CATEGORY

PROVEN TECHNOLOGY CATEGORY : GHTC-INDIA

PRODUCT / TECHNOLOGY

MODULAR TUNNEL FORMWORK SYSTEM

Alternate to conventional RCC framed structure with bricks/blocks as infill walling material

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CONTACT DETAILS

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BRIEF

Tunnel formwork is customized engineering formwork replacing conventional steel/plywood shuttering system. It is a mechanized system for cellular structures. It is based on two half shells which are placed together to form a room or cell. Several cells make an apartment. With tunnel forms, walls and slab are cast in a single day.

Tunnel formwork is customized engineering formwork replacing conventional steel/plywood shuttering system. It is a mechanized system for cellular structures. It is based on two half shells which are placed together to form a room or cell. Several cells make an apartment. With tunnel forms, walls and slab are cast in a single day. The structure is divided into phases. Each phase consists of a section of the structure that will be cast in one day. The phasing is determined by the program and the amount of floor area that can be poured in one day. The formwork is set up for the day's pour in the morning. The reinforcement and services are positioned and concrete is poured in the afternoon. Once reinforcement is placed, concrete for walls and slabs shall be poured in one single operation. The formwork is stripped the early morning next day and positioned for the subsequent phases. The on-site implementation of 24 hour cycle is divided into following operations.

- Stripping of the formwork from the previous day.
- Positioning of the formwork for the current day's phase, with the installation of mechanical, electrical and plumbing services.
- Installation of reinforcement in the walls and slabs.
- Concreting and if necessary, the heating equipment.

This system has been designed and developed to ensure that it is simple and quick to assemble and position the following:

- A full range of standard dimensioned components
- Multiple combination of panels for simple adoption to specific configurations
- Basic standard equipment incorporates com-

plete safety, circulation and stability equipment

- Calliper–device opposing Wall form packages are craned into position in one lift.

Characteristics of the system

- Maximum span between walls shall be 5.60 m without accessory units and 7.00 m with accessory units.
- Height of the formwork – The forms are designed for floor to ceiling height of 2.51 m minimum with the possibility to increase this by action of the leg jacks or with the use of movable panels in the event of extra heights.
- Appearances of the faces after form removal – The surfaces obtained allow direct application of finishing paint or wallpaper after sanding off the fins at the joints connecting the units and smoothing with paint filler.
- Working rhythm using the system – Under average temperature conditions, with the use of ordinary cement, the normal rhythm is two days per cycle with one day and two nights for drying and setting of the concrete.
- Time period required for execution of the process – The time required for execution shall vary according to the cell plan. For a type cell consisting of two formed wall surfaces and a floor surface, the average time is less than one & one half hours per square meter of building.
- Cost effectiveness: Highly cost effective due to repetition of formwork.(24 hours cycle)
- Resource efficiency.(saving of natural resources like sand, lime stone water)
- Quality &Durability.
- Environment friendliness including use of Agro-industrial wastes
- Ease of Working: can be operated very easily using mechanical means hence reduce manpower and speed up the construction work.
- Earthquake & Wind Resistant
- The equipment used each day is productive and is reused in subsequent phases.
- The existing equipment can be adapted on a day-to-day basis by the addition of standard elements and corner wall formwork to take into account different wall configurations on site.

ECONOMIC ASPECTS

- Highly cost effective.
- Reduced manpower and increased speed of construction.

SUSTAINABILITY ASPECT

- Reuse of Agro Industrial waste.

SUITABILITY AND AVAILABILITY

- Suitable all type of climate
- Suitable for individual/scattered and low to medium height houses.

LIMITATIONS, IF ANY

- The floor spans executed with movable forms shall not be more than 5.60 m, unless accessory units are used.
- The thickness of vertical in-situ walls shall not be more than 120 mm.
- Adequate working space is required to remove Tunnel formwork.
- Architectural design and planning should be suitable for Tunnel formwork.
- Unsuitable for small scale projects.

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MARKET LINKAGES

- Available across nation.

MAJOR PROJECTS

- Light House Project at Rajkot (1144 nos.-under construction).
- Apartments by M/s Runwal Group at Mumbai
- Apartments by M/s L&T South City Projects Ltd., at Chennai.

CERTIFICATION/INDIAN STANDARD/ENDORSEMENT

- PAC by BMTPC.