

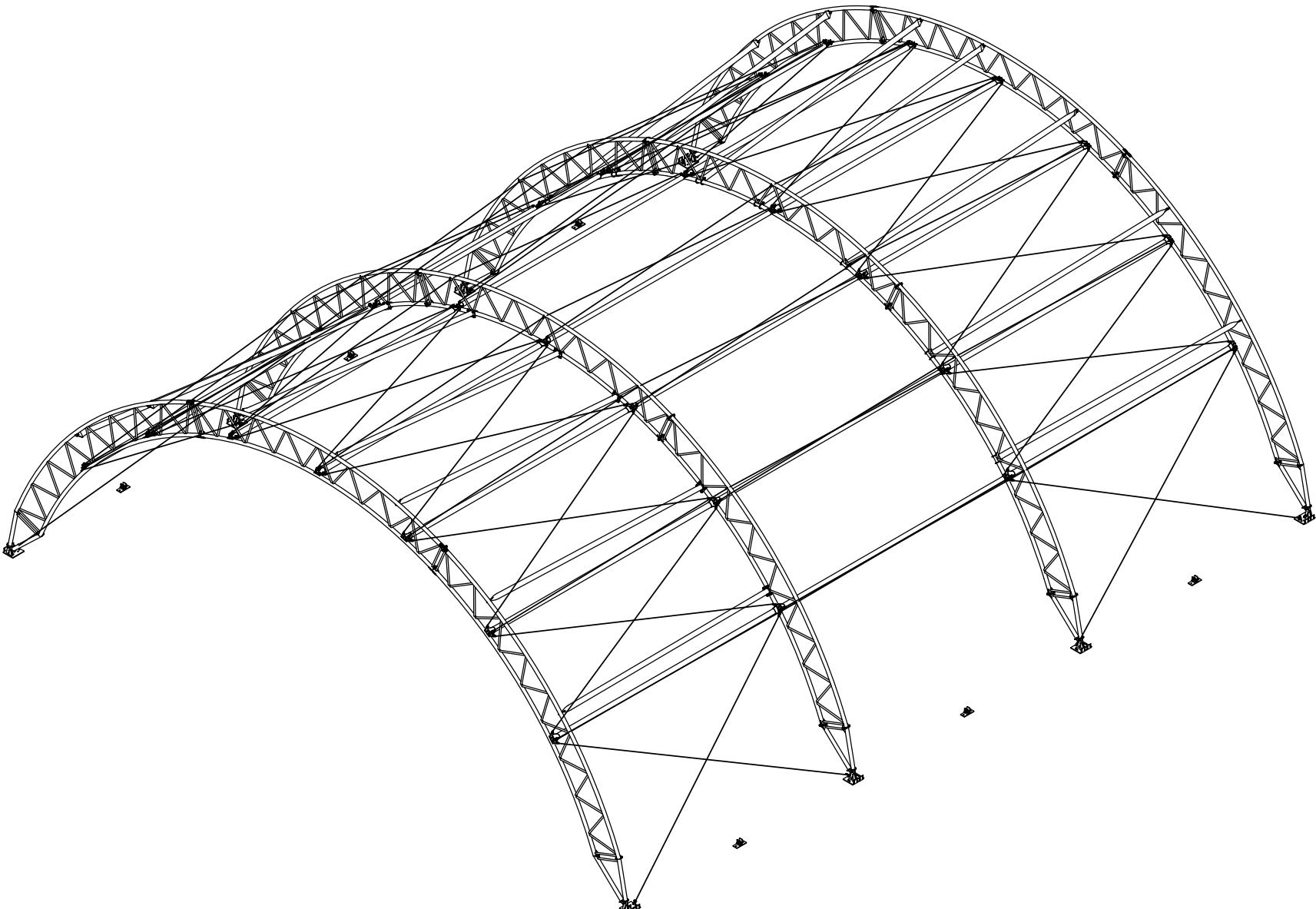
ADDITIONAL INFORMATION

THESE PRINTS IDENTIFY AND SHOW THE MAIN COMPONENTS AND CONNECTIONS FOR THIS BUILDING. LENGTH, WIDTH, AND OTHER IMPORTANT DIMENSIONS ARE ALSO PRESENT.

TO BEST UNDERSTAND HOW TO CONSTRUCT THIS BUILDING, THE INFORMATION CONTAINED WITHIN THESE SHEETS SHALL BE USED WITH THE INSTRUCTION MANUAL SHIPPED WITH THE BUILDING.

THE INSTRUCTIONS INCLUDE DETAILS NEEDED DURING CONSTRUCTION.

MOST QUESTIONS THAT ARISE BEFORE AND DURING CONSTRUCTION ARE ANSWERED WITHIN THE INSTRUCTIONS AND THESE SHEETS.



CUSTOMER DESIGN APPROVAL

COVER COLOR _____ SAMPLE APPROVED (CHECK BOX)

WEIGHT OF MATERIAL 12.5 OZ. CSG APPROVAL _____
(INITIAL)

FIRE-RATED OR NON FIRE-RATED _____

TERMINATION OF FABRIC GROUND FLAP W/ J-CHANNEL

CUSTOMER SIGNATURE

DATE

T05506020F

55' x 60' HD FREESTANDINGS 20'OC 12.5

DEVELOPED BY	
	
A DIVISION OF ENGINEERING SERVICES & PRODUCTS CO. 1440 18TH AVENUE SW DYERSVILLE, IA 52040 P: 563.875.2319 F: 563.875.2317 WWW.EASPSCO.COM	
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CUSTOMER #:	

BUILDING CONTENT GUIDE:

- [A1-1.0] COVER SHEET
- [B1-1.0] GENERAL NOTES
- [C1-1.0] BUILDING PLAN VIEW
- [D1-1.0] MATERIAL SPECIFICATIONS
- [E1-1.0] FRONT PROFILE (DIMENSIONS)
- [E2-1.0] FRONT PROFILE (END RAFTERS)
- [E3-1.0] FRONT PROFILE (MIDDLE RAFTERS)
- [F1-1.0] SIDE PROFILE (LEFT SIDE VIEW)
- [F2-1.0] SIDE PROFILE (RIGHT SIDE VIEW)
- [G1-1.0] DETAIL LOCATION CALL-OUTS
- [G2-1.0] BASE/WINCH CONNECTION DETAILS
- [G3-1.0] SPLICE CONNECTION DETAILS
- [G4-1.0] BRACE CONNECTION DETAILS
- [G5-1.0] CABLE LENGTH DETAILS
- [G6-1.0] SWAY CABLE DETAILS
- [H1-1.0] FOUNDATION DETAILS (BASE PLATES)
- [H2-1.0] FOUNDATION DETAILS (ANCHOR HOLES)
- [I] OMITTED
- [J1-1.0] PROTOTYPICAL REACTIONS
- [K] OMITTED
- [L1-1.0 - L5-1.0] OMITTED: FRONT ENDWALL (OPEN)
- [M1-1.0 - M5-1.0] OMITTED: BACK ENDWALL (OPEN)

CUSTOMER INFORMATION:	CONTACT PHONE:	STRUCTURE SKU #: T05506020F	STRUCTURE SIZE: 55' W x 60' L
		STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDINGS 20'OC 12.5	
SHEET TITLE: COVER SHEET			

DRAWING DETAILS		
DRAWN BY:	CREATION DATE:	
KMP	7/14/2011	
REVISIONS:		
NO.	BY:	REVISION DATE:
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NOT TO SCALE		SHEET SIZE: 11X17
SHEET: A1-1.0		

GENERAL NOTES

GENERAL NOTES:

FOUNDATION:

1. FOUNDATION AND ANCHORING SHALL BE ENGINEERED AND APPROVED BY A LOCALLY LICENSED STRUCTURAL ENGINEER.

GENERAL ABBREVIATIONS

TOS TOP OF STEEL / TSL TOP OF SLAB / GALV. GALVANIZED /
 FND FOUNDATION / EL ELEVATION / RND. ROUND /
 GA GAUGE / DIA DIAMETER / TYP. TYPICAL

SITE ADAPTATION/ENGINEERING VERIFICATION:

1. PRIOR TO COMMENCING FABRICATION FOR A SPECIFIC SITE, VERIFY IF ANY MODIFICATIONS TO THE STRUCTURE AND/OR FOUNDATION CONNECTIONS ARE REQUIRED BY THE SITE ADAPTATION ENGINEER.
2. THIS IS A PROTOTYPICAL DESIGN AND DOCUMENT SET. THE DESIGN AND DEPICTED FABRICATION, ERECTION, AND FOUNDATION DRAWINGS ARE ONLY VALID FOR THE EXACT DESIGN PARAMETERS AND COMBINATIONS OF PARAMETERS DOCUMENTED. THE DESIGN MUST BE SITE ADAPTED TO SPECIFIC SITES. ANY USE OF THIS DESIGN AND DOCUMENT FOR A SPECIFIC SITE REQUIRES:
 - A. DESIGN PARAMETER VERIFICATION BY A REGISTERED PROFESSIONAL ENGINEER, EXPERIENCED IN STRUCTURAL ENGINEERING. VERIFY THAT LOADING CONDITIONS AND THE REQUIREMENTS OF THE SITE ARE EQUAL TO OR LESS THAN THE DOCUMENTED DESIGN PARAMETERS AND/OR COMBINATION OF THE DOCUMENTED DESIGN PARAMETERS.
 - B. VERIFICATION OF SPECIFIC SITE SOIL CONDITIONS. FIELD VERIFY THAT THE EXISTING SITE SOIL CONDITIONS ARE EQUAL TO OR GREATER THAN THE DOCUMENTED DESIGN PARAMETERS AND/OR COMBINATIONS OF DOCUMENTED DESIGN PARAMETERS.
 - C. ANY SITE SPECIFIC CONDITIONS FAILING "A" OR "B" WILL REQUIRE RE-ANALYSIS OF THE STRUCTURE AND/OR FOUNDATION BY A CERTIFIED DESIGN PROFESSIONAL. FAILURE TO VERIFY THE VALIDITY OF THIS DESIGN FOR A SPECIFIC SITE, FOLLOWED BY ANY NECESSARY SITE ADAPTATION MODIFICATION CAN RESULT IN A DANGEROUS SITUATION.

STEEL:

1. ALL STRUCTURAL STEEL TUBING SHALL BE GALVANIZED, MIN. YIELD STRENGTH 50 KSI. SECTION PROPERTIES, DESIGN VALUES, AND GALVANIZING PROTECTION SHALL MEET OR EXCEED STANDARDS BY ALLIED TUBE AND CONDUIT - HARVEY, ILLINOIS.
2. STEEL PLATES SHALL COMPLY WITH ASTM A572 GRADE 50 OR EQUAL. STRUCTURAL STEEL IS TO BE SHOP PRIME-COATED WITH COLD GALVANIZING COMPOUND. APPLY SHOP PRIME-COAT TO OBTAIN A UNIFORM DRY FILM THICKNESS OF NOT LESS THAN 2-MILS.
3. ALL BOLTED CONNECTIONS SHALL USE A325 BOLTS WITH COMPATIBLE WASHERS AND NUTS OF DIAMETERS INDICATED ON PLANS. BOLTS NEED ONLY BE TIGHTENED TO THE SNUG-TIGHT CONDITION. THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH, OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH.
4. ALL STRUCTURAL STEEL IS TO BE FABRICATED IN ACCORDANCE WITH THE LATEST EDITION OF AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."

CABLES AND HARDWARE:

1. ALL CABLE SHALL BE GALVANIZED STEEL, MULTIPURPOSE, 7X19 (UP TO 3/8" DIA.) OR 6X26 (1/2" DIA.) CLASS STRAND CORE COMMERCIAL GRADE, OF DIAMETER INDICATED.
2. CABLE SLEEVES SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CABLES AND HARDWARE (CONT.):

3. USE THIMBLES WITH CABLE SLEEVES IN ALL LOOP-END APPLICATIONS.
4. TENSION CABLES AT TURNBUCKLE TO TAUT CONDITION (STRAIGHT AND NOT SLACK OR LOOSE).
5. TIGHTEN CABLES SEQUENTIALLY TO AVOID TWISTING OR DEFORMING STRUCTURAL ELEMENTS DURING ERECTION. RECHECK PREVIOUSLY TIGHTENED CABLES UNTIL ALL CABLES ACHIEVE TAUT CONDITION.

WELDING:

1. REFER TO "WELDING GUIDELINES" PUBLISHED BY ALLIED TUBE AND CONDUIT - HARVEY, ILLINOIS, FOR RECOMMENDED PROCESSES AND PRACTICES FOR WELDING GALVANIZED STEEL TUBING.
 - A. TO DEVELOP THE FULL STRENGTH AT PIPE JOINT, THE ALL AROUND FILLET WELDS SHALL BE SIZED AS FOLLOWS:

THICKNESS OF THE TUBE - MINIMUM FILLET WELD SIZE

GAUGE 14	1/8"
GAUGE 13 & 12	5/32"
GAUGE 11 & 10	3/16"
GAUGE 9 & 8	7/32"
GAUGE 7	1/4"

(PLEASE NOTE: WHEN TUBES OF TWO DIFFERENT WALL THICKNESSES ARE JOINED, THE MINIMUM FILLET WELD SIZE SHALL BE BASED ON THE THINNER OF THE TWO MEMBERS).

2. WELDS SHALL SHOW UNIFORM SECTION, SMOOTHNESS OF WELD METAL, FREEDOM FROM POROSITY AND CLINKERS, AND ADEQUATE STRENGTH AND DURABILITY.
3. ALL WELDS NOT OTHERWISE IDENTIFIED SHALL BE CONTINUOUS.
4. ALL SHOP WELDING IS TO BE DONE BY CERTIFIED OPERATORS (TEST POSITION 4F AND 5F WITH PIPE IS MINIMUM REQUIRED CERTIFICATION).
5. ALL WELDING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AWS D1.1 AND D1.3.

PAINTING AND TOUCH UP:

1. AFTER SHOP FABRICATION, TOUCH-UP ALL WELDS, ABRADED AREAS AND SCRATCHES WITH COLD GALVANIZING COMPOUND CONSISTENT WITH GALVANIZED TUBE MANUFACTURER'S RECOMMENDATIONS FOR COLOR AND COMPOSITION. PRIOR TO TOUCH-UP, CLEAN WELDED AND ABRADED AREAS WITH A WIRE BRUSH TO REMOVE SLAG AND LOOSE PARTICLES. SURFACES MUST BE CLEAN AND OIL FREE.
2. AFTER FIELD INSTALLATION, TOUCH-UP ALL ABRADED AREAS, SCRATCHES, FIELD WELDS, BOLTED CONNECTIONS AND ATTACHMENTS WITH COLD GALVANIZING COMPOUND OF THE SAME COMPOSITION AND COLOR USED FOR SHOP COATING.

ERECTION AND FIELD QUALITY CONTROL:

1. THE ERECTOR IS RESPONSIBLE FOR DESIGNING AND FURNISHING ALL TEMPORARY BRACING, SHORING, AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF ERECTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE STRUCTURAL ENGINEER ASSUMES NO LIABILITY FOR THE STRUCTURE DURING ERECTION.
2. NO OPENING (OTHER THAN THOSE SHOWN ON THE DRAWINGS) SHALL BE MADE IN ANY STRUCTURAL MEMBER, AND NO MODIFICATION OR ALTERATION SHALL BE MADE TO ANY STRUCTURAL MEMBER OR CONNECTION WITHOUT THE WRITTEN APPROVAL OF THE DESIGN ENGINEER.

CUSTOMER INFORMATION:	CONTACT PHONE:	STRUCTURE SKU #: T05506020F	STRUCTURE SIZE: 55' W x 60' L	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'	GENERAL NOTES		

DRAWING DETAILS		
DRAWN BY:	CREATION DATE: 7/14/2011	
REVISIONS:		
NO.	BY:	REVISION DATE:
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NOT TO SCALE		SHEET SIZE: 11X17
SHEET:		
B1-1.0		

CUSTOMER DESIGN APPROVAL

CUSTOMER SIGNATURE

DATE



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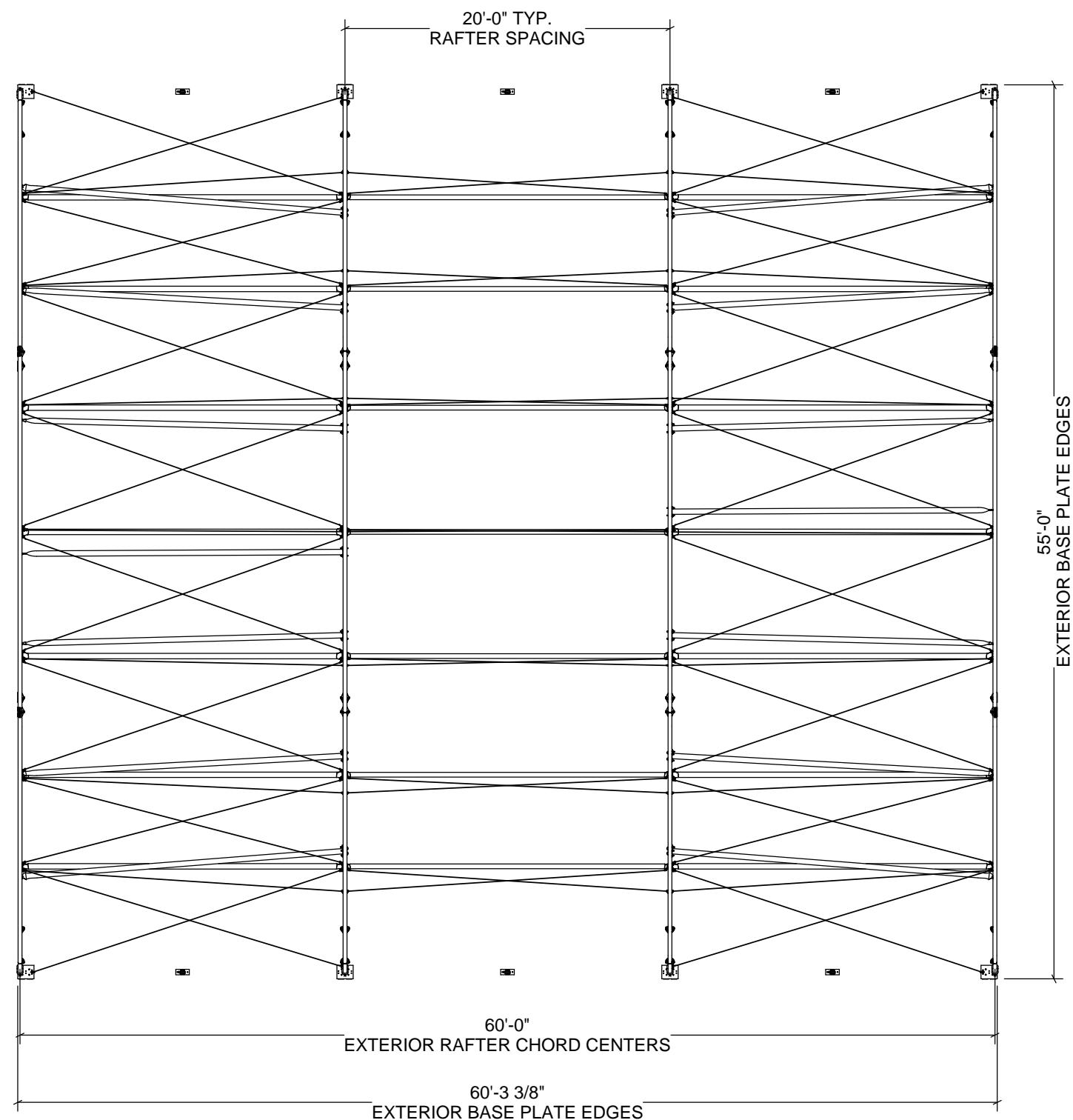
CUSTOMER #:

BUILDING PLAN VIEW

- CABLE PATTERN
- SWAY CABLE
- BUILDING DIMENSIONS
- RAFTER SPACING

FRONT ENDWALL (OPEN)

LEFT SIDE - SEE SHEET [F1-1.0] FOR ELEVATION VIEW



RIGHT SIDE - SEE SHEET [F2-1.0] FOR ELEVATION VIEW

BACK ENDWALL (OPEN)

CUSTOMER DESIGN APPROVAL

CUSTOMER SIGNATURE

DATE

DRAWING DETAILS

DRAWN BY: KMP
CREATION DATE: 7/14/2011

REVISIONS:

NO.	BY:	REVISION DATE:
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NOT TO SCALE

SHEET SIZE: 11X17

SHEET:

C1-1.0

ORDER #:

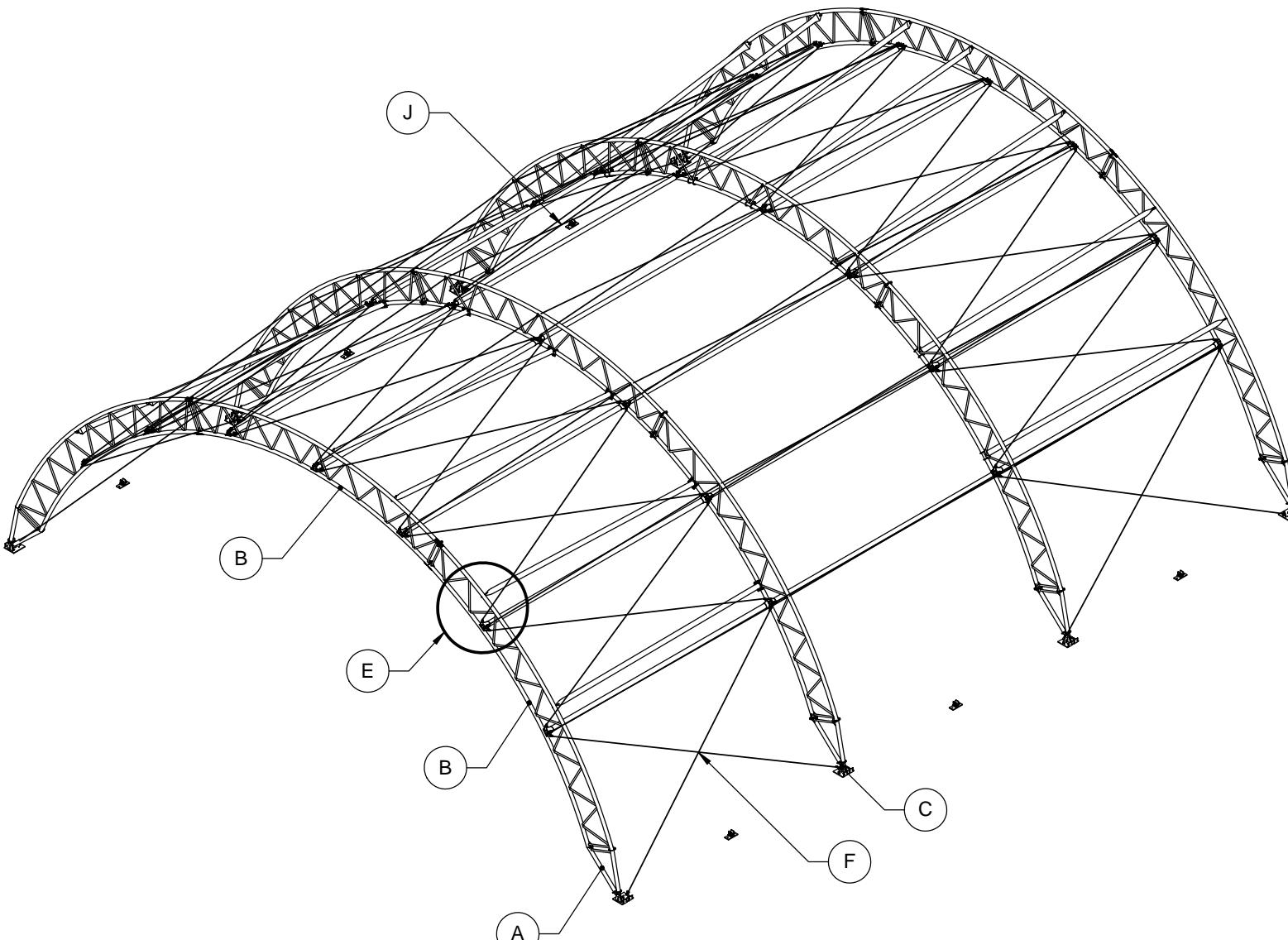
CUSTOMER #:

ITEM	DESCRIPTION	MATERIAL
A	TRUSS SUPPORT BASE ASSY	
	OUTER CHORD	GALV RND STEEL TUBE - 2.875" ϕ - 14 GA
	INNER CHORD	GALV RND STEEL TUBE - 2.875" ϕ - 14 GA
	WEB (STRAIGHT)	GALV RND STEEL TUBE - 1.25" ϕ - 14 GA
	CONNECTION PLATES	STEEL PLATE, 1/2" THICK
	GUSSETS	STEEL PLATE, 3/8" THICK
	PIVOT PLATE (CHORD)	STEEL PLATE, 3/8" THICK
B	TRUSS SEGMENT ASSY	
	OUTER CHORD	GALV RND STEEL TUBE - 2.875" ϕ - 14 GA
	INNER CHORD	GALV RND STEEL TUBE - 2.875" ϕ - 14 GA
	WEB (STRAIGHT)	GALV RND STEEL TUBE - 1.25" ϕ - 14 GA
	WEB (ANGLED)	GALV RND STEEL TUBE - 1.25" ϕ - 14 GA
	CONNECTION PLATES	STEEL PLATE, 1/2" THICK
	GUSSETS	STEEL PLATE, 3/8" THICK
C	BASES	
	HORIZONTAL	STEEL PLATE, 1/2" THICK
	VERTICAL (ROUNDED)	STEEL PLATE, 3/8" THICK
	GUSSETS	STEEL PLATE, 3/8" THICK
	THREADED STUDS	1/2" DIA X 1" HEIGHT
D	CABLE LINK	1/2 CHAIN LINK (3/4")
	BOLTS	
	BASE HINGE	3/4" X 2-3/4" A325 GRADE HEX BOLT
	CONNECTION PLATES	1/2" X 2-1/4" A325 GRADE HEX BOLT
	BRACE PLATES	#14 X 1" TEK SCREW
E	BRACING U-BOLTS	3/8" U-BOLT
	BRACING CONNECTION BOLTS	1/2" X 1-1/2" A325 GRADE HEX BOLT
	LATERAL BRACING (END BAYS)	GALV RND STEEL TUBE - 4.00" ϕ X 12 GA
	LATERAL BRACING (MID BAYS)	GALV RND STEEL TUBE - 3.500" ϕ X 14 GA
F	ANGLED BRACING	GALV RND STEEL TUBE - 4.00" ϕ X 12 GA
	THREADED STUD PLATE	1/4" PLATE WITH 1/2" X 2" STUDS
	CABLE ASSEMBLY	3/8" ϕ WIRE ROPE - 6 x 19 CLASS IWRC CORE
G	WIRE ROPE THIMBLE	HEAVY DUTY 3/8" - OPEN PATTERN - GALV
	CABLE SLEEVE	CABLE SLEEVE - 3/8" FORGED - GALV
H	WINCH ASSEMBLY	WINCH (2" STRAP)
I	CHORD BRACE	
J	SUPPORT BASE TO SEGMENT	STEEL PLATE, 1/8" THICK
	SEGMENT TO SEGMENT	STEEL PLATE, 1/8" THICK
J	SWAY CABLE ASSEMBLY	3/16" ϕ WIRE ROPE - 6 x 19 CLASS IWRC CORE
	TURNBUCKLE	1/2" - 12 JAW-JAW - 8,000 LB LOAD LIMIT
	WIRE ROPE THIMBLE	HEAVY DUTY 3/16" - OPEN PATTERN - GALV
	CABLE SLEEVE	CABLE SLEEVE - 3/16" FORGED - GALV

BOX BOLT HOLE SIZES & INSTALLATION TORQUE ₁		
BOX BOLT DIA.	HOLE DIA.	INSTALLATION TORQUE
1/4"	1/2"	14 FT-LB
5/16"	5/8"	18 FT-LB
3/8"	3/4"	33 FT-LB
1/2"	13/16"	59 FT-LB
5/8"	1-1/8"	140 FT-LB
3/4"	1-3/8"	221 FT-LB

1. REFER TO BOX BOLT TECHNICAL DATA FOR MORE INFORMATION IF USING BOX BOLTS

MATERIAL SPECIFICATIONS



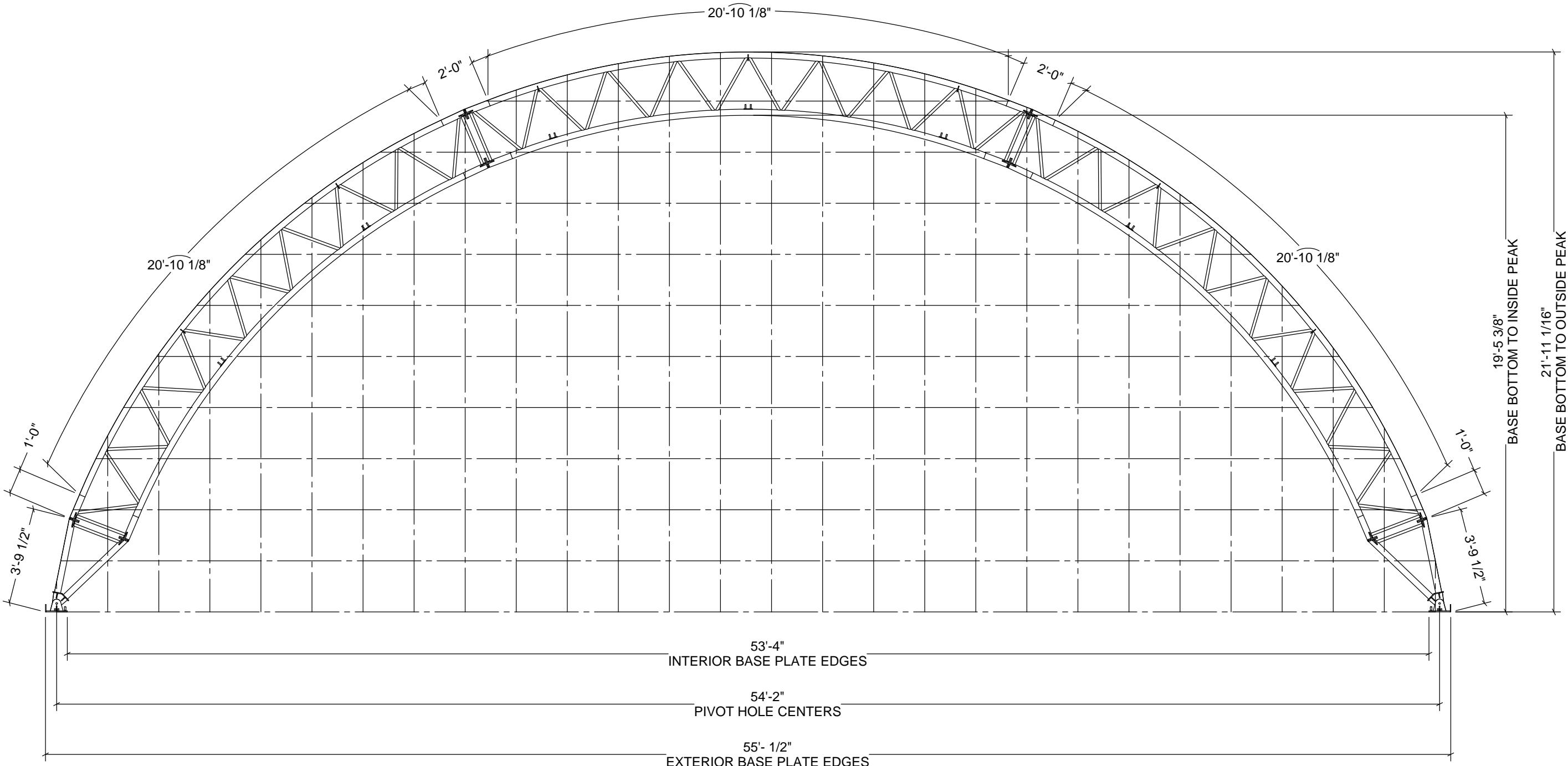
CUSTOMER INFORMATION:	CONTACT PHONE:	STRUCTURE SKU #:
		T05506020F
CUSTOMER CONTACT:	SHEET TITLE:	STRUCTURE SIZE:
		55' W x 60' L
SHEET TITLE:	REVISIONS:	STRUCTURE DESCRIPTION:
		55' x 60' HD FREESTANDING 20' OC 12.5'
MATERIAL SPECIFICATIONS		

DRAWING DETAILS		
DRAWN BY:	CREATION DATE:	
KMP	7/14/2011	
REVISIONS:		
NO.	BY:	REVISION DATE:
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NOT TO SCALE		SHEET SIZE: 11X17
SHEET:		
D1-1.0		

OVER-THE-TOP: 76'-7 13/16" (919 13/16")

FRONT PROFILE (DIMENSIONS)

- GRID REPRESENTS 24" SQUARES



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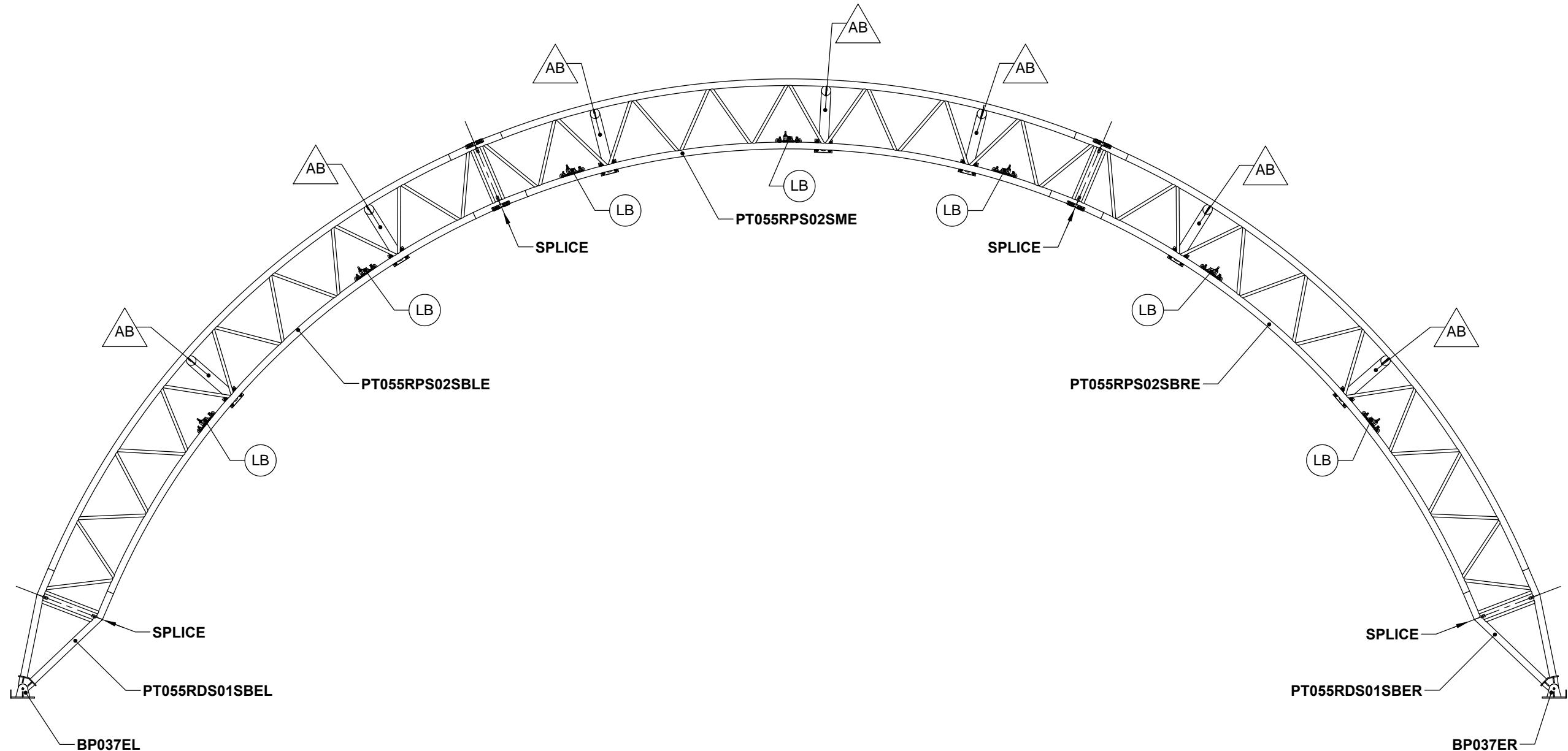
ORDER #:
CUSTOMER #:

CUSTOMER INFORMATION:	STRUCTURE SKU #: T05506020F
CUSTOMER CONTACT:	CONTACT PHONE: 55 W x 60' L
SHEET TITLE: FRONT PROFILE (DIMENSIONS)	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5

DRAWING DETAILS		
DRAWN BY: KMP	CREATION DATE: 7/14/2011	REVISIONS:
NO.	BY:	REVISION DATE:
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NOT TO SCALE	SHEET SIZE: 11X17	
SHEET:	E1-1.0	

**FRONT PROFILE (END RAFTERS)
• PART LOCATIONS**

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CUSTOMER #: _____



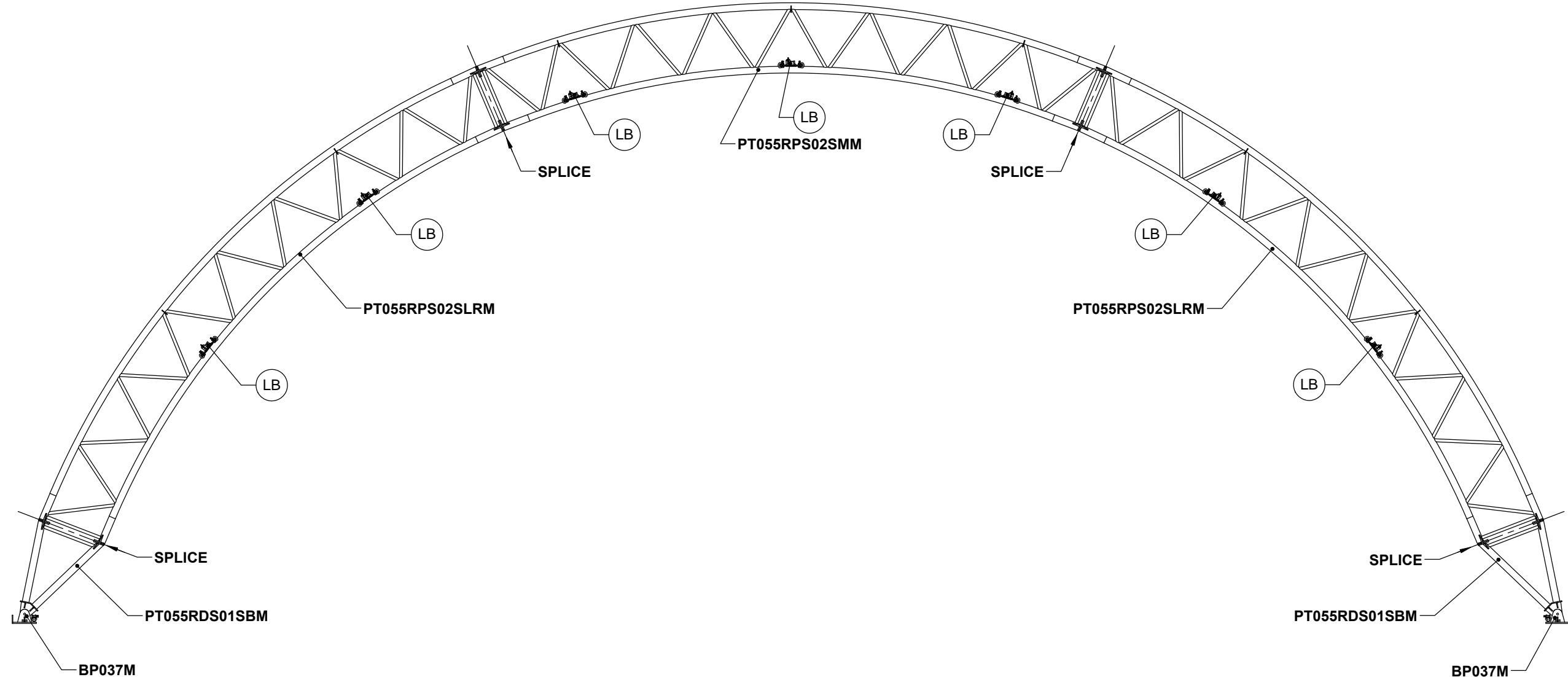
- **LB** = LATERAL BRACE (SKU: **LB40G12SL240**)
- **AB** = ANGLED BRACE (SKU: **AB40G12SVL240**)
- **SPLICE**: SEE DETAIL SHEET [G3-1.0]

CUSTOMER INFORMATION:	STRUCTURE SKU #: T0556020F	STRUCTURE SIZE: 55' W x 60' L
CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'
SHEET TITLE: FRONT PROFILE (END RAFTERS)		

DRAWING DETAILS		
DRAWN BY:	CREATION DATE:	
KMP 7/14/2011		
REVISIONS:		
NO.	BY:	REVISION DATE:
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NOT TO SCALE	SHEET SIZE: 11X17	
SHEET:	E2-1.0	

FRONT PROFILE (MIDDLE RAFTERS)
• PART LOCATIONS

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CUSTOMER #: _____



- **LB = LATERAL BRACE (SKU: LB35G14SL240)**
- **SPLICE: SEE DETAIL SHEET [G3-1.0]**

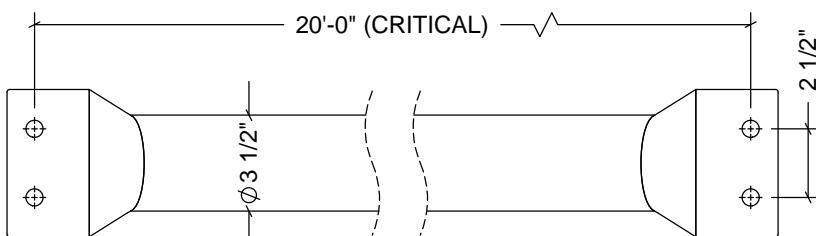
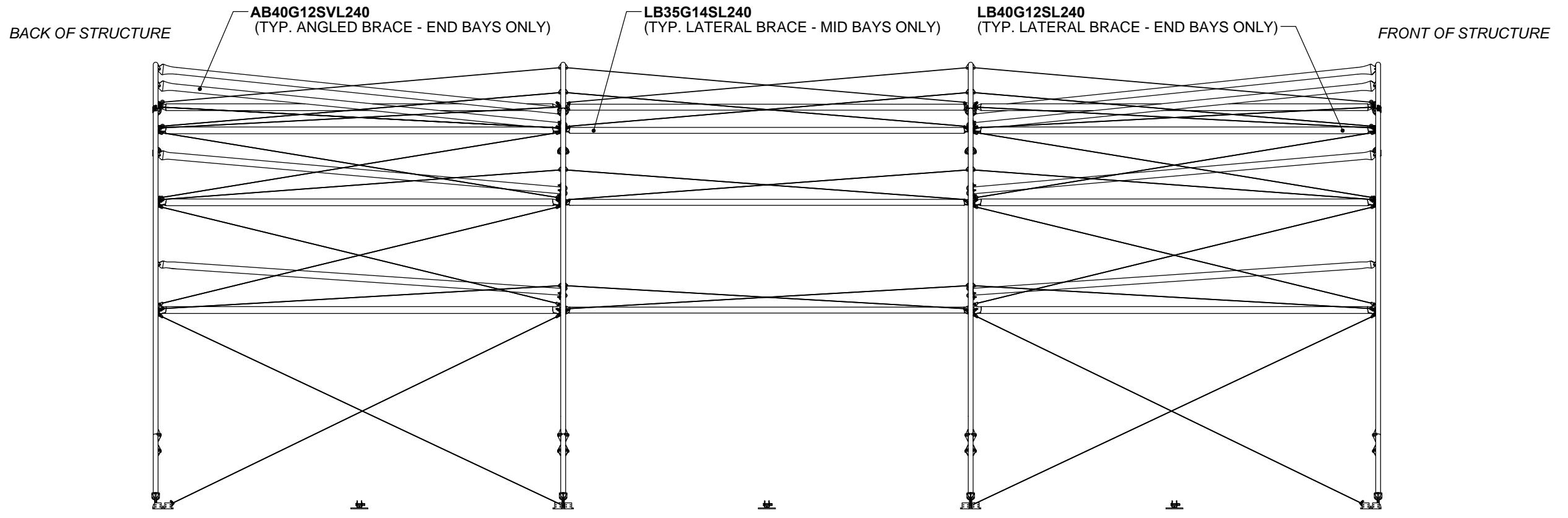
CUSTOMER INFORMATION:	STRUCTURE SKU #: T05506020F	STRUCTURE SIZE: 55' W x 60' L
CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'
FRONT PROFILE (MIDDLE RAFTERS)		

DRAWING DETAILS		
DRAWN BY:	CREATION DATE:	
KMP 7/14/2011		
REVISIONS:		
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NOT TO SCALE	SHEET SIZE: 11X17	
SHEET:	E3-1.0	

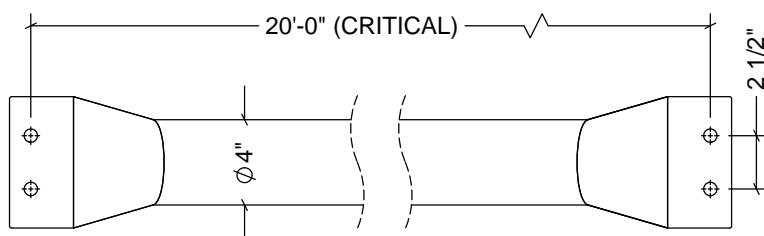
NOTE: REFER TO SHEET [E2-1.0] & [E3-1.0] FOR FRONT PROFILE OF BRACE LOCATIONS & SHEET [C1-1.0] FOR TOP VIEW OF BRACE LOCATIONS.

SIDE PROFILE (LEFT SIDE VIEW)

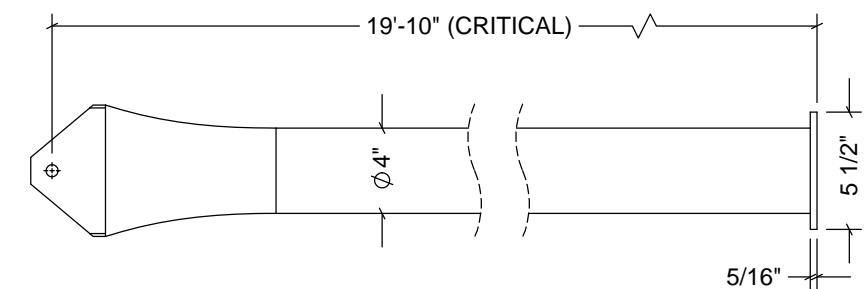
- LATERAL BRACING
- ANGLED BRACING
- CABLE LOCATION
- SWAY CABLE PATTERN



LB35G14SL240
3.5" DIA LATERAL BRACE
TYP. LATERAL BRACE - MID BAYS ONLY



LB40G12SL240
4.0" DIA LATERAL BRACE
TYP. LATERAL BRACE - END BAYS ONLY



AB40G12SVL240
4.00" DIA ANGLED BRACE
TYP. ANGLED BRACE - END BAYS ONLY

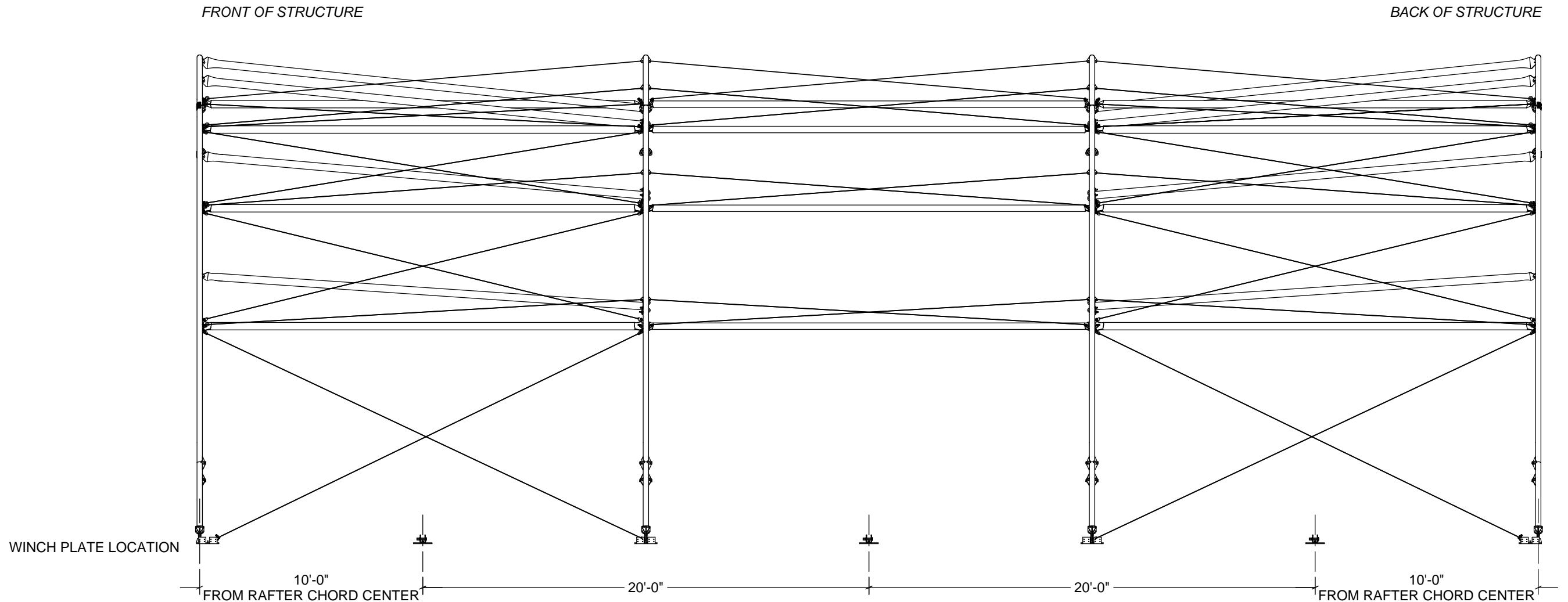
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CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'
SHEET TITLE: SIDE PROFILE (LEFT SIDE VIEW)		

DRAWING DETAILS		
DRAWN BY:	CREATION DATE:	
KMP		
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NOT TO SCALE	SHEET SIZE:	11X17
SHEET:		
F1-1.0		

NOTE: REFER TO SHEET [E2-1.0] & [E3-1.0] FOR FRONT PROFILE OF BRACE LOCATIONS & SHEET [C1-1.0] FOR TOP VIEW OF BRACE LOCATIONS.

SIDE PROFILE (RIGHT SIDE VIEW)

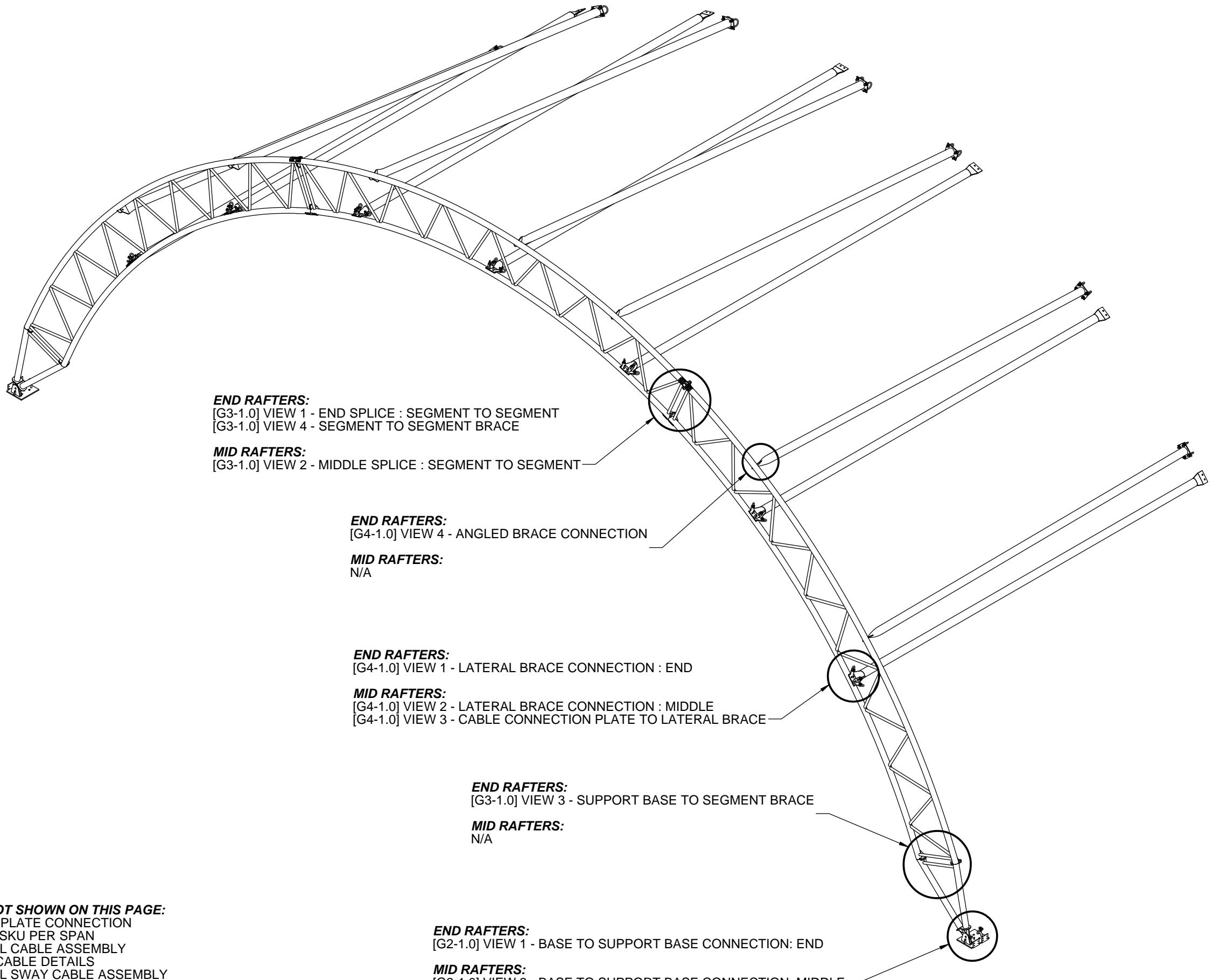
- CABLE LOCATION
- SWAY CABLE PATTERN



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CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'	
SHEET TITLE: SIDE PROFILE (RIGHT SIDE VIEW)		DRAWN BY: KMP	
		CREATION DATE: 7/14/2011	

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SHEET: F2-1.0		

DETAIL LOCATION CALL-OUTS



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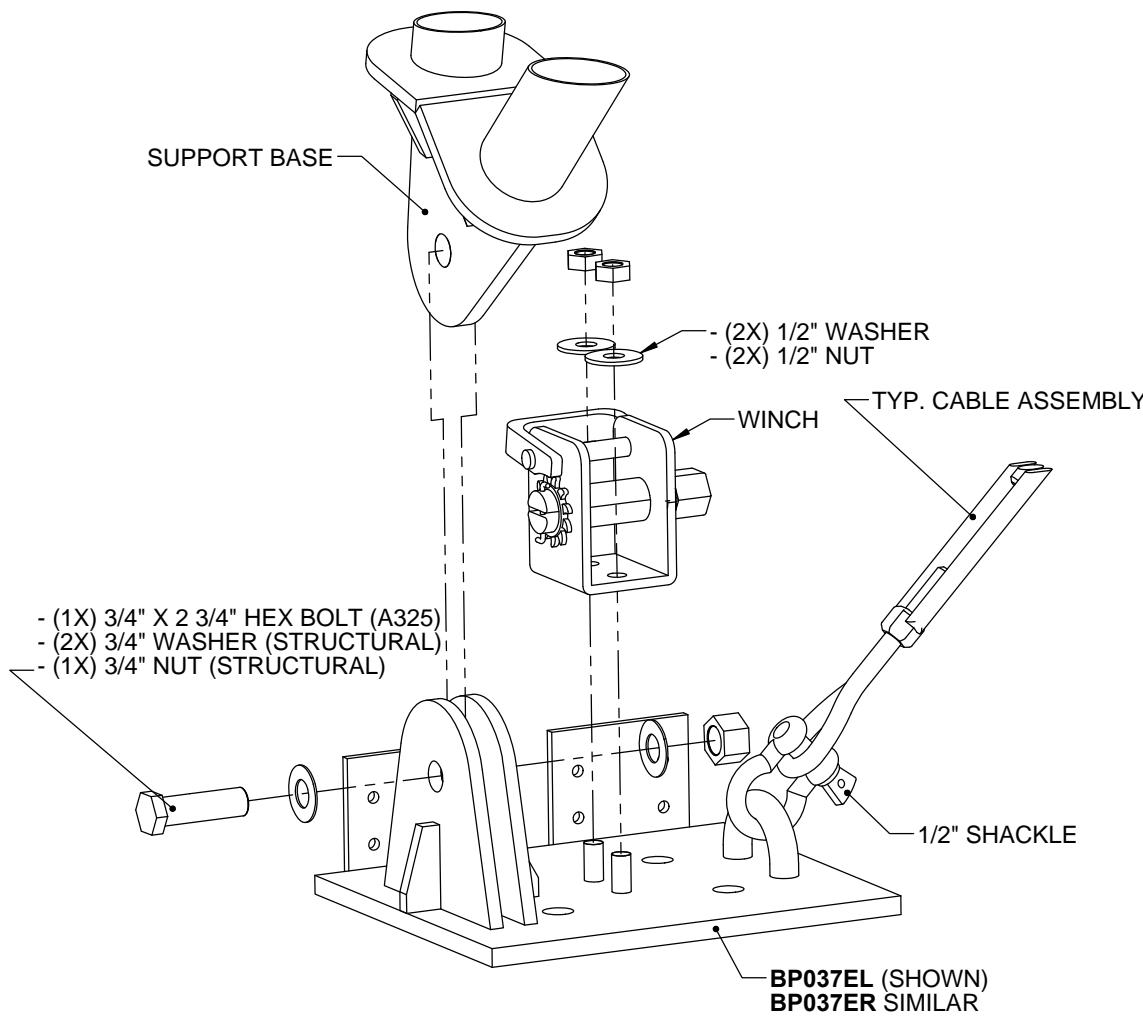


CUSTOMER INFORMATION:	STRUCTURE SKU #: T05506020F	STRUCTURE SIZE: 55' W x 60' L
CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'

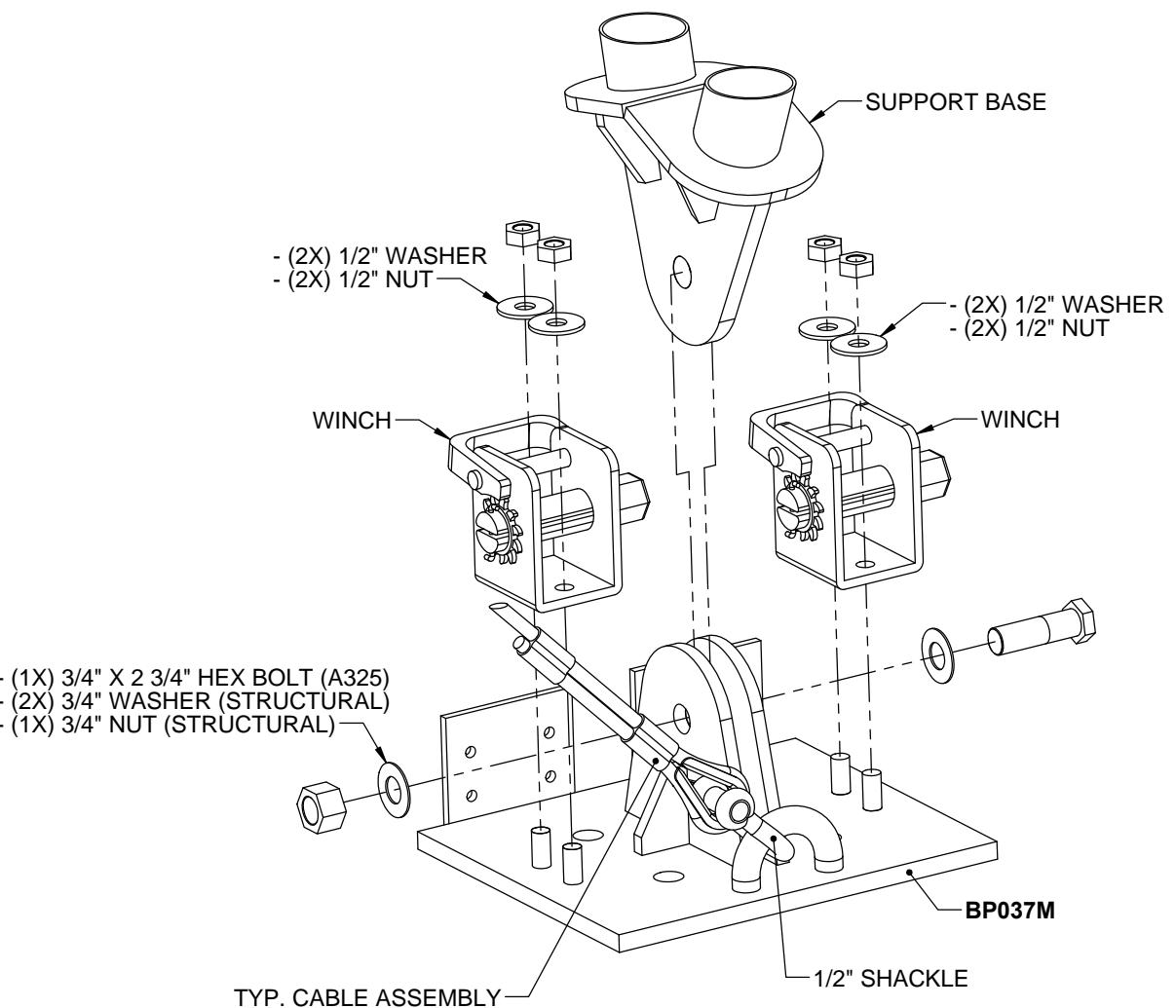
SHEET TITLE:	BASE/WINCH CONNECTION DETAILS
CUSTOMER CONTACT:	KMP 7/14/2011

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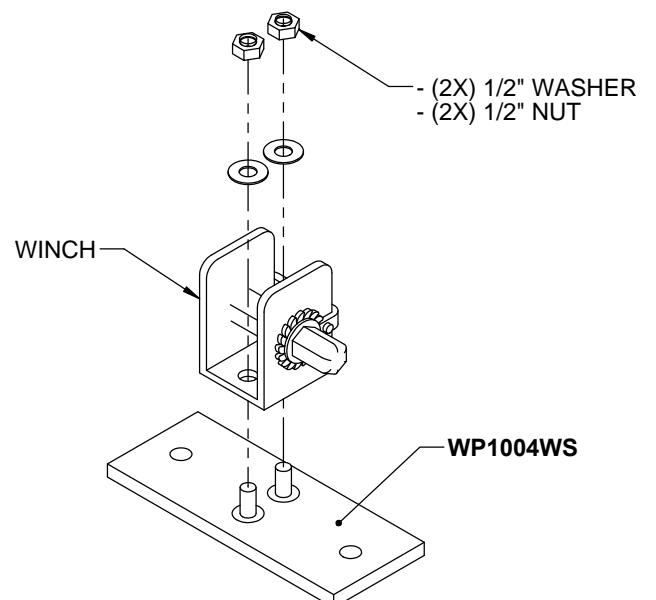
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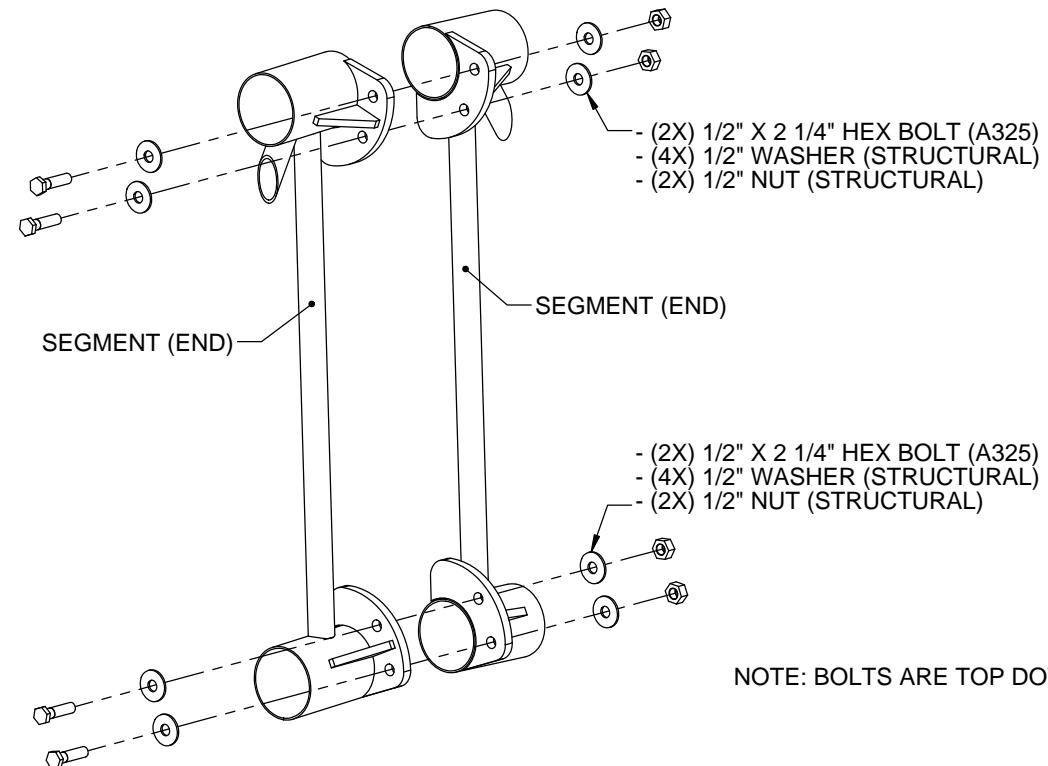
[G2-1.0] VIEW 1 - BASE TO SUPPORT BASE CONNECTION : END



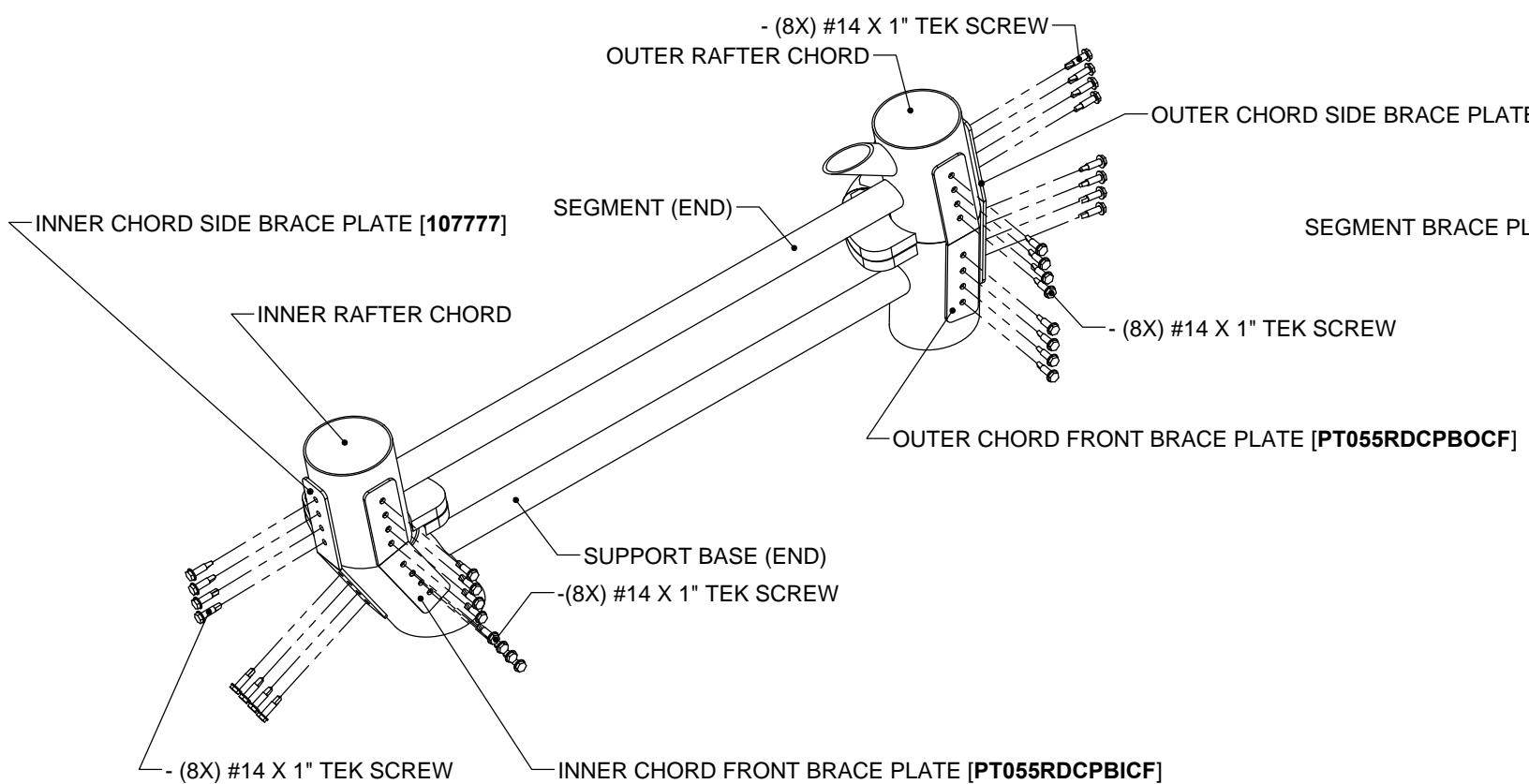
[G2-1.0] VIEW 2 - BASE TO SUPPORT BASE CONNECTION : MIDDLE



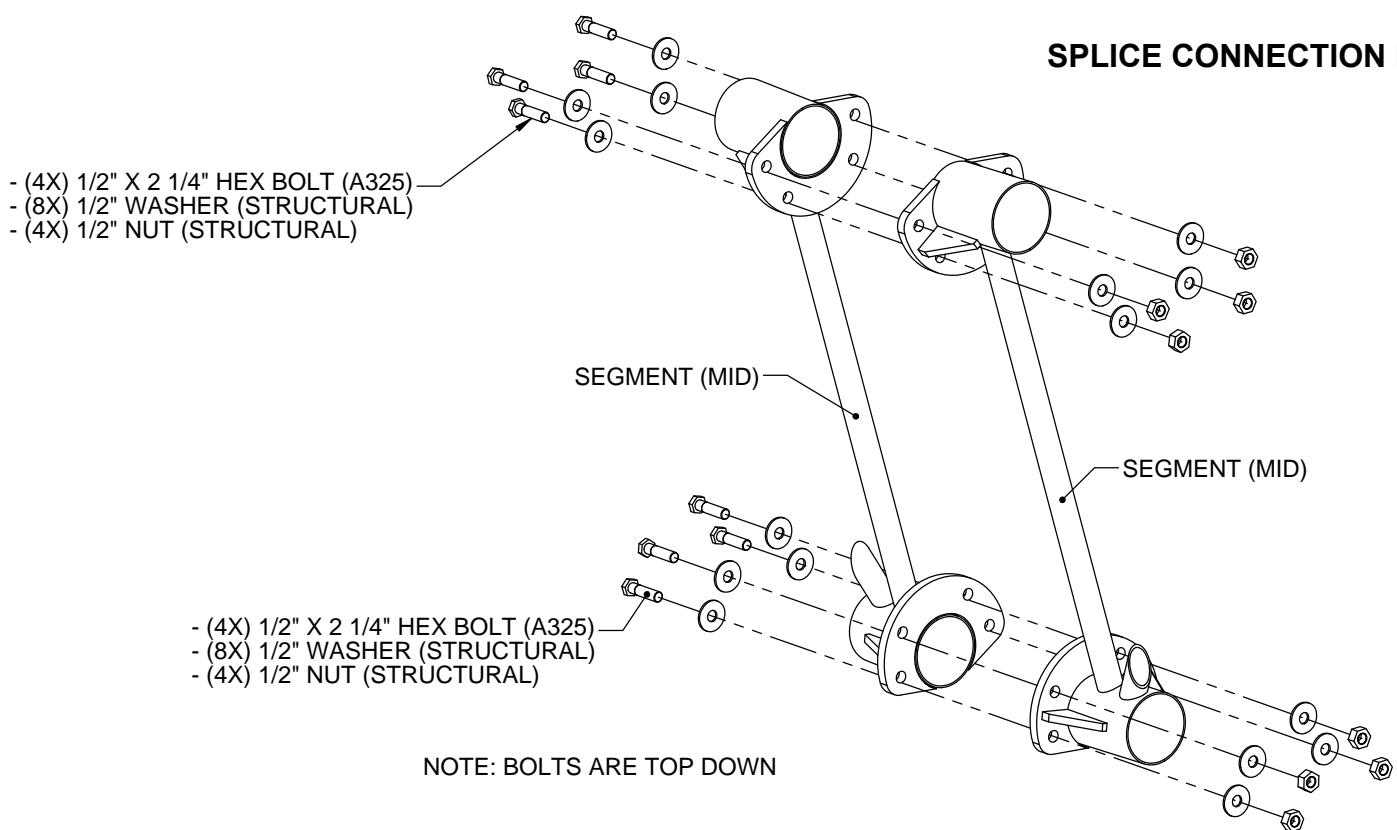
[G2-1.0] VIEW 3 - WINCH PLATE CONNECTION



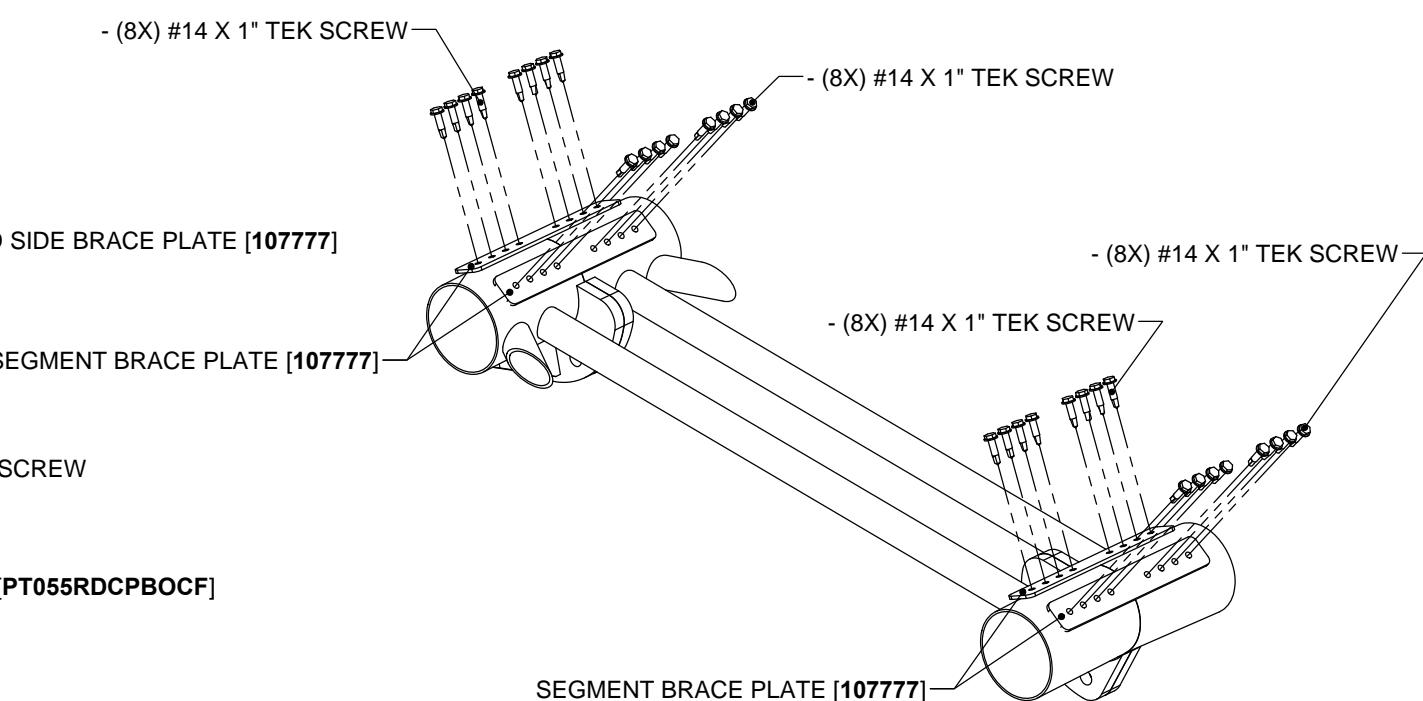
[G3-1.0] VIEW 1 - END SPLICE : SEGMENT TO SEGMENT



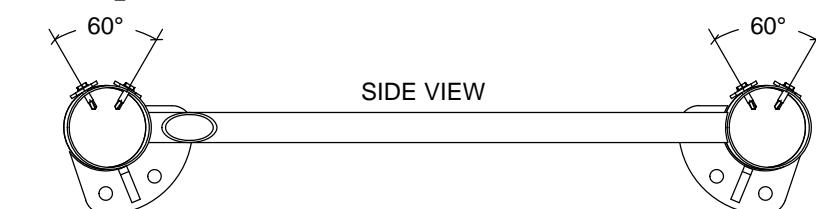
[G3-1.0] VIEW 3 - SUPPORT BASE TO SEGMENT BRACE



[G3-1.0] VIEW 2 - MIDDLE SPLICE : SEGMENT TO SEGMENT



[G3-1.0] VIEW 4 - SEGMENT TO SEGMENT BRACE

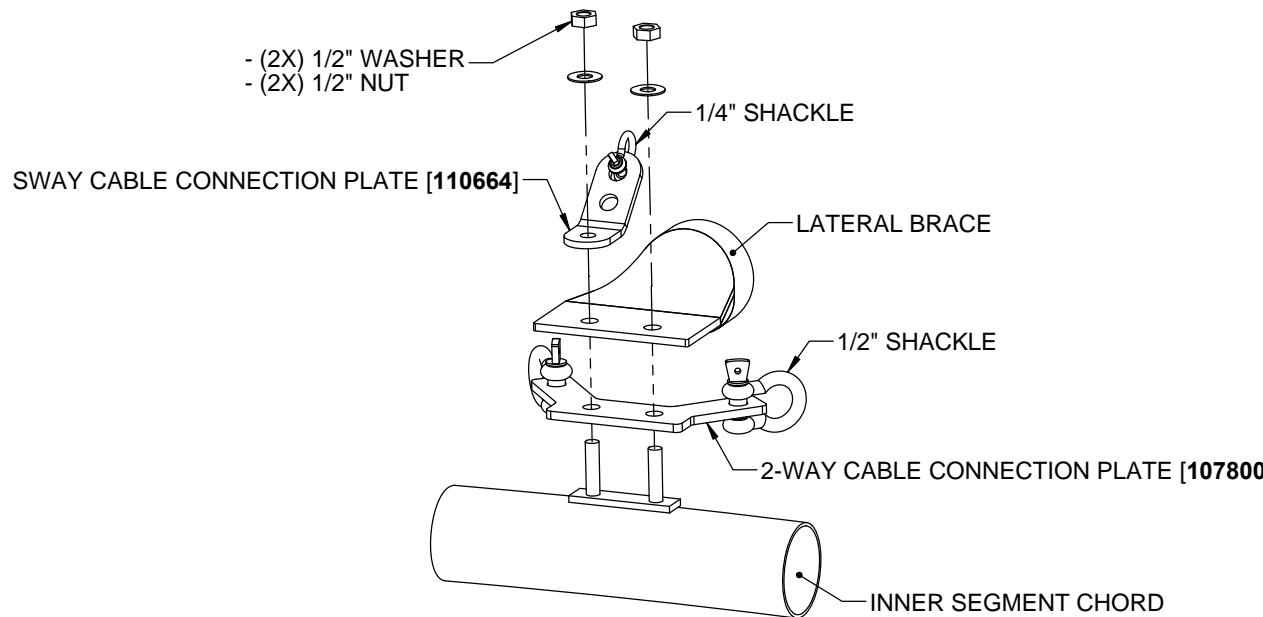


PLATES SHOULD BE POSITIONED 30 DEGREES FROM CENTER OF FRONT OF CHORDS,

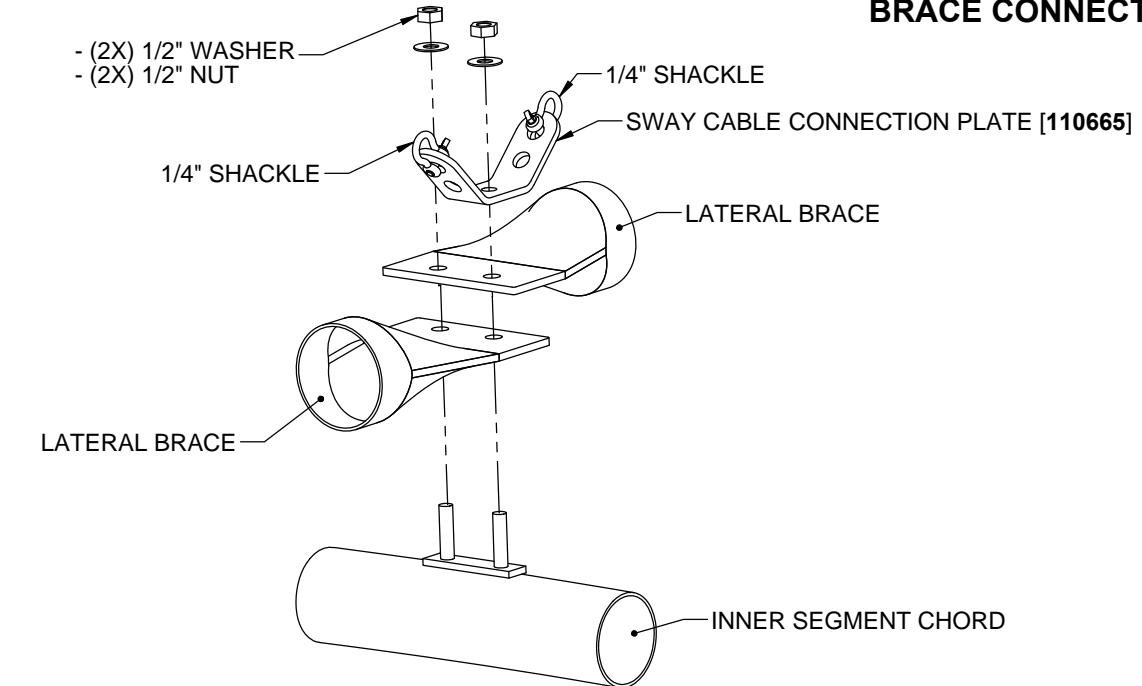
[G3-1.0] VIEW 4 - SEGMENT TO SEGMENT BRACE
 SIDE VIEW

CUSTOMER INFORMATION:	CONTACT PHONE:	STRUCTURE SIZE: 55' W x 60' L	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'	SHEET TITLE: SPICE CONNECTION DETAILS		
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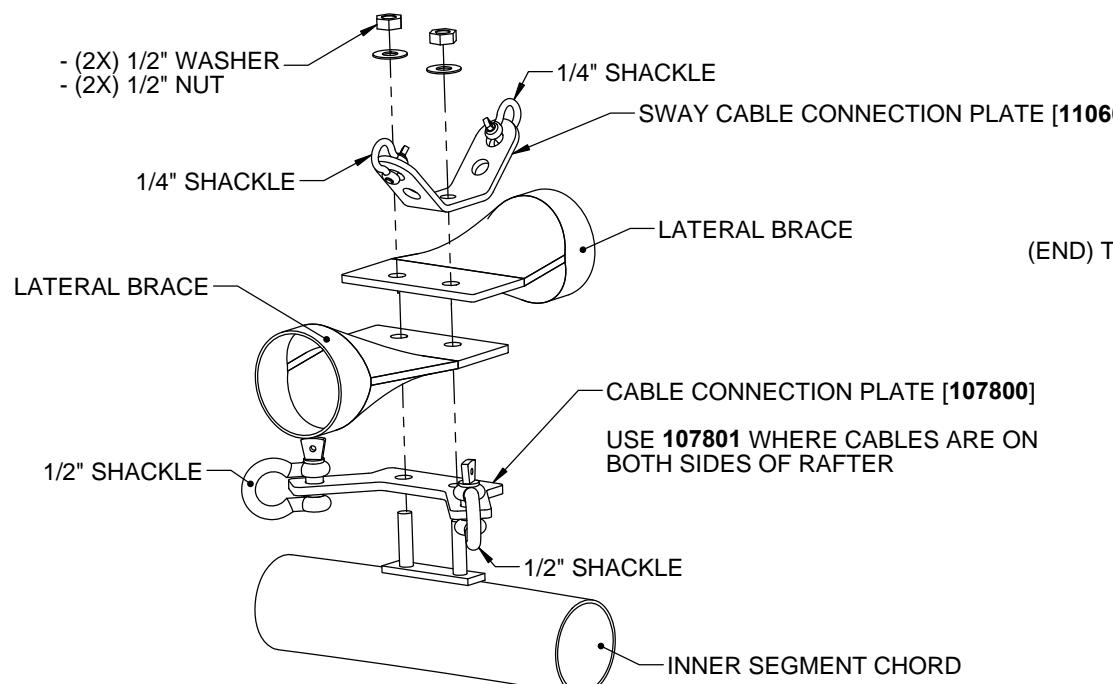
BRACE CONNECTION DETAILS



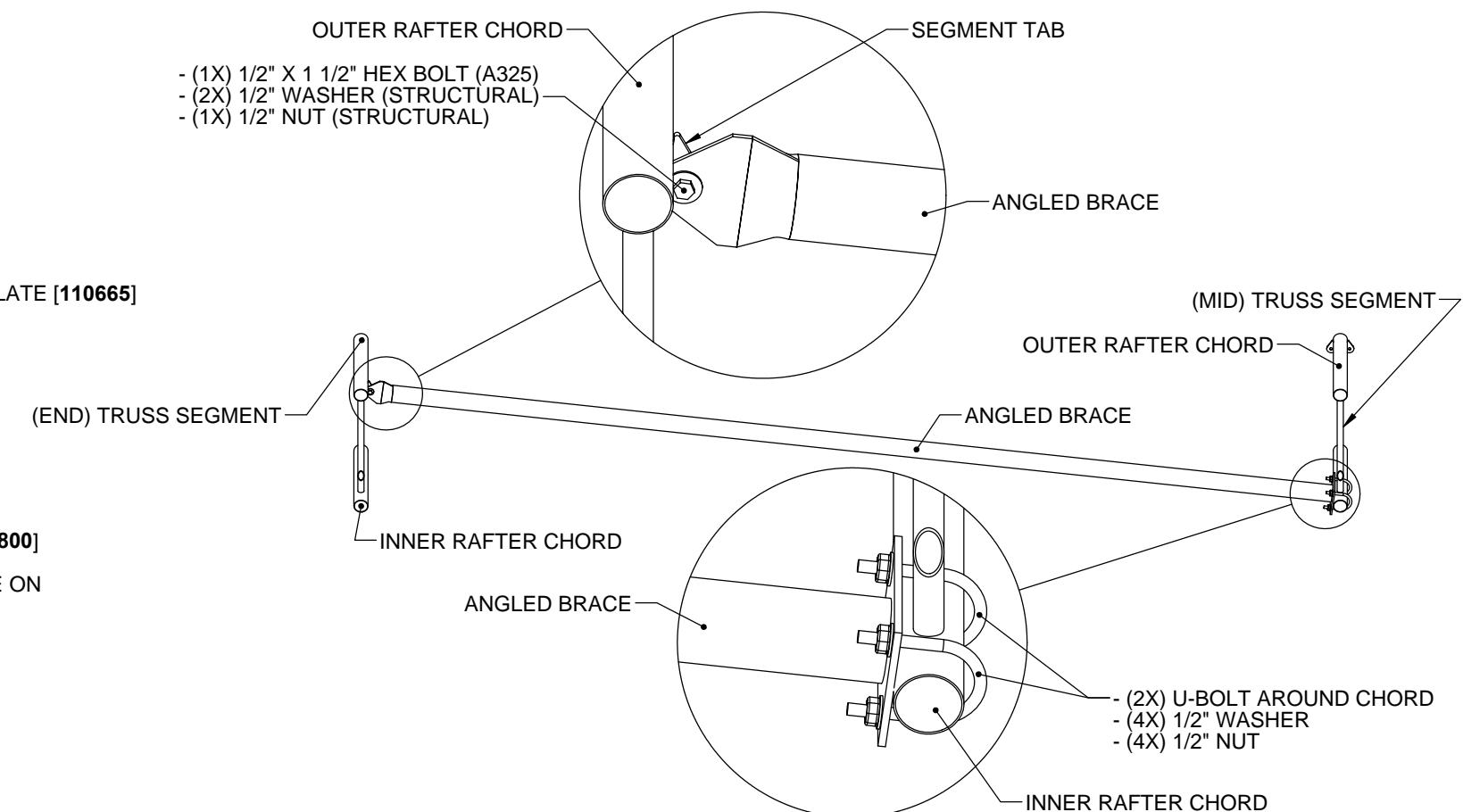
[G4-1.0] VIEW 1 - LATERAL BRACE CONNECTION : END



[G4-1.0] VIEW 2 - LATERAL BRACE CONNECTION : MIDDLE



[G4-1.0] VIEW 3 - CABLE CONNECTION PLATE TO LATERAL BRACE



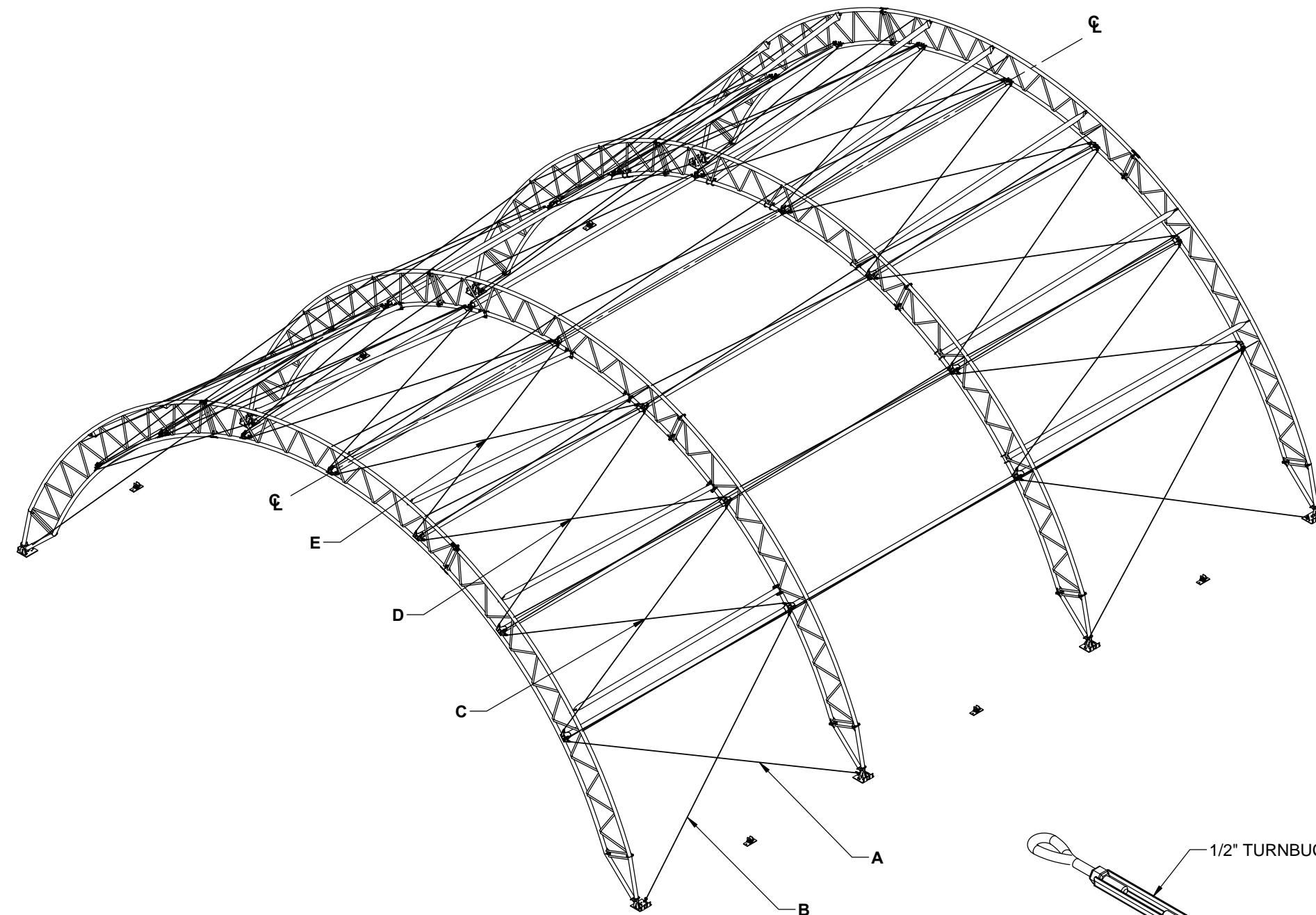
[G4-1.0] VIEW 4 - ANGLED BRACE CONNECTION

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CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'
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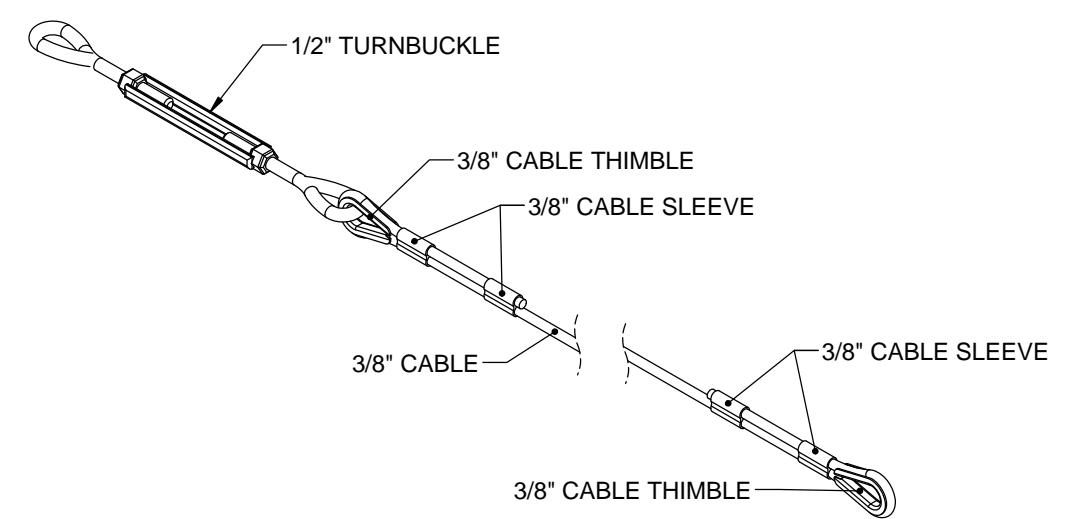
REFER TO SHEETS [A1-1.0], [C1-1.0], [F1-1.0], & [F2-1.0] FOR COMPLETE CABLE PATTERN.

CABLE LENGTH DETAILS



[G5-1.0] VIEW 1 - CABLE SKU PER SPAN

T045RDW : 20' RAFTER SPACING CABLE SKU'S		
SPAN	SKU	ACTUAL DISTANCE
A	CAB38T1C2207	22'-4 5/16"
B	CAB38T1C2202	21'-10 7/16"
C	CAB38T1C2011	20'-6 1/2"
D	CAB38T1C2011	20'-8 1/8"
E	CAB38T1C2011	20'-6 1/2"

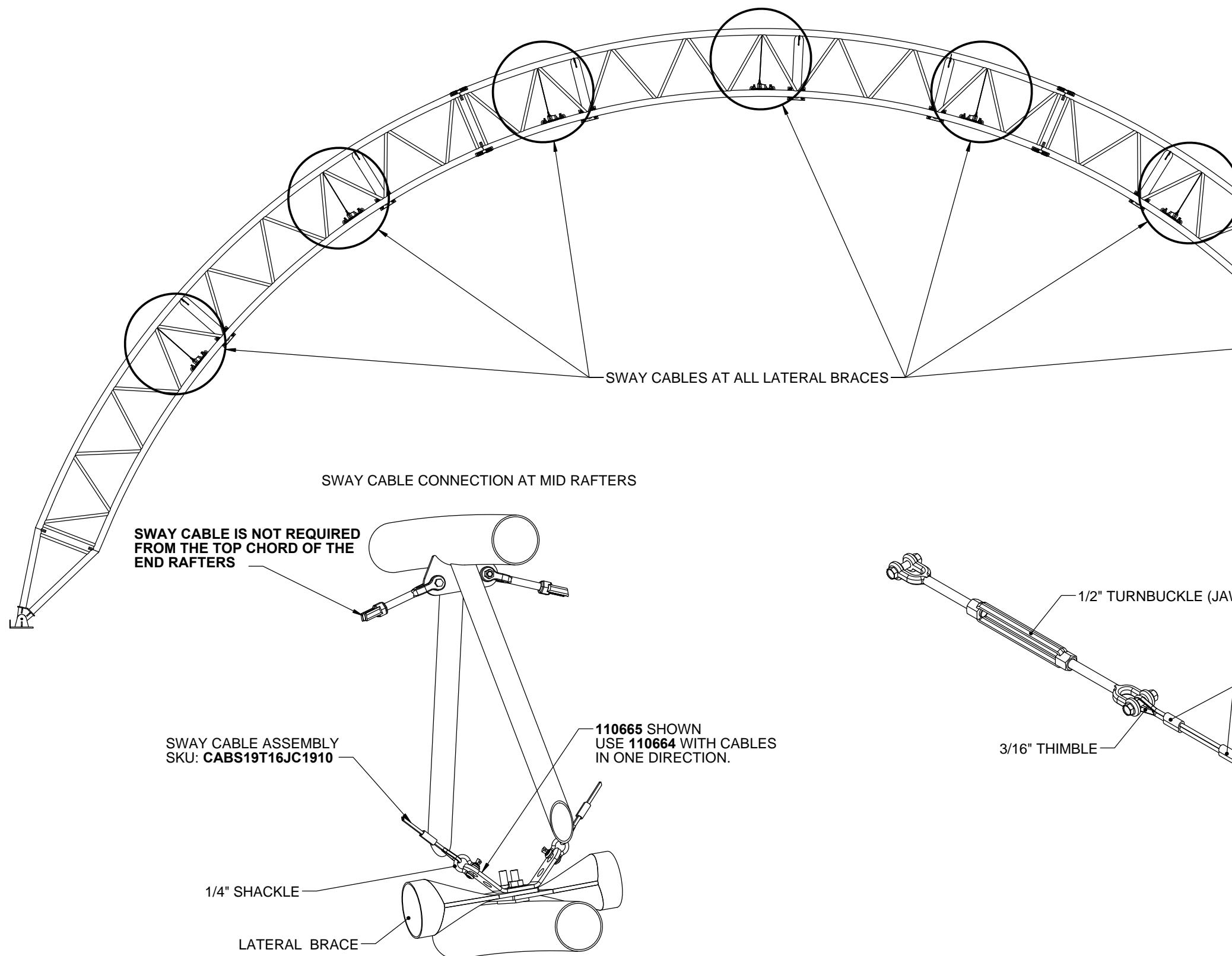


[G5-1.0] VIEW 2 - TYPICAL CABLE ASSEMBLY

DEVELOPED BY		
A DIVISION OF ENGINEERING SERVICES & PRODUCTS CO. 1440 18TH AVENUE SW DYERSVILLE, IA 52040 P: 563.875.2317 F: 563.875.2317 WWW.EASPSCO.COM		
ORDER #:		
CUSTOMER #:		
STRUCTURE SKU #: T05506020F		
STRUCTURE SIZE: 55' W x 60' L		
STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'		
CUSTOMER INFORMATION:		
CONTACT PHONE:		
CUSTOMER CONTACT:		
SHEET TITLE: CABLE LENGTH DETAILS		
DRAWING DETAILS		
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G5-1.0		

REFER TO SHEETS [A1-1.0], [C1-1.0], [F1-1.0], & [F2-1.0] FOR COMPLETE CABLE PATTERN.

SWAY CABLE DETAILS



[G6-1.0] VIEW 1 - SWAY CABLE DETAILS

[H1-1.0] VIEW 2 - TYPICAL SWAY CABLE ASSEMBLY

DEVELOPED BY	
ClearSpan	
A DIVISION OF ENGINEERING SERVICES & PRODUCTS CO.	
1440 18TH AVENUE SW Dyersville, IA 52240 P: 563.875.2319 F: 563.875.2317 WWW.EASPSCO.COM	
ORDER #:	
CUSTOMER #:	

STRUCTURE SKU #: T05506020F		STRUCTURE SIZE: 55' W x 60' L	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'
CUSTOMER INFORMATION:		CUSTOMER CONTACT:	
		CONTACT PHONE:	
		SHEET TITLE: SWAY CABLE DETAILS	

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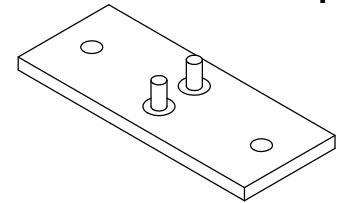
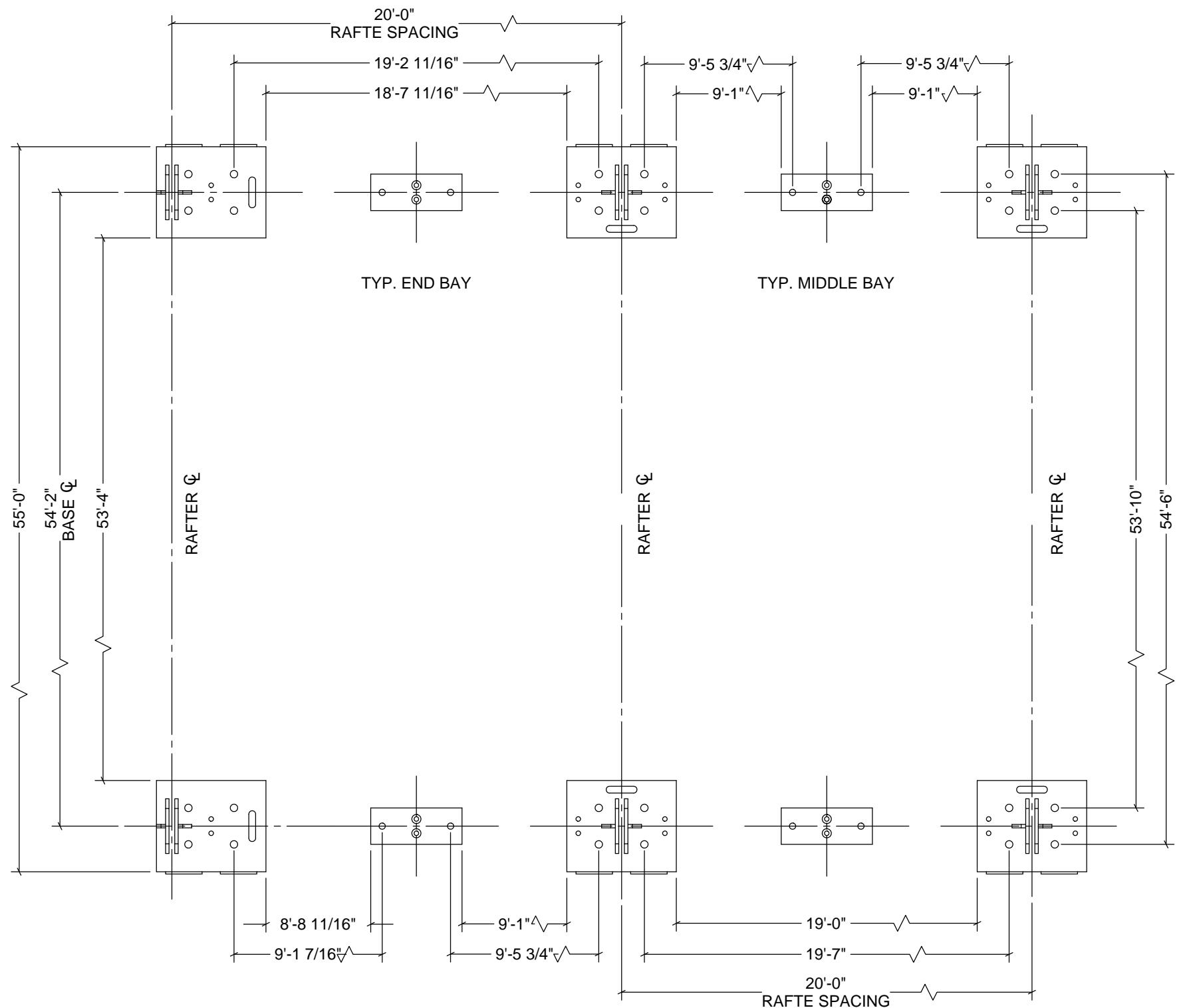
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CUSTOMER #:

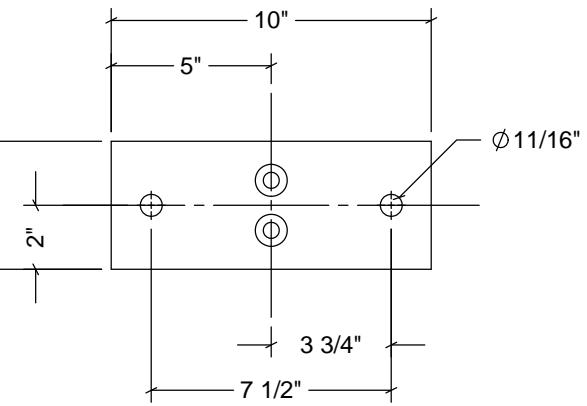
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CUSTOMER CONTACT:	STRUCTURE SIZE: 55' W x 60' L
SHEET TITLE: FOUNDATION DETAILS (BASE PLATES)	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5

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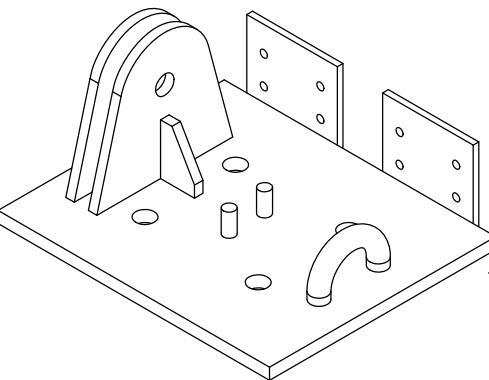
FOUNDATION DETAILS (BASE PLATES)



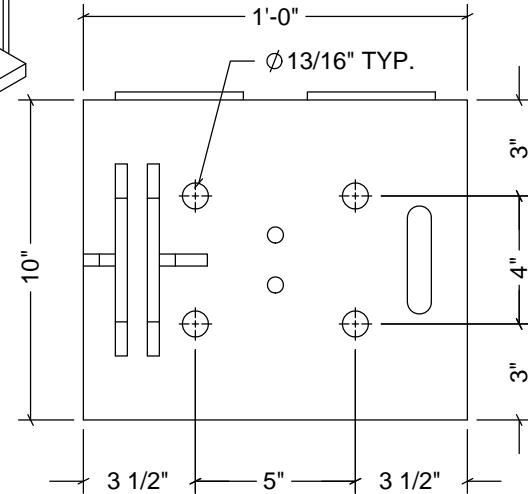
WP1004WS
ISOMETRIC VIEW



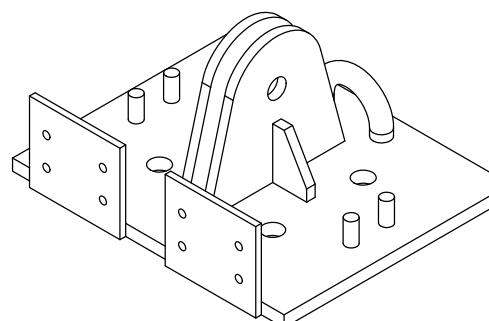
WP1004WS
TOP VIEW



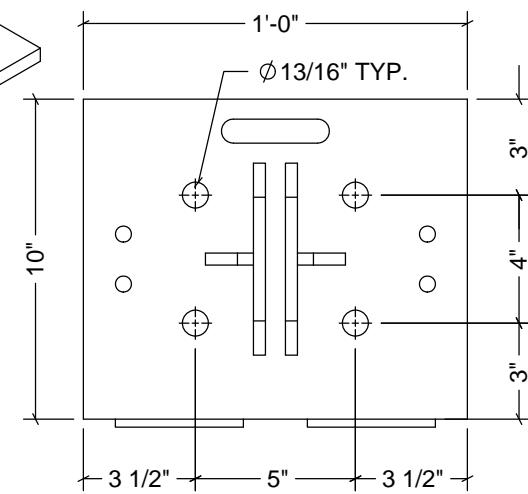
BP037EL
ISOMETRIC VIEW



BP037EL
TOP VIEW



BP037M
ISOMETRIC VIEW



BP037M
TOP VIEW

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ORDER #:

CUSTOMER #:

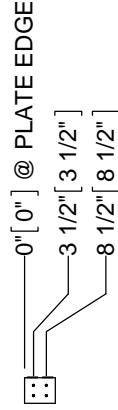
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CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE SIZE: 55' W x 60' L
SHEET TITLE: FOUNDATION DETAILS (ANCHOR HOLES)		STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5

DRAWING DETAILS		
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SHEET: H2-1.0		

FOUNDATION DETAILS (ANCHOR HOLES)

- ANCHOR HOLE LAYOUT

ANCHOR HOLES:



BASE CENTERS:

0'[0"] @ PLATE EDGE

6'[6"]

19'-11 3/16"[239 3/16"]
20'-4 3/16"[244 3/16"]

40'-1 11/16"[481 11/16"]
40'-1 11/16"[481 11/16"]

39'-11 3/16"[479 3/16"]
40'-4 3/16"[484 3/16"]

40'-1 11/16"[481 11/16"]

59'-6 7/8"[714 7/8"]
59'-11 7/8"[719 7/8"]
60'-3 3/8"[723 3/8"] @ PLATE EDGE

59'-9 3/8"[717 3/8"] @ PLATE EDGE

FOUNDATION NOTES:

- ESAPCO DOES NOT PROVIDE ANY MATERIAL OR DESIGN CRITERIA FOR THE CREATION OF THE FOUNDATION OR ANCHORING OF THIS BUILDING, UNLESS OTHERWISE NOTED.
- FOUNDATION AND ANCHORING SHALL BE ENGINEERED AND APPROVED BY A LICENSED STRUCTURAL ENGINEER OF OWNER'S CHOICE.
- FOUNDATION MUST MEET THE PROTOTYPICAL REACTIONS SHOWN BELOW.

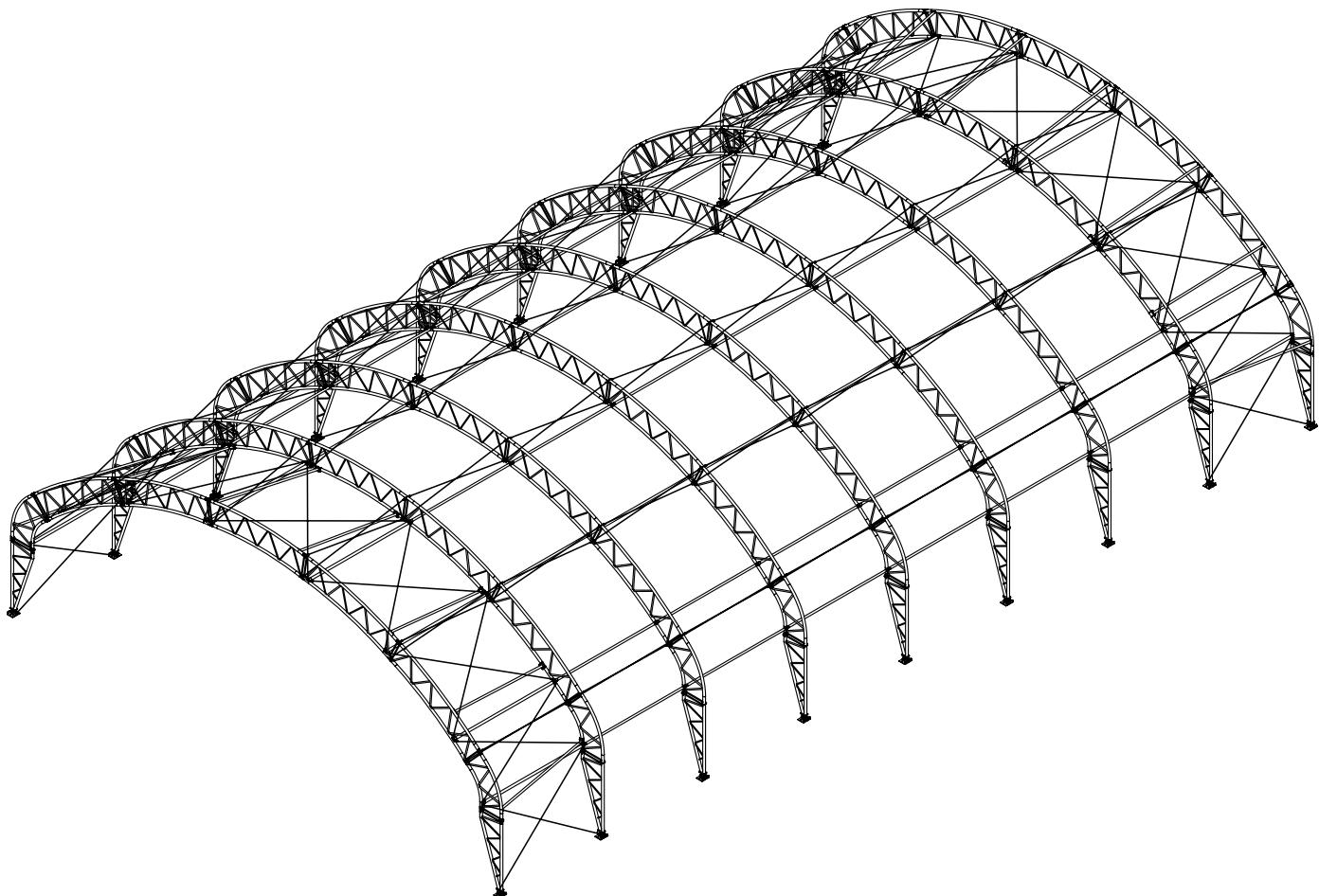
PROTOTYPICAL REACTIONS

CUSTOMER INFORMATION:	STRUCTURE SKU #: T05506020F	STRUCTURE SIZE: 55' W x 60' L
CUSTOMER CONTACT:	CONTACT PHONE:	STRUCTURE DESCRIPTION: 55' x 60' HD FREESTANDING 20' OC 12.5'
SHEET TITLE: PROTOTYPICAL REACTIONS		

DRAWING DETAILS		
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ClearSpan®

ClearSpan™ **Erecting the Truss Arch Frame**



Actual truss design and length may differ from what is shown. This guide outlines the basic truss assembly sequence. Always consult the final drawings and all documentation included with the truss building.

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**Typical Truss-Building
Assembly Steps**



YOU MUST READ THIS DOCUMENT BEFORE YOU BEGIN TO ASSEMBLE THE TRUSS-BUILDING FRAME.

This guide includes helpful hints and important information needed to safely erect a truss-building frame. Please read these instructions **before** you begin.

If you have any questions before or during the assembly, contact your project manager.

SAFETY PRECAUTIONS

- Wear eye and head protection.
- Wear gloves when handling truss-building components.
- Use a portable GFCI (Ground Fault Circuit Interrupter) when working with electric power tools and cords.
- Use lifts and other power tools suitable to accomplish the procedures outlined in this document and in the detailed final drawings.
- Safety harnesses are required for all workers in elevated positions.

⚠ WARNING: For safety reasons, those who are not familiar with recognized construction methods and techniques must seek the help of a qualified contractor.

SAFETY AND ASSEMBLY NOTICE

THE ASSEMBLY OF A CLEARSPAN TRUSS-BUILDING SYSTEM MUST CONFORM TO ALL AUTHORITIES HAVING JURISDICTION IN THE REGION WHERE THE BUILDING ERECTION WILL OCCUR. CLEARSPAN WILL NOT BE RESPONSIBLE FOR FAILURE TO COMPLY WITH ESTABLISHED BUILDING CODES AND RESTRICTIONS BY A CONTRACTOR SUPPLIED BY THE CUSTOMER. IN THOSE AREAS WHERE SUCH AUTHORITIES DO NOT EXIST, THE BUILDING ASSEMBLY MUST CONFORM TO THE REQUIREMENTS IDENTIFIED IN THIS DOCUMENT AND THE APPROVED BUILDING DRAWINGS.

ADDITIONALLY, CLEARSPAN WILL NOT BE RESPONSIBLE FOR ANY DAMAGE OR INJURY DIRECTLY OR INDIRECTLY RESULTING FROM THE ERECTION OF THE BUILDING REGARDLESS OF THE EXISTENCE OF CODES AND RESTRICTIONS AND WHETHER THESE WERE FOLLOWED OR IGNORED.

PRE-ASSEMBLY PROCEDURE

The following general series of steps will help you plan the erection of the truss-building system:

1. Verify that all parts are included in the shipment. Notify Customer Service for questions or concerns.
ATTENTION: Inspect the shipment for damage. Record any damage on the bill of lading before it is signed. If damage is found after opening a container, contact the carrier or carrier agent immediately. Contact your sales representative for additional information immediately when damage is discovered.
2. Unload the shipment. Use the diagram on the following page for a suggestion for material placement when the truss-building system is unloaded.
3. Read these instructions, the final drawings, and all additional documentation included with the shipment **before** you begin.
4. Gather the tools, bracing, lifts, ladders, and the required personnel. See the sample tool and equipment list below.
5. Check the weather **before** you begin and plan accordingly.
6. Read the warranty information and complete the documentation as instructed.

REQUIRED TOOLS

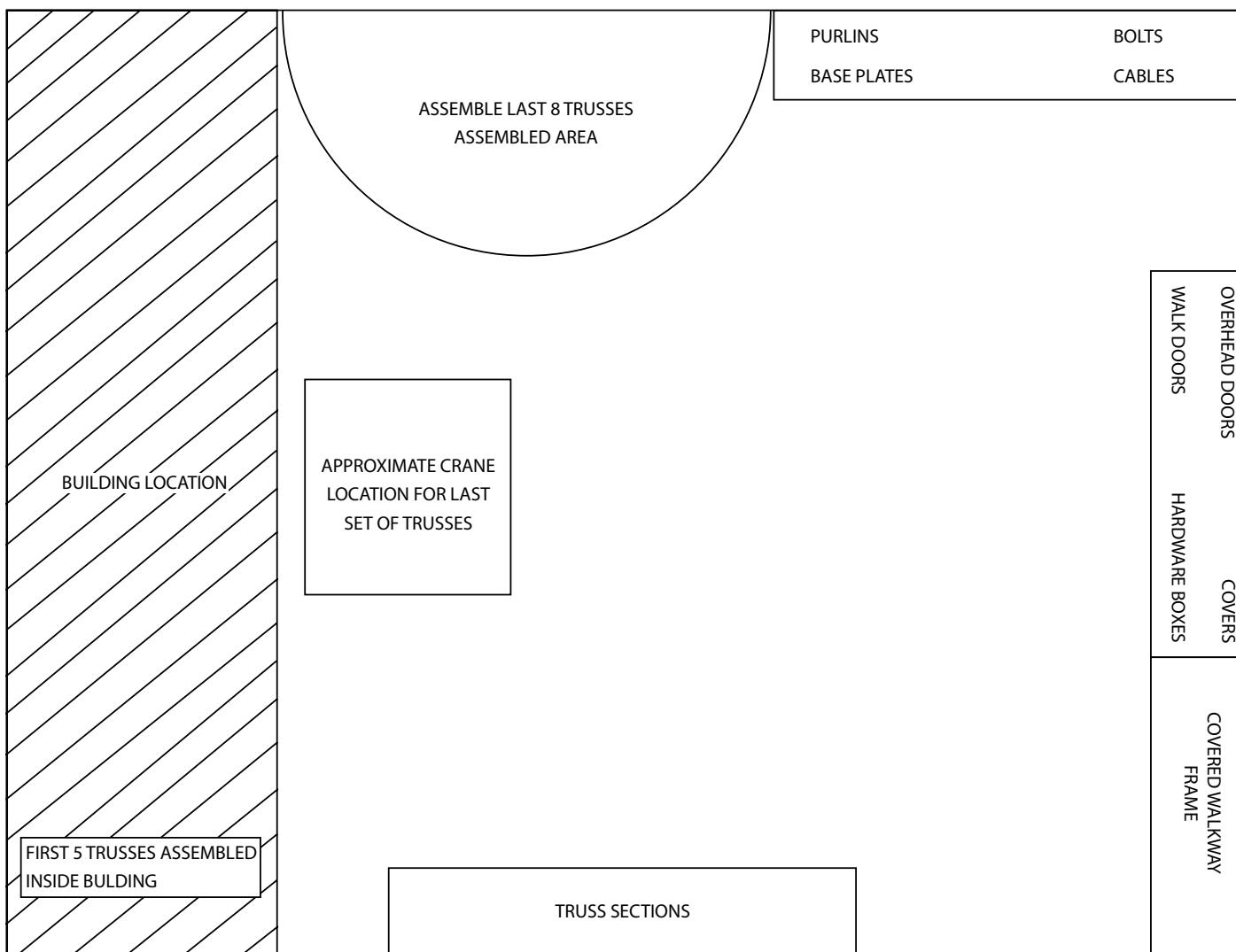
The following list identifies the basic equipment and some main tools needed to assemble a typical truss building.

The size of the required personnel lifts will vary as will the equipment needed to unload and move truss-building components. Additional hand tools and supports may be needed depending on the structure size, location, and existing restrictions and codes.

- Tape measure or measuring device, variable speed drill and impact driver (cordless with extra batteries works best).
- Metal file, metal cutting saw, wrenches, impact socket set, scissors or utility knife, hammers, and work gloves.
- Rough-terrain 6,000 lb telescoping fork truck (unloading and moving truss-building components).
- 40' - 80' 4WD boom (personnel lift).
- 26', 33', or 40' rough-terrain scissors lift (mainly single-chord buildings or insulation packages).
- Mini excavator, 1700 lb skid loader, and hydraulic hammer for mini excavator (for Manta Ray® anchor installation).
- Hammer drill (anchor bolt installation).

SAMPLE LAYOUT DIAGRAM SHOWING POSITIONS OF UNLOADED TRUSS BUILDING COMPONENTS

The diagram below shows one way to position the components of the truss shipment to minimize unnecessary steps after delivery. This is a best-case scenario. In many cases, the available site space is limited. Use this diagram to position components for easier access and truss assembly. Adjust positions based on availability of space.

**REQUIRED UNLOADING PROCEDURES:**

- Set all rafter sections/bundles on 4" x 4" blocks as needed to keep the components off the ground and out of water, snow, mud, etc.
- Set all end wall columns, end framing, and remaining straight frame members on 4" x 4" blocks to keep the components off the ground and out of water, snow, mud, etc.
- Protect all covers, end panels, and cardboard shipping containers and contents from the elements. Set on pallets off the ground and cover with plastic film or place in a building for use when needed.
- When unloading the bundles of truss segments from the flatbed, forks of the fork truck must support both chords of the truss segment. If forks are not long enough, use a sling and lift to unload the truss segment bundles.
- Do not position components and truss segments in the staging area or any place where a crane must pass or be positioned for the assembly of the truss-building components.

CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

SPECIAL ASSEMBLY NOTE: BEFORE YOU BEGIN

MANY OF THE PROCEDURES DESCRIBED BELOW AND WITHIN THIS GUIDE CAN OCCUR SIMULTANEOUSLY. SOME, HOWEVER, MUST BE COMPLETED BEFORE MOVING ON TO THE NEXT PROCEDURE.

TO BETTER UNDERSTAND THE ENTIRE ASSEMBLY PROCESS AND TO PREVENT DAMAGE OR POSSIBLE INJURY, READ THROUGH THIS ENTIRE GUIDE **BEFORE** YOU BEGIN.

Space below is reserved for customer notes.

BASIC ASSEMBLY PROCEDURES

The steps that follow describe the typical sequence that must be followed to ensure the proper assembly of a truss-building system. When present, local restrictions and building codes may require additional or alternative steps. Failure to follow these steps or adhere to recognized codes and standards or both may result in an improperly assembled truss-building system and will void the warranty and all protection the building owner is entitled to.

Complete these steps in the order they are presented. Consult the procedures later in this guide for additional details pertaining to the general steps listed below.

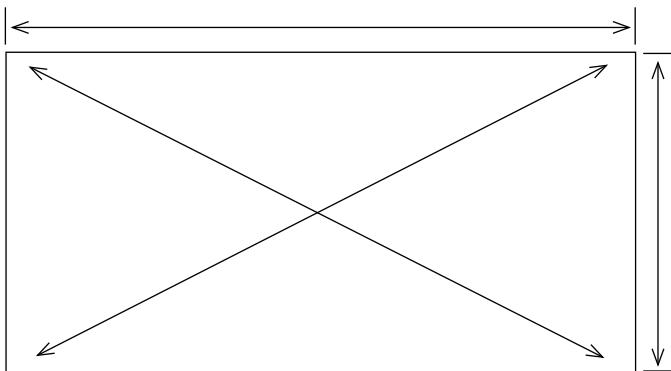
1. Verify that the foundation is square and prepared for the base plate installation.
2. Install anchor bolts and base plates.
3. Assemble the trusses on the ground and stage for lifting into position.
4. Set the first end truss and brace it in place.
5. Set the next truss and install all lateral bracing (purlins) between the installed end rafter and the second rafter.
6. Install all cables between the first two rafters and plumb the rafters.
7. Continue setting assembled trusses until all are set. See details in the procedure that follows.
8. Set end wall columns, install headers if any, and install telescoping purlins.
9. Install end panels (if equipped).
10. Install main cover(s).
11. Install all doors.

CHECK THE FOUNDATION

Other than overall design, foundations can be divided into two categories: engineered and non-engineered. Consult the information that follows to check the foundation before you begin the truss assembly steps.

Engineered Foundations

1. Check the foundation against the engineer's final drawings to ensure the actual dimensions match those shown on the drawing. Contact the engineer of record if the dimensions exceed acceptable tolerances.
2. Check the foundation for square by measuring from corner-to-corner and comparing the dimensions.



Sample Foundation

3. Verify that the foundation is level and capable of supporting the truss building.
4. Address all other concerns by contacting the engineer who designed the foundation and the contractor who constructed the foundation.

Non-Engineered Foundations

In those instances when an engineered foundation is not required by regional codes and restrictions or the building manufacturer, complete these steps:

1. Use the final building drawings to check the foundation dimensions.
2. Verify that the foundation is square.
3. Consult the final truss building drawings to determine the minimum requirements for the foundation.

NOTE: If the foundation does not appear adequate to support the building, resolve all issues and concerns before setting the truss frame. Contact a qualified contractor to discuss any issues that are identified.

SETTING THE ANCHOR BOLTS

After the foundation has passed inspection, set the anchor bolts for the base plates. In some instances, these bolts may have been installed during the construction of the foundation. Consult the following information for typical anchor bolt installation.

- If the anchor bolts for the base plates were installed during the construction foundation, use the final truss drawings to confirm base plate and anchor bolt locations. If issues are found, contact the foundation contractor and the foundation engineer for resolution.

ATTENTION: Do not set *base plates and trusses* until anchor bolt issues are resolved.

- For engineered truss buildings and foundations, consult the final drawings and install the anchor bolts according to those instructions. When epoxy is used to anchor the bolts to the foundation, prepare the foundation and apply the epoxy according to the manufacturer's instructions. Use epoxy that meets or exceeds the recommendations of the engineered requirements.
- Consult the final building drawings for the anchor bolt requirements and properties. Anchor bolt requirements are typically determined prior to construction based on building use, substrate anchoring to, and required structural properties of anchor to meet reaction forces at the base.
- Always follow the manufacturer's instructions when installing the mounting bolts and applying epoxy.
- Verify epoxy drying times and follow the manufacturer's instructions.



CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

INSTALL THE BASE PLATES

When anchor bolts are installed during the construction of the foundation, base plates are usually placed over the bolts and secured using washers and nuts as described in the final building or foundation drawings.

In many instances, the anchor bolts and base plates can be installed simultaneously. Here are those steps:

1. After the foundation is inspected and approved, consult the building diagrams to determine base plate placement. Mark the center line of each plate position on the foundation.
2. Mark the center of each plate and set the first end truss base plate in position.
3. Align the center marks, square the plate on the foundation, and mark the anchor bolt holes using the base as a template.
4. Remove the base plate and drill the anchor bolt holes to the required depth using the appropriate drill bit for anchor bolts that will be used.
5. Using compressed air or other means, clean out the anchor bolt holes. Wear eye protection!
6. Once the holes are clean, set the plate back in place and apply the recommended epoxy into each hole as described by the epoxy manufacturer.
7. Take the recommended anchor bolts, and carefully insert one into each anchor bolt hole. Adjust the nut and washer on the anchor bolt to gauge how far the bolt will drop into the hole.
8. Allow the epoxy to dry according to the manufacturer's instructions before you tighten the anchor bolts.
9. Repeat the procedure to install the remainder of the base plates.
10. After the epoxy has dried, return to all anchor bolts and tighten according to the instructions.



STEP 6: Apply epoxy into each anchor bolt hole.



STEP 7: Install anchor bolts.



STEP 7: Adjust nut to gauge depth.



STEP 8: Allow epoxy to dry before tightening the nuts.

ASSEMBLE TRUSSES

Prior to the assembly of the truss-building frame, the trusses must be constructed. Plan the assembly and setting of trusses to best use space, equipment, and contractors. In many instances, limited space and building size may not allow you to assemble all trusses without setting some in the process. The steps below describe the basic truss assembly process.

1. Consult the building drawings to identify the different truss segments that are needed to assemble one truss.

NOTE: Each truss building consists of end trusses and trusses positioned between the end trusses. Consult the building drawings to identify truss positions on the frame. Assemble the trusses in a stack using blocks to separate the different trusses. One end truss must be set in place first; do not bury the end trusses in the stacks. Take time to plan the truss assemble process.



Photo above shows a stack of assembled trusses ready to lift and set in position on the base plates attached to the foundation.

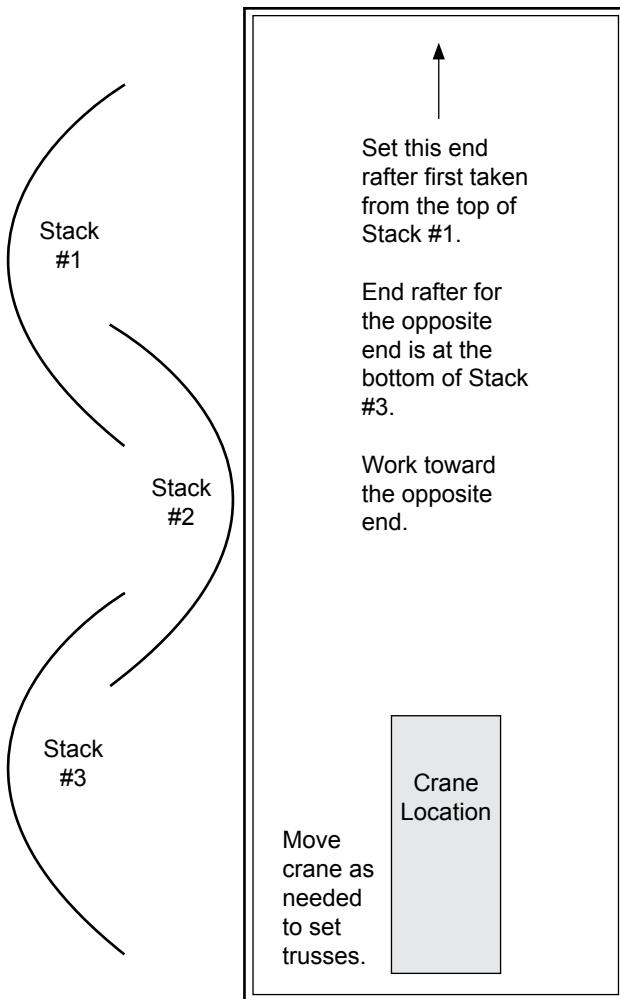
2. Assemble the trusses according to the drawings supplied with the truss building.
3. Tighten all fasteners.

NOTE: Use the details supplied with the drawings to identify the different connections and fasteners. Bolt tightening details are also described within the final drawing packet. The "snug-tight" condition is defined as the "tightness attained by a few impacts of an impact wrench, or the full effort of a man using an ordinary spud wrench."

4. Continue by setting the trusses.

EXAMPLE OF TRUSSES STAGED FOR LIFTING

Sample foundation with trusses staged for assembly is shown. This is one possibility. Site, building size, available equipment and other factors may require a different approach and lifting sequence.

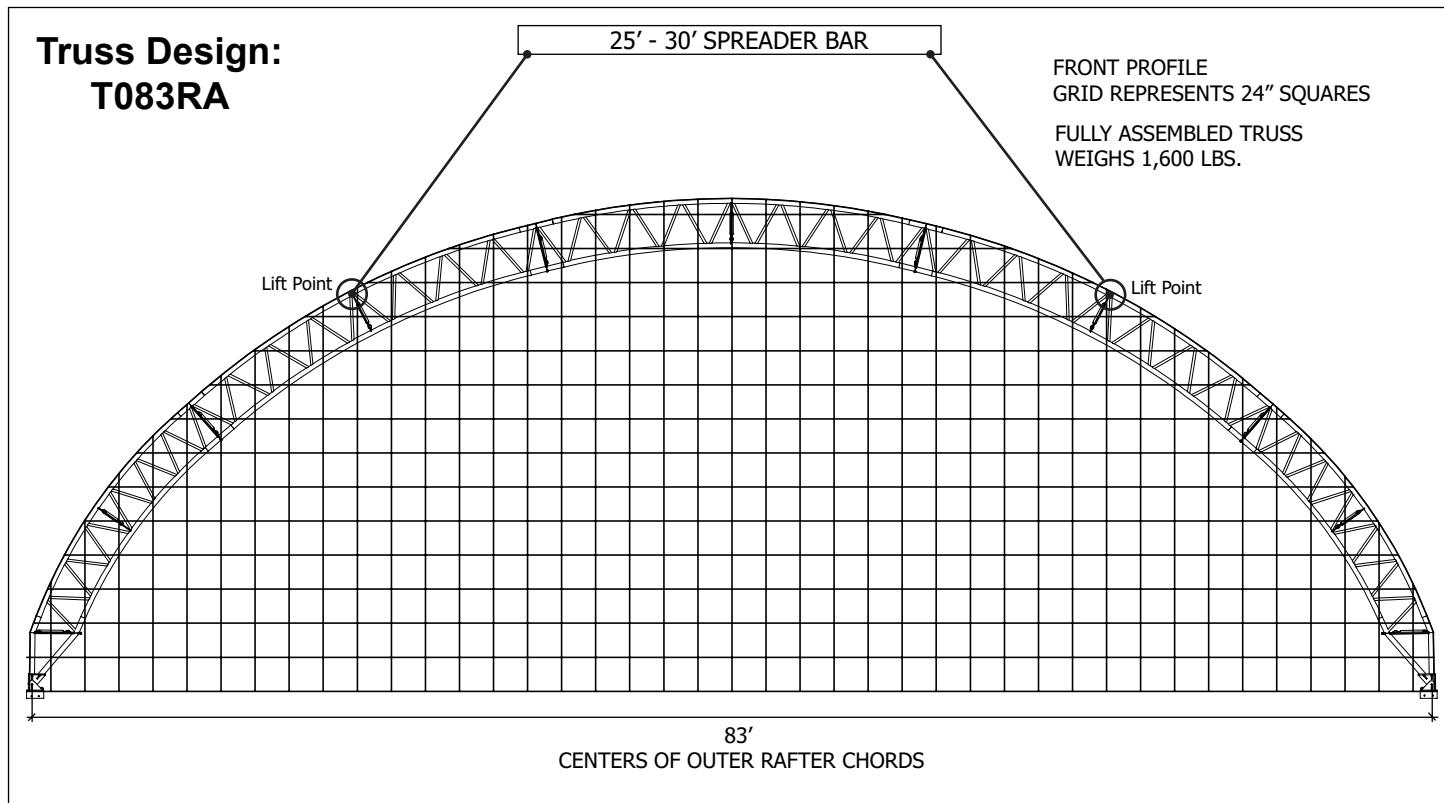
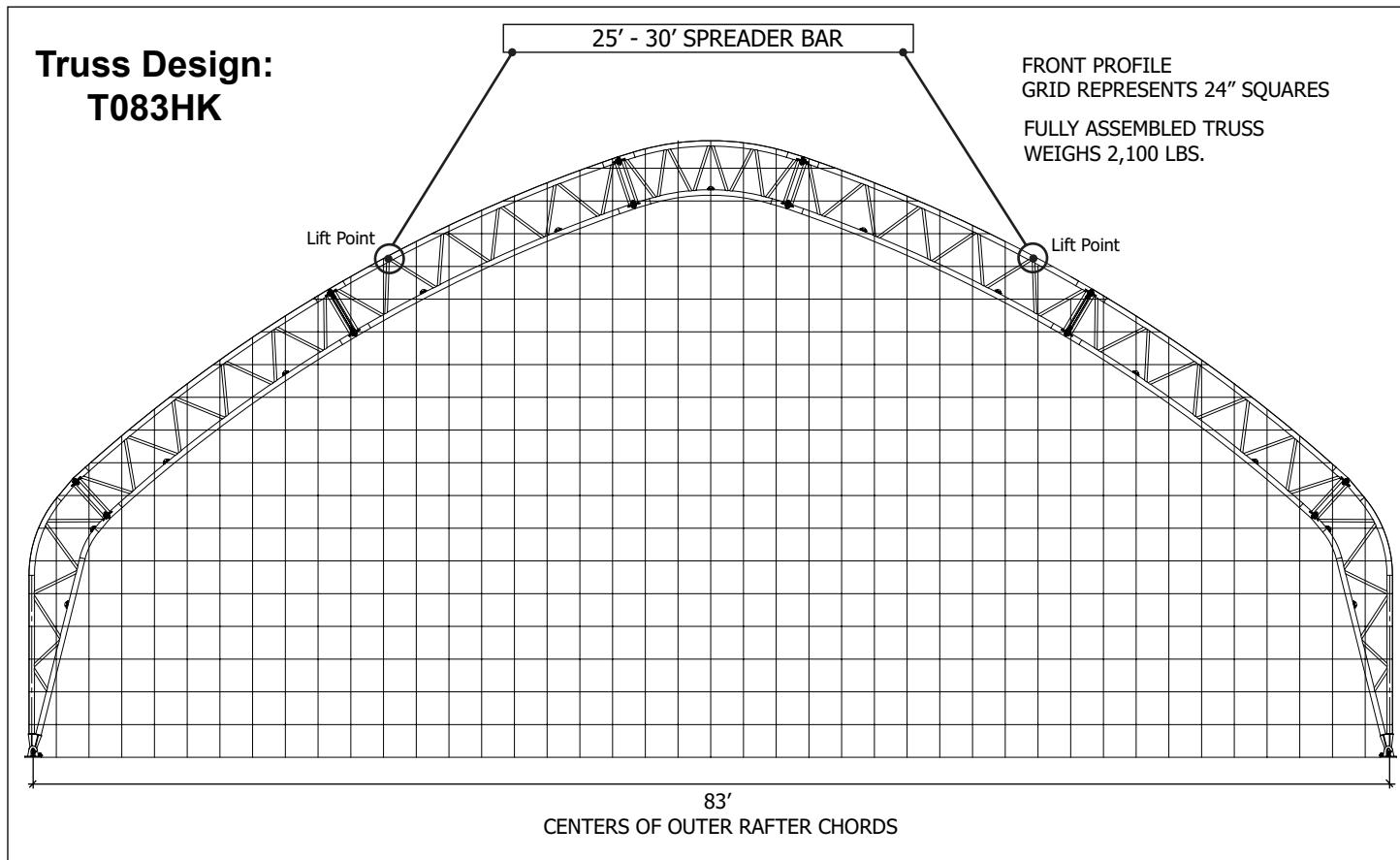


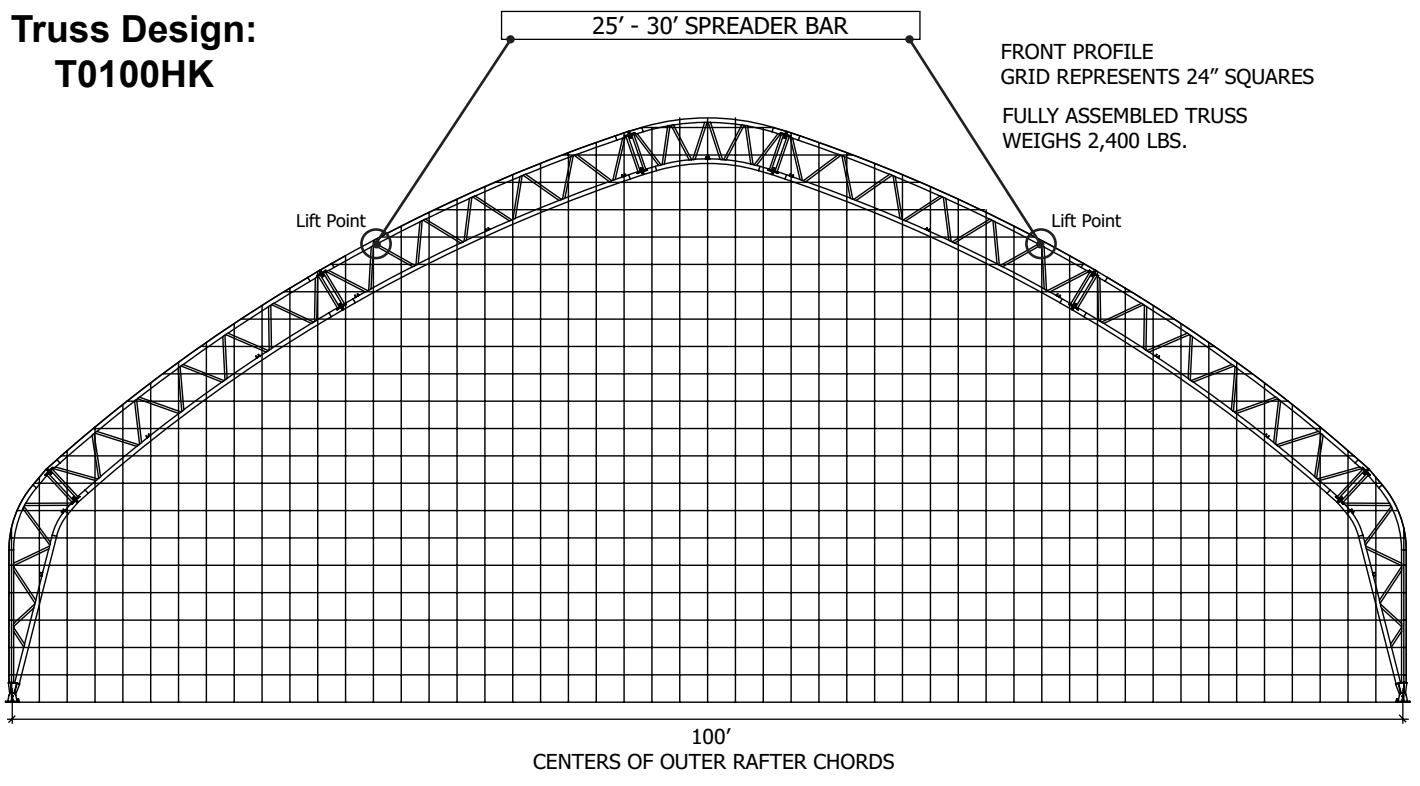
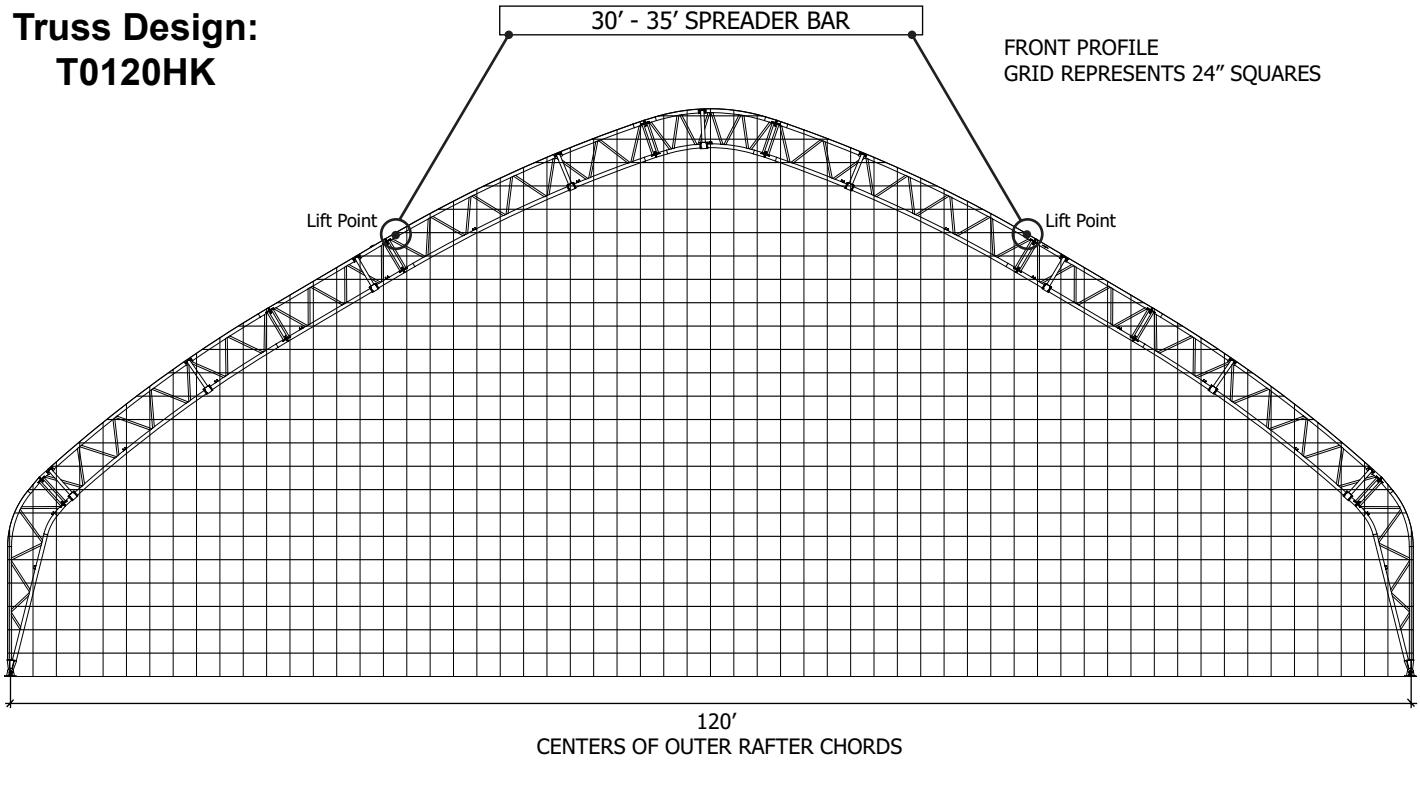
Assembled and Stacked Trusses

CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

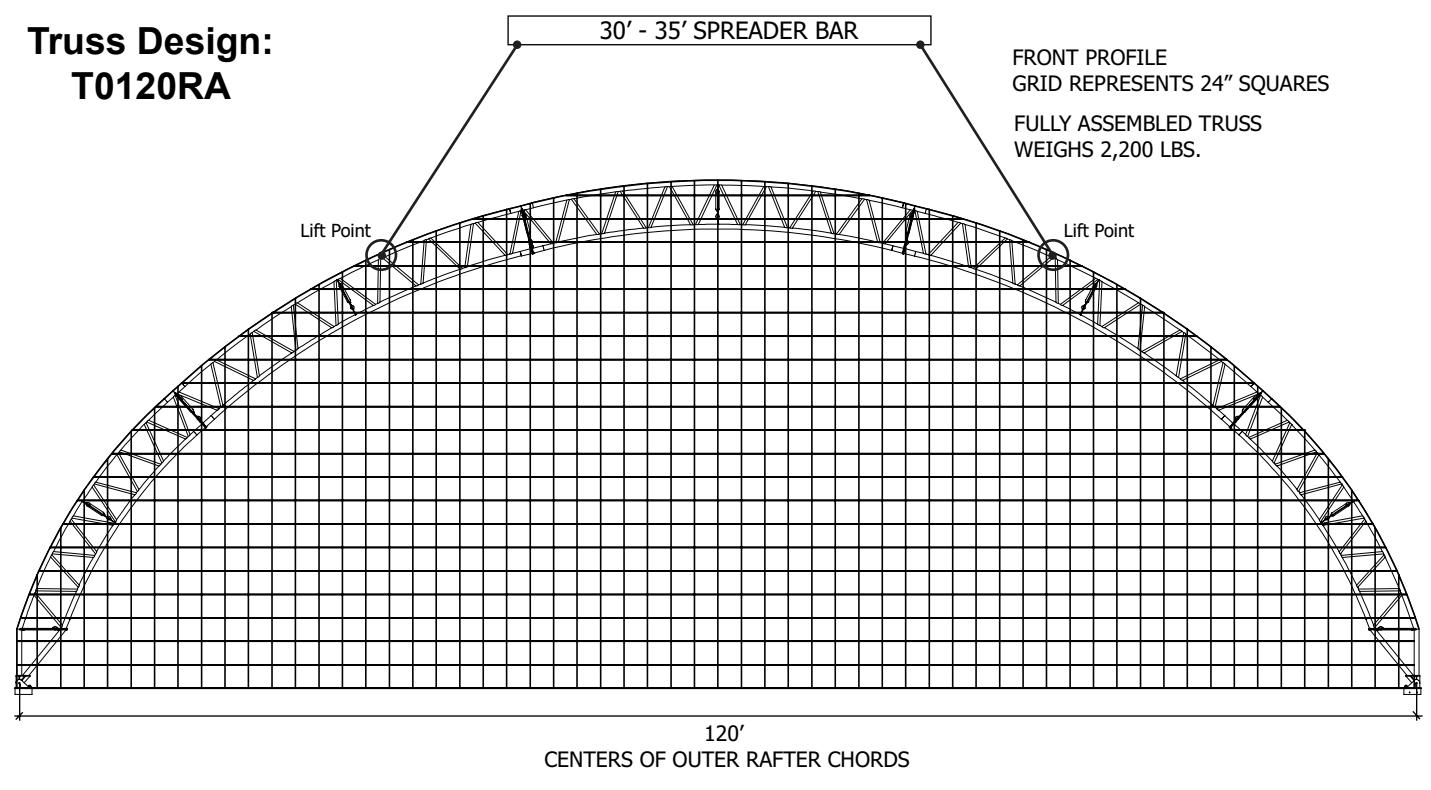
HOW TO LIFT THE ASSEMBLED TRUSS

Use the following diagrams to rig the assembled truss for lifting.

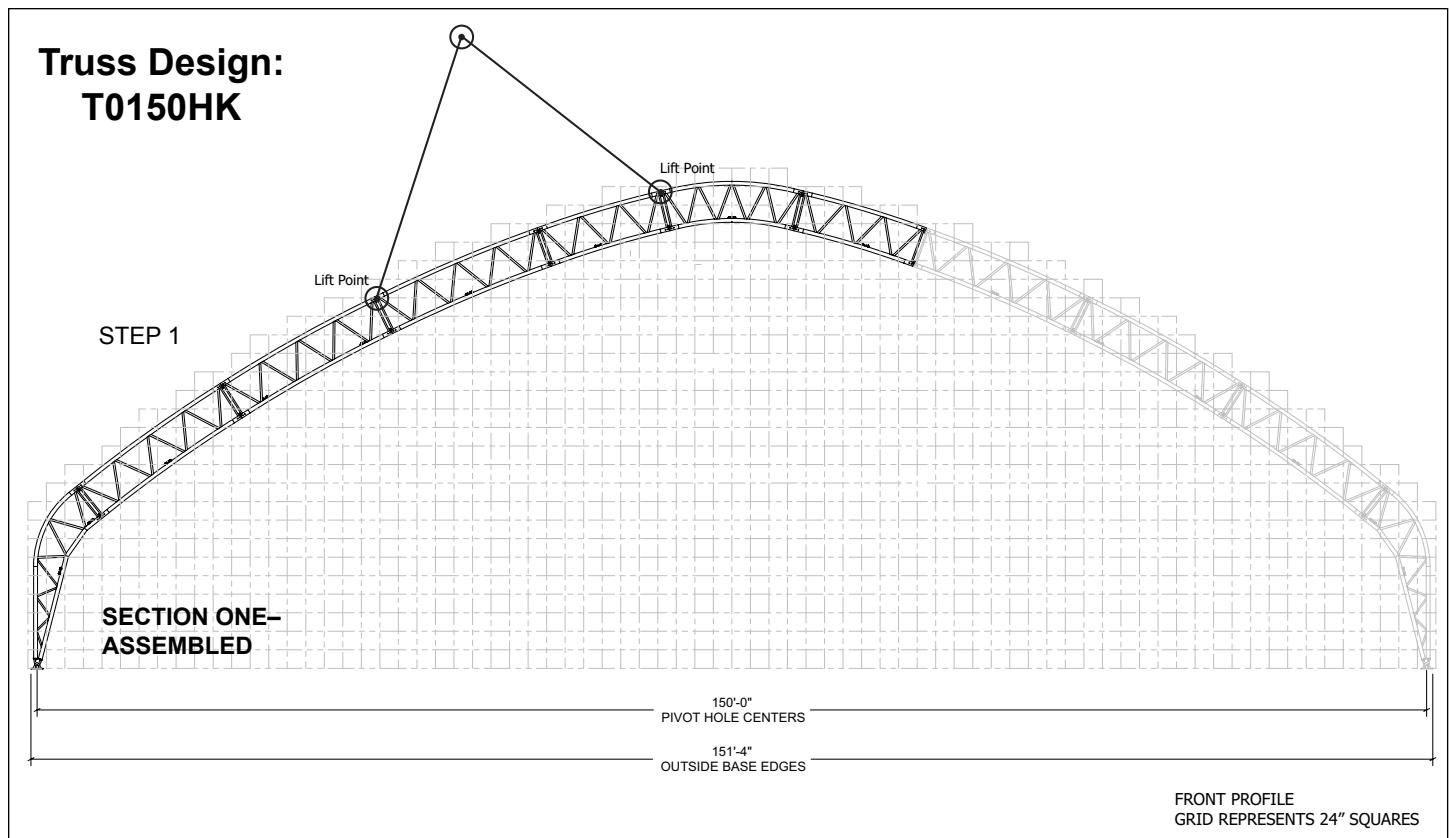


**Truss Design:
T0100HK****Truss Design:
T0120HK**

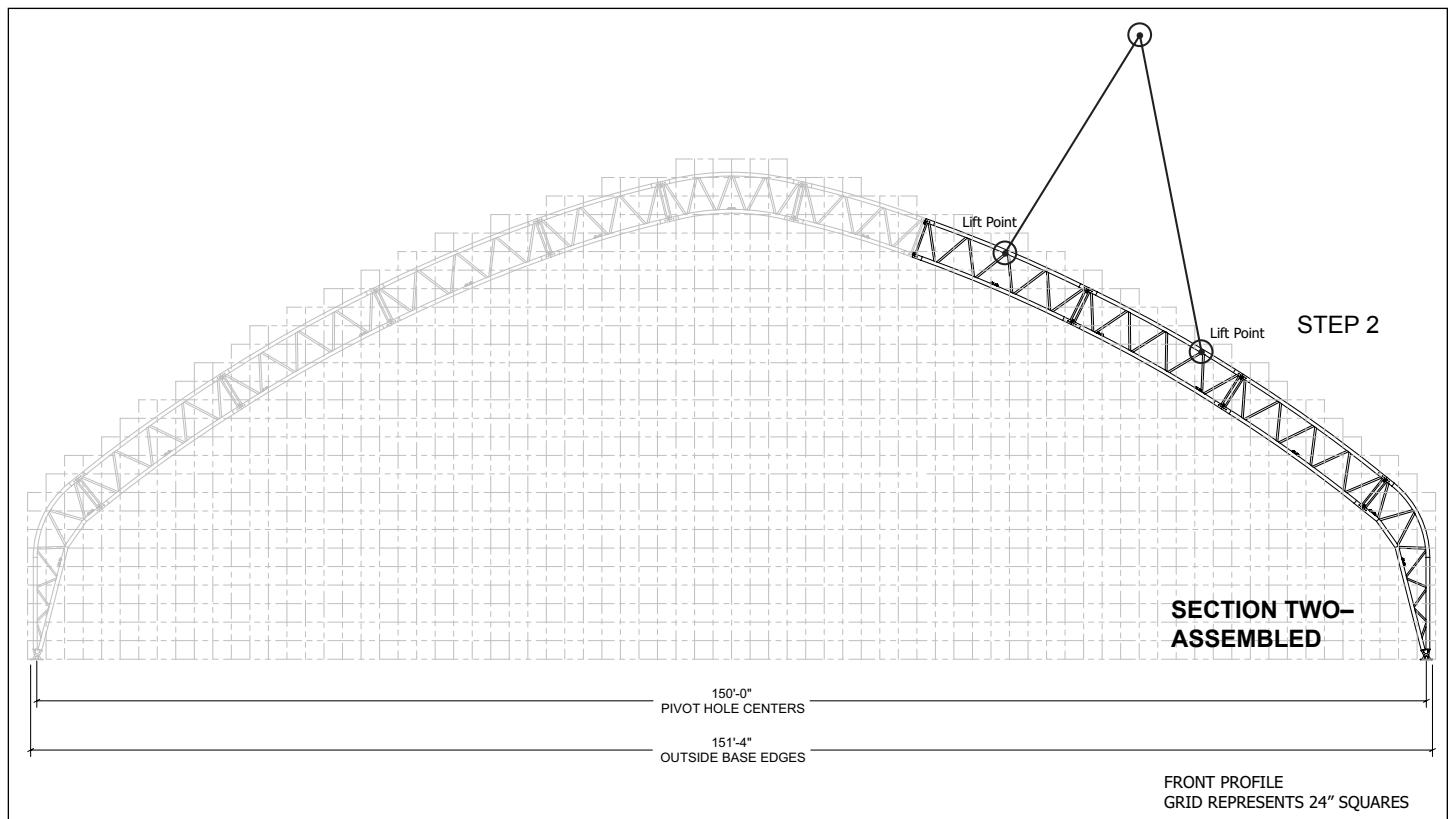
**Truss Design:
T0120RA**



STEP 1: ASSEMBLE SECTION ONE, SECURE LIFT TO THE ASSEMBLED SECTION, AND LIFT INTO POSITION. ANCHOR ASSEMBLY TO BASE PLATE.

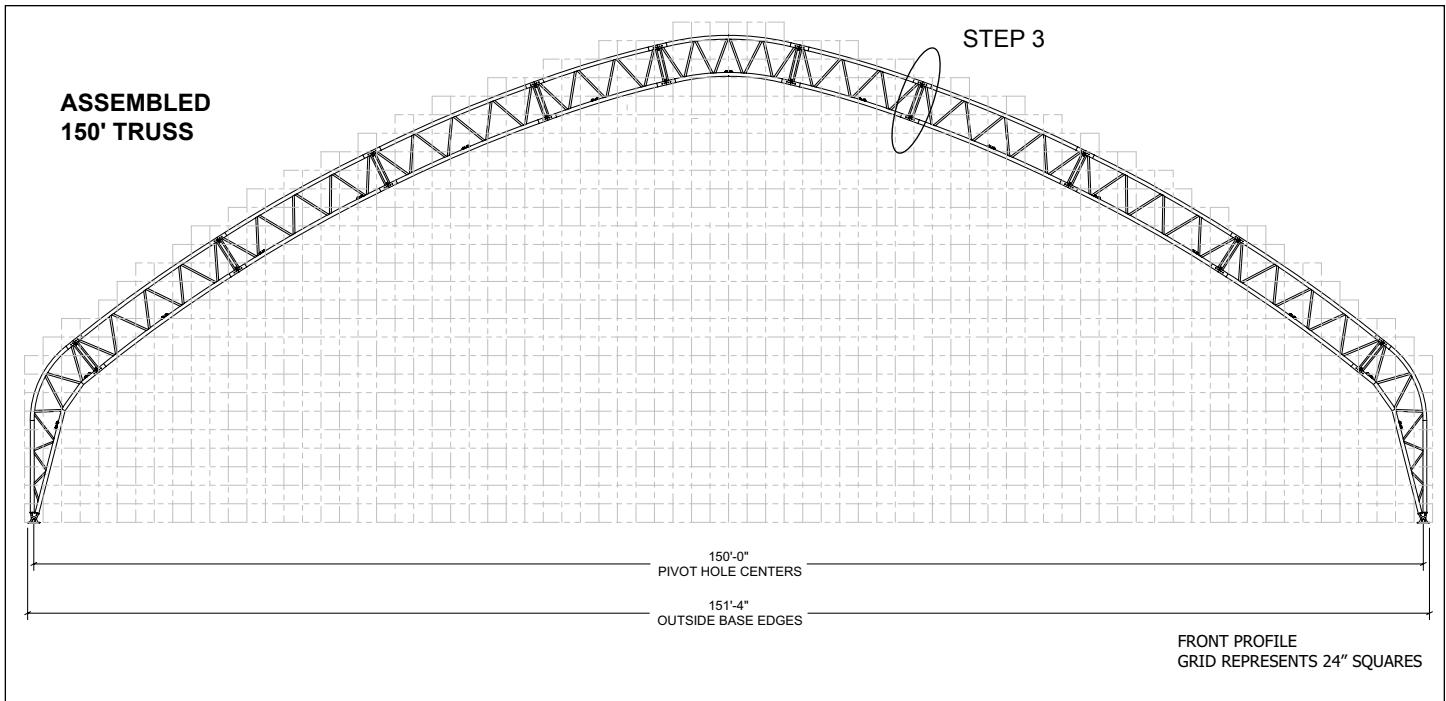


STEP 2: ASSEMBLE SECTION TWO, SECURE LIFT TO THE ASSEMBLED SECTION, AND LIFT INTO POSITION. ANCHOR ASSEMBLY TO BASE PLATE.



CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

STEP 3: SECURE SECTION ONE TO SECTION TWO.



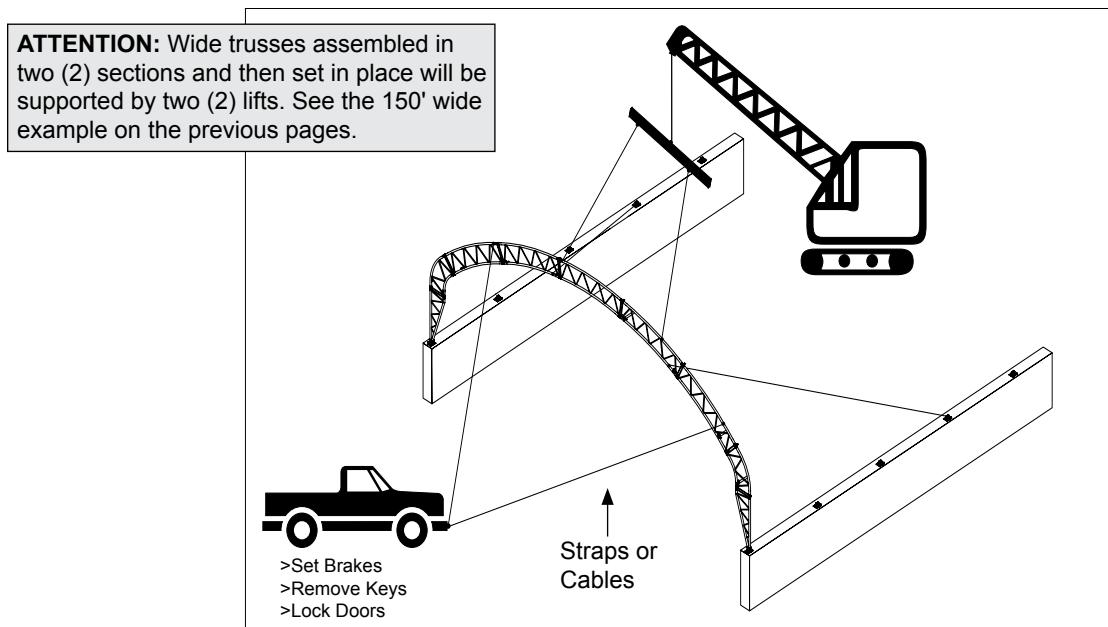
SETTING THE ASSEMBLED TRUSSES

In most cases, trusses are set beginning at one end of the foundation and working toward the other. Always consult the final drawings and other documentation included with the building to determine if special assembly instructions are present regarding the truss building. The following steps and diagrams describe how to lift and set the basic truss.

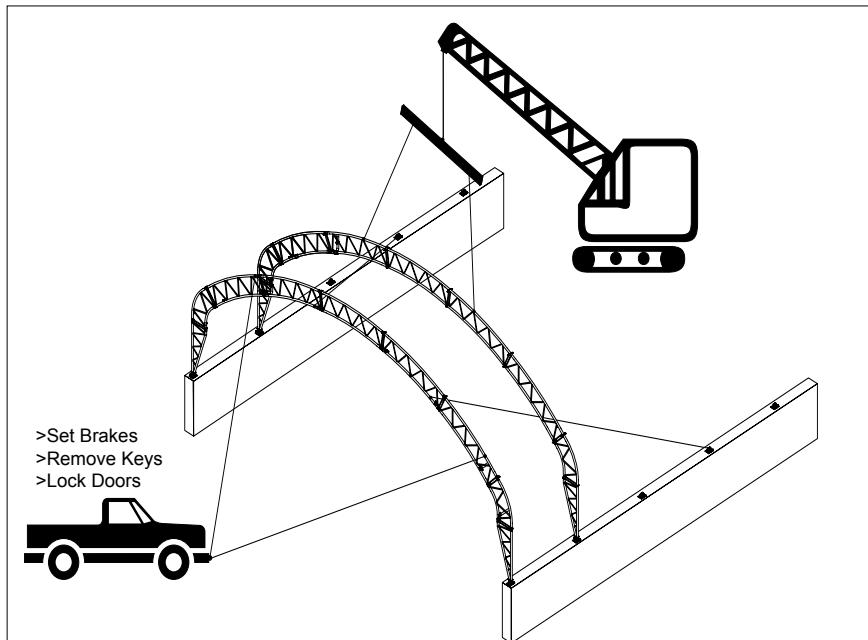
1. Verify that all anchor bolts are tight.
2. Using the diagrams on the previous pages to properly rig the truss, lift and set the first end truss in place and secure it to the installed base plates.

NOTE: Examine the end truss to determine the truss position as it sits on the foundation. The END PROFILES in the final drawings show the trusses as viewed from the outside looking at the frame. Use this to determine the truss orientation when the end segments of the end truss differ. Typically this affects only the end trusses.

3. Secure the truss using straps or cable as shown in the diagram below. This strapping must remain in place until the next truss is secured and attached to the end truss.



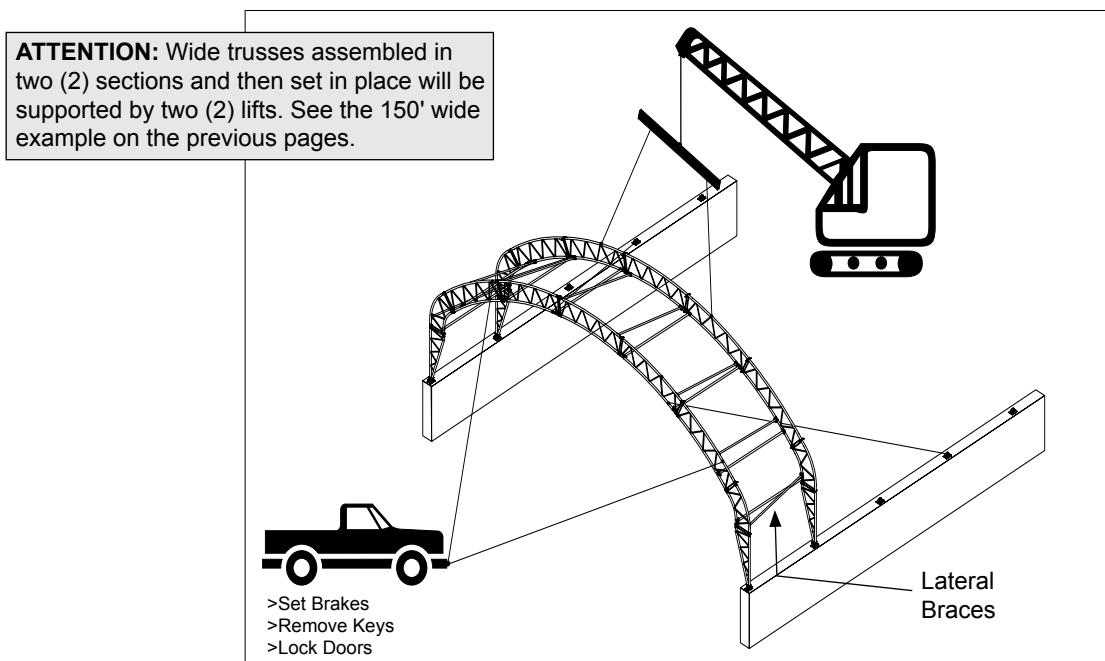
4. Unhook the crane, rig the first middle truss, set it into position, and secure it to the installed base plates.



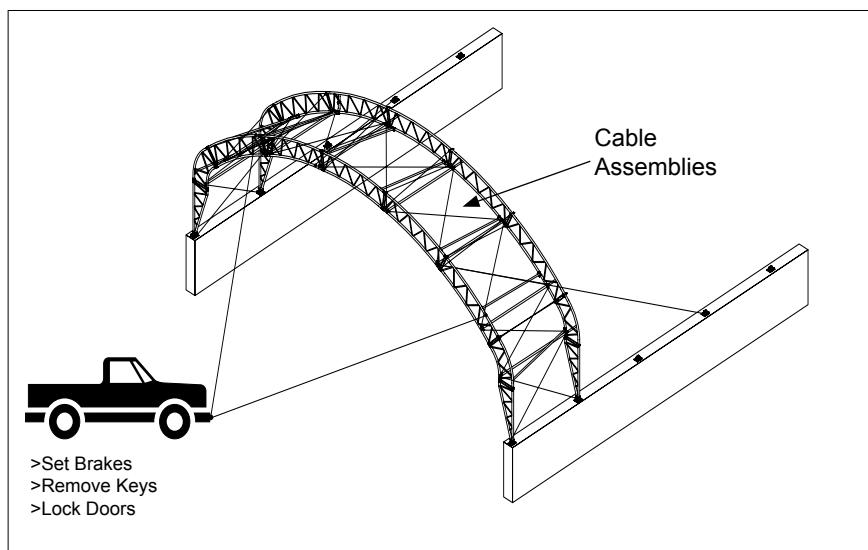
CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

SETTING THE ASSEMBLED TRUSSES – CONTINUED

5. With the crane in place, install all lateral bracing—purlins and struts—between the end truss and the first middle truss. Tighten all lateral bracing mounting bolts. ***Do not remove the straps at this time.***



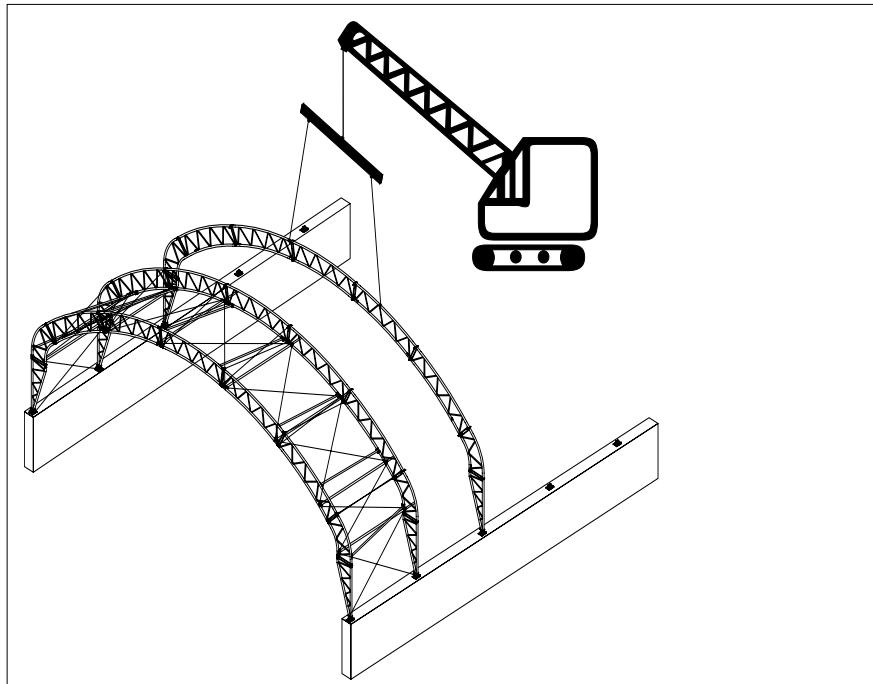
6. Once all lateral bracing is installed and tight, remove the crane, install all cable assemblies between the two trusses, and plumb the assembled trusses.



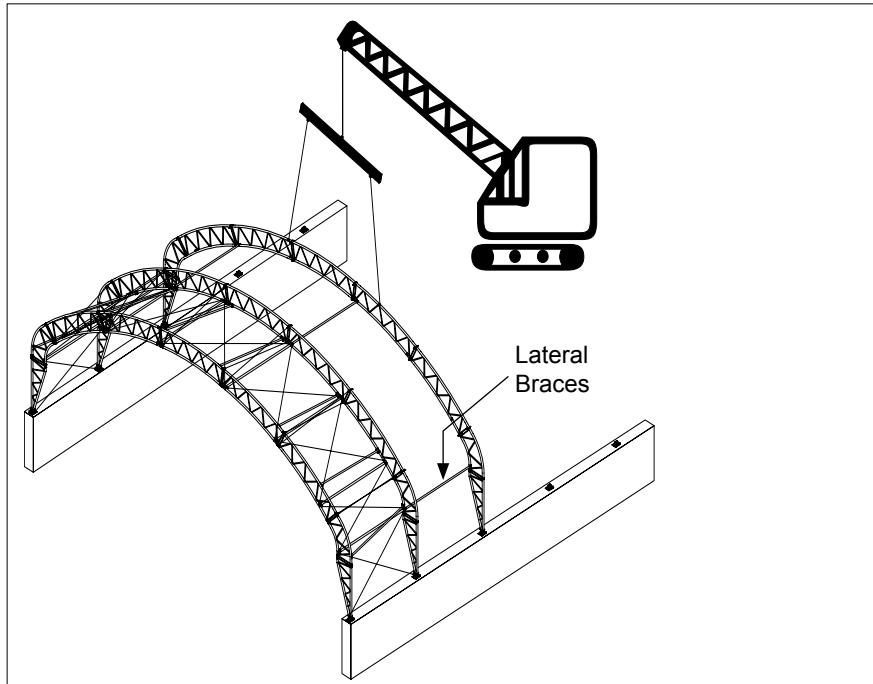
7. After the cables are installed and the trusses are plumb, remove the strapping that holds the end truss. The two segments can now stand on their own.

SETTING THE ASSEMBLED TRUSSES – CONTINUED

8. Rig the next truss, set it in place, and secure it to the base plates.



9. With the crane still supporting the truss, install at least half of the lateral bracing between the trusses.



10. Unhook the rigging from the truss and attach it to the next truss to set that assembly in place.

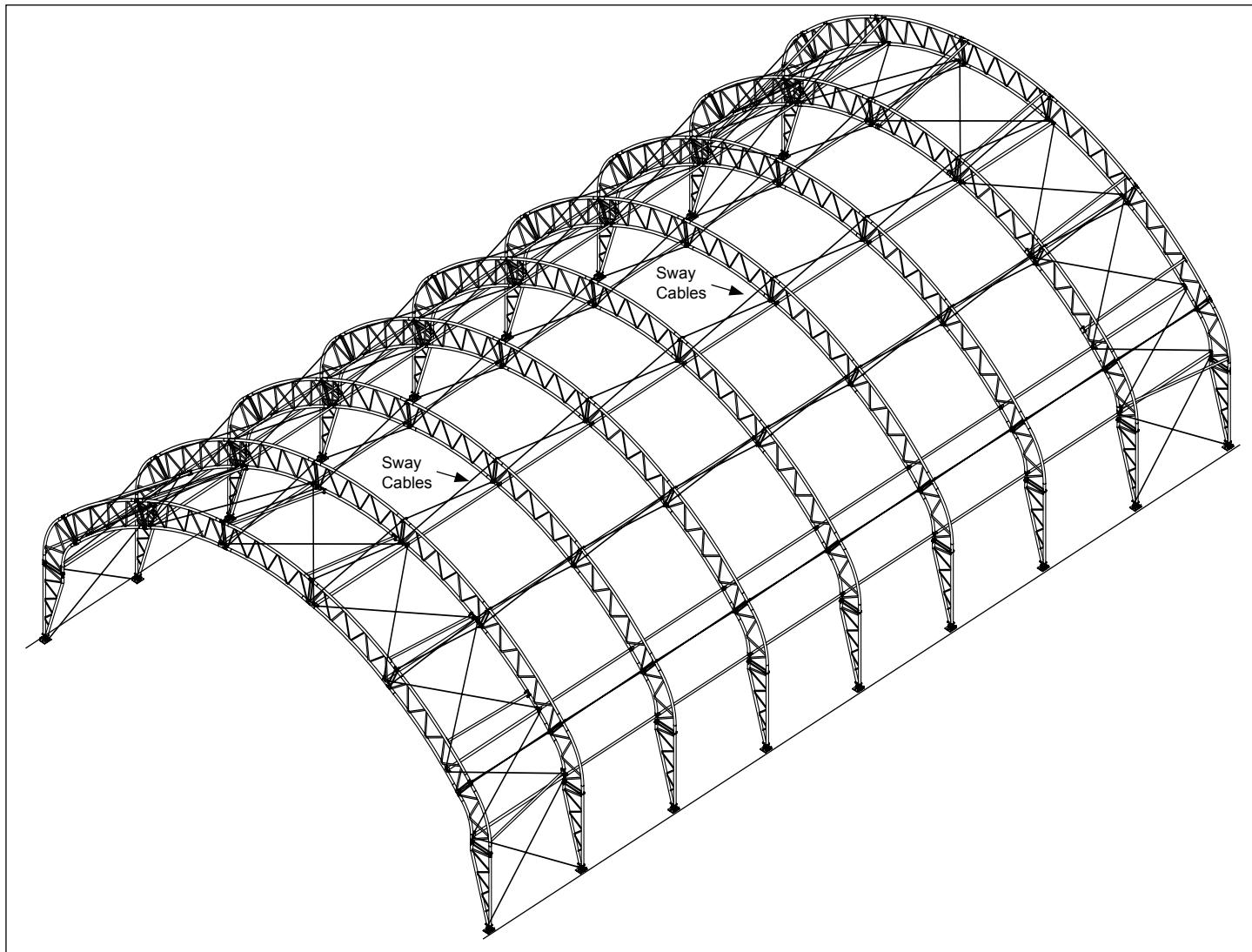
11. Continue this pattern of setting a truss, installing at least half of the lateral braces, unhooking the rigging, and setting the next truss — including the final end truss — until all are set and secure.

ATTENTION: Depending on personnel and equipment, all lateral bracing can be installed as subsequent trusses are set and attached to the existing frame.

CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

SETTING THE ASSEMBLED TRUSSES – CONTINUED

12. Return to the assembled frame and install and tighten the remaining cables.



NOTE: Depending on the length of the building and cover design, sway cables that are positioned where two main covers overlap can be installed *after* the covers are installed. This allows easier installation and stretching of the main covers at the overlap. This applies only to the sway cables positioned where two main covers overlap. Cables are installed after covers are installed in this location.

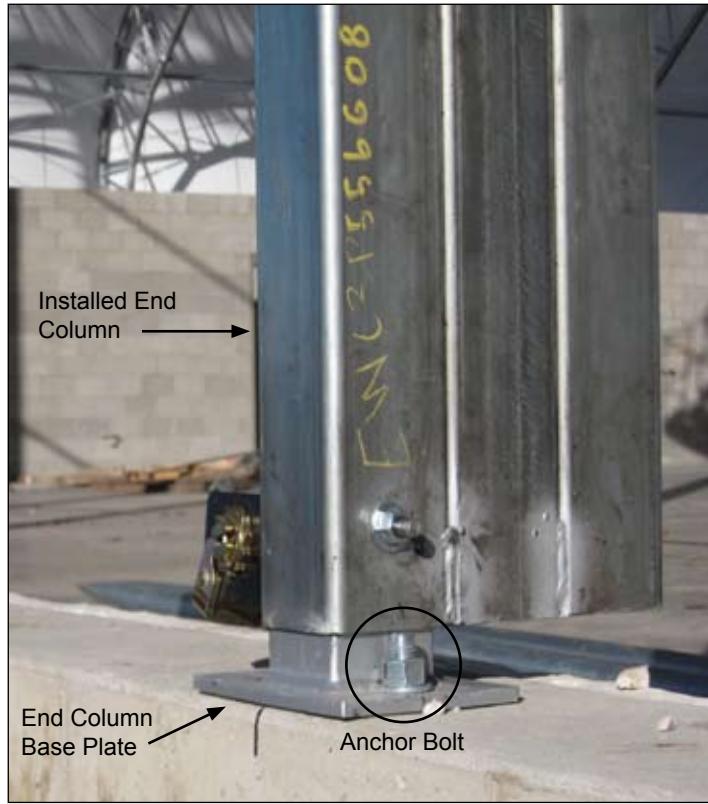
13. With the frame assembled, continue with the installation of the end wall framing if equipped.

INSTALL END FRAMING

The following procedure describes the basic steps to install the end framing of the truss building. Some truss buildings are not equipped with end framing.

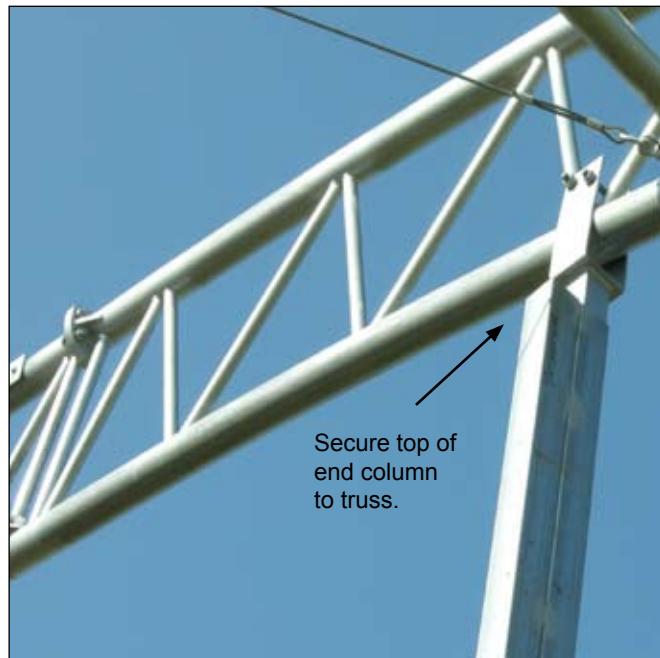
1. Locate the end frame components and review the details regarding the end frame as presented in the building drawings.
2. Install the anchors for the end column base plates.

NOTE: Consult the base plate installation steps presented earlier in this guide, or follow the instructions as indicated on the truss-building drawings.

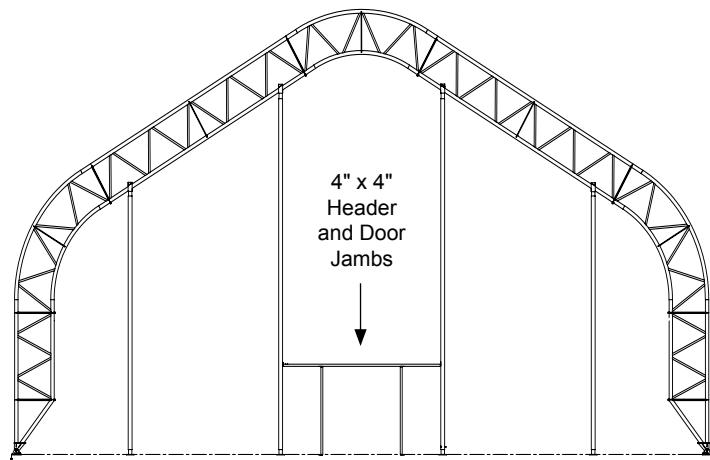


3. With the anchors installed, attach the end column base plates to the foundation.

4. Install all vertical columns according to the drawings. Slide the bottom onto the installed base, plumb the column, and secure the top to the truss as described in truss-building diagrams and drawings.



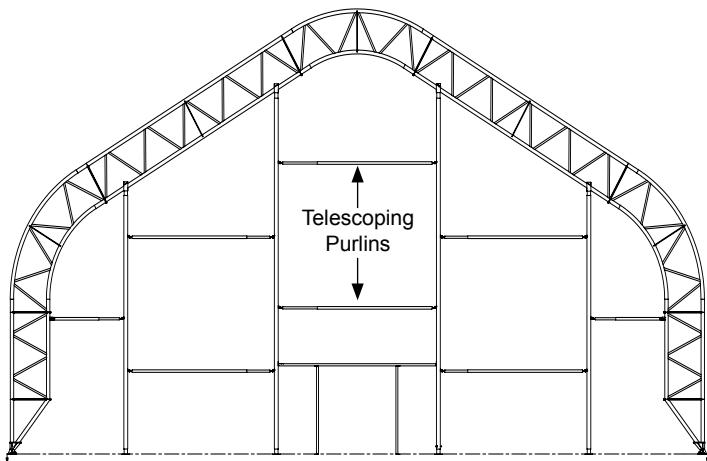
5. After all vertical columns are installed, verify dimensions and install the header(s) for overhead and pedestrian doors according to the drawings.



CLEARSPAN™ TRUSS-BUILDING ASSEMBLY

END FRAMING DIAGRAM – CONTINUED

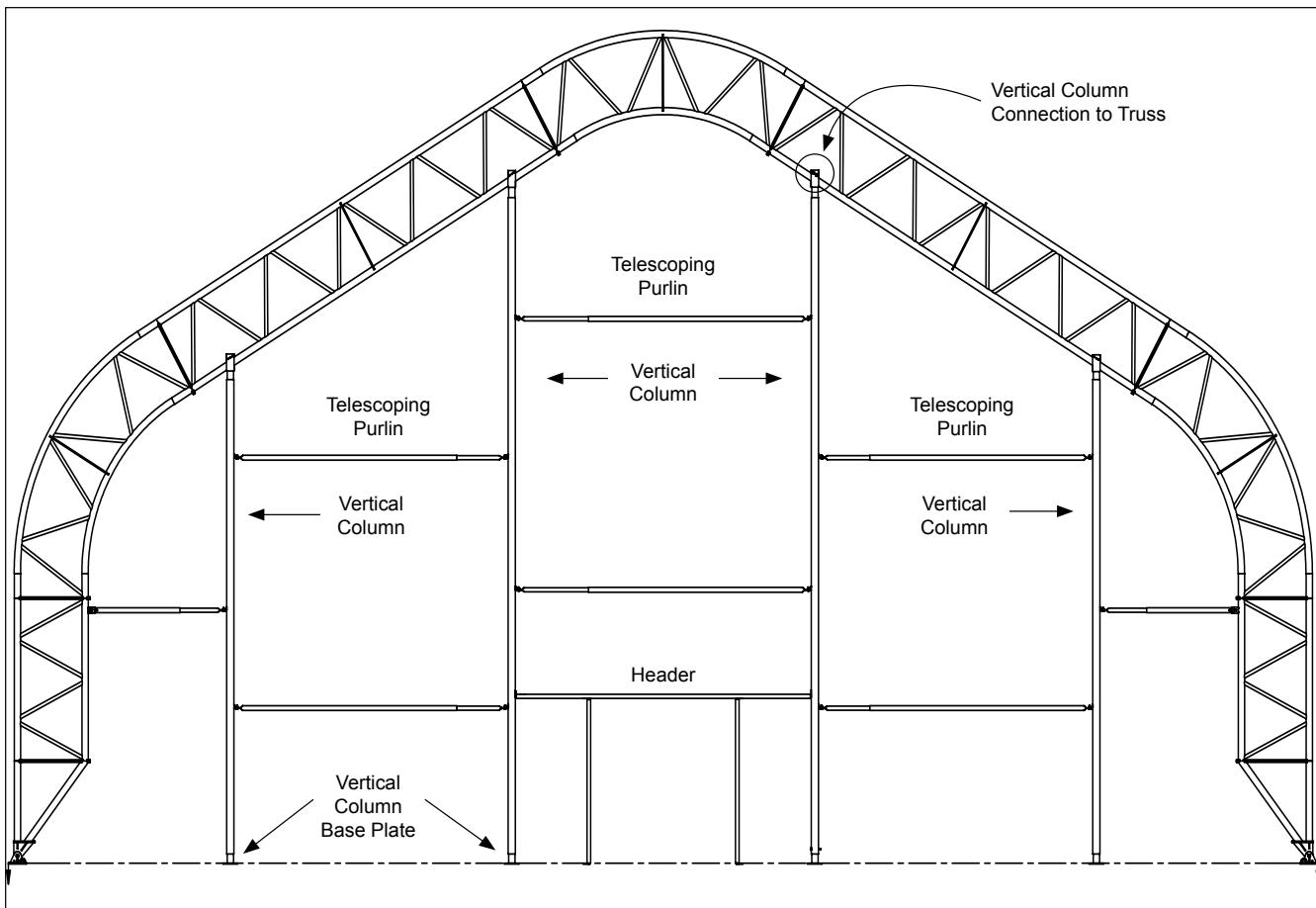
6. After the headers are attached, install all telescoping purlins between the vertical columns. Consult the end wall drawings for location and connection details.

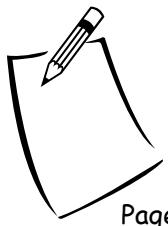


7. Continue with the installation of end panels, covers, and doors as described in the documentation included with those components.

SAMPLE END FRAMING DIAGRAM

The diagram below shows a typical end wall diagram for a truss-building system. The different components are labeled. Consult the actual end wall final drawings for connection and other details important to the assembly of the end frame.





Page reserved for customer notes.



ClearSpan™ Truss Arch Cover Installation



IMPORTANT INFORMATION! READ THIS ENTIRE DOCUMENT *BEFORE* YOU BEGIN TO INSTALL THE MAIN COVER OR COVERS.

**IMPORTANT: READ THIS DOCUMENT BEFORE YOU BEGIN TO INSTALL THE MAIN COVER**

The installation of the main cover is another step toward the completion of your building. To ensure that the cover is installed safely and properly, read the information that follows.

SAFETY PRECAUTIONS

- Wear approved eye and head safety gear.
- Wear gloves when handling metal tubes and strapping.
- Do not climb on the shelter or framing during or after construction or during the cover installation.
- Do not attempt to install the cover during windy conditions. A light breeze can easily lift a cover during installation which may cause property and cover damage and personal injury. *Exercise caution at all times during the installation.*
- Covers are heavy. Use proper lifts and adequate assistance during cover preparation and installation.

⚠ WARNING: The individuals installing the cover are responsible for furnishing all equipment and tools needed to complete the process. For safety reasons, those who are not familiar with the use of lifts and recognized construction methods and techniques *must seek the help of a qualified contractor.*

SITE

Before cover installation begins, determine where you will prepare the cover. Use these guidelines to prepare for the cover installation:

- Cover preparation area is typically at the base of the assembled frame along one side.
- Determine along which side of the frame you will prepare the cover. A typical cover installation begins with a prepared cover stretched out along one side of the frame. Cover is then pulled up onto the frame to the other side.
- Cover preparation area must be accessible, free of overhead obstacles and power lines, level (if possible), and free of ground debris that could damage the cover and interfere with the cover preparation.

FRAME PREPARATION

For a typical truss arch building, the frame is fully assembled *before* the cover is prepared and installed. Use the following guidelines to verify that the frame is ready for the cover installation:

- Verify that all ratchets and winches (if equipped) are mounted and tested for proper operation.
- Check all mounting bolts to ensure they are tight.
- Inspect *both end rafters* and verify that all sharp edges are properly covered to prevent cover damage.
- Inspect the end rafter upper chord mounting bolts and cover or tape as needed to protect the bonnet portion of the cover.
- Ensure that all cables are tight and that no loose cable ends can catch or damage the cover as it is pulled over the frame. Tape ends if needed.
- Tape *all upper chord rafter splices* using duct tape to prevent cover damage.
- Inspect the frame for sharp edges and cover or smooth these if found.
- Inspect the truss arch foundation and anchor system (if equipped) to verify that the cover will not catch on these during the installation.
- If an end wall is present, inspect the framing for sharp edges and clamps at the point where it is secured to the end rafter. Cover these as needed to protect the main cover bonnet.

REQUIRED EQUIPMENT AND TOOLS

In addition to basic hand tools, the following items are required to properly and safely install a typical truss arch main cover:

- Scissors, utility knife, or similar tools to notch cover pockets and cut strap and rope (if equipped) to length.
- Lifts adequate to reach the height of the frame and that extend over the frame from the outside.
- Ropes (supplied by customer) or straps for pulling the cover onto the frame. (The 2" strap sent with the building can be used to pull the covers into position.)
- Liquid dish soap to aid in sliding the conduit assemblies into the cover pockets. (May not be needed.)
- Duct tape to tape over the conduit splices and Tek screws during assembly.
- Power driver and drive bit to install self-tapping screws.

FINAL CHECK LIST BEFORE COVER INSTALLATION

1. Inspect frame and prepare for cover installation. (See previous page.)
2. Determine where cover will be prepared and clear site around the assembled frame.
3. Check weather and wind conditions.
4. Gather the necessary help, equipment, and tools.
5. Place the cover and cover conduit pipes in position along the side of the frame where the cover will be prepared.

COVER INSTALLATION OVERVIEW: Main Steps

1. Lift cover and move it into position along the side of the frame where it will be prepared.
2. Position the cover so that the pre-installed bonnet straps will be situated at each end of the frame once the cover is unrolled.
3. Determine which conduit pockets of the cover are used for securing the cover to the sides of the frame.

ATTENTION: Conduit pockets are labeled before the cover is folded and shipped. The labels identify the conduit diameter or type and are affixed to the pocket that the pipes are slid into during cover installation.

ALWAYS ASSEMBLE AND INSERT THE CORRECT CONDUIT PIPE INTO THE MAIN COVER POCKET LABELED FOR THAT PIPE.

4. Assemble and insert the side conduits into the main cover side pockets.
5. To pull the cover onto the frame, tie straps to the cover conduit and toss them over the frame.
6. Tie the free end of the straps to the lifts and pull the cover onto the frame.
7. Temporarily secure the cover to the frame to hold it in position.
8. Secure the sides of the main cover.
9. Assemble and insert the PVC conduit in the stretch pocket at each end of the cover, install the end strap and ratchet assemblies, and stretch the cover from end-to-end.
10. Secure the main cover bonnet.

⚠️ WARNING: To prevent injury and property damage, do not attempt to install the cover on windy or stormy days.

GETTING STARTED

1. Consult the photos and diagrams throughout the following pages to get a basic view of how a main cover is installed.
2. Read the individual sections for details that help describe the steps.
3. Verify that all tools, parts, weather conditions, and assistants are accounted for, considered, and checked before you begin.

NOTE ABOUT PHOTOS

The ClearSpan™ Truss Arch building line includes many different designs. The photos throughout this document show different truss arch frames at various stages of the main cover installation.

These general instructions are provided to assist you with the installation of the cover. Some steps shown within these pages may not apply specifically to (or show) your building.

In general, the basic cover installation steps are consistent across most truss arch designs. Details specific to a particular design are noted when necessary.



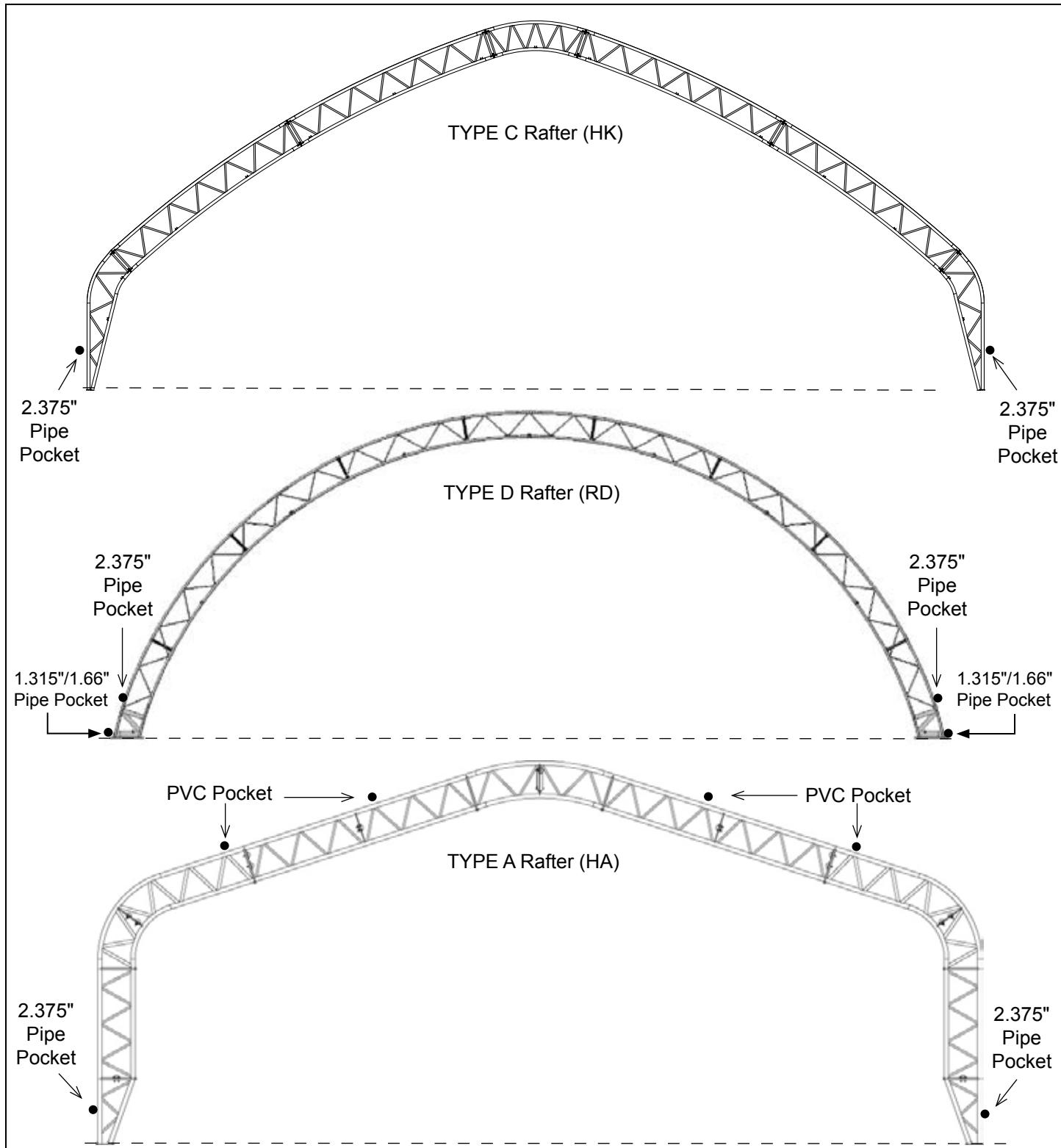
Sample photo showing main cover as it is moved to the preparation area along one side of the assembled frame.

CLEARSPAN™ TRUSS ARCH BUILDINGS

TYPICAL COVER DESIGN: Pocket Locations (Covers with roll-up sides may include additional pockets.)

Each truss arch cover includes different pockets used to hold cover conduits and PVC conduits. These pockets are heat-sealed to the main cover during manufacturing. The truss design and width determines the number and locations of the main cover pockets. In most instances, all *pockets are sealed to the inside or underside* of the main cover.

The diagrams below show the typical pocket locations for most truss arch designs. Use the diagrams to help during the main cover preparation steps presented later in these instructions. The diagrams reflect standard truss arch building designs. *Buildings designed specifically for a customer may include a special cover design that is not represented.*



TYPICAL COVER DESIGN: Pocket Locations (continued)

In addition to the pocket locations noted on the previous page, each truss arch main cover includes stretch pockets. These pockets are sealed to the cover at each end and are positioned a few feet from the bonnet pocket, which includes the pre-installed bonnet strap.

Unlike side pockets that receive metal pipes, the stretch pockets are reserved for PVC conduit that is assembled in sections as it is inserted into the stretch pocket *after the main cover is installed*. Once the PVC conduit is installed, strap and ratchet assemblies are added between the conduit and the upper chord of each end rafter. Ratchets are then tightened to stretch the main cover end-to-end.

Each main cover stretch pocket must be notched prior to or during the installation of the PVC conduit. *Stretch pockets are always located at the ends (front and back) of the main cover.*

Consult the photos below for examples showing the stretch pockets.

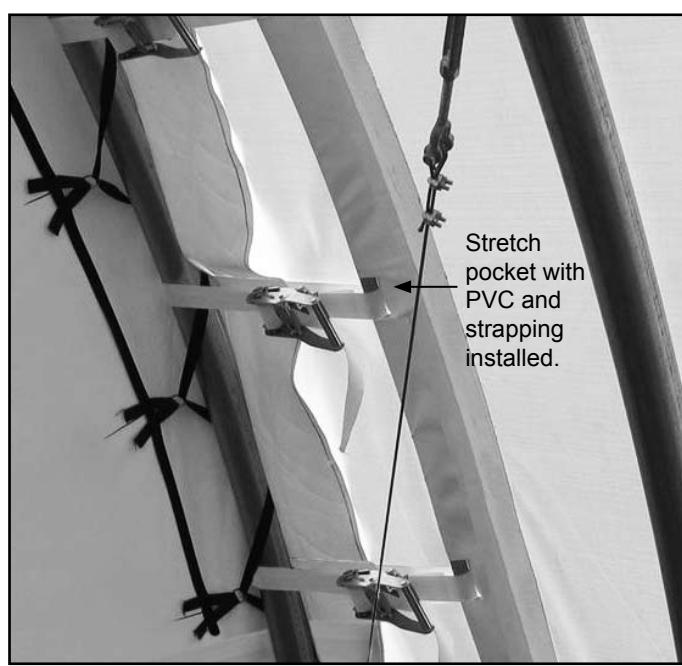
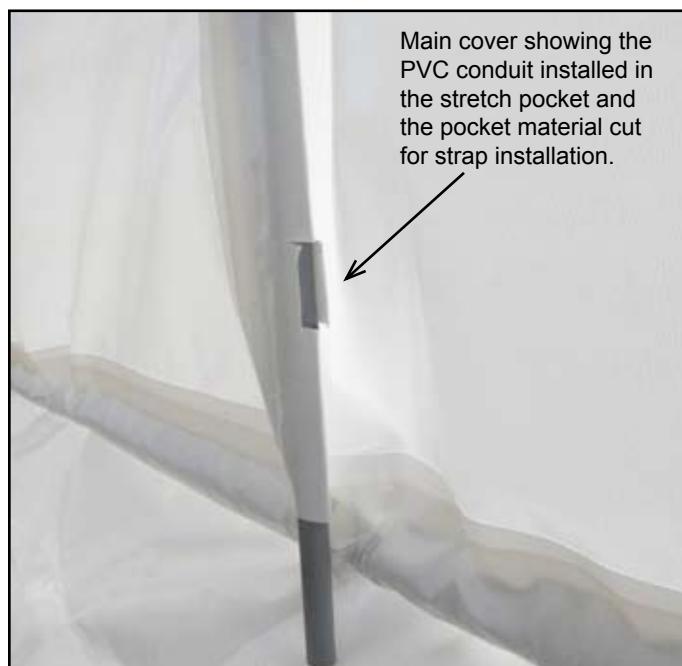
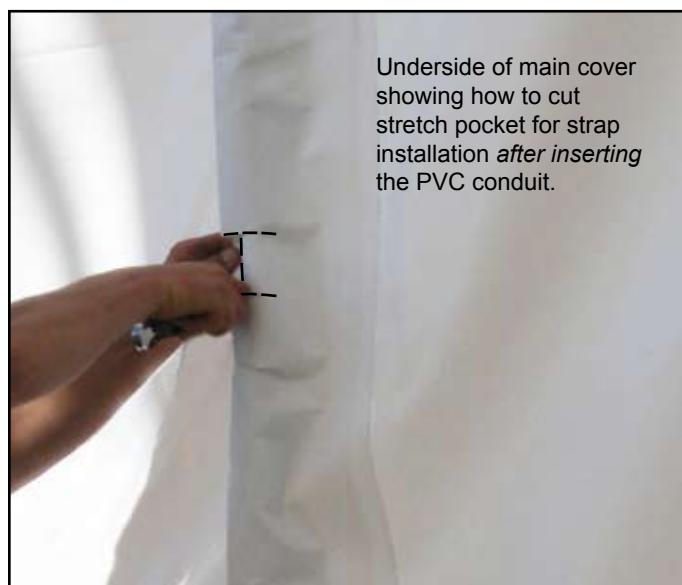


Photo above shows the main cover as seen looking from inside the building.

CLEARSPAN™ TRUSS ARCH BUILDINGS

STEP 1: SET MAIN COVER IN POSITION

Once the frame and site are prepared for cover installation, unpack the main cover and position it along one side of the frame. Use adequate help and lifts to move the cover into position. If the site is muddy, spread plastic (customer-supplied) on the ground to protect the cover during preparation if desired.



Photo above shows plastic (customer-supplied) spread on the ground to protect the main cover during preparation and installation.



Photo shows moving the cover prior to preparation and installation.



Cover is set into position next to the frame. Customer-supplied plastic is shown on the site to protect the cover and to keep it clean during preparation.



Photo above shows the main cover as it is unrolled to prepare for installation.

ATTENTION: Cover is heavy. Use adequate assistance when it is unrolled.



Photo (upper left) shows the cover in place at the base of the frame. Photo (above right) shows bonnet strapping present at both ends of the main cover. The strapping is pre-installed during manufacturing and is used to secure the bonnet portion of the main cover.

The bonnet is the portion of the main cover that laps over the end rafter at each end of the frame. In most instances, the ClearSpan™ logo is affixed to the bonnet of the cover at each end. Once the cover is installed and centered properly, the logo will be centered at the top of the end rafter at each end.



In addition to the bonnet strap, the photo (above left) shows the straps used to pull the main cover onto the frame.

These straps are tied to the cover conduit at evenly-spaced intervals throughout the length of the cover. As the length of the building increases, so does the number of straps needed to pull the cover over the frame.

ATTENTION: Do not use the bonnet strap to lift or pull the cover. The strap will pull out of the bonnet pocket.

MAIN COVER POCKET LABELS

All conduit pockets are identified by a label. Each label indicates the pipe diameter or type of the conduit that is used in that pocket. Typical conduit sizes and types identified by the labels can include any of the following:

- 2.375"
- 1.315"/1.66"
- PVC

Numbers indicate the diameter of the metal conduit pipe. PVC indicates pipe material.

NOTE: These pipe diameters, types, and quantities are also found on the materials lists sent with each shipment. *Custom buildings may include different pipes based on the custom style of the building.*

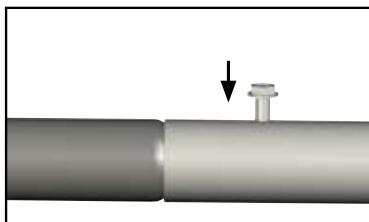
CLEARSPAN™ TRUSS ARCH BUILDINGS

STEP 2: ASSEMBLE 2.375" COVER CONDUIT AND INSERT INTO LABELED CONDUIT POCKET

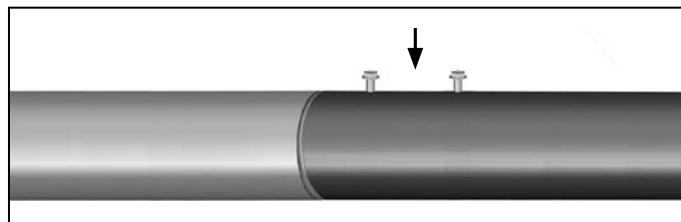
Truss arch buildings include cover conduit pipes of different diameters, lengths, and types; each has a specific use and position in the cover and on the frame. Use the pocket location diagrams on Page 4, the information that follows, and the labeled pockets to assemble and install the cover conduits for your truss arch.

Consult the parts list and the labels on the main cover pockets to identify what pipe to insert into which pocket.

Not all truss arch buildings are represented in the following photos. Use the information sent with your building and the parts lists to determine pipe diameters and cover conduit locations and quantities.



1.315" Pipe and PVC Conduit



1.66" Pipe and Greater

IMPORTANT: Secure each cover conduit splice using self-tapping Tek screws. For pipe diameters 1.66" or greater, use two Tek screws to best secure the splice and to prevent separation. To protect the cover pocket and to allow the conduit to slide into the pocket, wrap all splices and Tek screws using duct tape.

Consult the conduit installation photos and information below. Tools and materials needed for the installation of the 2.375" cover conduits include: Conduit pipe (2.375"), duct tape, power driver and nut-setter to install Tek screws, and liquid dish soap mixture to lubricate conduit and cover pocket during installation. ***Installation is similar for other pipe diameters.***

STEP 1: Place the 2.375" conduit pipe in a position near the cover end that allows conduit assembly as it is slid into the cover pocket.



STEP 2: If needed, prepare the conduit pipe by taping an object with a rounded end to the end of the conduit.

This allows the conduit to slide more easily into the conduit pocket.



A plastic soda bottle is shown to the right.

For long covers, additional help is needed during the installation of each section of the conduit.



Slide the prepared end of the conduit into the pocket.

Additional photos are shown on the following pages.



WARNING: To prevent injury and property damage, do not attempt to install the cover on windy or stormy days.



STEP 3: Insert the prepared end into the correct conduit pocket as shown.

STEP 4: If needed, mix a lubricating solution of dish soap and water and apply it liberally to the conduit and conduit pocket to allow the pipe to glide more easily into the pocket.



Photo (left) shows the where to apply the soap solution, if needed, before inserting the first conduit section into the main cover pocket.



Photo above shows where to apply dish soap lubricant during the installation of the cover conduit. Apply the solution at various times throughout the installation of the cover conduit.

CLEARSPAN™ TRUSS ARCH BUILDINGS



STEP 5: Slide the first pipe into the pocket until the tapered end is near the pocket and add the next section of pipe.



STEP 6: Install the first Tek screw to secure the splice joint.



STEP 7: Install the second Tek screw to secure the splice joint as shown.



STEP 8: Wipe the Tek screws and pipe splice with a clean towel or rag to remove metal and lubricating liquid.



STEP 9: Wrap the Tek screws and pipe splice with duct tape to protect the cover and cover pocket.



STEP 10: Repeat the steps until the entire conduit is assembled and inserted into the cover pocket. *Allow the conduit to extend beyond the cover pocket at each end a few inches to more easily pull the cover onto the frame.*

ATTENTION: Design of actual cover may differ from what is shown in these photos.



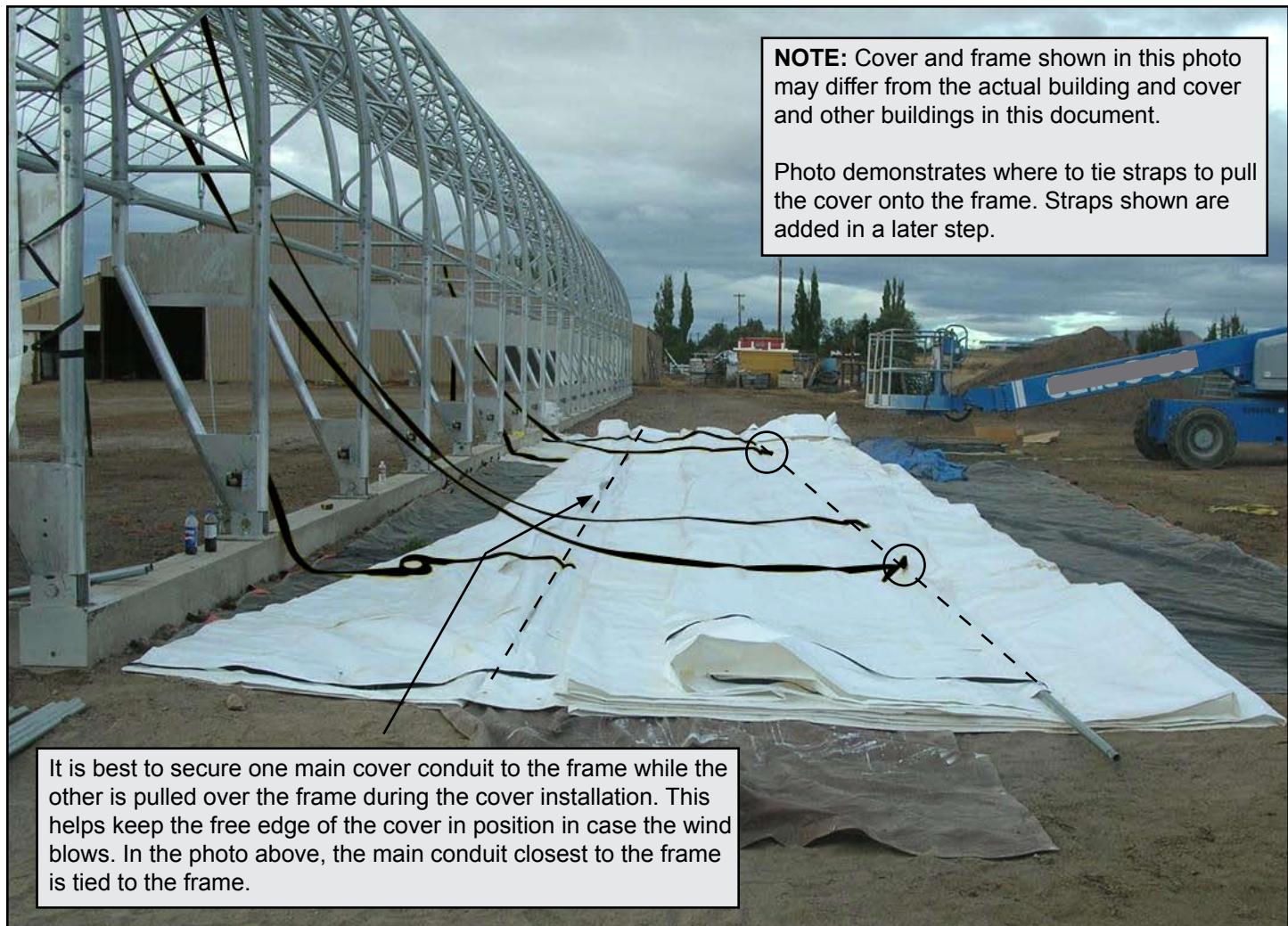
STEP 11: Once the first 2.375" cover conduit is assembled and installed, locate the second 2.375" conduit pocket on the main cover and repeat the steps to assemble and install that cover conduit.

STEP 12: Reposition the cover and conduits as needed to prepare for cover installation. Verify that the cover will unfold as desired when it is pulled onto the frame. Check also that the cover is aligned with the ends of the frame and in the desired position.

Covers are heavy and difficult to reposition once they are pulled onto the frame. To prevent possible cover damage and injury, follow the steps above.

The cover is pulled onto the frame using straps or ropes tied to the cover conduit. Pull the cover so the pockets remain *on the underside of the cover* once it is in place.

Refer to the photo shown below and others throughout this document. Dashed lines represent the positions of the 2.375" cover conduits that have been installed up to this point.



CLEARSPAN™ TRUSS ARCH BUILDINGS



STEP 13: Determine where to attach the straps used to pull the cover onto the frame and remove a section of the conduit pocket in those locations to expose the conduit. Try to align these straps with the rafters where ratchets or winches are installed to secure the cover to the frame.

ATTENTION: Do not cut through the main cover. Remove only material from the conduit pocket as shown above.



STEP 14: With the pocket material removed and the conduit exposed, tie straps or ropes to the conduit. Long covers require additional straps to safely pull the cover into position. Tie straps to each end and between the ends at evenly spaced intervals and toss the straps or ropes over the frame to the other side.



STEP 15: Tie the free strap ends to the lifts and remove the slack to even the strap lengths. To prevent possible cover damage, pull the cover evenly onto the frame. Verify that the conduit glides freely on the rafters. If needed, slide a smaller diameter pipe into the end of the installed main cover conduit to extend the conduit length during installation.

To prevent injury, temporarily secure the conduit extension to the cover conduit using duct tape so that it will not slide out of the conduit during installation. Remove the extension pipe once the main cover is pulled onto the frame and centered.



CLEARSPAN™ TRUSS ARCH BUILDINGS

ATTENTION: Pull cover slowly and evenly over the assembled frame.

Verify that the cover does not catch on any cable or frame members during the installation.

Reposition lifts and retie or reposition straps as needed throughout the process.

WARNING: Never leave a cover unsecured at any time. Sudden changes in the weather can lift a cover from the frame and may cause personal injury or property damage.



STEP 16: Continue pulling the cover into position on the assembled frame. Depending on conditions, it may be necessary to return to the side of the cover opposite the straps and temporarily secure the conduit pipe to the building frame to prevent an unexpected wind from lifting the cover off the frame. See the lower photo on Page 11 for details.

Once the cover is completely pulled into position, align the ends with the frame and center the cover as needed (side-to-side) on the frame. Example below shows the installation of one cover for the sample building frame.

The available space around the assembled frame can affect the way the cover is pulled into position.

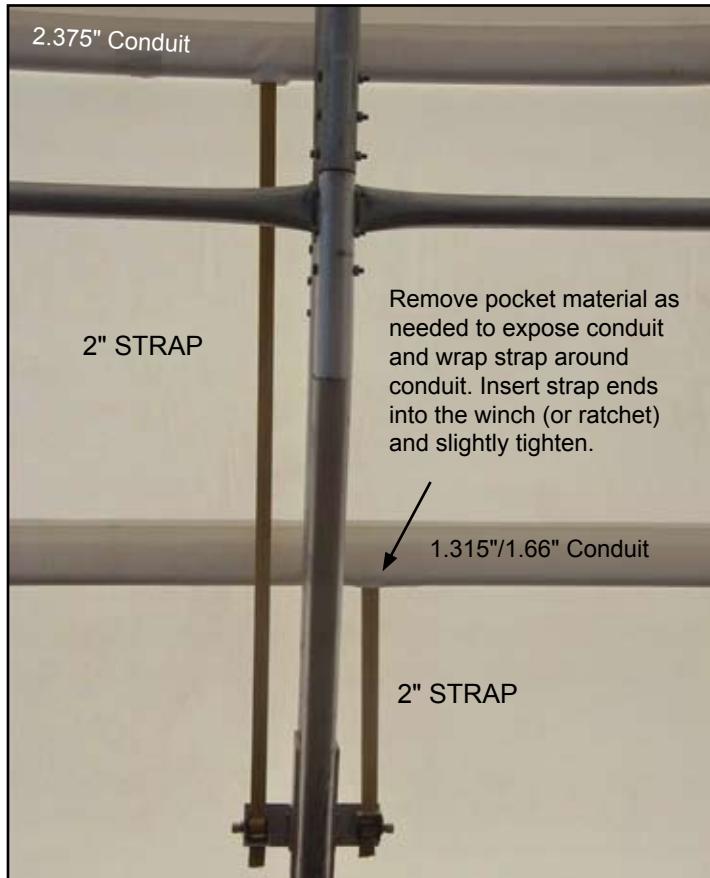
These photos show a building surrounded by adequate space to allow using lifts when pulling the cover.

If little or no space is present to pull the cover, it will be necessary to use other means to install the cover.

Using pulleys and ropes or cables to change the direction that force is applied to pull the cover, or using a crane to set a prepared cover into position on the frame are alternatives.

Consult a professional contractor to safely install the cover for your building and for cover installation suggestions if needed.





STEP 17: Locate the ratchets and/or winches attached to the building frame or foundation.

Remove a section of the 2.375" main cover conduit pocket material (or create a slit in the material above the conduit) in line with the winches (or ratchets) to prepare for strap installation. Refer to Step 13 on Page 12 for details.

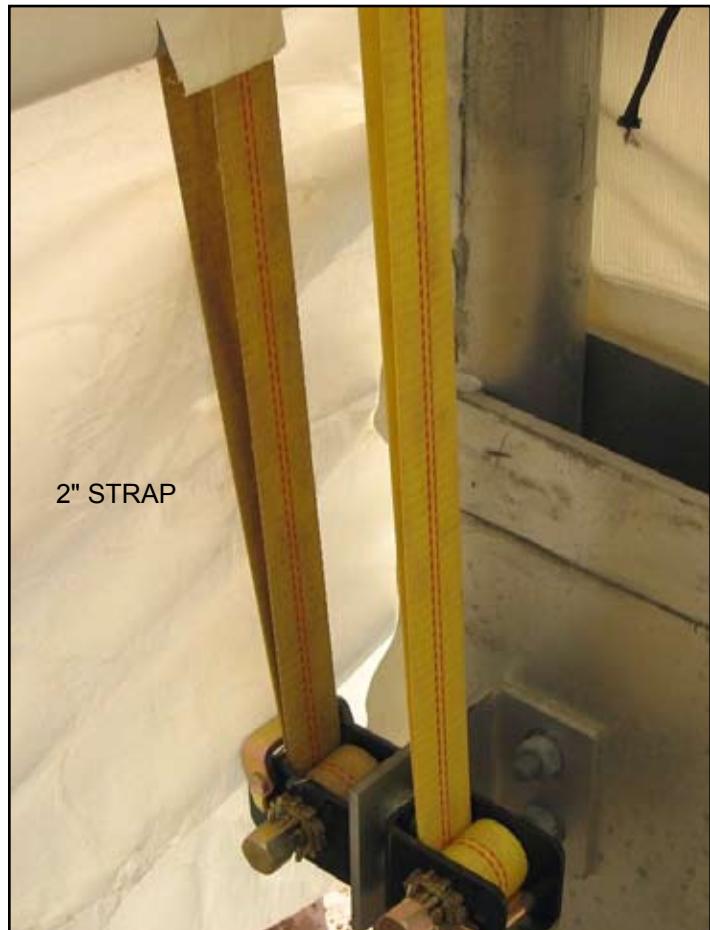
NOTE: You may be able to use the strap/rope positions cut in the pocket during the installation of the main cover.

Measure and cut the 2" straps to the required length. Install by wrapping each strap around the exposed conduit and insert the strap ends into the ratchet or winch. Slightly tighten to remove strap slack.

IMPORTANT: When measuring strap length, remember that straps wrap around the conduit and *both ends* are inserted into a ratchet or winch.

Straps should be loose enough to allow the cover to be stretched end-to-end as described in the next steps. Refer to the photos on this page to view sample strap, ratchet, or winch connections and locations. (Straps are shown fully tightened.)

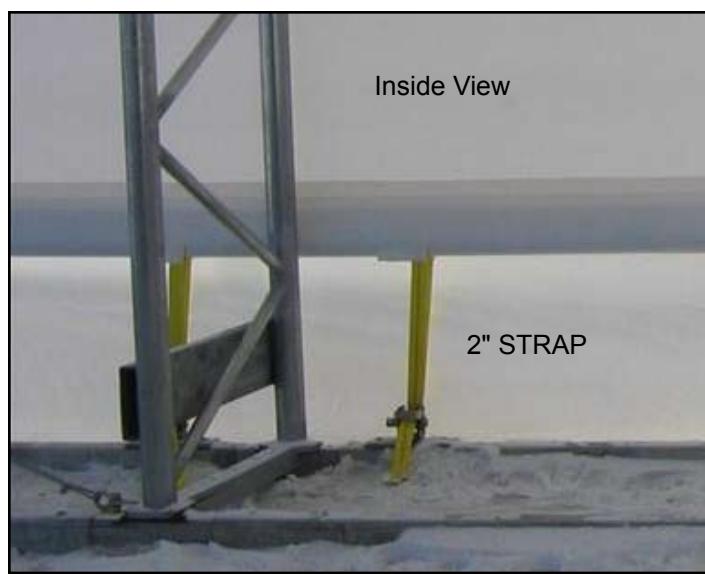
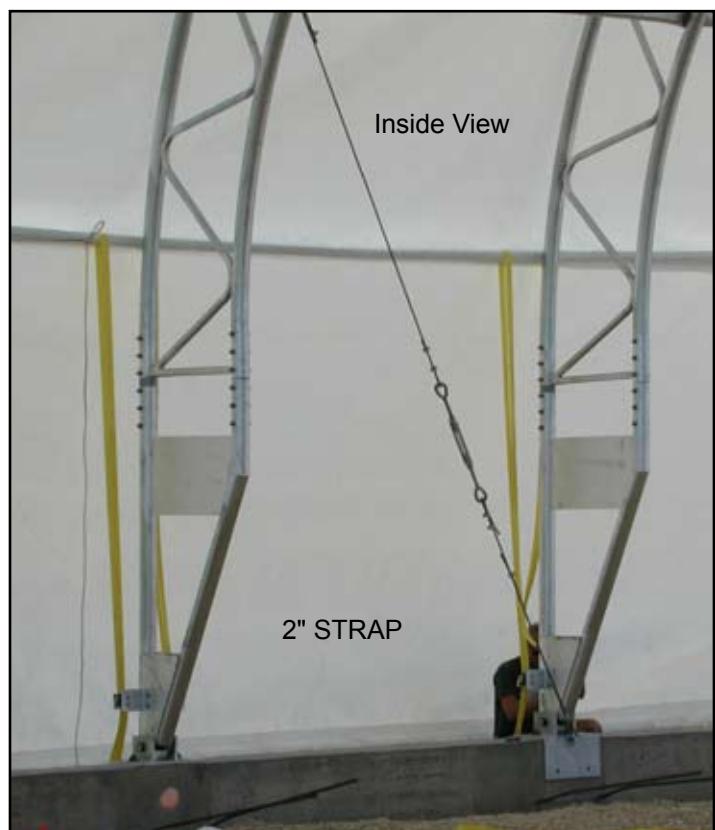
Positions of ratchets and winches may differ from what is shown. See the examples on the following page for additional applications.



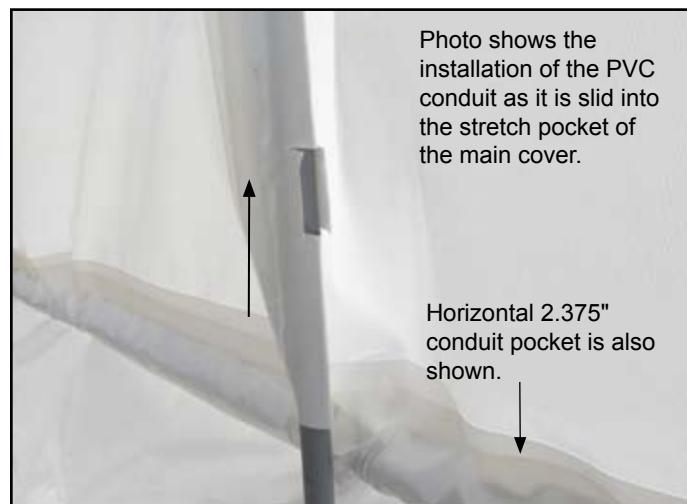
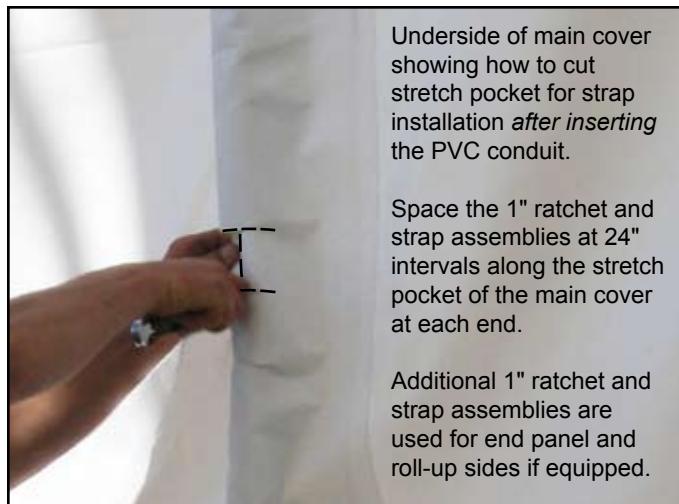
CLEARSPAN™ TRUSS ARCH BUILDINGS

ATTENTION: The photos on this page show different locations for ratchets and winches and the 2" straps used to secure the main cover.

Cover, rafter, and building design and use are considered when mounting winches and ratchets and securing the main cover.

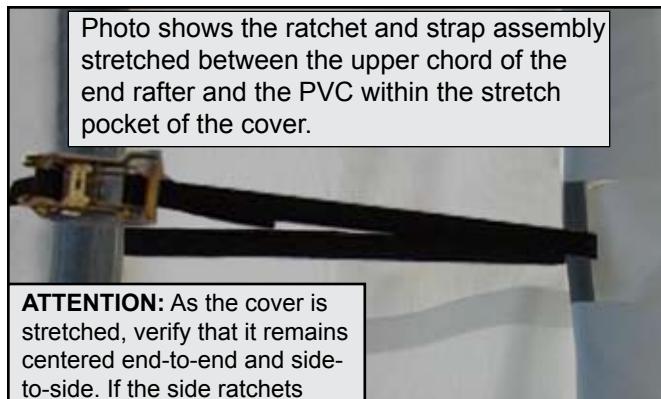


STEP 18– STRETCH POCKET PVC INSTALLATION: Slide the first section of PVC conduit (plain end first) into the PVC pocket. Apply PVC glue to the bell end of the conduit and insert the plain end of the next section of PVC into the bell end of the first section. Continue this pattern until the entire conduit is assembled and in the pocket. Repeat the steps to install the PVC at the other end of the cover.



With both PVC assemblies in place, attach the strap and ratchet assemblies at both ends and stretch main cover end-to-end. Install ratchets between the upper chord of the end rafter and the PVC conduit inside the stretch pocket.

NOTE: Space the 1" strap and ratchet assemblies every 24" along the stretch pocket of the main cover at each end. If you have 1" strap and ratchet assemblies remaining after the main cover or covers are installed, these are typically used to secure the end panels to the end frame. In some instances, these are also used for anti-billow control of roll-up sides. These photos show one sample building and the strap and ratchet assemblies used to stretch and secure the main cover at each end of the building. See *the note near the bottom of this page for buildings that have multiple main covers*.

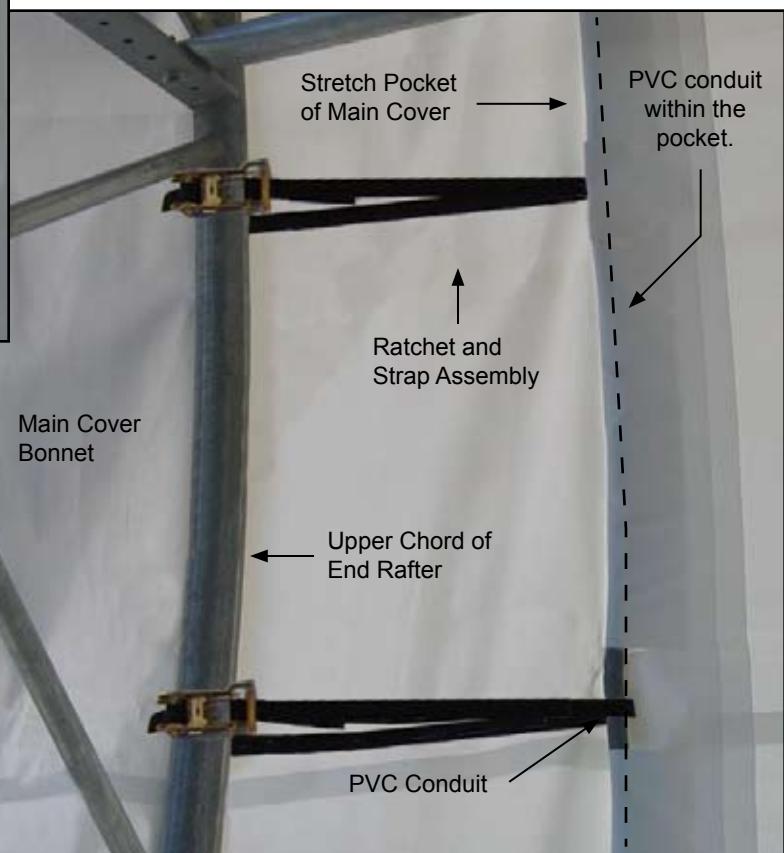


ATTENTION: As the cover is stretched, verify that it remains centered end-to-end and side-to-side. If the side ratchets are too tight, the cover will not stretch properly. Loosen—DO NOT REMOVE—the side ratchets as needed.

MULTIPLE MAIN COVERS

During the stretching of the cover, do not over tighten the strap and ratchet assemblies. Doing so will pull the top chord of the rafter out of square. View the rafters from the ground to verify that the upper and lower chords remain aligned. The upper chord of an end rafter is typical braced by a diagonal strut. Inside rafters are not.

Photos show the end rafter as seen from inside the building looking up at the stretch pocket and strap/ratchet assemblies.



CLEARSPAN™ TRUSS ARCH BUILDINGS

Stretching the Main Cover (continued)

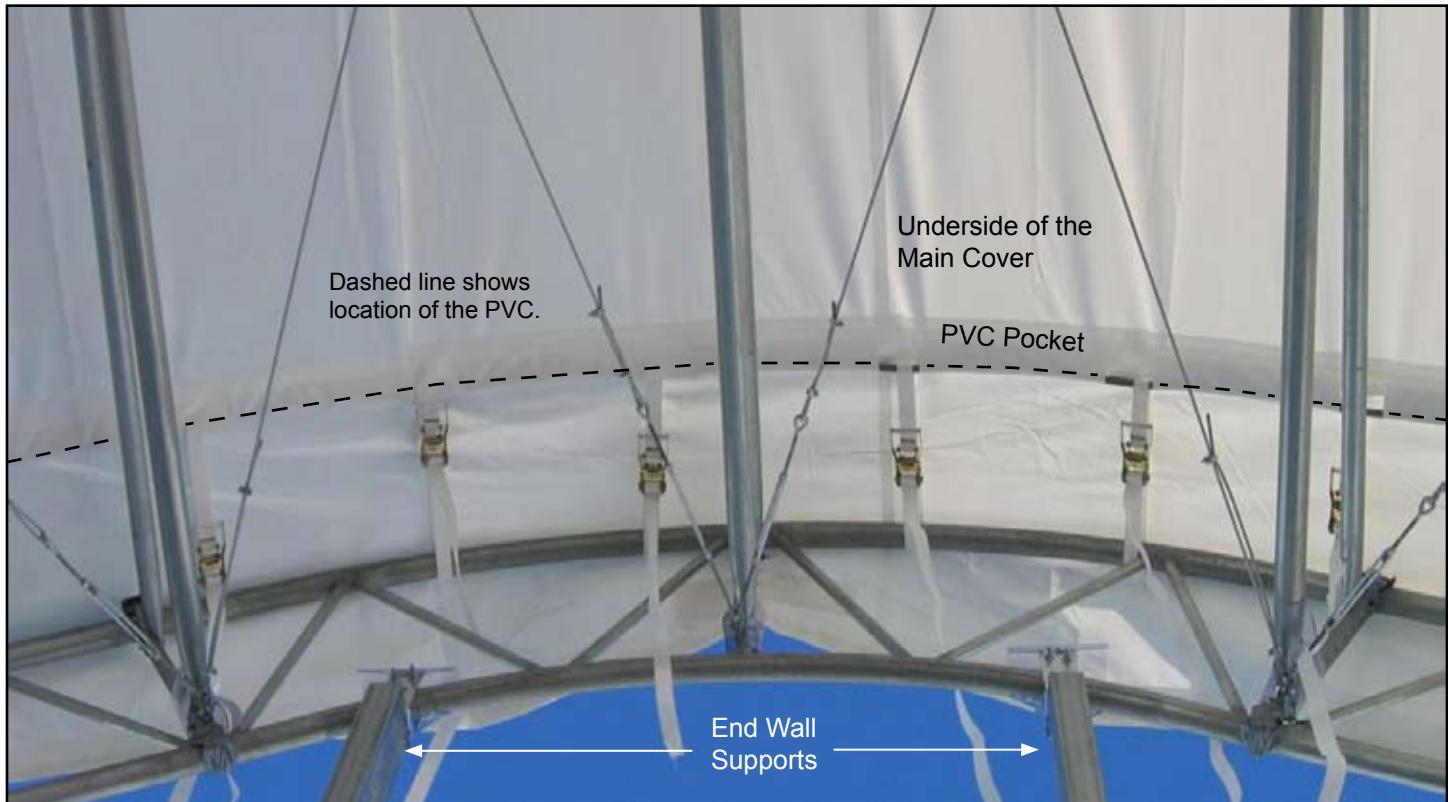


Photo above shows the end rafter as seen from the ground looking up. The vertical end wall framing is also visible. Strap and ratchet assemblies are shown between the upper chord of the end rafter and the PVC conduit.

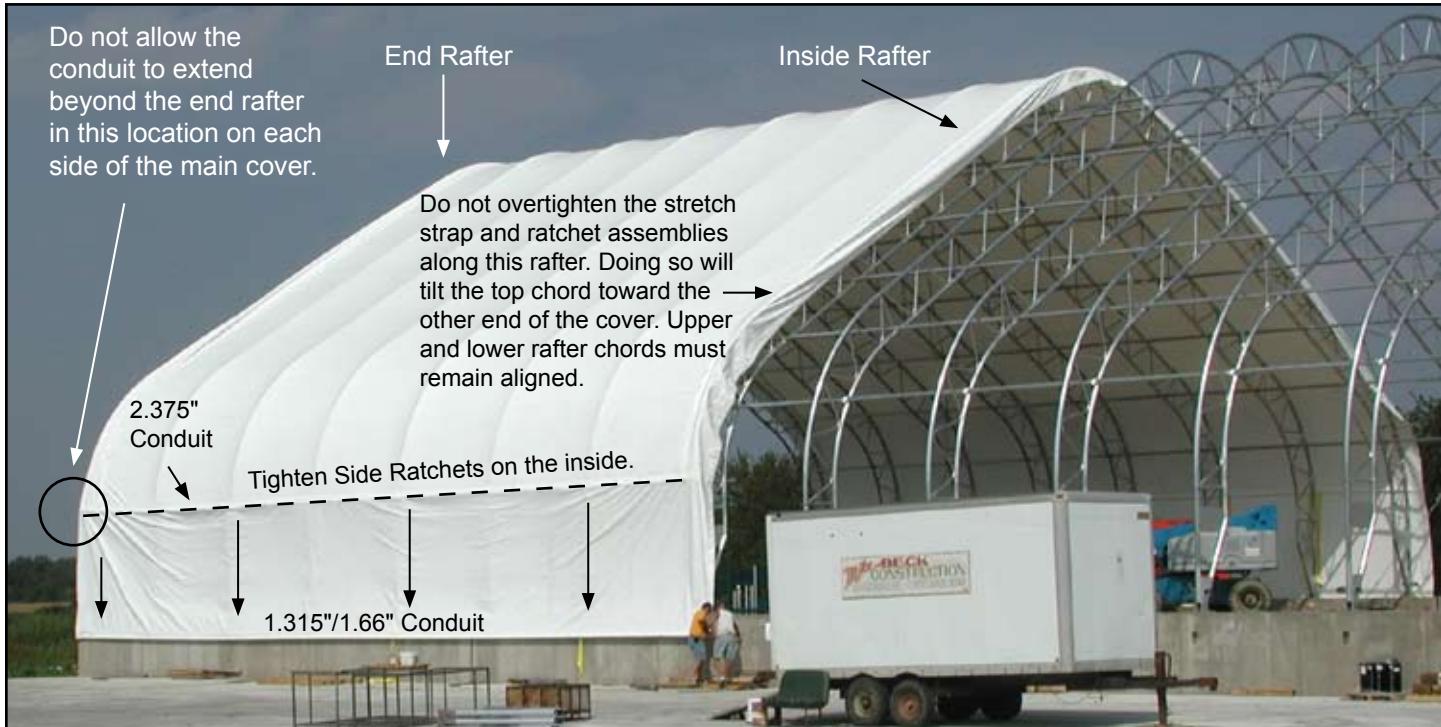


Photo above shows the conduit locations for a sample building with a single main cover. Conduit locations for other buildings may differ. *Use the conduit pocket labels for your cover during the installation steps.* Building size and design determine pocket type, pocket quantities, and location.

STEP 19: After stretching the main cover end-to-end and checking that all stretch pocket strap and ratchet assemblies are tight, return to the *side ratchets* and tighten those to secure the sides of the main cover. See Page 15 for examples. If the cover conduit extends beyond the outer edge of the *end rafter*, cut the conduit to prevent damage to the main cover bonnet. (See the lower photo on this page for circled locations.)



MULTIPLE MAIN COVERS: Depending on length, the conduit may not need cut at the end where the next main cover will be added. (This would be at an inside rafter. See the example in the photo below.) *Conduits within separate covers are typically aligned, but are not connected to each other. The owner/contractor can connect if possible and if desired.*



CLEARSPAN™ TRUSS ARCH BUILDINGS

STEP 20: With the side ratchets along each side tightened, locate the 1.315"/1.66" conduit pipe for the remaining conduit pocket along the side of the main cover. This pocket is near the edge of the main cover and is a few feet lower than the 2.375" conduit installed earlier. *Pocket is identified with a 1.315"/1.66" label.*

The truss arch design determines the location of the 1.315"/1.66" conduit pocket. In some cases, the pocket is at the bottom edge of the cover. With some designs, the 1.315"/1.66" conduit pocket is a few feet above the cover edge and covered with a skirt that extends below the pocket.

Use the Bill of Materials to determine the pipe diameter of this conduit (1.315" or 1.66"). (For buildings that do not include roll-up sides, this conduit is typically a 1.66" conduit.) Move the required pipe to one end of the cover near the 1.315"/1.66" conduit pocket. Assemble and insert this conduit into the pocket as previously described in the 2.375" conduit procedure. See Steps 4-11 if needed to properly prepare and insert the conduit.

ATTENTION (Roll-Up Sides): *Always use the smaller diameter 1.315" conduit pipe for the roll-up side of a main cover if equipped.* For a single roll-up side, determine which side of the cover you want to roll-up and install the 1.315" conduit in that pocket. The height of the sidewall and roll-up side can affect the number of conduit pockets of the main cover.

For truss arch buildings with one (1) roll-up side, the 1.315" conduit is used for the roll-up portion of the main cover; the 1.66" conduit is used to secure the side of the cover *opposite the roll-up side*. For buildings with two (2) roll-up sides, insert an assembled 1.315" conduit into each of the 1.315"/1.66" cover pockets.

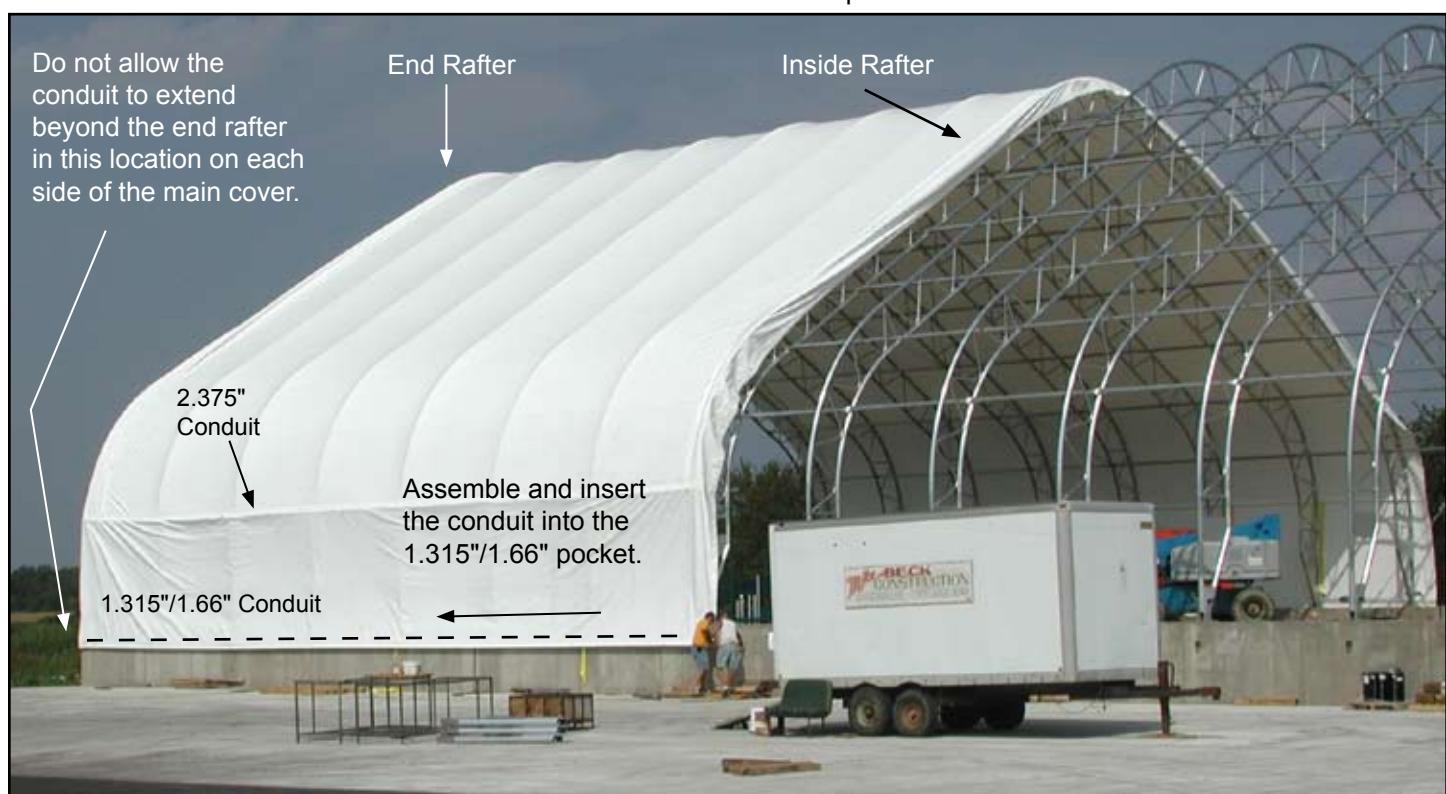


Photo (left) shows workers installing a 1.66" conduit into the 1.315"/1.66" pocket of the main cover.

Photo (right) shows an installed 1.66" conduit used to secure the lower section of a main cover.

Actual cover may differ from what is shown.



1.315"/1.66" Pocket

Main Cover Skirt

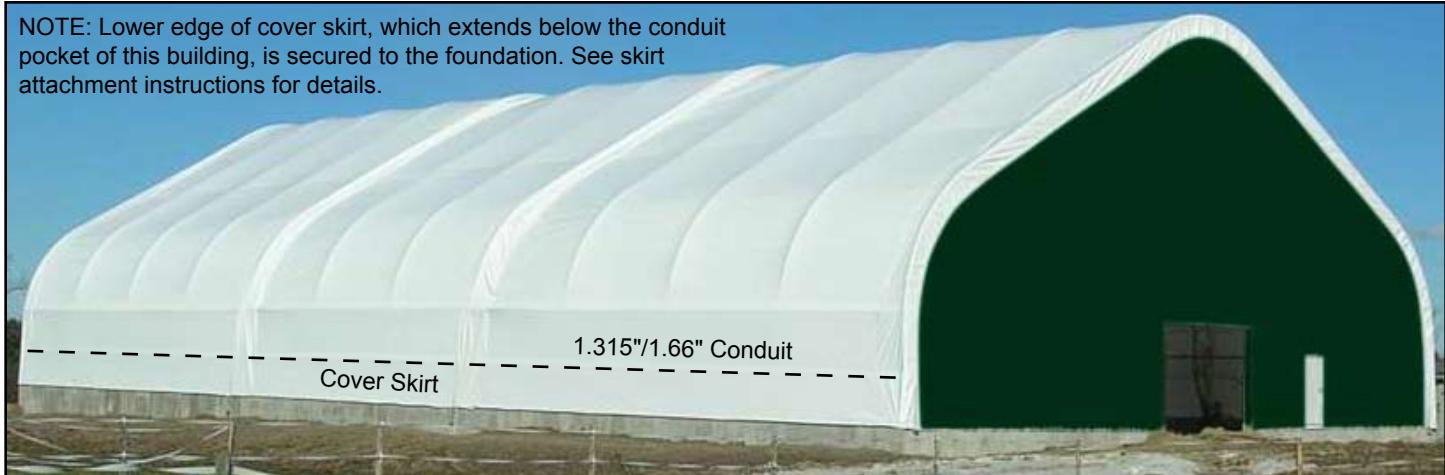
STEP 21: With the 1.315"/1.66" cover conduit inserted into each of the lower side pockets of the main cover, continue with the scenario that best describes and applies to your main cover and truss arch building design. The following possibilities describe combinations common to *most* of the truss arch buildings.

NOTE: Differences in design and changes made to a design *at the request of the customer* may require additional installation steps not covered within these pages. In such cases, it is the responsibility of the customer/contractor to adapt (or add to) these instructions as needed to complete the cover installation steps.

Scenario A (Single or Multiple Main Covers–No Roll-Up Sides): For single or multiple main covers (no roll-up sides), repeat Step 13 on Page 12 to remove pocket material in the strap locations for the final set of security straps. *These locations will align with the ratchets or winches attached to the frame or foundation.* See the photos on Page 15 for a reference if needed. Cut and install the straps and tighten as needed to secure the lower part of the main cover. *Continue with Step 22 (Secure the Bonnet).*

Additionally, for buildings with multiple main covers and no roll-up sides, repeat Steps 1-21 as needed to install the remaining cover or covers and continue with *Step 22*.

NOTE: Lower edge of cover skirt, which extends below the conduit pocket of this building, is secured to the foundation. See skirt attachment instructions for details.



Scenario B (Single or Multiple Main Covers–One Roll-Up Side): For single or multiple main covers (one roll-up side), move to the conduit *opposite where you want the roll-up side* and repeat Step 13 on Page 12 to remove pocket material in the strap locations for the final set of security straps for the conduit, which is typically a 1.66" diameter pipe. *These locations will align with the ratchets or winches attached to the frame or foundation.* See the photos on Page 15 for a reference if needed. Cut and install the straps and tighten as needed to secure the lower edge of the main cover.

Single Main Cover: After securing the cover opposite the roll-up side, secure the bonnet at the ends of the main cover (Step 22). After securing the bonnet portion of the main cover at each end of the building frame, continue with the Roll-Up Side Assembly procedure.

Additional Main Cover or Covers: To install additional covers, repeat Steps 1-21 and continue with Step 22.

Scenario C (Single or Multiple Main Covers–Two Roll-Up Sides): For single or multiple main covers (two roll-up sides), temporarily secure the roll-up sides (lower portion of the main cover with the 1.315" conduit installed–Step 20) to the frame or foundation using straps or ropes. This will help prevent damage or injury should the wind blow. Continue with Step 22.

Additional Main Cover or Covers: To install additional covers, repeat Steps 1-21 and continue with Step 22. During the installation of the remaining main covers, position these on the frame in a way that will allow the roll-up portion of each cover to overlap as desired to allow each roll-up side to function independently.

Review the Roll-Up Side procedure before you install the additional cover or covers to better understand how the twist-of-the-wrist assembly is attached and how it works.

After securing the bonnet (Step 22) at each end of the building frame, continue with the Roll-Up Side Assembly procedure.

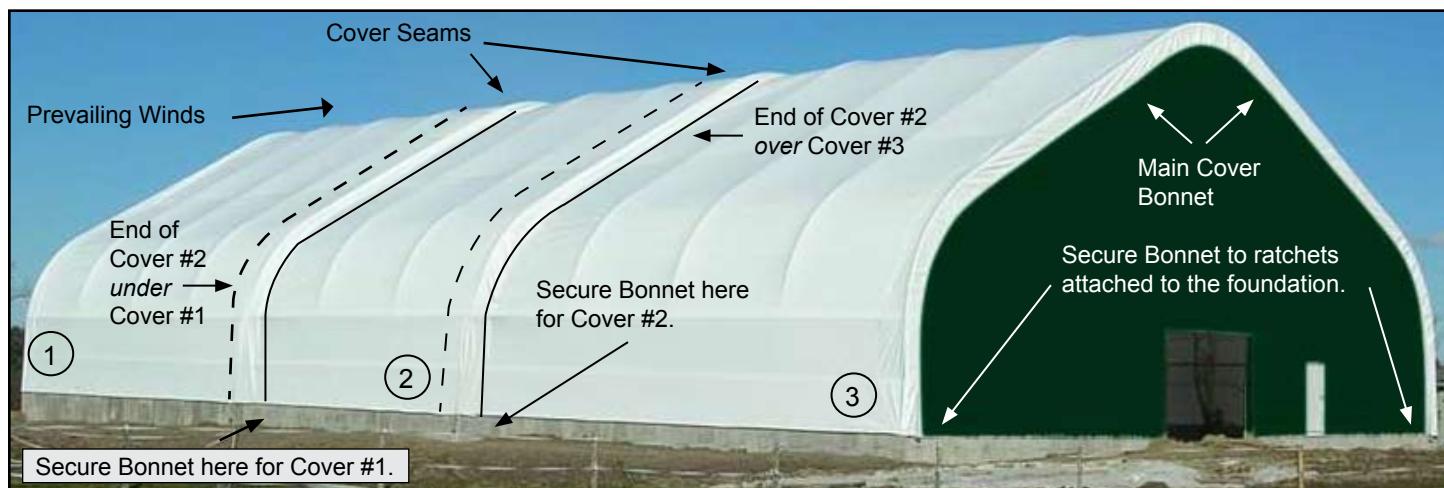
CLEARSPAN™ TRUSS ARCH BUILDINGS

STEP 22—SECURE THE BONNET: For buildings with a single main cover, return to the ends of the main cover, pull the bonnet portion of the cover over the end of the end rafter, insert the pre-installed bonnet strap ends into each end ratchet or winch attached to the end rafter or foundation, and tighten. (Locations will vary depending on building design.)

Example below shows a round-style truss arch building mounted on treated wood timbers. Bonnet is shown wrapped over the end rafter and secured to ratchets attached to the timbers. Circles identify the ends of one 2.375" conduit.



MULTIPLE MAIN COVERS: For buildings with multiple main covers as shown below, move to the *end rafter* and tighten the two bonnet ratchets at that end only. The remaining main cover bonnet is secured after you install the next cover.



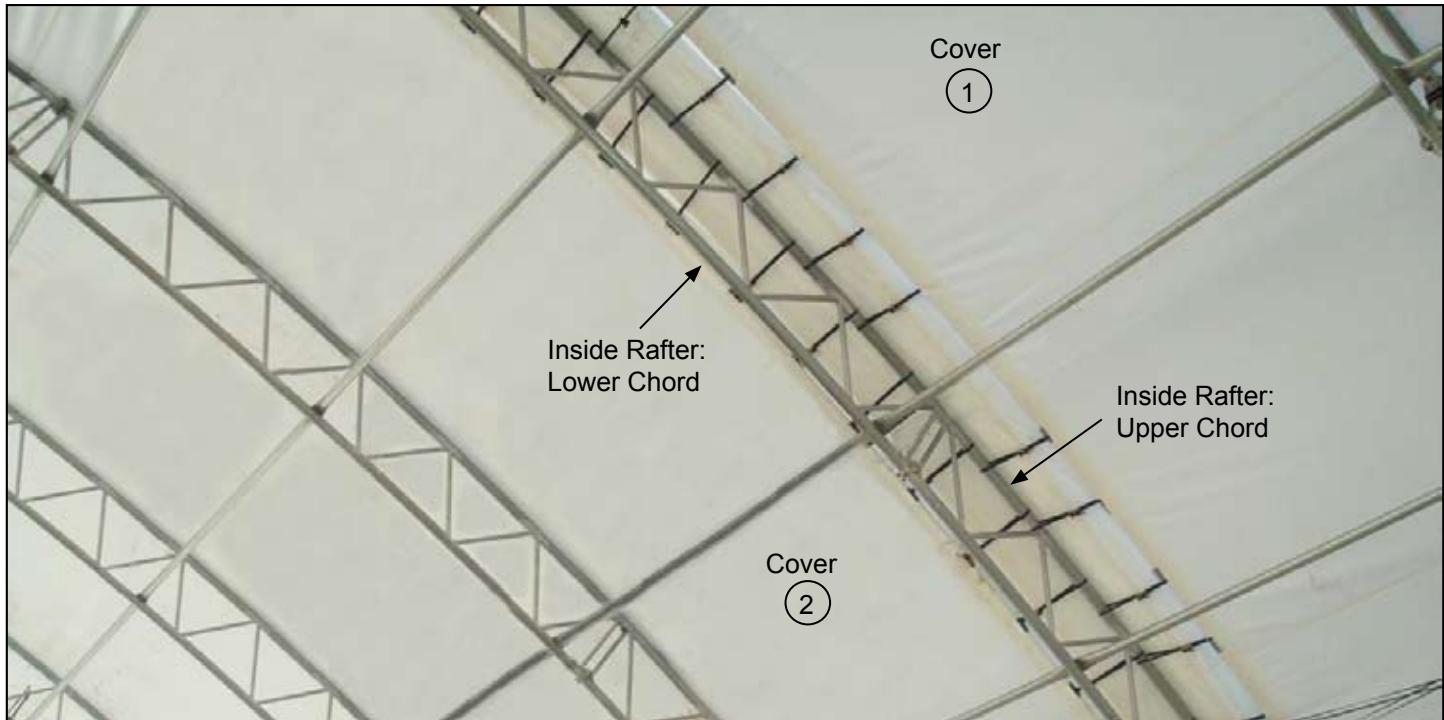
The seams between covers are secured using the bonnet straps of each cover. After installing an adjacent cover and stretching it end-to-end (Steps 1-21), pull the bonnet of one cover over the strap and ratchet assemblies of the adjacent cover and tighten the bonnet straps of both covers. *The strap and ratchet assemblies used to stretch each cover typically share the upper chord of the same rafter at the ends of those covers.* **ATTENTION:** See the information on the next page regarding the stretching of covers.

Bonnet straps for a building with multiple covers are secured to ratchets and winches mounted in the area where the covers overlap. Mount these in a position that aligns with the bonnet strap once the bonnet is evenly stretched over the end rafter and strap and ratchets of the adjacent cover. A bonnet that is overlapped by (or under) another bonnet is secured using winches or ratchets mounted on the *inside* of the building or foundation. Outer bonnets are secured to ratchets or winches mounted on the *outside* of the frame or foundation. See the suggested areas above.

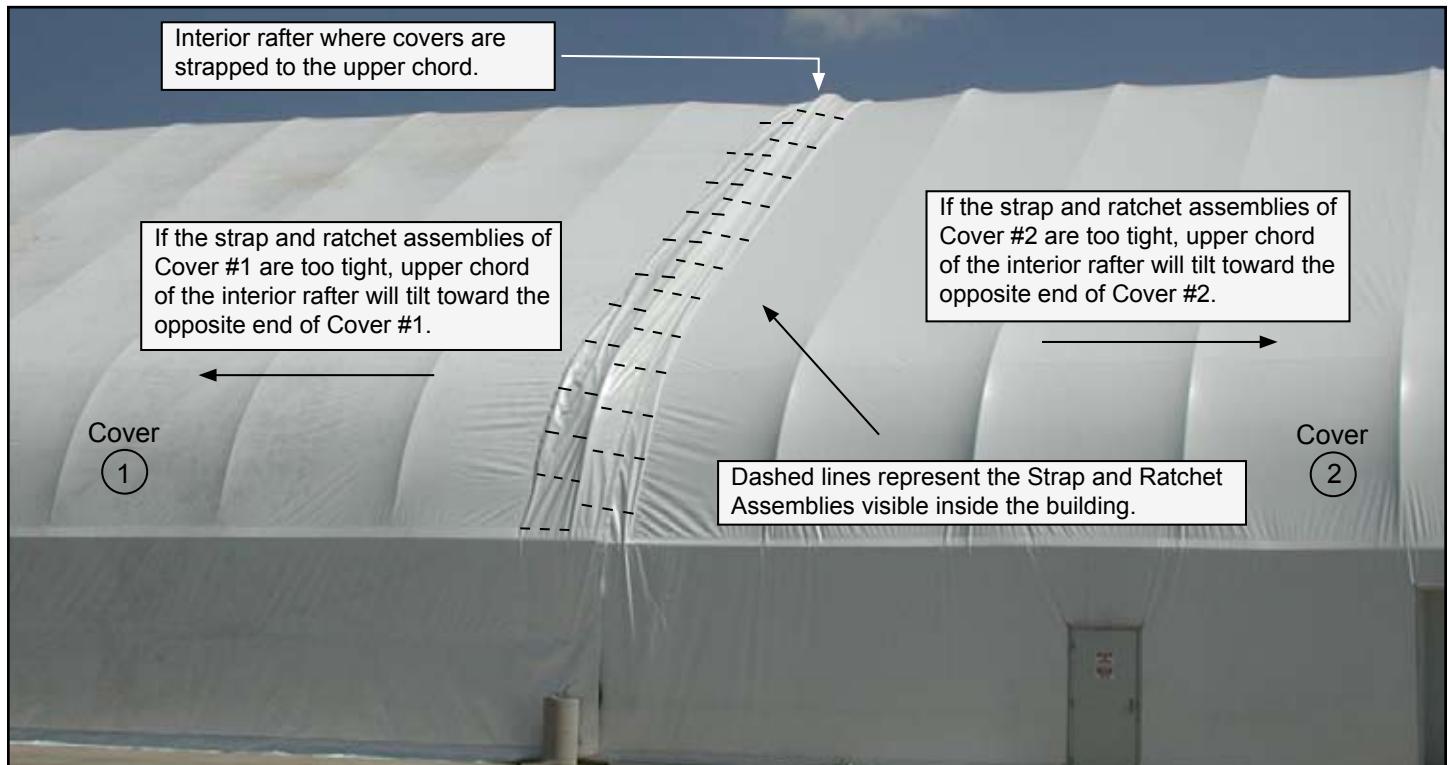
Prevailing Winds: In the example above, Cover #1 overlaps Cover #2 and Cover #2 overlaps Cover #3. The decision to overlap the covers as shown is influenced by the prevailing winds. Consider the prevailing winds when installing covers.

Installing Multiple Covers (continued)

During the installation of an *additional* main cover, the straps and ratchets used to stretch the cover end-to-end will share the same upper chord of an interior rafter as the adjacent cover. In the example shown below, the end of Cover #1 is secured to the upper chord of the interior rafter. The end of Cover #2 is also secured to the upper chord of the same rafter. Cover view is from the inside of the building looking up at the interior rafter where two covers meet.



IMPORTANT: As the strap and ratchets are installed and tightened for the second cover, verify that the upper and lower chord of the common interior rafter remain aligned. Loosen or tighten the ratchets and straps of *both* covers as needed to allow the upper and lower chords of the common interior rafter to remain aligned. View the rafter from the ground to verify that the chords stay aligned. See additional information in the example below.



Attaching the Main Cover Skirt

Truss arch main covers consist of two (2) basic designs: those that *include a pocket* at the lower edge along each side and those that include a cover skirt that *extends below the lower pocket* of the main cover along both sides.

If equipped, the cover skirt of a main cover must be secured to prevent property and cover damage and possible injury. The cover skirt can be secured in different ways depending on the building design and foundation. Consult the information and examples that follow to secure the cover skirt (if equipped) of your building.

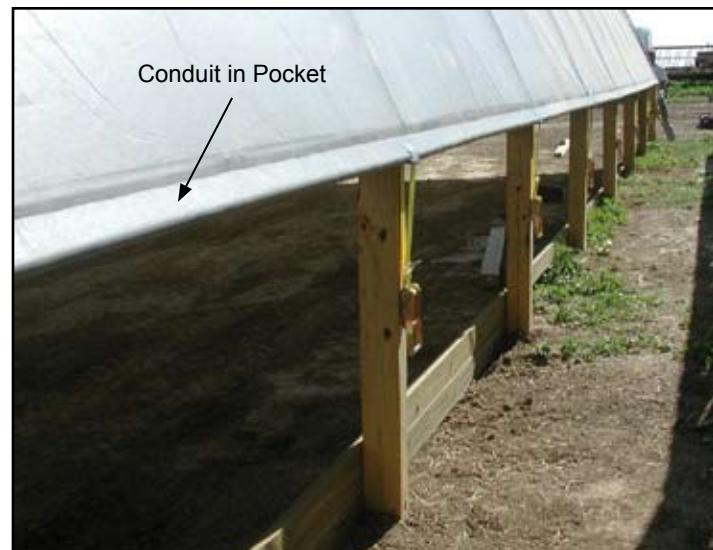
ATTENTION: *To prevent property damage and possible injury, you must secure the cover skirt.* Allowing the skirt to hang freely along the sides of the building may damage the cover and may invalidate the cover warranty. *The roll-up side of a main cover will not have a cover skirt.*

COVER STYLE #1 (No Cover Skirt): Conduit Pocket Along the Lower Edge of the Main Cover (Both Sides)

To properly stretch the main cover and adjust the strap tension, truss arch buildings with this cover type are erected on and anchored to a raised foundation. *No cover skirt is present.* Covers are anchored in place using straps and ratchets or winches. Inspect the cover, ratchets, winches, and straps regularly. Replace worn straps or broken components promptly.

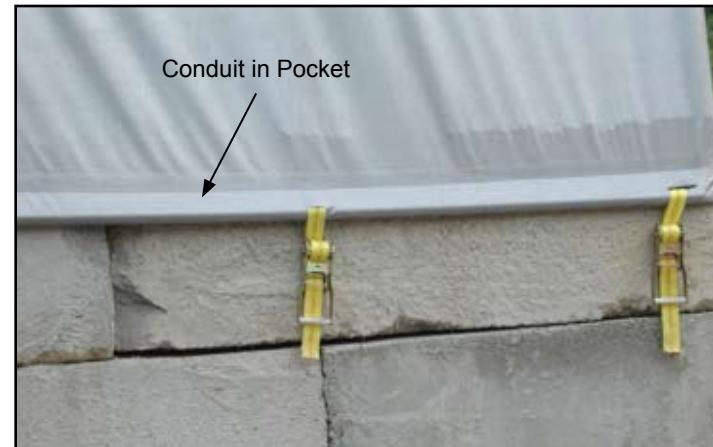


Building above is anchored to a perimeter concrete foundation. Cover is secured to the outside of the foundation along both sides.



Treated timbers serve to support the above building. Ratchets are anchored to the outside surface of each post along both sides.

Building below is set on and anchored to pre-cast concrete blocks that interlock to form the foundation. Ratchets are attached to the outside along both sides to secure the cover.



COVER STYLE #2: Skirt Extends Below Lower Conduit Pocket Along Both Sides

Many factors affect the way to properly secure a cover skirt. Location, site, building use, foundation, and available materials must all be considered. Consult the examples below for suggested methods. If none of the suggestions apply to your building, consult a qualified professional experienced with similar installations and structures, or call your sales representative for additional information.

(A) Skirt Secured By Backfill

After evenly spreading the cover skirt along the side of the building, cover the skirt with light rock or gravel. This secures the skirt and helps channel the water away from the building. Fill layer must be thick enough and the skirt deep enough to prevent the fill from washing away.



If the soil type is too loose to allow proper drainage or to hold the skirt in place, washed gravel or similar fill should be used. Dig a shallow trench along the building, spread the skirt out in the trench, and apply the gravel or fill over the exposed skirt.

ATTENTION: Inspect the perimeter of the building regularly to verify that the skirt and fill remain secure and in place.

CLEARSPAN™ TRUSS ARCH BUILDINGS

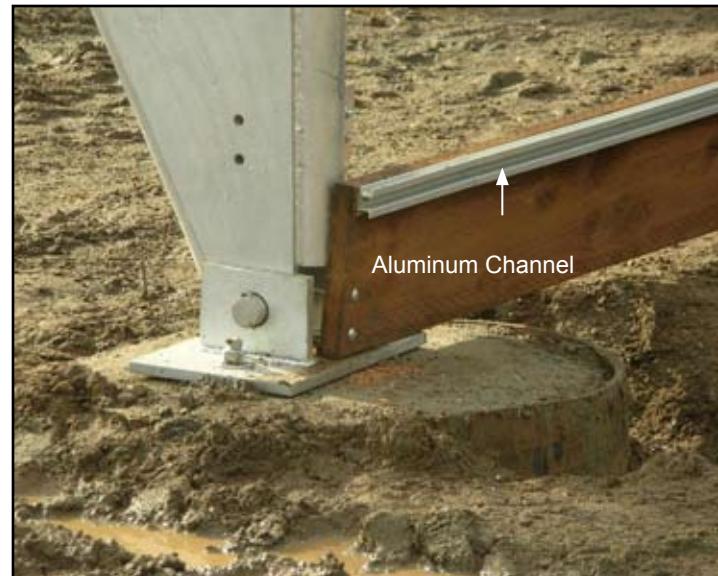
(B) Aluminum Channel and Retaining Strip – Secured to Baseboard

For buildings where a customer-supplied baseboard has been installed, the cover skirt can be secured to the baseboard in different manners. The photos shown below show the installed baseboard, the attached aluminum channel, and the installation of the retaining strip. (The aluminum channel and retaining strip are typically not included with most truss arch buildings and require an additional purchase. Contact your sales representative for to purchase these items to secure the skirt for your building.)

NOTE: The cover skirt can also be secured directly to the customer-supplied baseboard (no channel and retaining strips) using the appropriate fasteners and washers. Space screws at 12" intervals throughout the length of the building. (See photos under C.)



Step 1: Attach the baseboard to the rafters.



Step 2: Attach the aluminum channel to baseboard.



Step 3: Stretch the skirt and install the retaining strip.

NOTE: Do not damage the main cover during the installation of the retaining strip.

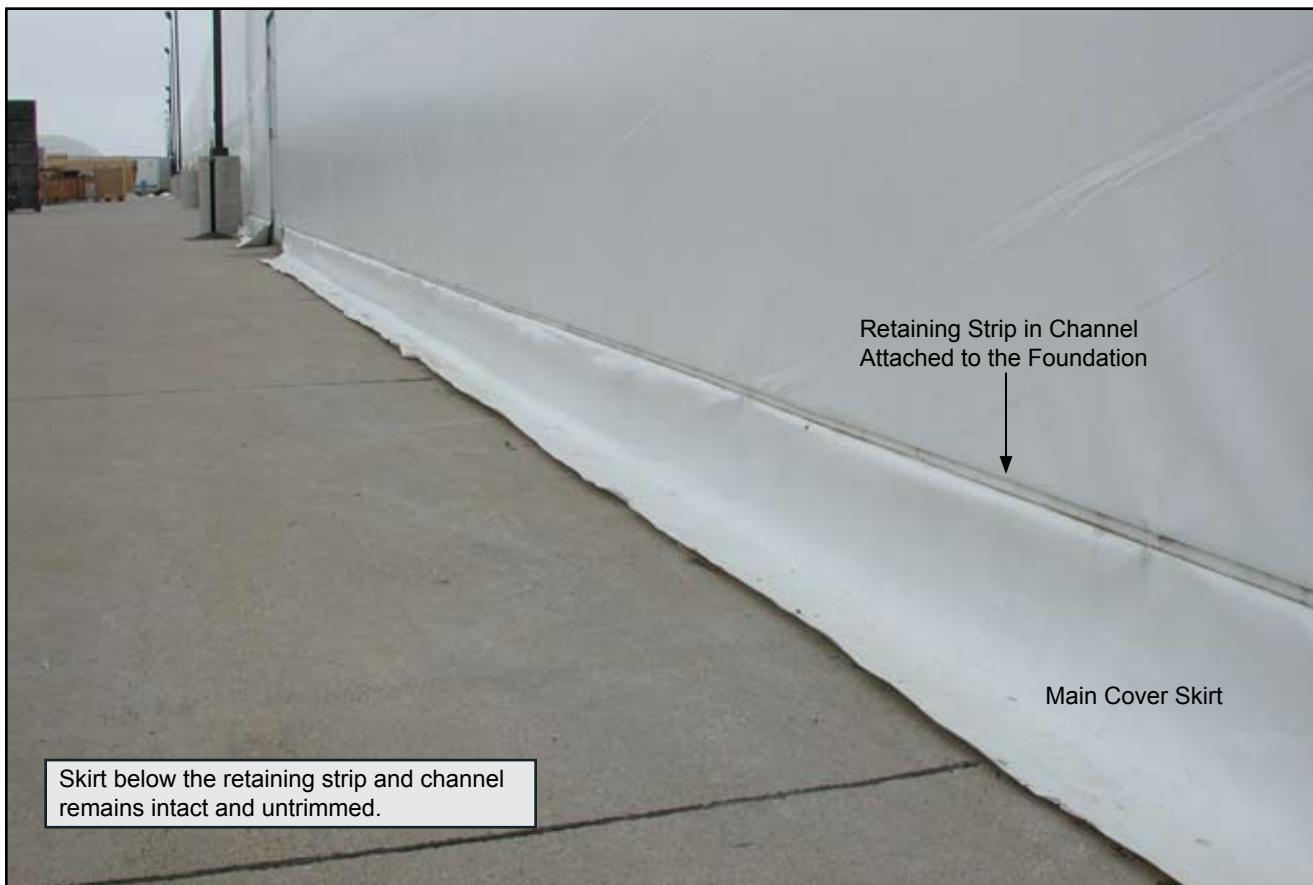
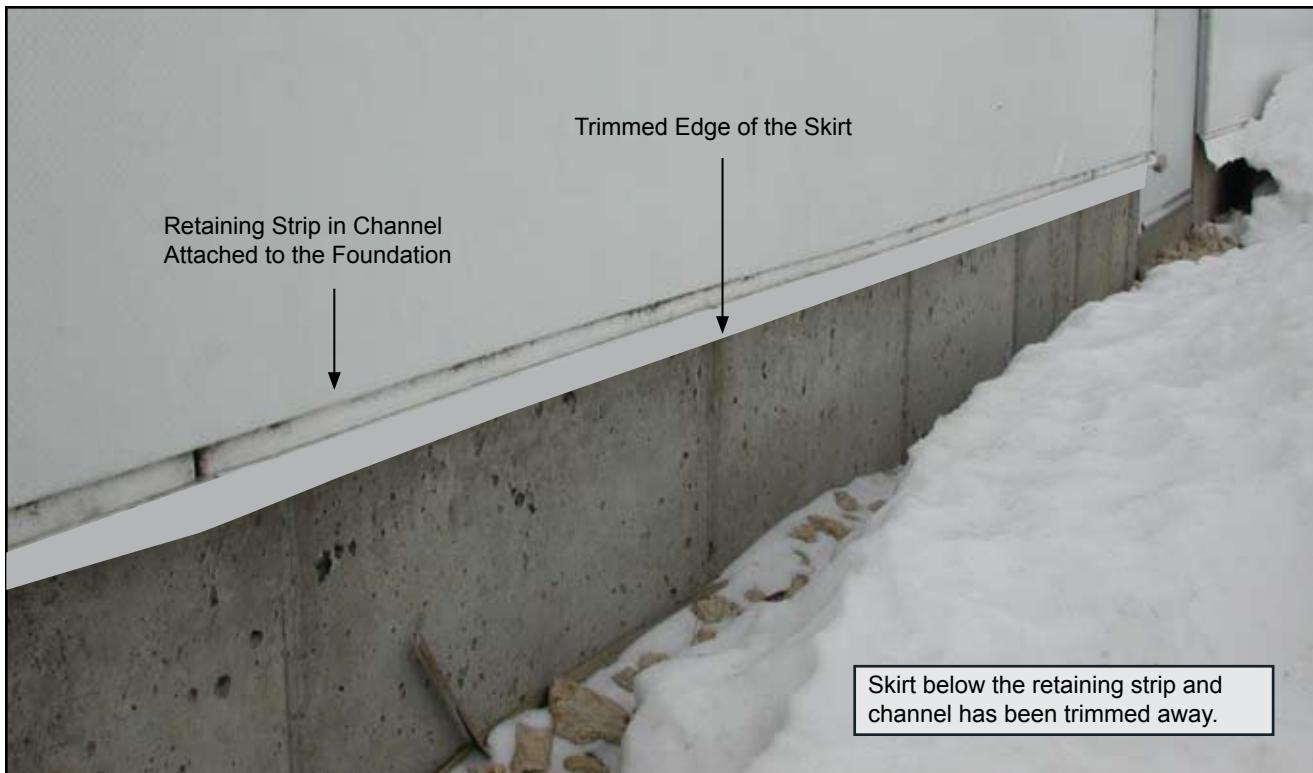


Step 4: Check the retaining strip and repeat the steps to secure the remainder of the cover skirt.

The skirt that remains below the retaining strip and channel can be trimmed to within 6" of the channel, or it can remain to help channel water away. See the photos on the next page.

B (continued)

In the photos below, the aluminum channel is attached directly to the concrete foundation that supports the truss arch building. The skirt is then stretched over the channel and secured to the channel by installing the retaining strip as described on the previous page. (All material require an additional purchase or are supplied by the customer.)



CLEARSPAN™ TRUSS ARCH BUILDINGS

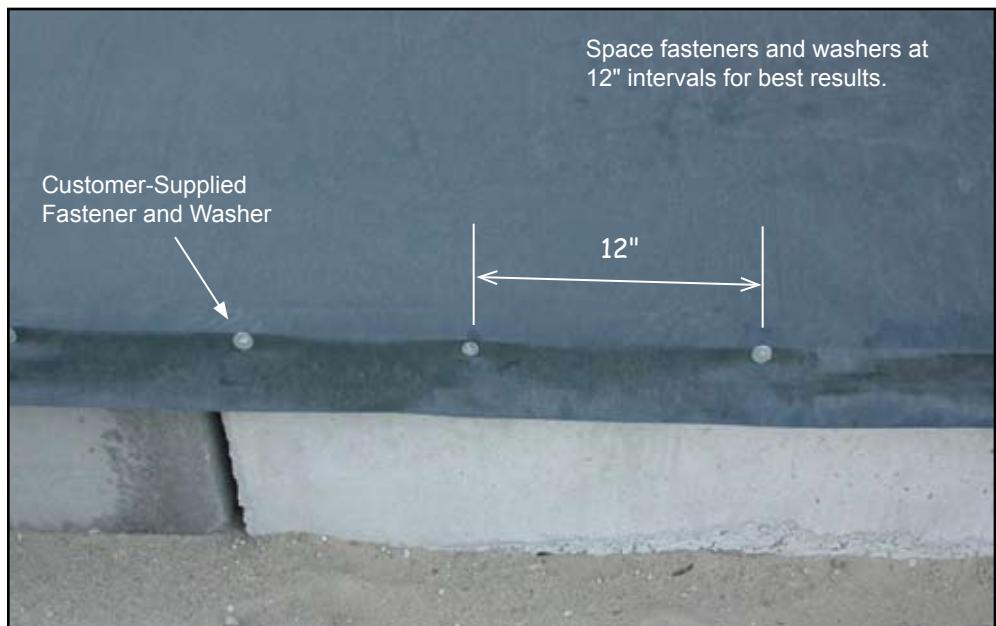
(C) No Baseboard – Concrete Foundation

The photos on this page show using customer-supplied fasteners to secure the skirt to the concrete block foundation of the building.

For best results and a better seal, first attach a treated-wood backing board (customer-supplied) to the concrete blocks. The skirt is then secured to the wood board with fasteners and washers.

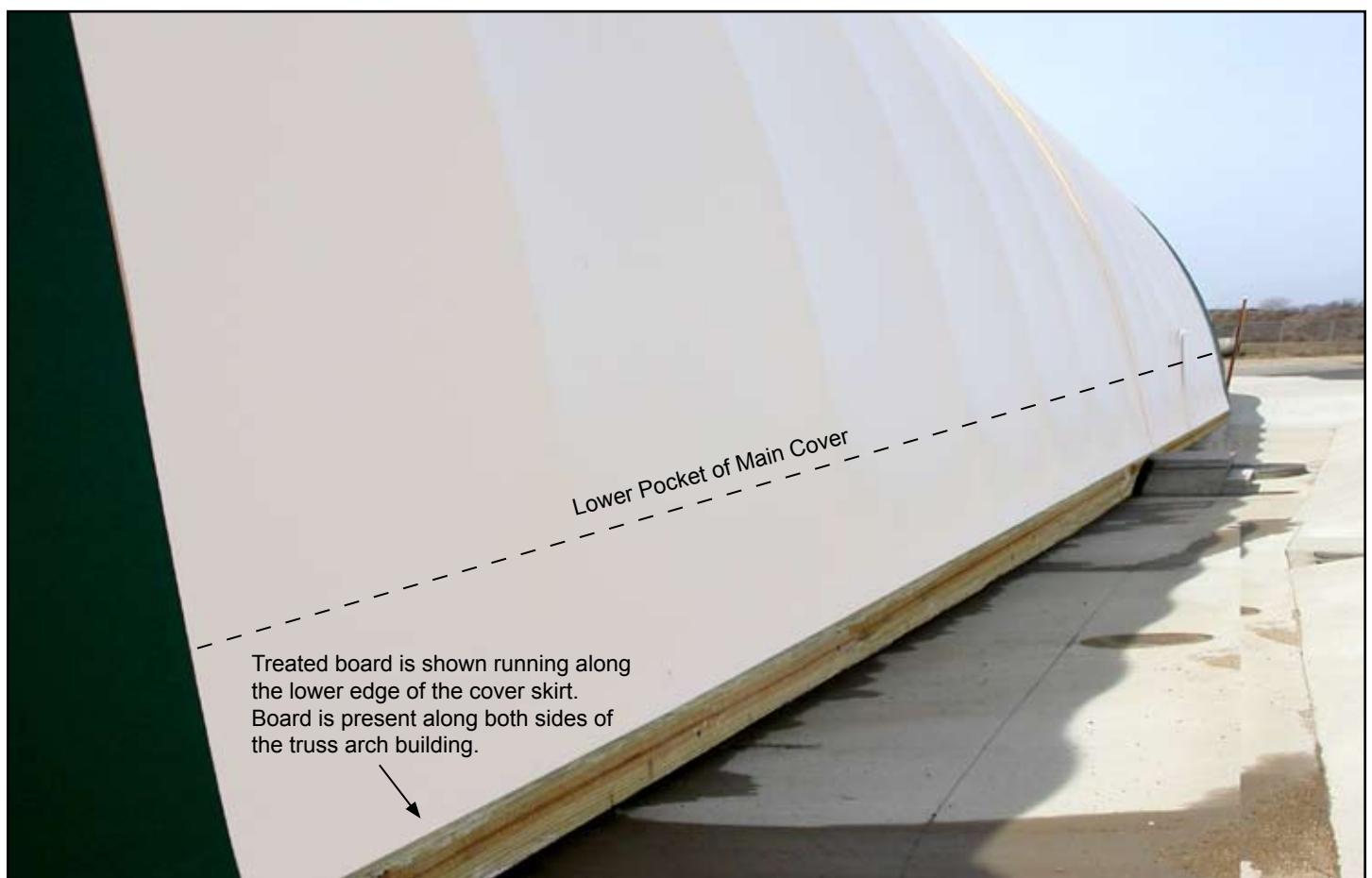
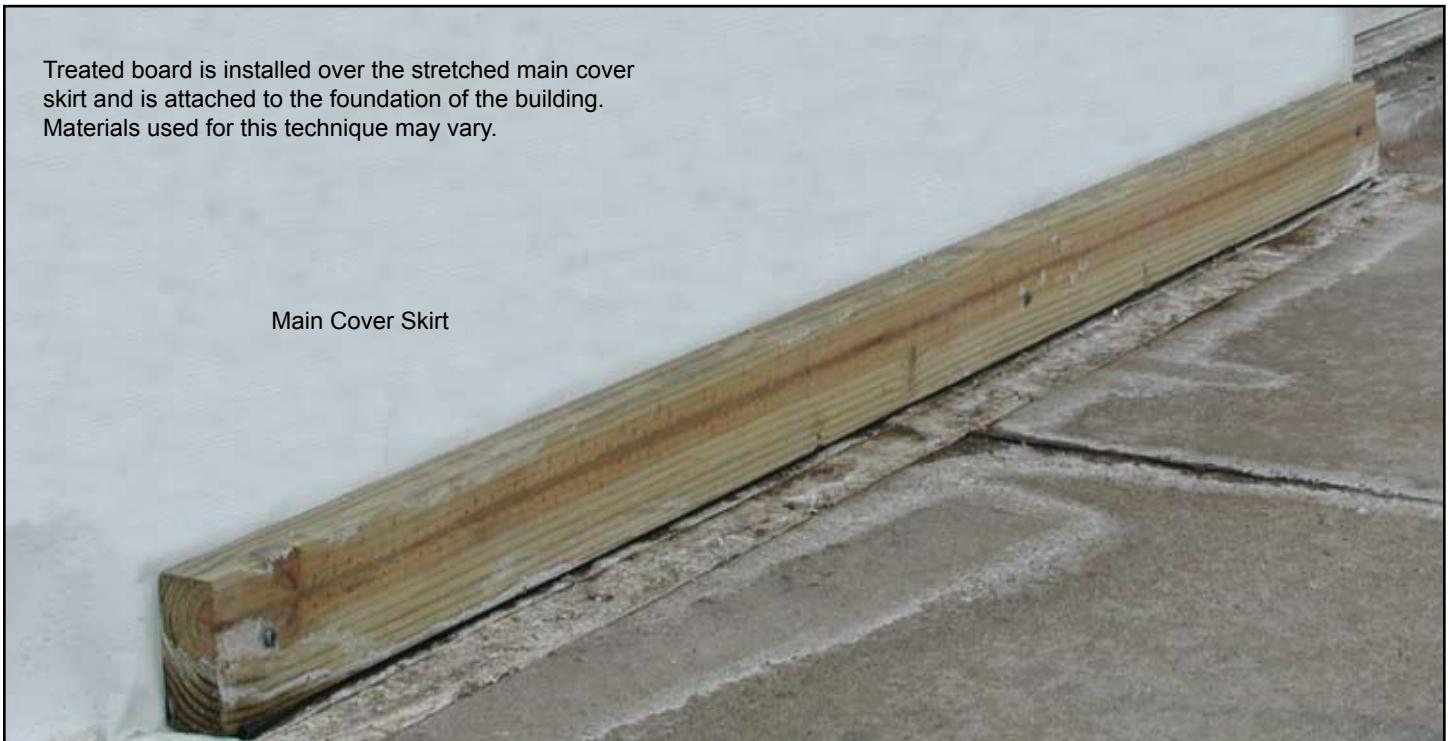
If creating a seal is not required, the skirt can be secured directly to the concrete blocks using the appropriate fasteners.

Use this technique to secure the skirt directly to a baseboard if installed. See item B.



(D) Wood Board Over Skirt – Secured to Foundation

For some buildings, installing a wood board over the main cover skirt and securing the board to the foundation works best. Board and fasteners appropriate for the foundation are supplied by the customer.



ClearSpan™ Twist-of-the-Wrist Assembly Instructions



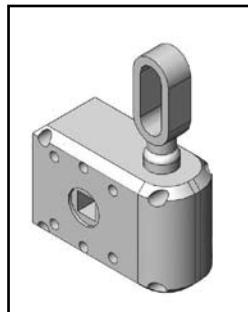
PARTS AND DESCRIPTIONS

8' or 16' ALUMINUM RAIL & MOUNTING HARDWARE

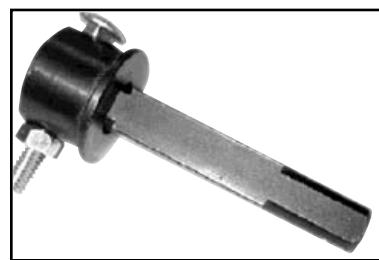
Item	Description	Qty.
AR5010	Chain Section	*
FALF15B	Locknut (1/4"-20)	*
FAG106B	Hex Cap (1/4" x 1-1/2" Zinc)	*
AS2200	Quick Link (1/8" Zinc Plated)	*
FA2087	Eyebolt (3/8" x 8" Zinc)	*
FALB04B	Nut (3/8"-16 Zinc)	*
FAME08B	Flat Washer (3/8" Zinc)	*
FA2160	Eye Screw (5/16" x 4" Zinc)	*
FAG108B	Hex Cap (1/4" x 1/2" Zinc)	*
102570 or 106427	8' or 16' Aluminum Channel	*

*Quantities vary depending on building and roll-up side configurations. Consult Bill of Materials for component details. Depending on the application, some components listed above may not be included with or used on your building.

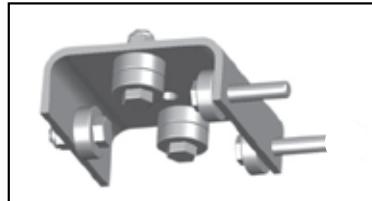
Additional Twist-of-the-Wrist Components



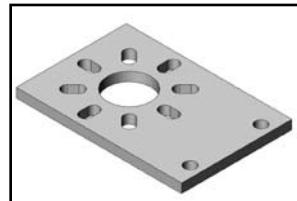
Gearbox



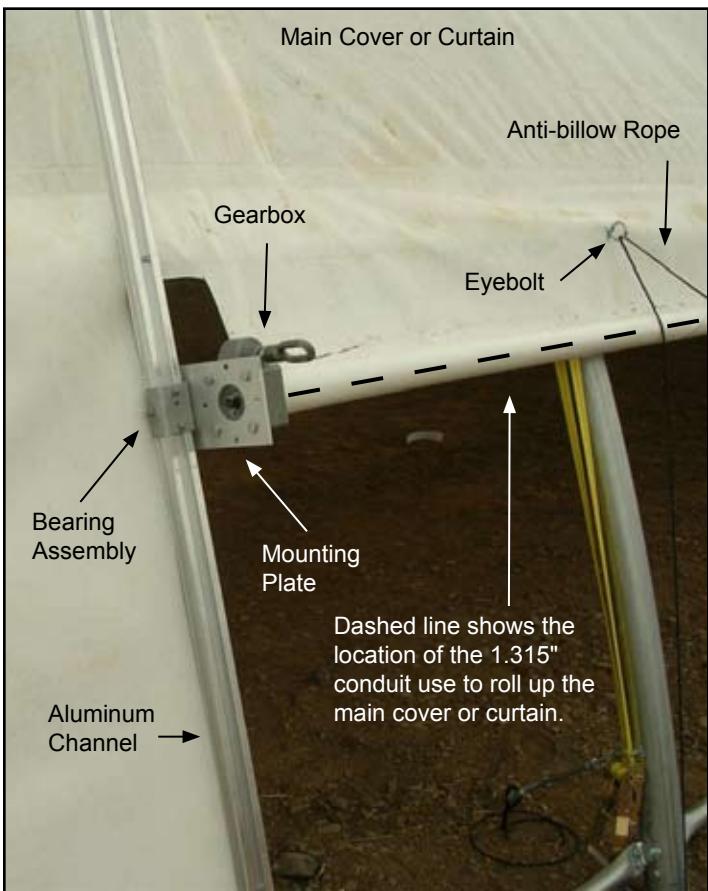
Adaptor and Drive Shaft



Bearing Assembly



Mounting Plate



General Information and Overview

In addition to other uses, the Twist-of-the-Wrist assembly allows the operator to "roll up" the side of a cover (shown above) or the end panel door of a shelter. The assembly can also raise and lower curtains of different lengths. These instructions describe the basic Twist-of-the-Wrist components and how to assemble those components.

IMPORTANT!

The parts needed to complete the installation of the roll-up side may differ between truss arch buildings. Some components shown within this instructions may not apply to your truss arch. It is possible that some parts included with your building will remain unused.

In addition, some buildings are equipped with a separate side panel or curtain that is attached to the building while other truss arch buildings use the lower portion of the main cover as the roll-up panel. Read though these instructions and adapt them as needed to install the roll-up components for your building.

These steps provide general information to help with the installation of the Twist-of-the-Wrist components. Review these instructions and skip the sections that do not apply.

IMPORTANT—ALL BUILDINGS: Before you begin the installation of the roll-up side components, return to all main cover straps and verify that they are tight.

CLEARSPAN™ TRUSS ARCH BUILDINGS

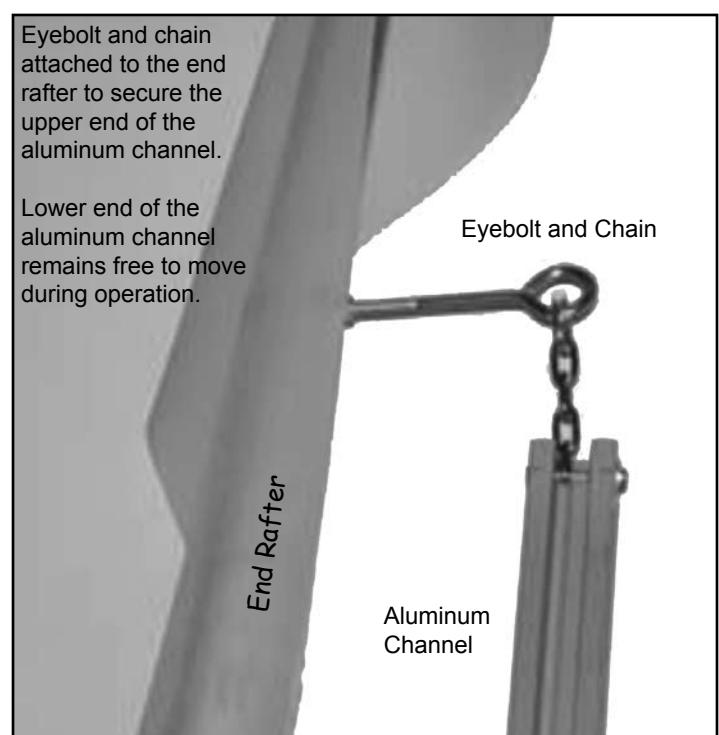
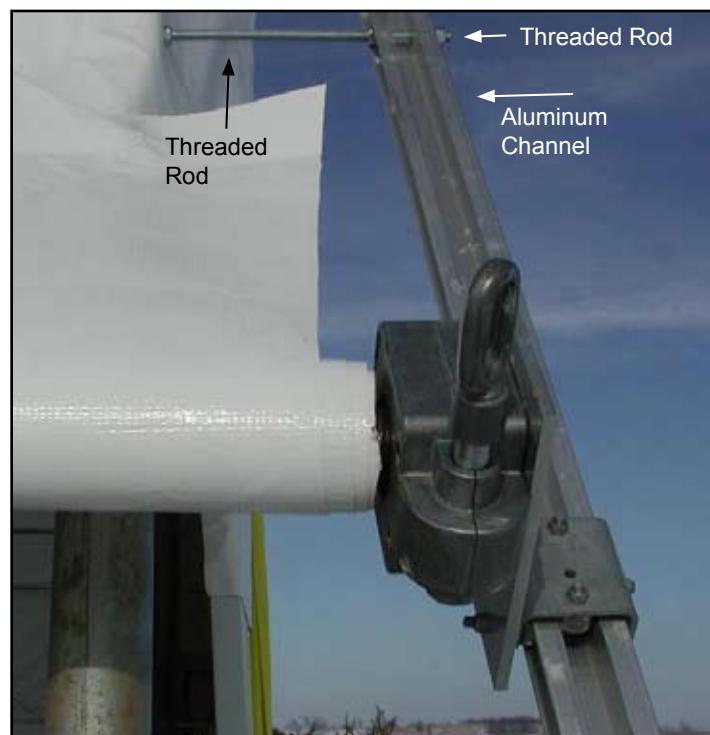
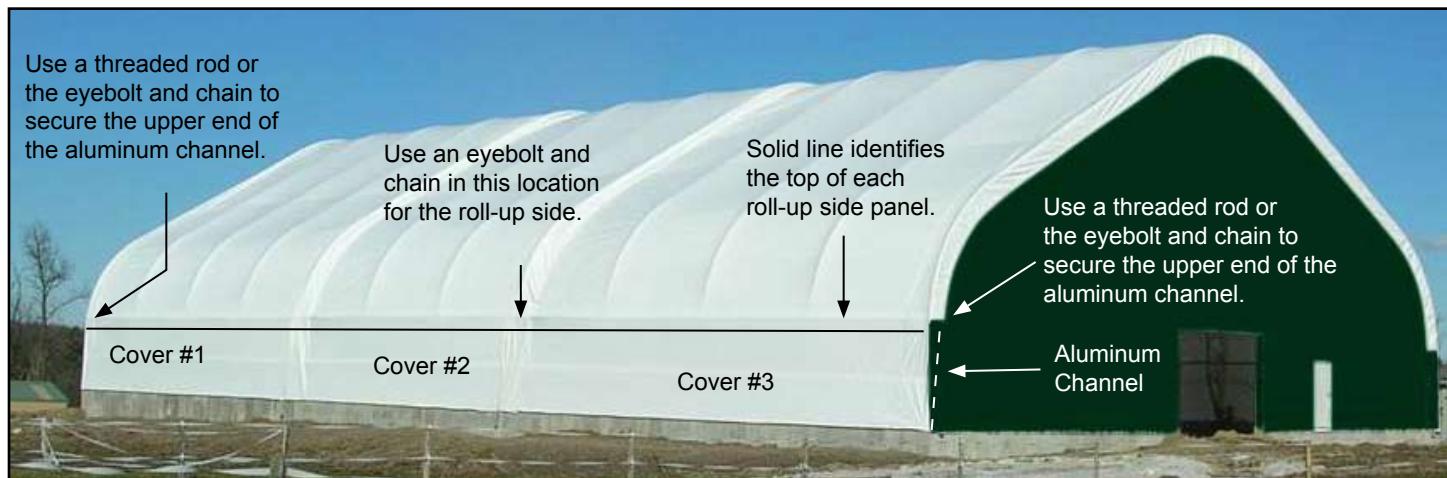
MULTIPLE COVERS: 3 or More

Each curtain or main cover section of a truss arch building requires a single roll-up assembly. During installation, consider how each roll-up panel will interact with the adjacent panel. Overlap the panels if needed so you can easily open all panels. Install the twist-of-the-wrist components in positions that allow proper operation of the individual roll-up panels.

Use the **Chain Link Installation** procedure to secure the upper portion of the aluminum channel for a twist-of-the-wrist assembly for covers that are between covers (e.g., Cover #2 below). Use a threaded rod to attach the twist-of-the-wrist components to the building at each end rafter (e.g., Cover #1 and Cover #3). See the photos below.

ATTENTION: For some applications, the eyebolts and chain links are used to attach the aluminum channel to the end rafters. (Threaded rods are typically used for the end rafter locations.) Check the parts sent with your building to verify which components are included with your twist-of-the-wrist assemblies.

If threaded rods are *not included*, individual sections of chain are typically used. Both options work for end rafters. Only the chain link application works for covers that are between other covers as shown in the example below.



TWIST-OF-THE-WRIST: GENERAL INSTRUCTIONS

The instructions below describe how to assemble and install a single Twist-of-the-Wrist assembly. The procedure is repeated for additional assemblies (if applicable). A curtain is used in the example. These steps can be easily adapted to other applications such as a main cover or end panel. The basic procedures to assemble and install the Twist-of-the-Wrist include the following:

1. Assemble the roll-up conduit. This is a 1.315" diameter metal conduit.
2. Attach the curtain to the shelter or building frame (if applicable).
3. Attach the roll-up conduit to the curtain or main cover panel. Use fabric clips (if equipped) or Tek screws and washers.
4. Assemble and attach the Twist-of-the-Wrist.
5. Install the Anti-Billow Rope system if equipped.
6. Test the operation of the Twist-of-the-Wrist.

ASSEMBLE THE 1.315" ROLL-UP CONDUIT

The roll-up conduit runs the length of the curtain or cover and serves as the center pipe that the curtain or cover wraps around when opened or rolled up. Skip this section if it does not apply.

Gather the parts:

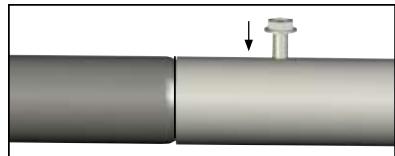
- 1.315" Pipe and Tek screws
- Fabric clips (if equipped)

Complete these steps to assemble the roll-up conduit:

1. Locate all sections of pipe.
2. Insert the swaged end of one pipe into the plain end of another pipe until the conduit is assembled.
3. Secure each pipe joint using a Tek screw.
4. Place the assembled conduit at the base of the shelter or frame where the curtain is located or will be installed.

NOTE: For easier handling, assemble longer conduits (40' and longer) in short sections if needed.

NOTE: Tape over the Tek screws and joints using heavy duct tape to prevent wear.



5. Continue with the procedure that follows to attach the curtain to the shelter or frame.

ATTACH CURTAIN (Skip section if this does not apply.)

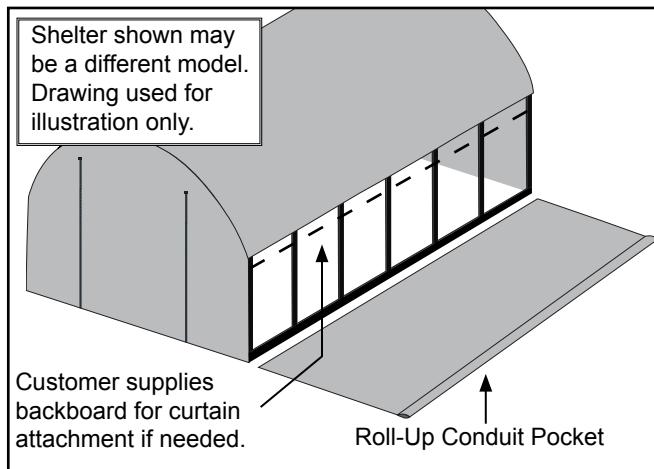
Gather the parts:

- Curtain (if equipped)
- Tek Screws and washers

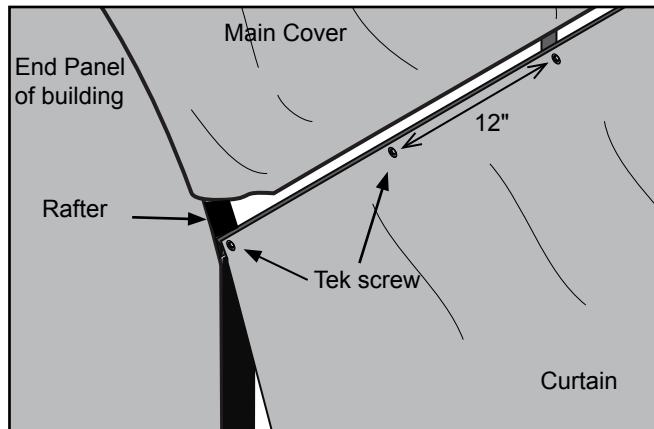
Different applications require different installation procedures. *It is the customer's responsibility to determine the best way to install a curtain (if equipped) based on building design and how the building is used.* (For some buildings, a portion of the main cover is used for the roll-up side.)

Complete these steps if applicable:

1. After assembling the conduit, take the curtain and unfold it on a clean, smooth surface near the frame.



2. Loosen the edge of the main cover if needed and attach the top of curtain to the frame using Tek screws and Fender washers. Evenly space the Tek screws every 12" for best results as shown below.



NOTE: If frame is wood, use wood screws.

3. Position the main cover over the top edge of the curtain and secure as needed. May not apply to all buildings.

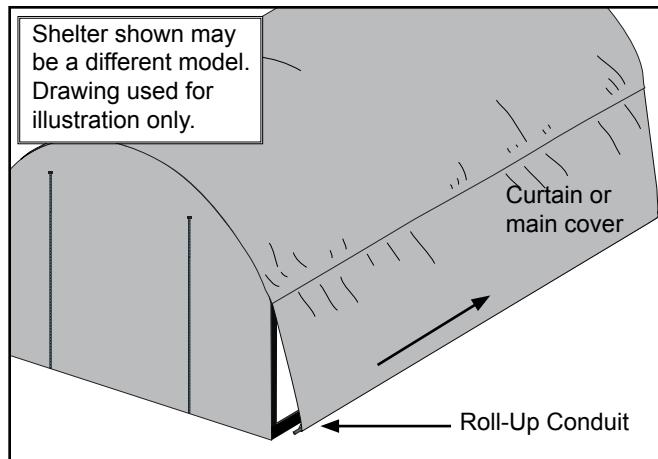
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ATTACH CONDUIT TO CURTAIN OR COVER PANEL

To this point, the top edge of the curtain is secured; the remainder of the curtain will hang down along the side of the building or frame.

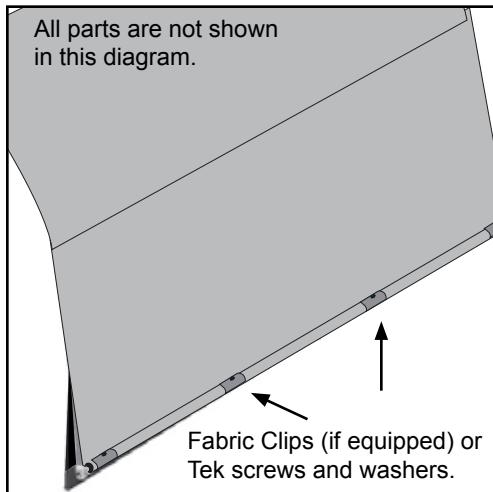
Gather the parts: Assembled conduit, Fabric clips, and Tek screws.

1. Unfold the lower portion of the curtain or cover (if needed) and evenly stretch it out along the frame.
2. Slide the assembled roll-up conduit into the pocket of the curtain if a pocket exists. If the lower portion of the main cover functions as the roll-up side, insert the 1.315" conduit into the cover pocket.



NOTE: Insert the conduit into the pocket so *the plain (non-tapered) end of the conduit* is at the end of the shelter where the gearbox will be installed. Allow the excess conduit length to extend beyond the curtain or panel at both ends *with most at the end where the Twist-of-the-Wrist assembly will be positioned*. The conduit is trimmed to length to attach the gearbox.

3. Secure panel to conduit using Tek screws and fabric clips (if equipped) or Tek screws and washers.



4. Continue with the Twist-of-the-Wrist Assembly procedure.

TWIST-OF-THE-WRIST ASSEMBLY

The Twist-of-the-Wrist assembly is designed to raise and lower the curtain or a portion of the main cover.

Gather the parts:

- Aluminum channel
- Gearbox and gearbox drive
- Mounting plate and roller bearing
- 3/8" eyebolt or 5/16" eye screw (depending on the shelter and frame material)
- 3/8" nuts and washers

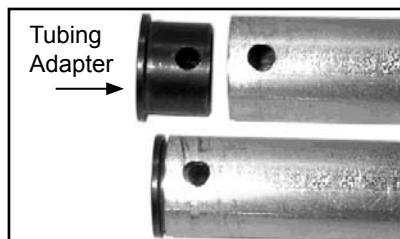
ATTENTION: These procedures describe the basic steps needed to assemble and attach the Twist-of-the-Wrist assembly. Additional modifications and components may be required if none of the following suggestions work for your application.

Those installing this assembly are responsible for determining the best way to install the curtain and all related components based on how the components are used.

Chain Link Installation Steps

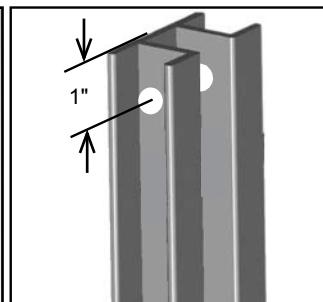
The following procedure describes using the supplied chain and eyebolt (or eye screw) to attach the upper end of the aluminum channel to the building or frame.

1. Drill a 5/16" hole through the roll-up conduit 1/2" from the end of the conduit.
2. Insert a tubing adapter (from the drive set) into the conduit and align the holes of the adapter with the drilled holes in the conduit.



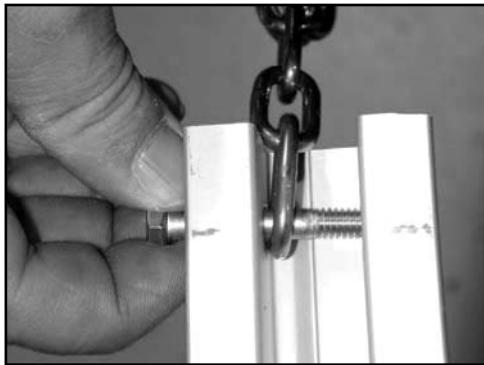
Curtain is not shown in the diagram. Slide the curtain out of the way if needed when drilling the mounting hole in the conduit.

3. Select the aluminum channel and drill a 5/16" hole through the center of the channel approximately 1" from the end. (See the diagrams below.)

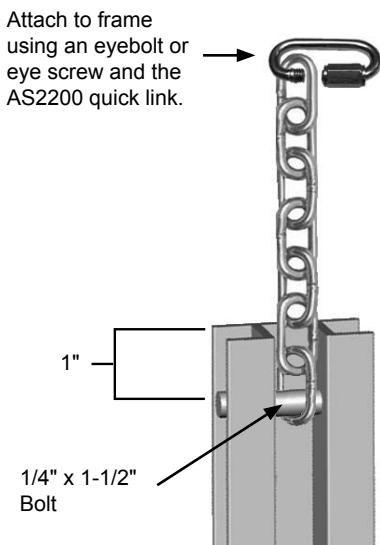


CHAIN LINK INSTALLATION (CONTINUED)

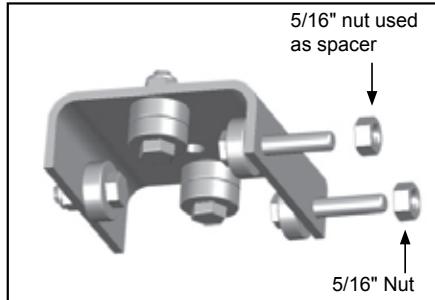
- Insert the 1/4" x 1-1/2" bolt through the channel, a link of the chain, and out through the other side of the channel.



- Secure the bolt to the channel using a 1/4" locknut. *Chain should slide freely on the 1/4" bolt.*
- Determine the desired height of the channel and install the eyebolt (for metal) or eye screw (for wood).

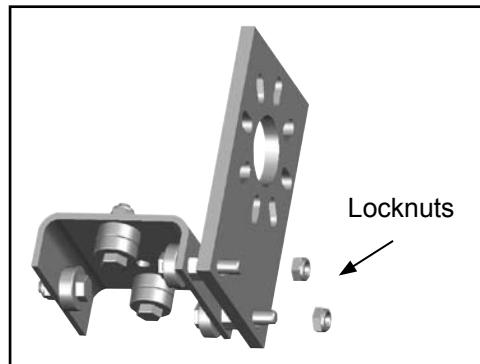


- Attach the chain to the fastener (previous step) using the AS2200 quick link. The channel will hang down from the fastener and chain; lower end remains free.
- Select the bearing bracket and attach the bearings as needed. (If the bearing component is assembled, continue with Step 9.) Assemble as follows if needed

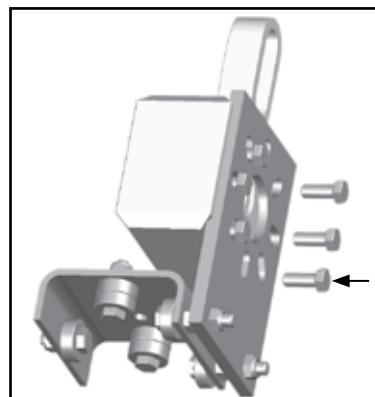


Single bearings are attached to the sides of the bracket and double bearings to the middle portion of the bracket. Use 1/4" hex bolts and locknuts as needed. *Install a flat washer on both sides of each bearing to insure proper operation of bearings and the assembly.* Install the longer bolts with bearings on the side of the bracket that has the two holes. Install these before installing the double bearing assemblies. For the spacers on the long bolts, insert a 5/16" nut over each bolt. *These nuts are used as spacers only. See previous diagram for details.*

- Slide the Twist-of-the-Wrist mounting plate over the long bolts and secure the plate with two locknuts.

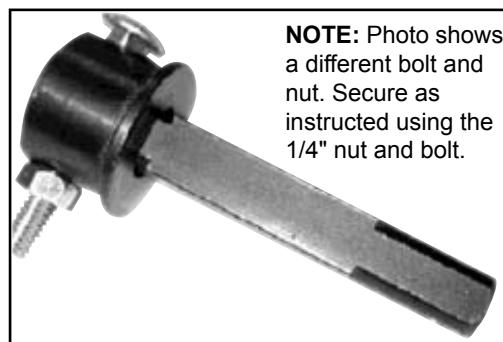


- Attach the Twist-of-the-Wrist gearbox to the mounting plate using hex head bolts included with the plate.



NOTE: The number of bolts used to secure the gearbox to the mounting plate may differ from what is shown in the diagram.

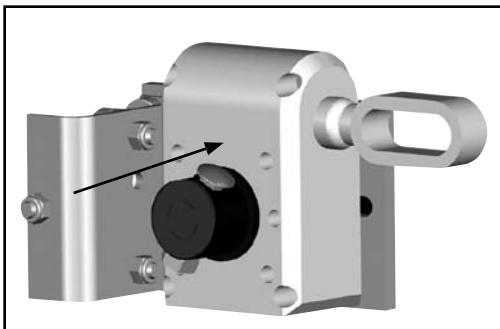
- Using a 1/4" x 2" bolt and 1/4" locknut, attach the square shaft to a tubing adapter.



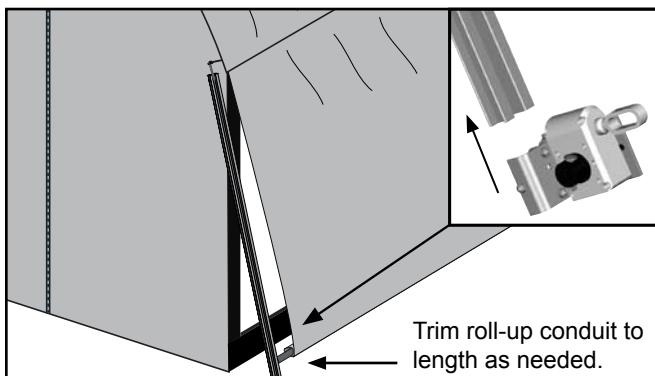
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CHAIN LINK INSTALLATION (CONTINUED)

12. Slide the square shaft through the Twist-of-the-Wrist gearbox.



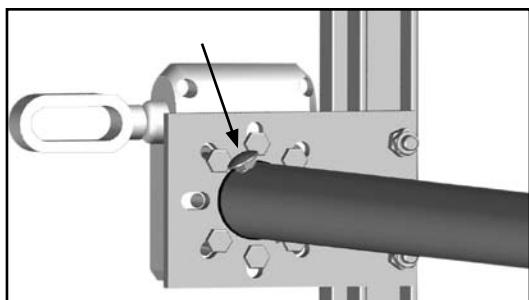
13. Slide the Twist-of-the-Wrist assembly onto the aluminum channel from the ground end. (This is the free end of the channel.)



14. Align the roll-up conduit with the gearbox and trim roll-up conduit to length as needed.

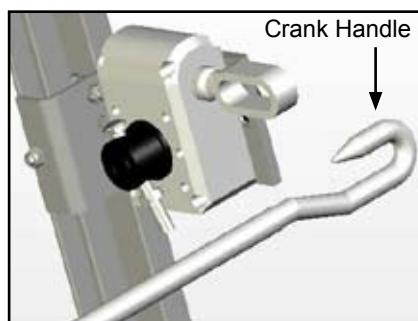
15. Check clearance between channel and the structure that the channel is attached to. Adjust if needed.

16. Attach the roll-up conduit to the square shaft of the assembly by inserting a 1/4" x 2" bolt through the hole in the conduit and tubing adapter. Tighten the locknut.



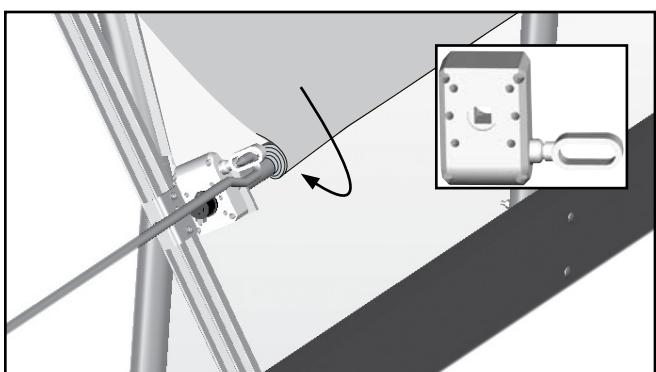
17. Straighten the curtain and center it along the shelter or building side as needed.

18. Attach the crank handle to the Twist-of-the-Wrist assembly. (Curtain is not shown in the diagram below.)



Drawing may show a different but similar application; the same operation technique is used.

19. Test the operation of the Twist-of-the-Wrist assembly.



NOTE: If the curtain rolls in the desired direction, but you want to turn the crank in the opposite direction for the same result, unbolt, reposition the gearbox, and remount it *on the same side of the mounting bracket*.

Verify that the curtain rolls in a direction that allows water to drain off of it as shown in the example above.

20. Continue by installing the anti-billow rope.

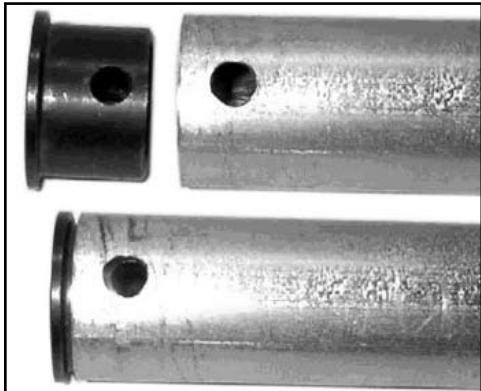
THREADED ROD INSTALLATION STEPS

Gather the parts:

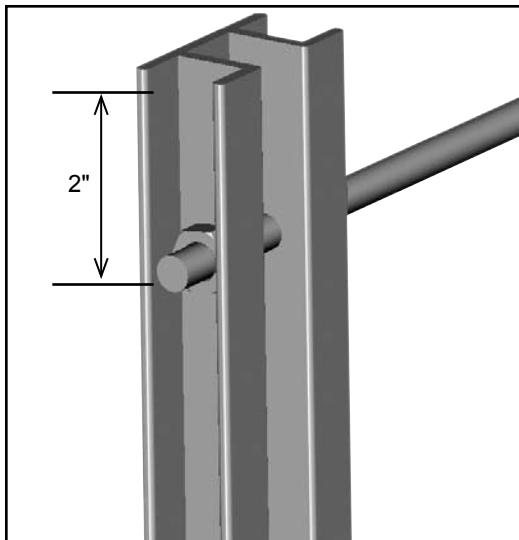
- Aluminum channel
- Drive handle
- Gearbox and gearbox drive
- Mounting plate
- Bearing and threaded rod
- 3/8" nuts and washers

The Twist-of-the-Wrist Assembly is designed to roll up a portion of the sides of the structure. The following steps describe the basic assembly and its installation.

1. Drill a 5/16" hole through the cover conduit 1/2" from the end of the conduit.
2. Insert a tubing adapter into the conduit and align the holes of the adapter with the drilled holes in the conduit.



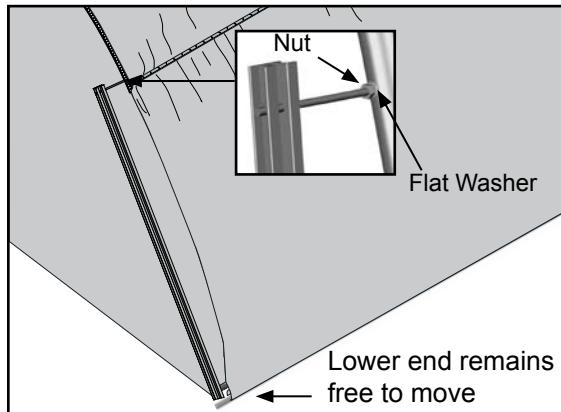
3. Select the aluminum channel and drill a 3/8" hole through the channel approximately 2" from the end and attach a threaded rod using a 3/8" nut on each side of the channel.



4. Position the channel along the end rafter at the end of the building where the Twist-of-the-Wrist assembly will be located.

NOTE: Verify that the lower end of the channel is slightly off the ground to allow it to move freely when the panel is rolled up and down.

5. Secure the upper end of the channel by drilling a 3/8" hole through the end rafter and attach as shown. The lower end of the channel will "float" and is not attached.



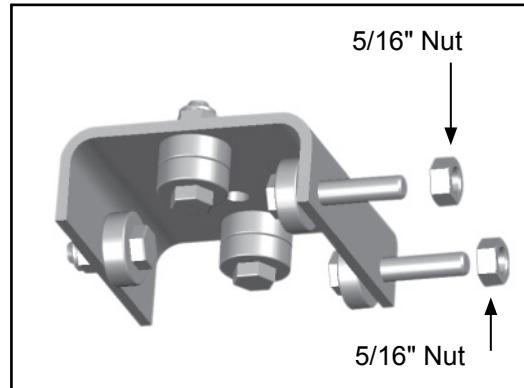
NOTE: Install a flat washer between the nut and the end panel (if equipped). Panel is not shown in the insert.

6. Select the bearing bracket and attach the bearings as needed. (In some instances, the bearings may come already attached.) Assemble as follows (if needed):

Single bearings are attached to the sides of the bracket and double bearings to the middle portion of the bracket. Use 1/4" hex bolts and locknuts as needed. Install a flat washer on both sides of each bearing to insure proper operation of bearings and the assembly.

Install the longer bolts with bearings on the side of the bracket that has the two holes. Install these *before* installing the double bearing assemblies. See the figures below.

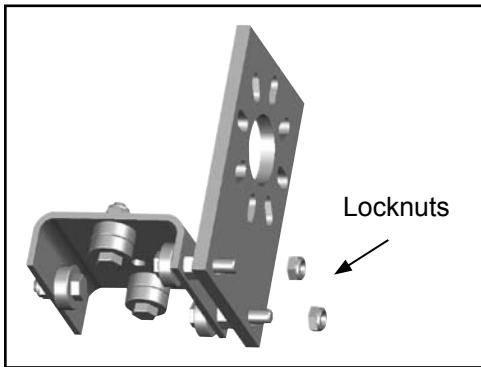
7. For the spacers on the long bolts, insert a 5/16" nut over each bolt. *These nuts are used as spacers only.*



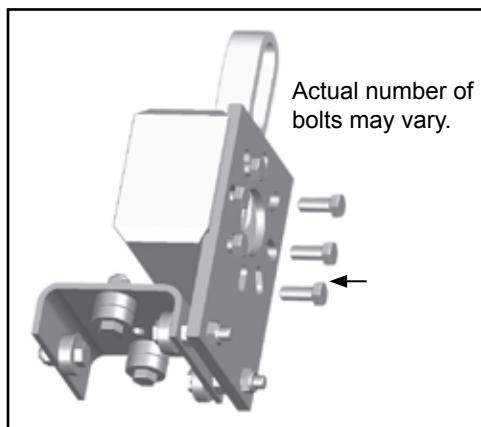
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THREADED ROD INSTALLATION STEPS (Continued)

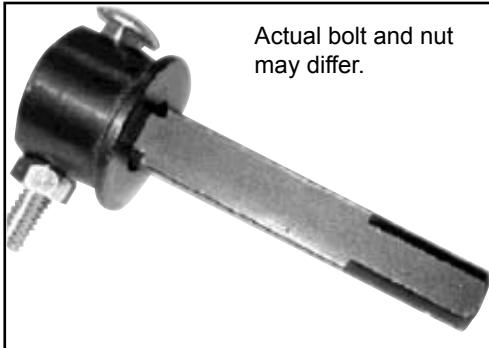
8. Slide the Twist-of-the-Wrist mounting plate over the long bolts and secure the plate with two lock nuts



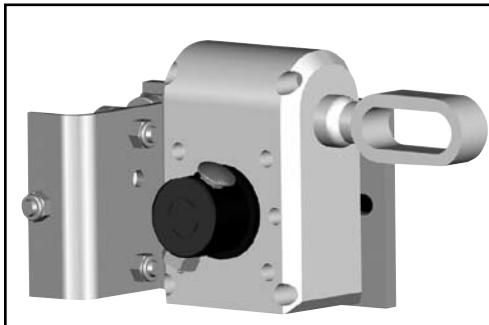
9. Attach the Twist-of-the-Wrist gearbox to the mounting plate using hex head bolts.



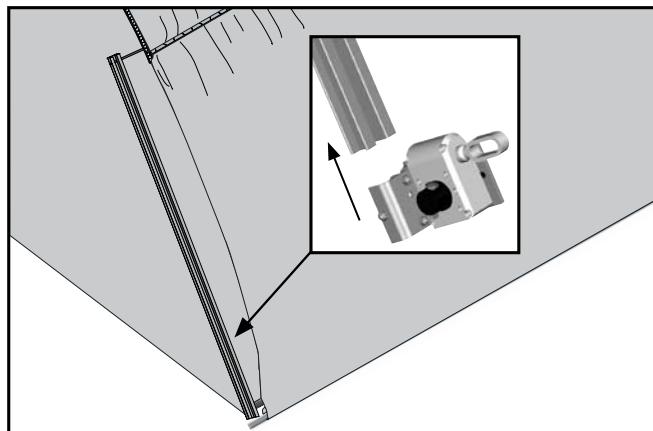
10. Using a carriage bolt, attach the square shaft to a tubing adapter.



11. Slide the square shaft through the Twist-of-the-Wrist gearbox.

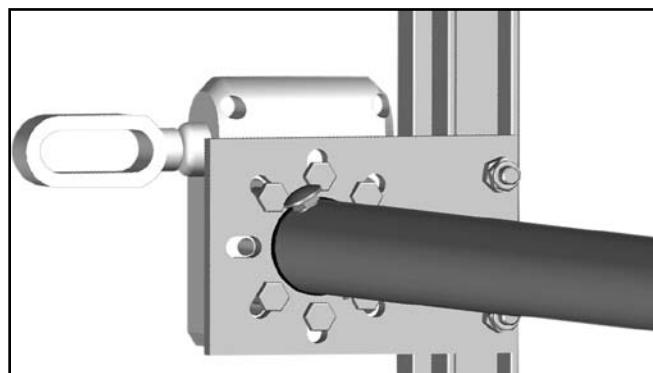


12. Slide the Twist-of-the-Wrist assembly onto the aluminum channel from the ground end. (This is the free end of the channel.)

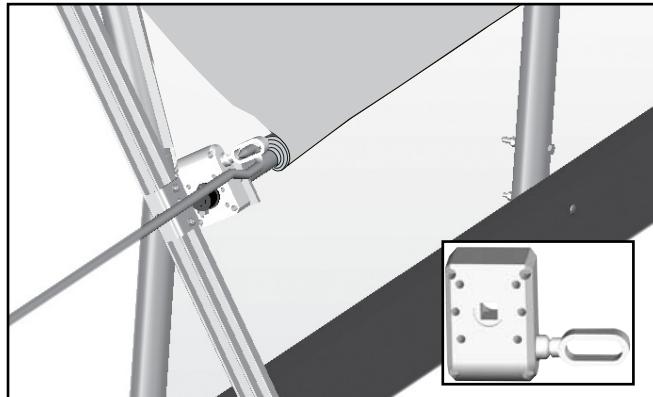


13. Roll the cover conduit up to the Twist-of-the-Wrist assembly.

14. Attach the rolled conduit to the square shaft of the assembly by inserting a carriage bolt through the hole in the conduit and tubing adapter. Tighten the nut.



15. Attach the crank handle to the Twist-of-the-Wrist assembly. (Cover is not shown in the above diagram.)



16. Test the operation of the Twist-of-the-Wrist assembly.

NOTE: If the cover rolls in the desired direction, but you want to turn the crank in the opposite direction for the same result, unbolt, reposition the gearbox, and remount it *on the same side of the mounting bracket*.

INSTALL ANTI-BILLOW ROPES

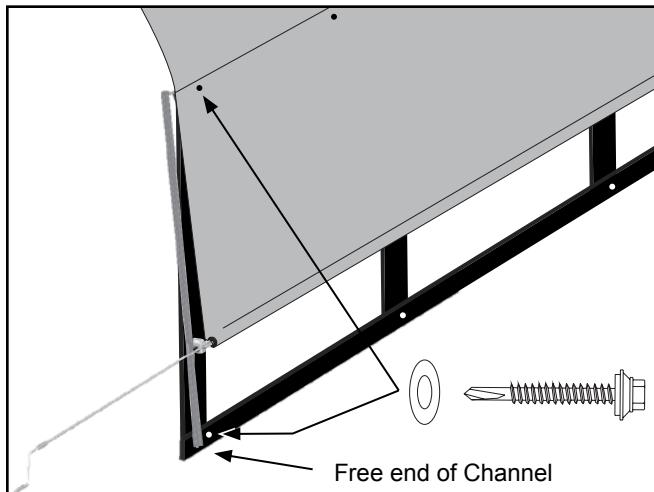
Gather the parts:

- Anti-billow rope
- Tek screws or wood screws
- Fender or Neo-bonded washers

Anti-billow ropes secure the roll-up curtain when it is in the down position. The procedure that follows describes using Tek screws (or wood screws) and Fender washers to wrap the rope around. The screws are installed into the frame or pony wall.

The steps that follow describe the basic installation of the anti-billow rope. Complete the following steps to install the anti-billow ropes.

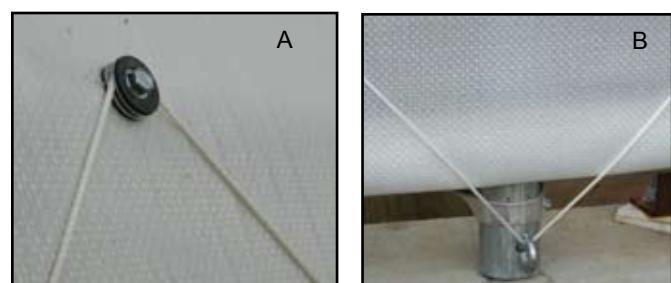
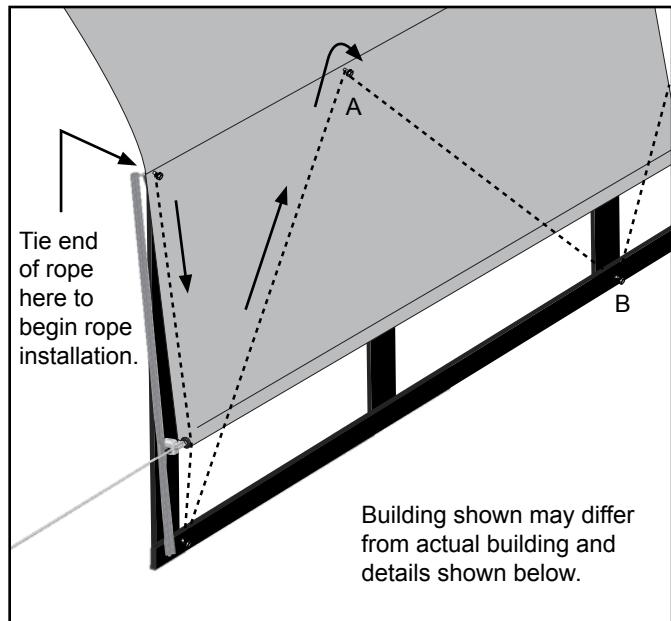
1. Using the Twist-of-the-Wrist assembly, roll up the curtain or cover panel a few inches above the ground.
2. Install the first screw and washer into the building frame at the base of the end rafter where the Twist-of-the-Wrist assembly is located.
3. Move up the same end rafter or frame support and install another screw and washer.



The diagram above shows the screw locations on a building where the anti-billow rope will be installed. See Photo A in the next column.

NOTE: Do not fully tighten the screw and washer against the frame or rafter. Allow space for the anti-billow rope to remain between the washer and the frame that the screw is attached to.

4. Attach the remaining screws and washers using the diagram below as a suggested guide.



NOTE: Distance between A and B will depends on the building. Space the screws as needed to best keep the roll-up panel in place when it is in the down or closed position.

5. Once all screws with washers are installed, grasp the end of the anti-billow rope and tie it to one of the upper screws at either end of the building or frame. See the pattern and arrows above.
6. Weave the rope between each screw and washer as shown and work to the other end. Temporarily hold or tie the rope to keep it in place.
7. Using the Twist-of-the-Wrist assembly, roll up the curtain or cover panel up to its highest position.
8. Move to the end of the frame where the rope has been temporarily secured and pull the anti-billow rope tight to remove excess slack.
9. Tie the rope to the screw to complete the weaving of the anti-billow rope and cut it to length.
10. Lower the curtain or panel to check the operation.
11. Repeat the above procedures as needed to install all remaining anti-billow ropes.