

### **SoftTech: Software for ESR and GSR**

SoftTech Engineers Pvt Ltd, a Pune based organisation dealing in civil engineering software solutions has introduced a new software package which provides analysis, design and drafting of elevated service reservoirs (ESR) and ground service reservoirs (GSR) in a total integrated environment. The software is developed using *MS Windows* architecture to support high-end graphics and powerful user interface. It runs on *Windows 95/98/NT/2000*.

The package provides three dimensional (3D) space frame analysis using advanced finite element method. Earthquake load and wind loads are automatically computed as per IS 1893 and IS 875, respectively. Both static and dynamic analysis of the structure are done for horizontal loads on the structure. The reports of analysis are generated in HTML/text form.

Design of container walls is done by the working stress method as per IS 3370 for uncracked section. Other components like staging columns, beams and foundations are designed as per IS 456 : 2000 by limit state method. Detailed calculation reports for design steps as well as concrete and steel quantities are produced in HTML/simple

text form for ready submission.

Graphical outputs of design drawings can be imported to *AutoCAD* by using the drafting interface which is in-built in the program. The design detailing is worked out as per IS 13920.

The available shapes for ESR are rectangular, circular, intze type and conical. Whereas for GSR, the shapes can be either rectangular or circular. For rectangular tanks, the bottom slab and top slab can be either flat slabs or slab-beam grid system. For circular tanks, the top and bottom slabs can be flat slabs, slab-beam grid system or domes. In case of intze type, the standard geometry of bottom dome, top dome, circular container and ring beams can be generated. For conical shape tanks, standard geometry of bottom dome, top dome and conical container are available.

Different types of staging systems for ESR can be provided. For rectangular tanks, it can be a staging of columns and beams with cross-connections. For circular intze and conical tanks, the staging can be a grid of beams and columns or a vertical cylindrical shaft. The generation of geometry is done graphically through an extremely user-friendly interface.

The software supports different foundation systems for the ESR depending upon their staging systems and soil conditions. For beam-column staging system, the foundation can be of isolated footings, raft foundations or under-reamed piles. Raft foundations can be slab-beam system or solid raft. For cylindrical shaft type staging, special annular raft foundation can be designed.

The software could be of help to the structural engineers for analysis and design of ESRs in earthquake prone areas.

In addition to the above, they also develop other software such as *STRUDS*, *STRUDS Steel*, *SEPL WT*, *SEPT Retwall*, *TECS*, *EasyFEM*, *Construction Manager*, *Microsurvey CAD*, *Felix CAD* etc.

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