

Self-Standing Compound Wall

SSWALL - Self Standing Boundary wall - is a sustainable technology of manufacturing precast concrete wall that combines greater stiffness matrix & a rib profile, thus reducing the thickness of the wall panel. It has a hollow counter weight in which earth has got to be filled and plants grown. The stabilization happens by the anchorage of roots. The rib profile is based on dummy rib theory and has only single layer reinforcement. The rib profile makes the panel behaves like a monolithic structural system. The monolithic behavior of the panel- with combination of greater stiffness matrix has reduced the volume of material being consumed. SSWALL panels help improve the quality of work and cost effective / complete, and can be erected by regular construction workers with the help of a crane and a jig. The Precast SSWALLS are factory manufactured boundary walls manufacture in a controlled environment.

Size of wall – 2.440*1.50 m

Panel face thickness -50mm

Ribs including panel -100*100mm

Reinforcement used -MS 6 mm dia

Volume of SSWALL -0.31cu.m

Weight of SSWALL -775kg

Weight of rebar – 8.8 kgs

What it changed or replaced?

The SSWALL is an eco-friendly precast concrete compound wall. Any structure has got to have a foundation for stability. Usually the foundation of a structure is below the earth formation level. As the foundation is below the earth - earth has got to be removed to place the foundation at required depth. Once the foundation is constructed, the excess earth has got to be disposed of, which ends up in lakes filling or any other location- which is **hazardous** to the **environment**. We have adopted a novel concept of a hollow counter weight theory - which gains stability by an action of roots getting embedded firmly into the soil — following the concept of soil nailing theory. Here a concept of soil - soil cohesion bonding, friction bonding, and plants-for anchor the wall. As the plant grows taller - the roots will grow deeper into the soil. This concept is used - on the principle soil soiling nailing theory. To simplify installation of precast walls, the earth has got to be leveled and the wall just placed on top of earth. To maintain horizontal level, a bed block at the junction of two walls may be preferred. Due to the concept of counter weight, SSWALL is stable by itself. To economies the SSWALL – a dummy rib theory is used – in lieu with stiffness matrix theory. By consolidating the freshly filled earth into the counter weight by watering – a cohesion bond is formed between soil – soil interface. There is no chance of slip or over-turning failure as the roots are embedded into the soil. This concept is not only environmentally friendly; it also enhances aesthetic beauty as plants are grown. Simple to install and easy to transport. Economical and user friendly. SSWALL is shaped & structured to make full use of its profile. Since the thickness is less, quantity of material required is less. It is placed on top of earth or with nominal excavation – can be placed on firm ground. The need for earth work excavation is minimal. There is no need to dispose earth which would have occurred in a regular masonry construction. In general –earth are disposed as landfills into lakes.

Concept:

For stability – uses a concept of counter [hollow space] weight. The counter weight has got to be filled with earth. Then plants are grown in this space. As the plants grown- the roots of the plant get firmly embed into the soil. This effect will act like soil nailing theory – thus enhancing the structural stability of the Walling system. Easy to erect and shift . Demoulding of precast wall panels-in regular climate (Sun) -24 hours before curing. Construction debris- can be recycle and used in these wall panels. Environment friendly. Aesthetic serenity. Prevents soil erosion. Economical viability.

Where & when it originated?

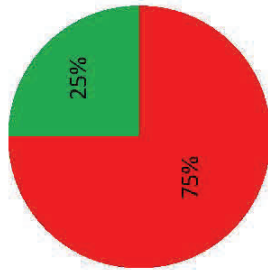
The reality of reducing skilled labour and escalation in material cost which pushed the project beyond schedule and cost over runs, KT group, partners, came up with a concept of thin precast walls. The idea was conceived by Mr. Kartik Janakiram BE. How does roots – anchorage stabilize, the soil from being eroded even on a sloping ground? Is there a need for a beam to stiffen the panels – why cannot we just provide a rib to enhance rigidity of the wall? With this in mind and, after preliminary calculations the first prototype was made in 2013 Mysore, Karnataka, India. The SSWALL is a thin concrete panel- which has great scope in the future.

SSWALL [self standing compound wall without a foundation]

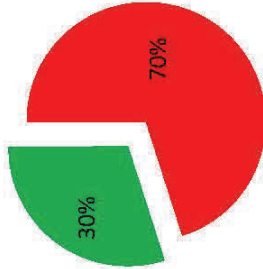
Roots – anchorage used for stabilization



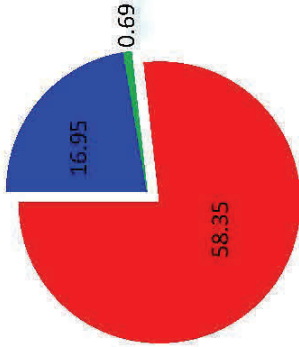
TIME ANALYSIS



COST ANALYSIS



MANPOWER ANALYSIS



MAN
MACHINE
CONVENTIONAL MASONRY WALL
PRECAST SSWALL

SSWALL panels are self standing precast compound wall placed on top of leveled earth – the concept of counter weight being anchored by roots against slip and over turning – is adopted. For economy a dummy rib theory is adopted to enhance the stiffness matrix of the system.

SSWALL – Self Standing RCC precast Compound wall

- Panel 50 mm thick,
- Hollow counter weight.
- Placed on level earth.
- Earth filled and plants grown.
- Stabilization by roots –anchorage of vegetation grown.
- Stiffness matrix used – dummy rib concept-
- Weight –775.00 kgs / number
- Shifting of panel – 24 hours before curing , to curing bay;
- Size of wall – 2.44 *1.50 m
- Thickness of rib -100 *100 mm
- Rebar - 6 mm dia [8.8kgs]
- Customized lifting jig required.
- Earth refill / wall = 0.22 cu.m
- unload & install = 3 mins / wall

