



# VII. C.

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Phone: 636-537-4000 • Fax 636-537-4798 • [www.chesterfield.mo.us](http://www.chesterfield.mo.us)

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## Planning Commission Staff Report

**Project Type:** Amended Architectural Elevations

**Meeting Date:** February 25, 2013

**From:** Justin Wyse, Senior Planner

**Location:** N. Outer 40 Road, east of Boone's Crossing

**Applicant:** Design Collective Inc., on behalf of Taubman Prestige Outlets of Chesterfield LLC

**Description:** **Chesterfield Outlets:** Amended Architectural Elevations for a 48.625 acre tract of land zoned "PC" Planned Commercial District located on the north side of N. Outer 40 Road, east of Boone's Crossing.

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### **PROPOSAL SUMMARY**

Design Collective Inc., on behalf of Taubman Prestige Outlets of Chesterfield LLC, has submitted Amended Architectural Elevations for the retail development located at building 16961 N. Outer 40 Road. The request is for approval of four lighting masts located on the previously approved buildings.

The height of the proposed masts is dictated by specific engineering criteria that require the masts to extend to a height of approximately 13 feet above the highest point on the building. Based on the engineering calculations, the top of the masts are 53 feet above the elevation of the finish floor. The proposed height would allow adequate protection for the highest portions of the building as well as the pedestrian mall area of the development.

The design of the masts is a cantilevered construction, which will enable direct connection of the mast to the roof structure, without the need for additional guy wires.

The masts are approximately 2” in diameter, and constructed of stainless steel. The air terminal at the top of the mast is approximately 6” in diameter.

**LAND USE AND ZONING HISTORY OF SUBJECT SITE**

St. Louis County zoned the subject site “NU” Non-Urban District in 1965. On November 21, 2011, the City of Chesterfield approved Ordinance 2682, which zoned the subject site from a “NU” Non-Urban District to a “PC” Planned Commercial District. A Site Development Plan depicting a 472,282 square foot retail center was approved by the City on March 26, 2012.

**Land Use and Zoning of Surrounding Properties:**

Direction	Land Use	Zoning
North	Levee / Trail	“FPNU” Floodplain Non-Urban District
South	N. Outer 40 Road and I-64	n/a
East	Ice Rink	“PC” Planned Commercial District
West	Office / Bank	“PC” Planned Commercial District



## **STAFF ANALYSIS**

### **Height**

The subject site is currently zoned "PC" Planned Commercial District under the terms and conditions of City of Chesterfield 2682. This ordinance states:

*"The maximum height of the building, exclusive of rooftop mechanical equipment and screening, shall not exceed 45 feet; however, architectural features, including but not limited to towers, that do not add any usable floor area may be a maximum of 60 feet in height."*

Under the regulation above, lightning masts fall under the exemption for mechanical equipment and screening. Therefore, the proposed maximum height of the proposed lightning masts of 53 feet would be compliant with the height requirements of Ordinance 2682.

### **Aesthetics**

The proposed changes to include the lightning masts are regulated by the requirements and standards of Section 1003.178 Architectural Review of the City of Chesterfield Zoning Ordinance. Under this section, the proposed amendment may be considered for administrative approval. After reviewing the proposal, it was determined by the Planning and Development Services Director that Planning Commission review of the request is appropriate.

Section 1003.177 requires that the development:

*"Screen rooftop equipment on all visible sides with materials that are an integral part of the architecture. Parapet walls or screen walls shall be treated as an integral part of the architecture and shall not visually weaken the design of the structure."*

In reviewing the proposed lightning masts, Staff does not believe that strict compliance with the above requirement is practical or desirable (e.g. a screen may diminish the effectiveness of the mast and would potentially draw more attention to the element). As such, the applicant has sought to locate the masts in such a way to provide the desired protection while minimizing the visual impact of the masts. The placement of the masts in the center of the north building roof provides the necessary protection of the entire project, while maximizing their distance from the most public sides of the project.

The masts, while quite tall, will represent a small element to a long, linear retail development. As mentioned in the Proposal Summary, the masts are approximately 2” in diameter and the air terminal at the top of the mast is approximately 6” in diameter. This scale of the proposed masts in relationship to the building is shown on the elevations.

*Spirit of St. Louis Airport*

As required, the Spirit of St. Louis Airport has reviewed the proposal and issued a letter stating they have no objections at this time and the request is approved. Additionally, Staff has coordinated with the applicant and the airport regarding the potential for obstruction lighting being required on the masts. The requirement for obstruction lighting comes from the Federal Aviation Administration (FAA), but based on conversations with airport officials, it is unlikely that obstruction lighting will be required.

**DEPARTMENTAL INPUT**

Staff has reviewed the Amended Architectural Elevations and recommends approval of the Amended Architectural Elevations with the condition that lightning masts are not to be used for any other purpose(s) in the future other than lightning protection, that a non-reflective material or coating be used on the masts to reduce the potential for glare, and that the approval be based on the information provided to the City of Chesterfield that obstruction lighting (or any other lighting) is not required or included with the proposed masts. The proposed Staff recommendation would allow for adequate public safety within the retail development and would minimize the visual impact of the masts.

**MOTION**

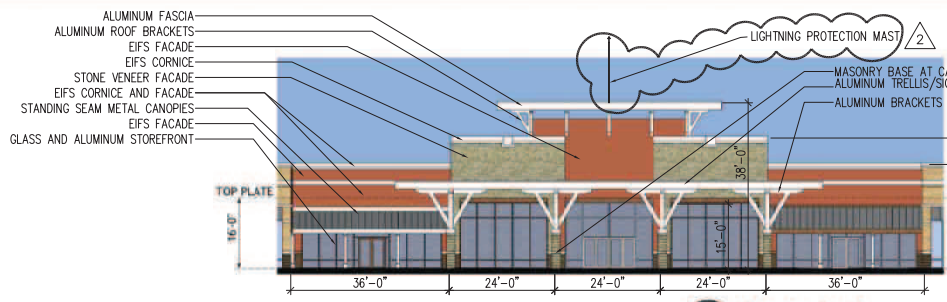
The following options are provided to the Planning Commission for consideration relative to this application:

- 1) “I move to approve (or deny) the Amended Architectural Elevations for Chesterfield Outlets.
  
- 2) “I move to approve the Amended Architectural Elevations for Chesterfield Outlets with the following conditions...” (Conditions may be added, eliminated, altered or modified)

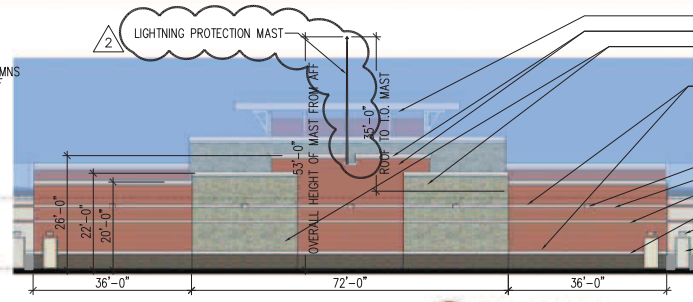
cc: Aimee Nassif, Planning and Development Services Director

Attachments: Amended Architectural Elevations

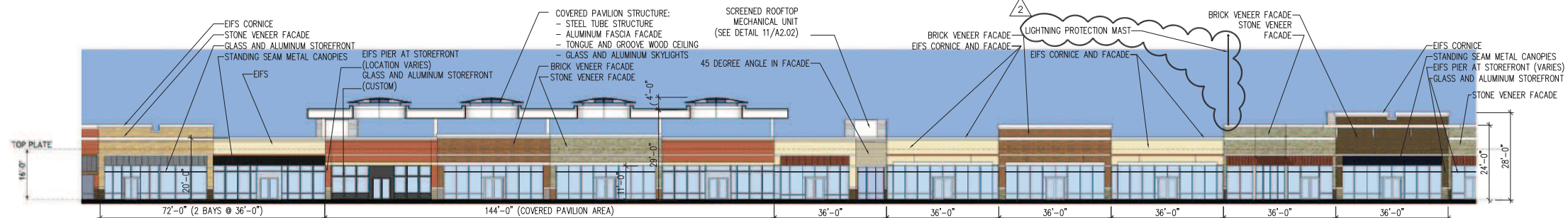




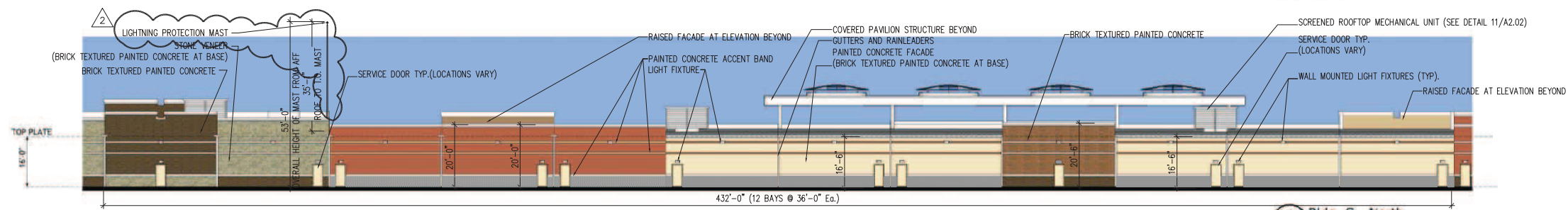
1 Bldg. F - South  
1/16"=1'-0"



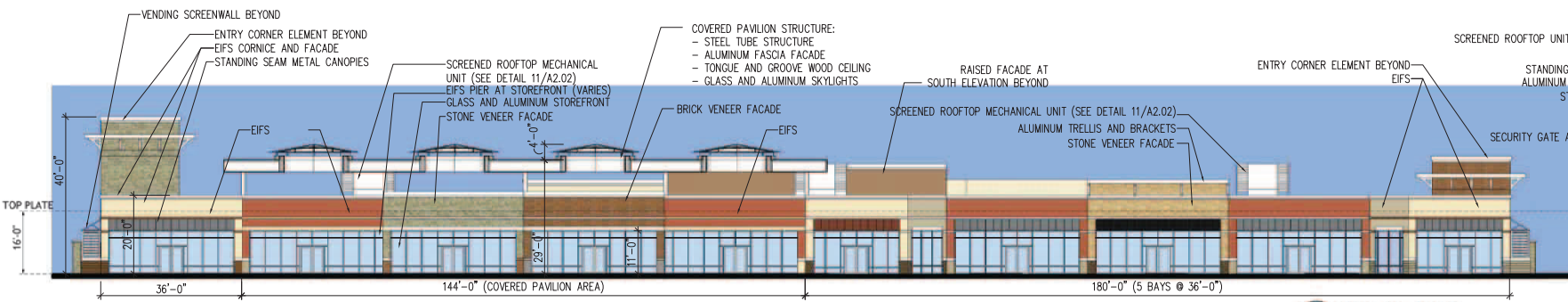
2 Bldg. F - North  
1/16"=1'-0"



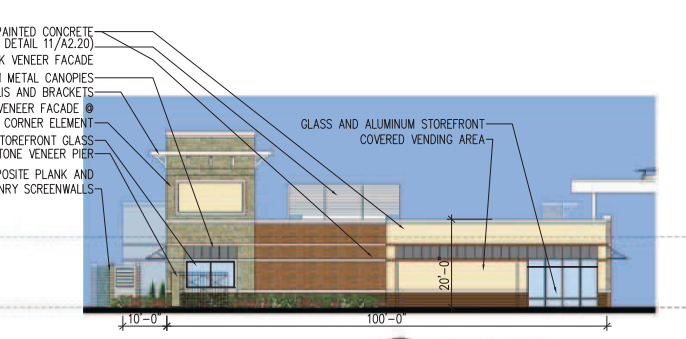
3 Bldg. G - South  
1/16"=1'-0"



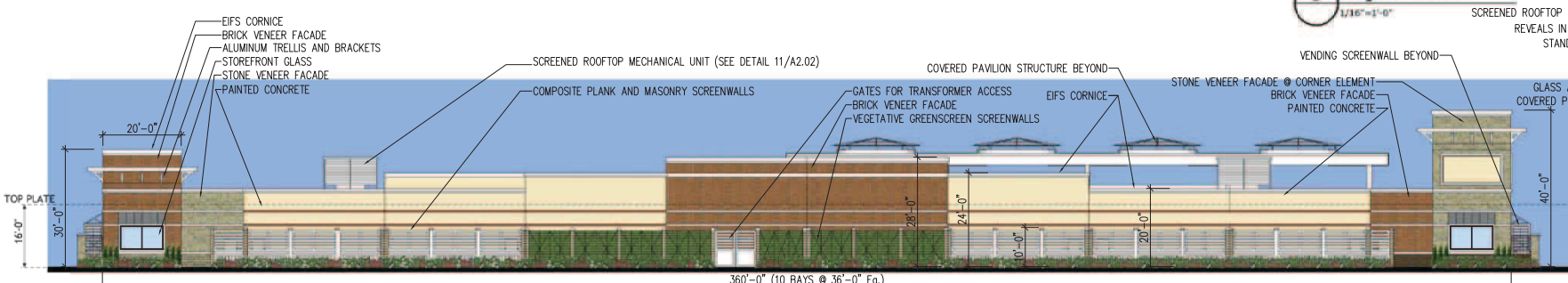
4 Bldg. G - North  
1/16"=1'-0"



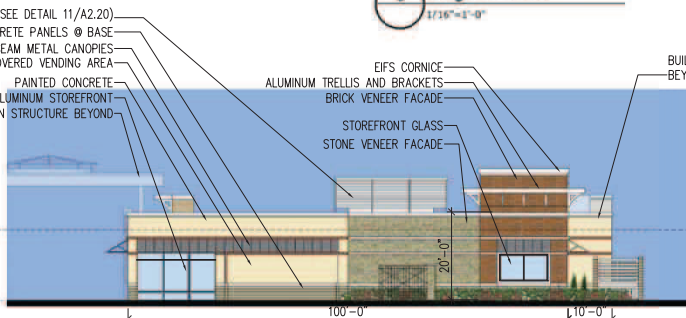
5 Bldg. H - North  
1/16"=1'-0"



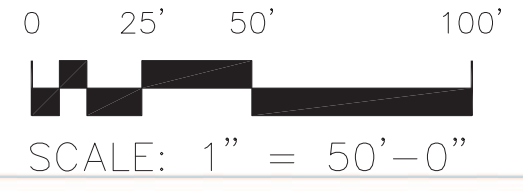
6 Bldg. H - East  
1/16"=1'-0"



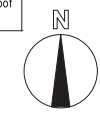
7 Bldg. H - South  
1/16"=1'-0"



8 Bldg. H - West  
1/16"=1'-0"



NOTE:  
Unless otherwise noted all roof  
drainage shall be internal.



**DESIGN COLLECTIVE**

ARCHITECTURE, PLANNING, INTERIORS  
WWW.DESIGNCOLLECTIVE.COM

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312 BLACKWELL STREET, SUITE 100  
DURHAM, NORTH CAROLINA 27701  
T: 919.384.9322 F: 919.384.9323

ISSUED FOR:	DATE:
CITY SUBMISSION	9-12-2012
1. ADD LIGHTNING MAST	1-3-2013
2. REVISED LIGHTNING MAST	1-31-2013

OWNER/DEVELOPER  
**T-O VENTURES LLC**

200 EAST LONG LAKE RD.  
SUITE 300  
BLOOMFIELD HILLS, MI  
48304-2324

PROJECT NAME  
**CHESTERFIELD  
OUTLETS**

PROJECT ADDRESS  
### N OUTER 40  
CHESTERFIELD, MO 63005

PROJECT MANAGER  
DCI Project No. 647-11  
Owner Project No.  
Drawn by \_\_\_\_\_ Checked by \_\_\_\_\_



SHEET TITLE  
**BUILDING F - G - H  
ELEVATIONS**

SCALE  
1/16"=1'-0"

SHEET NUMBER

**A2.03**

ISSUED FOR:	DATE:
CITY SUBMISSION	10-15-2012
1. ADD LIGHTNING MAST	1-3-2013
2. REVISED LIGHTNING MAST	1-31-2013

CONSULTANT:  
  
**T-O VENTURES LLC**

200 EAST LONG LAKE RD.  
SUITE 300  
BLOOMFIELD HILLS, MI  
48304-2324  
**CHESTERFIELD OUTLETS**

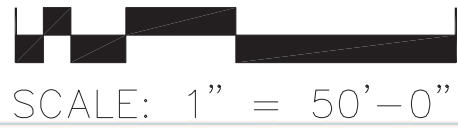
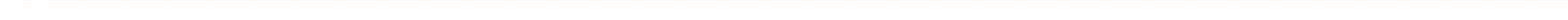
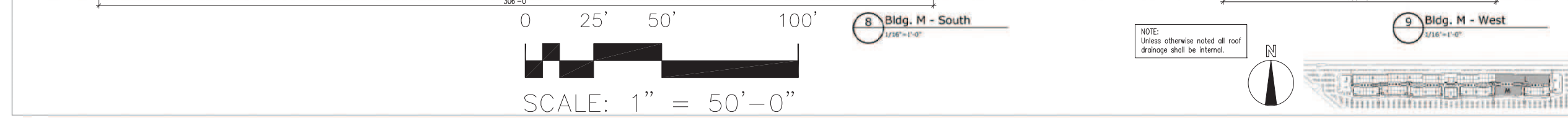
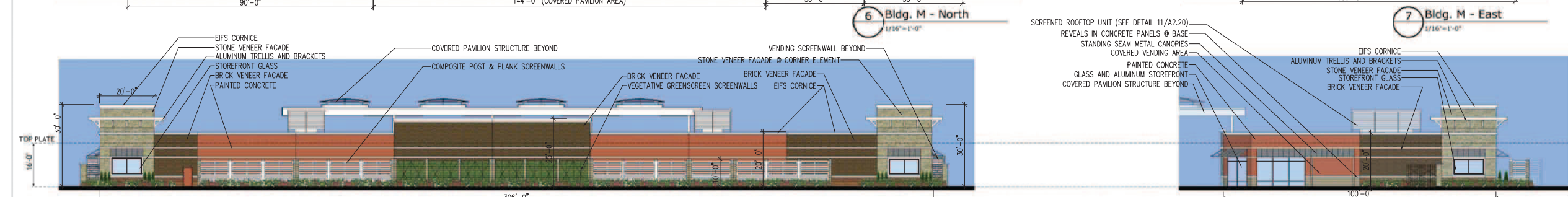
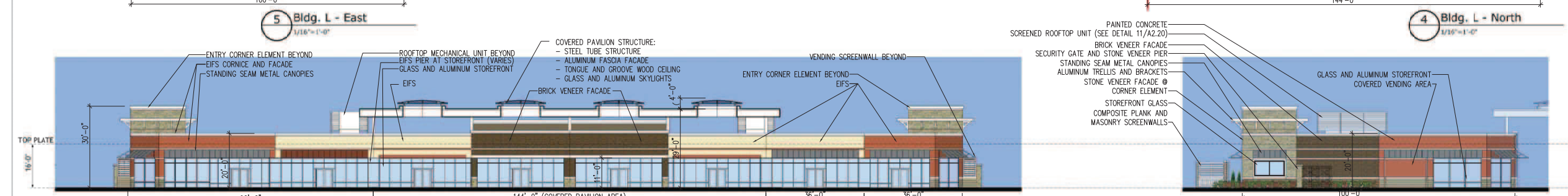
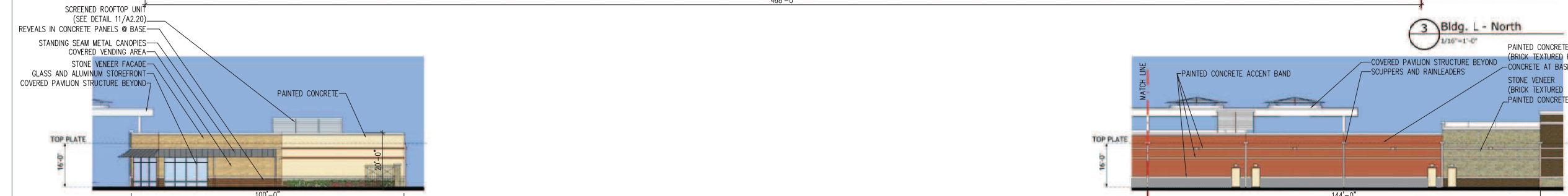
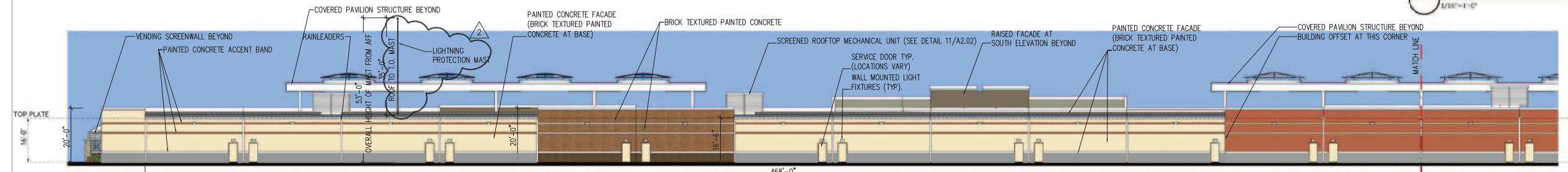
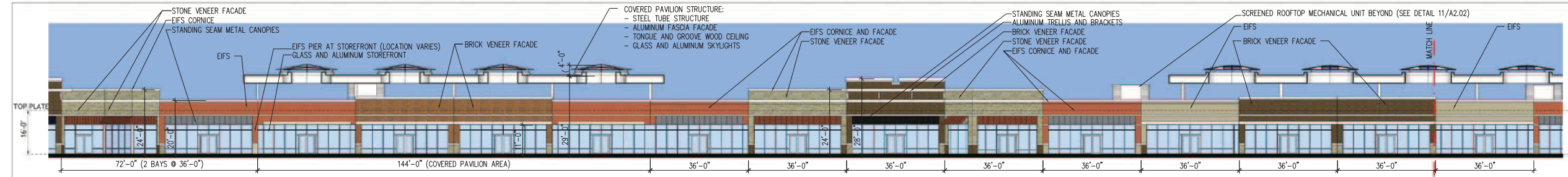
PROJECT ADDRESS  
### N OUTER 40  
CHESTERFIELD, MO 63005

PROJECT MANAGEMENT  
DCI Project No. 647-11  
Owner Project No.  
Drawn by \_\_\_\_\_ Checked by \_\_\_\_\_

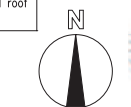
SHEET TITLE  
**BUILDING L - M  
ELEVATIONS**

SCALE  
1/16"=1'-0"  
SHEET NUMBER

**A2.05**



NOTE:  
Unless otherwise noted all roof drainage shall be internal.



## **TAUBMAN PRESTIGE OUTLETS OF CHESTERFIELD Chesterfield, Missouri**

### **Lightning Protection Systems Comparison February 7, 2013**

Two options been evaluated for the *Lightning Protection Systems* which are intended to protect the structure and occupants of the retail and common area components of the project. Following is a description of each option:

#### **Option A – Franklin System**

A *Franklin System* is the conventional and most widely used lightning protection system. The system consists of an array of roof-mounted “air terminals,” typically in the form of 18-inch or 24-inch high aluminum rods with pointed ends. The air terminals are placed around the roof perimeters, roof projections, and along roof gables at a spacing of 20 to 25 feet. They are also placed along flat interior roof expanses at intervals not exceeding 50 feet. Large pieces of rooftop equipment may also require air terminals placed on top of them as well.

All air terminals are interconnected by aluminum or copper stranded cable, also known as “roof conductors”. Vertical conductors, also called “downlead conductors”, are run from the roof conductors down to buried ground rods driven into the ground or to a buried ground rod or grid system. A downlead conductor should be run down to ground on average every 100 feet of horizontal distance around the building perimeter.

Installation of Franklin type lightning protection systems is governed by *Underwriters Laboratories (UL) Standard 96A* and by *National Fire Protection Association (NFPA) Article 780*. Upon passing inspection of a lightning protection installation by a UL representative, a UL Master Label is granted attesting that the system was installed in accordance with UL 96A.

#### **Option B – Early Streamer Emission (ESE) System**

An alternate technology to the Franklin System is the *Early Streamer Emission (ESE) System*. This system was initially developed in France but is widely used in the United States and around the world. Whereas the Franklin System provides a distributed array of targets to take the “hit” of a lightning strike and divert the energy to ground, the ESE system operates on a fundamentally different principal. A simplified explanation of ESE operation is that the air terminal device creates an upward leader of ionized energy that actively intercepts or “grabs” a lightning strike much earlier and more efficiently than the Franklin system. Therefore, far fewer (although more elaborate) air terminals are required to achieve an equivalent level of protection. ESE systems are commonly used in large open areas such as golf courses, football and baseball stadiums, and parks where it would be impossible or impractical to utilize conventional air terminal equipment.



The ESE system consists of a unique type of air terminal device that is mounted on top of a mast resembling a flag pole. The height of the mast should be such that the air terminal device is a prescribed height above the highest point in the zone that it will protect. Each air terminal mast would provide a circular zone of protection spanning a radius that varies depending on the height of the mast. Each ESE mast requires two (2) downlead conductors to the buried ground rod or grid system.

ESE systems are not currently UL listed and therefore cannot be granted a UL Master Label. They have been tested and are listed under several foreign standards. The manufacturers of most ESE systems typically offer a catastrophic insurance certificate covering a direct lightning strike within the area protected by the ESE system.

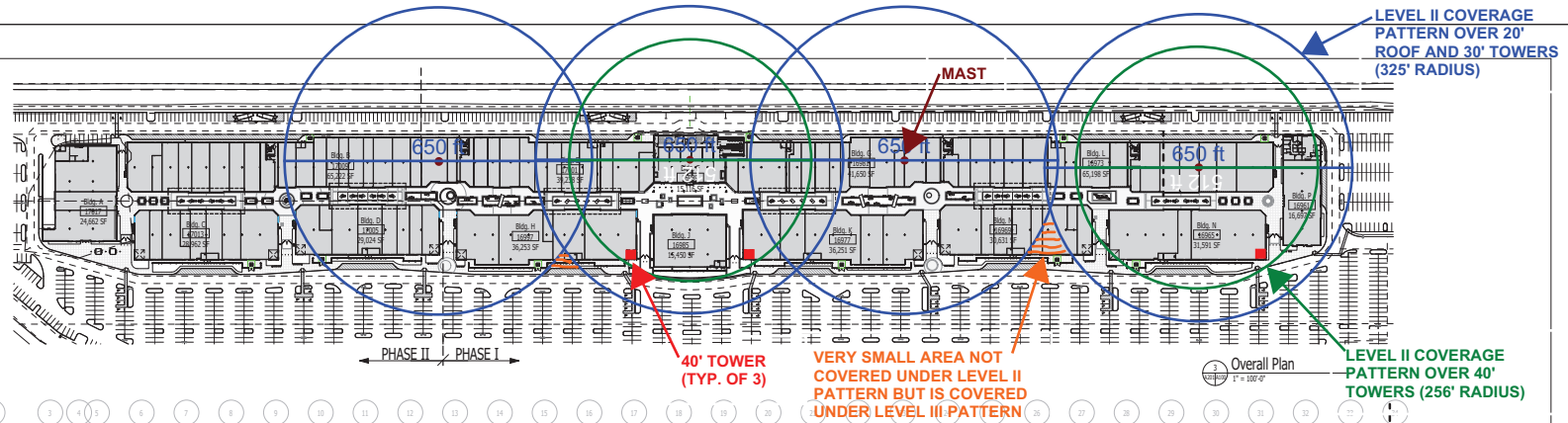
Refer to next page for a comparison table between Options A and B.

**Comparison between Option A – Franklin System and Option B – ESE System**

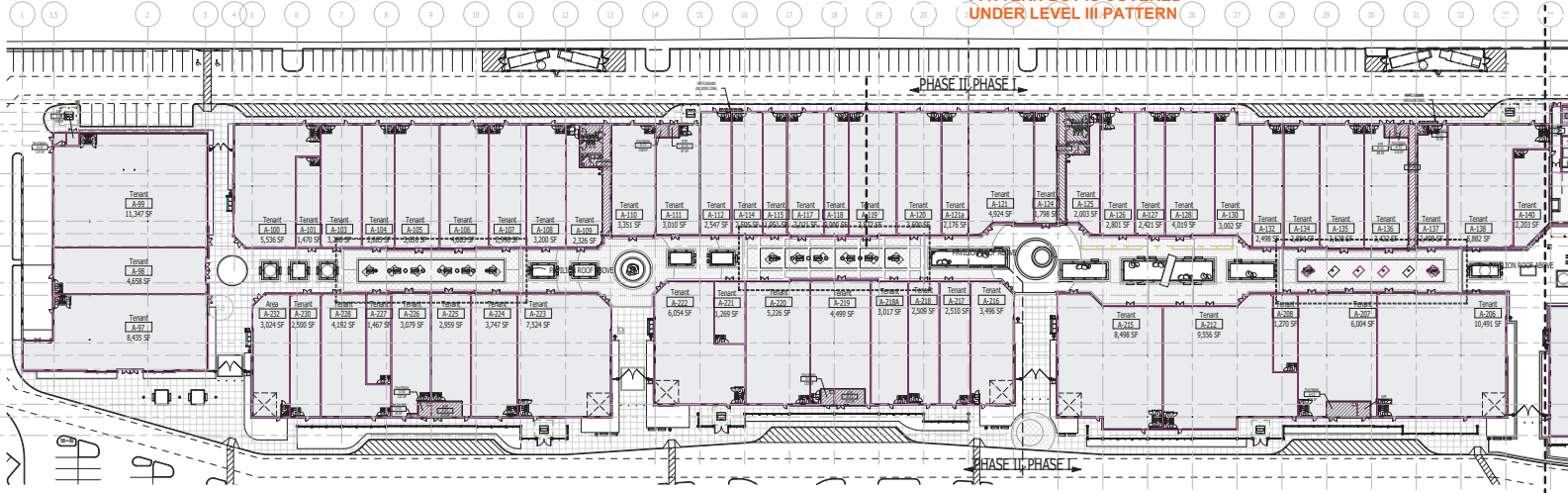
	<b>Option A – Franklin System</b>	<b>Option B – ESE System</b>
Advantages:	<ul style="list-style-type: none"> <li>• Most commonly used lightning protection system</li> <li>• Still considered the industry standard approach to lightning protection system design.</li> <li>• Can be provided by numerous manufacturers</li> <li>• Tested and listed by UL</li> <li>• Can be granted UL Master Label</li> <li>• Installation standard covered by UL and NFPA</li> </ul>	<ul style="list-style-type: none"> <li>• Far fewer air terminals</li> <li>• Far greater coverage area per air terminal</li> <li>• Fewer roof penetrations</li> <li>• Ideally suited to protecting outdoor public spaces due to large coverage area per air terminal</li> <li>• Minimal impact to system during re-roofing</li> <li>• No risk of impalement</li> <li>• Extensively tested by foreign testing agencies</li> <li>• Catastrophic insurance coverage certificate</li> </ul>
Disadvantages:	<ul style="list-style-type: none"> <li>• Large quantity of distributed air terminals</li> <li>• Greater quantity of roof penetrations</li> <li>• Not well suited to protecting outdoor public spaces</li> <li>• Several air terminals likely to be destroyed during roof repairs or re-roofing.</li> <li>• Potential OSHA recognized risk of impalement posed by pointed air terminals</li> </ul>	<ul style="list-style-type: none"> <li>• Masts are visible and must be carefully located to be visually acceptable</li> <li>• Masts must be attached to building structure</li> <li>• Not listed by UL or covered by NFPA</li> <li>• Cannot be granted UL Master label</li> <li>• Fewer manufacturers can provide this type of system</li> </ul>

# ESE LIGHTNING PROTECTION COVERAGE

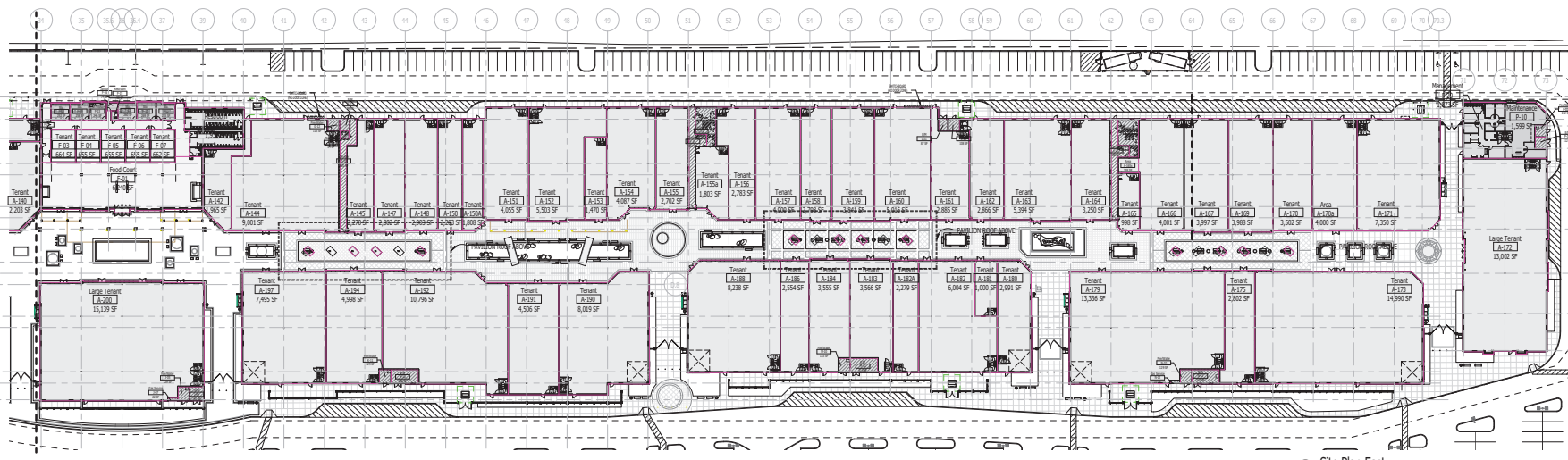
SWANSON RINK  
2/5/13



Overall Plan  
1" = 100'-0"



Site Plan West  
1" = 40'-0"



Site Plan East  
1" = 40'-0"

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DESIGN COLLECTIVE, INC. ALL RIGHTS RESERVED

ISSUED FOR: DATE: 2-28-2012

Construction Set

CONTRACTOR:

OWNER / DEVELOPER  
**Taubman Prestige**  
Outlets of  
Chesterfield  
200 East Long Lake Road Suite 300  
Bloomfields Hills, MI  
48304-2324

PROJECT NAME  
**Taubman Prestige**  
Outlets of  
Chesterfield

PROJECT ADDRESS  
17017 North Outer 40  
Chesterfield, MD 63005

PROJECT NUMBER  
647-11

DCI Project No. 647-11  
Owner Project No.  
Drawn By: Author Checked By: Checker



SHEET TITLE  
**FLOOR PLANS**

SCALE  
As indicated  
SHEET NUMBER  
**A100**



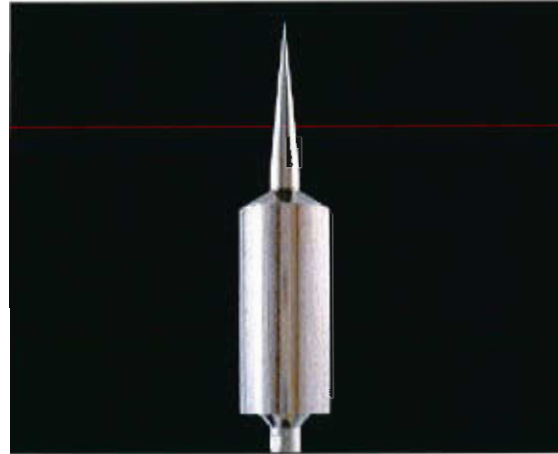


# ERITECH®

## Features

- Designed and tested to NFC17-102 and UNE-21186
- Stainless steel design suitable for most environments
- Available in three models to suit specific site requirements
- Suitable for connection to a variety of downconductor systems including tape, cable, smooth-weave and ERITECH® ERICORE conductor
- Fully compatible with the ERITECH System 3000 mast, ERITECH ERICORE cable and accessories

# SI INTERCEPTOR ESE Lightning Terminals



Meets the requirements  
of NFC17-102 and UNE-21186

## SPECIFICATIONS

### Testing of the ERITECH® SI INTERCEPTOR ESE

The ERITECH SI INTERCEPTOR ESE has been extensively tested at an independent high voltage laboratory\* in accordance with the requirements of French NFC17-102 and Spanish norm UNE-21186.

The testing, as defined in the above two standards, was designed to simulate naturally occurring conditions and allow comparison of the performance between differing types of lightning protection systems.

The test simulates natural field conditions where a permanent field (the one due to the charge between cloud and ground, simulated in the laboratory by a DC generator) is superimposed to a field impulse (the one due to the downward leader approaching ground, simulated by a Marx Generator with a long front time.)

The corona at the tip of the rod is measured by a photo-multiplier that enables the determination of the triggering time of both the simple passive rod (SR) and the ERITECH SI INTERCEPTOR ESE.

\* Test report available upon request.

The average value is then determined for both a simple passive rod and the ERITECH SI INTERCEPTOR ESE. The time difference is then defined as  $T(SR)$  minus  $T(SI)$  to achieve the  $\Delta T$  advantage for the ERITECH SI INTERCEPTOR ESE.

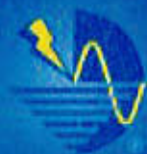
### Working Principles

During thunderstorm conditions when the lightning down-leader is approaching ground level, an upward leader may be created by any conductive surface. In the case of a passive lightning rod, the upward leader propagates only after a long period of charge reorganization. In the case of the ERITECH SI INTERCEPTOR ESE, the initiation time of an upward leader is greatly reduced.

The ERITECH SI INTERCEPTOR ESE generates controlled magnitude and frequency pulses at the tip of the terminal during high static fields characteristic prior to a lightning discharge. This enables the creation of an upward leader from the terminal that propagates towards the downward leader coming from the thundercloud.



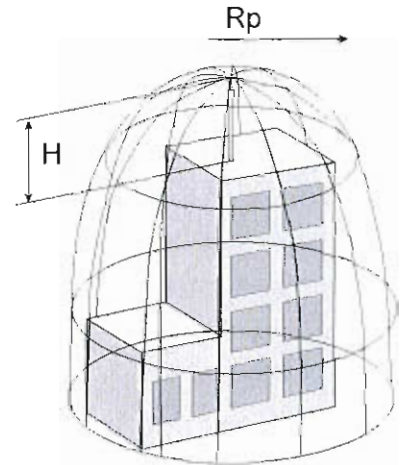
# ERICO®



### Protection Areas

According to NFC 17-102 1995, the standard protection radius (Rp) of the ERITECH® SI INTERCEPTOR ESE is linked to ΔT (below), the protecting levels I, II or III (as calculated in Annex B of NFC 17-102) and the height of the ERITECH SI INTERCEPTOR ESE above the structure to be protected (H, defined by NFC 17-102 as a minimum 2m).

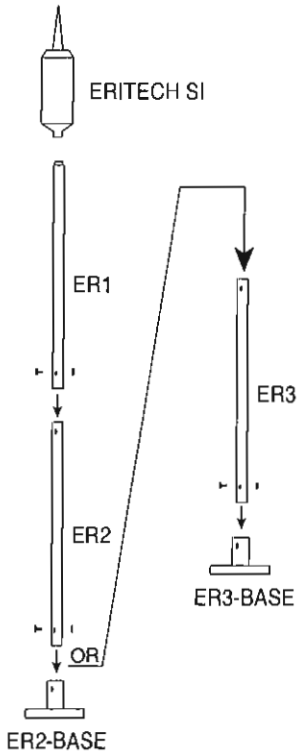
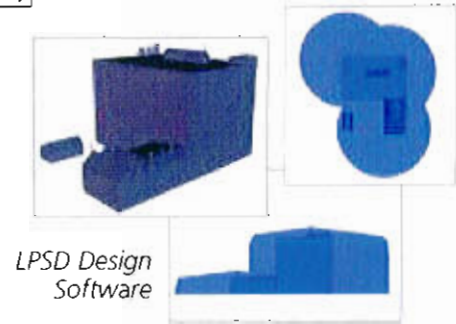
\*Refer to NFC 17-102 for related practical recommendations



	Level I (97%)			Level II (91%)			Level III (84%)		
ΔT (μsec)	25	40	60	25	40	60	25	40	60
Rp(m) Protection Radius									
H[m] (H[ft])	17 (56)	23 (75)	32 (105)	23 (75)	30 (98)	40 (131)	26 (85)	34 (111)	44 (144)
2 (6.6)	25 (82)	35 (115)	48 (158)	34 (111)	45 (148)	59 (199)	39 (128)	50 (164)	65 (213)
3 (9.8)	34 (111)	46 (151)	64 (210)	46 (151)	60 (197)	78 (256)	52 (171)	67 (220)	87 (285)
4 (13.0)	42 (138)	58 (190)	79 (259)	57 (187)	75 (246)	97 (318)	65 (213)	97 (318)	107 (351)
5 (16.4)	44 (144)	59 (194)	79 (259)	61 (200)	77 (253)	99 (325)	69 (226)	99 (325)	109 (358)
10 (32.8)									

### Design Support

ERICO's unique computer-aided design programs provide the highest level of lightning protection to a variety of design techniques and standards, including both NFC 17-102 and UNE-21186. Based on individual site parameters such as structure dimensions, terminal type and protection level, each LPSD (Lightning Protection System Design) design is customized for the project. It provides elevation, 3D and plan views enabling specific designs to be optimized for your facility. Please contact the nearest ERICO office for application engineering support. Office locations are available at [www.erico.com](http://www.erico.com).



ERITECH SI INTERCEPTOR and Accessories					
Ref Code	Part Number	Description	Packing Unit	Wt. (kg)	Wt. (lb.)
SI25	701535	ERITECH SI INTERCEPTOR, ESE - ΔT = 25 (μsec)	1	3	6.6
SI40	701536	ERITECH SI INTERCEPTOR, ESE - ΔT = 40 (μsec)	1	3	6.6
SI60	701537	ERITECH SI INTERCEPTOR, ESE - ΔT = 60 (μsec)	1	3	6.6
ER1-1000-SS	702255	Upper Stainless Steel Mast – 1m long Section 1	1	3.5	8
ER1-2000-SS	702260	Upper Stainless Steel Mast – 2m long Section 1	1	6.2	14
ER2-2000-SS	702265	Stainless Steel Mast – 2m (6.6 ft) long Section 2	1	4.9	11
ER2-3000-SS	702270	Stainless Steel Mast – 3m (9.8 ft) long Section 2	1	7.3	16
ER2-BASE-SS	702290	Stainless Steel Mast Base – Section 2	1	5.2	11
ER3-2000-SS	702275	Stainless Steel Mast – 2m (6.6 ft) long Section 3	1	5.3	12
ER3-3000-SS	702280	Stainless Steel Mast – 3m (9.8 ft) long Section 3	1	7.9	17
ER3-BASE-SS	702295	Stainless Steel Mast Base – Section 3	1	5.6	12
GUYKIT4	701300	KEVLAR® Guy Kit up to 4m (13 ft) masts	1	0.4	.08
GUYKIT7	701310	KEVLAR® Guy Kit up to 7m (23 ft) masts	1	0.7	.15
ALOF-1-GS	702175	Galv. steel wall brackets, set 1	1	1.5	3.3
LSEB-4554	702180	Support Brackets for Masts 2, 3 (set 2)	2	10.50	23
ACF-2-GS	103100	Parallel pipe clamp (set 2)	1	2.1	4.6
TMC-S5	702165	Tape to Mast Clamp Mast 2	1	0.2	0.4
CABTIE-SS	701420	Cable and Tape Ties for Mast 2, 3	1	-	-
WPC3050	702230	Waterproof Cone to Suit Masts 2, 3	1	0.07	.15
PCF-40-GS	102800	Protective sleeve, 30 (1.18") x 2mm (.08") tape, saddles incl.	1	1	2.2
CCJ-70-CA	102700	Earth Test Clamp for 8mm round or 30mm tape	1	0.4	0.8

WARNING – ERICO products shall be used only as illustrated and recommended in the product instruction sheets (additional instruction sheets are available at [www.erico.com](http://www.erico.com)). Misuse or misapplication may cause failure resulting in possible property damage or bodily injury.

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**ERITECH®**

# ERITECH® SYSTEM 1000

ESE Lightning Protection Products



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**FEB 13 2013**

Department of Public Services

**ERICO®**



## Active Protection

ERICO is a world leader in the provision of grounding solutions and lightning and surge protection technologies.

ERICO recognizes the importance of an integrated strategy in providing lightning protection and has incorporated several major concepts into a Six Point Plan of Protection:

1. Capture the lightning strike
2. Convey this energy to ground
3. Dissipate energy into the grounding system
4. Bond all ground points together
5. Protect incoming AC power feeders
6. Protect low voltage data/ telecommunications circuits



An unparalleled level of progressive engineering support and experience is built into each lightning and surge protection product and grounding solution. ERICO has developed specialized design software to enable the integration of all aspects affecting system performance, including local conditions, to help ensure that requirements of relevant standards are met or exceeded.

ERICO products are manufactured to ISO® 9001:2008 and are subjected to rigorous field and laboratory testing and computer modeling during product development. They are backed by extensive literature, test reports and technical papers, data sheets, installation instructions and risk-analysis software.

ERICO operates in every region of the world and supports the global market with an extensive distribution network to help ensure that our products and expertise are available for any project, regardless of size or location. Dedicated consulting teams assess the requirements of any project and provide expertise for optimal lightning protection solutions.

### Active Protection

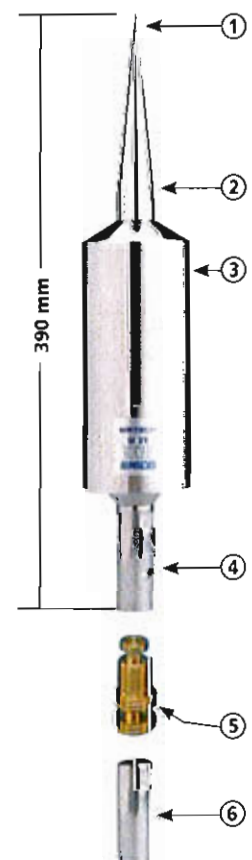
ERICO offers three ERITECH® INTERCEPTOR SI air terminals.

- SI25 with a triggering advance of 25µs
- SI40 with a triggering advance of 40µs
- SI60 with a triggering advance of 60µs

The ERITECH INTERCEPTOR SI is an Early Streamer Emission (ESE) air terminal in accordance to the NF C 17-102 and similar ESE standards. The design requirements, protection level calculations and protection radius are obtained from this standard.



Due to the internal control circuit, the ERITECH INTERCEPTOR SI enables the early launching of an upward leader compared to other passive components.



1. Strike tip
2. Stainless steel, corrosion resistant body
3. High voltage control section
4. Locking screw
5. Threaded mast coupling
6. Support mast



# Testing and Working Principles

## Testing

The ERITECH® INTERCEPTOR SI ESE has been extensively tested at an independent high voltage laboratory\* in accordance with the requirements of French NF C 17-102 and Spanish norm UNE-21186. The testing, as defined in the above two standards, was designed to simulate naturally occurring conditions and allow comparison of the performance between differing types of lightning protection systems.

The test simulates natural field conditions where a field impulse (the one due to the downward leader approaching ground, simulated by a Marx Generator with a long front time) is superimposed onto a permanent field (the one due to the charge between cloud and ground, simulated in the laboratory by a DC generator).

The corona at the tip of the rod is measured by a photo-multiplier that enables the determination of the triggering time of both the simple passive rod (SR) and the ERITECH INTERCEPTOR SI ESE.

The average value is then determined for both a simple passive rod and the ERITECH INTERCEPTOR SI ESE. The time difference is then  $T(SR)$  minus  $T(SI)$  to achieve the  $\Delta T$  advantage for the ERITECH INTERCEPTOR SI ESE.

## Working Principles

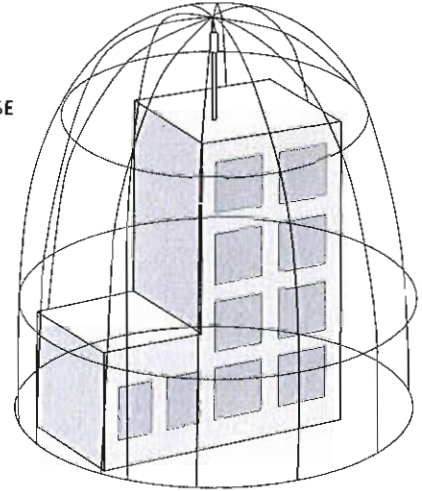
During thunderstorm conditions when the lightning down-leader is approaching ground level, an upward leader may be created by any conductive surface. In the case of a passive lightning rod, the upward leader propagates only after a long period of charge reorganization. In the case of the ERITECH INTERCEPTOR SI ESE, the initiation time of an upward leader is greatly reduced.

The ERITECH INTERCEPTOR SI ESE generates controlled magnitude and frequency pulses at the tip of the terminal during high static fields characteristic prior to a lightning discharge. This enables the creation of an upward leader from the terminal that propagates towards the downward leader coming from the thundercloud.

\* Test report available upon request.

ERITECH® INTERCEPTOR SI ESE  
Early Streamer Emission  
Lightning Terminal

According to  
the NF C 17-102  
and similar  
ESE standards



ERICO is dedicated to providing the best lightning protection solution for any given application, whether this involves the use of the standards-compliant ERITECH® SYSTEM 1000, ERITECH® SYSTEM 2000, ERITECH® SYSTEM 3000, isolated downconductor or a hybrid design utilizing a combination of multiple system types. ERICO manufactures lightning protection systems in full accordance with more than twelve national and international standards, as well as non-conventional systems based on enhanced air terminals and insulated conductors for applications where these provide an advantageous solution for the customer.

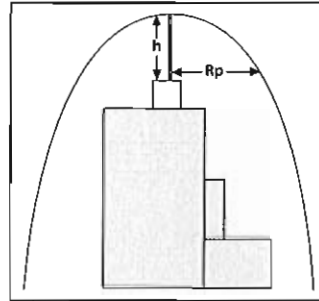
ERICO's approach is solutions driven. Some applications are more suited to the traditional conventional lightning protection designs that require protection via complete building structure bonding. Other applications are more suited to a method that utilizes protection via isolation or applications that require area protection or the decision may be purely based on a risk-assessment evaluation.

## Features

- Designed and tested to NF C 17-102 and similar standards
- Stainless steel design suitable for most environments
- Available in three models to suit specific site requirements
- Suitable for connection to a variety of downconductor systems including tape, cable, smooth-weave and ERITECH® ERICORE conductor
- Fully compatible with the ERITECH SYSTEM 3000 mast, ERITECH ERICORE cable and accessories, and isolated downconductor mast and conductor

# Protecting Areas

According to NF C 17-102 Ed. 2.0, the standard protection radius ( $R_p$ ) of the ERITECH® INTERCEPTOR SI ESE is linked to  $\Delta T$  (below), the protection levels I, II, III or IV (as calculated in NF C 17-108 or EN62305-2) and the height of the ERITECH INTERCEPTOR SI ESE above the structure to be protected ( $H$ , defined by NF C 17-102 as a minimum 2 m).



Protection Level	Protection Level I (99%, D = 20 m)			Protection Level II (97%, D = 30 m)			Protection Level III (91%, D = 45 m)			Protection Level IV (84%, D = 60 m)		
	Model	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60	SI 25	SI 40
$\Delta T$ ( $\mu s$ )	25	40	60	25	40	60	25	40	60	25	40	60
<b>Rp (m) Protection Radius</b>												
<b>h (m)</b>												
2	17	23	32	19	26	34	23	30	40	26	34	44
3	25	35	48	26	39	52	34	45	59	39	50	65
4	34	46	64	39	52	68	46	60	78	52	67	87
5	42	58	79	49	65	86	57	75	97	65	83	107
6	43	59	79	49	66	86	58	76	97	66	84	107
7	44	59	79	50	66	87	59	76	98	67	85	108
8	44	59	79	51	67	87	60	77	99	68	86	108

Where  $h > 5$  m, then  $R_p$  can be calculated from

$$R_p = \sqrt{h(2D-h) + \Delta L(2D+\Delta L)}$$

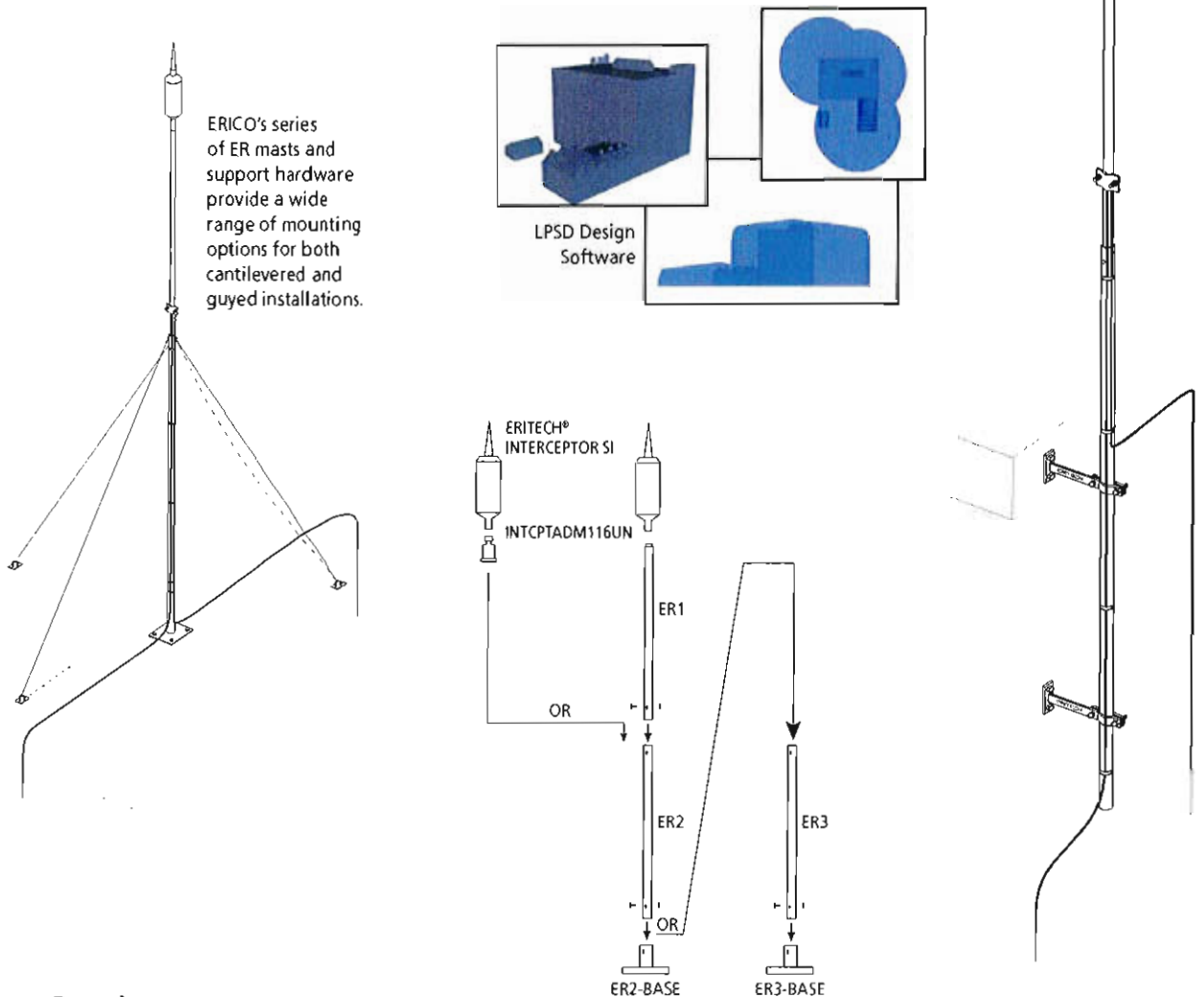
$\Delta L = v(m/\mu s) \times \Delta T(\mu s)$ , where  $v$  is assumed to be  $1m/\mu s$   
 $D =$  Protection Level, where  $D = 20, 30, 45$  or  $60$  m



## Design

The aim of lightning protection design is to mitigate all the factors that can impact the lightning risk. The requirements of NF C 17-108 or EN62305-2 provide guidance on calculation and selection of protection level for each specific application.

ERICO's unique computer-aided program provides design support for a variety of design techniques and standards including NF C 17-102. Based on individual site parameters such as structure dimensions, terminal type and protection requirements, each LPSD (Lightning Protection System Design) design is customized for the project. It provides elevation, 3D and plan views enabling terminal location, downconductor routing and grounding system requirements to be optimized for your facility.



### System Requirements:

The design and installation of the terminals should be completed in compliance with the requirements of the French Standard NF C 17-102. In addition to terminal placement requirements, the standard requires two downconductors per terminal to be installed on opposite walls. A downconductor cross-sectional area of  $\geq 50 \text{ mm}^2$  is specified. The downconductors are to be secured at three points per meter with equipotential bonding made to nearby metallic items.

Each downconductor requires a test clamp and dedicated earth system of 10 ohms or less. Should 10 ohms not be achievable, then 100 m of buried conductor with no single vertical or horizontal element exceeding 20 m is acceptable. The lightning protection ground should be connected to the main building ground and any nearby buried metallic items.

The NF C 17-102 and similar ESE standards requirements for inspection and testing ranges from each year to every three years dependent upon location and protection level selected.

# Ordering Information

## Air Terminals



ERITECH® INTERCEPTOR SI			
SI 25	(701535)	25 µs	5 kg
SI 40	(701536)	40 µs	5 kg
SI 60	(701537)	60 µs	5 kg



Mast Bracket		
ACF-2-GS	(103100)	2.1 kg

Parallel pipe clamp for masts 30 to 50 mm diameter. Supplied as set of two brackets.

## Masts and Bases



Masts and Bases			
ER1-1000-SS	(702255)	Upper section, 1 m	3.5 kg
ER1-2000-SS	(702260)	Upper section, 2 m	6.2 kg
ER2-2000-SS	(702265)	Mid section, 2 m	4.9 kg
ER2-3000-SS	(702270)	Mid section, 3 m	7.3 kg
ER3-2000-SS	(702275)	Lower section, 2 m	5.3 kg
ER3-3000-SS	(702280)	Lower section, 3 m	7.9 kg
ER2-BASE-SS	(702290)	Base for ER2 mast	5.2 kg
ER3-BASE-SS	(702295)	Base for ER3 mast	5.6 kg
ER1-xxxx-SS		mast diameter 25 mm	
ER2-xxxx-SS		mast diameter 32 mm	
ER3-xxxx-SS		mast diameter 38 mm	

## Adapters



ER2-xxxx-SS Adapter		
INTCPT-ADM116UN	(702301)	0.1 kg

Adapter to allow ERITECH INTERCEPTOR SI terminal to connect direct to ER2-xxxx-SS masts.

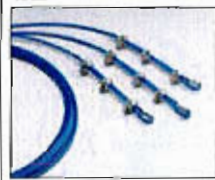


Water Pipe Adapter		
INTCPT-AD2BSPF*	(702297)	0.1 kg
INTCPT-ADF2NSP**	(702298)	0.1 kg

For mounting Air Terminals to non-insulated water pipe masts.

\* 2" British thread    \*\* 2" USA thread

## Masts Accessories



Guy Kit			
GUYKIT4MGRIP	(701305)	4 m	0.4 kg
GUYKIT7MGRIP	(701315)	7 m	0.7 kg

Guy kits for 4 m and 7 m vertical guy heights.



Adapter to 3/4" Thread		
INTCPT-ADM3/4UNC	(702299)	0.1 kg

Adapter to mount Air Terminal to conventional 3/4" lightning protection hardware.



Mast Clamp		
TMC-55	(702165)	0.2 kg

Clamp for connecting 25x3, 30x2 or 8 mm diameter conductor to ER1 or ER2 masts.



Mast Butt Adapter		
INTCPT-ADBUTT	(702296)	0.05 kg

Required to mount the ERITECH INTERCEPTOR Air Terminal into the System 3000 FRP mast.



Cable Tie		
CABTIE-55	(701420)	0.05 kg

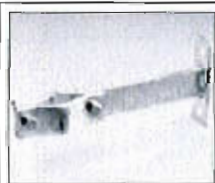
520 mm stainless steel cable tie for strapping downconductor to lower mast sections.

## Accessories



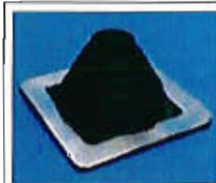
Lightning Event Counter		
LEC-IV	(702050)	2.0 kg

Installed on downconductor to record number of lightning strikes.



Mast Bracket		
ALOF-1-GS	(702175)	1.5 kg

280 mm galvanized steel bracket for masts 28 to 55 mm diameter.



Waterproof Cone		
WPC	(702230)	0.07 kg



Mast Bracket		
LSEB 4554	(702180)	10.5 kg

550 mm galvanized steel bracket for masts 38 to 76 mm diameter. Supplied as set of two brackets.

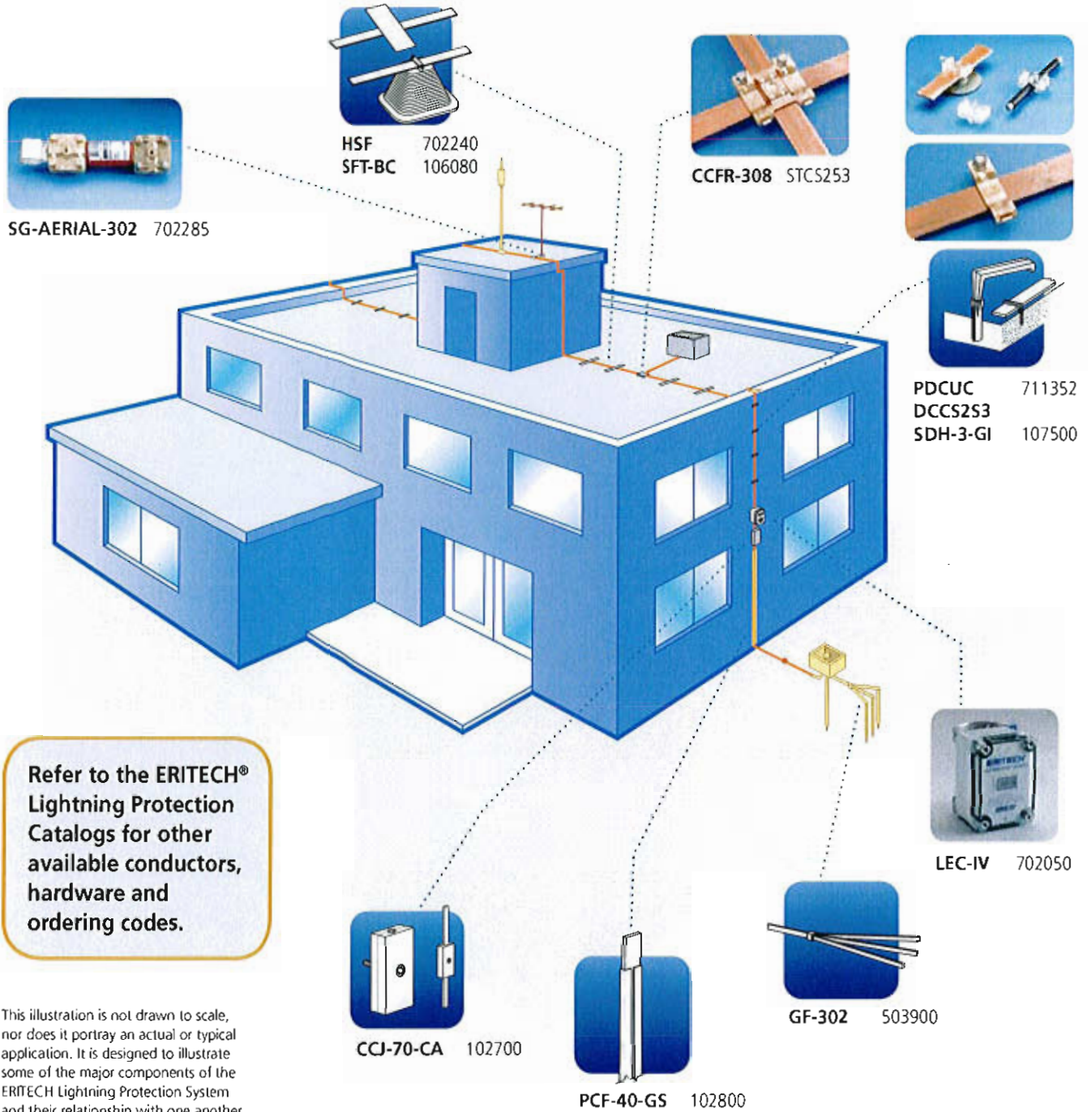


Aerial Spark Gap		
5G-AERIAL-302	(702285)	0.5 kg

For the connection of TV and communication masts to the lightning protection systems.



# Other Lightning Protection and Grounding Accessories



This illustration is not drawn to scale, nor does it portray an actual or typical application. It is designed to illustrate some of the major components of the ERITECH Lightning Protection System and their relationship with one another.

**WARNING**

ERICO products shall be installed and used only as indicated in ERICO's product instruction sheets and training materials. Instruction sheets are available at [www.erico.com](http://www.erico.com) and from your ERICO customer service representative. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.

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