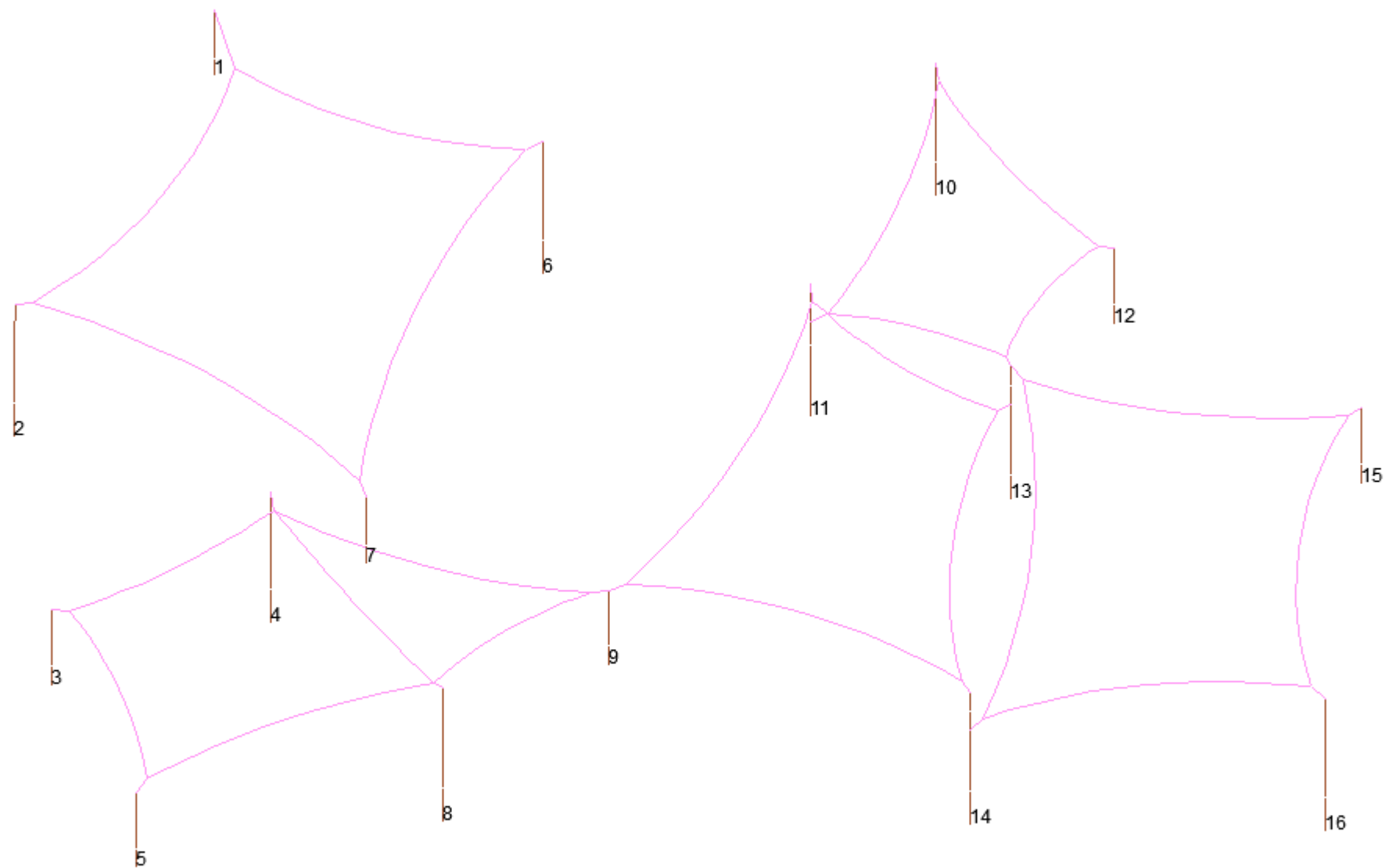


Part 5 Non-Linear Finite Element Analysis and Design

The 3D analysis is modelled as an assemblage of linear and planar elements with the appropriate stiffness properties and alignments assigned. Releases are set to simulate a zero moment condition where appropriate. Column bases are modelled as FIXED. The un-factored reactions are tabulated as well as the internal forces - axial, shears and moments, to check the member sizes and connections. Stress ratios for ASD elastic are less than 1.0. The column bases are acceptable up to 1.15 using plastic section modulus.

Also Included are spreadsheet calculations for Anchor Rods and Piers.





Notes:

1. The 'Reaction Forces' tabulated below represent the loads exerted by the analyzed model onto its supports.
2. The forces tabulated are Unfactored, Working Loads based on Analysis Cases.
3. The effects of prestress and dead load are included in all Analysis Cases.
4. Forces act in the directions defined by a right hand cartesian coordinate system. X and Y are in the horizontal plane, Z is upward. (Positive Z force means that the foundation or support is subjected to uplift.)
5. The coordinates tabulated are for analysis modeling only. They do not represent final work point locations in the structure.

Reaction Force Tabulation (tabulated by node) Units: kip & ft

Node No	AC No	X-Force (kip)	Y-Force (kip)	Z-Force (kip)	Horizontal Resultant	Resultant Force(3D)	X-Moment (kip-ft)	Y-Moment (kip-ft)	Z-Moment (kip-ft)	XY-Result (kip-ft)
2	1	4.250	-5.664	1.911	7.081	7.334	38.146	28.622	0.000	47.690
2	2	2.204	2.109	-0.660	3.050	3.121	-29.040	30.350	0.000	-42.005
2	3	2.952	-0.017	0.960	2.952	3.105	0.129	22.793	0.000	22.794
2	4	0.285	-0.414	-0.598	0.502	0.781	5.593	3.851	0.000	-6.790
2	5	0.558	2.951	0.994	3.003	3.163	-22.780	4.309	0.000	23.184
2	6	-1.620	-1.615	-0.630	2.288	2.373	22.247	-22.317	0.000	31.512
2	7	-4.678	5.058	2.509	6.889	7.332	-34.045	-31.487	0.000	46.373
2	8	-0.920	0.619	-0.683	1.108	1.302	-8.553	-12.717	0.000	15.326
2	9	1.030	0.194	3.459	1.048	3.614	-1.482	7.884	0.000	8.022
2	10	0.958	-1.220	-0.503	1.551	1.631	16.836	13.222	0.000	21.407
2	11	2.574	0.820	0.250	2.702	2.713	-3.034	27.991	0.000	-28.155
2	12	-1.818	-1.834	1.234	2.582	2.862	14.142	-14.021	0.000	19.915
2	13	-0.709	-4.124	0.617	4.184	4.230	38.566	-1.837	0.000	-38.609
2	14	-1.071	8.612	1.051	8.678	8.742	-92.397	-22.772	0.000	95.162
2	15	-1.895	-6.733	2.285	6.995	7.358	52.006	-14.633	0.000	54.025
2	16	-2.162	1.121	-0.494	2.436	2.485	-15.427	-29.763	0.000	33.524
3	1	0.901	-1.147	-0.058	1.459	1.460	7.743	6.082	0.000	-9.846
3	2	2.809	3.048	-1.884	4.145	4.553	-42.194	38.889	0.000	57.381
3	3	0.829	0.081	-0.080	0.833	0.837	-0.637	6.428	0.000	6.458
3	4	1.480	-2.136	-1.772	2.598	3.145	29.016	20.108	0.000	-35.302
3	5	0.348	2.275	-0.034	2.302	2.302	-17.628	2.692	0.000	17.832
3	6	-2.730	-2.886	-1.929	3.973	4.416	39.969	-37.807	0.000	55.017
3	7	-0.980	0.986	-0.034	1.390	1.390	-6.654	-6.613	0.000	9.381
3	8	-1.595	0.971	-1.321	1.867	2.287	-13.528	-22.206	0.000	26.002
3	9	0.249	-0.145	0.319	0.288	0.430	1.119	1.930	0.000	2.231
3	10	1.042	-1.648	-0.874	1.950	2.137	22.836	14.444	0.000	27.021
3	11	2.331	-2.409	-1.466	3.352	3.659	35.553	29.912	0.000	-46.462
3	12	-0.301	-0.296	0.002	0.422	0.422	-2.292	-2.330	0.000	3.269
3	13	2.196	-0.714	-2.482	2.310	3.390	8.707	31.118	0.000	-32.314
3	14	-2.411	3.578	-1.661	4.314	4.623	-43.903	-35.297	0.000	56.333
3	15	-0.522	-1.578	-0.074	1.662	1.664	12.227	-4.048	0.000	12.880
3	16	-3.648	2.020	-1.704	4.170	4.505	-27.944	-50.468	0.000	57.688

8" 6"

8" 5" 4" 8"

28" 1K

58" 1K

9" 1K

4" 1K

8" 5" 4" 8"

Model: D:\Wayne\03 NDN_WRPE_PROJECTS_June_5_2018\WYCKAM\Shade Sails Feb 2019\003shape_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.ndn
 Title: Model Title

Analysis Cases:

1. P Prestress and D.L.
2. W Wind 8 psf Uniform
3. L LL 5 psf Uniform
4. W Wind 8 psf Dir: 1,0
5. W Wind 8 psf Dir: 1,1
6. W Wind 8 psf Dir: 0,1
7. W Wind 8 psf Dir: -1,1
8. W Wind 8 psf Dir: -1,0
9. W Wind 8 psf Dir: -1,-1
10. W Wind 8 psf Dir: 0,-1
11. W Wind 8 psf Dir: 1,-1



Reaction Force Summation Units: kip

LC	X-Force	Y-Force	Z-Force
1	0.000	0.000	-4.749
2	-0.061	-0.138	11.702
3	0.000	0.000	-15.051
4	3.388	-0.129	7.166
5	1.727	1.758	6.171
6	0.072	1.711	6.155
7	-1.800	1.705	6.820
8	-1.741	-0.086	6.785
9	-1.716	-1.868	6.244
10	0.032	-1.837	6.205

11 1.674 -1.882 7.065

Notes:

1. The 'Reaction Forces' tabulated below represent the loads exerted by the analyzed model onto its supports.
2. The forces tabulated are Unfactored, Working Loads based on Analysis Cases.
3. The effects of prestress and dead load are included in all Analysis Cases.
4. Forces act in the directions defined by a right hand cartesian coordinate system. X and Y are in the horizontal plane, Z is upward. (Positive Z force means that the foundation or support is subjected to uplift.)
5. The coordinates tabulated are for analysis modeling only.
They do not represent final work point locations in the structure.



Reaction Force Tabulation (tabulated by node) Units: kip & ft

Node No	AC No	X-Force (kip)	Y-Force (kip)	Z-Force (kip)	Horizontal Resultant	Resultant Force(3D)	X-Moment (kip-ft)	Y-Moment (kip-ft)	Z-Moment (kip-ft)	XY-Result (kip-ft)
----	--	-----	-----	-----	-----	-----	-----	-----	-----	-----
1	1	0.587	-0.763	0.016	0.963	0.963	5.152	3.959	0.000	6.497
1	2	4.250	-5.664	1.911	7.081	7.334	38.146	28.622	0.000	47.690
1	3	0.901	-1.147	-0.058	1.459	1.460	7.743	6.082	0.000	9.846
1	4	3.559	-4.378	1.451	5.642	5.826	29.501	23.491	0.000	37.711
1	5	3.529	-4.347	1.388	5.599	5.769	29.539	23.540	0.000	37.771
1	6	3.491	-4.443	1.378	5.651	5.816	30.186	23.529	0.000	38.272
1	7	3.369	-4.525	1.323	5.641	5.794	30.741	22.948	0.000	38.362
1	8	3.340	-4.641	1.375	5.718	5.881	31.276	22.757	0.000	38.679
1	9	3.296	-4.683	1.415	5.727	5.899	31.313	22.458	0.000	38.534
1	10	3.285	-4.535	1.385	5.600	5.769	30.319	22.138	0.000	37.541
1	11	3.426	-4.537	1.468	5.686	5.872	30.329	22.843	0.000	37.969
2	1	0.701	0.720	-0.644	1.005	1.193	-9.918	9.651	0.000	13.839
2	2	2.204	2.109	-0.660	3.050	3.121	-29.040	30.350	0.000	42.005
2	3	2.809	3.048	-1.884	4.145	4.553	-42.194	38.889	0.000	57.381
2	4	1.954	1.583	-0.718	2.515	2.615	-21.805	24.909	0.000	33.105

2	5	1.686	1.673	-0.699	2.375	2.476	-22.038	22.219	0.000	31.294
2	6	1.720	1.756	-0.683	2.458	2.551	-23.177	23.697	0.000	33.147
2	7	1.477	1.704	-0.654	2.255	2.348	-22.462	21.342	0.000	30.985
2	8	1.878	1.878	-0.613	2.656	2.726	-25.866	26.872	0.000	37.298
2	9	1.855	1.743	-0.600	2.546	2.616	-25.011	26.551	0.000	36.477
2	10	1.732	1.449	-0.635	2.259	2.346	-20.965	23.857	0.000	31.759
2	11	1.903	1.562	-0.672	2.462	2.552	-22.519	25.210	0.000	33.803
3	1	0.725	0.054	0.024	0.727	0.727	-0.418	5.615	0.000	5.630
3	2	2.952	-0.017	0.960	2.952	3.105	0.129	22.793	0.000	22.794
3	3	0.829	0.081	-0.080	0.833	0.837	-0.627	6.428	0.000	6.458
3	4	2.564	0.003	0.702	2.564	2.658	-0.021	19.318	0.000	19.318
3	5	1.865	0.113	0.215	1.868	1.881	-0.626	14.187	0.000	14.201
3	6	1.774	0.118	0.211	1.778	1.790	-0.665	13.732	0.000	13.748
3	7	2.277	0.066	0.682	2.278	2.378	-0.266	17.844	0.000	17.846
3	8	2.296	0.008	0.692	2.296	2.398	-0.060	17.988	0.000	17.989
3	9	1.979	-0.013	0.541	1.979	2.051	-0.151	15.547	0.000	15.548
3	10	2.056	-0.019	0.541	2.056	2.126	-0.104	15.895	0.000	15.895
3	11	2.480	-0.057	0.704	2.480	2.578	0.195	18.914	0.000	18.915
4	1	0.388	-0.536	-0.661	0.662	0.936	7.252	5.253	0.000	8.955
4	2	0.285	-0.414	-0.598	0.502	0.781	5.593	3.851	0.000	6.790
4	3	1.480	-2.136	-1.772	2.598	3.145	29.016	20.108	0.000	35.302
4	4	0.614	-0.465	-0.631	0.771	0.996	6.294	6.337	0.000	8.931
4	5	0.589	-0.471	-0.766	0.754	1.075	7.359	6.977	0.000	10.141
4	6	0.431	-0.453	-0.749	0.625	0.976	7.119	5.826	0.000	9.199
4	7	0.142	-0.272	-0.600	0.307	0.674	4.668	2.906	0.000	5.499
4	8	0.131	-0.401	-0.585	0.422	0.722	5.425	2.756	0.000	6.085
4	9	0.189	-0.614	-0.618	0.642	0.891	7.317	3.541	0.000	8.128
4	10	0.348	-0.633	-0.633	0.722	0.960	7.569	4.699	0.000	8.909
4	11	0.452	-0.587	-0.612	0.741	0.961	6.958	5.132	0.000	8.646
5	1	0.125	0.746	0.011	0.756	0.756	-5.778	0.965	0.000	5.858
5	2	0.558	2.951	0.994	3.003	3.163	-22.780	4.309	0.000	23.184
5	3	0.348	2.275	-0.034	2.302	2.302	-17.628	2.692	0.000	17.832
5	4	0.592	2.386	0.715	2.459	2.561	-18.441	4.079	0.000	18.887
5	5	0.613	2.341	0.604	2.420	2.494	-17.852	4.488	0.000	18.407
5	6	0.522	2.279	0.583	2.338	2.410	-17.371	4.037	0.000	17.834
5	7	0.366	2.378	0.694	2.406	2.504	-18.126	3.080	0.000	18.385
5	8	0.341	2.236	0.670	2.262	2.359	-17.282	2.881	0.000	17.521
5	9	0.245	1.754	0.479	1.771	1.834	-13.812	2.140	0.000	13.977
5	10	0.327	1.796	0.492	1.825	1.890	-14.134	2.526	0.000	14.358
5	11	0.490	2.218	0.684	2.272	2.373	-17.392	3.541	0.000	17.749
6	1	-0.623	-0.645	-0.643	0.897	1.104	8.890	-8.587	0.000	12.360

6	2	-1.620	-1.615	-0.630	2.288	2.373	22.247	-22.317	0.000	31.512
6	3	-2.730	-2.886	-1.929	3.973	4.416	39.969	-37.807	0.000	55.017
6	4	-1.115	-1.495	-0.649	1.865	1.975	20.593	-17.398	0.000	26.958
6	5	-1.207	-1.269	-0.631	1.751	1.862	18.491	-17.649	0.000	25.562
6	6	-1.382	-1.340	-0.667	1.925	2.037	19.478	-19.031	0.000	27.232
6	7	-1.308	-0.946	-0.608	1.614	1.725	14.044	-16.992	0.000	22.045
6	8	-1.496	-1.313	-0.696	1.991	2.109	18.084	-19.593	0.000	26.663
6	9	-1.479	-1.426	-0.712	2.054	2.174	18.617	-19.354	0.000	26.855
6	10	-1.106	-1.227	-0.628	1.652	1.767	15.876	-15.235	0.000	22.004
6	11	-1.172	-1.465	-0.641	1.876	1.982	19.153	-17.158	0.000	25.714
7	1	-0.664	0.689	0.079	0.957	0.960	-4.648	-4.480	0.000	6.455
7	2	-4.678	5.058	2.509	6.889	7.332	-34.045	-31.487	0.000	46.373
7	3	-0.980	0.986	-0.034	1.390	1.390	-6.654	-6.613	0.000	9.381
7	4	-3.506	4.186	1.760	5.461	5.737	-28.200	-24.110	0.000	37.102
7	5	-3.515	4.287	1.832	5.544	5.839	-28.633	-23.923	0.000	37.312
7	6	-3.769	4.347	1.964	5.753	6.079	-29.033	-25.383	0.000	38.565
7	7	-3.856	4.140	1.908	5.658	5.971	-27.640	-25.727	0.000	37.760
7	8	-4.002	4.021	1.938	5.673	5.995	-27.083	-26.711	0.000	38.039
7	9	-3.955	3.876	1.878	5.538	5.848	-26.354	-26.394	0.000	37.299
7	10	-3.791	3.847	1.741	5.401	5.675	-26.161	-25.538	0.000	36.559
7	11	-3.643	3.941	1.713	5.367	5.634	-26.793	-24.790	0.000	36.502
8	1	-0.682	0.422	-0.590	0.802	0.996	-5.831	-9.416	0.000	11.076
8	2	-0.920	0.619	-0.683	1.108	1.302	-8.553	-12.717	0.000	15.326
8	3	-1.595	0.971	-1.321	1.867	2.287	-13.528	-22.206	0.000	26.002
8	4	-0.681	0.601	-0.668	0.908	1.127	-8.305	-10.987	0.000	13.773
8	5	-0.722	0.668	-0.626	0.984	1.167	-8.446	-10.772	0.000	13.689
8	6	-0.831	0.668	-0.635	1.066	1.241	-8.438	-11.490	0.000	14.256
8	7	-1.000	0.703	-0.666	1.222	1.392	-8.931	-13.034	0.000	15.800
8	8	-0.997	0.586	-0.671	1.156	1.337	-8.099	-12.995	0.000	15.312
8	9	-0.998	0.466	-0.725	1.102	1.319	-7.240	-13.019	0.000	14.897
8	10	-0.888	0.467	-0.718	1.003	1.233	-7.252	-12.278	0.000	14.260
8	11	-0.785	0.481	-0.672	0.921	1.140	-7.442	-11.642	0.000	13.817
9	1	0.200	-0.071	0.355	0.212	0.413	0.548	1.546	0.000	1.640
9	2	1.030	0.194	3.459	1.048	3.614	-1.482	7.884	0.000	8.022
9	3	0.249	-0.145	0.319	0.288	0.430	1.119	1.930	0.000	2.231
9	4	1.396	0.252	2.815	1.418	3.152	-1.930	10.216	0.000	10.396
9	5	1.643	0.766	2.603	1.813	3.172	-5.635	12.366	0.000	13.589
9	6	1.446	0.875	2.454	1.690	2.980	-6.474	11.107	0.000	12.856
9	7	0.799	0.382	2.571	0.886	2.719	-2.684	6.382	0.000	6.923
9	8	0.617	0.190	2.380	0.646	2.466	-1.457	4.989	0.000	5.198
9	9	0.980	0.300	1.994	1.025	2.242	-2.557	7.788	0.000	8.197
9	10	1.151	0.276	2.106	1.184	2.416	-2.371	8.852	0.000	9.164

9	11	1.114	0.030	2.592	1.115	72.822	-0.473	8.308	0.000	8.322
10	1	0.435	-0.629	-0.467	0.764	0.896	8.671	6.002	0.000	10.545
10	2	0.958	-1.220	-0.503	1.551	1.631	16.836	13.222	0.000	21.407
10	3	1.042	-1.648	-0.874	1.950	2.137	22.836	14.444	0.000	27.021
10	4	0.934	-0.936	-0.496	1.322	1.412	12.914	11.314	0.000	17.169
10	5	0.908	-0.901	-0.494	1.280	1.372	13.223	11.748	0.000	17.688
10	6	0.805	-0.981	-0.492	1.269	1.361	14.328	11.104	0.000	18.127
10	7	0.579	-0.854	-0.524	1.032	1.157	12.581	8.776	0.000	15.339
10	8	0.620	-0.991	-0.549	1.169	1.291	13.677	9.346	0.000	16.565
10	9	0.638	-1.104	-0.499	1.275	1.370	14.452	9.591	0.000	17.345
10	10	0.717	-1.060	-0.473	1.280	1.365	13.839	9.896	0.000	17.013
10	11	0.848	-1.062	-0.504	1.360	1.450	13.876	10.923	0.000	17.660
11	1	0.840	-0.147	-0.450	0.853	0.964	4.036	9.828	0.000	10.624
11	2	2.574	0.820	0.250	2.702	2.713	-3.034	27.991	0.000	28.155
11	3	2.331	-2.409	-1.466	3.352	3.659	35.553	29.912	0.000	46.462
11	4	2.341	0.517	0.013	2.397	2.397	-0.840	24.519	0.000	24.534
11	5	2.140	0.819	0.077	2.291	2.293	-3.797	22.751	-0.001	23.066
11	6	1.899	0.949	0.099	2.123	2.125	-5.507	20.551	0.000	21.276
11	7	1.865	0.694	0.032	1.990	1.990	-2.025	21.197	0.000	21.293
11	8	1.779	0.721	0.045	1.920	1.920	-3.649	19.874	0.000	20.207
11	9	1.754	0.685	0.063	1.883	1.884	-3.990	19.428	0.000	19.833
11	10	2.040	0.571	0.023	2.118	2.118	-2.188	22.208	0.000	22.316
11	11	2.170	0.473	-0.003	2.221	2.221	-1.148	23.097	0.001	23.125
12	1	-0.430	-0.362	0.113	0.562	0.573	2.805	-3.327	0.000	4.352
12	2	-1.818	-1.834	1.234	2.582	2.862	14.142	-14.021	0.000	19.915
12	3	-0.301	-0.296	0.002	0.422	0.422	2.292	-2.330	0.000	3.269
12	4	-1.227	-1.373	0.810	1.841	2.011	10.605	-9.972	0.000	14.557
12	5	-1.370	-1.326	0.845	1.907	2.086	10.492	-10.830	0.000	15.079
12	6	-1.384	-1.243	0.839	1.860	2.041	9.848	-10.691	0.000	14.536
12	7	-1.451	-1.234	0.803	1.904	2.067	9.777	-10.959	0.000	14.686
12	8	-1.479	-1.375	0.767	2.019	2.160	10.622	-11.180	0.000	15.421
12	9	-1.525	-1.466	0.798	2.115	2.261	11.076	-11.531	0.000	15.989
12	10	-1.455	-1.485	0.872	2.079	2.254	11.219	-11.239	0.000	15.880
12	11	-1.349	-1.473	0.863	1.997	2.175	11.127	-10.666	0.000	15.414
13	1	0.126	-0.552	-0.670	0.567	0.877	4.936	2.818	0.000	5.684
13	2	-0.709	-4.124	0.617	4.184	4.230	38.566	-1.837	0.000	38.609
13	3	2.196	-0.714	-2.482	2.310	3.390	8.707	31.118	0.000	32.314
13	4	-0.382	-3.705	0.314	3.724	3.738	34.912	-0.987	0.000	34.925
13	5	-0.587	-3.429	0.283	3.479	3.490	32.370	-2.452	0.000	32.463
13	6	-0.715	-3.521	0.292	3.593	3.604	33.647	-2.905	0.000	33.772
13	7	-0.550	-3.322	0.321	3.368	3.383	32.547	0.092	0.000	32.547

13	8	-0.371	-3.332	0.277	3.353	73.364	31.935	2.276	0.000	32.016
13	9	-0.273	-3.458	0.240	3.469	3.477	32.918	3.006	0.000	33.055
13	10	-0.327	-3.406	0.226	3.422	3.430	32.193	1.091	0.000	32.211
13	11	-0.323	-3.641	0.253	3.655	3.664	33.998	0.403	0.000	34.000
14	1	-0.614	1.589	-0.660	1.703	1.827	-18.311	-9.572	0.000	20.662
14	2	-1.071	8.612	1.051	8.678	8.742	-92.397	-22.772	0.000	95.162
14	3	-2.411	3.578	-1.661	4.314	4.623	-43.903	-35.297	0.000	56.333
14	4	-0.841	7.042	0.619	7.092	7.119	-76.858	-20.704	0.000	79.598
14	5	-0.886	6.871	0.585	6.928	6.952	-74.028	-19.595	0.000	76.577
14	6	-0.795	6.809	0.578	6.856	6.880	-72.617	-16.841	0.000	74.544
14	7	-1.082	6.886	0.483	6.970	6.987	-73.181	-19.442	0.000	75.719
14	8	-0.761	6.894	0.540	6.936	6.957	-73.062	-15.146	0.000	74.616
14	9	-0.682	7.088	0.582	7.121	7.144	-75.688	-14.911	0.000	77.143
14	10	-0.696	7.015	0.557	7.049	7.071	-75.737	-16.597	0.000	77.534
14	11	-0.764	7.017	0.636	7.058	7.087	-76.591	-18.743	-0.001	78.851
15	1	-0.298	-0.960	0.019	1.005	1.005	7.438	-2.311	0.000	7.789
15	2	-1.895	-6.733	2.285	6.995	7.358	52.006	-14.633	0.000	54.025
15	3	-0.522	-1.578	-0.074	1.662	1.664	12.227	-4.048	0.000	12.880
15	4	-1.129	-5.363	1.596	5.480	5.708	41.459	-9.375	0.000	42.506
15	5	-1.305	-5.158	1.473	5.320	5.520	40.204	-10.411	0.000	41.530
15	6	-1.543	-5.082	1.498	5.311	5.519	39.620	-11.931	0.000	41.378
15	7	-1.718	-5.056	1.603	5.340	5.576	39.415	-12.959	0.000	41.490
15	8	-1.867	-5.425	1.767	5.738	6.004	41.935	-14.107	0.000	44.244
15	9	-1.801	-5.763	1.934	6.038	6.340	44.211	-13.598	0.000	46.255
15	10	-1.486	-5.732	1.863	5.922	6.208	43.977	-11.482	0.000	45.451
15	11	-1.308	-5.688	1.726	5.837	6.087	43.646	-10.433	0.000	44.875
16	1	-0.816	0.446	-0.581	0.930	1.096	-6.147	-11.229	0.000	12.802
16	2	-2.162	1.121	-0.494	2.436	2.485	-15.427	-29.763	0.000	33.524
16	3	-3.648	2.020	-1.704	4.170	4.505	-27.944	-50.468	0.000	57.688
16	4	-1.685	1.016	-0.469	1.968	2.023	-13.987	-25.235	0.000	28.852
16	5	-1.654	1.120	-0.518	1.998	2.064	-14.403	-23.786	0.000	27.807
16	6	-1.598	0.975	-0.514	1.872	1.941	-12.394	-22.000	0.000	25.251
16	7	-1.710	0.963	-0.548	1.962	2.037	-12.237	-22.517	0.000	25.627
16	8	-1.771	0.859	-0.552	1.968	2.044	-11.825	-23.363	0.000	26.185
16	9	-1.939	0.746	-0.526	2.077	2.143	-11.284	-25.668	0.000	28.039
16	10	-1.875	0.838	-0.515	2.054	2.117	-12.559	-25.805	0.000	28.699
16	11	-1.867	0.908	-0.469	2.076	2.129	-13.517	-26.718	0.000	29.943



Reaction Force Tabulation (tabulated by load case)

Units: kip & ft

AC Node	X-Force	Y-Force	Z-Force	Horizontal	Resultant	X-Moment	Y-Moment	Z-Moment	XY-Result
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No	No	(kip)	(kip)	(kip)	Resultant	Force(3D)	(kip-ft)	(kip-ft)	(kip-ft)	(kip-ft)
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1	1	0.587	-0.763	0.016	0.963	0.963	5.152	3.959	0.000	6.497
1	2	0.701	0.720	-0.644	1.005	1.193	-9.918	9.651	0.000	13.839
1	3	0.725	0.054	0.024	0.727	0.727	-0.418	5.615	0.000	5.630
1	4	0.388	-0.536	-0.661	0.662	0.936	7.252	5.253	0.000	8.955
1	5	0.125	0.746	0.011	0.756	0.756	-5.778	0.965	0.000	5.858
1	6	-0.623	-0.645	-0.643	0.897	1.104	8.890	-8.587	0.000	12.360
1	7	-0.664	0.689	0.079	0.957	0.960	-4.648	-4.480	0.000	6.455
1	8	-0.682	0.422	-0.590	0.802	0.996	-5.831	-9.416	0.000	11.076
1	9	0.200	-0.071	0.355	0.212	0.413	0.548	1.546	0.000	1.640
1	10	0.435	-0.629	-0.467	0.764	0.896	8.671	6.002	0.000	10.545
1	11	0.840	-0.147	-0.450	0.853	0.964	4.036	9.828	0.000	10.624
1	12	-0.430	-0.362	0.113	0.562	0.573	2.805	-3.327	0.000	4.352
1	13	0.126	-0.552	-0.670	0.567	0.877	4.936	2.818	0.000	5.684
1	14	-0.614	1.589	-0.660	1.703	1.827	-18.311	-9.572	0.000	20.662
1	15	-0.298	-0.960	0.019	1.005	1.005	7.438	-2.311	0.000	7.789
1	16	-0.816	0.446	-0.581	0.930	1.096	-6.147	-11.229	0.000	12.802
1	Sum	0.000	0.000	-4.749						
2	1	4.250	-5.664	1.911	7.081	7.334	38.146	28.622	0.000	47.690
2	2	2.204	2.109	-0.660	3.050	3.121	-29.040	30.350	0.000	42.005
2	3	2.952	-0.017	0.960	2.952	3.105	0.129	22.793	0.000	22.794
2	4	0.285	-0.414	-0.598	0.502	0.781	5.593	3.851	0.000	6.790
2	5	0.558	2.951	0.994	3.003	3.163	-22.780	4.309	0.000	23.184
2	6	-1.620	-1.615	-0.630	2.288	2.373	22.247	-22.317	0.000	31.512
2	7	-4.678	5.058	2.509	6.889	7.332	-34.045	-31.487	0.000	46.373
2	8	-0.920	0.619	-0.683	1.108	1.302	-8.553	-12.717	0.000	15.326
2	9	1.030	0.194	3.459	1.048	3.614	-1.482	7.884	0.000	8.022
2	10	0.958	-1.220	-0.503	1.551	1.631	16.836	13.222	0.000	21.407
2	11	2.574	0.820	0.250	2.702	2.713	-3.034	27.991	0.000	28.155
2	12	-1.818	-1.834	1.234	2.582	2.862	14.142	-14.021	0.000	19.915
2	13	-0.709	-4.124	0.617	4.184	4.230	38.566	-1.837	0.000	38.609
2	14	-1.071	8.612	1.051	8.678	8.742	-92.397	-22.772	0.000	95.162
2	15	-1.895	-6.733	2.285	6.995	7.358	52.006	-14.633	0.000	54.025
2	16	-2.162	1.121	-0.494	2.436	2.485	-15.427	-29.763	0.000	33.524
2	Sum	-0.061	-0.138	11.702						
3	1	0.901	-1.147	-0.058	1.459	1.460	7.743	6.082	0.000	9.846
3	2	2.809	3.048	-1.884	4.145	4.553	-42.194	38.889	0.000	57.381

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3	3	0.829	0.081	-0.080	0.833	0.837	-0.627	6.428	0.000	6.458
3	4	1.480	-2.136	-1.772	2.598	3.145	29.016	20.108	0.000	35.302
3	5	0.348	2.275	-0.034	2.302	2.302	-17.628	2.692	0.000	17.832
3	6	-2.730	-2.886	-1.929	3.973	4.416	39.969	-37.807	0.000	55.017
3	7	-0.980	0.986	-0.034	1.390	1.390	-6.654	-6.613	0.000	9.381
3	8	-1.595	0.971	-1.321	1.867	2.287	-13.528	-22.206	0.000	26.002
3	9	0.249	-0.145	0.319	0.288	0.430	1.119	1.930	0.000	2.231
3	10	1.042	-1.648	-0.874	1.950	2.137	22.836	14.444	0.000	27.021
3	11	2.331	-2.409	-1.466	3.352	3.659	35.553	29.912	0.000	46.462
3	12	-0.301	-0.296	0.002	0.422	0.422	2.292	-2.330	0.000	3.269
3	13	2.196	-0.714	-2.482	2.310	3.390	8.707	31.118	0.000	32.314
3	14	-2.411	3.578	-1.661	4.314	4.623	-43.903	-35.297	0.000	56.333
3	15	-0.522	-1.578	-0.074	1.662	1.664	12.227	-4.048	0.000	12.880
3	16	-3.648	2.020	-1.704	4.170	4.505	-27.944	-50.468	0.000	57.688

3 Sum 0.000 0.000 -15.051

4	1	3.559	-4.378	1.451	5.642	5.826	29.501	23.491	0.000	37.711
4	2	1.954	1.583	-0.718	2.515	2.615	-21.805	24.909	0.000	33.105
4	3	2.564	0.003	0.702	2.564	2.658	-0.021	19.318	0.000	19.318
4	4	0.614	-0.465	-0.631	0.771	0.996	6.294	6.337	0.000	8.931
4	5	0.592	2.386	0.715	2.459	2.561	-18.441	4.079	0.000	18.887
4	6	-1.115	-1.495	-0.649	1.865	1.975	20.593	-17.398	0.000	26.958
4	7	-3.506	4.186	1.760	5.461	5.737	-28.200	-24.110	0.000	37.102
4	8	-0.681	0.601	-0.668	0.908	1.127	-8.305	-10.987	0.000	13.773
4	9	1.396	0.252	2.815	1.418	3.152	-1.930	10.216	0.000	10.396
4	10	0.934	-0.936	-0.496	1.322	1.412	12.914	11.314	0.000	17.169
4	11	2.341	0.517	0.013	2.397	2.397	-0.840	24.519	0.000	24.534
4	12	-1.227	-1.373	0.810	1.841	2.011	10.605	-9.972	0.000	14.557
4	13	-0.382	-3.705	0.314	3.724	3.738	34.912	-0.987	0.000	34.925
4	14	-0.841	7.042	0.619	7.092	7.119	-76.858	-20.704	0.000	79.598
4	15	-1.129	-5.363	1.596	5.480	5.708	41.459	-9.375	0.000	42.506
4	16	-1.685	1.016	-0.469	1.968	2.023	-13.987	-25.235	0.000	28.852

4 Sum 3.388 -0.129 7.166

5	1	3.529	-4.347	1.388	5.599	5.769	29.539	23.540	0.000	37.771
5	2	1.686	1.673	-0.699	2.375	2.476	-22.038	22.219	0.000	31.294
5	3	1.865	0.113	0.215	1.868	1.881	-0.626	14.187	0.000	14.201
5	4	0.589	-0.471	-0.766	0.754	1.075	7.359	6.977	0.000	10.141
5	5	0.613	2.341	0.604	2.420	2.494	-17.852	4.488	0.000	18.407
5	6	-1.207	-1.269	-0.631	1.751	1.862	18.491	-17.649	0.000	25.562
5	7	-3.515	4.287	1.832	5.544	5.839	-28.633	-23.923	0.000	37.312

003shape_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.txt

5	8	-0.722	0.668	-0.626	0.984	1.167	-8.446	-10.772	0.000	13.689
5	9	1.643	0.766	2.603	1.813	3.172	-5.635	12.366	0.000	13.589
5	10	0.908	-0.901	-0.494	1.280	1.372	13.223	11.748	0.000	17.688
5	11	2.140	0.819	0.077	2.291	2.293	-3.797	22.751	-0.001	23.066
5	12	-1.370	-1.326	0.845	1.907	2.086	10.492	-10.830	0.000	15.079
5	13	-0.587	-3.429	0.283	3.479	3.490	32.370	-2.452	0.000	32.463
5	14	-0.886	6.871	0.585	6.928	6.952	-74.028	-19.595	0.000	76.577
5	15	-1.305	-5.158	1.473	5.320	5.520	40.204	-10.411	0.000	41.530
5	16	-1.654	1.120	-0.518	1.998	2.064	-14.403	-23.786	0.000	27.807

5	Sum	1.727	1.758	6.171						
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6	1	3.491	-4.443	1.378	5.651	5.816	30.186	23.529	0.000	38.272
6	2	1.720	1.756	-0.683	2.458	2.551	-23.177	23.697	0.000	33.147
6	3	1.774	0.118	0.211	1.778	1.790	-0.665	13.732	0.000	13.748
6	4	0.431	-0.453	-0.749	0.625	0.976	7.119	5.826	0.000	9.199
6	5	0.522	2.279	0.583	2.338	2.410	-17.371	4.037	0.000	17.834
6	6	-1.382	-1.340	-0.667	1.925	2.037	19.478	-19.031	0.000	27.232
6	7	-3.769	4.347	1.964	5.753	6.079	-29.033	-25.383	0.000	38.565
6	8	-0.831	0.668	-0.635	1.066	1.241	-8.438	-11.490	0.000	14.256
6	9	1.446	0.875	2.454	1.690	2.980	-6.474	11.107	0.000	12.856
6	10	0.805	-0.981	-0.492	1.269	1.361	14.328	11.104	0.000	18.127
6	11	1.899	0.949	0.099	2.123	2.125	-5.507	20.551	0.000	21.276
6	12	-1.384	-1.243	0.839	1.860	2.041	9.848	-10.691	0.000	14.536
6	13	-0.715	-3.521	0.292	3.593	3.604	33.647	-2.905	0.000	33.772
6	14	-0.795	6.809	0.578	6.856	6.880	-72.617	-16.841	0.000	74.544
6	15	-1.543	-5.082	1.498	5.311	5.519	39.620	-11.931	0.000	41.378
6	16	-1.598	0.975	-0.514	1.872	1.941	-12.394	-22.000	0.000	25.251

6	Sum	0.072	1.711	6.155						
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7	1	3.369	-4.525	1.323	5.641	5.794	30.741	22.948	0.000	38.362
7	2	1.477	1.704	-0.654	2.255	2.348	-22.462	21.342	0.000	30.985
7	3	2.277	0.066	0.682	2.278	2.378	-0.266	17.844	0.000	17.846
7	4	0.142	-0.272	-0.600	0.307	0.674	4.668	2.906	0.000	5.499
7	5	0.366	2.378	0.694	2.406	2.504	-18.126	3.080	0.000	18.385
7	6	-1.308	-0.946	-0.608	1.614	1.725	14.044	-16.992	0.000	22.045
7	7	-3.856	4.140	1.908	5.658	5.971	-27.640	-25.727	0.000	37.760
7	8	-1.000	0.703	-0.666	1.222	1.392	-8.931	-13.034	0.000	15.800
7	9	0.799	0.382	2.571	0.886	2.719	-2.684	6.382	0.000	6.923
7	10	0.579	-0.854	-0.524	1.032	1.157	12.581	8.776	0.000	15.339
7	11	1.865	0.694	0.032	1.990	1.990	-2.025	21.197	0.000	21.293
7	12	-1.451	-1.234	0.803	1.904	2.067	9.777	-10.959	0.000	14.686

003shape_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.txt

7	13	-0.550	-3.322	0.321	3.368	773.383	32.547	0.092	0.000	32.547
7	14	-1.082	6.886	0.483	6.970	6.987	-73.181	-19.442	0.000	75.719
7	15	-1.718	-5.056	1.603	5.340	5.576	39.415	-12.959	0.000	41.490
7	16	-1.710	0.963	-0.548	1.962	2.037	-12.237	-22.517	0.000	25.627
7	Sum	-1.800	1.705	6.820						
8	1	3.340	-4.641	1.375	5.718	5.881	31.276	22.757	0.000	38.679
8	2	1.878	1.878	-0.613	2.656	2.726	-25.866	26.872	0.000	37.298
8	3	2.296	0.008	0.692	2.296	2.398	-0.060	17.988	0.000	17.989
8	4	0.131	-0.401	-0.585	0.422	0.722	5.425	2.756	0.000	6.085
8	5	0.341	2.236	0.670	2.262	2.359	-17.282	2.881	0.000	17.521
8	6	-1.496	-1.313	-0.696	1.991	2.109	18.084	-19.593	0.000	26.663
8	7	-4.002	4.021	1.938	5.673	5.995	-27.083	-26.711	0.000	38.039
8	8	-0.997	0.586	-0.671	1.156	1.337	-8.099	-12.995	0.000	15.312
8	9	0.617	0.190	2.380	0.646	2.466	-1.457	4.989	0.000	5.198
8	10	0.620	-0.991	-0.549	1.169	1.291	13.677	9.346	0.000	16.565
8	11	1.779	0.721	0.045	1.920	1.920	-3.649	19.874	0.000	20.207
8	12	-1.479	-1.375	0.767	2.019	2.160	10.622	-11.180	0.000	15.421
8	13	-0.371	-3.332	0.277	3.353	3.364	31.935	2.276	0.000	32.016
8	14	-0.761	6.894	0.540	6.936	6.957	-73.062	-15.146	0.000	74.616
8	15	-1.867	-5.425	1.767	5.738	6.004	41.935	-14.107	0.000	44.244
8	16	-1.771	0.859	-0.552	1.968	2.044	-11.825	-23.363	0.000	26.185
8	Sum	-1.741	-0.086	6.785						
9	1	3.296	-4.683	1.415	5.727	5.899	31.313	22.458	0.000	38.534
9	2	1.855	1.743	-0.600	2.546	2.616	-25.011	26.551	0.000	36.477
9	3	1.979	-0.013	0.541	1.979	2.051	-0.151	15.547	0.000	15.548
9	4	0.189	-0.614	-0.618	0.642	0.891	7.317	3.541	0.000	8.128
9	5	0.245	1.754	0.479	1.771	1.834	-13.812	2.140	0.000	13.977
9	6	-1.479	-1.426	-0.712	2.054	2.174	18.617	-19.354	0.000	26.855
9	7	-3.955	3.876	1.878	5.538	5.848	-26.354	-26.394	0.000	37.299
9	8	-0.998	0.466	-0.725	1.102	1.319	-7.240	-13.019	0.000	14.897
9	9	0.980	0.300	1.994	1.025	2.242	-2.557	7.788	0.000	8.197
9	10	0.638	-1.104	-0.499	1.275	1.370	14.452	9.591	0.000	17.345
9	11	1.754	0.685	0.063	1.883	1.884	-3.990	19.428	0.000	19.833
9	12	-1.525	-1.466	0.798	2.115	2.261	11.076	-11.531	0.000	15.989
9	13	-0.273	-3.458	0.240	3.469	3.477	32.918	3.006	0.000	33.055
9	14	-0.682	7.088	0.582	7.121	7.144	-75.688	-14.911	0.000	77.143
9	15	-1.801	-5.763	1.934	6.038	6.340	44.211	-13.598	0.000	46.255
9	16	-1.939	0.746	-0.526	2.077	2.143	-11.284	-25.668	0.000	28.039

9	Sum	-1.716	-1.868	6.244	78					
10	1	3.285	-4.535	1.385	5.600	5.769	30.319	22.138	0.000	37.541
10	2	1.732	1.449	-0.635	2.259	2.346	-20.965	23.857	0.000	31.759
10	3	2.056	-0.019	0.541	2.056	2.126	-0.104	15.895	0.000	15.895
10	4	0.348	-0.633	-0.633	0.722	0.960	7.569	4.699	0.000	8.909
10	5	0.327	1.796	0.492	1.825	1.890	-14.134	2.526	0.000	14.358
10	6	-1.106	-1.227	-0.628	1.652	1.767	15.876	-15.235	0.000	22.004
10	7	-3.791	3.847	1.741	5.401	5.675	-26.161	-25.538	0.000	36.559
10	8	-0.888	0.467	-0.718	1.003	1.233	-7.252	-12.278	0.000	14.260
10	9	1.151	0.276	2.106	1.184	2.416	-2.371	8.852	0.000	9.164
10	10	0.717	-1.060	-0.473	1.280	1.365	13.839	9.896	0.000	17.013
10	11	2.040	0.571	0.023	2.118	2.118	-2.188	22.208	0.000	22.316
10	12	-1.455	-1.485	0.872	2.079	2.254	11.219	-11.239	0.000	15.880
10	13	-0.327	-3.406	0.226	3.422	3.430	32.193	1.091	0.000	32.211
10	14	-0.696	7.015	0.557	7.049	7.071	-75.737	-16.597	0.000	77.534
10	15	-1.486	-5.732	1.863	5.922	6.208	43.977	-11.482	0.000	45.451
10	16	-1.875	0.838	-0.515	2.054	2.117	-12.559	-25.805	0.000	28.699
10	Sum	0.032	-1.837	6.205						
11	1	3.426	-4.537	1.468	5.686	5.872	30.329	22.843	0.000	37.969
11	2	1.903	1.562	-0.672	2.462	2.552	-22.519	25.210	0.000	33.803
11	3	2.480	-0.057	0.704	2.480	2.578	0.195	18.914	0.000	18.915
11	4	0.452	-0.587	-0.612	0.741	0.961	6.958	5.132	0.000	8.646
11	5	0.490	2.218	0.684	2.272	2.373	-17.392	3.541	0.000	17.749
11	6	-1.172	-1.465	-0.641	1.876	1.982	19.153	-17.158	0.000	25.714
11	7	-3.643	3.941	1.713	5.367	5.634	-26.793	-24.790	0.000	36.502
11	8	-0.785	0.481	-0.672	0.921	1.140	-7.442	-11.642	0.000	13.817
11	9	1.114	0.030	2.592	1.115	2.822	-0.473	8.308	0.000	8.322
11	10	0.848	-1.062	-0.504	1.360	1.450	13.876	10.923	0.000	17.660
11	11	2.170	0.473	-0.003	2.221	2.221	-1.148	23.097	0.001	23.125
11	12	-1.349	-1.473	0.863	1.997	2.175	11.127	-10.666	0.000	15.414
11	13	-0.323	-3.641	0.253	3.655	3.664	33.998	0.403	0.000	34.000
11	14	-0.764	7.017	0.636	7.058	7.087	-76.591	-18.743	-0.001	78.851
11	15	-1.308	-5.688	1.726	5.837	6.087	43.646	-10.433	0.000	44.875
11	16	-1.867	0.908	-0.469	2.076	2.129	-13.517	-26.718	0.000	29.943
11	Sum	1.674	-1.882	7.065						

Node Coordinates of the Reaction Nodes

Units: ft

003shape_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.txt			
Node	X-Coord	Y-Coord	Z-Coord
----	-----	-----	-----
1	17.149	121.470	0.000
2	19.159	85.008	0.000
3	31.478	65.255	0.000
4	42.728	77.005	0.000
5	44.105	52.368	0.000
6	45.764	114.580	0.000
7	46.242	84.913	0.000
8	61.551	65.387	0.000
9	65.564	83.534	0.000
10	67.257	132.845	0.000
11	68.263	110.550	0.000
12	83.622	127.486	0.000
13	84.144	109.631	0.000
14	94.729	80.900	0.000
15	105.493	121.379	0.000
16	117.230	91.000	0.000

Layer

- CATENARY
- COLUMNS
- LINKS
- RIDGE BELT

80

1

6

2

4

7

3

5

8

9

10

11

12

13

15

14

16



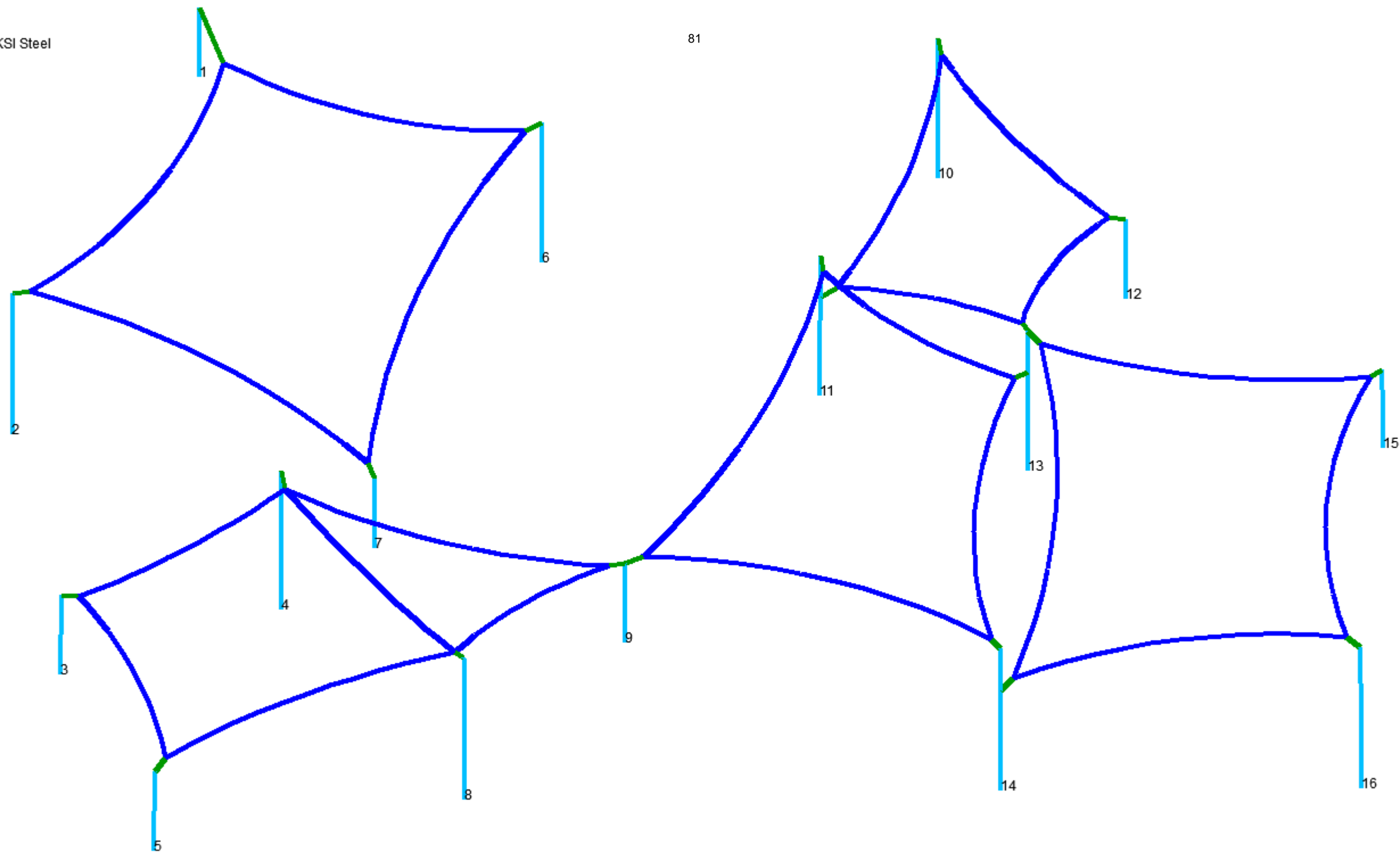
Material

45 KSI Steel

SP

SS

81

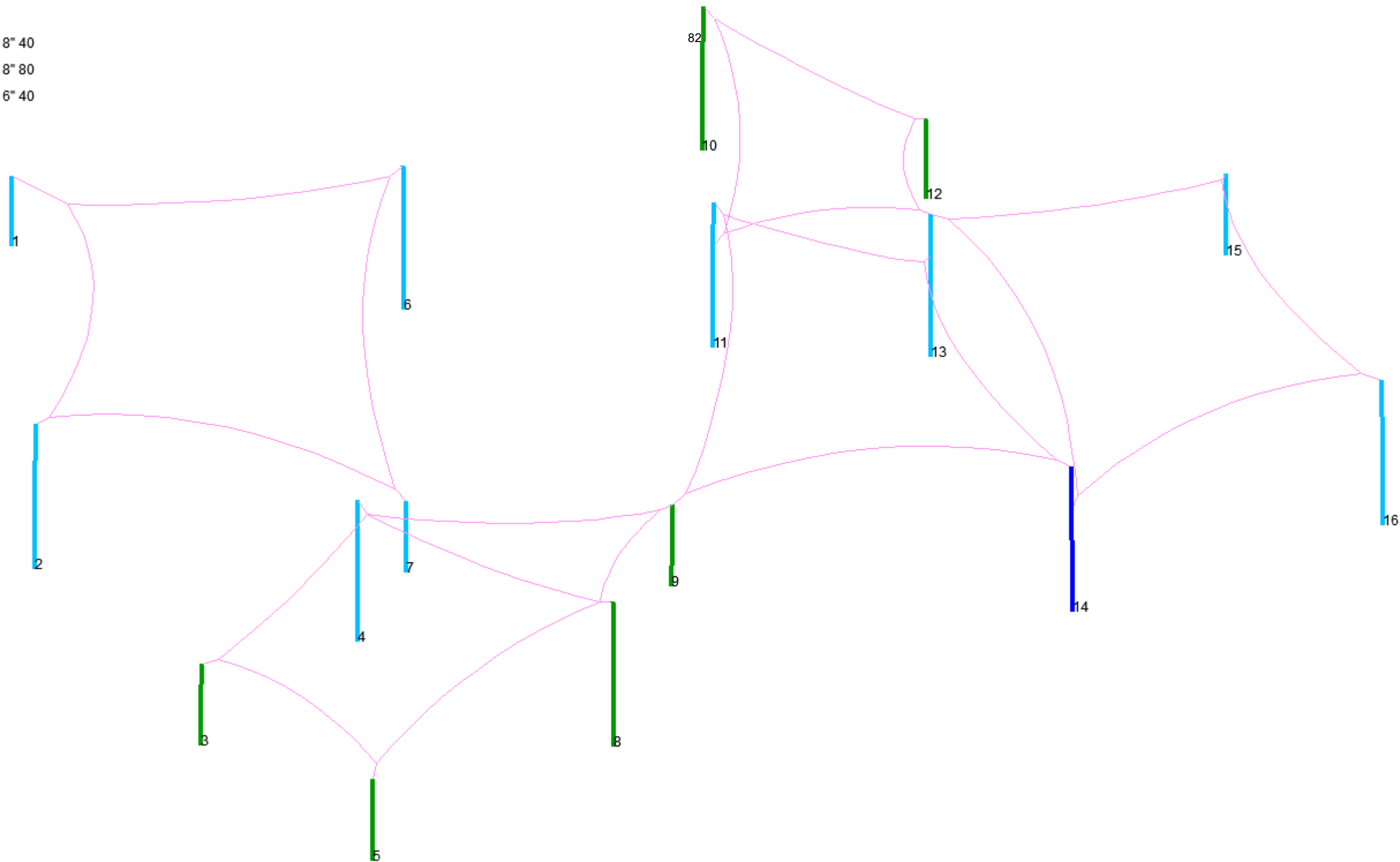


Section

CHS 8" 40

CHS 8" 80

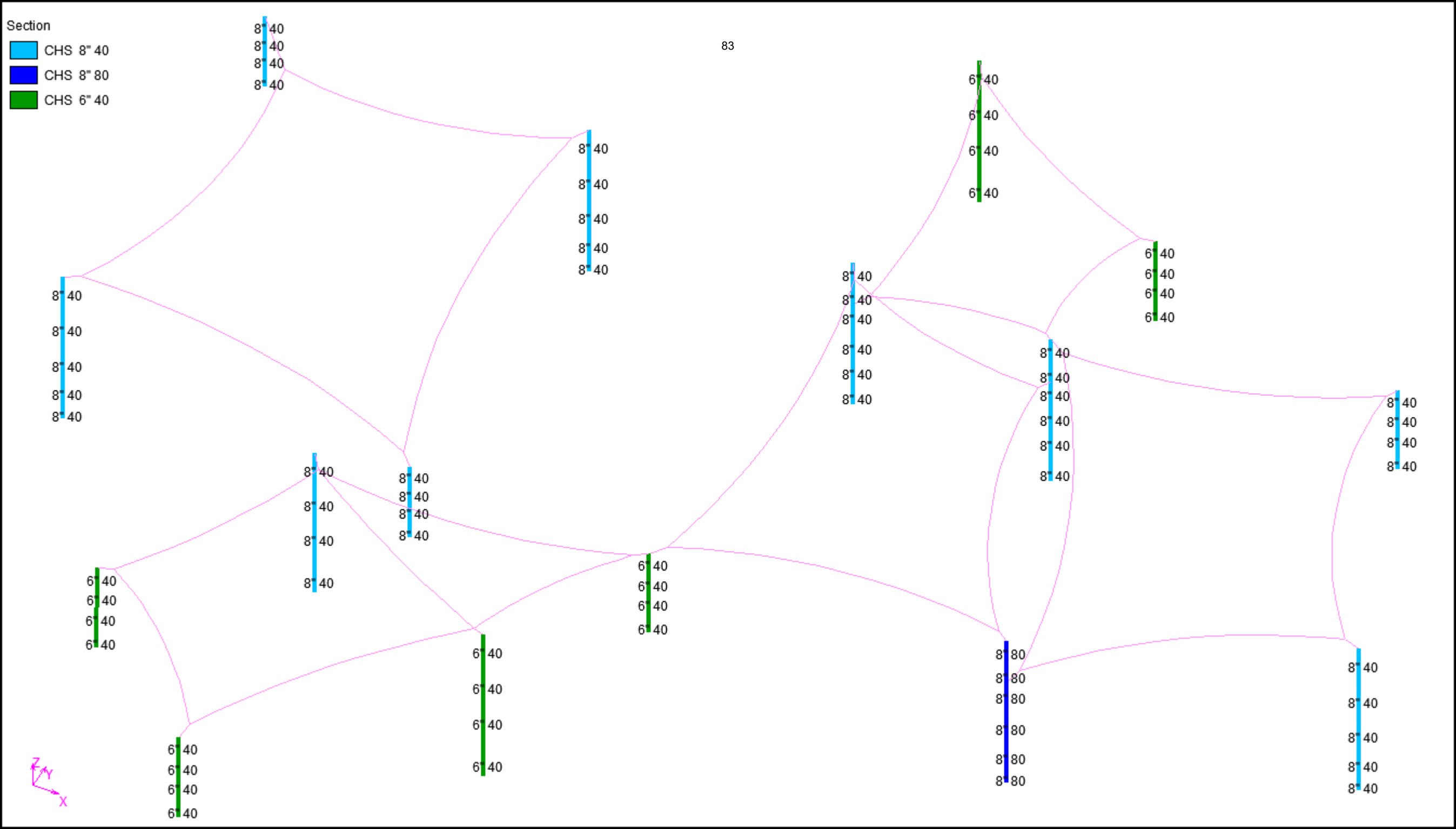
CHS 6" 40



Section

- CHS 8" 40
- CHS 8" 80
- CHS 6" 40

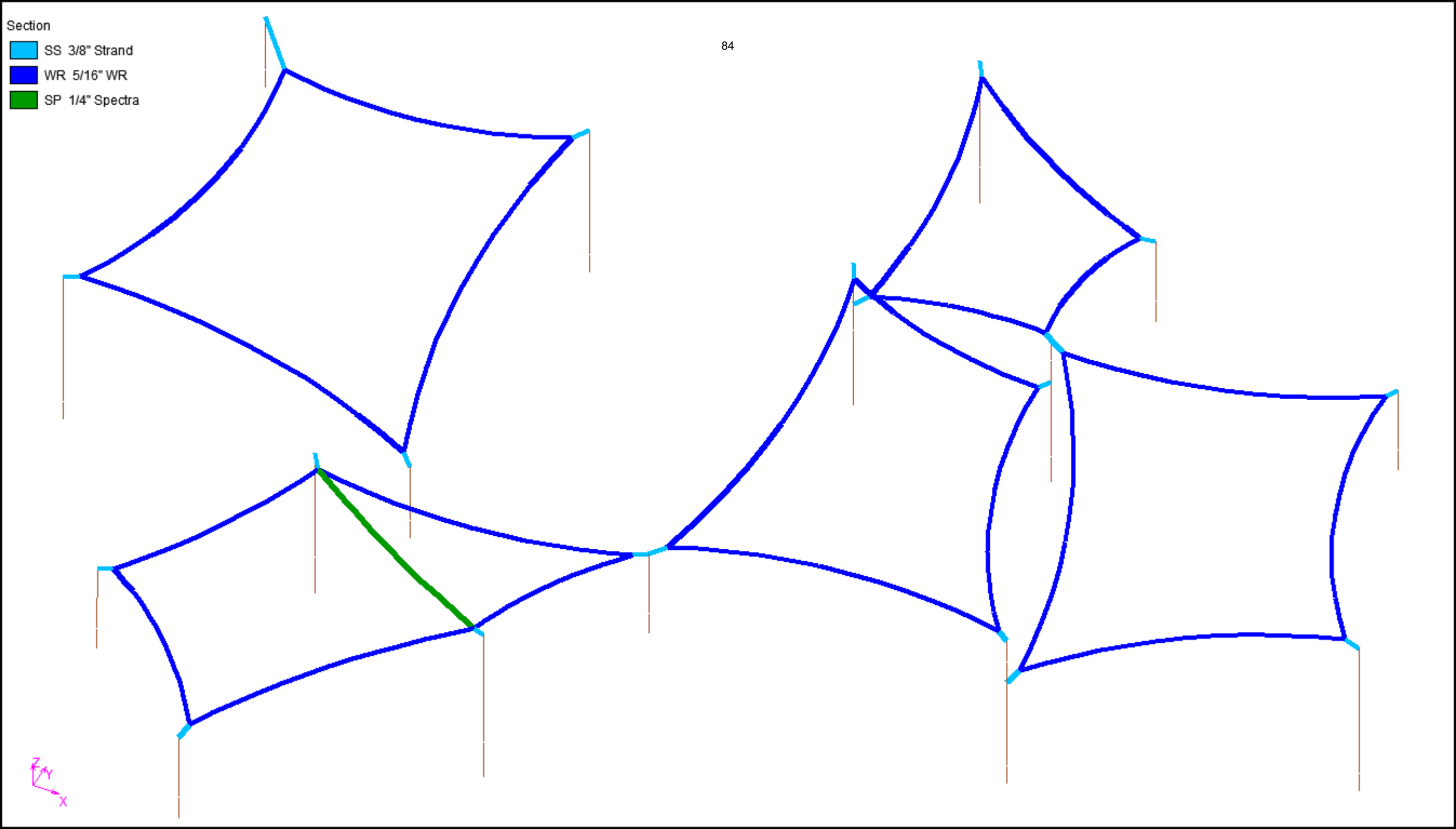
83

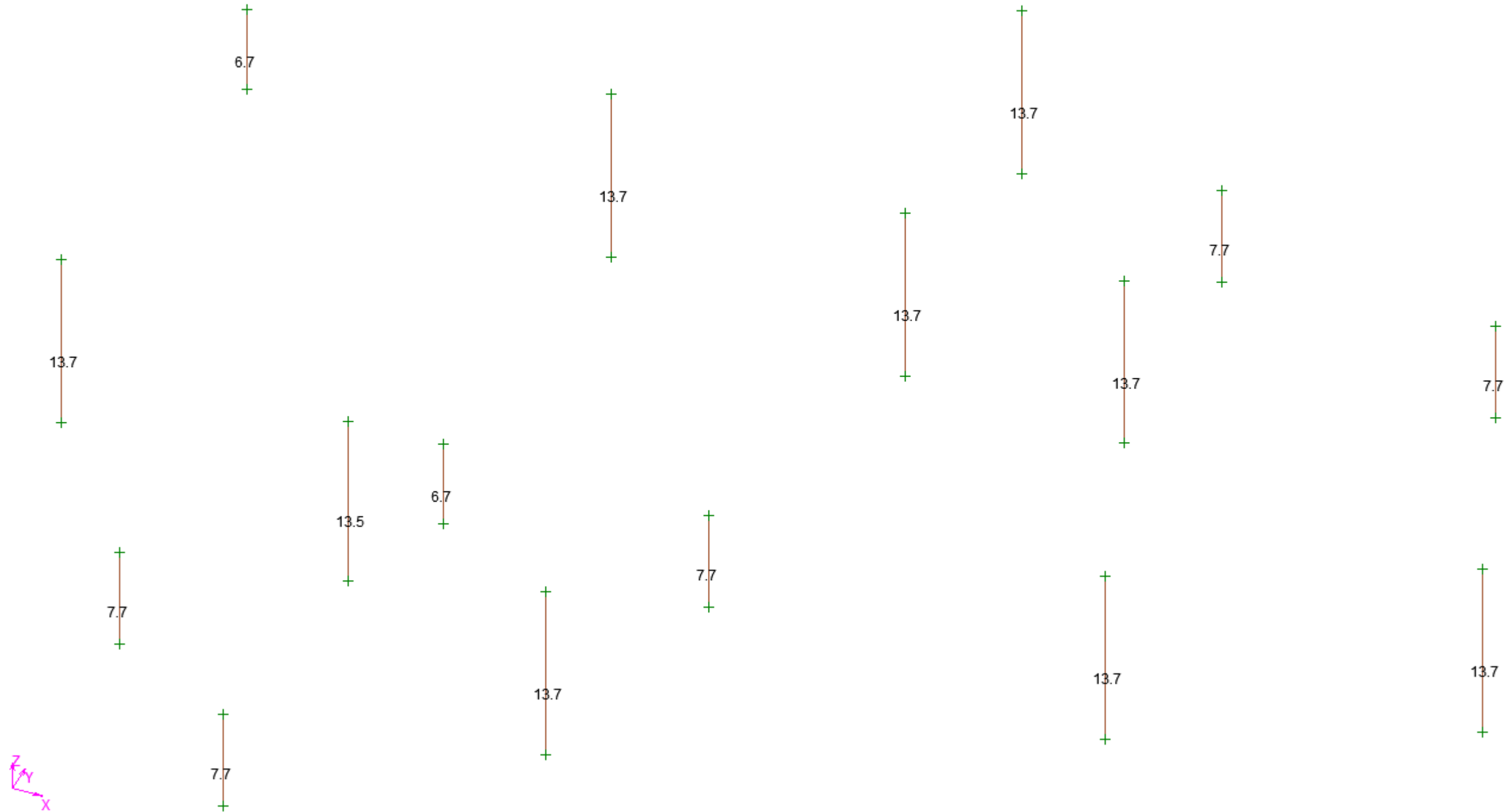


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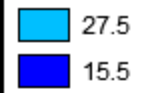
- SS 3/8" Strand
- WR 5/16" WR
- SP 1/4" Spectra

84

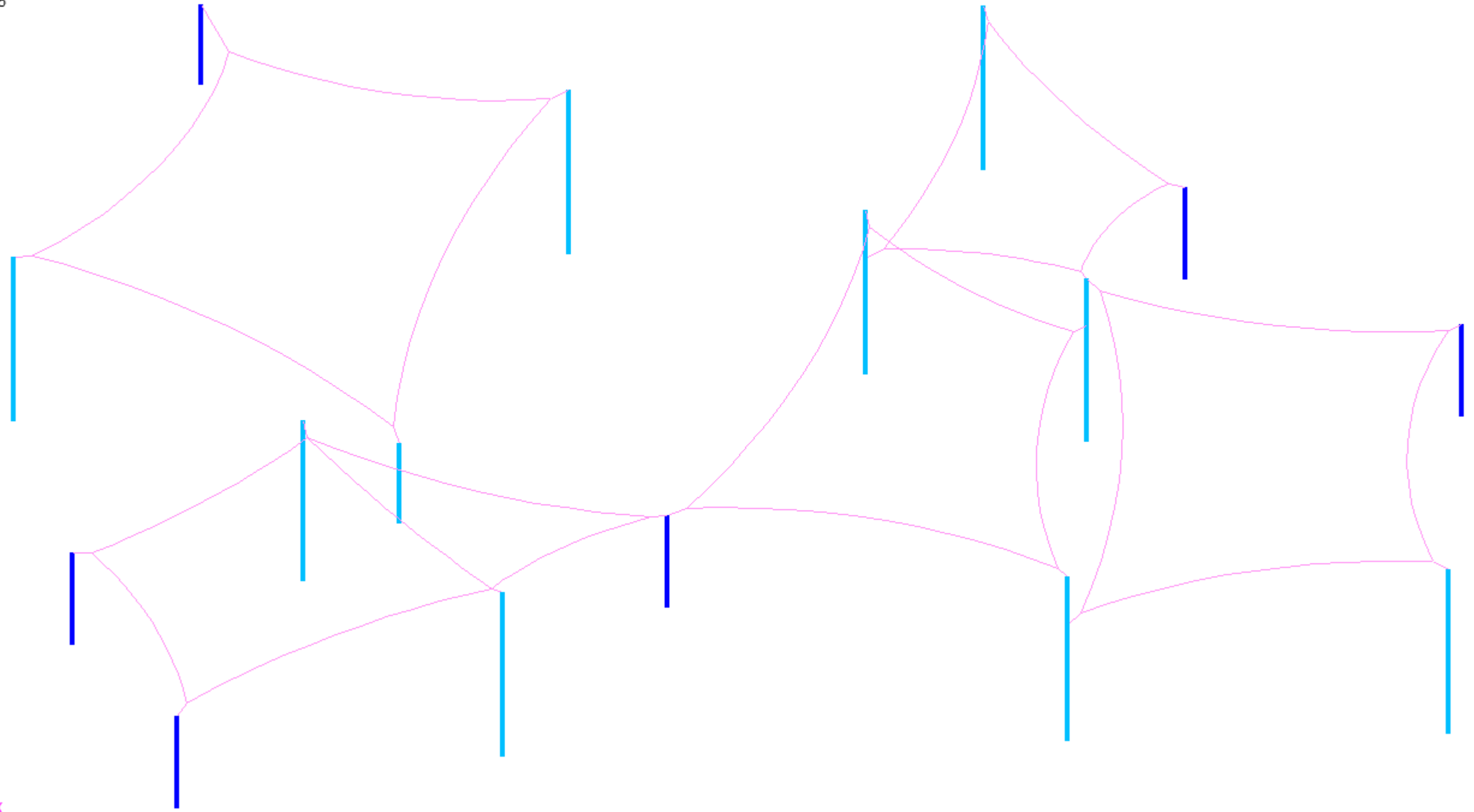




Unbraced Length when $L_y = L_z$ (ft)



86



87

1

6

10

12

13

15

16

2

7

3

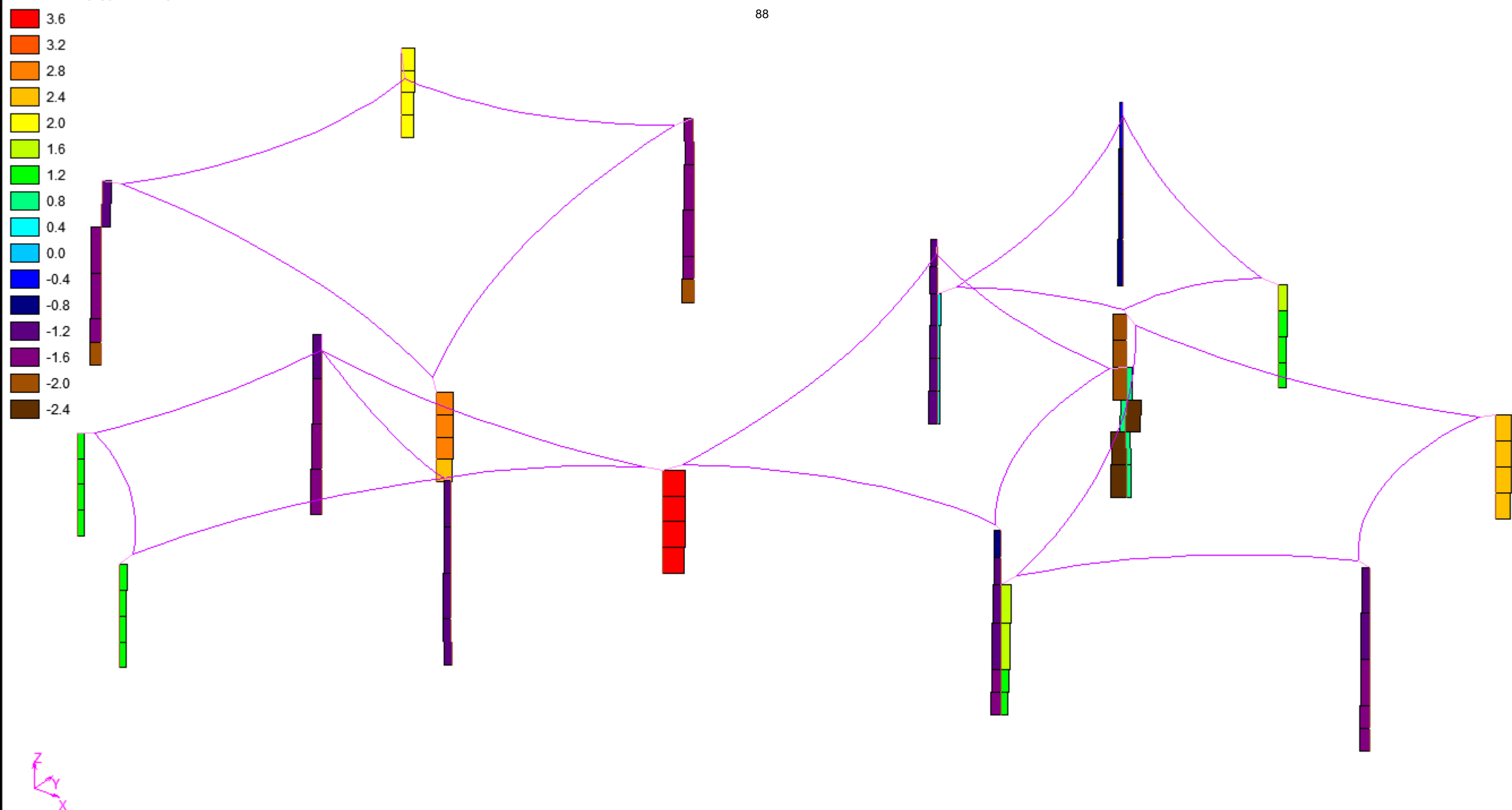
8

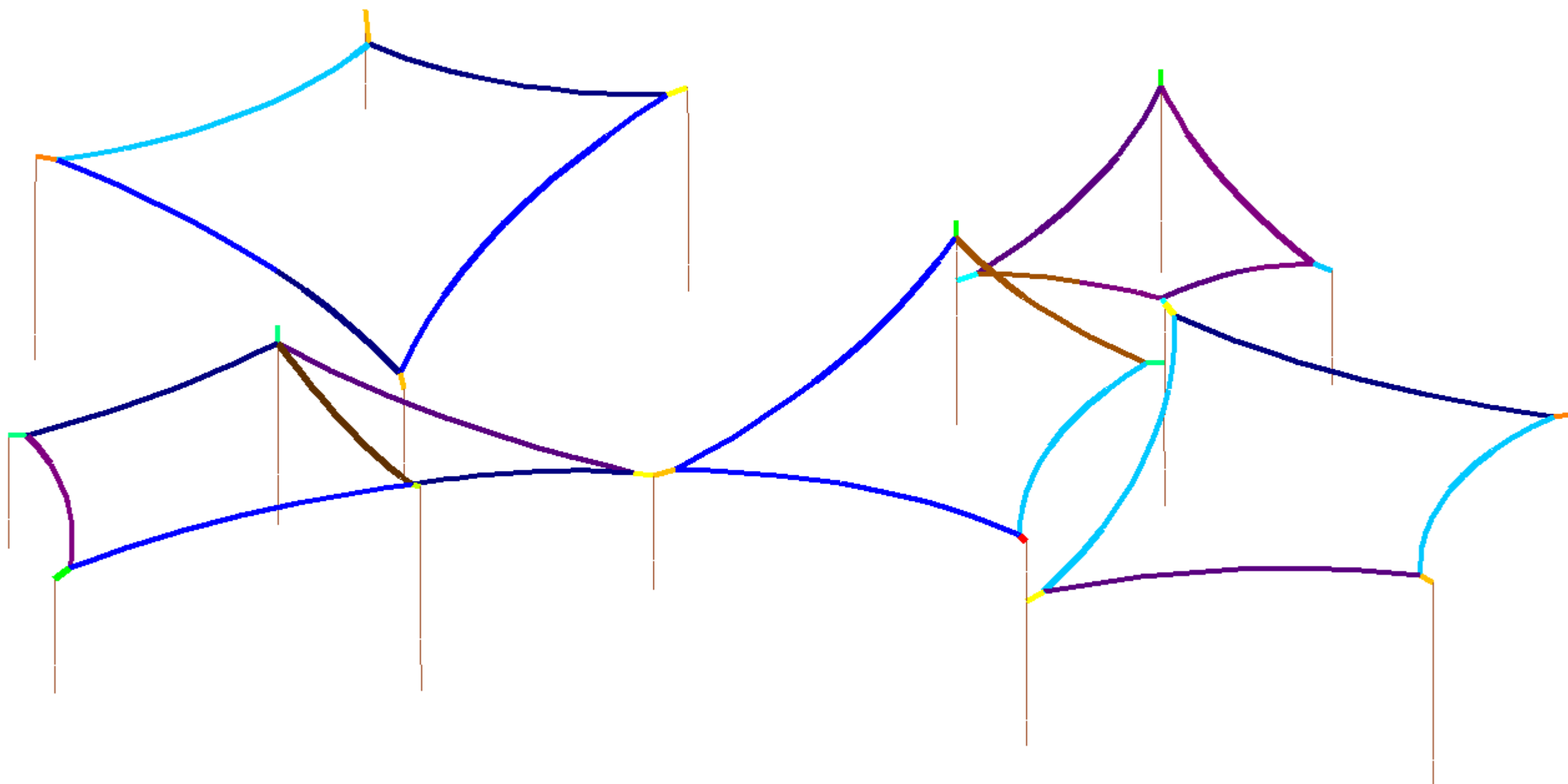
5

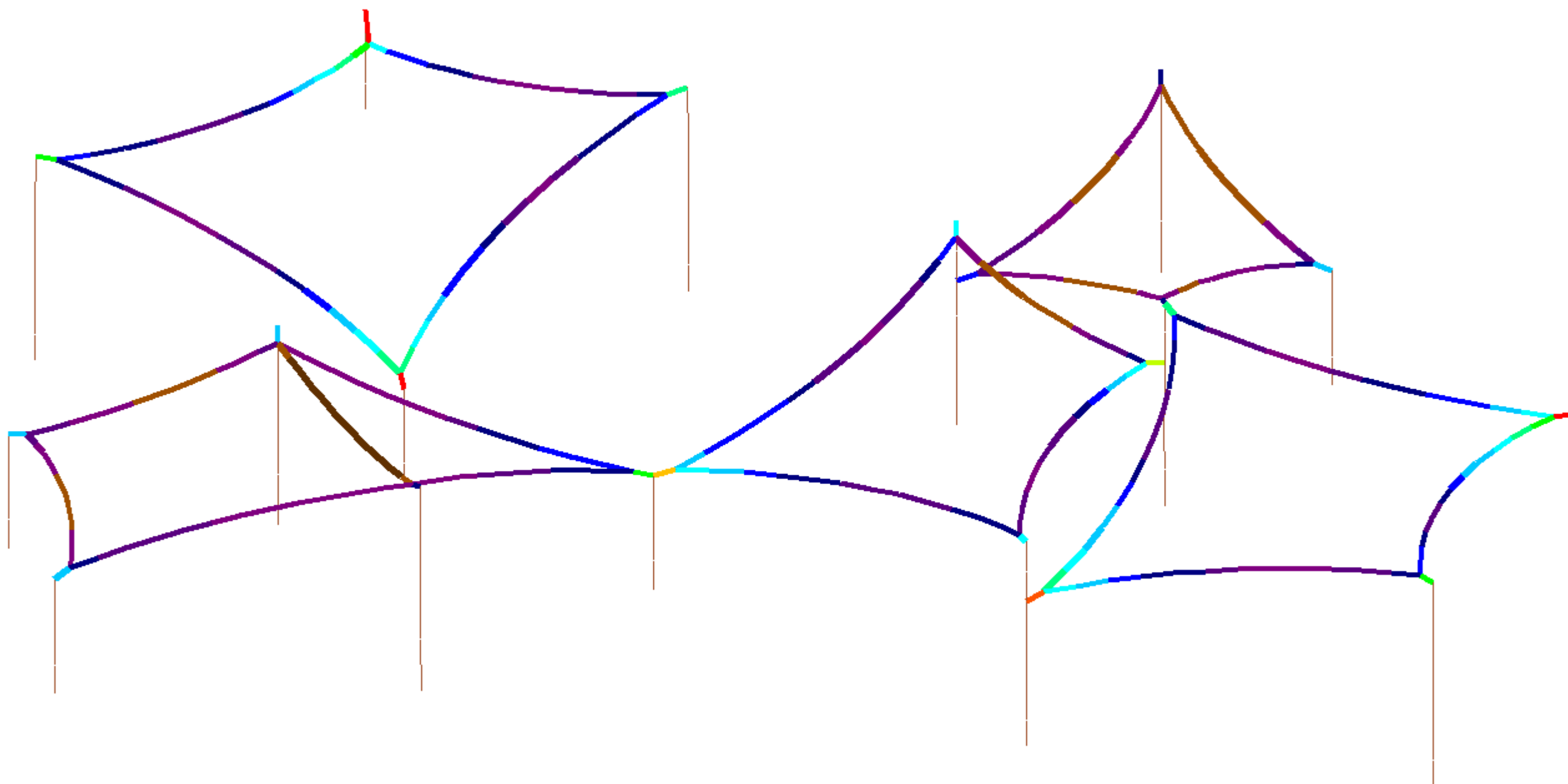
11

14



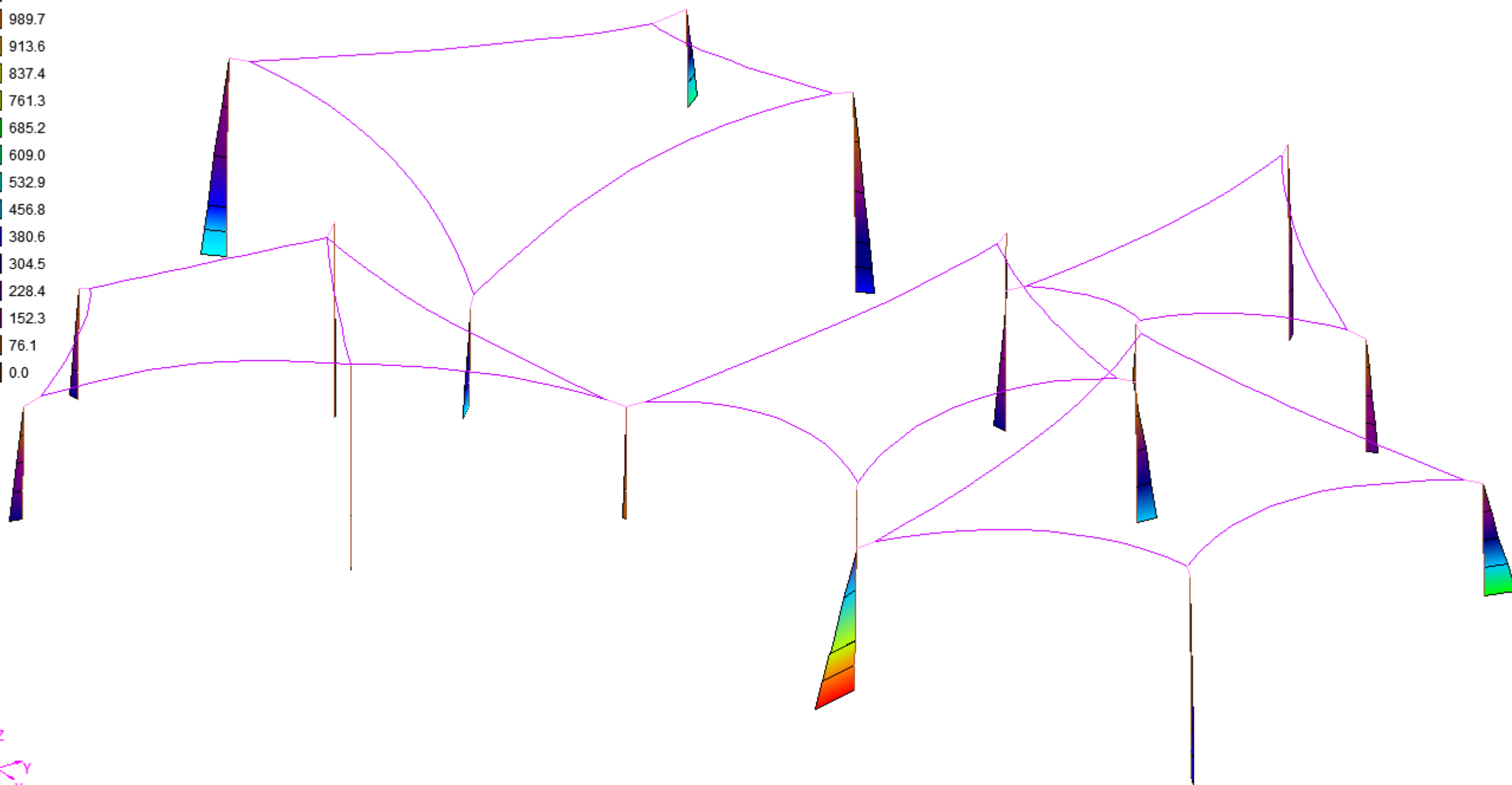
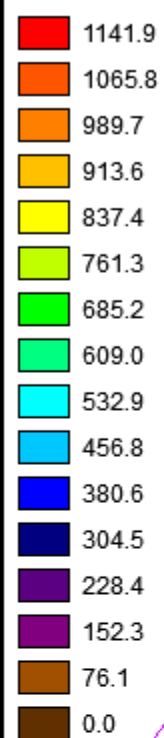






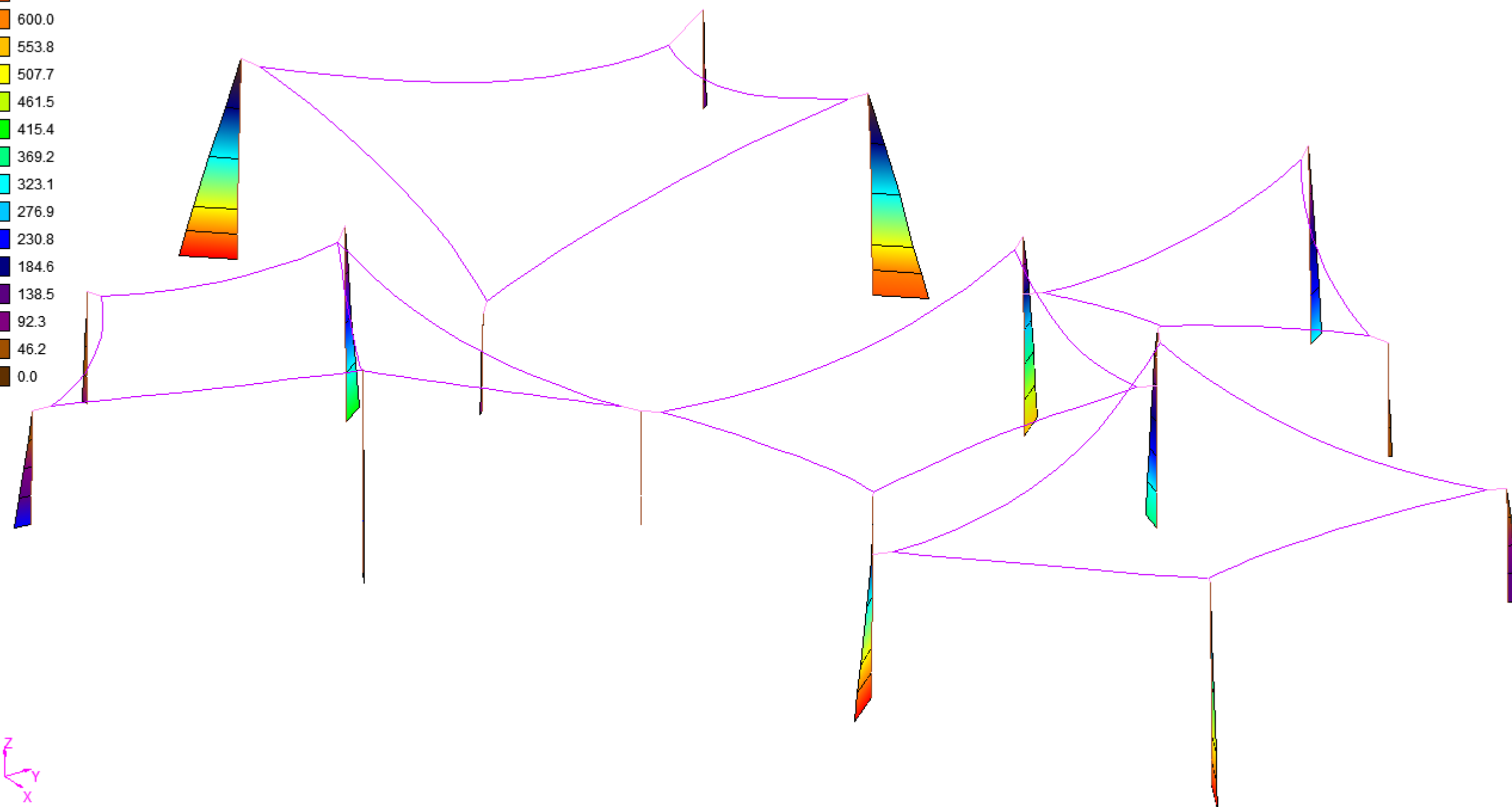
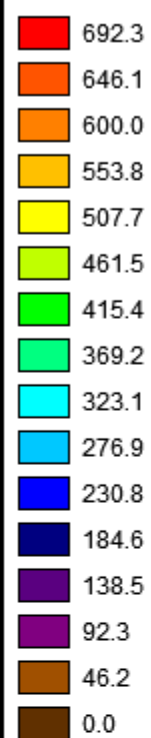
Resultant Moments: (in-kip) - LC:2

91



Resultant Moments: (in-kip) - LC:3

92





Model: D:\Wayne\03 NDN_WRPE_PROJECTS_June_5_2018\WYCKAM\Shade Sails Feb 2019\003shape_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.ndn

Title: Model Title

Analysis Cases:

1. P Prestress and D.L.
2. W Wind 8 psf Uniform
3. L LL 5 psf Uniform
4. W Wind 8 psf Dir: 1,0
5. W Wind 8 psf Dir: 1,1
6. W Wind 8 psf Dir: 0,1
7. W Wind 8 psf Dir: -1,1
8. W Wind 8 psf Dir: -1,0
9. W Wind 8 psf Dir: -1,-1
10. W Wind 8 psf Dir: 0,-1
11. W Wind 8 psf Dir: 1,-1

▲Axial Forces (Maximum and Minimum) - Summarized for all layers
 Forces based on 'Analysis Cases'

		Elem No	Layer Name	AC No	Axial Force (kip)
		----	-----	--	-----
Cables	Max Force	109	CATENARY	2	4.7
	Min Force	172	CATENARY	3	0.1
Cables	Max Force	307	LINKS	2	7.4
	Min Force	296	LINKS	3	0.3
Cables	Max Force	358	RIDGE BELT	3	0.7
	Min Force	352	RIDGE BELT	3	0.0

▲Beam Element Forces (Maximums and Minimums) - Summarized for Layer: 5
 Forces based on 'Analysis Cases'

Elem No	Layer Name	AC No	Axial Force (kip)	Torsion (kip-in)	Shear-Z (kip)	Shear-Y (kip)	M-YY at I (kip-in)	M-YY at J (kip-in)	M-ZZ at I (kip-in)	M-ZZ at J (kip-in)
----	-----	--	-----	-----	-----	-----	-----	-----	-----	-----

Max P	48	COLUMNS	2	3.6	0.0	-1.0	0.1	0.0	23.8	0.0	2.2
Min P	47	COLUMNS	3	-2.4	0.0	0.7	2.2	-131.5	111.1	364.8	-300.2
Max T	56	COLUMNS	5	0.1	0.0	1.0	2.0	-72.5	42.8	267.1	-207.6
Min T	43	COLUMNS	2	1.4	-0.1	1.8	-8.5	220.9	-296.9	381.0	-729.8
Max Vz	3	COLUMNS	2	2.0	0.0	6.8	-1.8	276.1	-414.3	74.2	-111.3
Min Vz	4	COLUMNS	2	2.0	0.0	-6.8	-1.8	552.7	-414.3	-148.5	111.3
Max Vy	23	COLUMNS	2	2.6	0.0	5.0	4.7	-406.0	304.3	380.6	-285.3
Min Vy	70	COLUMNS	2	1.1	0.0	-1.8	-8.5	371.9	-333.9	-1079.7	904.9
My - I	38	COLUMNS	2	2.3	0.0	-6.0	3.6	556.8	-417.3	332.1	-248.9
My - I	23	COLUMNS	2	2.6	0.0	5.0	4.7	-406.0	304.3	380.6	-285.3
My - J	23	COLUMNS	2	2.6	0.0	5.0	4.7	-406.0	304.3	380.6	-285.3
My - J	73	COLUMNS	3	-1.6	0.0	3.3	-2.5	414.1	-482.9	314.2	-366.4
Mz - I	71	COLUMNS	2	1.2	0.0	1.8	-8.5	296.3	-334.3	730.1	-904.7
Mz - I	70	COLUMNS	2	1.1	0.0	-1.8	-8.5	371.9	-333.9	-1079.7	904.9
Mz - J	70	COLUMNS	2	1.1	0.0	-1.8	-8.5	371.9	-333.9	-1079.7	904.9
Mz - J	71	COLUMNS	2	1.2	0.0	1.8	-8.5	296.3	-334.3	730.1	-904.7

Model: D:\Wayne\03 NDN_WRPE_PROJECTS_June_5_2018\WYCKAM\Shade Sails Feb
2019\003shape_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.ndn

Title: Model Title

Analysis Cases:

1. P Prestress and D.L.
2. W Wind 8 psf Uniform
3. L LL 5 psf Uniform
4. W Wind 8 psf Dir: 1,0
5. W Wind 8 psf Dir: 1,1
6. W Wind 8 psf Dir: 0,1
7. W Wind 8 psf Dir: -1,1
8. W Wind 8 psf Dir: -1,0
9. W Wind 8 psf Dir: -1,-1
10. W Wind 8 psf Dir: 0,-1
11. W Wind 8 psf Dir: 1,-1

↑

Total Membrane Area:

Plan Area: 2110 sq.ft
Surface Area: 2148 sq.ft

Sails Layer:

Plan Area: 398 sq.ft
Surface Area: 411 sq.ft

MESH Layer:

Plan Area: 1712 sq.ft
Surface Area: 1737 sq.ft

Membrane Stress Summary:

Units: lb / in

Layer Name	Load Case	Load Type	Maximum Stresses (Nodal averaged)		
			Warp	Fill	Shear
Sails	1	P	1	1	0
Sails	2	W	19	28	20
Sails	3	L	14	15	25
Sails	4	W	15	20	15
Sails	5	W	9	17	10
Sails	6	W	9	17	10

Sails	7	W	15	20 ₉₇	15
Sails	8	W	15	20	15
Sails	9	W	12	15	12
Sails	10	W	12	15	12
Sails	11	W	15	20	15

-----		-----	-----	-----
Max		19	28	25

MESH	1	P	1	1	0
MESH	2	W	25	29	26
MESH	3	L	18	17	16
MESH	4	W	24	25	21
MESH	5	W	20	26	24
MESH	6	W	21	22	27
MESH	7	W	23	21	21
MESH	8	W	25	19	23
MESH	9	W	23	20	19
MESH	10	W	23	23	18
MESH	11	W	23	24	19

-----		-----	-----	-----
Max		25	29	27

Over All Maximum		25	29	27
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Model: D:\Wayne\03 NDN_WRPE_PROJECTS_June_5_2018\WYCKAM\Shade Sails Feb
2019\003_Shade_Sails_WYCKAM_WRPE_IWRC_CATS.ndn

Title: Model Title

Analysis Cases:

1. P Prestress and D.L.
2. W Wind 10.00 Uniform
3. L LL 6.00 Uniform
4. W Wind 8 psf Dir: 1,0
5. W Wind 8 psf Dir: 1,1
6. W Wind 8 psf Dir: 0,1
7. W Wind 8 psf Dir: -1,1
8. W Wind 8 psf Dir: -1,0
9. W Wind 8 psf Dir: -1,-1
10. W Wind 8 psf Dir: 0,-1
11. W Wind 8 psf Dir: 1,-1

Membrane Quantity Summary

Mat Set	Material	Surface Area (sq.ft)	Plan Area (sq.ft)	Weight (lb)
---	-----	-----	-----	-----
3	Isotropic	2,195	2,154	0

Summary of Quantities by Element Type:

Type	Description	Total Length (ft)	Total Weight (lb)	Surface Area (sq.ft)
----	-----	-----	-----	-----
3	Cables (CL)	535	85	
20	Beams	176	4,666	366

Summary of Quantities by Layer:

Layer No.	Layer Name	Member Size	Length (ft)	Weight (lb)	Surface Area (sq.ft)
-----	-----	-----	-----	-----	-----
4	CATENARY	5/16" WR	481.263	75	0
5	COLUMNS	6" 40	58.498	1,111	101
		8" 40	103.496	2,958	234
		8" 80	13.749	597	31
6	LINKS	3/8" Strand	33.573	10	0
8	RIDGE BELT	1/4" Spectra	19.835	0	0
				-----	-----
				4,751	366

Summary of Quantities by Section Size:

Line No.	Section Designation	Length (ft)	Weight (lb)	Unit Wt (lb/ft^2)	Surface (sq.ft)
1	6" 40	58.498	1,111	0.516	101
2	8" 40	103.496	2,958	1.373	234
3	8" 80	13.749	597	0.277	31
			4,666	2.166	366

Summary of Quantities by Cable Size:

Line No.	Cable Designation	Length (ft)	Weight (lb)
1	1/4" Spectra	19.835	0
2	3/8" Strand	33.573	10
3	5/16" WR	481.263	75
			85

Part 6

Spreadsheet Calculations & Spec Sheets

		Tension = 5 kips												Threads Included		
		Shear = 10 kips												A325		
6.625 Col - A193 B7 Bolts		Ft = 43.8 Ksi							I TOTAL					A307	A449	A490
1" Diameter		S = 9.5 in^3							66.36					Ft	Ft	Ft
		M = 405 in-k												ksi	ksi	ksi

		Tension = 5 kips												Threads Included		
		Shear = 10 kips												A325		
8sch40 - A193 B7 Bolts		Ft = 43.8 Ksi												A307	A449	A490
7/8" Diameter		S = 18.0 in^3												Ft	Ft	Ft
		M = 769 in-k												ksi	ksi	ksi
					I TOTAL											
					134.92											

		Tension = 5 kips											Threads Included				
		Shear = 10 kips											A325				
8sch80 - A193 B7 Bolts			Ft = 43.9 Ksi					I TOTAL							A307	A449	A490
1.125" Diameter			S = 29.7 in^3					222.61		Bolt	Max.	Nominal			Ft	Ft	Ft
			M = 1284 in-k							Grade	ksi	in	in^2	ksi	ksi	ksi	ksi
										A307	20	0.25	0.049	25.5	-19.9	#NUM!	21.8
Item	# bolts	Bolt Area	Area	Ix	D	Ay	y-bar	AD^2	A449/A325	44	0.3125	0.077	16.2	-3.2	27.9	43.9	
		in^2	in^2	in^4	in		in	in^4	A193 B7	44	0.375	0.11	11.4	5.5	37.0	49.3	
A	1	0.99	0.99	0.0	15	14.9		55.7	A490	54	0.5	0.20	6.3	14.8	42.0	52.6	
B	2	0.99	1.98	0.0	12.8	25.3		55.6			0.625	0.31	4.0	18.7	43.2	53.4	
C	2	0.99	1.98	0.0	7.5	14.9		0.0			0.75	0.44	2.8	20.9	43.6	53.7	
D	2	0.99	1.98	0.0	2.2	4.4		55.6			0.875	0.6	2.1	22.3	43.8	53.8	
E	1	0.99	0.99	0.0	0	0.0		55.7			1	0.79	1.6	23.2	43.9	53.9	
F	0	0	0	0.0	0	0.0		0.0			1.125	0.99	1.3	23.7	43.9	53.9	
G	0	0	0	0.0	0	0.0		0.0			1.25	1.23	1.0	24.2	43.9	54.0	
H	0	0	0	0.0	0	0.0		0.0			1.375	1.49	0.8	24.5	44.0	54.0	
Total	8	A total 7.9		0.0		59.4	7.5	222.6			1.5	1.77	0.7	24.7	44.0	54.0	

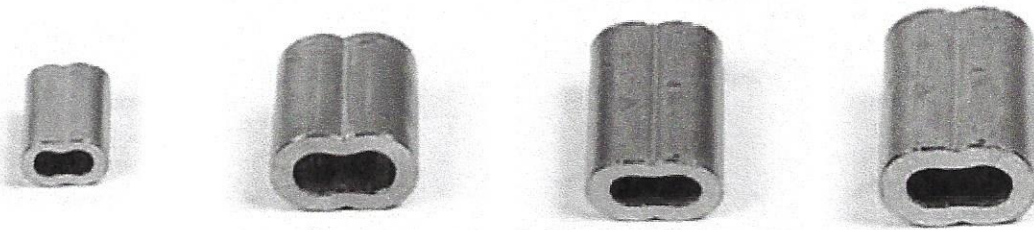
IBC 2006, UBC 97 Pier Depth							
WRPE 3/13/19					6SCH40		
1806.8.2.1 Nonconstrained		$d = A/2(1+(1+4.36h/A)^{.5}) =$			7.1	feet	
1806.8.2.2 Constrained		$d = (4.25(Ph/(S3)b))^{.5} =$			3.6	feet	
A =	$2.34P/(S1)b$			A =	2.23	feet	
b =	diameter of footing (feet)			b =	3.00	feet	
d =	depth of footing (less than 12 feet)			d =	12.00	feet	
h =	height of lateral load "P" (feet)			h =	14.00	feet	
P =	lateral load (pounds)			P =	2000	lbs	
S1 =	allowable lateral soil-bearing			S1 =	700	psf	
	Table 18-I-A at a depth of 1/3 of d						
S3 =	allowable lateral soil-bearing			S3 =	3000	psf	
	Table 18-I-A at a depth of d						
				Moment	336	in-kips	
				Moment	28	ft-kips	
Note: the values below can be multiplied by a factor of 2.0 for 1/2" allowable movement							
CLASS	1	2	3	4	5		
	Lateral	Lateral	Lateral	Lateral	Lateral		
	Bearing	Bearing	Bearing	Bearing	Bearing		
	Rock	Sed/Fol. Rock	Sandy Gravel	Silty Sand	Sandy Clay		
	psf	psf	psf	psf	psf		
1.00	1200	400	200	150	100		
2.00	2400	800	400	300	200		
3.00	3600	1200	600	450	300		
4.00	4800	1600	800	600	400		
5.00	6000	2000	1000	750	500		
6.00	7200	2400	1200	900	600		
7.00	8400	2800	1400	1050	700		
8.00	9600	3200	1600	1200	800		
9.00	10800	3600	1800	1350	900		
10.00	12000	4000	2000	1500	1000		
11.00	13200	4400	2200	1650	1100		
12.00	14400	4800	2400	1800	1200		

IBC 2006, UBC 97 Pier Depth							
WRPE 3/13/19					8SCH40		
1806.8.2.1 Nonconstrained		$d = A/2(1+(1+4.36h/A)^{.5}) =$			8.6	feet	
1806.8.2.2 Constrained		$d = (4.25(Ph/(S3)b))^{.5} =$			5.6	feet	
A =	$2.34P/(S1)b$			A =	3.12	feet	
b =	diameter of footing (feet)			b =	3.00	feet	
d =	depth of footing (less than 12 feet)			d =	12.00	feet	
h =	height of lateral load "P" (feet)			h =	14.00	feet	
P =	lateral load (pounds)			P =	4200	lbs	
S1 =	allowable lateral soil-bearing			S1 =	1050	psf	
	Table 18-I-A at a depth of 1/3 of d						
S3 =	allowable lateral soil-bearing			S3 =	2700	psf	
	Table 18-I-A at a depth of d						
				Moment	706	in-kips	
				Moment	59	ft-kips	
Note: the values below can be multiplied by a factor of 2.0 for 1/2" allowable movement							
CLASS	1	2	3	4	5		
	Lateral	Lateral	Lateral	Lateral	Lateral		
	Bearing	Bearing	Bearing	Bearing	Bearing		
	Rock	Sed/Fol. Rock	Sandy Gravel	Silty Sand	Sandy Clay		
	psf	psf	psf	psf	psf		
1.00	1200	400	200	150	100		
2.00	2400	800	400	300	200		
3.00	3600	1200	600	450	300		
4.00	4800	1600	800	600	400		
5.00	6000	2000	1000	750	500		
6.00	7200	2400	1200	900	600		
7.00	8400	2800	1400	1050	700		
8.00	9600	3200	1600	1200	800		
9.00	10800	3600	1800	1350	900		
10.00	12000	4000	2000	1500	1000		
11.00	13200	4400	2200	1650	1100		
12.00	14400	4800	2400	1800	1200		

IBC 2006, UBC 97 Pier Depth							
WRPE 3/13/19					8SCH80		
1806.8.2.1 Nonconstrained		$d = A/2(1+(1+4.36h/A)^{.5}) =$			12.2	feet	
1806.8.2.2 Constrained		$d = (4.25(Ph/(S3)b))^{.5} =$			6.7	feet	
A =	$2.34P/(S1)b$				A =	5.66	feet
b =	diameter of footing (feet)				b =	3.00	feet
d =	depth of footing (less than 12 feet)				d =	12.00	feet
h =	height of lateral load "P" (feet)				h =	13.00	feet
P =	lateral load (pounds)				P =	8700	lbs
S1 =	allowable lateral soil-bearing				S1 =	1200	psf
	Table 18-I-A at a depth of 1/3 of d						
S3 =	allowable lateral soil-bearing				S3 =	3600	psf
	Table 18-I-A at a depth of d						
					Moment	1357	in-kips
					Moment	113	ft-kips
Note: the values below can be multiplied by a factor of 2.0 for 1/2" allowable movement							
CLASS	1	2	3	4	5		
	Lateral	Lateral	Lateral	Lateral	Lateral		
	Bearing	Bearing	Bearing	Bearing	Bearing		
	Rock	Sed/Fol. Rock	Sandy Gravel	Silty Sand	Sandy Clay		
	psf	psf	psf	psf	psf		
1.00	1200	400	200	150	100		
2.00	2400	800	400	300	200		
3.00	3600	1200	600	450	300		
4.00	4800	1600	800	600	400		
5.00	6000	2000	1000	750	500		
6.00	7200	2400	1200	900	600		
7.00	8400	2800	1400	1050	700		
8.00	9600	3200	1600	1200	800		
9.00	10800	3600	1800	1350	900		
10.00	12000	4000	2000	1500	1000		
11.00	13200	4400	2200	1650	1100		
12.00	14400	4800	2400	1800	1200		

WIRE ROPE FITTINGS

Standard safety factor for working load is 1/4 of breaking load



Made from high quality nickel plated copper, recommended for use with SS wire.

ITEM #	DESCRIPTION	WIDTH	LENGTH	HOLE WIDTH	HEIGHT
		D (mm/in)	L (mm/in)	A (mm/in)	H (mm/in)
NP-WRS-03	Polyfab Swaging Sleeve for 3.2mm wire NPC	7.4/0.29	13/0.51	3.6/0.14	10.5/0.41
NP-WRS-05	Polyfab Swaging Sleeve for 5mm wire NPC	11/0.43	25/0.98	5.5/0.22	17/0.67
NP-WRS-06	Polyfab Swaging Sleeve for 6mm wire NPC	13/0.51	28/1.10	7/0.28	20.5/0.81
NP-WRS-08	Polyfab Swaging Sleeve for 8mm wire NPC	17/0.67	31/1.22	9/0.35	26/1.02

5" $\frac{5}{16}$ IWRC

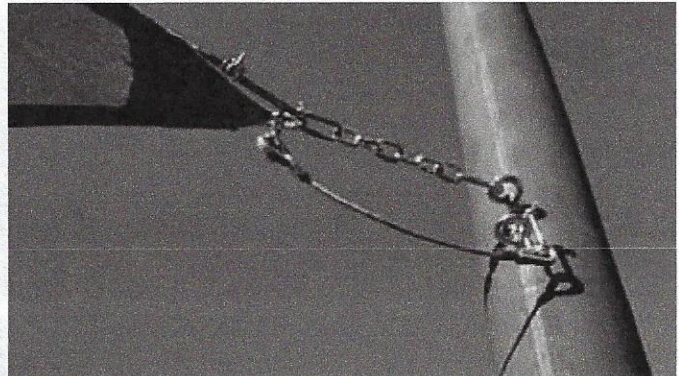
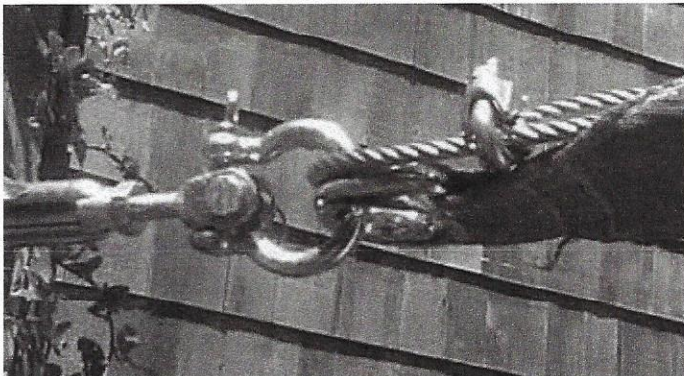
SAFETY CABLES

Standard safety factor for working load is 1/4 of breaking load



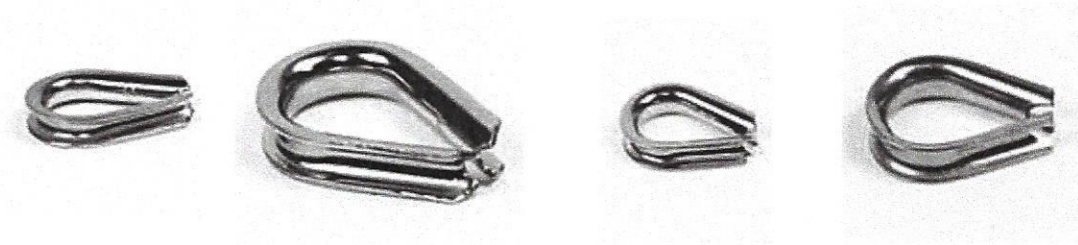
Made from high quality 316 Marine grade stainless steel in the USA.

ITEM #	DESCRIPTION	CABLE LENGTH	MAXIMUM SHACKLE PIN TO FIT
		(in)	(mm/in)
SS-SC-15	Polyfab Pro Safety Cable looped with thimble on each end	15	10 3/8"



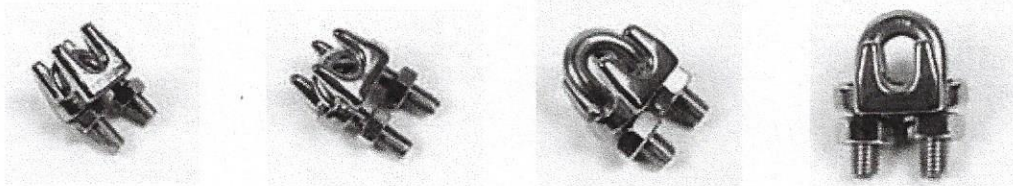
WIRE ROPE FITTINGS

Standard safety factor for working load is 1/4 of breaking load



Made from high quality 316 Marine grade stainless steel.

ITEM #	DESCRIPTION	INSIDE WIDTH	LENGTH
		(mm/in)	(mm/in)
SS-WRT-03	Polyfab Thimble for 3.2mm wire rope AISI 316	12/0.47	29/1.14
SS-WRT-04	Polyfab Thimble for 4mm wire rope AISI 316	13/0.51	34/1.34
SS-WRT-05	Polyfab Thimble for 5mm wire rope AISI 316	15/0.59	37/1.46
SS-WRT-06	Polyfab Thimble for 6mm wire rope AISI 316	17/0.67	40/1.57
SS-WRT-08	Polyfab Thimble for 8mm wire rope AISI 304	22/0.87	48/1.89
SS-WRT-10	Polyfab Thimble for 10mm wire rope AISI 304	25/0.98	59/2.32



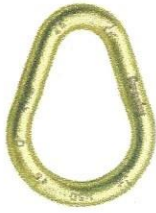
Made from high quality 316 Marine grade stainless steel.

ITEM #	DESCRIPTION	Thread
SS-WRC-03	Polyfab Wire Rope Clamp for 3.2mm wire AISI 316	M3
SS-WRC-04	Polyfab Wire Rope Clamp for 4mm wire AISI 316	M4
SS-WRC-05	Polyfab Wire Rope Clamp for 5mm wire AISI 316	M5
SS-WRC-06	Polyfab Wire Rope Clamp for 6mm wire AISI 316	M6
SS-WRC-08	Polyfab Wire Rope Clamp for 8mm wire AISI 316	M8
SS-WRC-10	Polyfab Wire Rope Clamp for 10mm wire AISI 316	M10

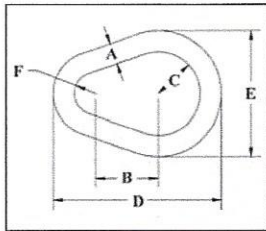
Pear Shaped Links



A-341



- Alloy Steel - Quenched and Tempered
- Individually Proof Tested at 2 times Working Load Limit with certification.
- Proof Test certification shipped with each link.
- Sizes 1/2", 5/8", 3/4", 7/8", 1", 1-1/4", and 1-3/8" are drop forged.



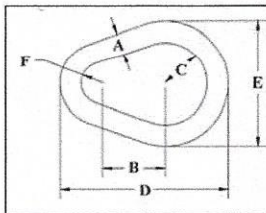
A-341 Alloy Pear Shaped Links

Size (A) (in.)	A-341 Stock No.	Working Load Limit		Weight Each (lbs.)	Dimensions (in.)				
		(lbs.)*	(t)		B	C	D	E	F
1/2	1013575	7000	3.15	.55	1.50	1.00	4.00	3.00	.50
5/8	1013584	9000	4.09	1.10	1.88	1.25	5.00	3.75	.63
3/4	1013595	12300	5.59	1.76	2.25	1.50	6.00	4.50	.75
7/8	1013604	15000	6.81	2.82	2.63	1.75	7.00	5.25	.88
1	1013613	24360	11.0	4.22	3.00	2.00	8.00	6.00	1.00
†† 1 1/8	1013622	30600	13.9	6.25	3.38	2.25	8.75	6.75	1.13
1 1/4	1013631	36000	16.4	8.25	4.00	2.50	10.00	7.50	1.25
1 3/8	1013640	43000	19.5	11.25	4.13	2.75	11.00	8.25	1.38
†† 1 1/2	1013649	54300	24.7	14.25	4.50	3.00	12.00	9.00	1.50
†† 1 5/8	1013658	62600	28.4	18.50	4.88	3.25	13.00	9.75	1.63
†† 1 3/4	1013667	84900	38.6	22.50	5.25	3.50	14.00	10.50	1.75
†† 1 7/8	1013676	95800	43.5	29.00	5.63	3.75	15.00	11.25	1.88
†† 2	1013685	102600	46.6	34.00	6.00	4.00	16.00	12.00	2.00
†† 2 1/4	1013694	143100	65.0	48.00	6.75	4.50	18.00	13.50	2.25
†† 2 1/2	1013703	147300	66.9	66.00	7.50	5.00	20.00	15.00	2.50
†† 2 3/4	1013712	216900	98.6	88.00	8.25	5.50	22.00	16.50	2.75
†† 3	1013721	228000	103	114.00	9.00	6.00	24.00	18.00	3.00
†† 3 1/4	1013730	262200	119	146.00	9.75	6.50	26.00	19.50	3.25
†† 3 1/2	1013739	279000	126	181.00	10.50	7.00	28.00	21.00	3.50
†† 4	1013748	373000	169	271.00	12.00	8.00	32.00	24.00	4.00

* Based on single leg sling (in-line load), or resultant load on multiple legs with an included angle less than or equal to 120°. Minimum Ultimate load is 5 times the Working Load Limit.
 †† Welded Link.

Rigging
Accessories

G-341 / S-341



- Forged carbon steel - Quenched and Tempered.
- Self Colored or Hot Dip galvanized.

G-341 / S-341 Weldless Sling Links

Size (A) (in.)	Stock No.		Working Load Limit Single Pull (lbs.)*	Weight Each (lbs.)	Dimensions (in.)				
	G-341 Galv.	S-341 S.C.			B	C	D	E	F
3/8	1013897	1013904	1800	.23	1.13	.75	3.00	2.25	.38
1/2	1013913	1013922	2900	.55	1.50	1.00	4.00	3.00	.50
5/8	1013931	1013940	4200	1.06	1.87	1.25	5.00	3.75	.63
3/4	1013959	1013968	6000	1.88	2.25	1.50	6.00	4.50	.75
7/8	1013977	1013986	8300	2.75	2.63	1.75	7.00	5.25	.88
1	1013995	1014002	10800	4.35	3.00	2.00	8.00	6.00	1.00
1 1/4	1014011	1014020	16750	7.60	4.00	2.50	10.25	7.50	1.25
1 3/8	1014039	1014048	20500	11.30	4.13	2.75	11.00	8.25	1.38

* Ultimate Load is 6 times the Working Load Limit. Based on single leg sling (in-line load), or resultant load on multiple legs with an included angle less than or equal to 120°.

Jaw & Jaw Turnbuckles



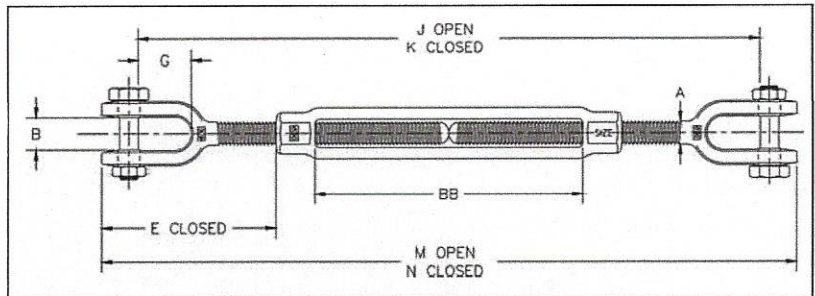
Fatigue Rated

HG-228



Meets the performance requirements of Federal Specifications FF-T-791b, Type 1, Form 1 - CLASS 7, and ASTM F-1145, except for those provisions required of the contractor. For additional information, see page 391.

- End fittings are Quenched and Tempered, bodies heat treated by normalizing.
- Hot Dip galvanized steel.
- TURNBUCKLES RECOMMENDED FOR STRAIGHT OR IN-LINE PULL ONLY.
- Forged jaw ends are fitted with bolts and nuts for 1/4" through 5/8", and pins and cotters on 3/4" through 2-3/4" sizes.
- Modified UNJ thread on end fittings for improved fatigue properties.
- Body has UNC threads.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Lock Nuts available for all sizes (see page 170).
- Comprehensive end fitting data provided on page 168.
- Fatigue Rated.



Rigging
Accessories

HG-228

Jaw & Jaw

Thread Dia. & Take Up (in.)	HG-228 Stock No.	Working Load Limit (lbs.)*	Weight Each (lbs.)	Dimensions (in.)								
				A	B	E Closed	G	J Open	K Closed	M Open	N Closed	BB
† 1/4 x 4	1032493	500	.37	.25	.45	1.66	.64	11.19	7.19	12.18	8.18	4.07
† 5/16 x 4-1/2	1032518	800	.56	.31	.50	2.02	.87	13.07	8.57	14.12	9.62	4.58
† 3/8 x 6	1032536	1200	.85	.38	.53	2.11	.85	16.25	10.25	17.50	11.50	6.10
1/2 x 6	1032554	2200	1.82	.50	.64	3.22	1.07	18.65	12.65	20.14	14.14	6.03
1/2 x 9	1032572	2200	2.29	.50	.64	3.20	1.07	24.94	15.94	26.43	17.43	9.36
1/2 x 12	1032590	2200	2.71	.50	.64	3.20	1.07	30.94	18.94	32.43	20.43	12.36
5/8 x 6	1032616	3500	3.21	.63	.79	3.90	1.32	19.74	13.74	21.82	15.82	6.03
5/8 x 9	1032634	3500	3.95	.63	.79	3.89	1.32	26.08	17.08	28.16	19.16	9.39
5/8 x 12	1032652	3500	4.58	.63	.79	3.89	1.32	32.08	20.08	34.16	22.16	12.39
3/4 x 6	1032670	5200	4.80	.75	.97	4.71	1.52	21.09	15.09	23.68	17.68	6.13
3/4 x 9	1032698	5200	5.85	.75	.97	4.68	1.52	27.49	18.49	30.08	21.08	9.59
3/4 x 12	1032714	5200	6.72	.75	.97	4.68	1.52	33.49	21.49	36.08	24.08	12.59
3/4 x 18	1032732	5200	8.45	.75	.97	4.71	1.52	45.49	27.49	48.08	30.08	18.53
7/8 x 12	1032750	7200	9.37	.88	1.16	5.50	1.77	34.65	22.65	37.62	25.62	12.16
7/8 x 18	1032778	7200	11.8	.88	1.16	5.50	1.77	47.12	29.12	50.09	32.09	18.63
1 x 6	1032796	10000	10.4	1.00	1.34	6.09	2.05	23.82	17.82	27.18	21.18	6.18
1 x 12	1032812	10000	13.8	1.00	1.34	6.09	2.05	35.82	23.82	39.18	27.18	12.18
1 x 18	1032830	10000	17.1	1.00	1.34	6.09	2.05	47.82	29.82	51.18	33.18	18.18
1 x 24	1032858	10000	21.0	1.00	1.34	6.06	2.05	60.42	36.42	63.78	39.78	24.84
1-1/4 x 12	1032876	15200	21.9	1.25	1.84	8.09	2.82	39.37	27.37	43.58	31.58	12.06
1-1/4 x 18	1032894	15200	25.9	1.25	1.84	8.09	2.82	51.37	33.37	55.58	37.58	18.06
1-1/4 x 24	1032910	15200	29.8	1.25	1.84	8.09	2.82	63.93	39.93	68.14	44.14	24.62
1-1/2 x 12	1032938	21400	32.6	1.50	2.06	8.93	2.81	40.76	28.76	45.68	33.68	12.32
1-1/2 x 18	1032956	21400	38.0	1.50	2.06	8.93	2.81	52.76	34.76	57.68	39.68	18.32
1-1/2 x 24	1032974	21400	43.5	1.50	2.06	8.93	2.81	65.38	41.38	70.30	46.30	24.94
1-3/4 x 18	1033018	28000	53.5	1.75	2.60	9.36	3.35	53.35	35.35	59.16	41.16	18.37
1-3/4 x 24	1033036	28000	61.1	1.75	2.60	9.36	3.35	65.35	41.35	71.16	47.16	24.37
2 x 24	1033054	37000	96.3	2.00	2.62	11.80	3.74	69.64	45.64	76.72	52.72	24.48
2-1/2 x 24	1033072	60000	167	2.50	3.06	13.26	4.44	72.97	48.97	82.18	58.18	24.60
2-3/4 x 24	1033090	75000	199	2.75	3.69	14.92	4.19	74.75	50.75	85.50	61.50	24.65

* Proof Load is 2.5 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.

† Mechanical Galvanized

Crosby® Bolt Type Shackles

Load Rated

Fatigue Rated



QUIC-CHECK®

MAXTOUGH®



BOLT TYPE ANCHOR SHACKLES

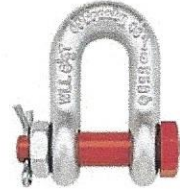


G-2130 S-2130

Bolt Type Anchor shackles with thin head bolt - nut with cotter pin. Meets the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 3, except for those provisions required of the contractor. For additional information, see page 391.

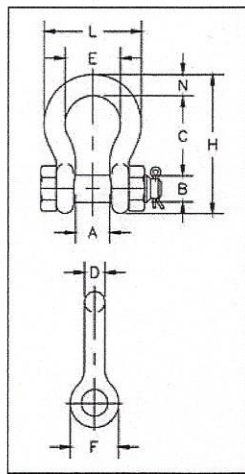
- Capacities 1/3 thru 150 metric tons.
- Working Load Limit permanently shown on every shackle.
- Forged — Quenched and Tempered, with alloy pins.
- Hot Dip galvanized or Self Colored.
- Fatigue rated (1/3t - 55t).
- Shackles 25t and larger are **RFID EQUIPPED**.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Shackles 55 metric tons and smaller can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification when requested at time of order.
- Shackles 85 metric tons and larger can be provided as follows.
 - Non Destructive Tested
 - Serialized Pin and Bow
 - Material Certification (Chemical) Certification must be requested at time of order.
- Look for the Red Pin® . . . the mark of genuine Crosby quality.
- Type Approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7, and ABS Guide for Certification of Cranes.

BOLT TYPE CHAIN SHACKLES

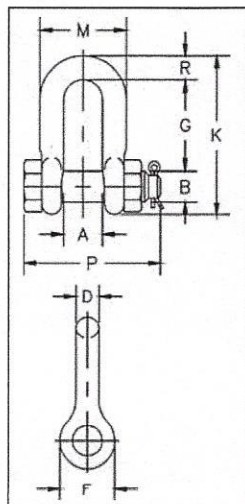


G-2150 S-2150

Bolt Type Chain shackles. Thin hex head bolt - nut with cotter pin. Meets the performance requirements of Federal Specification RR-C271D Type IVB, Grade A, Class 3, except for those provisions required of the contractors. For additional information, see page 391.



G-2130 S-2130



G-2150 S-2150

Nominal Size (in.)	Working Load Limit (t)*	Stock No.		Weight Each (lbs.)	Dimensions (in.)										Tolerance +/-	
		G-2130	S-2130		A	B	C	D	E	F	H	L	N	O	A	
3/16	1/3‡	1019464	-	.06	.38	.25	.88	.19	.60	.56	1.47	.98	.19	.06	.06	
1/4	1/2	1019466	-	.11	.47	.31	1.13	.25	.78	.61	1.84	1.28	.25	.06	.06	
5/16	3/4	1019468	-	.22	.53	.38	1.22	.31	.84	.75	2.09	1.47	.31	.06	.06	
3/8	1	1019470	-	.33	.66	.44	1.44	.38	1.03	.91	2.49	1.78	.38	.13	.06	
7/16	1-1/2	1019471	-	.49	.75	.50	1.69	.44	1.16	1.06	2.91	2.03	.44	.13	.06	
1/2	2	1019472	1019481	.79	.81	.64	1.88	.50	1.31	1.19	3.28	2.31	.50	.13	.06	
5/8	3-1/4	1019490	1019506	1.68	1.06	.77	2.38	.63	1.69	1.50	4.19	2.94	.69	.13	.06	
3/4	4-3/4	1019515	1019524	2.72	1.25	.89	2.81	.75	2.00	1.81	4.97	3.50	.81	.25	.06	
7/8	6-1/2	1019533	1019542	3.95	1.44	1.02	3.31	.88	2.28	2.09	5.83	4.03	.97	.25	.06	
1	8-1/2	1019551	1019560	5.66	1.69	1.15	3.75	1.00	2.69	2.38	6.56	4.69	1.06	.25	.06	
1-1/8	9-1/2	1019579	1019588	8.27	1.81	1.25	4.25	1.13	2.91	2.69	7.47	5.16	1.25	.25	.06	
1-1/4	12	1019597	1019604	11.71	2.03	1.40	4.69	1.29	3.25	3.00	8.25	5.75	1.38	.25	.06	
1-3/8	13-1/2	1019613	1019622	15.83	2.25	1.53	5.25	1.42	3.63	3.31	9.16	6.38	1.50	.25	.13	
1-1/2	17	1019631	1019640	19.00	2.38	1.66	5.75	1.53	3.88	3.63	10.00	6.88	1.62	.25	.13	
1-3/4	25	1019659	1019668	33.91	2.88	2.04	7.00	1.84	5.00	4.19	12.34	8.80	2.25	.25	.13	
2	35	1019677	1019686	52.25	3.25	2.30	7.75	2.08	5.75	4.81	13.68	10.15	2.40	.25	.13	
2-1/2	55	1019695	1019702	98.25	4.13	2.80	10.50	2.71	7.25	5.69	17.90	12.75	3.13	.25	.25	
3	† 85	1019711	-	154.00	5.00	3.30	13.00	3.12	7.88	6.50	21.50	14.62	3.62	.25	.25	
3-1/2	† 120 ‡	1019739	-	265.00	5.25	3.76	14.63	3.62	9.00	8.00	24.88	17.02	4.38	.25	.25	
4	† 150 ‡	1019757	-	338.00	5.50	4.26	14.50	4.00	10.00	9.00	25.68	18.00	4.56	.25	.25	

Nominal Size (in.)	Working Load Limit (t)*	Stock No.		Weight Each (lbs.)	Dimensions (in.)										Tolerance +/-	
		G-2150	S-2150		A	B	D	F	G	K	M	P	R	G	A	
1/4	1/2	1019768	-	.13	.47	.31	.25	.62	.91	1.59	.97	1.56	.25	.06	.06	
5/16	3/4	1019770	-	.23	.53	.38	.31	.75	1.07	1.91	1.15	1.82	.31	.06	.06	
3/8	1	1019772	-	.33	.66	.44	.38	.92	1.28	2.31	1.42	2.17	.38	.13	.06	
7/16	1-1/2	1019774	-	.49	.75	.50	.44	1.06	1.48	2.67	1.63	2.51	.44	.13	.06	
1/2	2	1019775	1019784	.75	.81	.64	.50	1.18	1.66	3.03	1.81	2.80	.50	.13	.06	
5/8	3-1/4	1019793	1019800	1.47	1.06	.77	.63	1.50	2.04	3.76	2.32	3.56	.63	.13	.06	
3/4	4-3/4	1019819	1019828	2.52	1.25	.89	.75	1.81	2.40	4.53	2.75	4.15	.81	.25	.06	
7/8	6-1/2	1019837	1019846	3.85	1.44	1.02	.88	2.10	2.86	5.33	3.20	4.82	.97	.25	.06	
1	8-1/2	1019855	1019864	5.55	1.69	1.15	1.00	2.38	3.24	5.94	3.69	5.39	1.00	.25	.06	
1-1/8	9-1/2	1019873	1019882	7.60	1.81	1.25	1.13	2.68	3.61	6.78	4.07	5.90	1.25	.25	.06	
1-1/4	12	1019891	1019908	10.81	2.03	1.40	1.25	3.00	3.97	7.50	4.53	6.69	1.38	.25	.06	
1-3/8	13-1/2	1019917	1019926	13.75	2.25	1.53	1.38	3.31	4.43	8.28	5.01	7.21	1.50	.25	.13	
1-1/2	17	1019935	1019944	18.50	2.38	1.66	1.50	3.62	4.87	9.05	5.38	7.73	1.62	.25	.13	
1-3/4	25	1019953	1019962	31.40	2.88	2.04	1.75	4.19	5.82	10.97	6.38	9.33	2.12	.25	.13	
2	35	1019971	1019980	46.75	3.25	2.30	2.10	5.00	6.82	12.74	7.25	10.41	2.36	.25	.13	
2-1/2	55	1019999	1020004	85.00	4.12	2.80	2.63	5.68	8.07	14.85	9.38	13.58	2.63	.25	.25	
3	† 85	1020013	-	124.25	5.00	3.25	3.00	6.50	8.56	16.87	11.00	15.13	3.50	.25	.25	

* NOTE: Maximum Proof Load is 2.0 times the Working Load Limit. Minimum Ultimate Strength is 6 times the Working Load Limit. For Working Load Limit reduction due to side loading applications, see page 74.

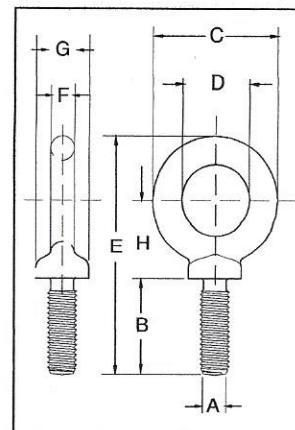
† Individually Proof Tested with certification.

‡ Furnished in Anchor style only and furnished with Round Head Bolts with welded handles.



S-279 / M-279
Shoulder Type
Machinery
Eye Bolts

- Forged Steel - Quenched & Tempered.
- Working Load Limits shown are for in-line pull. For angle loading, see page 200.
- Fatigue rated at 1-1/2 times the Working Load Limit at 20,000 cycles.
- Recommended for in-line pull.
- S-279 threaded UNC.
- M-279 metric threaded.
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, these bolts meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.



Fatigue Rated



S-279 UNC Shoulder Type Machinery Eye Bolts

Size (in.)	S-279 Stock No.	Working Load Limit (lbs.)*	Weight Per 100 (lbs.)	Dimensions (in.)							
				A** Thread	B	C	D	E	F	G	H
1/4 x 1	9900182	650	5.00	1/4 - 20	1.02	1.13	.75	2.29	.19	.53	.77
5/16 x 1-1/8	9900191	1200	9.00	5/16 - 18	1.15	1.38	.88	2.74	.25	.59	.95
3/8 x 1-1/4	9900208	1550	15.00	3/8 - 16	1.27	1.62	1.00	3.07	.31	.69	1.05
1/2 x 1-1/2	9900217	2600	28.00	1/2 - 13	1.53	1.95	1.19	3.70	.38	.91	1.27
5/8 x 1-3/4	9900226	5200	55.00	5/8 - 11	1.79	2.38	1.38	4.45	.50	1.13	1.53
3/4 x 2	9900235	7200	96.00	3/4 - 10	2.05	2.76	1.50	5.07	.63	1.38	1.71
7/8 x 2-1/4	9900244	10600	154.00	7/8 - 9	2.31	3.25	1.75	5.87	.75	1.56	2.00
1 x 2-1/2	9900253	13300	238.00	1 - 8	2.57	3.76	2.00	6.66	.88	1.81	2.30
1-1/8 x 2-3/4	9900257	15000	320.00	1-1/8 - 7	2.75	4.19	2.25	7.20	.97	2.06	2.35
1-1/4 x 3	9900262	21000	399.00	1-1/4 - 7	3.09	4.50	2.50	7.95	1.00	2.28	2.73
1-1/2 x 3-1/2	9900271	24000	720.00	1-1/2 - 6	3.60	5.50	3.00	9.49	1.25	2.75	3.28
1-3/4 x 3-3/4	9900280	34000	1040.00	1-3/4 - 5	3.75	6.26	3.50	10.48	1.38	3.00	3.60
2 x 4	9900289	42000	1880.00	2 - 4-1/2	4.00	7.62	4.00	12.31	1.81	3.38	4.50
2-1/2 x 5	9900298	65000	3250.00	2-1/2 - 4	5.00	8.76	4.50	14.88	2.12	4.25	5.50

*Ultimate Load is 5 times the Working Load Limit. Maximum Proof Load is 2 times the Working Load Limit. ** All bolts threaded UNC.



M-279 Metric

Size (mm)	M-279 Stock No.	Working Load Limit (kg)*	Weight Each (kg)	Dimensions (mm)							
				A** Thread	B	C	D	E	F	G	H
M6 x 13	1045753	200	.03	M6 x 1.0	13.0	28.7	19.1	47.0	4.9	13.5	19.6
M8 x 13	1045789	400	.05	M8 x 1.25	13.0	35.1	22.4	54.8	6.4	15.0	24.1
M10 x 17	1045833	640	.07	M10 x 1.5	17.0	41.1	25.4	64.3	7.9	17.5	26.5
M12 x 20.5	1045869	1000	.11	M12 x 1.75	20.5	49.5	30.2	77.7	9.7	23.1	32.8
M16 x 27	1045913	1800	.25	M16 x 2.0	27.0	60.5	35.1	96.0	12.7	28.7	38.9
M20 x 30	1045995	2500	.42	M20 x 2.5	30.0	70.0	38.1	108	16.0	35.1	43.4
M24 x 36	1046029	4000	1.05	M24 x 3.0	36.0	95.5	51.0	142	22.4	46.0	58.4
M27 x 69.8	1046038	5000	1.42	M27 x 3.0	69.8	107	57.1	183	24.6	52.3	59.7
M30 x 45	1046075	6000	1.77	M30 x 3.5	45.0	114	63.5	171	25.4	58.0	69.3
M36 x 54	1046109	8500	3.12	M36 x 4.0	54.0	140	76.0	207	31.8	70.0	83.3
M42 x 95.2	1046118	14000	4.58	M42 x 4.5	95.2	159	88.9	266	35.0	76.2	91.4
M48 x 102	1046127	17300	8.71	M48 x 5.0	102	194	101	313	46.0	85.9	114
M64 x 127	1046136	29500	14.74	M64 x 6.0	127	223	114	378	53.8	108	140

*Ultimate Load is 5 times the Working Load Limit. Maximum Proof Load is 2 times the Working Load Limit. ** On Request: Special threading or as forged bolts for customer conversion.



EYE NUTS

Material: C-1030, Stainless Steel

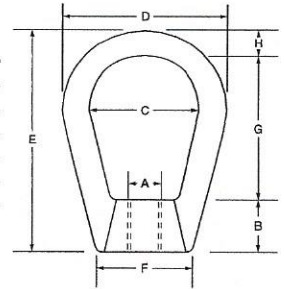
Threads: U.N.C. Class 2B, Right or Left Hand, Metric

Finish: Self-Colored, Galvanized, Plated, Electro-Polished

Options: Other Alloys; Heat Treating, Special Threading

Note: Not Recommended For Lifting

Part No. Tapped RH	Tap Size A	Thread Length B	I. D. C	O. D. D	Overall Length E	Bell F	I. D. Length G	Bail Thickness H	Rated Capacity (Lbs.)	Unit Weight (Lbs.)
NES05-01	3/8	5/8	1 1/4	2	2 1/2	7/8	1 1/2	3/8	2700	0.25
NES05-02	1/2	5/8	1 1/4	2	2 1/2	7/8	1 1/2	3/8	2700	0.30
NES10-01	5/8	3/4	1 1/2	2 1/2	3	1 3/8	1 3/4	1/2	5000	0.50
NES10-02	3/4	3/4	1 1/2	2 1/2	3	1 3/8	1 3/4	1/2	5000	0.55
NES20-01	7/8	1	2 1/4	4	5	1 9/16	3	7/8	10000	2.00
NES20-02	1	1	2 1/4	4	5	1 9/16	3	7/8	10000	2.00



Maximum Working Loads Has Been Estimated With A Safety Factor 5:1



CLEVELAND CITY FORGE

STRAND		Class A		Wire Rope		Class A		Crosby G-213 (** G-2130)							EAR PLATE						
Cable Diameter inches	Breaking Strength kips	Factor of Safety	Wire Rope Diameter inches	Breaking Strength kips	Factor of Safety	Nominal Shackle Size	Breaking Strength kips	Factor of Safety	Anchor Shackle		Pin Diameter in	Jaw Opening in	Plate Radius in	Plate Thickness in	Boss Thickness in	Boss Diameter in	Boss Weld in				
									Shackle	Shackle								Hole Diameter in	Shackle		
		2.2			2.2	5/8 3 1/4T	39	5.9		2.65	7/8	3/4	1 1/16	1 1/8	1/2	1 7/8	1/8				
			3/8	13	5.9	3/4	57	8.0		14.7	1	7/8	1 1/4	1 3/8	1/2	2 1/4	1/4				
			7/16	17.6	8.0	4 3/4T	57	10.5		21.5	1	7/8	1 1/4	1 3/8	1/2	2 1/4	1/4				
			1/2	23	10.5	4 3/4T	57	13.2		21.5	1	7/8	1 1/4	1 3/8	1/2	2 1/4	1/4				
1/2	30	13.6	9/16	29	13.2	7/8	78	16.4		29.4	1 1/8	1	1 7/16	1 5/8	1/2	2 3/4	1/4				
			5/8	36	16.4	6 1/2T	78	23.6		29.4	1 1/8	1	1 7/16	1 5/8	1/2	2 3/4	1/4				
5/8	48	21.8	3/4	52	23.6	1	102	31.8		38.5	1 1/4	1 1/8	1 11/16	1 7/8	3/4	3 1/4	1/4				
3/4	68	30.9	7/8	70	31.8	1 1/4	144	41.4		54.3	1 1/2	1 3/8	2 1/32	2 1/4	7/8	3 3/4	1/4				
7/8	92	41.8	1	91	41.4	1 3/8	162	52.7		61.1	1 5/8	1 1/2	2 1/4	2 3/4	1	4 5/8	5/16				
			1 1/8	116	52.7	1 1/2	204	65.5		77.0	1 3/4	1 5/8	2 3/8	3	1	5	5/16				
1	122	55.5	1 1/4	144	65.5	1 3/4	300	79.5		113.2	2 1/8	2	2 7/8	3 3/8	1 1/8	5 5/8	5/16				
			1 3/8	175	79.5	2 1/4	300	94.5		113.2	2 1/8	2	2 7/8	3 3/8	1 3/8	5 7/8	5/16				
1 1/4	192	87.3	1 1/2	208	94.5	2	420	130.0		158.5	2 3/8	2 1/4	3 1/4	1 1/2	3/4	6	5/16				
1 3/8	232	105.5	1 3/4	286	130.0	2 1/2	660	169.1		249.1	2 7/8	2 3/4	4 1/8	1 5/8	1 1/8	7 5/8	5/16				
1 3/4	376	170.9	2	372	169.1	2 1/2	660	222.7		249.1	2 7/8	2 3/4	4 1/8	2 1/4	3/4	8 1/4	5/16				
2	490					3	850			320.8	3 3/8	3 1/4	5	2 3/4	1	9 1/4	5/16				

FOR INFORMATION ONLY - NOT FOR CONSTRUCTION																							
Column Size	Section Modulus in.^3	Maximum Moment in.-kip	Mast Base Moment in.-kip	Moment at top or Earth kip ft	WRPE cubic yards	2' - 0"		Footing Vertical Reinf.	J cubic yards	2' - 6"		Footing Vertical Reinf.	K cubic yards	3' - 0"		Footing Vertical Reinf.	L cubic yards	3' - 6"		Footing Vertical Reinf.	M cubic yards	4' - 0"	
						depth feet	Minimum			depth feet	Minimum			depth feet	Minimum			depth feet	Minimum			depth feet	Minimum
46 ksi																							

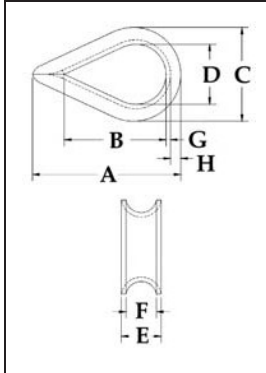
Wire Rope Thimbles

G-411



- Hot Dip galvanized steel.
- The standard choice for light duty applications and loading conditions.

G-411 meets the performance requirements of Federal Specification FF-T-276b Type II, except for those provisions required of the contractor. For additional information, see page 391.



Standard Wire Rope Thimbles

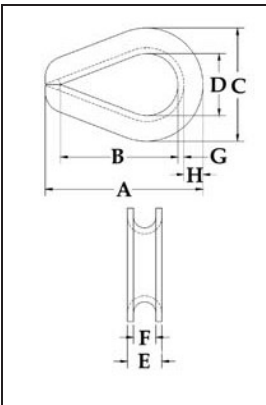
Rope Dia.		G-411 Stock No.	Weight Per 100 (lbs.)	Dimensions (in.)							
(in.)	(mm)			A	B	C	D	E	F	G	H
1/8	3-4	1037256	3.50	1.94	1.31	1.06	.69	.25	.16	.05	.13
3/16	5	1037274	3.50	1.94	1.31	1.06	.69	.31	.22	.05	.13
1/4	6-7	1037292	3.50	1.94	1.31	1.06	.69	.38	.28	.05	.13
5/16	8	1037318	4.00	2.13	1.50	1.25	.81	.44	.34	.05	.13
3/8	9-10	1037336	6.70	2.38	1.63	1.47	.94	.53	.41	.06	.16
1/2	11-13	1037354	12.50	2.75	1.88	1.75	1.13	.69	.53	.08	.19
5/8	16	1037372	34.50	3.50	2.25	2.38	1.38	.91	.66	.13	.34
3/4	18-20	1037390	47.10	3.75	2.50	2.69	1.63	1.08	.78	.14	.34
7/8	22	1037416	84.60	5.00	3.50	3.19	1.88	1.27	.94	.16	.44
1	24-26	1037434	97.50	5.69	4.25	3.75	2.50	1.39	1.06	.16	.41
1-1/8 - 1-1/4	28-32	1037452	175.00	6.25	4.50	4.31	2.75	1.75	1.31	.22	.50

G-414



- Available in Hot Dip galvanized or Stainless Steel (Type 304).
- Stainless steel recommended for more corrosive environments where greater protection is required.
- Greater protection against wear and deformation of the wire rope eye.
- Longer service life.

G-414 meets the performance requirements of Federal Specification FF-T-276b Type III, except for those provisions required of the contractor. For additional information, see page 391.



Extra Heavy Wire Rope Thimbles

Rope Dia.		Stock No.		Weight Per 100 (lbs.)	Dimensions (in.)							
(in.)	(mm)	G-414 Galv.	SS-414 Stainless		A	B	C	D	E	F	G	H
* 1/4	6-7	1037639	1037960	6.50	2.19	1.62	1.50	.88	.41	.28	.06	.25
* 5/16	8	1037657	1037988	11.80	2.50	1.88	1.81	1.06	.50	.34	.08	.30
* 3/8	9-10	1037675	1038004	21.60	2.88	2.12	2.12	1.12	.63	.41	.11	.39
7/16	11-12	1037693	-	34.70	3.25	2.38	2.38	1.25	.72	.47	.12	.45
* 1/2 - 9/16	13-15	1037719	1038022	51.00	3.62	2.75	2.75	1.50	.89	.59	.15	.48
* 5/8	16	1037755	1038040	75.70	4.25	3.25	3.12	1.75	1.00	.66	.16	.53
* 3/4	18-20	1037773	1038068	158.10	5.00	3.75	3.81	2.00	1.22	.78	.22	.69
7/8	22	1037791	-	177.80	5.50	4.25	4.25	2.25	1.38	.94	.22	.78
1	24-26	1037817	-	313.90	6.12	4.50	4.75	2.50	1.56	1.06	.25	.88
1-1/8 - 1-1/4	28-32	1037835	-	400.00	7.00	5.12	5.88	2.88	1.88	1.31	.25	1.25
1-1/4 - 1-3/8	32-35	1037853	-	886.00	9.08	6.50	6.81	3.50	2.25	1.44	.37	1.29
1-3/8 - 1-1/2	35-38	1037871	-	1294.80	9.00	6.25	7.12	3.50	2.62	1.56	.50	1.31
1-5/8	40	1037899	-	1700.00	11.25	8.00	8.12	4.00	3.00	1.72	.50	1.38
1-3/4	44	1037915	-	1775.00	12.19	9.00	8.50	4.50	3.06	1.84	.50	1.50
1-7/8 - 2	48-52	1037933	-	2775.00	15.12	12.00	10.38	6.00	3.38	2.09	.50	1.69
2-1/4	56	1037951	-	3950.00	17.50	14.00	11.88	7.00	3.88	2.38	.62	1.82

* SS-414 sizes available in stainless steel type 304.

CABLE & COMPONENTS

Wire Rope Clips

The following instructions, supplied by the Wire Rope Technical Board, will result in an approximate 80% efficiency rating when the clips are applied as instructed, on GAC, SSAC, RRL or RLL, 6 x 19 class or 6 x 37 class, fiber core or IWRC, non-Seale type construction wire rope. If applied to vinyl coated ropes, vinyl must first be stripped from clip connection area.

How to Apply Clips

1. Turn back the specified amount of rope from the thimble. Apply the first clip one clip width from the dead end of the wire rope (U-bolt over dead end - live end rests in clip saddle). Tighten nuts evenly to recommended torque.
2. Apply the next clip as near to the loop as possible. Turn on nuts firmly but do not tighten.
3. Space additional clips, if required, equally between the first two. Tighten on nuts - take up rope slack - tighten all nuts evenly on all clips to recommended torque.
4. NOTICE! Apply the initial load and retighten nuts to the recommended torque. Rope will stretch and be reduced in diameter when loads are applied. Inspect periodically and retighten to recommended torque.



Right Way - For Maximum Rope Strength



Wrong Way -
Clips Staggered



Wrong Way -
Clips Reversed



⚠ WARNING

Failure to make a termination in accordance with aforementioned instructions, or failure to periodically check and retighten to the recommended torque, may result in death or serious injury.

Drop Forged Wire Rope Clips

Rope Dia. (in.)	Minimum Number of Clips	Rope Turn-back (in.)	Torque (ft./lbs.)	Weight Per 100 Pieces (lbs.)
1/8	2	3 1/4	4 1/2	6
3/16	2	3 3/4	7 1/2	10
1/4	2	4 3/4	15	18
5/16	2	5 1/4	30	30
3/8	2	6 1/2	45	47
7/16	2	7	65	76
1/2	3	11 1/2	65	80
9/16	3	12	95	104
5/8	3	12	95	106
3/4	4	18	130	150
7/8	4	19	225	212
1	5	26	225	250
1 1/8	6	34	225	280
1 1/4	7	44	360	415
1 3/8	7	44	360	460
1 1/2	8	54	360	530

Malleable Wire Rope Clips

Rope Dia. (in.)	Minimum Number of Clips	Rope Turn-back (in.)	Torque (ft./ lbs.)	Quantity Per Bag	Weight Per Bag (lbs.)
1/8	3	5	3	200	10
3/16	3	6	5	150	12
1/4	3	7	15	100	12
5/16	3	8	15	100	15
3/8	3	10	30	50	11

Note: Malleable clips are not to be used for overhead lifting. Use in light duty, non-critical applications only.

CROSBY CLIPS WARNINGS AND APPLICATION INSTRUCTIONS



WARNING

- Failure to read, understand, and follow these instructions may cause death or serious injury.
- Read and understand these instructions before using clips.
- Match the same size clip to the same size wire rope.
- Prepare wire rope end termination only as instructed.
- Do not use with plastic coated wire rope.
- Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque (See Table 1, this page).

Efficiency ratings for wire rope end terminations are based upon the catalog breaking strength of wire rope. The efficiency rating of a properly prepared loop or thimble – eye termination for clip sizes 1/8" through 7/8" is 80%, and for sizes 1" through 3-1/2" is 90%.

The number of clips shown (see Table 1) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 37 Class, FC or IWRC; IPS or XIP, XXIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 1 inch and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation - resistant RRL wire rope, 8 x 19 Class, IPS, XIP, XXIP sizes 1-1/2 inch and smaller; and to rotation-resistant RRL wire rope, 19 x 7 Class, IPS, XIP, XXIP sizes 1-3/4 inch and smaller.

For other classes of wire rope not mentioned above, we recommend contacting Crosby Engineering at the address or telephone number on the back cover to ensure the desired efficiency rating.

For elevator, personnel hoist, and scaffold applications, refer to ANSI A17.1 and ANSI A10.4. These standards do not recommend U-Bolt style wire rope clip terminations. The style wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

1. Refer to Table 1 in following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope – live end rests in saddle (Never saddle a dead horse!). Use torque wrench to tighten evenly, alternate from one nut to the other until reaching the recommended torque.



Figure 1

2. When two clips are required, apply the second clip as near the loop or thimble as possible. Use torque wrench to tighten evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. Proceed to Step 3.



Figure 2

3. When three or more clips are required, space additional clips equally between first two - take up rope slack - use torque wrench to tighten on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque.



Figure 3

4. If a pulley (sheave) is used in place of a thimble, add one additional clip. Clip spacing should be as shown.

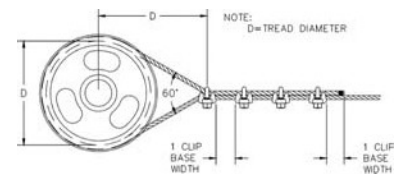


Figure 4

5. WIRE ROPE SPlicing PROCEDURES:

The preferred method of splicing two wire ropes together is to use inter-locking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 5).

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the



Figure 5

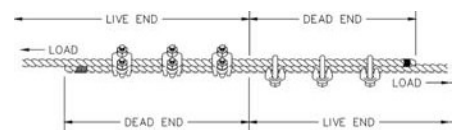


Figure 6

turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.

6. IMPORTANT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and use torque wrench to retighten to recommended torque. In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size (in.)	Rope Size (in.)	Minimum No. of Clips	Amount of Rope to Turn Back in Inches	* Torque in Ft.Lbs.
1/8	1/8	2	3-1/4	4.5
3/16	3/16	2	3-3/4	7.5
1/4	1/4	2	4-3/4	15
5/16	5/16	2	5-1/4	30
3/8	3/8	2	6-1/2	45
7/16	7/16	2	7	65
1/2	1/2	3	11-1/2	65
9/16	9/16	3	12	95
5/8	5/8	3	12	95
3/4	3/4	4	18	130
7/8	7/8	4	19	225
1	1	5	26	225
1-1/8	1-1/8	6	34	225
1-1/4	1-1/4	7	44	360
1-3/8	1-3/8	7	44	360
1-1/2	1-1/2	8	54	360
1-5/8	1-5/8	8	58	430
1-3/4	1-3/4	8	61	590
2	2	8	71	750
2-1/4	2-1/4	8	73	750
2-1/2	2-1/2	9	84	750
2-3/4	2-3/4	10	100	750
3	3	10	106	1200
3-1/2	3-1/2	12	149	1200

If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4.

If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.

*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

Rev. 1

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Forged Wire Rope Clips



**SEE APPLICATION AND
WARNING INFORMATION**

Para Español: www.thecrosbygroup.com

On Page 50

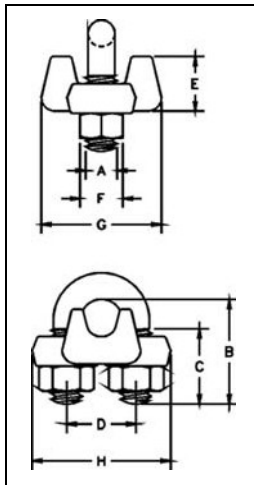
G-450



- Each base has a Product Identification Code (PIC) for material traceability, the name CROSBY or CG, and a size forged into it.
- Based on the catalog breaking strength of wire rope, Crosby wire rope clips have an efficiency rating of 80% for 1/8" - 7/8" sizes, and 90% for sizes 1" through 3-1/2".
- Entire Clip-Galvanized to resist corrosive and rusting action.
- Sizes 1/8" through 2-1/2" and 3" have forged bases.
- All Clips are individually bagged or tagged with proper application instructions and warning information.
- Clip sizes up through 1-1/2" have rolled threads.
- Crosby products meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements. Importantly, Crosby products meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Look for the Red-U-Bolt®, your assurance of Genuine Crosby Clips.

Crosby Clips, all sizes 1/4" and larger, meet the performance requirements of Federal Specification FF-C-450 TYPE 1 CLASS 1, except for those provisions required of the contractor. For additional information, see page 391.

G-450 Crosby® Clips



Rope Size		G-450 Stock No.	Std. Package Qty.	Weight Per 100 (lbs.)	Dimensions (in.)							
(in.)	(mm)				A	B	C	D	E	F	G	H
1/8"	3-4*	1010015	100	6	.22	.72	.44	.47	.37	.38	.81	.99
3/16"	5*	1010033	100	10	.25	.97	.56	.59	.50	.44	.94	1.18
1/4	6-7	1010051	100	19	.31	1.03	.50	.75	.66	.56	1.19	1.43
5/16	8	1010079	100	28	.38	1.38	.75	.88	.73	.69	1.31	1.66
3/8	9-10	1010097	100	48	.44	1.50	.75	1.00	.91	.75	1.63	1.94
7/16	11	1010113	50	78	.50	1.88	1.00	1.19	1.13	.88	1.91	2.28
1/2	12-13	1010131	50	80	.50	1.88	1.00	1.19	1.13	.88	1.91	2.28
9/16	14-15	1010159	50	109	.56	2.25	1.25	1.31	1.34	.94	2.06	2.50
5/8	16	1010177	50	110	.56	2.25	1.25	1.31	1.34	.94	2.06	2.50
3/4	18-20	1010195	25	142	.62	2.75	1.44	1.50	1.39	1.06	2.25	2.84
7/8	22	1010211	25	212	.75	3.12	1.62	1.75	1.58	1.25	2.44	3.16
1	24-26	1010239	10	252	.75	3.50	1.81	1.88	1.77	1.25	2.63	3.47
1-1/8	28-30	1010257	10	283	.75	3.88	2.00	2.00	1.91	1.25	2.81	3.59
1-1/4	32-34	1010275	10	438	.88	4.44	2.22	2.34	2.17	1.44	3.13	4.13
1-3/8	36	1010293	10	442	.88	4.44	2.22	2.34	2.31	1.44	3.13	4.19
1-1/2	38	1010319	10	544	.88	4.94	2.38	2.59	2.44	1.44	3.41	4.44
1-5/8	41-42	1010337	Bulk	704	1.00	5.31	2.62	2.75	2.66	1.63	3.63	4.75
1-3/4	44-46	1010355	Bulk	934	1.13	5.75	2.75	3.06	2.92	1.81	3.81	5.24
2	48-52	1010373	Bulk	1300	1.25	6.44	3.00	3.38	3.03	2.00	4.44	5.88
2-1/4	56-58	1010391	Bulk	1600	1.25	7.13	3.19	3.88	3.19	2.00	4.56	6.38
2-1/2	62-65	1010417	Bulk	1900	1.25	7.69	3.44	4.13	3.69	2.00	4.69	6.63
** 2-3/4	** 68-72	1010435	Bulk	2300	1.25	8.31	3.56	4.38	4.88	2.00	5.00	6.88
3	75-78	1010453	Bulk	3100	1.50	9.19	3.88	4.75	4.44	2.38	5.31	7.61
** 3-1/2	** 85-90	1010426	Bulk	4000	1.50	10.75	4.50	5.50	6.00	2.38	6.19	8.38

* Electro-plated U-Bolt and Nuts. ** 2-3/4" and 3-1/2" base is made of cast steel.

SS-450

- Each base has a Product Identification Code (PIC) for material traceability, the name CROSBY or "CG", and a size forged into it.
- Entire clip is made from 316 Stainless Steel to resist corrosive and rusting action.
- All components are Electro-Polished.
- All Clips are individually bagged or tagged with proper application instructions and warning information.

SS-450 Stainless Steel Wire Rope Clips



Rope Size		SS-450 Stock No.	Std. Package Qty.	Weight Per 100 (lbs.)	Dimensions (in.)							
(in.)	(mm)				A	B	C	D	E	F	G	H
1/8	3-4	1011250	Bulk	6	.22	.72	.44	.47	.41	.38	.81	.94
3/16	5	1011261	Bulk	10	.25	.97	.56	.59	.50	.44	.94	1.16
1/4	6-7	1011272	Bulk	20	.31	1.03	.50	.75	.66	.56	1.19	1.44
3/8	9-10	1011283	Bulk	47	.44	1.50	.75	1.00	.91	.75	1.63	1.94
1/2	12-13	1011305	Bulk	77	.50	1.88	1.00	1.19	1.13	.88	1.91	2.28
5/8	16	1011327	Bulk	106	.56	2.38	1.25	1.31	1.34	.94	2.06	2.50

Sheave Size & Wire Rope Strength

Strength Efficiency

Bending wire rope reduces its strength. To account for the effect of bend radius on wire rope strength when selecting a sheave, use the table below:

Ratio A	Strength Efficiency Compared to Catalog Strength in %
40	95
30	93
20	91
15	89
10	86
8	83
6	79
4	75
2	65
1	50

$$\text{Ratio A} = \frac{\text{Sheave Diameter}}{\text{Rope Diameter}}$$

Example

To determine the strength efficiency of 1/2" diameter wire rope using a 10" diameter sheave:

$$\text{Ratio A} = \frac{10" (\text{sheave diameter})}{1/2" (\text{wire rope diameter})} = 20$$

Refer to ratio A of 20 in the table then check the column under the heading "Strength Efficiency Compared to Catalog Strength in %"...91% strength efficiency as compared to the catalog strength of wire rope.

Fatigue Life

Repeated bending and straightening of wire rope causes a cyclic change of stress called "fatiguing." Bend radius affects wire rope fatigue life. A comparison of the relative effect of sheave diameter on wire rope fatigue life can be determined as shown below:

Ratio B	Relative Fatigue Bending Life
30	10.0
25	6.6
20	3.8
18	2.9
16	2.1
14	1.5
12	1.1

$$\text{Ratio B} = \frac{\text{Sheave Diameter}}{\text{Rope Diameter}}$$

$$\text{Relative Fatigue Bending Life} = \frac{\text{Relative Fatigue Bending Life Sheave \#1}}{\text{Relative Fatigue Bending Life (Sheave \#2)}}$$

Example

To determine the extension of fatigue life for a 3/4" wire rope using a 22.5" diameter sheave versus a 12" diameter sheave:

$$\text{Ratio B} = \frac{22.5" (\text{sheave diameter})}{3/4" (\text{wire rope diameter})} = 30$$

$$\text{Ratio B} = \frac{12" (\text{sheave diameter})}{3/4" (\text{wire rope diameter})} = 16$$

The relative fatigue bending life for a ratio B of 16 is 2.1 (see above Table) and ratio B of 30 is 10.

$$\text{Relative Fatigue Bending Life} = \frac{10}{2.1} = 4.7$$

Therefore, we expect extension of fatigue life using a 22.5" diameter sheave to be 4.7 times greater than that of a 12" diameter sheave.

Recommended Bend Radius

To obtain reasonable life from your rope, you must choose the proper diameter rope for your application. In general, the larger the size of the drum or pulley with respect to the wire diameter, the longer the service life.

The tables below provide the minimum recommended pulley diameter. The bend radius of the rope is approximately half of the recommended pulley tread diameter.

If you don't see what you're looking for here, contact us (sales@loosco.com) and one of our wire rope experts will be able to assist you.

Rope Constructions 3x7, 6x7, 6x42, 7x3, and 7x7		
Rope Diameter	Min. Recommended Pulley Diameter	Approx. Bend Radius
0.009"	3/8"	3/16"
0.014"	5/8"	5/16"
0.024"	1"	1/2"
0.027"	1 5/32"	37/64"
0.030"	1 9/32"	41/64"
0.031"	1 5/16"	21/32"
0.032"	1 11/32"	43/64"
0.035"	1 1/2"	3/4"
0.036"	1 17/32"	49/64"
0.047"	2"	1"
0.063"	2 5/8"	1 5/16"
0.075"	3 9/32"	1 41/64"
0.094"	3 15/16"	1 31/32"
0.125"	5 1/4"	2 5/8"
0.156"	6 9/16"	3 9/32"
0.188"	7 7/8"	3 15/16"
0.250"	10 1/2"	5 1/4"
0.313"	13 1/8"	6 9/16"
0.375"	15 3/4"	7 7/8"

Rope Constructions 6x19, 7x19, and 19x7		
Rope Diameter	Min. Recommended Pulley Diameter	Approx. Bend Radius
0.024"	19/32"	19/64"
0.027"	21/32"	21/64"
0.032"	25/32"	25/64"
0.036"	7/8"	7/16"
0.038"	15/16"	15/32"
0.047"	1 1/8"	9/16"
0.063"	1 1/2"	3/4"
0.094"	2 1/4"	1 1/8"
0.125"	3"	1 1/2"
0.156"	3 3/4"	1 7/8"
0.178"	4 1/2"	2 1/4"
0.219"	5 1/4"	2 5/8"
0.250"	6"	3"
0.313"	7 1/2"	3 3/4"
0.375"	9"	4 1/2"
0.438"	10 1/2"	5 1/4"
0.500"	12"	6"
0.563"	13 1/2"	6 3/4"
0.625"	15"	7 1/2"

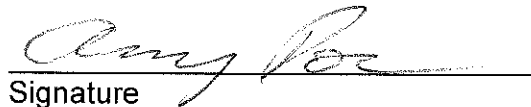
Rope Constructions 6x37 and 8x19		
Rope Diameter	Min. Recommended Pulley Diameter	Approx. Bend Radius
0.188"	2 1/4"	1 1/8"
0.250"	3"	1 1/2"
0.313"	3 3/4"	1 7/8"
0.375"	4 1/2"	2 1/4"
0.438"	5 1/4"	2 5/8"
0.500"	6"	3"
0.563"	6 3/4"	3 3/8"
0.625"	7 1/2"	3 3/4"



EXHIBIT "B"

BID SHEET		
PROJECT: Shade Sails for the Big Toy at Keizer Rapids Park OWNER: CITY OF KEIZER		
PROJECT	DESCRIPTION	AMOUNT
1	Sails #1, #3, and #4 – Columns 1, 2, 6, 7, 9, 10, 11, 12, 13 and 14 [BID AS SEPARATE PROJECT]	\$ \$136,132
2	Sails #2 and #5 – Columns 3, 4, 5, 8, 15 and 16 [BID AS SEPARATE PROJECT]	\$ \$88,634
	LESS Total dollar discount if both projects are completed at the same time	\$ \$15,286
	TOTAL bid for both projects if they are completed at the same time	\$ \$209,480

Company Name: Wyckam LLC
 Company Address: 7304 NE M L King Jr. Blvd, Portland, OR 97211
 Company Phone #: 503-729-6051
 Company Fax #: N/A
 Contact Name: Amy Poe
 Email Address: amy@wyckam.com


 Signature
 Amy Poe
 Printed Name

CITY COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND CITY COUNCIL MEMBERS

**THROUGH: CHRIS EPPLEY
CITY MANAGER**

**FROM: BILL LAWYER
PUBLIC WORKS DIRECTOR**

SUBJECT: PARKS VEHICLE PURCHASE

BACKGROUND:

The Public Works Department budgeted in the FY 19/20 Parks Services Fund for a vehicle. The new vehicle will be a 2019 Ford F-250 4x2 pickup truck. This vehicle will replace a 1999 Ford F-250 pickup truck. The purchase of this vehicle is identified in the Parks Priorities 3 to 5 year plan supported by the Parks and Recreation Advisory Board and the City Council.

Staff researched pricing for this vehicle and determined procurement through the Oregon Cooperative Procurement Program (ORCPP) provided the best price to the City. Purchase of this vehicle will be from Landmark Ford for a cost of \$28,716.64 with a trade in allowance for the 1999 Ford F-250 of \$1,000.00 which brings the final purchase price to \$27,716.64.

FISCAL IMPACT:

Funds are available in the FY 19/20 Parks Services Fund.

RECOMMENDATION:

Staff recommends City Council adopt the attached Resolution authorizing the City Manager to purchase a 2019 Ford F250 4x2 pickup truck from Landmark Ford for \$27,716.64 and trade in a 1999 Ford F-250 4x2 pickup.

Please contact me with any questions or concerns.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

AUTHORIZING THE CITY MANAGER TO PURCHASE 2019
FORD F-250 VEHICLE FOR THE PARKS DIVISION OF THE
PUBLIC WORKS DEPARTMENT AND AUTHORIZING
DISPOSITION OF SURPLUS PROPERTY

WHEREAS, the City of Keizer has funds budgeted in the 2019-2020 Parks
Services Fund to purchase a new vehicle to replace a 1999 Ford 250 pickup used
primarily by the Parks Division;

WHEREAS, the City has determined procurement through the Oregon
Cooperative Procurement Program (ORCPP) provided the best price of \$27,716.64 for a
2019 Ford F-250 vehicle after the trade in allowance for the 1999 Ford F-250 of
\$1,000.00 from Landmark Ford;

WHEREAS, Ordinance No. 2008-579 allows the disposal of City-owned surplus
property by several methods, including any method that in the City's discretion is in the
best interests of the City;

WHEREAS, staff has recommended the disposal of the 1999 Ford 250 as surplus
property because it is no longer useful or needed;

WHEREAS, the City Manager approves of the disposal of the 1990 Ford 250 as
surplus property;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the City

1 Manager is hereby authorized to purchase a 2019 Ford F-250 vehicle from Landmark
 2 Ford for a purchase price up to \$27,716.64 after trade-in credits described below.

3 BE IT FURTHER RESOLVED that the City Council of the City of Keizer
 4 declares the 1999 Ford -250 as surplus property.

5 BE IT FURTHER RESOLVED that the 1999 Ford F-250 be disposed of by use as
 6 a trade-in against the 2019 F-250 vehicle with a value of \$1,000.00.

7 BE IT FURTHER RESOLVED that the City Manager is authorized to take any
 8 and all necessary acts to effectuate the purchase of the 2019 Ford F-250 vehicle and the
 9 disposal of the surplus property.

10 BE IT FURTHER RESOLVED that this Resolution shall take effect immediately
 11 upon the date of its passage.

12 PASSED this _____ day of _____, 2019.

13

14 SIGNED this _____ day of _____, 2019.

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 Mayor

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 City Recorder



MINUTES
KEIZER CITY COUNCIL WORK SESSION
Monday, July 8, 2019
Keizer Civic Center, Council Chambers
Keizer, Oregon

**CALL TO
ORDER**

Mayor Clark called the meeting to order at 6:00 pm. Roll call was taken as follows:

Present:

Cathy Clark, Mayor
 Kim Freeman, Councilor
 Marlene Parsons, Councilor (phone)
 Laura Reid, Councilor
 Roland Herrera, Councilor
 Elizabeth Smith, Councilor
 Dan Kohler, Councilor

Staff:

Chris Eppley, City Manager
 Shannon Johnson, City Recorder
 Tracy Davis, City Recorder

City Attorney Shannon Johnson announced that Council Procedures do not allow for attendance via phone so Council would need to suspend the rules to allow Councilor Parsons to participate in the meeting via telephone.

Councilor Freeman moved to suspend the rules so that Councilor Parsons could participate in the meeting by phone. Councilor Herrera seconded.

Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

DISCUSSION

**a. Charter
Review
Committee**

Mr. Johnson reviewed his staff report and went through the options.

Mayor Clark clarified the Charter Review Committee options and the importance of the City Charter. City Manager Chris Eppley explained the role of the Charter.

Discussion followed regarding committee appointment processes.

Mayor Clark then explained that one of the recommendations that Council will make to the Charter Review Committee will be to remove Chapter 44 and make sure the language is updated throughout the document. The committee will do the detail work and then bring Council their findings.

Council will develop the ballot title.

It was noted that the Charter covers all residents – voting or not - so it is important to have as many different perspectives on the committee to include a wide variety of voices.

Mayor Clark noted that she would be appointing two councilors to be on the Charter Review Committee and that the Volunteer Coordinating Committee had recommended five qualified people. At this time those volunteers are required to be registered voters. This is an option of Council and can be altered with a clear, equitable reason.

Councilors shared their thoughts regarding requirements of Charter Review Committee members, the 'elector' vs. 'citizen' requirement, the Volunteer Coordinating Committee process, Councilor expectations of their appointee to the VCC, and input they had received regarding the elector requirement.

Mayor Clark noted that because there was a lot of sentiment toward changing the requirement from 'elector' to 'resident of the city', this matter would be addressed at the July 15 Council meeting.

The next item to be addressed would be how to make the change in the committee. Following discussion on the options, Mayor Clark noted that the options that would be brought to Council on the 15th would be a direct appointment for a position or to reopen the recruitment for two positions through the VCC. Council will choose whether or not to accept the recommendation of the VCC for the five members and then provide direction for the other two positions or possibly send all recommendations back and begin recruitment anew.

ADJOURNMENT Mayor Clark adjourned the meeting at 7:14 p.m.

MAYOR:

APPROVED:

Cathy Clark

Debbie Lockhart, Deputy City Recorder

COUNCIL MEMBERS

Councilor #1 – Laura Reid

Councilor #4 – Roland Herrera

Councilor #2 – Kim Freeman

Councilor #5 – Elizabeth Smith

Councilor #3 – Marlene Parsons

Councilor #6 – Daniel R. Kohler

Minutes approved: _____



MINUTES
KEIZER CITY COUNCIL
Monday, July 15, 2019
Keizer Civic Center, Council Chambers
Keizer, Oregon

CALL TO ORDER

Mayor Clark called the meeting to order at 7:00 pm. Roll call was taken as follows:

Present:

Cathy Clark, Mayor
Kim Freeman, Councilor
Marlene Parsons, Councilor
Roland Herrera, Councilor
Daniel Kohler, Councilor
Elizabeth Smith, Councilor
Laura Reid, Councilor

Staff:

Chris Eppley, City Manager
Shannon Johnson, City Attorney
Nate Brown, Community Development
Bill Lawyer, Public Works Director
John Teague, Police Chief
Tim Wood, Finance Director
Tracy Davis, City Recorder

FLAG SALUTE

Mayor Clark led the pledge of allegiance.

**SPECIAL ORDERS
OF BUSINESS**

Council wished City Recorder Tracy Davis a happy birthday.

**COMMITTEE
REPORTS**

**a. Volunteer of the
Quarter Award**

Mayor Clark praised Darrell Richardson for all he has done for the City over the past years and summarized letters submitted by Randy & Cheri Miller, Richard Walsh, Clint Holland and Garry Whalen. Matt Lawyer, Clint Holland, Terry Moore, Barb Smith and John Hinkey shared their grateful thoughts regarding Mr. Richardson as well. Mayor Clark then presented a clock and certificate of appreciation to Mr. Richardson.

Mr. Richardson announced that he had been in the house by Sunset Park for 41 years. He shared his plans for the future which include spending time with his great grandchildren in Texas.

Traffic Safety/Bikeways/Pedestrian Committee report: David Dempster referred Council to the handout he had prepared which included the recommendations to Council that the Committee had made and described the issues which were brought to the committee by residents near Honeysuckle and Fifth. Pat Fisher provided additional information and also suggested that when the sidewalk obstruction issue is addressed, Council develop a plan to educate the community on where to put their trash receptacles so that they don't block sidewalks or bike lanes.

Public Works Director Bill Lawyer announced that he supported painting the curbs as requested by the committee but did not support the pedestrian flag program because ODOT has indicated that it has failed in other areas.

Councilor Kohler reported that the traffic problem is really only for three months out of the year and the solutions proposed would be year round and possibly unwelcome by the neighborhood.

Council agreed by consensus to direct staff to paint the curbs as requested by the Committee. Mr. Lawyer indicated that he would contact the swim club prior to painting. Mayor Clark urged him to consider painting a pickup/drop off zone by the pool entrance as well.

Planning Commission Report: Mark Caillier reported on the recent Planning Commission Public Hearing noting that they voted to recommend that Council adopt the text amendment proposed by staff which would allow flexibility in Area D of Keizer Station.

Parks Board Report: Matt Lawyer shared information from the Parks Board including future grant requests for an Eagle Scout project, new soccer goals and more exercise equipment.

Kevin Cameron, Marion County Commissioner, urged Council to approve the room fee waiver for the 11th Annual Second Chance Breakfast.

PUBLIC TESTIMONY

Darrell Richardson, Keizer, announced that he was planning on selling his house and requested that the new owners be allowed to use City property to access the garages at the back of his property even though the agreement that he signed specifically states that the allowance is not transferable to any other property owner.

Mayor Clark responded that there is a signed agreement in place and to her knowledge it has been decided that the agreement will stand. Conversation ensued regarding the route that Mr. Richardson uses to get to his garage and control of vehicles driving on park property.

Shirley DeShon, Keizer, wife of Darrell Richardson, urged Council to reconsider their denial of this request, pointing out all the work that Mr. Richardson had put into the park without compensation. She suggested that even large corporations reconsider policy and protocol and urged Council to do the same.

Jim Taylor, Keizer, explained that he was on Council when this issue was originally addressed. He pointed out that originally Darrell and Shirley had not planned on selling but circumstances have changed and they would lose money by selling the property without access to the buildings at the back. He suggested an agreement for the new owner that would allow access to the buildings but have conditions that, if

broken, would result in automatic termination of the agreement.

Mayor Clark suggested that the new property owner could work with the City on options on how to adapt the property and alternatives to protect the trees.

PUBLIC HEARING

a. Proposed Text Amendments to the Keizer Development Code Section 2.118 (Urban Transition) – Modifying the Standards of the Urban Transition (UT) Zone

Mayor Clark opened the Public Hearing.

Community Development Director Nate Brown summarized his staff report. Mayor Clark commended staff for their efforts in reaching out to the property owners that would be affected by this amendment.

With no testimony, Mayor Clark closed the Public Hearing.

Councilor Freeman moved to direct staff to prepare an ordinance with findings to adopt the proposed revisions to the Urban Transition Zone 2.118. Councilor Herrera seconded. Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

ADMINISTRATIVE ACTION

a. Waiver of Community Center Rental Fee – Marion County Reentry Initiative Annual Community Breakfast

City Manager Chris Eppley read his staff report.

Councilor Freeman moved that the Keizer City Council grant the request for a complete rental fee waiver (room rental including staffing and security/cleaning deposit). Councilor Herrera seconded.

Councilors Herrera and Freeman and Mayor Clark praised the reentry program.

Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

b. RESOLUTION – Amending the Keizer Little League Park Long Range Planning Task Force; Amending R2018-2897; Repealing R2019-2945

City Attorney Shannon Johnson summarized his staff report.

Councilor Freeman moved that Keizer City Council adopt a Resolution Amending the Keizer Little League Park Long Range Planning Task Force; Amending R2018-2897; Repealing R2019-2945. Councilor Herrera seconded. Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

**c. RESOLUTION –
Adopting
Policies for
Keizer Parks
Youth Grant
Program**

Public Works Director Bill Lawyer read his staff report. Councilor Kohler provided additional information.

Councilor Freeman moved that Keizer City Council adopt a Resolution Adopting Policies for Keizer Parks Youth Grant Program. Councilor Herrera seconded. Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

**d. RESOLUTION –
Establishing
Charter Review
Committee;
Repeal of R2019
2977**

Mr. Johnson summarized his staff report.

Councilor Freeman moved that the Keizer City Council adopt Alternative B which is to create a nine member committee with seven members at large who must be residents of the city for at least six months prior to the date of the resolution. These members would be nominated by the Volunteer Coordinating Committee who would nominate two additional members. Councilor Herrera seconded.

Mayor Clark clarified that five members have already been recommended. Council is now asking the Volunteer Coordinating Committee to reopen the process and recruit *two additional members* changing the requirement from elector to resident.

Motion passed as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera and Smith (6)

NAYS: Kohler (1)

ABSTENTIONS: None (0)

ABSENT: None (0)

Councilor Freeman moved that the Keizer City Council send the matter to the Volunteer Coordinating Committee for recommendations for the two additional members. Councilor Herrera seconded.

Mr. Johnson explained that all recommendations will be brought to Council at one time. Mayor Clark noted that people who had applied before and not been chosen would be invited to be interviewed again and additional applicants would be accepted as well.

Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

CONSENT CALENDAR

- a. RESOLUTION – Authorizing the City Manager to Purchase a 2020 BMW R1250RT-P Motorcycle for Police Department
- b. Approval of July 1, 2019 City Council Regular Session Minutes

Mayor Clark pulled item b.

Councilor Freeman moved for approval of Item A of the Consent Calendar. Councilor Herrera seconded. Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)

NAYS: None (0)

ABSTENTIONS: None (0)

ABSENT: None (0)

Mayor Clark and Councilor Reid noted that they would abstain from voting on the Minutes because they were not at the meeting.

Councilor Freeman moved for approval of Item B of the Consent Calendar. Councilor Herrera seconded. Motion passed as follows:

AYES: Freeman, Parsons, Herrera, Smith and Kohler (5)

NAYS: None (0)

ABSTENTIONS: Clark and Reid (2)

ABSENT: None (0)

COUNCIL LIAISON REPORTS

Councilor Herrera reviewed events and meetings he had attended and announced upcoming ones. He also announced that C-TEC student Anthony Garcia took second place in the nation from C-TEC, and he (Herrera) was chosen by National Association of Latino Elected Officials for a scholarship to attend an emergency preparedness conference in southern California.

Council Parsons urged Councilors to attend the Keizer United luncheons, announced the upcoming Volunteer Coordinating Committee meeting and the Steak and Bacon Championships at Willow Lake Golf Center.

Councilor Smith announced that the carving of one of the cultural history poles has begun, the heritage center bell will be placed on top of it.

Councilor Freeman announced upcoming meetings and events and reported that she had attended the Marion County Fair.

Councilor Reid reported on meetings and events she had attended and announced the Shakespeare in the Park and the 5k Foot Pursuit race benefiting Special Olympics.

Councilor Kohler reviewed meetings and events he had attended. He noted that a business sustained some damage from volunteers putting up the Christmas decorations on River Road and that the business owner was directed to have it repaired and send the bill to the City which he did, but he has not received reimbursement. Councilor Freeman

responded that the Chamber had informed her that the business that repaired the damage had donated the repair cost. She suggested that a conversation be held between the Chamber and the City. Finance Director Tim Wood indicated that he would contact them.

Mayor Clark reported on events and meetings she had attended, announced upcoming ones, and urged everyone to register for National Night out.

OTHER BUSINESS Chief Teague announced upcoming events including Blast Camp, National Night Out and the 5k Foot Pursuit run.

Public Works Director Bill Lawyer updated Council on the River Road work being done and planned, announced that the Lockhaven/14th work would be starting soon and that Bair Park underbrush has been cleared.

Community Development Director Nate Brown provided details of the Planning Commission Public Hearing planned for August 14 and reported on the progress of the cultural history pole carving.

WRITTEN COMMUNICATIONS None

AGENDA INPUT **August 5, 2019 - 7:00 p.m.** ~ City Council Regular Session
August 12, 2019 - 6:00 p.m. ~ City Council Work Session - cancelled
August 19, 2019 - 7:00 p.m. ~ City Council Regular Session

ADJOURNMENT Mayor Clark adjourned the meeting at 9:05 p.m.

MAYOR:

APPROVED:

Cathy Clark

Debbie Lockhart, Deputy City Recorder

COUNCIL MEMBERS

Councilor #1 – Laura Reid

Councilor #4 – Roland Herrera

Councilor #2 – Kim Freeman

Councilor #5 – Elizabeth Smith

Councilor #3 – Marlene Parsons

Councilor #6 – Daniel R. Kohler

Minutes approved: _____

Written Communications/Testimony and Submitted Documents

Written
communication
8-5-19



Oregon

Kate Brown, Governor

Department of Transportation

Region 2 Headquarters

455 Airport Road SE Building B

Salem, Oregon 97301-5395

Telephone (503) 986-2600

Fax (503) 986-2630

DATE: July 15, 2019

TO: Salem River Crossing Project Partners

FROM: Sonny Chickering, Region 2 Manager *SPAC*

SUBJECT: Status of Salem River Crossing Project Documentation

ODOT Region 2 and Federal Highway Administration (FHWA) staff are working to prepare the final documentation for the Salem River Crossing project. As you know, in March the Salem City Council voted to not address issues raised in the Land Use Board of Appeals remand of the city's urban growth boundary amendment and related actions, vacating the land use approvals that were necessary to advance the project. Without these land use approvals, ODOT (pursuant to OAR 731-015-0075(3)) cannot publish a Final Environmental Impact Statement (FEIS) for the preferred alternative identified by the Project Oversight Team.

As a result of the above described action, ODOT and FHWA are preparing the final documentation (FEIS and Record of Decision (ROD)) for the No-build alternative. As we have informed you previously, we need to complete these actions and publish the FEIS and ROD prior to September 30 to avoid having to pay back federal funds expended in the development of the project. We are currently on course to complete these tasks. Within the next 2 weeks, ODOT and FHWA will announce (via notice in local newspapers) that a combined FEIS/ROD documenting the No-build alternative will be published and made available in late summer. Notice of the final documents will be provided by publication of a Notice of Availability in the Federal Register and through local media outlets.

Distribution List

Chuck Bennett, Mayor, City of Salem
Steve Powers, City Manager, City of Salem

Cathy Clark, Mayor, City of Keizer ✓
Chris Eppley, City Manager, City of Keizer

Kevin Cameron, Chair, Marion County Board of Commissioners
Jan Fritz, Chief Administrative Officer, Marion County

Craig Pope, Chair, Polk County Board of Commissioners
Greg Hansen, Administrative Officer, Polk County

cc:

Peter Fernandez, City of Salem
Julie Warncke, City of Salem
Nate Brown, City of Keizer
Austin McGuigan, Polk County
Phillip Ditzler, FHWA Oregon Division
Emily Cline, FHWA Oregon Division
Lisa Nell, ODOT Region 2
Anna Henson, ODOT Region 2
Dan Fricke, ODOT Region 2

*Replacement
Resolution
handed out
8-5-19*

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2019-_____

**AUTHORIZATION FOR SUPPLEMENTAL BUDGET - INTERFUND LOAN FROM
PARK IMPROVEMENT FUND TO PARK SERVICES FUND**

WHEREAS ORS 294 provides that a supplemental budget may be adopted when an occurrence or condition which had not been ascertained at the time of the preparation of a budget for the current year which requires a change in financial planning.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Keizer, that the following appropriations be made for fiscal year ending June 30, 2020:

	Adopted/ Amended Budget	Adjustment		Revised Budget
		Increase	Decrease	
Park Improvement Fund				
Capital Outlay	600,000	-	150,000	450,000
Transfers Out	-	150,000		150,000
Park Services Fund				
Transfers In	360,800	150,000		510,800
Capital Outlay	503,000	150,000		653,000
To provide for an interfund capital loan from the Park Improvement Fund to the Park Services Fund.				

BE IT FURTHER RESOLVED that this resolution shall take effect immediately upon the date of its passage.

PASSED this ____ day of _____, 2019

SIGNED this ____ day of _____, 2019

Mayor

City Recorder

*walk on staff/resolution
8-5-19*

CITY COUNCIL MEETING: August 5, 2019

AGENDA ITEM NUMBER: _____

TO: MAYOR CLARK AND COUNCIL MEMBERS
THROUGH: CHRISTOPHER C. EPPLEY, CITY MANAGER
FROM: E. SHANNON JOHNSON, CITY ATTORNEY
SUBJECT: QUARRY LITIGATION - SETTLEMENT

After multiple stray bullets from the quarry across the river struck the Sunset Park area in September 2017, and after a stray bullet came through the side of Tom and Sheryl Bauer's house in June 2018, the Bauers filed suit against Lance Davis and Northwest Rock, Inc. Part of the claims for relief were for a permanent injunction requiring all shooting to stop on the quarry.

The City Council authorized our office to file a motion to intervene as a formal party in this litigation and such motion was granted by the judge. The defendants filed motions to dismiss the case based on venue and jurisdiction, but the judge ruled against such motions. Consequently, the parties went through formal depositions and discovery.

On July 26, 2019, the parties entered into formal mediation. The mediator was former judge Don Dickey. Previous to this, the parties had discussed the details of a complicated settlement that involved a shooting structure, additional berms, shooting logs, video cameras, additional signage and oversight to make shooting of handguns and long guns safe on the property. However, with the assistance of Judge Dickey, the parties reached a much simpler resolution. Mr. Davis agreed to allow only the use of shotguns on the property, except in self-defense. This is a tremendous victory for the City of Keizer and its residents.

The attached Resolution authorizes the City Manager and the City Attorney to sign the settlement agreement and stipulated judgment which will conclude the matter.

RECOMMENDATION:

Adopt the attached Resolution authorizing the City Attorney to sign the stipulated judgment and the City Manager to sign the settlement agreement.

Please let me know if you have any questions. Thank you.

ESJ/tmh

1 CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

2
3 Resolution R2019-_____
4

5 AUTHORIZING CITY MANAGER AND CITY ATTORNEY TO
6 SIGN SETTLEMENT AGREEMENT AND STIPULATED
7 JUDGMENT IN THE BAUER/CITY OF KEIZER VS.
8 DAVIS/NORTHWEST ROCK LITIGATION
9

10 WHEREAS, Lance Davis (hereinafter "Davis") is the owner of certain real
11 property commonly known as 4000 Riverbed Rd., Salem, OR (hereinafter "Property")
12 and the owner of Northwest Rock, Inc. an Oregon Corporation which operates a gravel
13 mining and processing facility on the Property;

14 WHEREAS, Tom and Sheryl Bauer (hereinafter "Bauers") allege a bullet was
15 fired on the Property that entered the Bauers' home;

16 WHEREAS, Bauers initiated litigation against Davis and Northwest Rock in the
17 Circuit Court of Marion County, Oregon, which case was assigned Case No. 18CV38037
18 (hereinafter "Lawsuit") in which case Bauers sought an order restricting firing of
19 weapons on the Property;

20 WHEREAS, the City of Keizer intervened in the lawsuit seeking similar
21 injunctive relief to the Bauers;

22 WHEREAS, the parties reached an agreement resolving the injunctive claims in
23 dispute in the Lawsuit in which Davis agrees to allow only use of shotguns on the
24 property;

25 WHEREAS, the parties wish to reflect that agreement in writing;

1 NOW, THEREFORE,

2 BE IT RESOLVED by the City Council of the City of Keizer that the City
3 Manager is authorized to sign the Settlement Agreement of Equitable Claims attached
4 hereto and by this reference incorporated herein.

5 BE IT FURTHER RESOLVED that the City Attorney is authorized to sign the
6 General Judgment Granting Injunctive Relief attached hereto and by this reference
7 incorporated herein.

8 BE IT FURTHER RESOLVED that the City Attorney and City Manager are
9 authorized to take all reasonable actions to effectuate the settlement referenced herein.

10 BE IT FURTHER RESOLVED that this Resolution shall take effect immediately
11 upon the date of its passage.

12 PASSED this _____ day of _____, 2019.

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14 SIGNED this _____ day of _____, 2019.

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Mayor

City Recorder

SETTLEMENT AGREEMENT OF EQUITABLE CLAIMS

This Settlement Agreement of Equitable claims is entered into by and between City of Keizer ("Keizer"), Tom and Sheryl Bauer ("Bauers"), Lance Davis ("Davis"), and Northwest Rock, Inc., an Oregon corporation ("NW Rock") this ____ day of August, 2019.

Whereas, Davis is the owner of certain real property commonly known as 4000 Riverbend Rd., Salem, OR 97304, which property is more particularly on Exhibit A attached hereto ("Property"); and

Whereas, NW Rock operates a gravel mining and processing facility on the Property; and

Whereas, Bauers allege a bullet was fired on the Property, that entered the Bauers' home; and

Whereas, Bauers initiated litigation against Davis and NW Rock in the Circuit Court of Marion County, Oregon, which case was assigned Case No. 18CV38037 ("Lawsuit"), in which case Bauers sought an order restricting firing of weapons on the Property; and

Whereas, Keizer intervened in the lawsuit, seeking similar relief to the Bauers; and

Whereas, the parties reached an agreement resolving the equitable claims in dispute in the Lawsuit and wish to reflect that agreement in writing; now, therefore,

*** * * W I T N E S S E T H * * ***

1. The parties shall cause the stipulated judgment attached hereto as Exhibit B, or similar form approved by the Court, if the Court does not approve of Exhibit B, to be entered in the Lawsuit.

2. This agreement will be executed in one or more counterparts, each of which shall be deemed an original, and will become effective and binding upon the parties at such time as all signatories herein have signed a counterpart of this agreement. All counterparts so executed shall constitute one agreement binding on all the parties hereto, notwithstanding that all the parties are not signatory to the same counterpart. Photocopied or electronic signatures will be deemed originals for the purpose of this agreement.

3. The agreement shall be governed by, construed and enforced in accordance with the laws of the State of Oregon, and venue for such action with respect to its enforcement shall lie in Marion County, Oregon Circuit Court.

4. The provisions of this agreement are contractual, not mere recitals, and shall be considered severable so that if any provision or part of this agreement shall at any time be held invalid, that provision, or part thereof, shall remain in force and effect, only to the extent allowed by law, and all other provisions of the agreement shall remain in full force and effect.

5. The agreement shall be binding upon and inure to the benefit of the parties hereto, their respective heirs, executors, administrators, representatives and assigns.

6. No breach of any of the provisions hereof can be waived unless in writing and signed by the waiving party. The waiver of one breach shall not be deemed to be a waiver of any other breach of the same or any other provision hereof. This agreement may be amended only by written amendment executed by the parties at interest at the time of the modification.

7. This agreement supersedes any previous agreements between the parties, whether oral or written, and embodied all terms and conditions of the agreement between the parties with respect to the lawsuit. No other agreement, statement, or promise made by or to any party will be binding on the parties unless (a) it is in writing and signed by all parties; and (b) specifically refers to this agreement.

8. The parties represent and declare that in entering into and executing this agreement, each relied solely on their own judgment, belief, and knowledge, and the advice and recommendation of their own independently selected counsel concerning the nature, extent, and duration of the rights and claims and that they have not been influenced to any extent whatsoever in executing this agreement by any representations, warranties, or statements governing any matter made by the other not set forth herein.

9. The parties represent and declare they have carefully read this agreement and know the contents thereof and they signed the same freely and voluntarily.

10. The parties agree to execute such other and further documents as may be necessary to effectuate the provision of this agreement and to cooperate, in good faith, for that purpose.

11. The parties agree they will each bear their own costs and expenses, including attorneys' fees associated with the lawsuit and this agreement.

12. Each of the parties signing below represents and warrants that they are authorized to execute this agreement and that any and all actions, necessary or required, to authorize the execution of the agreement were taken and are in effect on behalf of any entity on whose behalf they execute the agreement.

IN WITNESS WHEREOF, the parties have executed this agreement on the dates indicated below, which is effective on the last date signed below.

Thomas G. Bauer

Date

Sheryl A. Bauer

Date

Northwest Rock, Inc.

By _____
Lance Davis, President

Date

D. Lance Davis, Jr.

Date

City of Keizer

By _____
Christopher C. Eppley, City Manager

Date

APPROVED AS TO FORM:

Leonard Williamson, attorney for Davis and NW Rock

Date

Mark C. Hoyt, attorney for Bauers

Date

Ralph C. Spooner, attorney for NW Rock

Date

Larry Blunck, attorney for Lance Davis

Date

Shannon Johnson, attorney for City of Keizer

Date

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4 **IN THE CIRCUIT COURT OF THE STATE OF OREGON**
5 **FOR THE COUNTY OF MARION**

6 **THOMAS G. BAUER and SHERYL**
7 **A. BAUER,**

8 Plaintiffs,

9 v.

10 **NORTHWEST ROCK, INC., dba**
11 **SALEM MOBILE MIX, an Oregon**
corporation, and **D. LANCE DAVIS,**
JR.,

12 Defendants,

13 And

14 **CITY OF KEIZER, an Oregon**
15 **Municipal Corporation,**

16 Intervenor.

Case No. 18CV38037

GENERAL JUDGMENT GRANTING
INJUNCTIVE RELIEF

17
18 This matter came before the Court based upon the stipulation of plaintiffs, Tom
19 and Cheryl Bauer, by and through their counsel, Mark C. Hoyt, of Sherman Sherman
20 Johnnie & Hoyt, LLP, City of Keizer, by and through its counsel, Shannon Johnson,
21 Lance Davis, by and through his counsel, Larry Blunck and Leonard Williamson, and NW
22 Rock by and through its counsel, Ralph Spooner and Leonard Williamson, for entry of
23 judgment based upon the stipulation of the parties.

24 NOW THEREFORE:

1 **IT IS HEREBY ORDERED AND ADJUDGED:**

2 1. The Stipulated Extended Temporary Restraining Order entered by this
3 Court in this matter on October 3, 2018 enjoining the discharge of fire arms on Lance
4 Davis' real property commonly known as 4000 River Bend Rd., Salem, OR 97304, more
5 particularly described on Exhibit A ("Property") is dissolved;

6 2. Plaintiffs' and Intervenor City of Keizer's request for injunctive relief is
7 granted, and Defendant Lance Davis is hereby ordered and directed that shooting of
8 firearms, except in self-defense, shall be limited only to shotguns on the Property;

9 3. Plaintiffs' remaining claims are hereby dismissed with prejudice;

10 4. Neither costs nor attorney fees are awarded to any party.

11 Dated this ____ day of _____, 2019.

12 **IT IS HEREBY STIPULATED:**

13 Dated: _____

14 Mark C. Hoyt, OSB No. 923419
Of Attorneys for Plaintiffs

15 Dated: _____

16 Lawrence P. Blunck, OSB No. 841780
Of Attorneys for Defendant D. Lance
17 Davis Jr.

18 Dated: _____

19 Ralph C. Spooner, OSB No. 732880
Of Attorneys for Defendant
20 Northwest Rock, Inc.

21 Dated: _____

22 E. Shannon Johnson, OSB No. 852482
Of Attorneys for Intervenor
23 City of Keizer
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Dated: _____

Leonard W. Williamson,
OSB No. 910020
Of Attorneys for Defendants

IT IS SO ORDERED.

JUDGE CHANNING BENNETT

1 **CERTIFICATE OF COMPLIANCE WITH UTCR 5.100**

2 The undersigned counsel for Plaintiffs hereby certifies as follows with respect to
3 this proposed form of General Judgment Granting Injunctive Relief:

4 This proposed order is ready for judicial signature because:

- 5
- 6 1. [] Each opposing party affected by this order or judgment has stipulated to
7 the order or judgment, as shown by each opposing party's signature on the
8 document being submitted.
- 9 2. [X] Each opposing party affected by this order or judgment has approved
10 the order or judgment, as shown by signature on the document being submitted or
11 by written confirmation of approval sent to me.

12 SHERMAN, SHERMAN, JOHNNIE & HOYT, LLP

13 _____
14 Mark C. Hoyt, OSB No. 923419
15 Of Attorneys for Plaintiffs

SHERMAN, SHERMAN, JOHNNIE, & HOYT, LLP
693 Chemeketa Street NE / Post Office Box 2247
Salem, Oregon 97308-2247
(503)364-2281 FAX: (503)370-4308

CERTIFICATE OF SERVICE

I hereby certify that on the _____ day of _____, 2019, I served or caused to be served a true and correct copy of **GENERAL JUDGMENT GRANTING INJUNCTIVE RELIEF** on the following at their last-known addresses as shown below:

Lawrence P. Blunck
Blunck & Walhood, LLC
2350 Willamette Falls Drive
West Linn, OR 97068
larry@bluncklaw.com
Of Attorneys for Defendant
D. Lance Davis, Jr.

Ralph C. Spooner
Spooner & Much, P.C.
530 Center Street NE, Ste. 712
Salem, OR 97301
rspooner@smapc.com
Of Attorneys for Defendant Northwest
Rock, Inc., dba Salem Mobile Mix

Leonard W. Williamson
Van Ness, Williamson LLP
285 Liberty Street NE, Ste. 360
Salem, OR 97301
l.williamson@vwllp.com
Of Attorneys for Defendants

E. Shannon Johnson
Keizer City Hall
PO Box 21000
Keizer, OR 97307
JohnsonS@Keizer.org
Of Attorneys for Intervenor

☒ **BY REGULAR MAIL:** I placed copies of the document(s) in a sealed envelope and caused such envelope to be deposited in the United States Mail at Salem, Oregon, with postage thereon fully prepaid and addressed as listed above.

☐ **BY HAND DELIVERY:** I arranged for the documents to be hand delivered to the address(es) listed above.

☒ **BY ELECTRONIC MAIL:** I served the documents by electronic mail to the electronic mail address(es) listed above.

☐ **BY FACSIMILE:** I served the documents by facsimile to the facsimile number(s) listed above.

SHERMAN, SHERMAN, JOHNNIE & HOYT, LLP

Mark C. Hoyt, OSB No. 923419
Of Attorneys for Plaintiffs