

TRANSMISSION, DISTRIBUTION & INDUSTRIAL SYSTEMS ANALYSIS

Substation Grounding

Short-Circuit

ARC Flash Hazard

Device Coordination

Power Cable Ampacity

And more...

CYMGRD, Substation Grounding Program

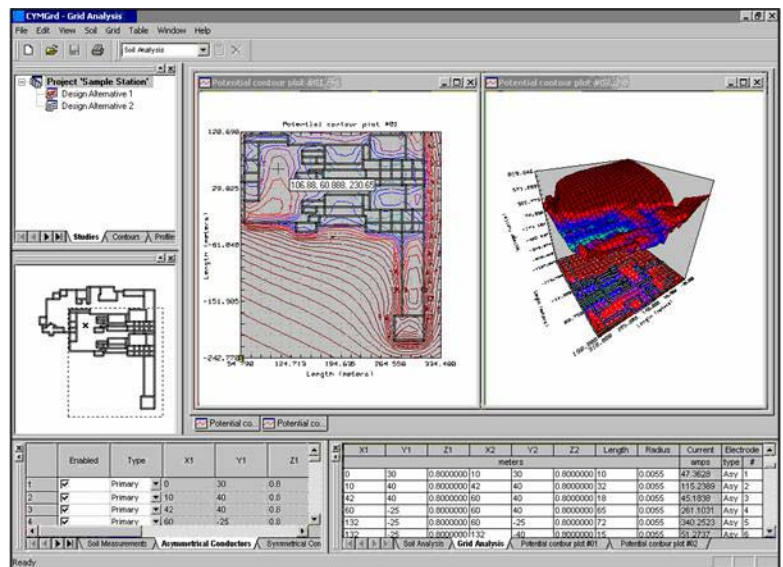
CYMGRD is CYME's substation grounding grid design and analysis module specially designed to help engineers optimize the design of new grids and reinforce existing grids, of any shape, by virtue of easy to use, built-in danger point evaluation facilities. The program conforms to IEEE Std. 80-2000, Std. 81-1983 and Std. 837-2002.

Program Features

The use of CYMGRD allows for the rapid analysis of various design alternatives to choose an economical solution for any particular installation. User-friendly data entry, efficient analysis algorithms and powerful graphical facilities render CYMGRD an efficient tool that helps the engineer arrive at technically sound and economical designs.

Analytical Capabilities

- Finite element analysis of the Ground Grid Conductors, Rods and wire assembly.
- Computation of Rg and GPR (Ground Potential Rise).
- Touch and surface potential analysis, inside and outside the grid perimeter, with color display in 2D or 3D representation.
- Step voltage analysis.
- Uniform or two-layer Soil Model from field measurements or user-defined values.
- Computation of reduction factor (Cs).
- Library of the most common types of surface layer materials.
- Library of typical station soil resistivity values.
- Safety assessment calculations for maximum permissible Touch and Step Voltages as per IEEE 80-2000.
- Current Split Factor (SF) estimated from substation configuration data as per IEEE Std. 80-2000.
- Computation of the Decrement Factor (DF) from bus (X/R) ratio and shock duration data as per IEEE Std. 80-2000.
- DC component of asymmetrical fault current taken into account in the computations.
- Electrode analysis for the optimal sizing of Conductors and Rods based on the most common type of electrode material as per IEEE Std. 80-2000 and Std. 837-2002.
- Supports symmetrical or asymmetrical grids of any shape.
- Arbitrarily located ground Rods.
- Ability to model Return electrodes and Distinct electrodes.
- Ability to model concrete encased rods.
- Computation of maximum allowable single phase to ground fault current for a specified grid.



CADGRD, The CYMGRD / AutoCAD Interface module

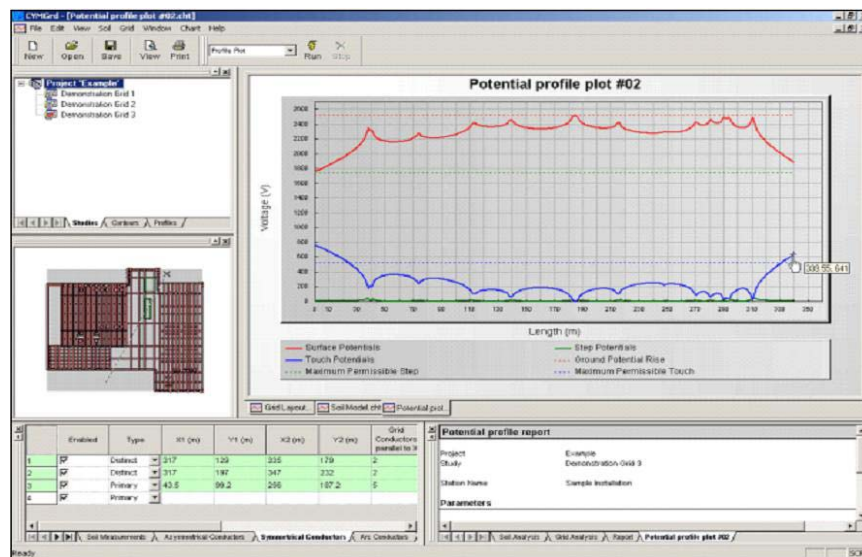
CADGRD is a utility program accessible through the CYMGRD menu structure, that allows the user to alternate between the AutoCAD and CYMGRD environments.

CADGRD is not a substitute for AutoCAD. In fact, AutoCAD remains a firm software requirement for CADGRD, because it is AutoCAD that will produce the necessary *.DXF and / or *.DWG file that contain the pictorial description of the substation grid layout.

CYMVIEW, Simulation Results Management

CYMVIEW is common to all simulation modules that generate any kind of charts. CYMVIEW is capable of managing the outputs of different modules including CYMGRD.

- Graphical comparison of deduced soil model with field measurements, for model acceptance.
- Color-coding of the surface potential gradients based on user-defined thresholds for Touch or Surface potentials. Any area of the grid can be selected with the mouse for detailed calculations and danger point evaluation.
- Equipotential contours for surface potentials in either 2-D or 3-D plots, with facilities to examine the graphs from any desired viewing angle.
- Graphics of Touch and Step voltage variation along any straight line, with comparison to the safe values computed by the safety assessment module.
- Graphic indications on the 2-D grid layout of the area being analyzed for Touch and Step voltages, for easy identification of hazardous locations.



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