This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

ANSI ES1.9-2020
Crowd Management

Approved by the ANSI Board of Standards Review on 06 July 2020

ES/2019-2001r4

© 2020 Entertainment Services and Technology Association (ESTA) and Event Safety Alliance (ESA).
All rights reserved.

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Notice and Disclaimer

ESTA does not approve, inspect, or certify any installation, procedure, equipment or material for compliance with codes, recommended practices or standards. Compliance with an ESTA standard or recommended practice, or an American National Standard developed by ESTA is the sole and exclusive responsibility of the document user and is entirely within their control and discretion. No markings, identification or other claims of compliance shall constitute any certification or approval whatsoever by ESTA.

ESTA neither guarantees nor warrants the accuracy or completeness of any information published herein and disclaim liability for any personal injury, property or other damage or injury of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document.

In issuing and distributing this document, ESTA does not either (a) undertake to render professional or other services for or on behalf of any person or entity, or (b) undertake any duty to any person or entity with respect to this document or its contents. Persons using this document should rely on his or her own independent judgment or, as appropriate, seek professional advice when determining the exercise of reasonable care in any given circumstance.

Published by:

ESTA
630 Ninth Avenue, Suite 609
New York, NY 10036 USA
Phone: 212-244-1505
Fax: 212-244-1502
standards@esta.org
http://www.esta.org/

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

The ESTA Technical Standards Program

The ESTA Technical Standards Program was created to serve the ESTA membership and the entertainment industry in technical standards related matters. The goal of the Program is to take a leading role regarding technology within the entertainment industry by creating recommended practices and standards, monitoring standards issues around the world on behalf of our members, and improving communications and safety within the industry. ESTA works closely with the technical standards efforts of other organizations within our industry, including ESA, USITT and VPLT, as well as representing the interests of ESTA members to ANSI, ICC, UL, and the NFPA. The Technical Standards Program is accredited by the American National Standards Institute.

The Technical Standards Council (TSC) was established by ESTA to oversee and coordinate the Technical Standards Program. Made up of individuals experienced in standards-making work from throughout our industry, the Committee approves all projects undertaken and assigns them to the appropriate working group. The Technical Standards Committee employs a Technical Standards Manager to coordinate the work of the Committee and its working groups as well as maintain a “Standards Watch” on behalf of members. Working groups include: Control Protocols, Electrical Power, Event Safety, Floors, Fog and Smoke, Followspot Positions, Photometrics, Rigging, and Stage Lifts.

ESTA encourages active participation in the Technical Standards Program. There are several ways to become involved. If you would like to become a member of an existing working group, as have over three hundred people, you must complete an application, which is available from the ESTA office. Your application is subject to approval by the working group and you will be required to actively participate in the work of the group. This includes responding to letter ballots and attending meetings. Membership in ESTA is not a requirement. You can also become involved by requesting that the TSC develop a standard or a recommended practice in an area of concern to you.

The Event Safety Working Group, which authored this Standard, consists of a cross section of entertainment industry professionals representing a diversity of interests related to event production, insurance and legal matters, rigging and stage machinery for theatrical events. ESTA is committed to developing consensus-based standards and recommended practices in an open setting. Future Event Safety Working Group projects will include updating this publication as changes in technology and experience warrant, as well as developing new standards and recommended practices for the benefit of the entertainment industry.

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Investors in Innovation

The Technical Standard Program (TSP) is financially supported by ESTA and by companies and individuals who make undirected donations to the TSP. Contributing companies and individuals who have helped fund the TSP are recognized as “Investors in Innovation.” The Investors in Innovation when this standard was approved by ANSI’s Board of Standards Review include these companies and individuals:

VISIONARY LEADERS ($50,000 & up)

ETC
PLASA
ProSight Specialty Insurance

VISIONARY ($10,000 & up; >100 employees/members)

Chauvet Professional
Cisco
Columbus McKinnon Entertainment Technology
Robe
Disney Parks Live Entertainment

VISIONARY ($5,000 & up; 20–100 employees/members)

Altman Lighting, Inc.
German Light Products
JR Clancy
McLaren Engineering Group
Rose Brand
Stage Rigging
Theatre Projects
Theatre Safety Programs
TMB

VISIONARY ($500 & up; <20 employees/members)

About the Stage
B-Hive Industries, Inc.
Scott Blair
Boston Illumination Group
Candela Controls, Inc.
Clark Reder Engineering
Tracey Cosgrove & Mark McKinney
Doug Fleenor Design
EGI Event Production Services
Entertainment Project Services
Neil Huff
Interactive Technologies
Jules Lauve
Brian Lawlor
Michael Lay
Limelight Productions, Inc.
Link
John T. McGraw
Mike Garl Consulting
Mike Wood Consulting
Reed Rigging
Reliable Design Services
Alan Rowe
Sapsis Rigging Inc.
Dana Taylor
Steve Terry
Vertigo
Steve A. Walker & Associates
WNP Services

INVESTOR ($3,000–$9,999; >100 employees/members)

Actors' Equity Association
Barbizon Lighting Company
Golden Sea Professional Lighting Provider
IATSE Local 728
IATSE Local 891
Lex
NAMM
Rosco Laboratories
Texas Scenic Company

INVESTOR ($1,500–$4,999; 20–100 employees/members)

American Society of Theatre Consultants
BMI Supply
City Theatrical Inc.
H&H Specialties, Inc.
InterAmerica Stage, Inc.
Lycian Stage Lighting
Morpheus Lights
Niscon Inc.

INVESTOR ($200–$499; <20 employees/members)

Bruce Darden
Guangzhou Color Imagination LED Lighting
Kenney Drapery Associates, Inc.
Indianapolis Stage Sales & Rentals, Inc.
L1 Inc.
Lighting Infusion LLC
Scott Madaski
Mediam Sp. zo.o.
Nanyi Audio & Lighting Enterprise Co., Ltd.
Qdot Lighting Ltd.
Show Light Oy

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

SUPPORTER ($50 - $2,999; >100 employees/members)
Harlequin Floors

SUPPORTER ($50 - $1,499; 20–100 employees/members)
ACT Lighting Inc./AC Power Distribution
ARM Automation, Inc.
Ian Foulds, IATSE Local 873
General Lighting Electronic Co. Ltd.
Guangzhou YaFeng Optoelectronic Equipment Co.
Guangzhou Yilaiming Photoelectric Technology Co., Ltd.
HAYA Light Equipment Ltd. Co.
High Output
InCord
Intella Systems Co., Ltd.
iWeiss
LA ProPoint, Inc.
Moss LED Inc.
Movecat GmbH
Nanshi Lighting
Oasis Stage Werks
Shenzhen Ifountain Technology
Skjonberg Controls Inc.
Stage Equipment & Lighting
Stagemaker
Stageworks
Syracuse Scenery and Stage Lighting Co., Inc.
Taurus Light Co. Ltd.
Ultratec Special Effects
Vincent Lighting Systems
Zhuhai Shengchang Electronics Co.

SUPPORTER ($50 - $199; <20 employees/members)
Capture Visualisation AB
Clik Systems
DMX Pro Sales
Foshan Leiyuan Photoelectric Co. Ltd.
Jack Gallagher
Tony Giovannetti
Pat Grenfell
Beverly and Tom Inglesby
Eddie Kramer
Jason Kyle
LuxBalance Lighting
Tyrone Mellon, Jr.
Orange Pi DMX
Lizz Pittsley
Michael Skinner
Studio T+L
Terrier Marketing
Stephen Vanciel
Arjan van Vught

Memorial donor: The Estate of Ken Vannice

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Contact Information

Technical Standards Manager
Karl G. Ruling
ESTA
630 Ninth Avenue, Suite 609
New York, NY 10036
USA
+1-212-244-1505
karl.ruling@esta.org

Assistant Technical Standards Manager
Richard J. Nix
ESTA
630 Ninth Avenue, Suite 609
New York, NY 10036
USA
+1-212-244-1505
richard.nix@esta.org

Technical Standards Council Chairpersons
Mike Garl
Mike Garl Consulting LLC
+1-865-389-4371
mike@mikegarlconsulting.com

Mike Wood
Mike Wood Consulting LLC
+1-512-288-4916
mike@mikewoodconsulting.com

Event Safety Working Group Chairperson
Dr. Donald Cooper
Executive Director, Event Safety Alliance
330-414-8938
dcc1@neo.rr.com

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Acknowledgments

The Event Safety Working Group members when this document was approved by the working group on 20 May 2020 are shown below:

Voting Membership List

Jacob Abbott; PSAV Presentation Services; P; G
Steven A. Adelman; Adelman Law Group, PLLC; P; G
Mike Aug; Chicken Scratch LLC; I; EVP
Jesse Barnes; Safewise Risk Management, Inc; P; G
Alyxzander Bear; Insomniac; P; EVP
Bennett Brian; Reed Rigging Inc.; P; DR
Christian A. Buschhoff; xEMP extra Entertainment Media Publishing oHG; P; G
Donald Cooper; Event Safety Alliance; P; G
Monique Corbeil; CITT/ICTS; P; G
Rebecca Cotter; City of Markham, Ontario; P; DE
Jeremy Dixon; Digital Sound Systems; A; DR
Don Earl; Earl Girls, Inc.; P; DR
Ethan W Gilson; Entertainment Rigging Services, LLC; P; DE
Sanford P. Gilzow; Shur-Rig LLC; P; DR
Joe Golden; Gallagher Staging & Productions; P; DE
Jerry Gorrell; Theatre Safety Programs; P; G
Randell Greenlee; VPLT; P; G
Robert Haycock; UC Berkeley; I; EW
Danielle Hernandez; Furman University; P; G
Dominic Housiaux; Lankey & Limey, LTD; P; EVP
Neil Huff; Taylor & Taylor Insurance Brokers; P; INS
Cedric Jackson; Screen Actors Guild - American Federation of Television & Radio Artists; P; PA
Janine A. Jordan; Electronic Music Alliance; P; G
Eric Kant; Phase01 Crowd Management; P; DE
Daniel H. Louis; Theta Consulting LLC; P; G
Richard J. Nix; Richard J. Nix; I; G
Kevin Pew; Digital Sound Systems; P; DR
Jeffrey M. Reder; Clark-Reder Engineering, Inc.; A; DE
Ryan Riordan; Accurate Staging, Inc.; P; DR
Chris Schmidt; Freeman Companies; P; DR
Janet Sellery; CITT/ICTS; A; G
Steven Serafin; The Hartford Group; P; INS
Keith Sklar; Actors' Equity Association; P; PA
Stewart Stephens; Ashford Management Group; P; G
Will Todd; Area Four Industries; P; EQP
Stephen Vanciel; IATSE Local 631; P; EW
Patrick Wallace; PSAV Presentation Services; A; G
Allen Winzler; Clark-Reder Engineering, Inc.; P; DE
Claire Wright; Buddy, LLC; P; EQP

Observer Members

Brent Armstrong; Alpine Rigging & Structural Design; O; DE
Federico Augugliaro; Verity Studios AG; O; EQP
Evan Bailey; Disco Donnie Presents; O; DE
Justin Bennett; University of the Incarnate Word; O; EVP
Keith Bohn; Area Four Industries; O; EQP
Eric Colby; The Metropolitan Opera / Lincoln Center; O; EVP
Gareth Conner; Creative Conners, Inc.; O; EQP
Jim Digby; Event Safety Alliance; O; EVP
Douglas Frawley; Atomic Design; O; DE
Roderick van Gelder; Stage Safety pty ltd; O; DE
William B. Gorlin; M.G. McLaren, P.C.; O; G
Greg Guzzetta; Event Intelligence Group; O; EVP

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Tim Hansen; Oasis Stage Werks; O; DR
Markus Hehn; Verity Studios AG; O; EQP
Karen Hoffman; Madison Square Garden Company; O; EVP
Edwin S. Kramer; 1501; O; EW
Jim Larkin; The Long Center for the Performing Arts; O; EVP
George Long; Aggreko; O; DR
Ross Long; I.A.T.S.E. Local 891; O; G
Diane K. Mack; Mack Strategies, LLC.; O; G
Franco Magliozzi; Chubb Group of Insurance Companies; O; INS
Bruno Marx; Eventknowhow; O; EVP
Orestes Mihaly; Production Resource Group; O; EVP
Kurt J. Miner; Allianz Global Corporate & Specialty; O; INS
Janine Ashley Oblak; Janine Ashley Oblak; O; EW
Erik Ornberg; Encore Event Technologies; O; DR
Don Parman; Actsafe; O; G
Dana Risinger; Walmart Stores, Inc.; O; EVP
Tim Roberts; The Event Safety Shop; O; G
Tim Salamon; PSAV Presentation Services; O; G
Jason Showers; Advanced Staging Productions; O; DE
Sean Spence; Full Spectrum Security Consultants; O; DE
Eric Stuart; Gentian Events Ltd; O; DE
Peter Willis; Howard Eaton Lighting Ltd.; O; EQP
Jeong Sik Yoo; Ghost LX; O; G
Andrew Young; Andrew Young; O; EW

Interest category codes
DE = Designer of Events
DR = Equipment Dealer or Rental Company
EQP =Equipment Producer
EVP = Event Producer
EW = Event Worker
G = General interest
INS = Event Insurance Company
PA = Performing Artist

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Table of Contents

Notice and Disclaimer ii
The ESTA Technical Standards Program iii
Investors in Innovation iv
Contact Information vi
Acknowledgments vii
Table of Contents ix
Foreword 1
Introduction 1
1 Using this Crowd Management Standard 3
1.1 Scope 3
1.2 Purpose 3
1.3 Equivalency 3
1.4 Application 3
1.5 Normative References 3
2 Definitions 4
3 The “DIME-ICE” Crowd Management Model 5
3.1 Prior Crowd Management Models 5
3.2 DIME-ICE 6
4 Application of the DIME-ICE Model 9
4.1 Design 9
4.1.1 The Configuration and Use of Space 9
4.1.2 Design and Monitoring of General Admission Events 10
4.1.3 Barricades 10
4.1.4 Create More Valuable Real Estate 11
4.1.5 Corrals 11
4.2 Information 12
4.2.1 Foreseeable Crowd Behavior 12
4.2.2 Emergency Announcements 12
4.2.3 Signage 13
4.3 Management 13
4.3.1 Managing an Early Arriving Crowd 14
4.3.2 Monitoring the Crowd from Above 14
4.3.3 Managing the Crowd During Severe Weather 14
4.3.4 Managing the Crowd During Civil Disturbances and Acts of Targeted Violence 17
4.3.5 Event Medical Care and Harm Reduction 17
4.3.6 Incident Reporting 18
4.4 Expectations 18
4.4.1 Situational Awareness 18
4.4.2 Confirmation Bias and Normalcy Bias 19
4.4.3 Prohibited Items and Behavior 19
5 References 20

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

Foreword

The ***Event Safety Guide*** was first published by the Event Safety Alliance ("ESA") in 2014 as a treatise which identified and explained various reasonable practices regarding special event safety. With permission from the UK Health and Safety Executive, ESA's *Guide* was modeled after, and extensively borrowed from HSG195, *The Event Safety Guide (Second edition), A guide to health, safety and welfare at music and similar events,* often referred to as "The Purple Guide."

In 2016, the Event Safety Working Group (ESWG) was established within ESTA's Technical Standards Program in order to convert certain *Event Safety Guide* chapters into formally recognized, consensus- based standards that could be universally referenced across special events organizers, producers, enforcement agencies and user-groups. This document is one of those standards, intended to be used in conjunction with each other, which are used to identify reasonable care and safety at special events. Because events constantly evolve, so too will this collection of standards.

It is assumed in this Crowd Management standard that the design and implementation of processes described here are entrusted to reasonably qualified and experienced people who are knowledgeable about the circumstances of their particular event.

This standard may serve as guidance to regulatory and other enforcement authorities. Compliance with this standard, however, does not itself satisfy legal obligations or confer immunity from legal consequences in any specific circumstance.

Introduction

I. Context of this Standard

This standard focuses on what one should do, or may do, under various circumstances. It is guidance regarding actions. It is important to understand this guidance in the broader context of event management. That context is generally comprised of the following four elements.

a) Risk Assessment. Event managers and staff must know their roles and how those roles fit with their professional peers, vendors, patrons, and artists. It is important, especially for events that involve more people or more complicated elements, for there to be a risk assessment for that event. From this risk assessment, event organizers can triage their risks and try to mitigate the risks that are most likely to occur or most likely to significantly impact the event.

b) Emergency Action Plan. A careful risk assessment will lead naturally to the event organizer creating an emergency action plan to memorialize everyone's duties and responsibilities, which will ideally articulate staff's duties during both normal operations and if one of the foreseeable issues does arise during an event. Those duties and responsibilities should be built upon the foundation of this standard, as well as all the circumstances of each event.

c) Training. Once there is a plan for the event, the event organizer can ensure that staff are trained to perform their tasks and carry out their responsibilities consistent with that plan. Even the best-written documents do not teach themselves – it is essential to train staff to implement the event plans and to reinforce safe work habits.

d) Supervision. Because even the most well-trained, conscientious people are fallible, the final layer of assurance of safe practices consistent with this standard and the event's emergency action plan is supervision. If everyone is working consistent with their training, then this will be a way to encourage continued excellence; if someone is falling behind, supervision provides a means to quickly detect and correct non-compliant or unsafe behavior.

II. Where Do Crowd Problems Happen?

Because crowds can become the scene of mayhem before, during, or after any type of event, no one with crowd management responsibility should get too comfortable that they have the correct, final, and absolute answer to a situation. History suggests that complacency and overconfidence invite trouble.

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

The most significant threats have changed over time. In the first half of the twentieth century, structure fires caused the most carnage in crowded places. Notorious incidents included the 1911 Triangle Shirtwaist factory fire, the 1942 Cocoanut Grove nightclub fire, and the 1944 Hartford circus tent fire, each of which left more than 100 people dead. Nightclubs continue to be the scene of horrific fires and high casualty counts, including the Lame Horse in Russia in 2009 and Kiss in Brazil in 2013.

Sports venues have been the scene of crowd disasters as well. The infamous 1989 Hillsborough Stadium disaster in England left 96 people dead in a crowd crush; 83 people died in Guatemala in 1998 trying to enter a stadium for a World Cup qualifying match; 43 people died in an overcrowded South African stadium in 2001 when fans rushed in as the match began; in 2012, 79 people died following disturbances at an Egyptian stadium.

Tunnels have proved hazardous for large crowds. In 1990, 1,426 pilgrims died in blocked pedestrian tunnel exits leading out from Mecca during the Hajj in Saudi Arabia. In 2010, 21 people were killed and more than 500 injured trying to pass through a tunnel leading to the site of Germany's Love Parade music festival.

Blocked or insufficient exits remain a deadly contributor to many crowd disasters. In one weekend in February, 2003, 100 people died in The Station nightclub fire in Rhode Island trying to exit an over-crowded building, and 21 more people perished at the E2 nightclub in Chicago in a crush of patrons trying to reach too-narrow exit doors after someone used pepper spray on the upstairs dance floor.

These incidents are listed first so crowd managers do not exclusively focus on the current worst-case scenario, targeted violence or active shooter incidents. It is true that the two most deadly shootings in United States history (as of this writing) – the 2017 Route 91 Harvest Festival in Las Vegas, and 2016 Pulse nightclub in Orlando, Florida – both occurred at live entertainment venues. But the crowd management issues raised by these shootings, and other acts of violence in public places, are substantially similar to the issues raised throughout this standard.

The variety of crowd disasters underscores that it is both pointless and inaccurate to demonize any type of event as more inherently dangerous than others. There is some element of risk in every crowd and every place where people gather in groups. Regardless of the event, anticipated crowd, or worst-case scenario, a crowd manager should be attentive to all of the issues raised in this standard.

III. Duty to Have a Reasonable Crowd Management Plan

As with any standard that covers a broad subject, one should not get lost in the details of this Crowd Management standard. The number or names of factors to be considered is less important than the event organizer's thoroughness in identifying and considering their own reasonably foreseeable risks and developing reasonable risk mitigation plans to address them.

The root of a plan that is "reasonable" is that one has a reason for one's actions – ideally a good reason. Event organizers can most effectively assess and plan to mitigate crowd management risks when they work with all relevant stakeholders during the planning process, collectively assess the risks for that event at that time for that crowd, and record the reasons for those decisions in a manner that will survive the event and help explain the decision-making process long after memories have faded and staff have moved to new jobs.

The necessity of a crowd management plan has long been memorialized in NFPA 101, Life Safety Code®, which requires event organizers to develop a Life Safety Evaluation for large venue or festival seating events. An NFPA-compliant life safety evaluation requires event organizers to consider a wide range of scenarios and hazards that may require special attention and planning.

IV. "Best" Practices

There is no single "best" practice for crowd management. Once one meets the minimum legal requirements embodied in applicable statutes and regulations, there may be many reasonable ways to manage a crowd. Those choices might be different for a different event, or the same event with different weather, or where the crowd is foreseeably more or less active or made up of differing age groups. Users of this standard should find that liberating and empowering. Crowd managers must think through the circumstances of their event, take seriously open-ended questions such as "What could go wrong?" and "What new problems might a proposed solution

This is a preview of "ANSI ES1.9-2020". Click here to purchase the full version from the ANSI store.

create?" then either (a) accept the most reasonably foreseeable risks as is, or allocate resources to (b) eliminate them entirely, (c) mitigate them as much as possible, or (d) transfer them to someone else (e.g., through contractual indemnification or insurance). This thought process is part of what makes a crowd manager's job interesting and important every day.

1 Using this Crowd Management Standard

1.1 Scope

The scope of this standard is to (a) define "crowd management," as distinguished from "crowd control," (b) provide an overview of crowd management theory and vocabulary, and (c) apply these terms to certain reasonably foreseeable risks that arise during live events. The standard is intended both to identify minimum requirements and provide questions and suggestions that help event organizers make reasonable choices under the circumstances of their event.

This standard applies to anyone working in the live event industry whose job functions may include crowd management during either the ordinary course of an event or in an emergency. As used here, the live event industry includes concerts, festivals, sporting events, community celebrations, theater and film production, corporate events and activations, trade shows, and similar events, both indoors and outdoors.

Crowd management is an extensive topic which crosses multiple disciplines and practical applications. For example, this standard touches on, but does not comprehensively address, event security and incident command, which are discussed in detail in other standards. The duty to maintain a safe environment for visitors extends beyond simply reading this standard (although it is a good place to start). For event professionals whose duties entail significant or regular responsibility for public safety or emergency planning, you are strongly advised to undertake specific training or research applicable to your duties and the environment in which you perform them.

1.2 Purpose

The purpose of this standard is to help reduce the risk of harm to people attending events and to improve their experience in crowded places at entertainment, sports, cultural, and corporate events and experiences.

1.3 Equivalency

The provisions of this standard are not intended to prevent the use of any materials or to prohibit any design or method not specifically described in this standard, provided that any such alternative design or method complies with the intent of these provisions. The quality and effectiveness of all methods of work that one chooses to apply for a given event should be at least equivalent to those described in this standard. This standard is not intended to replace any applicable laws, regulations, codes, or other guidance – it supplements those authorities with the goal of improving safety.

1.4 Application

This document is part of a collection of standards relating to event safety. Users should consider the requirements of the complete collection in relation to the application of this standard, where such consideration is necessary to coordinate and correlate related requirements into a crowd management plan.

1.5 Normative References

The following documents contain requirements relating to the scope of this standard. They are provided for guidance only, unless stated otherwise in this standard. Where a specific version of a document is not given, the version applicable to the event's state, local, or municipal jurisdiction should be used. European standards are also recommended for review, as they are useful sources of guidance where domestic national standards do not already exist.

NFPA 1, *Fire Code*®, 2018 edition
NFPA 101, *Life Safety Code*®, 2018 edition
International Fire Code
International Building Code
Sports Grounds Safety Authority, *Guide to Safety at Sports Grounds* (the "Green Guide"), 2018 edition
SGSA *Alternative Uses of Sports Grounds*
HSG154, *Managing Crowds Safely*, 2014 http://www.hse.gov.uk/pubns/indg142.htm#intro
Event Safety Alliance, *Event Safety Guide*, 2014