



UTS: Engineering



Reducing childhood deaths - soccer goal posts safety

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Introduction

- A ten-year-old NSW boy died in 1999 when he was struck on the head by the crossbar of an unanchored moveable soccer goal that was accidentally pulled down onto him by an opposing player doing a chin-up, during an informal game
- In June 2003 a three-year-old NSW child died at a soccer field when an unsecured portable soccer goal toppled over striking her on the head
- The goal, which could be easily tipped over by hand, weighed 180 kg, was about twenty years old and had no rear ground bar
- The goal was at the side of a field and was not being used in play





Introduction (cont.)

- On 27 August 2004 the NSW Deputy State Coroner heard during an inquest that there had been seven deaths, at least, and one person made paraplegic in Australia since 1986, 27 deaths and 49 serious injuries in the USA from 1979 to 2003 and seven other deaths in the UK, Ireland, Malta and Japan involving moveable soccer goals



Introduction (cont.)

- It is difficult to assess accurately how many moveable soccer goals are in use in Australia
- However, weekend or inter-club soccer involves several hundred thousand players
- Additionally, indoor soccer premises, which also use moveable soccer goals, are in existence in most local government/council areas





Introduction (cont.)

- High winds can also cause moveable soccer goals to fall over
- For example, a 9-year-old was fatally injured when a goal was tipped over by a gust of wind
- In another incident, a 19-year-old goalie suffered stress fractures to both legs when the soccer goal was blown on top of her
- Almost all of the goals involved in the accidents were 'homemade' and were not professionally manufactured
- These homemade goals are often very heavy and unstable

Prepared by A/Prof David Eager



Some background

- Soccer is Australia's most popular team sport
- Unfortunately there are hidden dangers such as tipping or collapsing of the goal
- The majority of moveable soccer goals are constructed of metal, weighing in the vicinity of 250 kg



MAKE SAFETY YOUR GOAL

Soccer goalpost safety. Play your part and
 Check it Secure it Test it Respect it

Prepared by A/Prof David Eager





Some background (cont.)

- The deaths and numerous serious injuries are a result of blunt force trauma to the head, neck, chest, and limbs of the victims
- In most cases these occurred when the goal was accidentally tipped onto the victim



UTS assists OFT draft Regulation

- The Faculty of Engineering, University of Technology Sydney was engaged by the NSW Office of Fair Trading in December 2004 to conduct collaborative research and on-site impact testing on a variety of soccer goals
- The results of this testing were used to draft the technical component of the Soccer Goal Regulation (NSW)





Developing the safety Standard

- The best soccer goals are ones that are permanently fixed into the ground
- Where permanently fixed goals are not feasible semi-permanent or sleeved posts are recommended
- Only when neither permanent nor semi-permanent goals are available should moveable goals be used and these need to comply with the safety Standard



Developing the safety Standard

- The Regulation was enacted in NSW during the first sitting of Parliament in 2005
- Most Australian States and Territories mirrored this Legislation
- This completed the easy phase of the intervention





Developing the safety Standard

- The next stage involved two parallel activities, namely:
 1. Drafting a national Standard that all relevant representing bodies would accept (including Soccer NSW, Australian Toy Association, Consumers Federation of Australia, Dept Education, Children Hospital, OFT, and Engineers Australia)
 2. The public education and phasing in of the Regulation (the 'honeymoon' period)



Developing the safety Standard (cont.)

It was also agreed that the Standard should include guidance on the following safety and design issues:

- Net attachment/anchor method
- Strength/unexpected collapse
- Impact hazard
- Entrapment
- Stability
- Labelling





Developing the safety Standard (cont.)

- The Australian Standards Committee relied upon the ASTM F2056:2000 and EN 784:2004 when developing the test method



Developing the safety Standard (cont.)

To a comply with the Standard a Moveable goal shall pass any one of the follow three tests:

1. Fall Over Test + Static Load Test
or
2. Weight Test
or
3. Horizontal Pull Test





Developing the safety Standard (cont.)

Fall Over Test + Static Load Test

- Release the goal including attachments in the forward and reverse direction from its fall over point of no return so that it falls and impacts a load cell with a force of less than 200 N
and
- Position the goal including attachments with the rear elevated by 0.3 m (see Figure 3 – Static load test) so that the static load is less than 28 kg



Developing the safety Standard (cont.)

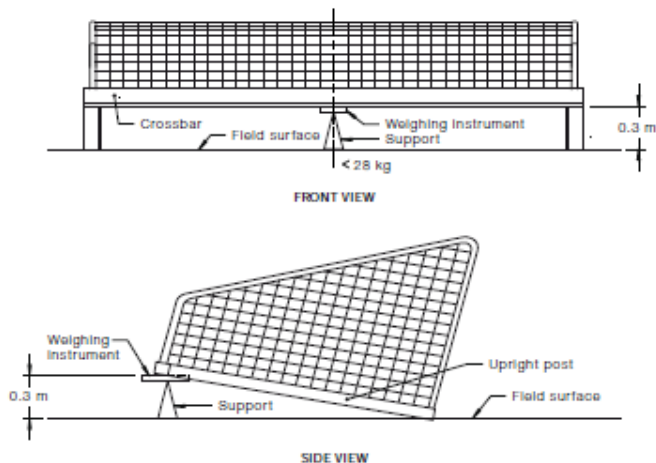


FIGURE 3 STATIC LOAD TEST





Developing the safety Standard (cont.)

Weight Test

- Weigh less than 28 kg with all attachments such as net, stakes

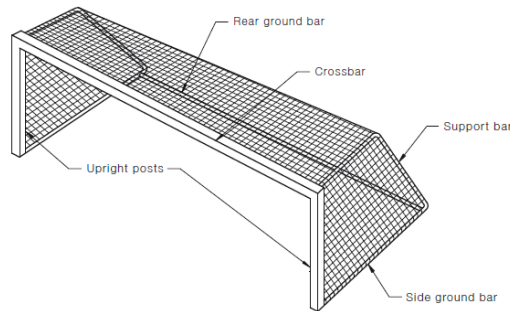


FIGURE 1 COMPONENTS OF A MOVABLE SOCCER GOAL



Developing the safety Standard (cont.)

Horizontal Pull Test

- Apply a horizontal pulling force of 2000 N to the centre of the crossbar for no less than 60 seconds and no more than 70 seconds
- If the goal topples over or does not return to the original position the test is deemed to have failed





Developing the safety Standard (cont.)

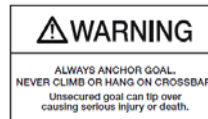
To a comply with the Standard a Moveable goal shall also pass:

- Strength test
- Warning labeling requirements
- Documentation requirements, including assembly instructions and safety instructions
- Marking requirements



Recommendations

- It is recommended that the soccer industry be discouraged from using moveable goals that have the potential to overturn and be encouraged to progressively convert to the semi-permanent in-ground 'sleeved' or 'bolted' support systems; or permanent in-ground support systems





Conclusions

- On the 23 November 2007 Standards Australia published Playing field equipment – Soccer goal Part 1: Safety aspects AS 4866.1:2007
- The objective of this Standard is to eliminate the risk of unintentional fall over or collapse of soccer goals
- Let's trust that it achieves this objective



Conclusions (cont.)

- AS 4866.1:2007 specifies the safety and performance requirements for soccer goals that are used for training and competition in outdoor sports facilities and indoor arenas
- This Standard is the first part in a series addressing safety aspects of sporting goals
- Further parts are planned to address safe use, storage and maintenance

