



**Chapter 31, 2014 Ed.
Indiana Fire Code**

Tents And Other Membrane Structures

Presented by the State Fire Marshal's Office

Division of Fire and Building Safety

PREFACE

- This presentation was created by the Division of Fire and Building Safety, a part of the Indiana Department of Homeland Security to help event coordinators, vendors and code enforcement officials understand the requirements of Chapter 31 in the 2014 edition of the Indiana Fire Code. These slides contain the information found in “Final Rule”, LSA Document # 13-341 (F), which adds 675 IAC 22-2.5 to adopt the 2012 International Fire Code, first printing, with Indiana amendments to create the 2014 Indiana Fire Code. I have started with those subjects which generate the most questions from the public and code enforcement officials, i.e., the size of tents, cooking and where tents may be placed. In the future, more information concerning the rest of Chapter 31 will be added.

- Basic information:

Chapter: 31 Tents and Other Membrane Structures

Model Code: 2012 International Fire Code, first printing

Indiana Fire Code: 2014 Indiana Fire Code

Indiana Administrative Code: 675 IAC 22-2.5

Effective date: 12-01-2014

Previous Code in effect covering Tents, Canopies and Other Membrane Structures:

2008 Indiana Fire Code, Chapter 24, repealed 12-01-2014

con't.

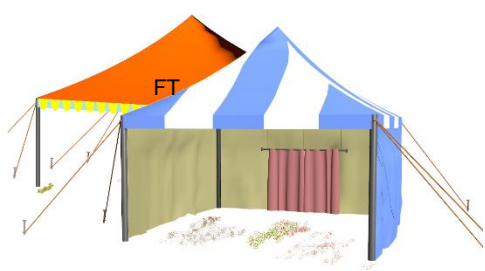
np

PREFACE

- The majority of the slides in this presentation have been completely re-done. Changes had to be made anyway due to the deletion of “canopies” in the 2009 International Fire Code (model). So I took the opportunity to enhance the pictures and add text to further explain the code requirements.
- If the slides / notes pages are printed, for best results, print them in color. If printed in black and white, “crops” and other “picture covers” will become apparent.
- The master copy of this presentation is kept on file in the Division of Fire and Building Safety, contact Jeff Short at 317-232-2222. This master copy is shown as “Rev Web 7, 01-01-2019”.
- If there is a “np” in the bottom right hand corner of a slide, this means I have included a “Note to Instructor”. You can read these by changing to the *Notes Page* view.
- Drawings: Sketchup 2014, 2015 (A sincere thank you to everyone who contributes to the 3D Warehouse)

Kerkythea Echo 2008
Photoshop CS, CS6

Jeff Short (Asst. Director, Code Enforcement)



Tents And Other Membrane Structures

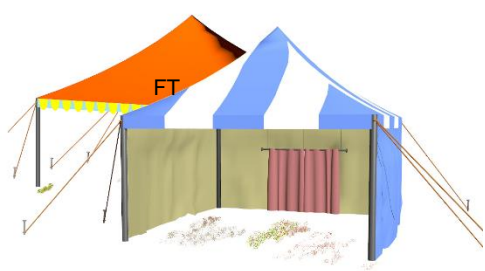
Introduction, General Overview, Definitions and Frequently Asked Questions

Section 1: The Elimination of Canopies

Section 2: The Scope and how it effects Chapter 31

Section 3: Cooking

**Definitions, General Overview and the Code
“Scope” Tents and 2 Q & A’s
“Regular” Tents**



Tents And Other Membrane Structures

Section 4: Merchandise Display

Baskets - “Scope” Tents

Car - “Scope” Tents

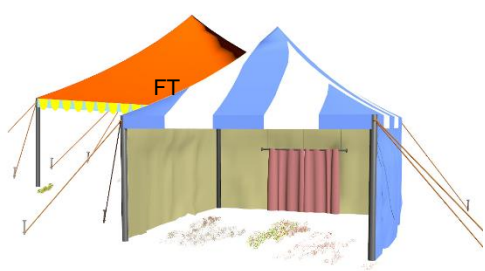
Lawnmowers - “Regular” Tents

Balloons / Compressed Gas Cylinders - “Regular” Tents

Portable, Electric Space Heaters - “Regular” Tents

Picture #1 - “Scope” and “Regular” Tents

Section 5: Anchorage Required



Tents And Other Membrane Structures

Section 6: Compound Scenarios

Balloons / Compressed Gas Cylinders - “Scope” Tents

Portable, Electric Space Heaters - “Scope” Tents

Flammable – Liquid – Fueled Generators - “Scope” Tents

Electrical Code Violations - “Scope” Tents

Section 7: Flame Propagation Performance Treatment and Smoking

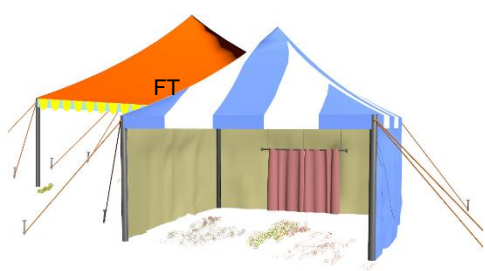
Section 8: Seating Arrangements and Means of Egress

Seating Arrangements - “Scope” Tents

Seating Arrangements - “Regular” Tents

Means of Egress - “Scope” Tents

Means of Egress - “Regular” Tents



Tents And Other Membrane Structures

Section 9: Separation of Generators

“Scope” Tents - found in Section 6: Compound Scenarios

“Regular” Tents

Section 10: Exit Signs and Means of Egress Illumination

Section 11: Use Period

Section 12: Location

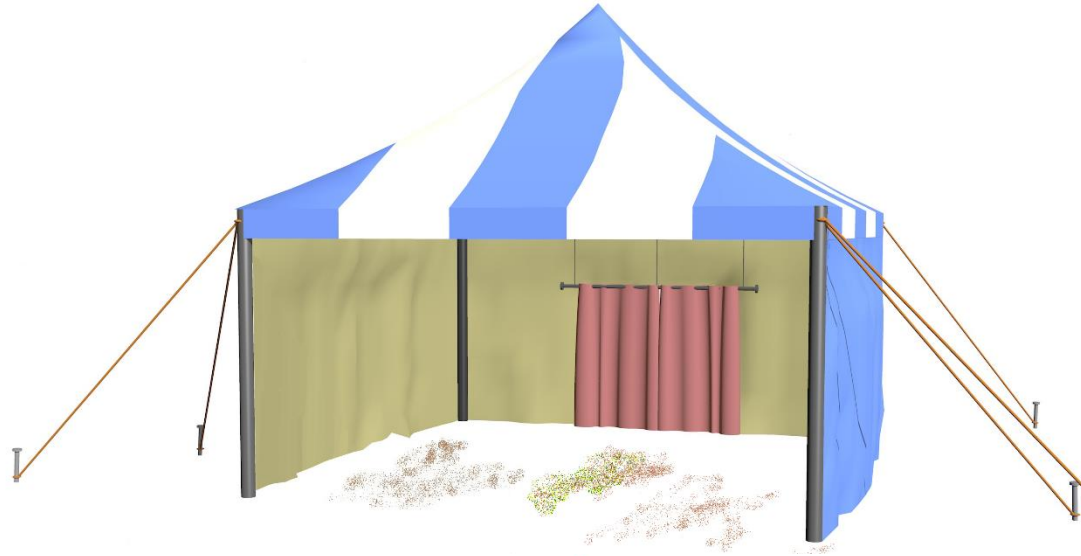
Section 13: Portable Fire Extinguishers

Appendix A - Staking Analysis: vertical vs “at an angle”

GENERAL OVERVIEW

TENTS

**“SCOPE” TENT =
(blue & white top)**



**“REGULAR” TENT =
(orange top with FT)**
{ FT is an abbreviation for flame
propagation performance treatment }

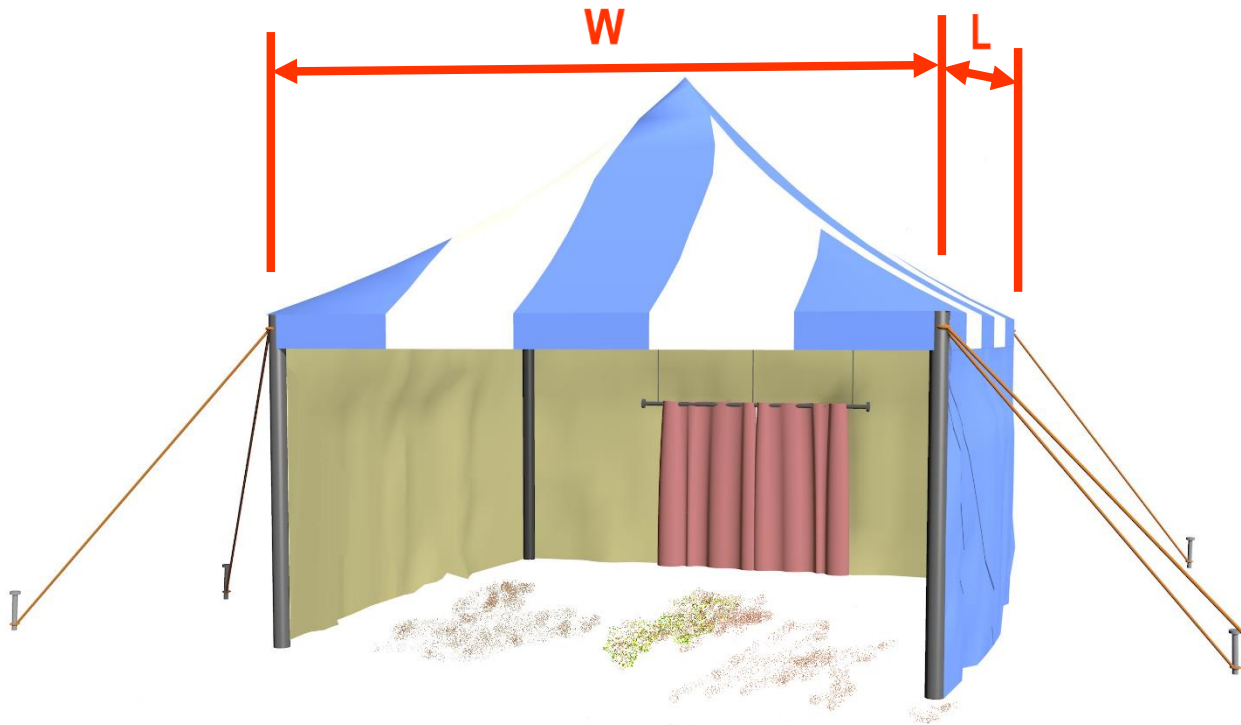


n p = there are notes to the instructor on the *Notes Page*

V = the slide is showing a violation

GENERAL OVERVIEW

- FOR PURPOSES OF DETERMINING THE SQUARE FOOTAGE OF A TENT, COMPUTE THE LENGTH TIMES THE WIDTH FROM ONE SIDE OF THE MATERIAL TO THE OTHER SIDE.

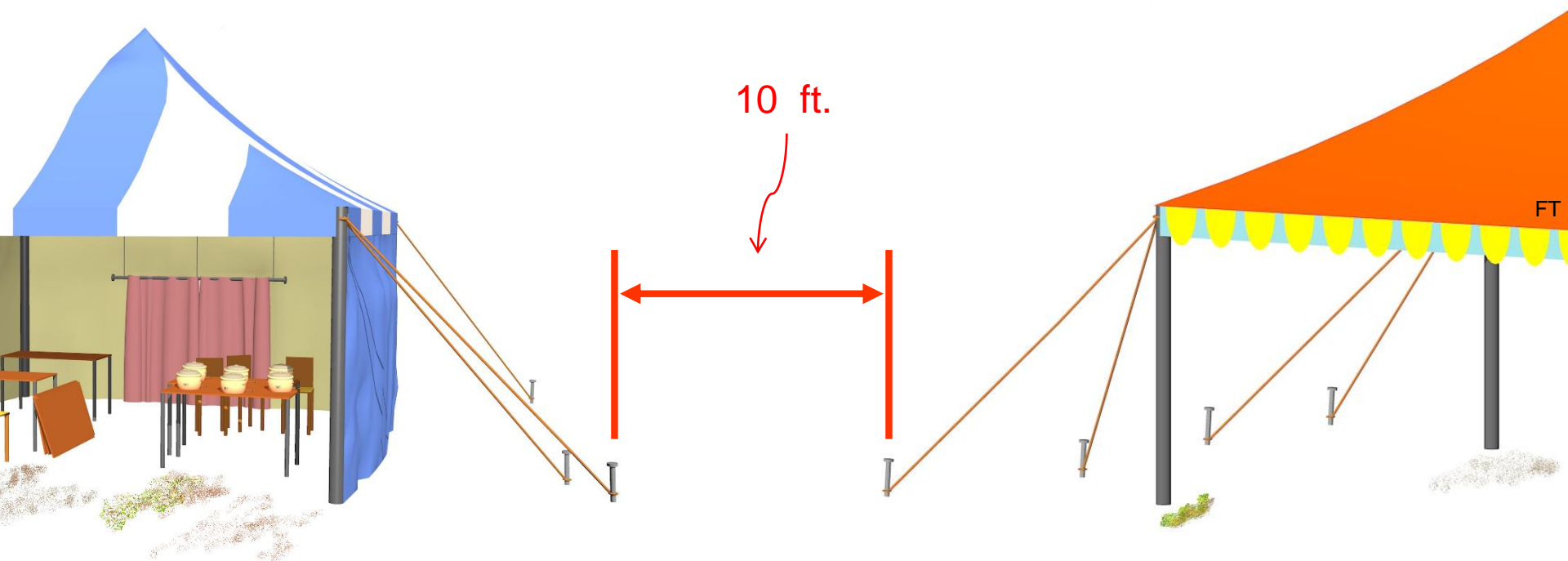


THE MEASUREMENT IS **NOT** TAKEN FROM THE POINT
WHERE THE ROPE ATTACHES TO THE STAKE.

GENERAL OVERVIEW - LOCATION

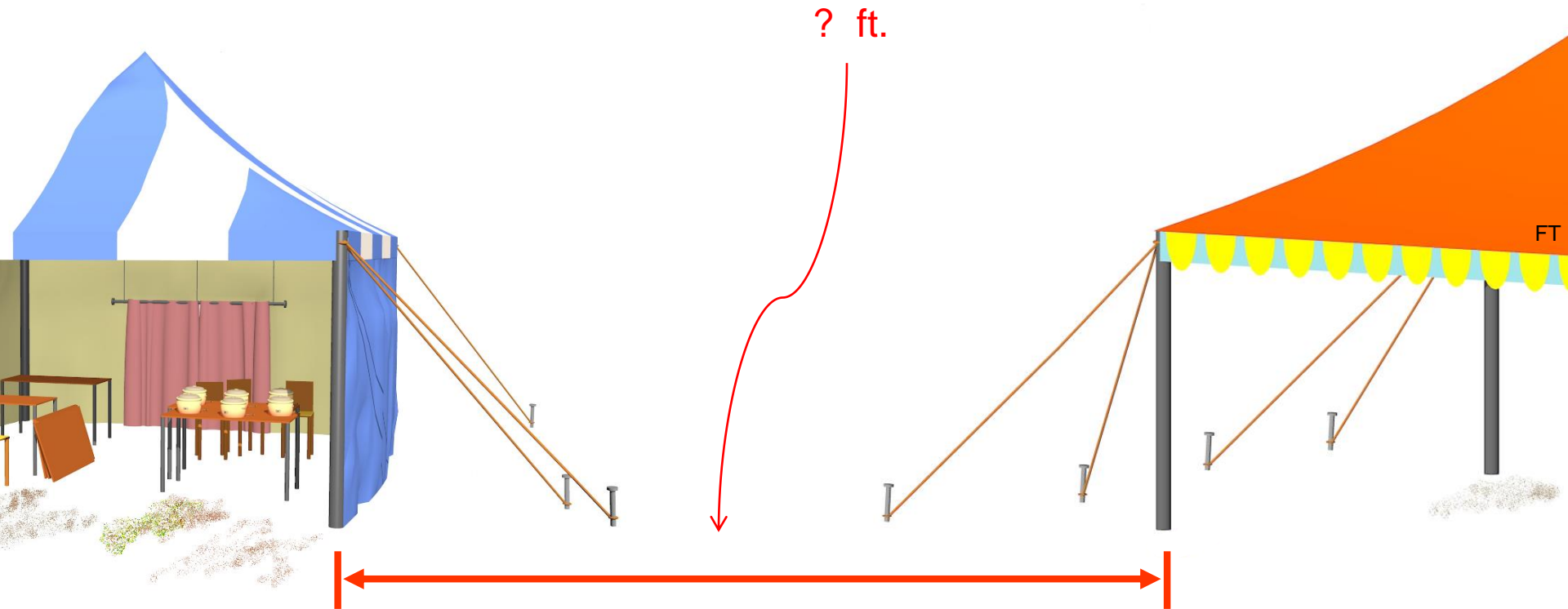


FOR PURPOSES OF DETERMINING REQUIRED DISTANCES, SUPPORT ROPES AND GUY WIRES SHALL BE CONSIDERED AS PART OF THE TEMPORARY MEMBRANE STRUCTURE OR TENT.



**THE MEASUREMENT IS TAKEN FROM THE POINT WHERE
THE ROPE ATTACHES TO THE STAKE.**

GENERAL OVERVIEW - LOCATION

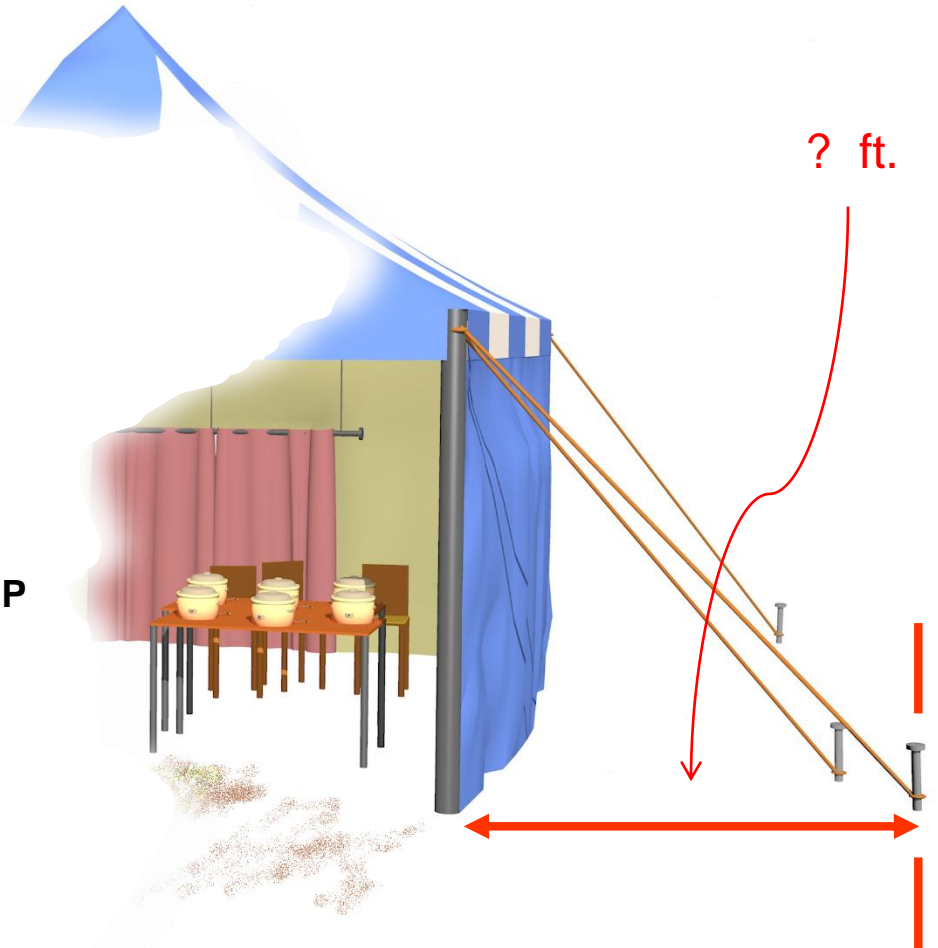


**WHAT IS THE ACTUAL DISTANCE BETWEEN THE
TENTS, FABRIC TO FABRIC ?**

GENERAL OVERVIEW - LOCATION

Use geometry to solve this problem

- THE GROUND IS LEVEL AT THE BOTTOM OF THE TENT POLE
- THE ROPE IS ATTACHED TO THE TOP OF THE TENT POLE AT A 45° ANGLE
- IT IS 10 FT. FROM THE GROUND TO WHERE THE ROPE IS ATTACHED

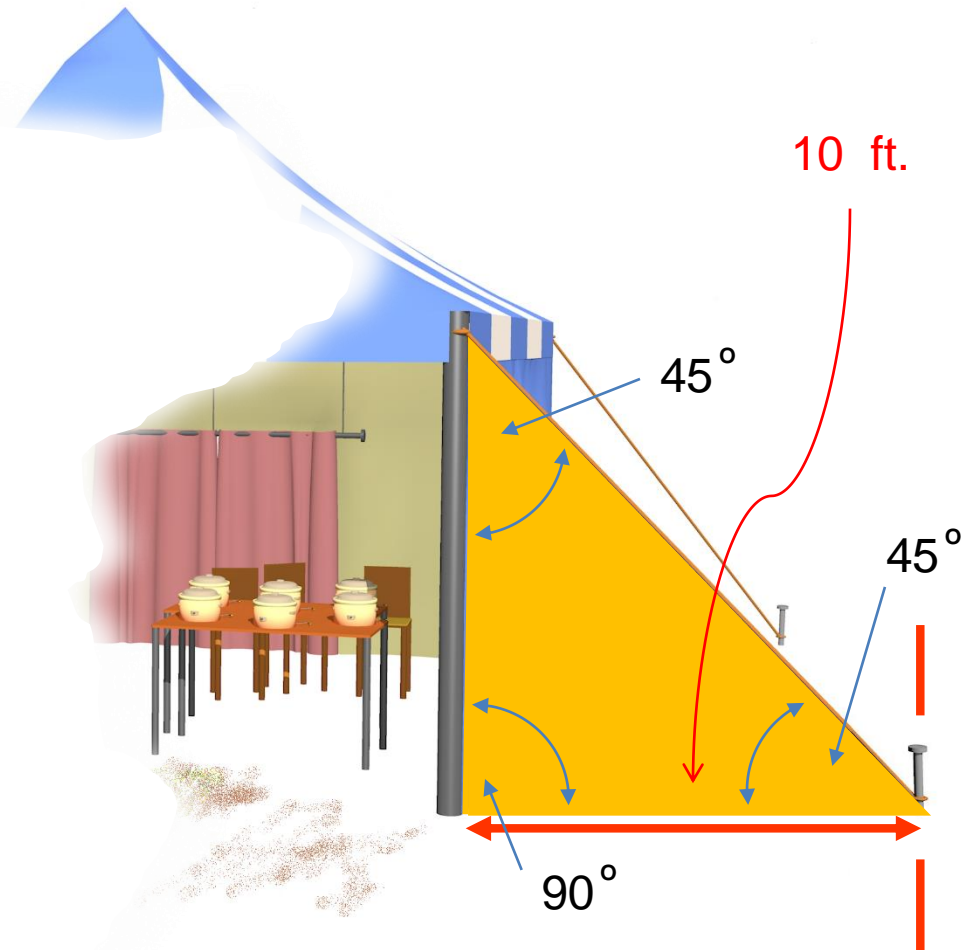


HOW FAR IS IT FROM THE BOTTOM OF THE
TENT POLE TO THE STAKE ?

GENERAL OVERVIEW - LOCATION

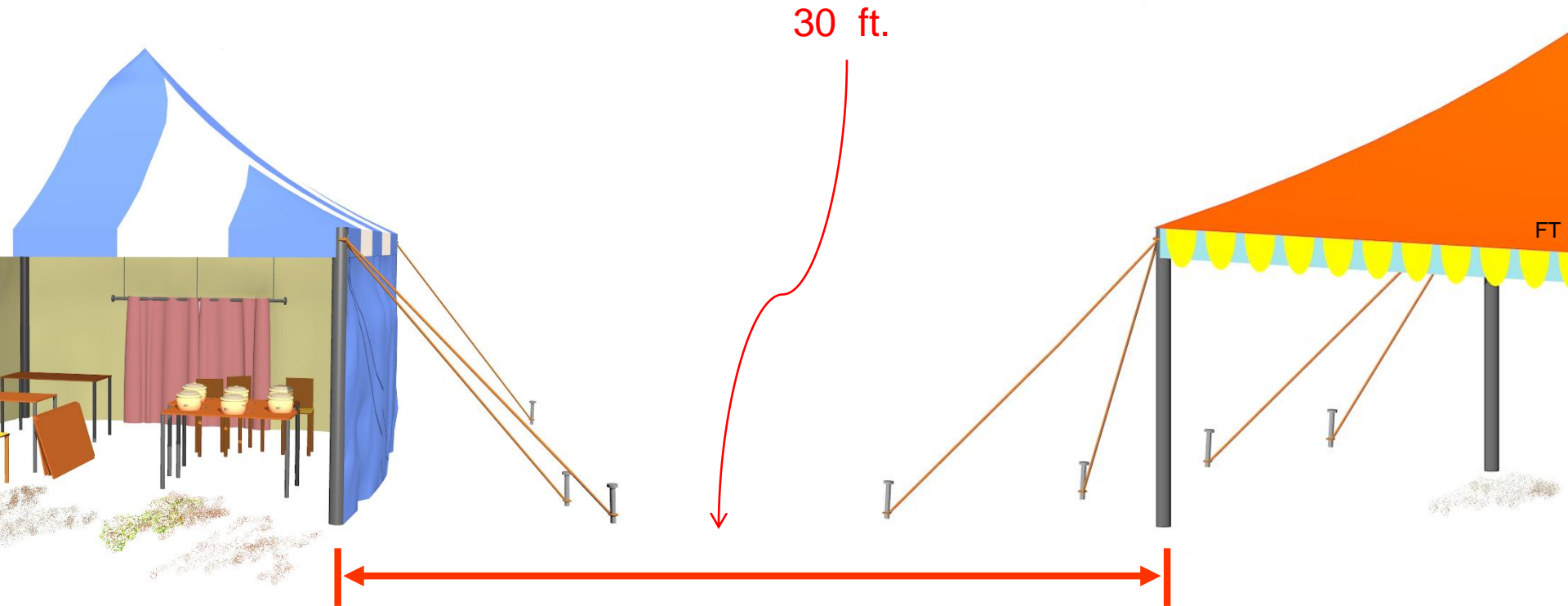
Use geometry to solve this problem

- THE SHAPE WE ARE STUDYING IS CALLED AN ISOCELES TRIANGLE
- THIS IS A TRIANGLE WITH TWO SIDES OF EQUAL LENGTH
- THE INTERIOR ANGLES OF ANY TRIANGLE ALWAYS EQUAL 180°



IT IS 10 FT. FROM THE BOTTOM OF THE
TENT POLE TO THE STAKE.

GENERAL OVERVIEW - LOCATION

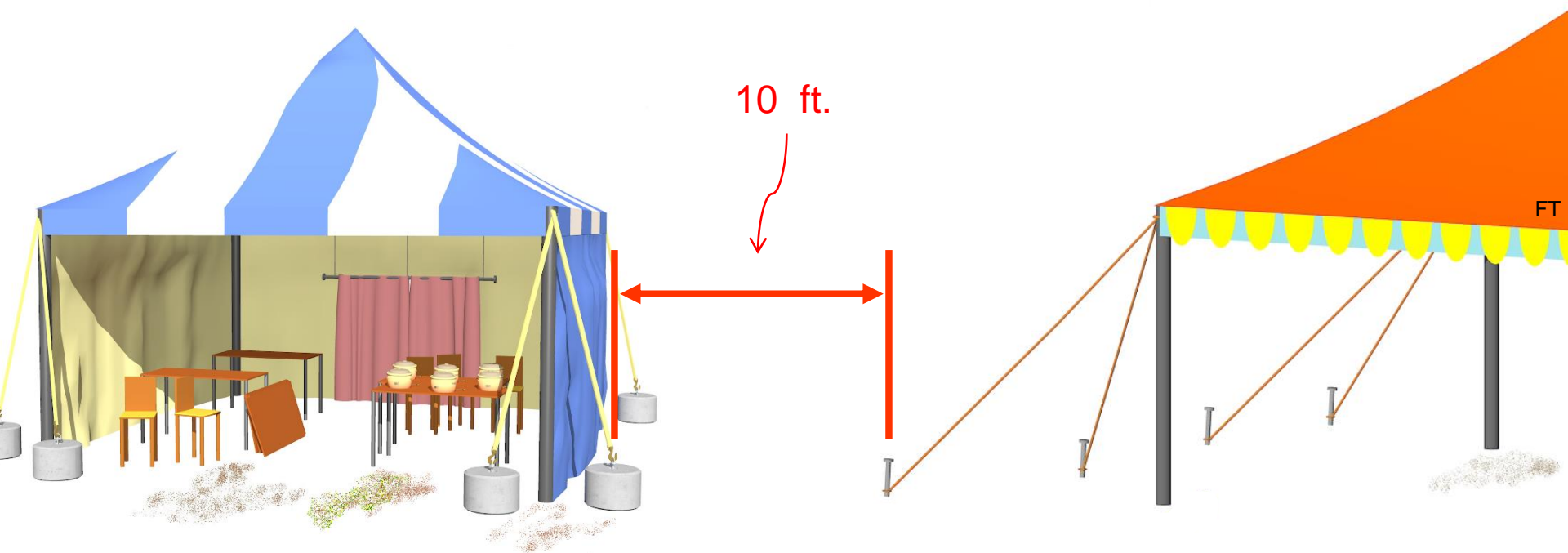


THE ACTUAL DISTANCE BETWEEN THE TENTS, FABRIC TO FABRIC, IS MUCH GREATER DUE TO THE GEOMETRY.

GENERAL OVERVIEW - LOCATION



FOR PURPOSES OF DETERMINING REQUIRED DISTANCES, SUPPORT ROPES AND GUY WIRES SHALL BE CONSIDERED AS PART OF THE TEMPORARY MEMBRANE STRUCTURE OR TENT.



THE MEASUREMENT IS TAKEN FROM THE POINT WHERE THE ROPE ATTACHES TO THE WEIGHT.

GENERAL OVERVIEW

Critical Square Footage

PRIOR TO THE 2014 Ed. IFC

200 sq. ft.

400 sq. ft.

15,000 sq. ft.

2014 Ed. IFC

400 sq. ft.

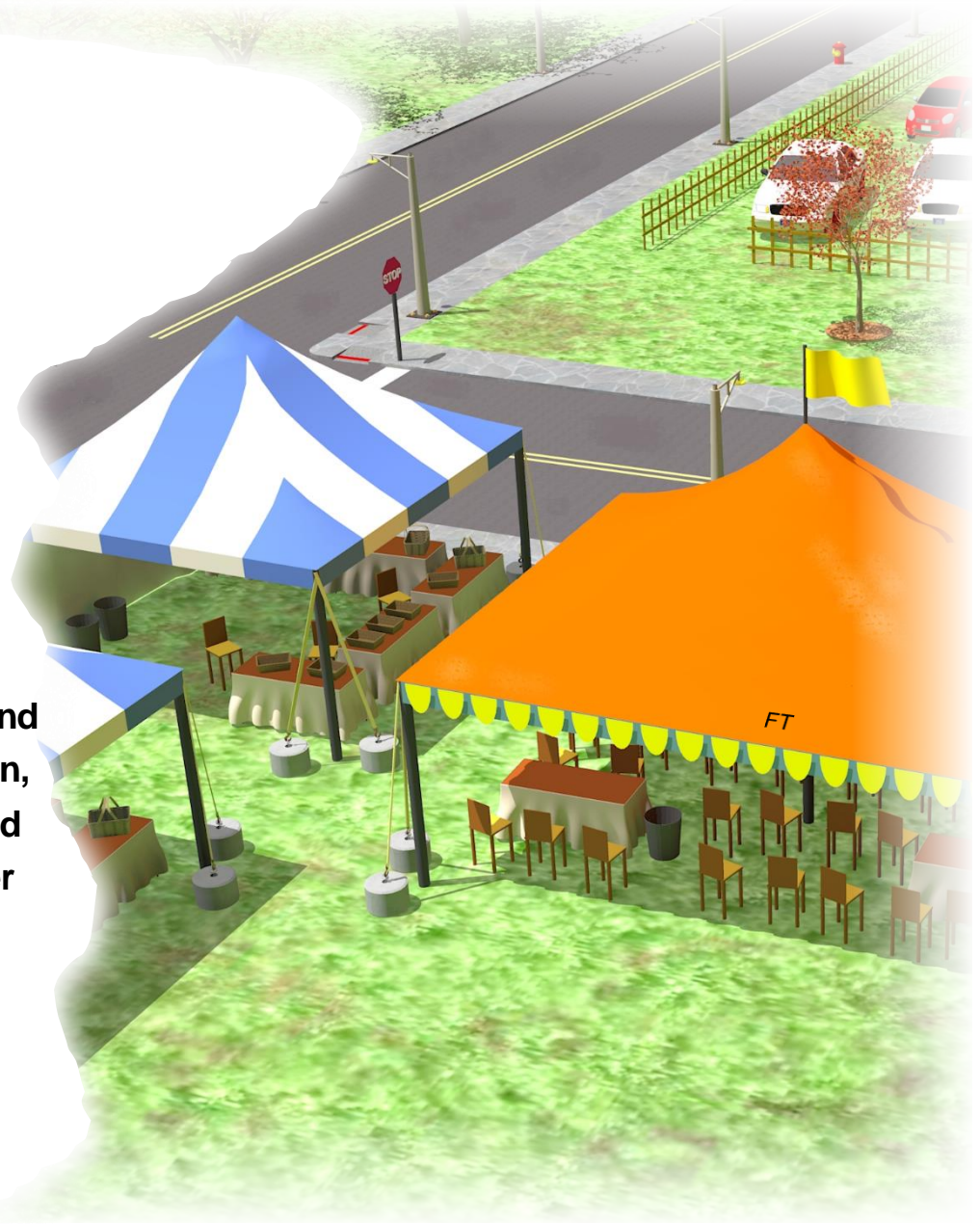
15,000 sq. ft.

GENERAL OVERVIEW

Which tent forces the code requirements ?

- There are a few fundamental concepts one must remember as the scenarios move beyond the basics and become more life-like and complex. For the 1st example and the starting point for this explanation, assume there is no open or exposed flame nor cooking of any kind under these tents; they are being used for ticket sales and seating.

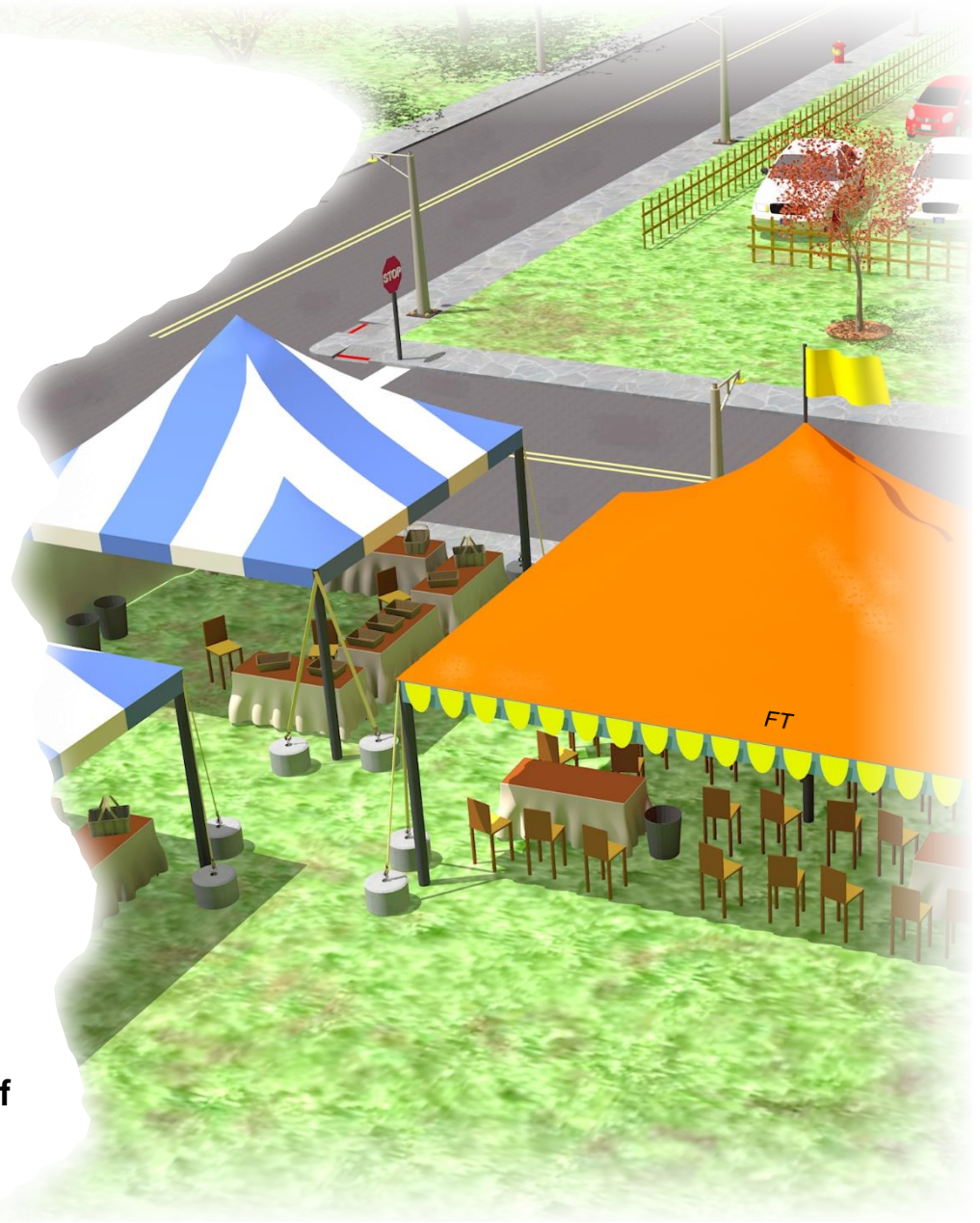
Which tent forces the code requirements ?



GENERAL OVERVIEW

Which tent forces the code requirements ?

- The tent in excess of 400 sq. ft. (orange top) determines the code requirements. The fundamental concept one must remember is the two admin tents, each 400 sq. ft. or less (blue / white top) aren't required to meet any of Ch. 31 due to the way the Scope, Sec. 3101.1, has been amended. The "orange top tent" has to meet everything in Ch. 31, so this tent in excess of 400 sq. ft. takes charge of the picture and must meet the requirements of Ch. 31.



GENERAL OVERVIEW

Which tent forces the code requirements ?

- For the 2nd example, there is open flame equipment (cooking) inside the tent to the right. The two tents on the left are being used for ticket sales / administration. The two admin tents, each 400 sq. ft. or less (blue / white top) aren't required to meet any of Ch. 31 due to the way the *Scope*, Sec. 3101.1, has been amended. The tent with the grills has a sidewall down which means it has to meet Sec. 3104.15.5. The tent on the right forces the code requirements.



GENERAL OVERVIEW

Which tent forces the code requirements ?

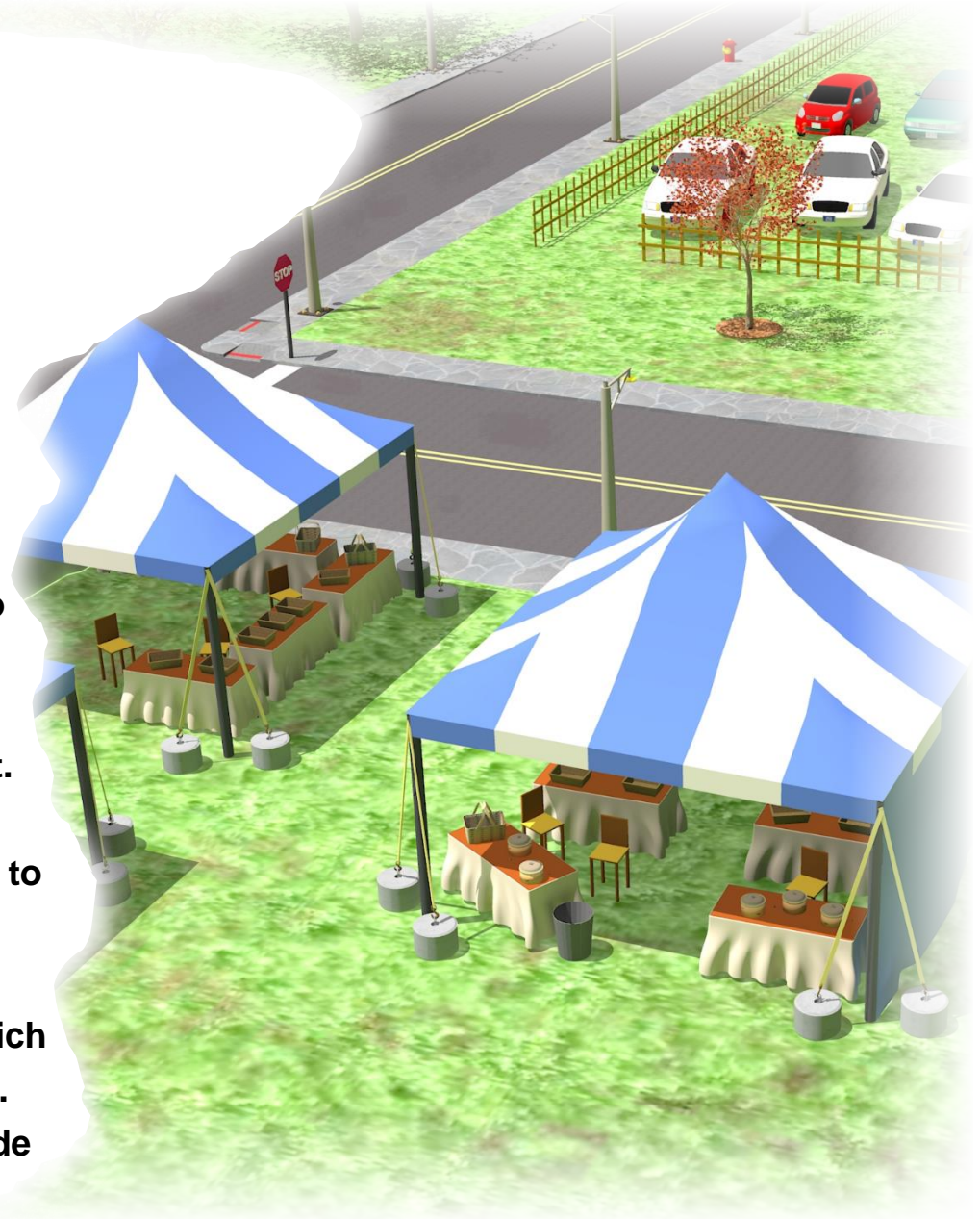
- For the 3rd example, there is open flame equipment (cooking) inside the tent to the right. The two tents on the left are being used for ticket sales / administration. The two admin tents, each 400 sq. ft. or less (blue / white top) aren't required to meet any of Ch. 31 due to the way the *Scope*, Sec. 3101.1, has been amended. The tent with the grills has no sidewalls down but it still falls under Sec. 3104.7. The tent on the right forces the code requirements.



GENERAL OVERVIEW

Which tent forces the code requirements ?

- For the 4th example, there is “no open flame” equipment (cooking) inside the tent to the right. The two tents on the left are being used for ticket sales / administration. The two admin tents, each 400 sq. ft. or less (blue / white top) aren’t required to meet any of Ch. 31 due to the way the *Scope, Sec. 3101.1*, has been amended. The tent with the crock pots has a sidewall down which means it has to meet *Sec. 3104.15.5*. The tent on the right forces the code requirements.



GENERAL OVERVIEW

Which tent forces the code requirements ?

- For the 5th example, there is open flame equipment (cooking) inside the tent to the right. The tent on the left is being used for ticket sales / administration. The admin tent, in excess of 400 sq. ft. (orange top) has to meet everything in Ch. 31. The tent with the grills, 400 sq. ft. or less (blue / white top) has a sidewall down which means it has to meet Sec. 3104.15.5. Both tents force the code requirements.

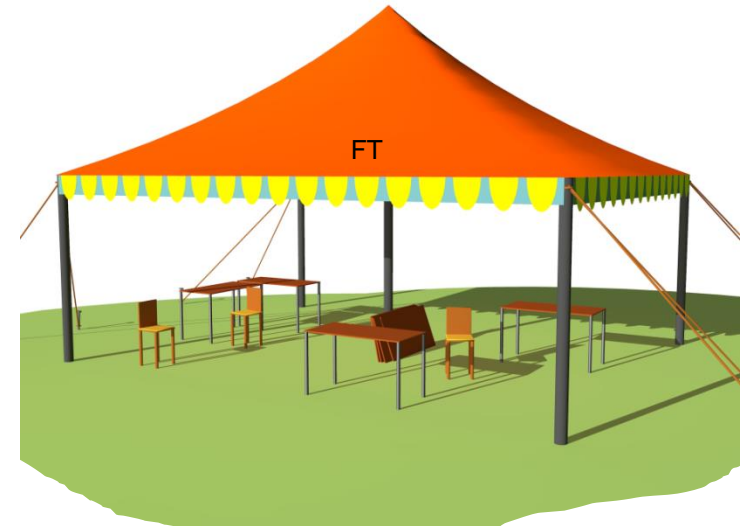


GENERAL OVERVIEW

Determining the use and occupancy classification

- Generally, temporary tents and temporary membrane structures are not classified with respect to occupancy type. The normal procedure explained in the Indiana Building Code of first determining the use of a room or building (in this case the tent) and then figuring out the occupancy classification is not used. There are however, two times when this is not true.

con't. on the next slide

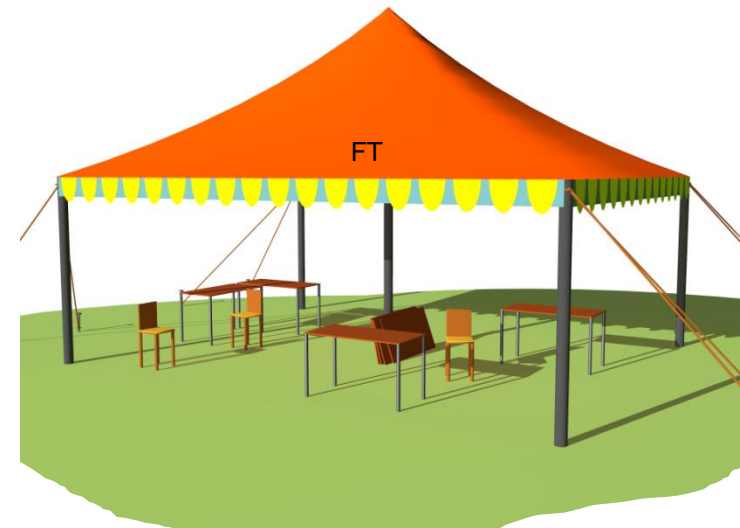


GENERAL OVERVIEW

Determining the use and occupancy classification, con't.

- The first has to do with a “place of assembly”. There are a few code sections in Ch. 31 where the term “place of assembly” is used. Section 3103.3, titled *“Place of Assembly”*, has been amended and becomes a definition of this term. So, in those few sections, an occupancy classification has been determined and requirements listed.

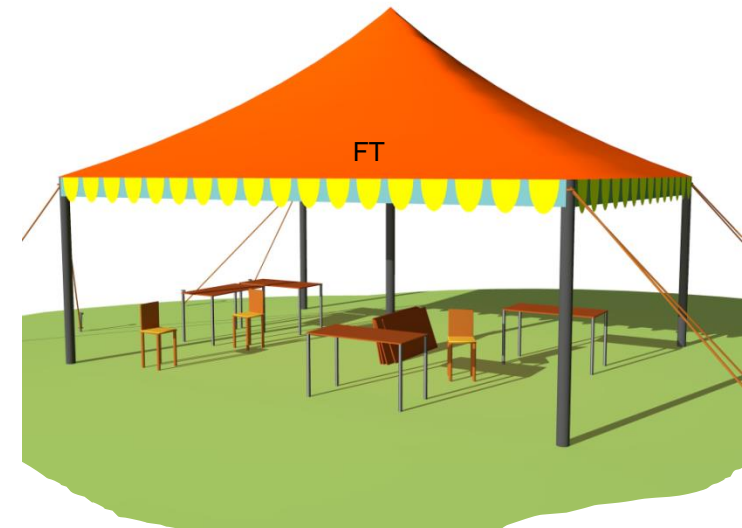
con't. on the next slide



GENERAL OVERVIEW

Determining the use and occupancy classification, con't.

- The second example is when a temporary tent or temporary membrane structure is erected for a period of more than 30 days within a 12 – month period on a single premises. Because of this duration, these tents and /or membrane structures are now treated as permanent structures. Chapter 3 from the Indiana Building Code (IBC) is applied and a use and occupancy classification determined. The terminology also changes. The IBC addresses these permanent tents as membrane structures. Go to Sec. 11, *Use Period*, for an explanation of this requirement.



NOTIFICATION REQUIRED

Amendment; LSA Doc. # 13 - 341 (F)
675 IAC 22 - 2.5 (eff. 12 - 01 - 14)



THE FIRE DEPARTMENT HAVING JURISDICTION SHALL BE NOTIFIED WHEN TENTS AND MEMBRANE STRUCTURES HAVING AN AREA IN EXCESS OF 400 SQ. FT. ARE ERECTED, OPERATED, OR MAINTAINED FOR ANY PURPOSE.

This is simply a way for the local fire code official and the first responders to be made aware of tents and membrane structures in their jurisdiction.

This section sets the minimum size structure that requires notification.

PLACE OF ASSEMBLY

**Amendment; LSA Doc. # 13 - 341 (F)
675 IAC 22 - 2.5 (eff. 12 - 01 - 14)**



FOR THE PURPOSES OF THIS CHAPTER, A PLACE OF ASSEMBLY SHALL INCLUDE A CIRCUS, CARNIVAL, TENT SHOW, THEATER, SKATING RINK, DANCE HALL OR OTHER PLACE OF ASSEMBLY IN OR UNDER WHICH PERSONS GATHER FOR ANY PURPOSE. A TENT, TEMPORARY MEMBRANE STRUCTURE, AIR – SUPPORTED OR AIR – INFLATED STRUCTURE WITH AN OCCUPANT LOAD OF 50 OR MORE SHALL BE CONSIDERED A PLACE OF ASSEMBLY. OPEN OR EXPOSED FLAME EQUIPMENT SHALL NOT BE PERMITTED IN A PLACE OF ASSEMBLY.

The confusing part of this section is the last sentence. Go to the next slide for a discussion concerning “scope” tents and this sentence.

PLACE OF ASSEMBLY

“Scope” Tents

- At first glance, there appears to be a conflict between the last sentence of this Section and the exception to Sec. 3104.7, *Open or exposed flame*, which allows open flame cooking under a “scope” tent. Fire code officials have spent a lot of time discussing “scope” tents and whether they could ever be a “place of assembly”. (If a factor of 5 net or 7 net is chosen from Table 1004.1.2, *Maximum Floor Area Allowances Per Occupant*, they could be. $400 / 5 = 80$ and $400 / 7 = 57$) This discussion is for naught as soon as one realizes Sec. 3103.3 is not one of the three code sections amended by the Scope. Therefore, Sec. 3103.3, *Place of Assembly* is not applicable to a “scope” tent.



USE PERIOD

Amendment; LSA Doc. # 13 - 341 (F)
675 IAC 22 - 2.5 (eff. 12 - 01 - 14)



**TEMPORARY TENTS, AIR – SUPPORTED, AIR – INFLATED OR
TENSIONED MEMBRANE STRUCTURES SHALL NOT BE ERECTED
FOR A PERIOD OF MORE THAN 30 DAYS WITHIN A 12 – MONTH
PERIOD ON A SINGLE PREMISES.**

**Go to Sec. 11, *Use Period*, for an explanation of this requirement. Both
“scope” and “regular” tents are discussed.**

CONSTRUCTION DOCUMENTS

**Amendment; LSA Doc. # 13 - 341 (F)
675 IAC 22 - 2.5 (eff. 12 - 01 - 14)**



A DETAILED SITE AND FLOOR PLAN FOR TENTS OR MEMBRANE STRUCTURES WITH AN OCCUPANT LOAD OF 50 OR MORE SHALL BE PROVIDED TO THE FIRE DEPARTMENT HAVING JURISDICTION. THE TENT OR MEMBRANE STRUCTURE FLOOR PLAN SHALL INDICATE DETAILS OF THE MEANS OF EGRESS FACILITIES, SEATING CAPACITY, ARRANGEMENT OF THE SEATING AND LOCATION AND TYPE OF HEATING AND ELECTRICAL EQUIPMENT.

A detailed site and floor plan minimizes possible conflicts at the time of the field inspection. The applicant and designer also benefit from having the plans reviewed prior to the erection of the tent / structure.

INSPECTIONS

Amendment; LSA Doc. # 13 - 341 (F)
675 IAC 22 - 2.5 (eff. 12 - 01 - 14)



THE ENTIRE TENT, AIR – SUPPORTED, AIR – INFLATED OR TENSIONED MEMBRANE STRUCTURE SYSTEM SHALL BE INSPECTED AT REGULAR INTERVALS, BUT NOT LESS THAN ONE (1) TIME PER USE PERIOD, BY THE OWNER OR AGENT TO DETERMINE THAT THE INSTALLATION IS MAINTAINED IN ACCORDANCE WITH THIS CHAPTER.

The inspections required by this section are not conducted by the fire code official. They are conducted by the owner or his or her agent to make certain the tent / structure continues to meet the code.

INSPECTION REPORT

Amendment; LSA Doc. # 13 - 341 (F)
675 IAC 22 - 2.5 (eff. 12 - 01 - 14)



**AN INSPECTION REPORT SHALL BE MADE AVAILABLE TO THE
FIRE DEPARTMENT HAVING JURISDICTION AND SHALL CONSIST
OF MAINTENANCE, ANCHORS, AND FABRIC INSPECTIONS.**

**The inspection report referred to in this section shows the results of
the inspection conducted by the owner or his agent. This report
includes any completed maintenance work.**

THE 5 MOST COMMON ACTIVITIES UNDER A TENT

Merchandise display
and / or seating

Cooking, no open flame
(Crock pot category)

no grease-
laden vapors

produces grease-
laden vapors

Misc. heat
producing devices

Cooking, with open flame

no grease-
laden vapors

produces grease-
laden vapors

Compound
scenarios

np

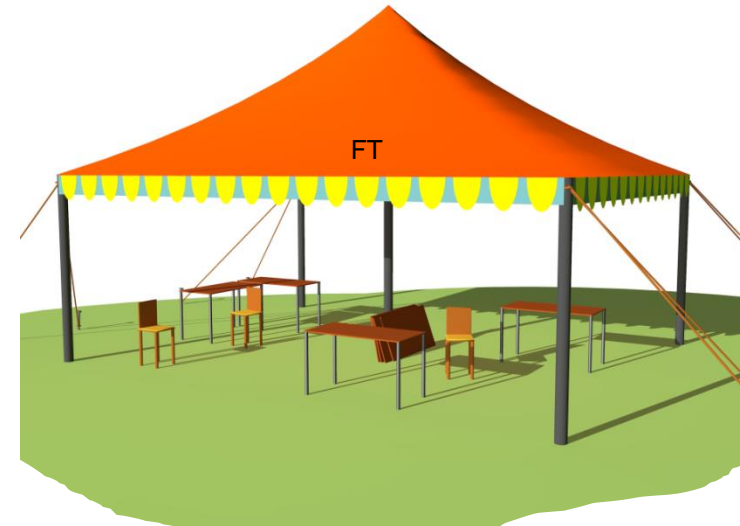
DEFINITIONS

TENTS

- A structure, enclosure or shelter
- With or without sidewalls or drops
- Fabric or pliable material
- Supported by any manner

Except: by air or

the contents it protects



DEFINITIONS

CANOPIES

- **A structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and may be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the outer end.**

DEFINITIONS

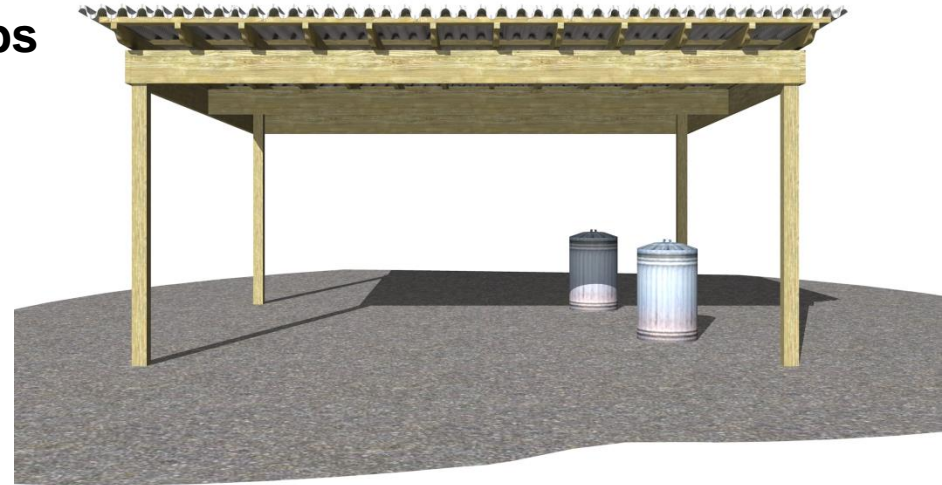
~~TENTS~~

- A structure, enclosure or shelter
- With or without sidewalls or drops
- ~~■ Fabric or pliable material~~
- Supported by any manner

Except: by air or

the contents it protects

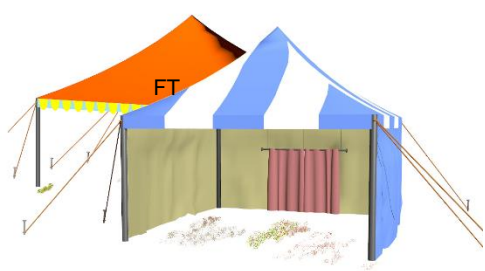
THIS CARPORT IS A WOOD STRUCTURE. IT IS NOT MADE WITH A FABRIC OR PLIABLE MATERIAL.



THIS CARPORT DOES **NOT** MEET THE DEFINITION OF A TENT.

IT IS **NOT** REGULATED BY CHAPTER 31.

FREQUENTLY ASKED QUESTIONS



■ What is a “scope” tent ?

This is slang for a tent which is 400 square feet or less. Throughout these slides, a “scope” tent is drawn with a blue and white top.

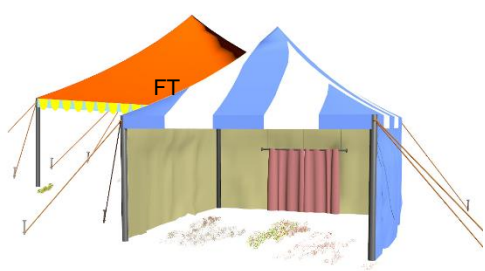
■ What is a “regular” tent ?

This is slang for a tent which is in excess of 400 square feet. These are drawn with an orange top and FT. (FT is an abbreviation for flame propagation performance treatment)

■ When cooking is discussed, what does the term “crock pot” category mean ?

It is a collective term used to describe all of the cooking equipment which does not use flame visible during the ordinary use of the equipment or device. A crock pot is the first item on our list, so the whole list became known as the “crock pot” category.

FREQUENTLY ASKED QUESTIONS

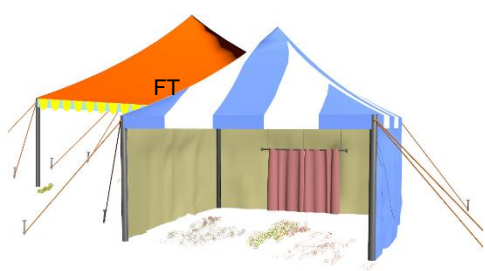


■ Why isn't the term *canopy* used any more in the 2014 Ed. IFC ?

The term *canopy* was removed from Chapter 24 of the International Fire Code, IFC, (model) in the 2009 edition. This was done because there was a major difference in the way tents and canopies were defined between the building and fire codes. With some minor differences in the respective wording, a tent was a tent in either code. But that was not true with canopies. A comparison was made between the way the term *canopy* was used in Chapter 24, IFC, 2009 ed., Tents and Other Membrane Structures and how the term *canopy* was used in Chapter 22, IFC, 2009 ed., Motor Fuel-Dispensing Facilities and Repair Garages. The two terms were totally out of sync. Another example was found in Sec. 406.5.2, International Building Code, IBC, Canopies, Motor fuel-dispensing facilities. Therefore it was determined on a national level to delete the term *canopy* from Ch. 24, IFC and leave the rest of the IFC and IBC alone.

Note: this change occurred in the 2009 edition of the International Fire Code which was not adopted by the Indiana Fire Prevention and Building Safety Commission. This explains why there are no black bars (the visual clue indicating a change) in the margins of the 2012 International Fire Code.

FREQUENTLY ASKED QUESTIONS

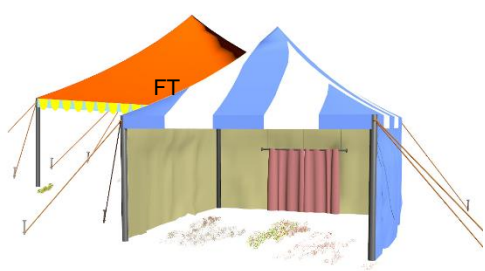


■ Why can't I find the following requirement in Ch. 31 ?

**“ When tent stakes and ropes extend into traffic areas,
highly visible covers shall be provided. ”**

It's because this requirement is found in Sec. 319, Carnivals and Fairs. More specifically, Section 319.3 is titled Concession Stands and within this is Section 319.3.5. This is where this sentence is found.

FREQUENTLY ASKED QUESTIONS



- **There are a few instances in Chapter 31 when a tent also has to meet the requirements found in the Indiana Building Code, (IBC). For example, if a tent is erected on a single premises for a year that tent is considered permanent. (see Sections 3103.5, (IFC) *Use Period* and 3104.1, (IFC) *General*) What terminology does the IBC use when discussing tents?**

The IBC uses the term “membrane structure” when talking about tents. This is a bit of a switch because Chapter 31 of the Indiana Fire Code has a specific definition of “membrane structures”. Be aware of this when using the IBC and trying to find the requirements for tents.

OSFM POLICIES

POLICY #	FIRST FOUND IN	CODE IN EFFECT	SUBJECT
1 – 3104.7	REV WEB 5 08-01-2015	2014 IFC	Open or exposed flame - while open to the public
2 – 3104.7	REV WEB 5 08-01-2015	2014 IFC	Open or exposed flame – use of the word heat
3 – 3104.6	REV WEB 5 08-01-2015	2014 IFC	Smoking – using open or exposed flame to address smoking

REVISION SLIDE HISTORY

Revision number	Date	Comments
Rev Web 0	09-22-06	2003 IFC
Rev Web 1	06-22-07	2003 IFC
Rev Web 2	05-11-08	2003 IFC
Rev Web 3	07-19-08	2008 IFC
Rev Web 4	05-05-09	2008 IFC
Rev Web 5	08-01-15	2014 IFC
Rev Web 6	02-01-17	2014 IFC
Rev Web 7	01-01-19	2014 IFC



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