

# STREETS

# DISTRIBUTION DESIGNER™

by Safearth

## Risk-based earthing design – fast!

Producing risk-based distribution earthing designs can be tricky and time consuming. People living all around electrical assets need to be kept safe during earth fault events, but design budgets are usually very limited and the earthing system must be affordable to build. All this puts a lot of pressure on the earthing designer.

Streets® design software has been developed to address this very problem. This simple but extremely powerful tool enables designers to explore the available options and develop the best solution as quickly as possible, in order to meet the relevant Australian Standards such as AS2067, AS/NZS3835 and AS/NZS4853.



- Quickly analyse soil test results
- Select applicable safety criteria
- Recalculate fault levels & clearing times
- Assess hazards against risk-based criteria
- Model earth return paths and MEN
- See current distributions
- Specify local earthing
- Graph results
- Generate reports

imagery ©2019 Google

# safearth

software

## Streets® combines a sophisticated analytical calculation engine with a designer-friendly user interface.

This powerful tool captures the essential elements of the distribution earthing design process in a logical sequence to focus designer effort, record relevant information and help determine the optimum earthing design in the shortest possible time.

### Overview

Save time and money on distribution earthing design & construction by employing Safearth's state-of-the-art tool.

Streets draws on Safearth's decades of experience in earthing design, software development and earthing testing. It solves the thorny problem of producing safe distribution designs, compliant to criteria developed by quantitative risk-based (QRA) methods, without employing complex, costly multipurpose earthing design tools or using "free" tools with limited accuracy and capability – often based on formulaic empirical approximations rather than a proven analytical calculation engine.

Complex design tools are usually expensive to buy, maintain and train staff in their correct use. Producing distribution earthing designs that model the surrounding MEN and earthing interconnections is very time consuming in such tools as they provide great flexibility but also require significant data input, which can dramatically increase the cost of accurate earthing design.

Free tools often rely on modelling approximations, which can lead to unnecessarily conservative earthing designs which are costly to build, or designs with significantly higher risk than indicated by the tools. In addition, they are often accompanied by lots of procedures to manage cases the software can't handle.

### Feature List

- Tailored distribution design process in accordance with AS2067
- Analyse Wenner soil resistivity results and create a homogenous or two-layer model
- Model buried earthing for common and separate designs
- Specify supply voltage and prospective fault level and clearing time
- Calculate EPR based on prospective fault level
- Recalculate fault current and clearing times to account for all earthing impedances
- Analyse local and system earthing elements
- Calculate MEN input impedance
- Calculate conductive current distribution for interconnections
- Model multiple interconnected distribution assets in one design
- Calculate clearing times for relays and fuses
- Show schematic view of earthing arrangement
- Specify radius for calculation of soil voltage profiles and exclusion zone distances
- Select applicable hazard scenarios
- Select safety criteria from various Australian Standards
- Review compliance of design to criteria
- Review results in tabular & graphical form
- Calculate exclusion zones required around the earthing system to selected assets
- Automatically generate the design report



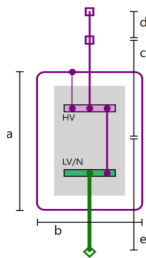
# Standout Features

## Determine a Soil Model

Streets makes it easy to document and incorporate soil resistivity test results into an appropriate homogeneous or two-layer soil model for use in the modelling calculations.

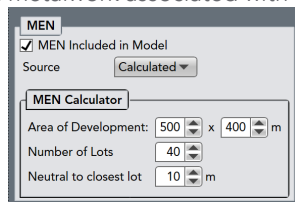
## Design a local earth grid

Compute the HV and LV earthing system resistances and assess the touch voltage and LV transfer voltage against Australian Standards criteria.



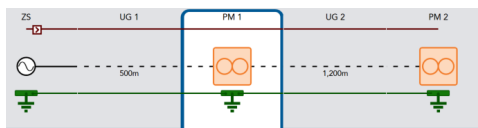
## Model MEN Areas

Often distribution substations are connected to an MEN area or other low impedance earthing system (perhaps earthed metalwork associated with conveyors or pumping stations). Streets can model MEN systems and/or allows for the input of a connected earthing system impedance.



## Model Earthing Connections

Often fault current returns to the source via various elements other than just the local earthing. Streets allows the designer to conductively model earthing interconnections (cable sheaths, neutrals, overhead earth wires), and neighbouring MEN areas or other distribution assets.



## Recalculate fault levels & clearing times

Assess the impact of the earthing impedance on the actual fault level, clearing time and safety performance of the earthing design. This can make a substantial difference to the best choice of design.

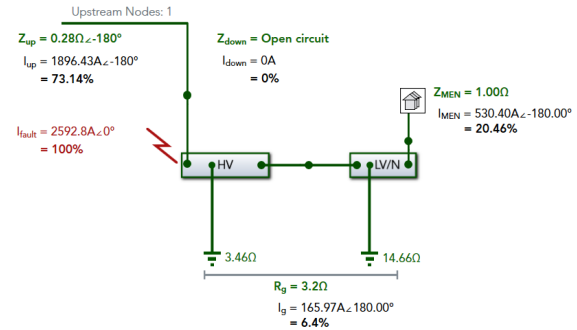
Prospective Fault Data	
Supply Voltage (L-G)	6.986V
Prospective Fault Level	3000A ∠ 0°
Apparent Source Impedance	2.30 ∠ 0°
Prospective Clearing Time	0.5s

Design SLG Fault Scenario	
Design Scenario	Recalculated
Clearing Element	ZS
Fault Level Source	Adjust Prospective
Fault Loop Impedance	6.10 ∠ 0°
- Source Impedance	2.30 ∠ 0°
- Asset Earthing	3.2Ω
- ZS Earthing	Earthing 1 (0.60 ∠ 0°)
Fault Level	1140.68A
Clearing Time	0.66s

## Show Current Distribution

Display the current distributions and input impedances. This helps you determine the most effective means to improving design performance.



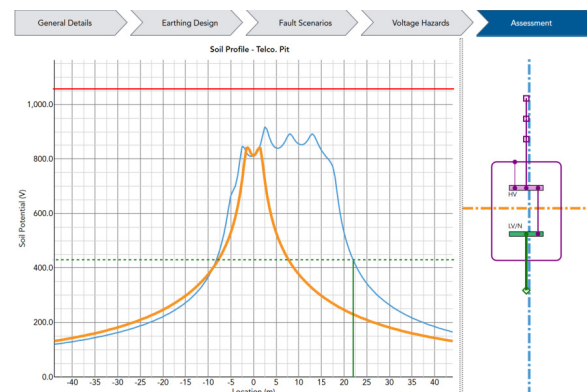
## Calculate Exclusion Zones

Specify applicable Australian Standards Criteria and calculate the separation required from the earthing system.

Hazard Type	Applicable Standard	Criteria
Asset Touch Voltage	AS 2067: 2016	DU
LV Transfer Voltage	AS 2067: 2016	TDMEN
Telco. Pit	AS/NZS 3835.1: 2006	Category C
Pipeline Asset	AS/NZS 4853: 2000	Public Access
Metallic Fence	AS 2067: 2016	TDB
MEN Item	AS 2067: 2016	TDMEN

## Graph Soil Voltage Profiles and Hazards

Display the soil voltage at a distance from the asset earthing system, along with EPR, voltage hazards and exclusion distances.



## Automatically Produce a Report

Minimise documentation effort by generating a PDF report of the completed design, which can then be submitted for approval to the designated approving authority.

# Why Safearth Software?

Safearth has a long history of developing software for earthing design and analysis. This history goes hand in hand with our commitment to research, and much of our technical software was initially developed to support various research projects.

Originally part of a major electrical utility, Safearth focussed its initial efforts on addressing the immediate needs of that utility context. Over time we have developed our capability and expanded our horizons through consulting work, which has led to a broader focus for our development efforts.

One of the factors that distinguishes Safearth's software is that we use it ourselves to support

our design and testing services, so it has been 'field proven' over many years. Our own design and testing consultants rely on our software to support their services.

Our consulting context also gives rise to a strong end-user focus in our software. We build software to improve the efficiency of our designers and testers, with an emphasis on helping designers to extract meaning from calculations and modelling, and avoid 'information overload'.

**Put simply, we make great software because we use it and rely on it ourselves. Now, you have access to some of the same tools we use.**

## Training

Safearth have been at the forefront of earthing theory and practice for more than 25 years. We delivered the first public earthing training course in Australia in the early 1990s and have since trained hundreds of people around the world.

We have a large team of trainers who are all earthing experts with substantial experience in both R&D and practical applications. We know

about real-world problems and constraints, and have provided thousands of solutions in design, testing and refurbishment of assets across all industries.

Talk to us about your training needs. We have regular public courses in design and testing, and can develop custom courses to suit your organisations particular needs.

## Consulting & Testing

Safearth has more than 20 degree-qualified specialist engineers with world recognised expertise in all areas relating to earthing systems.

Our experience extends to all areas of power generation, reticulation and use, including substations, transmission and distribution systems, power stations, industrial plants and mining operations.

Safearth are available to:

- review your Streets earthing design
- assist with or carry out more complex designs
- provide technical and engineering support with any electrical problem or issue
- carry out testing for you, or with you
- assist you to plan and implement your testing strategy
- develop standards, policies and procedures
- investigate incidents of electric shock, circulating current or complex interactions
- carry out safety audits on electrical assets



NEWCASTLE | PERTH | ADELAIDE | BRISBANE  
SYDNEY | MELBOURNE | CANBERRA  
USA | CANADA | EUROPE

**For sales, support, or training:**

☎ 1800 327 844 🌐 [safearth.com](http://safearth.com)

✉ [enquiries@safearth.com](mailto:enquiries@safearth.com)

Trusted provider of valuable solutions in every aspect of earthing system management for more than 30 years.

**safearth**