



Table 3-1: Masonry Technique Comparison

Factor	Green Precast Modular	Block work	Conventional Panels
Build concept	<ul style="list-style-type: none"> ◆ A single trade and sub-contract package ◆ Cast complete rooms in one piece and install with a single lift ◆ Sub-terrain structures 	<ul style="list-style-type: none"> ◆ Requires separate structures of beams, columns, and floor system using pre-cast ◆ Wall in-fills need more jointing detail ◆ Must use separate floor system for multi-level 	<ul style="list-style-type: none"> ◆ Flat elements cast on flat table and installed individually and requiring numerous joints, brackets and grouting
Factory Production	<ul style="list-style-type: none"> ◆ Monolithic cast of unit walls and ceiling, to between the equivalent of 5 and 14 flat panels ◆ No brackets, props or vertical joints required ◆ Customizable for penetrations and openings ◆ Repetitious production of a module 	<ul style="list-style-type: none"> ◆ More on-site trades: reinforcement, brick or block laying, and rendering ◆ On-site labor intensive ◆ Load bearing needs to be steel and concrete reinforcement ◆ Concrete pump and untidy 	<ul style="list-style-type: none"> ◆ Larger factory area for equivalent production and many more vertical joints
Insulation	<ul style="list-style-type: none"> ◆ Closed joints reducing locations for air transfer ◆ Mould internal foam layer sandwich panel (200- 210mm) ◆ External UV reflective (up to 100%) coating, available in 45 colors 	<ul style="list-style-type: none"> ◆ N/A 	<ul style="list-style-type: none"> ◆ Must be cast in foam, walls have a perimeter boarder not containing insulation ◆ Many vertical joints ◆ Cast in foam layer does not extend to full area of panel
Wastage	<ul style="list-style-type: none"> ◆ Walls and roof act together structurally minimizing the volume of concrete, steel, reinforcing bars leading to less wastage 	<ul style="list-style-type: none"> ◆ Excessive site wastage, clean up, disposal: cutting of bricks, pallets, mortar, sand piles, hoses, and water 	<ul style="list-style-type: none"> ◆ Minimum 2 layers of reinforcing for insulated walls ◆ Requires extra 12m vertical jointing per room



Factor	Green Precast Modular	Block work	Conventional Panels
Finishes	<ul style="list-style-type: none"> ◆ Plain, colored oxides, or sandblast ◆ Cornices are built in ◆ Internal and external paint can be applied in the production process 	<ul style="list-style-type: none"> ◆ Only achieved by site application, increased labor cost and inferior accuracy ◆ Colored bricks available, generally need to apply another finish or lining 	<ul style="list-style-type: none"> ◆ Factory painting not possible due to multiple joints ◆ Color variation, as panels are poured separately ◆ More visible joints
Labor	<ul style="list-style-type: none"> ◆ Hydraulic mold requires 8 men to operate up to 80M2 per 12 hours ◆ Installation requires 3 people 	<ul style="list-style-type: none"> ◆ Labor intensive ◆ Requires more site amenities, supervision, temporary services, and scaffoldings 	<ul style="list-style-type: none"> ◆ Each panel require 2 man days (~10 man days for 5 panels)
Installation	<ul style="list-style-type: none"> ◆ A single lift ◆ No propping or leveling ◆ Minimal site fittings, brackets, and dowels ◆ Solid working platform immediately available for subsequent levels ◆ Erect 4 levels in a day ◆ Greater accuracy, monolithic construction reduces bracket and joint costs, ~\$100 per room 	<ul style="list-style-type: none"> ◆ Slow ◆ Labor intensive ◆ More overhead costs 	<ul style="list-style-type: none"> ◆ Multiple small lifts, causes delays, 2 levels/day max ◆ 5 crane movements to install panel ◆ Individual propping and leveling ◆ Less accuracy, with accumulating errors ◆ No immediate working platform until all jointing is completed
Transport and lifting	<ul style="list-style-type: none"> ◆ 1 crane to extract and place for yard and site 	<ul style="list-style-type: none"> ◆ Extensive scaffolding material hoist, safety provisions 	<ul style="list-style-type: none"> ◆ Need ~8 cranes on site
Services	<ul style="list-style-type: none"> ◆ Windows and door frames, and electrical and plumbing conduits built into mold ◆ Can cast holes in roof slabs for vertical plumbing service running from top to bottom of building 	<ul style="list-style-type: none"> ◆ Must be progressively manually built-in or chased in later 	<ul style="list-style-type: none"> ◆ Impractical to install factory windows ◆ Corner electrical joining impossible ◆ Plumbing service holes more difficult



Factor	Green Precast Modular	Block work	Conventional Panels
Hydronic heating/cooling	<ul style="list-style-type: none">◆ Pipes can be cast into floor for efficient heating and cooling	<ul style="list-style-type: none">◆ Not possible	<ul style="list-style-type: none">◆ Difficult/impossible to do with hollow core planks
Safety	<ul style="list-style-type: none">◆ Modern lifting techniques◆ Safe working platforms◆ Limited access to external surface required	<ul style="list-style-type: none">◆ Excessive site labor with potentially high injury risk.◆ Loose power leads, hoses, scaffolding creates safety risks.	<ul style="list-style-type: none">◆ Installation requires temporary phase with added safety requirement

There are alternative modular technologies but each offers inferior quality modules. The process for producing the module is a cross between traditional panel production and modular production. These technologies use a three-dimensional mold but not a single pour technique. Panels are poured and then allowed to cure for four, six to eight hours before another panel is poured. Although this does produce a single unit with closed joints, not being allowed to cure at the same time reduces the strength of the joints. This increases the probability of cracks and gaps that result in excessive water leaks and reduce the energy efficiency, durability, and safety of the model and the entire structure.

None of these alternative modular systems are known to be currently available in the UAE market; Green Precast's first mover position will be a deterrent to other technologies from competing in the market.