

Global Water & Energy Ltd.

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Pure Water Solutions for a Living Planet

PMIP CONSTRUCTION



PMIP Technical Specifications

The Pre-Manufactured Insulated Panels (PMIP) consist of a high-density expanded polystyrene core material bonded to, and acting integrally with, relatively thin, high-strength facing materials consisting of cellulose based fiber cement boards. When used as a wall, roof, or floor system in housing and multistory building apartments, the PMIPs provide exceptional strength for the amount of material used, superior insulation and acoustical properties. In combination the PMIP panels provide the best of both worlds while having numerous advantages over standard building materials.

This superior construction method can be used for housing, offices, schools, hospitals, barracks, work camps, and other construction needs, where high quality, rapid construction at affordable cost is desired.

Panel Assembly-

Interconnecting splines are typical of panel-to-be attachment. Splines are 3.5" – 4" wide strips running the full length or height of adjacent panels, parallel to, and at both faces. At panel joints, the splines are shared by adjacent panels, with each panel connected by screws to half of the spline. Panels are manufactured with the expanded polystyrene (EPS) foam core pre-cut to accommodate the thickness of the spline at its edges. Splines are typically at the same thickness as the panel skins where they are attached to. Thickness of the panels is determined prior to construction (preferably during design stage) in accordance with the loading, insulation and aesthetic requirements. Adhesives are not required during construction while special elastomeric sealants and bonding agents are applied at the joints and inter-connections with structure members, consistent with good workmanship. Any sealant or bonding agents used are compatible with the materials to which they are applied. Panels are aligned properly, are level and plumb, sealed and fastened within specified tolerances.

The panels are then fastened through the skins into the interconnecting splines. It is necessary that the splines be single pieces along the full length or height of the panels. It is acceptable with longer panels to use two or more splines to complete the length required, though as a rule, the longer the individual splines the better.

Floor Panels

Manufactured with fiber cement board facings or oriented strand board on both sides of the polystyrene core. The floor panels can be of various thickness governed by strength serviceability requirements and acoustical needs. Spans of up to 12 feet without supports are available. PMIP floors are not “springy” nor do they “squeak”. Floor panels are excellent soundproofing between floors, in apartment buildings for example. When panels are installed, the floor is ready for floor covering.

Wall Panels

It can accommodate various interior and exterior finishes in conjunction with the main PMIP wall. An exterior finish can be T-111, metal or aluminum, brick or masonry tiles, aggregated wash-out, plain concrete texture, stucco and different wood finishes such as cedar or split log. The PMIP offer excellent insulation and acoustical properties. It is great for common walls or party walls, partition walls firewalls and cladding.

Roof Panel

This is excellent for cathedral ceilings and high ceilings. Roof panels will span 12 feet without support. Typically a ridge beam is needed at the center with panels resting on beam and exterior walls. With a free span of 12 feet, a building could be designed with 24 feet width space. If more width space is required, intermediate beams will have to be provided or partition walls can act as supports at intermediate locations to accommodate wall span requirements. Roofing panels can be manufactured with varying thickness. The thicker the panel, the more savings on heating or cooling is achieved.

The roof panel is the most versatile on the market. When panels are in place, they can be used as the roofing material itself. It can be painted in line with the owner requirements or can be applied on with additional aesthetic features such as wood shakes, sheathing, or plastic roofing.

Panel Openings

Window and Door openings in walls are typically pre-cut at the plant prior to delivery to construction site in accordance to the design drawings. Panel openings are prepared by cutting through the full thickness of the panel. With the panel section removed, the EPS is recessed from the cut opening to accept a dimensional lumber wrap or C-channels.

2X lumber material is typical of sills and jams, 4X or larger lumber material may be required at the header depending on the width and location of the opening. The dimensional lumber faces align with cut panel skins. In the absence of lumber, galvanized steel C-channels can be used corresponding to dimensional lumber specifications. It is acceptable for an opening to span through a spline connection though it should not begin or end within 6” of a panel joint with a spline connection.

An opening may exist immediately next to a post within the wall with the jamb nailed directly to the post, providing the header is properly supported.



Benefits of PMIP

Builders and Contractors

- Ease of Construction
- Faster Build Time
- Lower Costs
- Non-Combustible Facings- High-Fire Rating
- Structural Integrity
- Green building Technology and LEED compliant
- Design Friendly
- High Wind Resistant

Consumers

- Lower Utility Bills
- Fire Resistant
- High Acoustical Property
- Mold and Moisture Resistant
- Termite and Pest Resistant
- Earthquake Resistant
- Environmentally Safe
- High Wind Resistant

Structural Integrity: A PMIP building is significantly superior to a conventionally framed building in terms of shear resistance, flexural strength, compressive resistance and uplift resistance. Evidence of the superior performance of PMIPs can be found in the real world, where PMIP houses have survived earthquakes and hurricanes when the stick-built houses around them were destroyed.

Earthquake Resistance: Earthquakes will not bother the PMIP Building System unless the ground sinks which effect the building and its foundation. Seismic Tests have been conducted on the PMIP Building Systems by the FAS (Federation of American Scientists) engineers and have withstood and suppressed the strongest earthquake and ground acceleration recorded in history. It has successfully met the acceptance criteria of structural integrity stated in the test plan during the 5 seismic simulation tests it has undergone.

Moisture Protection: PMIPs have a very low moisture permeability which makes it an excellent choice for a building structural and thermal envelope as well as roofing material. These panels are also excellent choice for basements and foundation wall when designed and engineered in accordance with its physical properties. It's insulation characteristic creates warmer areas and during cold weather conditions and cooler areas in the summer below ground applications.

Fire Resistance and Retardation: Meet and exceeds fire tests required for the type of buildings and structural components for which they're normally used. The fiber cement surface is non-combustible, will not burn, and has a zero flame-spread index, a zero smoke development number and a fire rating of zero (accdg. To NFRA). The EPS

is fire retardant with a flash point between 600 degrees and 650 degrees F, as opposed to Douglas which has a flash point of 500 F degrees.

Wind Resistance: Standard installed panels can withstand winds of over 150 mph and are easily upgraded to withstand 200mph winds.

Termite and Rodent resistance: Fiber cement boards won't burn, rot or cup and is impervious to salt spray, termites, woodpeckers, carpenter bees, and other pests. Fiber cement siding is appropriated for hot and humid climates because it is resistant to rot, fungus, and termite infestation. Fiber cement holds paint for several years longer then wood. Have zero nutritive value for plants, insects or vermin. Borax is added to create another barrier against insects.

High Energy Savings: High R-factor and helps retain heating and cooling in a building resulting in a substantial reduction in utility costs. The expanded polystyrene dose not lose its insulation value over the years, nor dose it release toxic chemicals. Exceeds insulation costs and retain R-value over time. In an average 1200 sq. ft (140sq m) home, one would normally use a 3-4 ton A/C unit. With a PMIP panel home, that same area would only use a 1.5 – 2 ton A/C unit, a savings of 50% on an air conditioning expense.

Sound Insulation: PMIP panels are sound retardant. Low Noise Transmission. They are resistant to sound transmission and are excellent for apartment buildings, hotels and offices. They can also be used for interior party walls and floors in multiple dwelling units.

Electrical Systems: Electrical chases are pre-cut into the foam core of the panel prior to assembly. The PMIP panel ESP core, because of its high insulation values, act as electrical chases for electrical wiring within the building envelope, thus eliminating the need for added piping protection, thus providing additional savings in construction costs.

Construction Ease: Designed to help you build better buildings in less time. PMIP panels are quick and easy to assemble, saving significantly in labor costs. Skilled help is unnecessary, making the panels an excellent choice for do-it-yourself builder. PMIP panels can be per-engineered thus eliminating many of the steps that are normally required on the job site in a conventional building construction. Built-in insulation, exterior and interior are ready to receive almost any type of finish, such as plain latex paint, stucco finish, metal or aluminum siding, colored granules, pea-gravel, decorative tiles or various types of aggregate texturing: Exterior requires no moisture sealant, panels can be customized in the factory to meet your individual needs.



Work site has limited debris and minimal tools needed to make this construction go smoothly



Product Approvals and Certifications

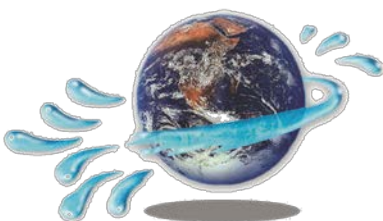
- ICC Certification Report
- Seismic Testing Certifications
- Moisture Test Data
- Endorsed by the Federation of American Scientists
- Approval from the Florida Building Code
- Signed agreement with the Haitian Building Counsel (USAID)

PMIP Savings

- Materials
- Time
- Labor
- Money
- Energy

PMIP construction is the most environmentally friendly of all contemporary building methods. The expanded polystyrene (EPS) foam core doesn't contain harmful CFUs that affect the ozone layer and is manufactured using non-toxic products. Compare that to fiberglass insulation, which is manufactured with toxic material content and is required to have a cancer warning on every roll.

Building made from PMIP panels helps reduce pollution and also save energy and forests by consuming much less heating and cooling energy, thus reducing utility bills and reducing the need for lumber. There is also much less waste from PMIP- designed building than a conventional building, saving land fills space and reducing pollution from burning waste. PMIP panels are a green alternative building system and LEED (Leadership in Energy and Environmental Design) compliant. The PMIP building, thus PMIP are designed to become the preferred construction material of building professionals.



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