

BIP Application Checklist for Innovative Building and Construction Materials

Introduction:

To facilitate BIP evaluation, all applications shall include the drawings, detailing, test reports, certificates, relevant approvals from overseas authorities, and other documentation of the proposed system covering sections (A) to (H) described below.

(A) General

1. Information on the intended usage of proposed material

- 1.1 Briefly describe the usage scenario for the proposed material.
- 1.2 Briefly describe why the proposed material is deployed for the above usage scenario.
- 1.3 Briefly describe the benefit(s) of adopting the material, such as:
 - Productivity gain;
 - Reduction of maintenance need/ frequency;
 - Cost reduction;
 - Reduction of environmental impact etc
- 1.4 Define if the proposed material is being used for structural or non-structural purpose.
- 1.5 List the project(s) for which the proposed material is going to be deployed and the adopter/ client. List may be provided in Excel format. Please provide a supporting letter indicating the intent of adoption (if any).
- 1.6 Briefly describe how the proposed material is being applied in the project(s) listed in s/n 1.5.(eg. for fire-resistance, corrosion-retardance, waterproofing, as a standalone material, replacement for other materials, integration with other materials, for main building structure, roads, pavements, civil works etc). Please provide illustrations if necessary.

2. Information on the specifications/ performance of the proposed material to show that the material is fit for its intended usage

- 2.1 Briefly describe the proposed material, its characteristics and suitability of usage
- 2.2 Attach the Material Safety Data Sheet/ Product Safety Data Sheet of the proposed material.
- 2.3 Attach relevant certification or test results conducted according to relevant code(s) by the accredited laboratory, to show that the proposed material is fit for its intended usage as listed in S/N 1.1.
- 2.4 Highlight any potential regulatory issues associated with the use of the proposed material. (eg. Fire rating concerns, leaching of heavy metals, etc) and seek the relevant authority's approval.
- 2.5 Highlight any potential safety issues associated with the use of the proposed material.
- 2.6 To the best of your knowledge, please list any existing product(s) in the market used for the same scenario, which is comparable to the proposed material. Please also provide a comparison between the proposed material and the existing product(s) in terms of the following:
 - Material performance;
 - Material selling price;
 - Material availability;
 - Appeal to the industry

3. Information on the commercial readiness and supply of the proposed material in Singapore

- 3.1 Briefly describe the relationship between the Applicant and the material supplier? (eg. developer-client, supplier-licensed dealer of the material, etc.).
- 3.2 Briefly describe the business plan for this proposed material in Singapore. (i.e. Pricing model, commercialisation model to reach out to targeted adopters, etc.)
- 3.3 List the production/ supply source(s) of the proposed material.

- 3.4 List the production location(s) of the proposed material and provide the Factory Production Control (FPC) certificate of the factories.
- 3.5 Briefly describe the supply chain of the material into Singapore, and whether the supply is sustainable (please provide an estimated available volume of supply).
- 3.6 Provide the production capacity of the material globally and the supply capacity in Singapore
- 3.7 To the best of your knowledge, please list some accredited laboratories in Singapore that can conduct the tests based on the codes/standards listed in S/N 4.3.
- 3.8 For repair materials, please state the following:
 - The repair/ maintenance requirements
 - Availability of such repair materials and expertise in the industry and
 - Whether the repair/ maintenance materials are proprietary

(B) Design & Construction (BCA)

Note: To provide information to demonstrate compliance of the proposed material according to BCA's Building Control Act and regulations, local or international design codes and specifications. (please show approvals from overseas authorities where relevant). These include but are not limited to the following:

1. List the local/international codes/standards or approved documents by which the proposed material is regulated.
2. Attach test reports/certificates endorsed by accredited laboratories to show that the proposed material is fit for the intended usage.
3. List the local or equivalent codes/standards adopted for testing the proposed material.
4. Attach documentary proof to demonstrate the suitability and design adequacy of the proposed material, such as:
 - Structural analysis and performance assessment endorsed by QP (if any).
 - Detailed architectural and/or structural plans to illustrate the proposed use (min. A3 drawing size)

Technical assessment and attestation from an appropriate specialist, on the fitness of the product for its intended use. The technical assessment document shall be substantiated with details of the following:

- i. Mechanical resistance and stability;
- ii. Safety in case of fire;
- iii. Safety in use;
- iv. Short and long-term durability;
- v. Material compatibility if used as a composite with other materials.
5. Attach information and assessment reports of past track records of local and international testbeds/ pilots (if any).
6. Attach information of the Quality Control & Quality Assurance regime for the proposed material.

Section (C) to (H): To provide information demonstrating compliance of the proposed material according to technical requirements of the respective agencies. These include but are not limited to the following:

(C) Land Transport Materials and Workmanship (LTA)

1. Attach information on the performance requirements according to LTA's Materials and Workmanship Specifications and other regulations.

(D) Management of Working & Design Risks (MOM)

1. Technical assessment and attestation from appropriate specialist/s, on the occupational safety and health risks associated with the material usage, mixing, storage, handling, alternation, breaking down and disposal, during the construction, workplace occupancy, maintenance and demolition stages (herewith referred to as "the 4 stages of work"). The assessment should include the following:
 - a. Test reports/ certificates by SAC-recognised laboratories, in accordance to local and/ or internationally established codes.
 - b. Assessment of the material SDSes and identification of any toxic substance that would expose any worker in the 4 stages of work to levels in excess of the permissible exposure levels as specified in the First Schedule of the WSH (General Provisions) Regulations- Permissible Exposure levels of toxic substances (Long term) and (Short term).
 - c. Conformance to relevant WSH codes and standards associated with processing, application and use of the materials, including but not limited to:
 - Requirements on packaging / panel sizes taking reference from SS 569: Code of Practice for manual handling.
 - Absence of substances contributing to ill health effects as listed in SS 554: Code of Practice for indoor air quality for air-conditioned buildings.
 - Prevailing fire safety requirements and compatibility & precautionary advice on any safety or ill health effects when used/ in contact with other chemicals/ products or when exposed to hot work.
 - d. Recommended control measures to mitigate the safety and health risks to workers in the 4 stages of work.

(E) Sanitary and Water Services (PUB)

1. Attach information on proof of compliance to PUB's Stipulation of Standards & Requirements for Water Fittings (PUB S&R) and Singapore Standard SS 636:2018 Code of Practice for Water Services. This include the following:
 - A list of proposed water fittings types and its materials for conveyance of potable water.
 - Full and valid test reports for all proposed water fittings and materials which have been tested to standards stipulated in the PUB S&R, as documentary proof that they are fit and safe for potable water use.[Note: Only test reports from SAC-accredited test laboratory or its Mutual Recognition Arrangement (MRA) partners are acceptable. Test reports shall bear the SAC-SINGLAS mark or the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC-MRA) mark.]

For more information on stipulation of standards, please refer to PUB S&R at PUB's website at www.pub.gov.sg under Fittings & Standards webpage.

Proof of compliance to the prescribed standards stipulated in the Code of Practice on Sewerage and Sanitary Works (COPSSW) for pipes and fittings used in the sewerage and sanitary system. This include the following:

- Certificates of conformity/ test reports of all proposed pipe materials to show they have been tested to the prescribed standards stipulated in the COPSSW

- Materials and products tested in accordance with the prescribed standards stipulated in the COPSSW and certified by a conformance assessment body or certification body accredited by SAC-SINGLAS or under its Mutual Recognition Agreements (MRAs) are deemed approved and can be used in the sanitary/sewerage works. The manufacturer's name/ brand name or mark and the standards under which the products are conformed to shall be marked clearly on the pipes and fittings, manhole/inspection chamber frames and covers.

Attach information on requirements according to PUB regarding treatment of trade effluent/ leachate from the use of the material, if any, before discharging into public sewers.

(F) Fire Safety (SCDF)

1. The proposed material shall comply with the prevailing Fire Code requirements.
2. Detailed drawings of the proposed material to illustrate compliance to the Fire Code shall be submitted to SCDF for further evaluation and approval.
3. Where required to indicate the performance of the products/materials/systems, test reports issued by test laboratories accredited by Singapore Accreditation Council (SAC) or recognised under the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Agreement (i.e. between Singapore and other countries) shall be provided.
4. In the case of regulated fire safety products, test performance reports shall be certified by any of the accredited Certification Bodies (CB) in Singapore before they can be used for building construction in Singapore.
5. To avoid unnecessary delay of project completion, Qualified Person (QP) should engage the CB for early conduct of inspections to fulfil the surveillance regime requirements, where required.

(G) Environmental (NEA)

1. Attach information on environmental-related requirements according to the following codes/ standards:
 - Code of Practice on Environmental Health.
 - Singapore Standard on the Code of Practice for Pollution Control (i.e. SS 593:2013)
 - Environmental Public Health Act, Environmental Protection and Management Act, and their attendant regulations, including the Environmental Protection and Management (Control of Noise at Construction Sites) Regulations.
 - The materials do not contain any constituents that could pose health or safety impacts to building occupants.
 - Debris from building and construction works as well as from building demolition could be recycled for reuse and will not pose waste disposal problem.

(H) Planning (URA)

1. Attach information on storage planning requirements according to URA. Please note the following:
 - Suitable factory/ warehouse spaces shall be secured for the purposes of storage and production of the materials as they will not be allowed to take up TOL land.
 - Storage/ usage shall not affect the amenity or convenience of the surrounding developments