BuildTrust® Assessment &
Assessor Manual

BUILDTRUST® ASSESSOR CERTIFICATION PROGRAM

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What is BuildTrust®

The Micro Builders Association, Singapore (MBAS) created BuildTrust® with reference to Building and Construction Authority (BCA)'s CONQUAS, to develop and establish a standardised construction quality assessment scheme for the industry.

BuildTrust® is an independent assessment. Project engineers or architects should not use BuildTrust® to determine the acceptability of the building or components of the building project unless it is specified in the building contract.

Objectives of BuildTrust®

BuildTrust® aims to make quality assessment objective by:

- Measuring constructed works against workmanship standards and specification.
- Enabling quality assessment to be carried out systematically within reasonable cost and time.

Scope of BuildTrust®

- BuildTrust® sets out the standards for various aspects of construction work and awards points to works that meet these standards. These points are then summed up to calculate a total quality score known as the BuildTrust® score for the building project.
- BuildTrust® covers most aspects of general building architectural works and the assessment shall be completed prior to the application for TOP inspection, whichever comes first.

Derivation of BuildTrust®

- The minimum standards were derived from guides and information provided by the industries or based on the general specifications used in their projects.
- To meet the expectations of the end user, feedback from complaints, homeowners' survey findings and defects listing were also considered in refining the weightages and assessment standards for the future.
- During the development of BuildTrust®, a number of studies and trials were conducted to fine-tune its new test techniques and assessment standards. Moderation of the scoring system was carried out alongside trials to ensure accuracy, consistency and alignment with the expectations of end users.

BuildTrust® Relationship Chart

Item 1

The contractor needs to build as per owner's requirements.

Item 2

The owner needs to build as per authorities' requirement and get approval to build.

Item 3

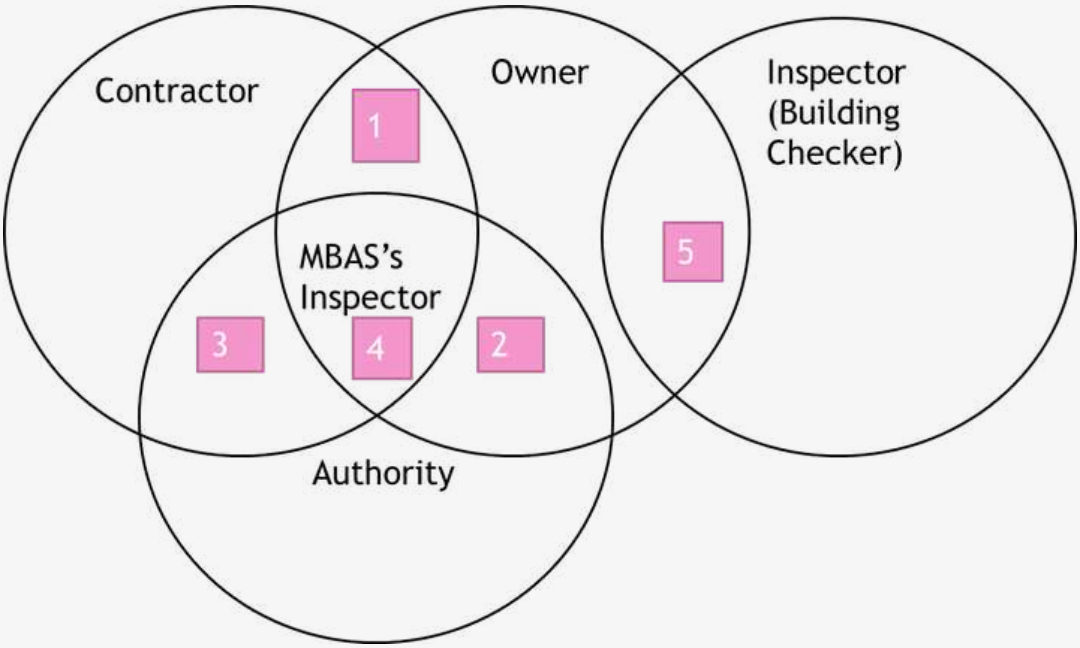
The contractor needs to follow authorities' requirement and legal construct the building.

Item 4

MBAS inspectors need to have the knowledge and understanding of the three parties. (contractors, building owners and authorities').

Item 5

The building inspector or checker are employed by the owner. They may not understand the construction details. Mainly just look for defects to meet their targets.



BuildTrust® Assessor

MBAS BuildTrust® Assessors undergo training programs and have experience in the building industry. They received trainings and calibration programs to ensure competency and consistency in the assessment.

Components to be Assessed

- Internal Finishes
- External Finishes
- Installation Methods Verification and Functional Test
- Bonus Points

Each component is further divided into different items for assessment. The assessment are primarily based on workmanship standards achieved through factory/site inspection.

The assessment on the functional performance of selected services and installations helps to safeguard the interest of the building occupants in terms of safety, comfort and the identification of defects that would only surface over time.

Component Weightages

Component	Weightage
Internal Finishes	60
External Finishes	20
Installation Verification Methods and Functional Tests	20
Sub Total BuildTrust® Score	100
Bonus Points	4
Total BuildTrust® Score	**104**

BuildTrust® Quality Grade

Scores 49 and below are considered a fail, and no certificate will be issued.

Quality Grade	Score
Accredited	50 - 59
Gold	60 - 74
Platinum	75 - 85
Platinum Plus	86 and above

Assessment Approach

Assessors will approach the assessment base on drawings and location plans. 100% samples to be inspected on site.

The scoring will be done on the works that are inspected for the first time. Rectification and correction carried out after the assessment will not be re-scored. The objective of this practice is to encourage contractors "doing things right the first time".

When an assessed item does not comply with the corresponding BuildTrust® standards, it is considered a failure and an "X" will be noted in the assessment form. Likewise, a "✓" is given for an item meeting the standards. A "blank" will indicate that the item is not applicable. The score is computed based on the number of "✓" over the total number of items assessed.

In general, if an item is absent from a project, it will not be factored into the scoring. In such instances, the score will be prorated accordingly. Conversely, if an available item is not submitted for assessment, it will be deemed a failure, resulting in no points being awarded.

Internal Finishes

Internal finishes deal mainly with the finishes and components. This is the part where the quality and standard of workmanship are most visible.

Component	Weightage
Floor	12.0
Internal Wall	8.0
Ceiling	4.0
Door	11.0
Window	8.0
Component	12.0
M&E Fitting	5.0
Internal Finishes (Total)	**60.0**

Internal Finishes

Component	Element Weightage	Defect Category	Defect Weightage
Floor	12.0	Finishing	3.6
		Alignment & Evenness	2.1
		Crack & Damages	3.6
		Hollowness	1.5
		Jointing	1.2
Internal Wall	8.0	Finishing	2.0
		Alignment & Evenness	1.0
		Crack & Damages	3.6
		Hollowness	0.8
		Jointing	0.6
Ceiling	4.0	Finishing	0.8
		Alignment & Evenness	0.8
		Crack & Damages	1.2
		Hollowness	1.0
		Jointing	0.2

Internal Finishes

Component	Element Weightage	Defect Category	Defect Weightage
Door	11.0	Joint & Gap	1.0
		Alignment & Evenness	1.0
		Material & Damages	2.8
		Functionality	3.4
		Accessories Defects	2.8
Window	8.0	Joint & Gap	0.8
		Alignment & Evenness	0.8
		Material & Damages	2.0
		Functionality	3.2
		Accessories Defects	1.2
Component	12.0	Joint & Gap	1.2
		Alignment & Evenness	2.4
		Material & Damages	4.8
		Functionality	1.8
		Accessories Defects	1.8

Internal Finishes

Component	Element Weightage	Defect Category	Defect Weightage
M&E Fitting	5.0	Joint & Gap	0.5
		Alignment & Evenness	0.5
		Material & Damages	1.5
		Functionality	2.0
		Accessories Defects	0.5
Internal Finishes (Total)	**60.0**		

External Finishes

The assessment will cover the roof, external walls and external works at the completion stage of the building.

Component	Weightage
Roof	5.0
External Wall	5.0
External Work	10.0
External Finishes (Total)	**20.0**

For the assessment of roofs, 100% will be assessed. For the assessment of external walls, 100% of the total number of buildings will be assessed. For a building, the external wall will be divided into 4 walls for assessment.

Each item in the External Work will be assessed separately and all the locations listed above must be assessed where applicable.

Installation Methods Verification

Installation methods documents and photos to be verified on the following 4 trades.

Component	Weightage
Internal Wet Area Waterproofing Process	0.5
Stone/Tiling Installation Process	0.5
Timber Flooring Installation Process	0.5
Windows Installation Waterproofing Process	0.5
Installation Methods Verification (Total)	**2.0**

The documents and photos will be verified by BuildTrust® Assessors against the submitted approved method statements with the site. They will also be compared against the BCA good industry practice guides.

Functional Tests

Functional tests will be carried out to check window water-tightness, wet area water-tightness and adhesion of internal wall tiles. Accordance to contract specification, set out by the Qualified Person (QP).

Component	Weightage
Field Window Water-Tightness Test (AMMA Test 501.2)	7.0
Wet Area Water-Tightness Test (With Arch works completed)	5.0
Water Flow Test	2.0
100% EN 14179-2 Heat Soak Test	2.0
Tiles Adhesive (Specifictaion)	2.0
Functional Tests (Total)	**18.0**

Bonus Points

Bonus points are awarded to projects that employ better buildable designs, facilitating higher quality achievement and maintaining good safety records.

Documents and photos demonstrating the successful implementation of the components need to be submitted to the BuildTrust® Assessor. This initiative aims to improve our industry's standards and methods of construction.

Component	Weightage
Good Workplace Safety and Health (WSH) practices	1.0
Using advance machineries for the project to cut down construction time	1.0
Implementation of innovative & productive methodologies	2.0
Bonus Points (Total)	**4.0**

Major Defects

Major defects are largely classified as defects that would either:

* Affect the livability of end-users and, hence, generally not be acceptable to end-users
* Affect the end-user and/or the functionally of the architectural, mechanical and/or electrical components in the building.

Examples are as follows:

* Any missing/broken accessories for the architectural items.
* Any cracked/chipped/broken windowpanes, shower screens, mirrors and any glass items.
* Any visually visible cracked tiles/stones, timber doors & flooring, ceiling boards and cracks on painted walls, etc.
* Functionally deficient doors, windows, wardrobes, cabinets, taps, water closets, switches, etc.
* Leaking in fan coil units, water seepage through walls or windows, etc.
* Misaligned door frames – only for cases where verticality tolerance is > 3mm per door frame height.
* The score will be adjusted if the actual work is different from the drawing or different from the owners' requirements.

Rectified Major Defects

* We allow contractors to verify major defects, however the score will not be affected or adjusted. We will monitor the situation along with the progress.
* The Resident Technical Officer or Qualified Person can verify the defects and submit it to the BuildTrust® Assessor.

Floor

Finishing

* No stain marks
* Consistent colour tone
* Floor divider provided where required

Floor

Alignments & Evenness

* Evenness of surface (not more than 3mm per 1.2m)
* Falls in wet areas should be in the right direction
* No ponding in falls for wet areas
* For the staircase, the variance in lengths of threads and risers must not exceed 5mm, nosing must be straight
* Skirting size and joint aligned with the floor if of the same material

Floor

Crack & Damages

* No visible damages / defects

Floor

Hollowness / Delamination

* No hollow sound when tapped with a hard object
* No sign of delamination

Floor

Jointing

* Consistent skirting thickness
* No visible gap between the wall & skirting

Types of Flooring

Screed Finish

* Surfaces should not be excessively rough or patchy
* No visible trowel marks
* Expansion joints should be provided at intervals as stated by the architect

Types of Flooring

Tiled Finish

* Consistent color and neat pointing
* No hollow sound when tapped with a hard object
* Joints are aligned and consistent with skirting and wall tiles
* Consistent joint size
* Lippage between two tiles should not be more than 0.5mm
* Expansion joints should be provided at intervals as stated by the architect

Types of Flooring

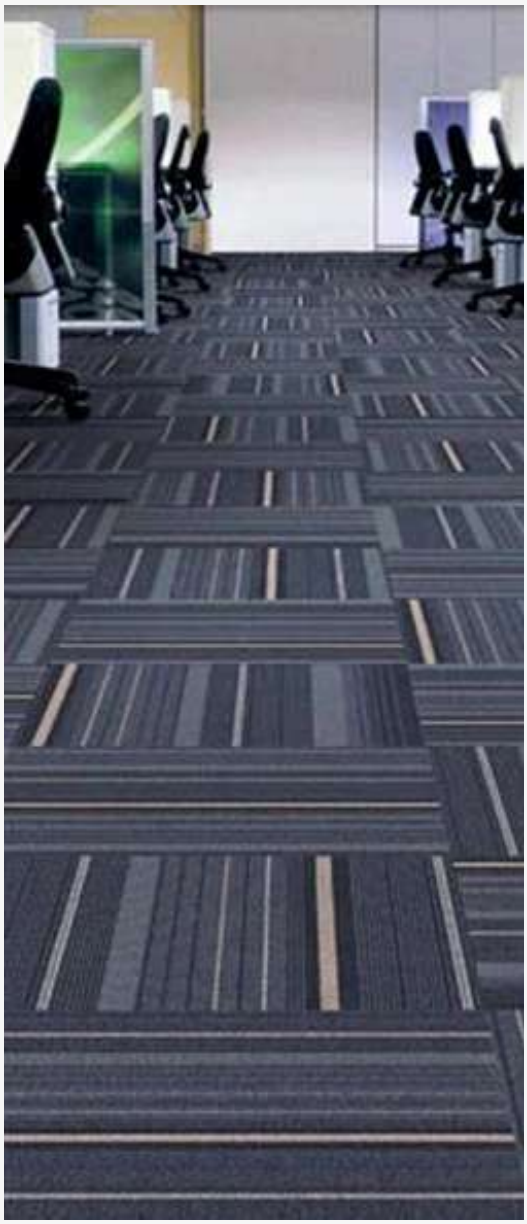
Timber Floor

* No warpage
* Timber strips should rest firmly on joists or screed
* No visible gaps in between timber strips
* Ensure edges of the floor to be properly sealed

Types of Flooring

Carpet

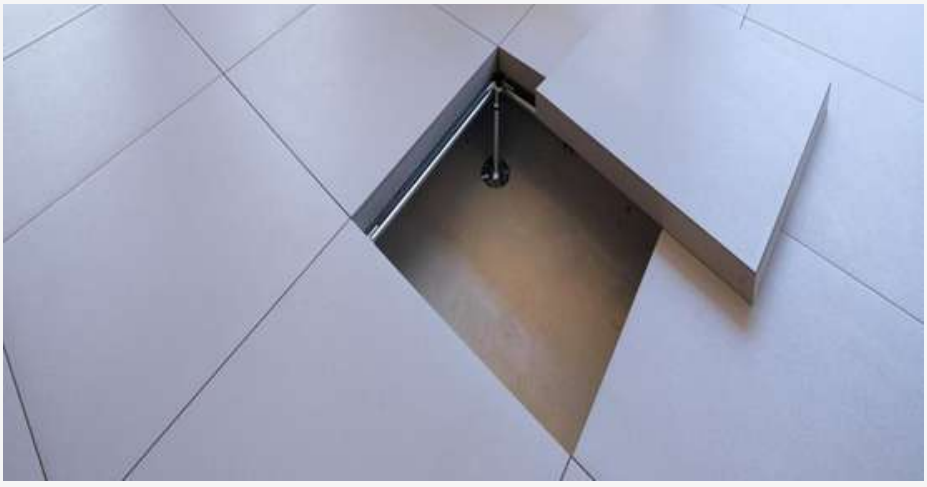
* Stretched and even surface
* Joints should not be visible
* Proper anchoring at all edges

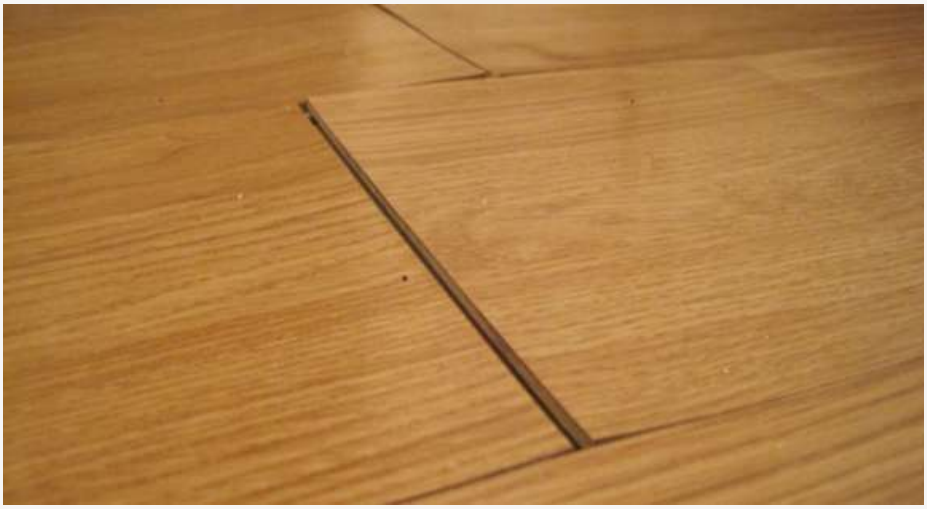


Types of Flooring

Raised Floor

* No loose floor panels
* No protrusions or potential of tripping over floor panels
* No jolting or rocking panels





Types of Flooring

Mass Engineered Timber (MET)

* Surface finish grade as per project's specifications
* Visual finish surface to be planed and sanded
* Knot size tolerance:
  ** Domestic grade – Not more than 20mm in diameter
  ** Industrial and Standard grade – Not more than 50mm diameter
* Voids to be filled if specified
* No damage, e.g, dents
* Crack tolerance:
  ** Domestic grade – not more than 200mm long and 2mm wide
  ** Industrial and Standard grade – not more than 400mm long and 4mm width
* Hollowness:
  ** Not applicable for exposed MET elements
  ** Not applicable for ceramic/stone/screed floor finishes laid directly on MET elements
  ** No hollowness for ceramic/stone floor finished laid on screed over MET elements

Flooring Samples

Closed vein is smooth and cannot be felt

After rectification, the floor should be smooth.

Flooring Samples

Consistent tonality (patterns and shades blend)

Flooring Samples

Inconsistent tonality

Flooring Samples

Uneven timber flooring

Uneven tiles with sharp edge

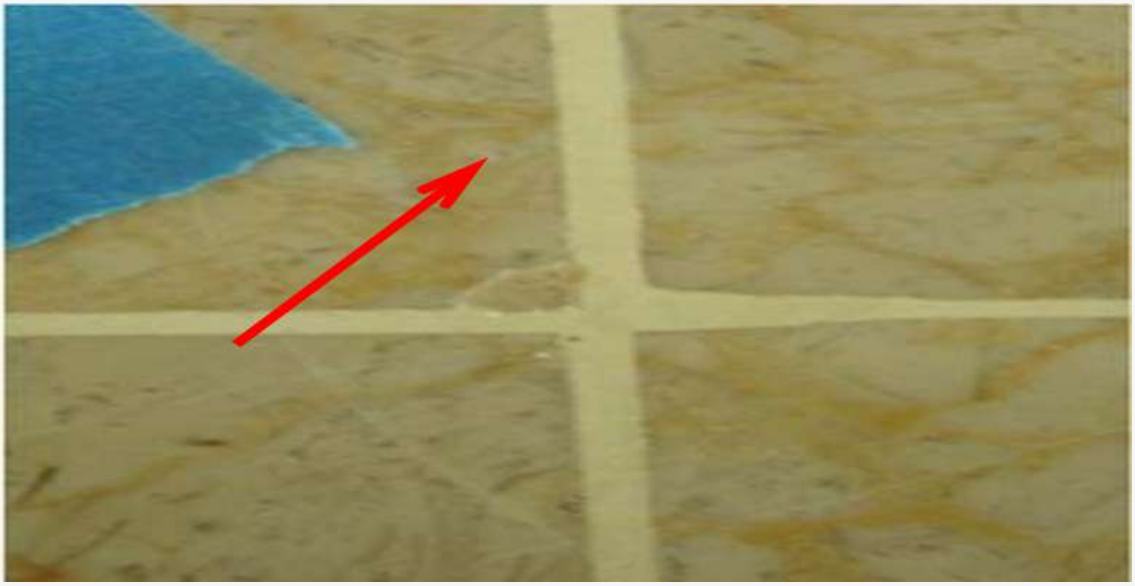
Flooring Samples

Chip-offs on marble

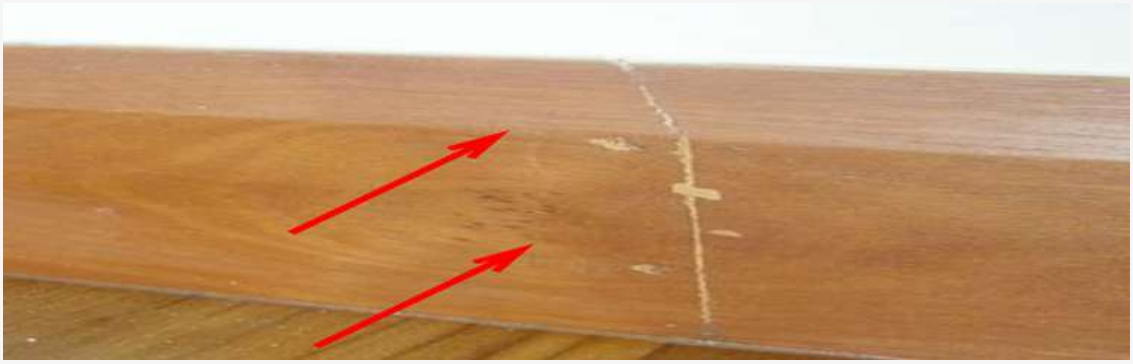
Indentationson timber

Flooring Samples

Poor touch-up on chip-off

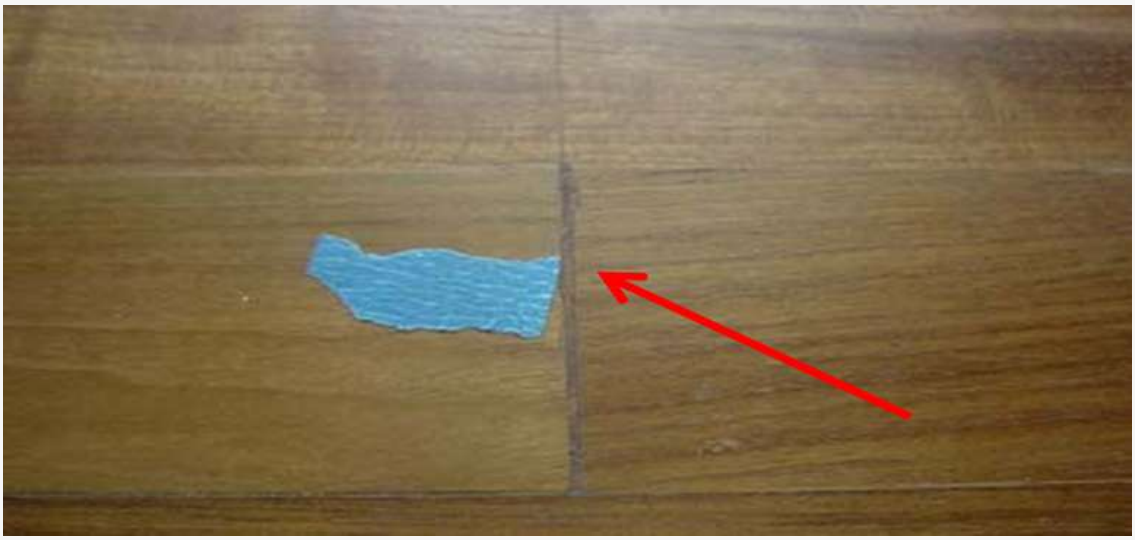


Poor touch-up on nail marks

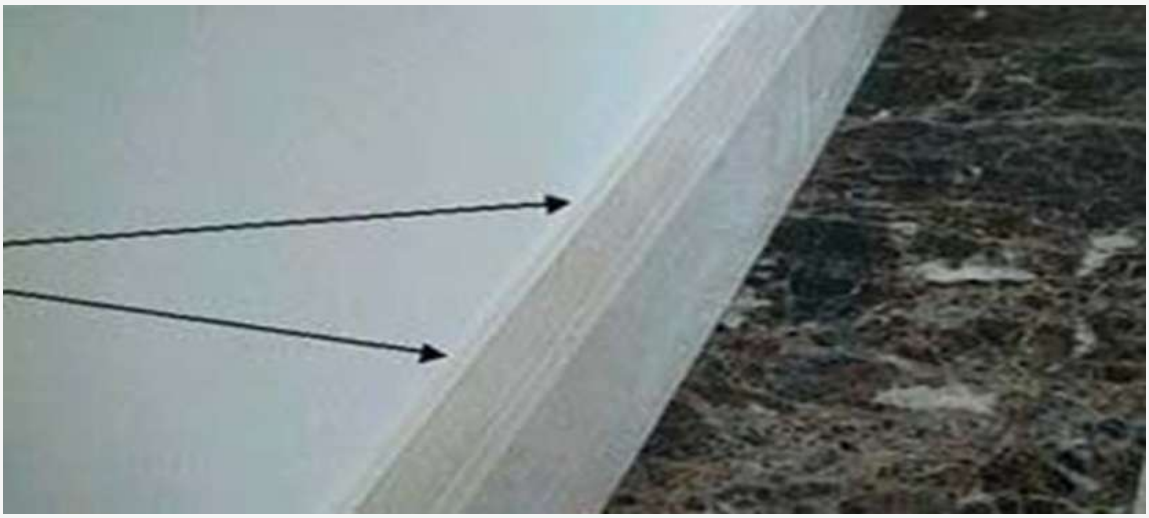


Flooring Samples

Inconsistent joints



Good consistent joint between wall and skirting



Flooring Samples

Inconsistent joints

Gap at skirting joint

Internal Walls

Finishing

* No stain marks
* Consistent color tone
* No rough or patchy surface

Internal Walls

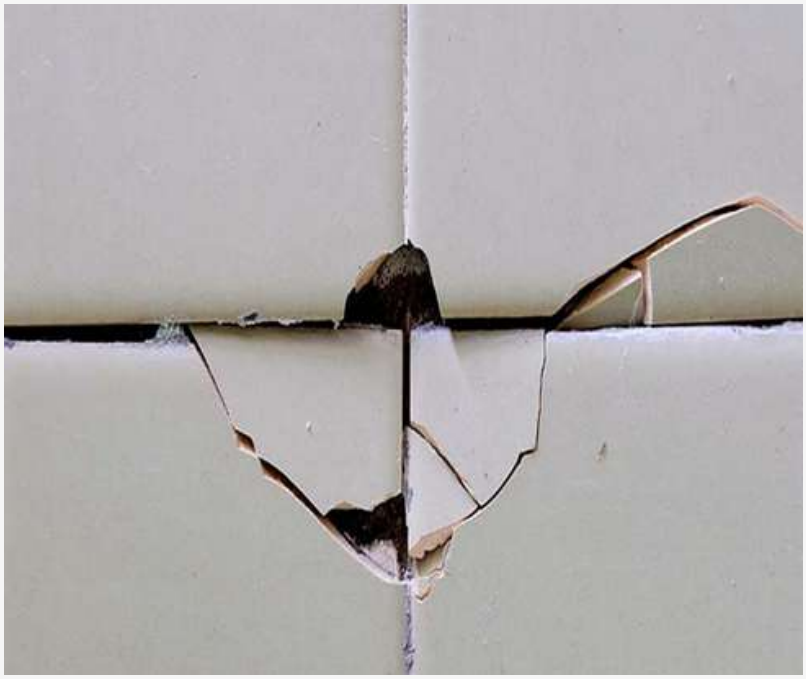
Alignments & Evenness

* Evenness of surface (not more than 3mm per 1.2m)
* Verticality of the wall (not more than 3mm per meter)
* Walls meet at right angles (not more than 4mm over)
* Edges (wall to wall) should appear straight and aligned

Internal Walls

Crack & Damages

* No visible damage / defects



Internal Walls

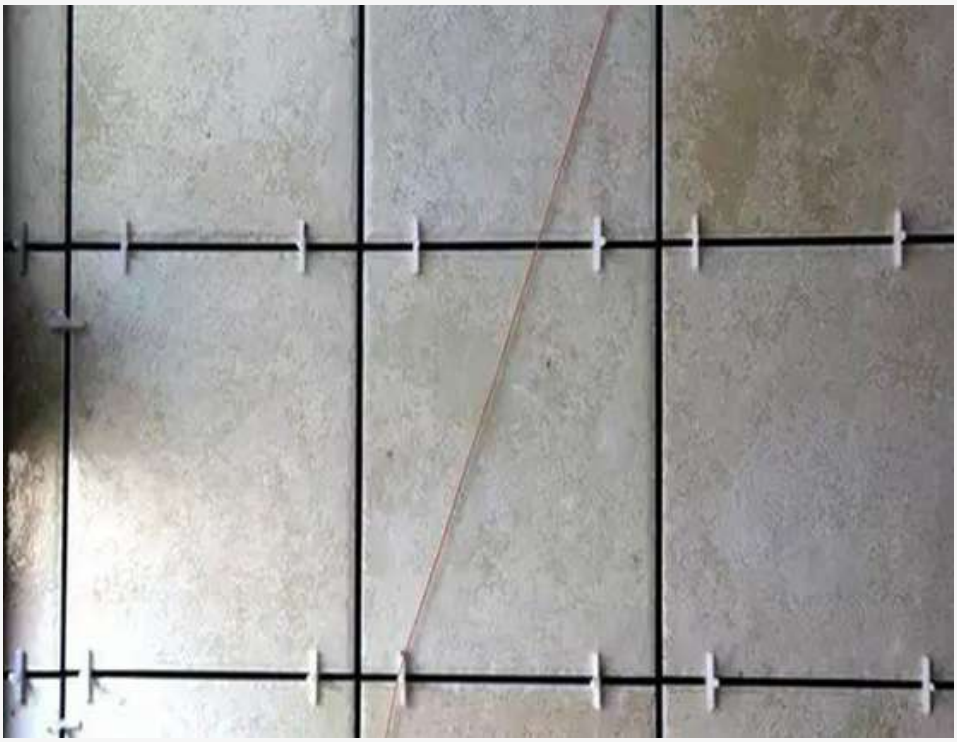
Hollowness / Delamination

* No hollow sound when tapped with a hard object
* No sign of delamination

Internal Walls

Jointing

* No hollow sound when tapped with a hard object
* No sign of delamination



Types of Walls

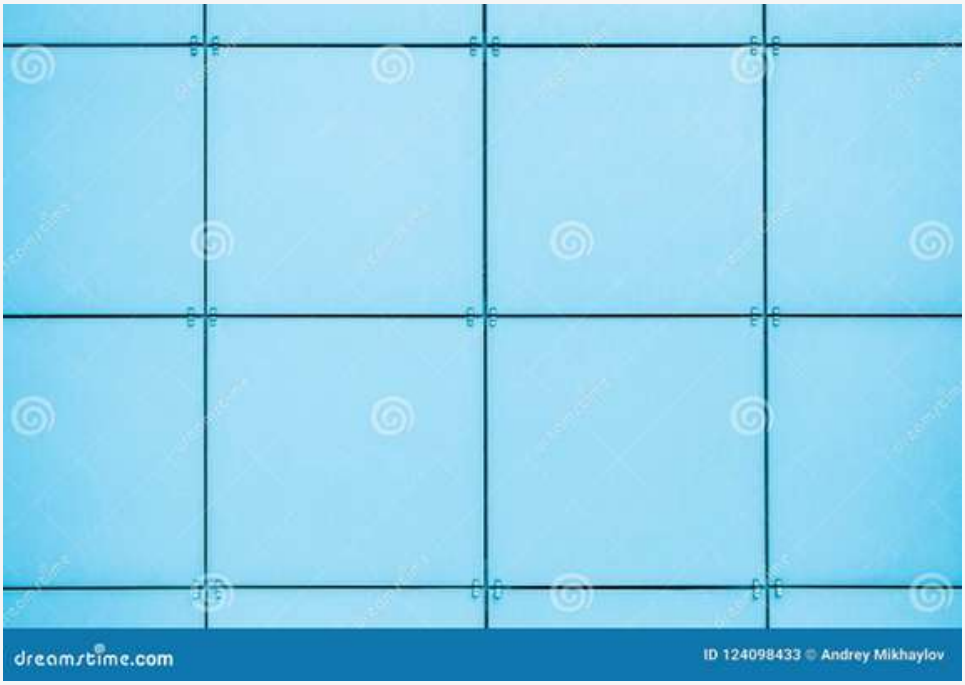
Plaster Finish

* Surface evenness (no more than 3mm over 1.2m)
* No hollow sounds when tapped with a hard object
* Surfaces should not be unduly rough or patchy especially with no brush or trowel marks

Types of Walls

Tiles Finish

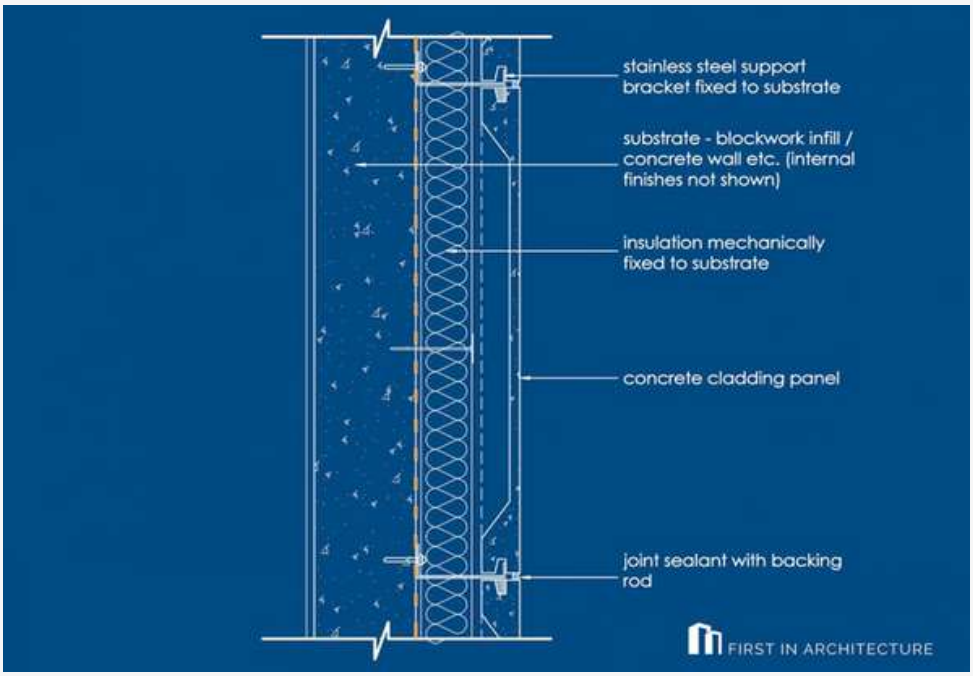
* Tiles joints aligned and with a consistent joint size
* No hollow sound when tapped with a hard object
* Consistent color and neat pointing
* Lippage between two tiles should not be more than 0.5mm



Types of Walls

Cladding

* Proper anchorage for panels
* Joints aligned and with consistent joint size
* Sealant material compatible with cladding
* Consistent spacing and within allowable tolerance



Types of Walls

Architectural Coating

* Substrate – see plaster finish
* Finished texture and colour to be uniform

Types of Walls

Painting

* Substrate – refer to plaster finish
* Surface is evenly painted
* Good opacity, with no patchiness resulting from touch up work
* Free from peeling, blistering and chalkiness
* No discolouration or fading

Types of Walls

Pre-cast Concrete Planks

* Alignment with adjacent planks should not exceed 3mm
* Plane tolerance (3mm/1.2m)

Types of Walls

Wallpaper

* Stretched and uneven surface
* Joint should not be visible
* Proper anchoring at all edges
* Edges should be neatly laid and finished

Types of Walls

Glass Block

* Pointings should be satisfactory
* Joints should be even
* Glass blocks should be properly aligned

Types of Walls

Wood / Timber Panels

* Timber panels should rest firmly on joists or screed
* No visible gaps between panels
* Edges should be properly aligned and sealed
* No warpages
* No cracks

Types of Walls

Fair-Face Concrete

* Consistence distribution of blowholes for the same samples / surrounding area
* All blowhole sizes to be equal or less than 8mm
* Consistent tonality for the same samples / surrounding area
* No exposed aggregate
* No cracks and damages

Wall Samples

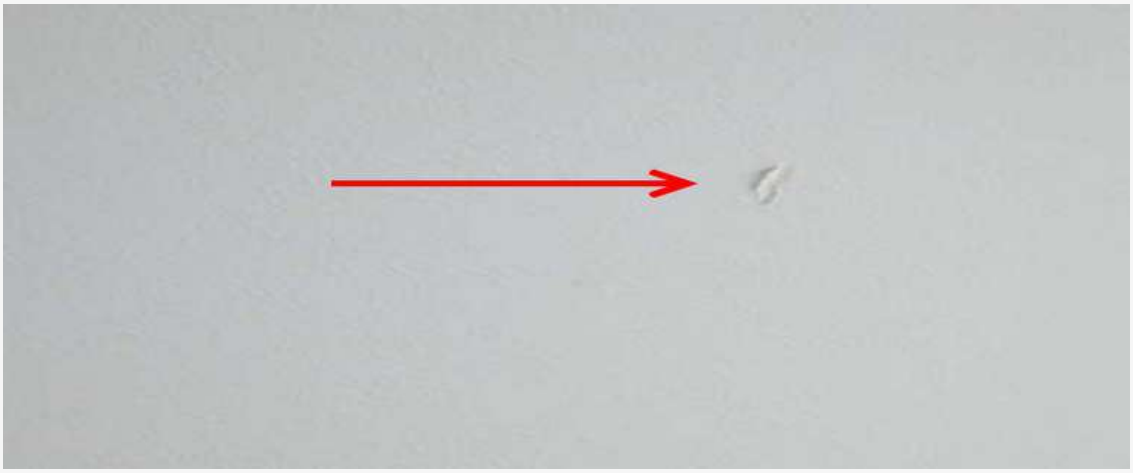
Smooth and free of brush marks

Inconsistent tonality on marble wall

Wall Samples

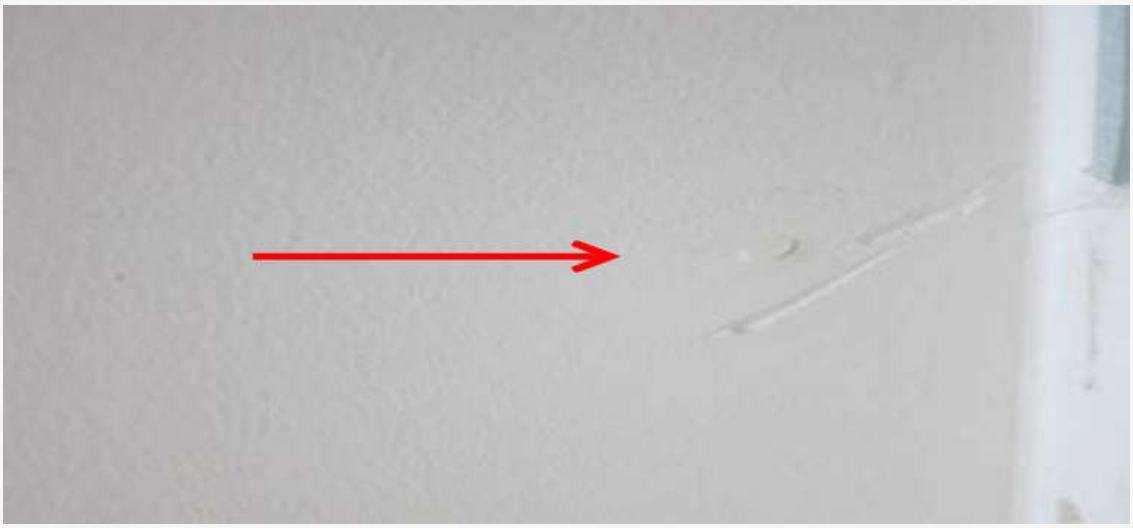
Brush mark patchiness

Chip-off on wall surface

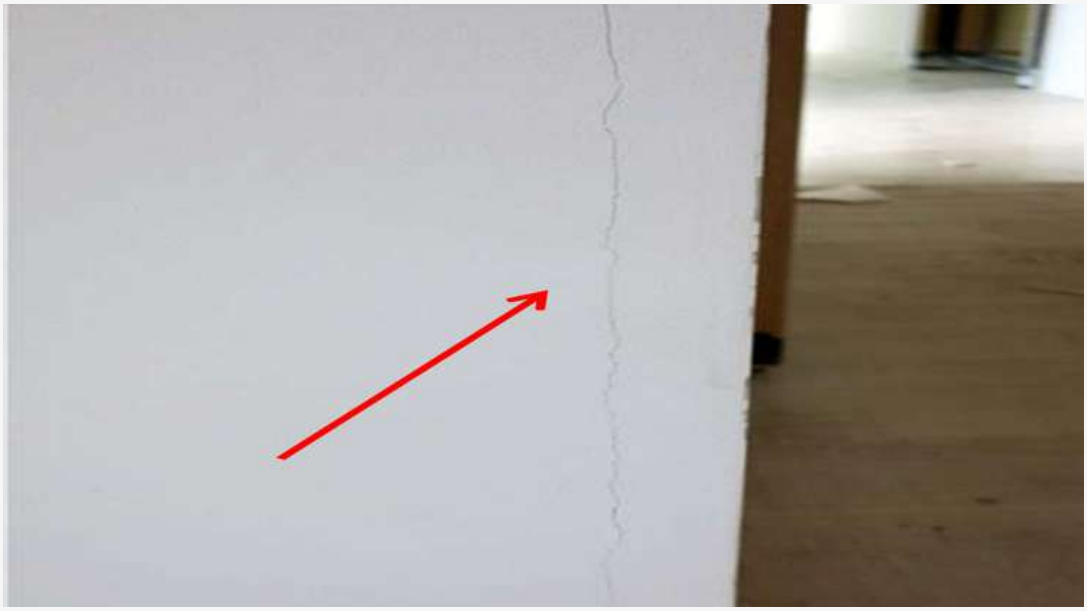


Wall Samples

Poor painting on wall surface



Crack on wall



Wall Samples

Straight and consistent wall joints in room

Straight and consistent wall joints in bath

Ceiling

Finishing

* No stain marks
* Consistent color tone
* No patchy surface

Ceiling

Alignment & Evenness

* Overall surface should be smooth, even and not wavy
* Straightness of corners

Ceiling

Crack & Damages

* No visible damages e.g. spalling, leaks, crack, etc

Ceiling

Roughness

* No rough surface

Ceiling

Jointing

* Consistent, aligned and neat

Types of Ceiling

Skim Coats / Boarded Ceiling

* Non-patchy, without any pinholes and devoid of trowel marks
* Formwork joints are smoothly grounded
* Paintwork with good opacity and with no brush marks
* Access door joints should be sharp and with consistent width

Types of Ceiling

False Ceiling / Grid System

* Alignment of rails should be visually straight
* Surface should be level and even overall
* Chipped surfaces or corners should not be visible

Types of Ceiling

Mass Engineered Timber (MET)

* Surface finish grade as per project's specification
* Visual finish surface to be planed and sanded
* Knot size tolerance:
  ** Domestic grade – Not more than 20mm in diameter
  ** Industrial and Standard grade – Not more than 50mm diameter
* Voids to be filled if specified
* No damages, e.g., dents
* Crack tolerance:
  ** Domestic grade – not more than 200mm long and 2mm in width
  ** Industrial and Standard grade – Not more than 400mm long and 4mm in width

Ceiling Samples

Smooth and consistent ceiling surface

Ceiling Samples

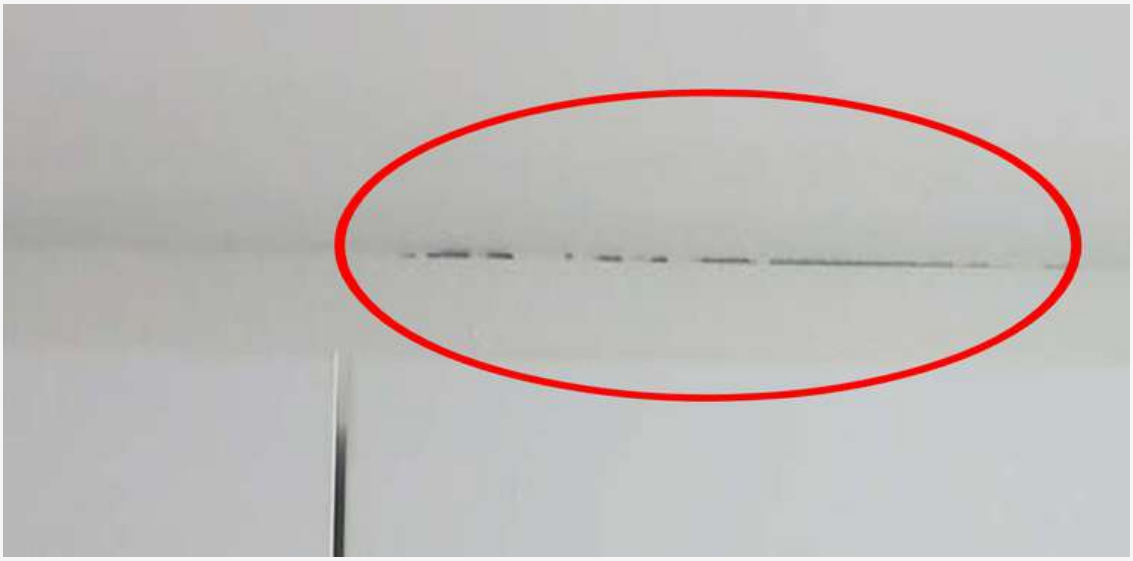
Peel-offs and chip-offs on ceiling

Straight and consistent ceiling to wall edge joint in the room

Ceiling Samples

Straight and consistent ceiling to wall edge joint in the toilet

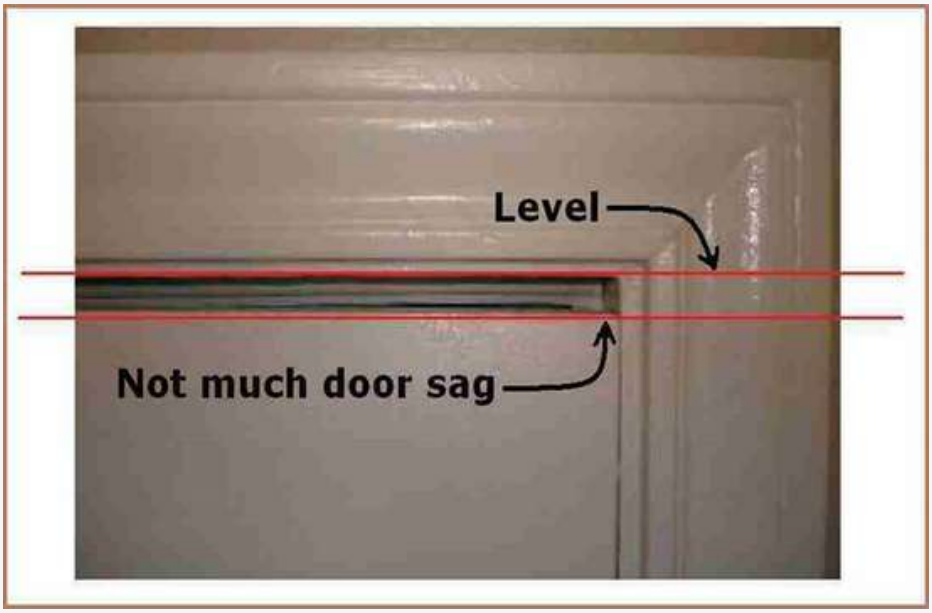
Poor ceiling to wall edge joint



Door

Joints & Gap

* No visible gaps between door frame and the wall
* Consistent and neat joints
* Consistent gap between the door leaf and the frame, not more than 3mm
* No visible gaps within the door leaf and the door frame
* Consistency with no visible gaps for miter joints



Door

Alignment & Damages

* Alignment / level with walls
* Door frame and leaf to flush
* Door and frame corners maintained at right angles
* No rattling sound when door is closed

Door

Material & Damages

* No stain marks and any visible damage
* No sags or warps on the door leaf
* Fire stop provided where necessary
* Door joints and nail holes filled up, properly sanded down and with a good paint finish (including on the top and bottom of the door leaf, and consistent in color)
* Glazing clean and evenly sealed with gasket
* No sign of corrosion for metal frame
* Consistent colour tone

Door

Functionality

* Ease in opening, closing and locking
* No squeaking sound when swinging the door leaf

Door

Accessories Defects

* Lock sets with a good fit and no stains
* No signs of corrosion in ironmongery
* No missing or defective accessories

Door Samples

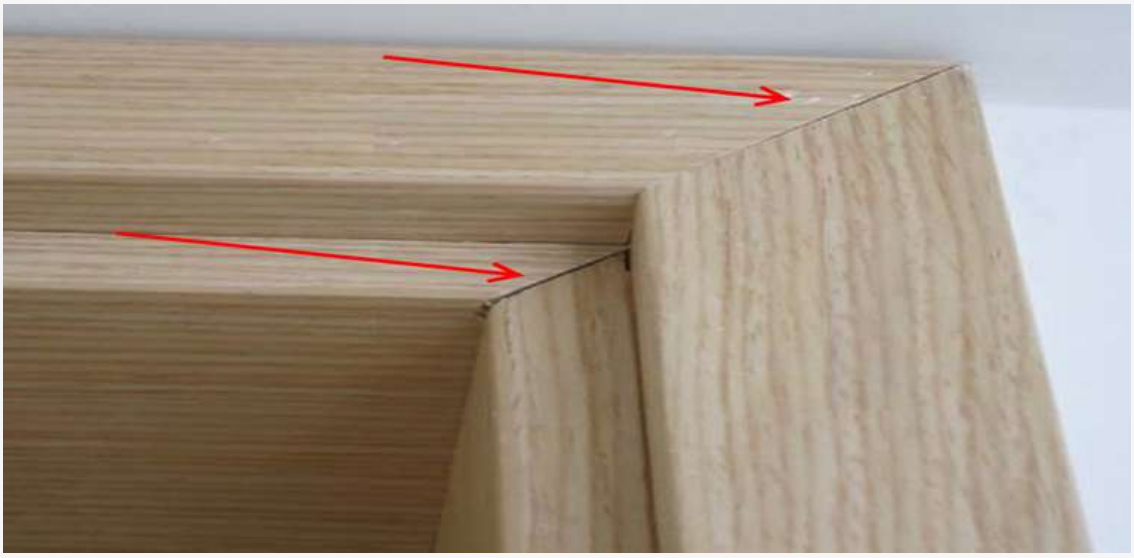
Good and consistent joint of door frame and wall

Good and consistent joint of door frame and ceiling

Door Samples

Good and consistent joint of door and wall

Poor MITRE joint of door frame



Door Samples

Door leaf and frame flushed and aligned

Door leaf and frame misaligned

Door Samples

Damage on the door

Damage on the side of the door

Door Samples

Door hinge free from rust and stain, screws are flushed and well-fitted

Door handle free from rust and stain

Door Samples

Shower door hinge free from rust and stain, screws are flushed and well-fitted

Shower door handle free from rust

Door Samples

Balcony sliding door should close or slide smoothly, door frame should be aligned, no damages on the glass panel

Windows

Joints & Gap

* No visible gap between window frame and wall
* Consistent gap between window leaf and frame, not more than 5mm (timber window only)
* No visible gaps within the window leaf and frame
* No visible gaps between the window leaf and frame
* Neat joint between the window and the wall, both internally and externally
* Consistent and no visible gaps at miter joints

Windows

Alignment & Evenness

* Alignment / level with wall opening
* Window leaf and frame corners maintained at right angles

Windows

Material & Damages

* No stain marks and any visible damage / defects
* Louvre windows with glass panels of correct lengths
* Glazing clean, evenly sealed with putty or gasket for aluminum windows

Windows

Functionality

* Ease in opening, closing and locking
* No signs of rainwater leakage
* No squeaky sound during swinging the door leaf

Windows

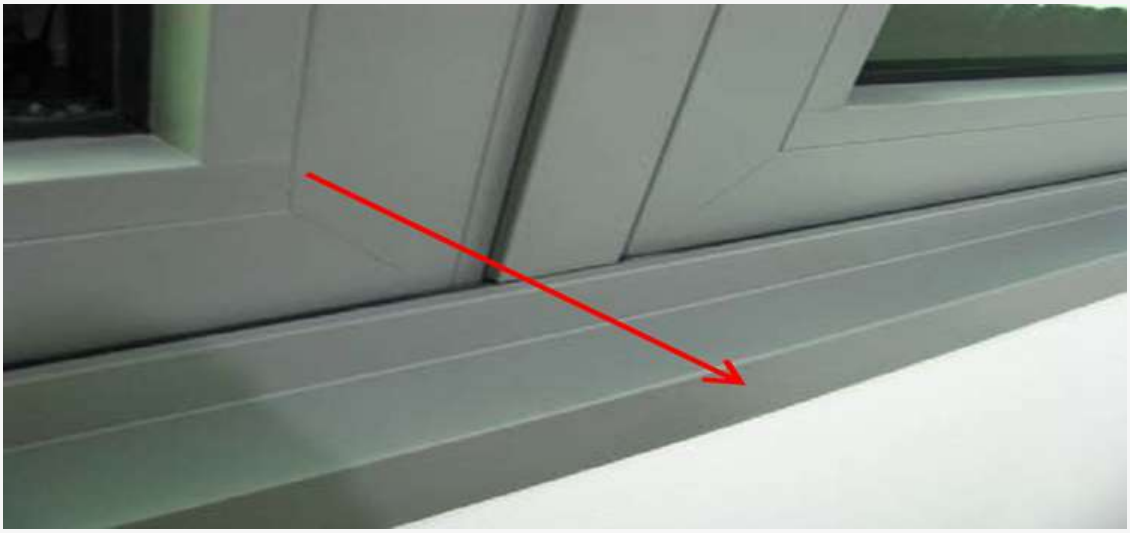
Accessories Defects

* Lock sets with good fits and alignment
* No sign of corrosion
* No missing or defective accessories
* Countersunk screws levelled and flushed, with no over-tightened screws
* Stainless steel screws used at hinges for swing window




Window Samples

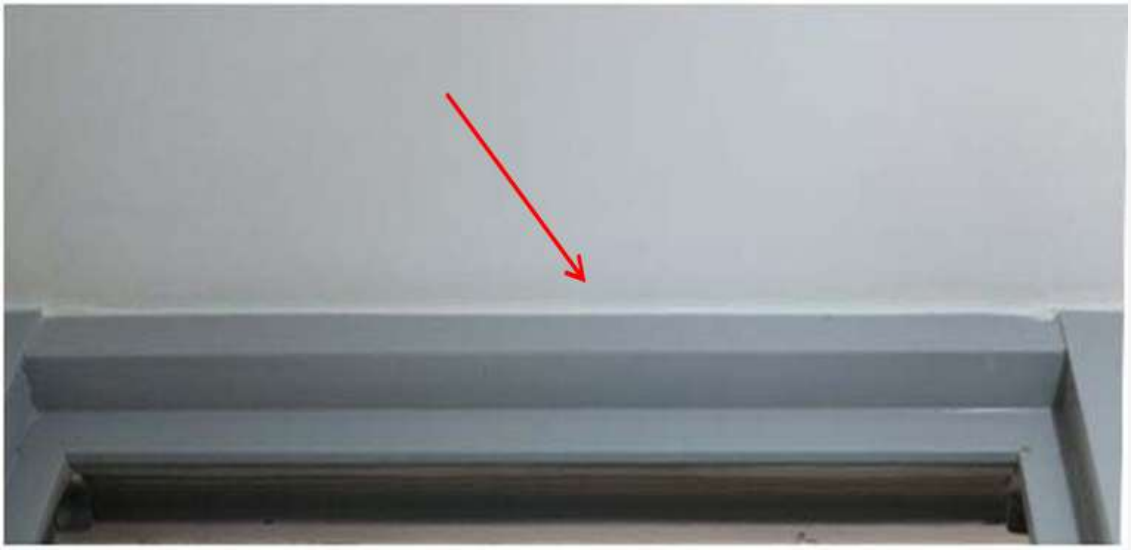
Neat and consistent window frame to joints



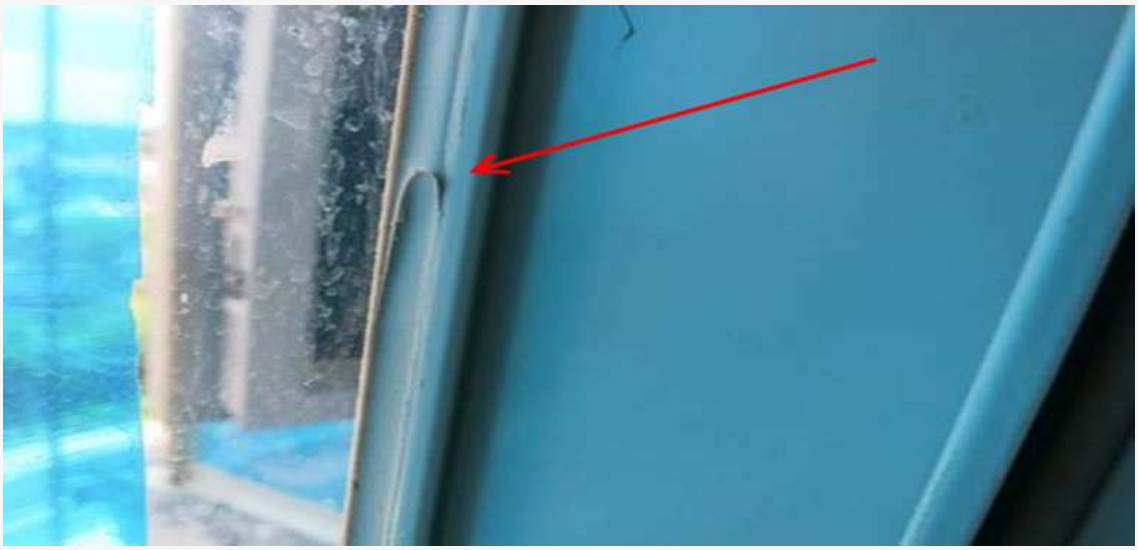
Window frame level and aligned

Window Samples

Neat and consistent window frame to ceiling joints



Sealant not properly applied



Window Samples

Window flushed and aligned when closed

Dent on the window frame

Window Samples

Dent on the window frame

Window Samples

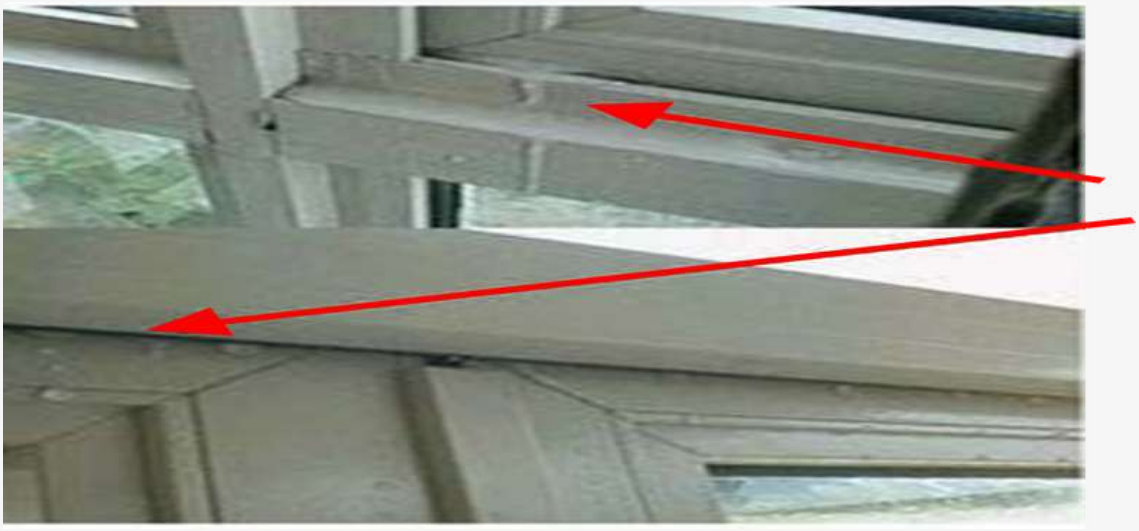
Scratch mark on the window frame

Window handle are well-fitted, aligned and free from damage

Window Samples

Latch operating smoothly

Water leakage during window water tightness test



Components

* Internal fixtures such as wardrobe, kitchen cabinet, vanity top, mirror, bathtub, water closet, shower screen and basin
* External fixtures such as signage, emergency lightings, railing, unit number plates, lift fittings, letter box, lightings, metal gate, etc

Joints & Gap

* Consistent joint width & neat joint
* No visible gap
* Welding joints grounded or flushed

Alignment & Evenness

* Level and in alignment

Material & Damages

* No stain marks
* No visible damage / defects
* Consistent in color tone

Functionality

* Functional, secured and safe

Accessories Defects

* No missing accessories
* No sign of corrosion
* No visible damages / defects

Component Samples

Drawer open and close smoothly

Component Samples

Wardrobe door flushed and aligned

Cabinet doors flushed and aligned

Component Samples

Kitchen cabinet door not aligned

Bath cabinet door not aligned

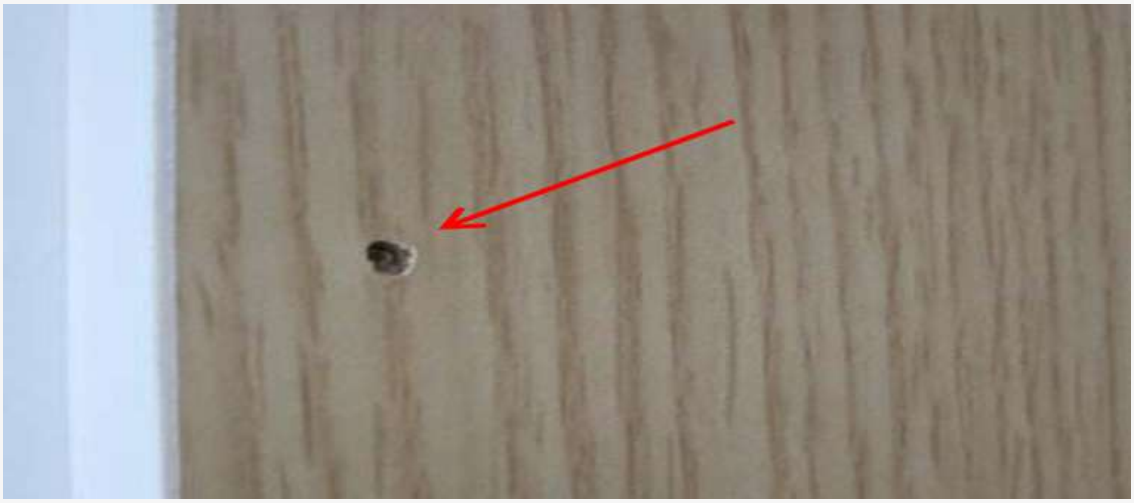
Component Samples

Cabinet door not aligned

Chip-offs and bad touch-up at wardrobe

Component Samples

Nail mark not touched-up



Wardrobe handles are level and aligned, free from stain mark not touched-up

Component Samples

Wardrobe handles are level and aligned, free from stains

Joint between toilet bowl and wall is neat & consistent

Component Samples

Joint between vanity top and tiled wall is neat and consistent

M&E Fitting

Examples: power point, telephone point, air-con diffuser, fan coil unit, lighting, smoke alarm, sprinkler heads, CCTV camera, etc

Installation

* Fittings must be aligned and location as per approved drawings
* No stains
* Neat patch-up for pointing / penetration

Safety

* No exposed wiring within reach

Damages

* No visible damages

Basic M&E Fittings

Joints & Gap

* No visible gap
* Consistent joint width & neat

Alignment & Evenness

* Aligned, leveled and straight

Material & Damages

* No stain marks
* No visible damage / defects
* Securely fixed
* Consistent in colour tone

Functionality

* Functional and safe

Accessories Defects

* No missing accessories

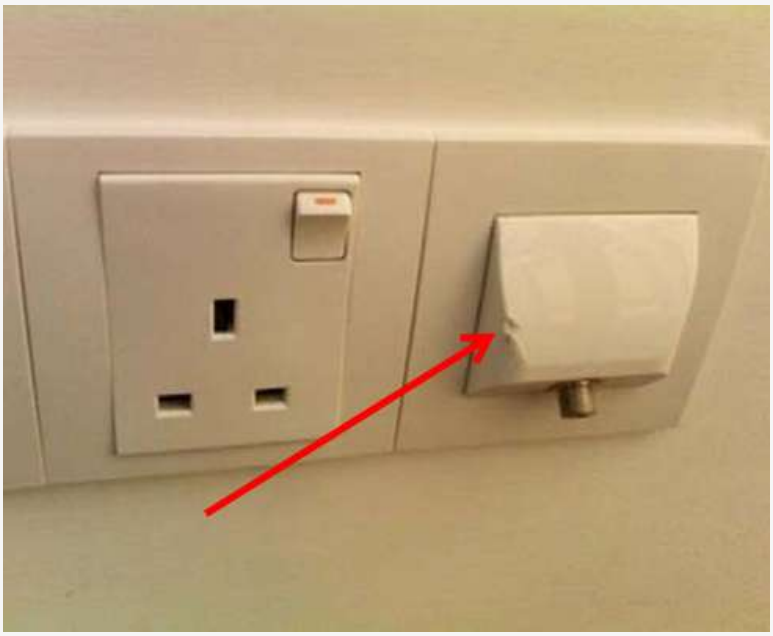
M&E Fitting Samples

Wall mounted fan coil unit of the air-conditioner is aligned and level

Switches are level

M&E Fitting Samples

Dent on internet access point



Gap between wall and switch

M&E Fitting Samples

Joint not consistent

Plumbing & Sanitary Fitting

Gully & Floor Traps

* No damages or chokage
* Must be securely fixed
* Trap's top should be lower than the surrounding floor level

Pipes

* Visually aligned horizontally, vertically and parallel to the building surface
* Inclined pipes laid to proper gradients
* No leakage at joints
* Plumb < 10mm / story height
* Brackets firmly secured and with adequately spacing
* If painted, no drippings and with good spacing

Fittings

* Firmly secured & joints properly sealed & pointed
* No leakage at joints
* No chipping or cracks
* No paint drops or mortar droppings
* Fittings in working condition
* Accessible for maintenance
* Do not cause obstruction or pose a safety hazard (e.g. sprinkler head pointing inward)
* No sediments or particles found in water collected at terminal water fitting (remove aerator & showerhead)
* All sensor covers properly sealed against water seepage
* Materials used are of approved types

Plumbing & Sanitary Fitting Samples

No leakage at pipe joints, and pipe to wall penetration is neat and consistent

Floor trap flushed to the floor

Plumbing & Sanitary Fitting Samples

No water drip from closed tap

Stain on floor trap

Roof

General Requirements

Stain / Painting

* No stain marks
* Good paint works

Rough / Uneven / Falls

* Appear smooth with no tool marks
* Even and level, especially to prevent potential tripping
* Good falls in the right direction

Crack / Chip / Damage

* No visible damages / defects

Joint / Sealant / Alignment

* Consistent joint width, neat & aligned

Chokage / Ponding

* No sign of chokage and ponding

Construction

* No signs of leaking
* Proper dressing for any protrusions
* Neat & secure installation of fixtures

Types of Roof

Flat roof

* Ponding less than 3mm
* Surface should be level to avoid tripping
* Proper dressing for any protrusions
* Openings to be sealed to prevent pest invasion
* Clean and no stain marks

Types of Roof

Pitched roof

* No leaking
* No rust or stains
* Good painting on roof structural members
* Roof tiles in alignment
* Openings to be sealed to prevent pest invasion
* Consistent colour tone
* Proper dressing for any protrusions

Waterproofing (Exposed)

* Should be evenly installed, with no sharp protrusion
* Complete adhesion to the base
* Good laps at joints and proper vertical abutment details
* No leaking and no signs of damage to the membrane / coating
* Clean and no mortar stains
* No paint defects

Gutters

* No ponding and chokage
* No cracks, chips and any other visible damages / defects
* RWDP inlet should be lower than the surrounding gutter invert level
* Gutter and RWDP inlet to be covered to prevent chokage wherever practical
* Clean and no cement stains

External Walls

General Requirements

Evenness / Roughness

* Overall surface should be even, not wavey & not patchy

Staining / Painting

* No visible stain marks
* Good paint works

Cracking / Damages

* No visible damages / defects

Jointing / Alignment

* External features visually in alignment
* Corners of wall maintained at right angles and straight
* Consistent joint width, neat & aligned

Plaster Finish

* As above

Tiled Finish

* Tile joints aligned and between 2-4mm wide unless specified
* Plumb tolerance and evenness of surface (3mm / 1.2m)

External Walls

General Requirements

Claddings / Curtain Walls

* Gaps around openings to be properly sealed
* Joints of regular widths as specified
* Plumb tolerance as specified
* Evenness of surface, no dents or scratches
* Sealant material should be compatible with cladding

Facing Brickwork

* 10mm joint with pointing
* Weepholes are provided as specified
* No mortar droppings and other stains
* No efflorescence

Architectural Coating

* Substrate - refer to plaster finish
* Finished texture and color to be uniform
* No paint drips or other stains

Painting

* Substrate - refer to plaster finish
* Surfaces are evenly painted with no patchiness from touch-up work
* Good opacity, no discolouration and free from peeling

External Walls

General Requirements

Fair-Faced Concrete

* No exposed aggregate
* Consistent tonality when viewed as a whole

MET (Mass Engineered Timber)

* Crack tolerance:
  ** Domestic grade - Not more than 200 mm long and 2mm in width
  ** Industrial and Standard grade - Not more than 400mm long and 4 mm in width

* An item is deemed to have failed if any one of the standards is not met

External Works

General Requirements (basis for assessment)

* No stain marks or visible damages / defects
* Finishes must be even, level , align & consistent
* Consistent joints width and neatness
* Paintwork with good opacity, no patchiness and no brush marks
* Constructed according to Contract Specifications
* Fixtures installed must be safe, secured and functional
* Standards defined under Part 1: Internal Finishes, Part 2: Roof , Part 3: External Wall shall apply to similar items
* MET (Mass Engineered Timber) standards applied for MET finishes as in Part 1: Internal Finishes

Link-Way / Shelter

Floor

* As per Internal Finishes - Floor

Column

* As per Internal Finishes - Wall

Ceiling

* As per Internal Finishes - Ceiling

Other Finishes

* As per Internal Finishes - Components

M&E Fitting

* As per M&E - Basic M&E Fittings

Apron & Drain

Drain

* Free flowing and no ponding of water

Drain Cover

* Level and does not jolt or rock
* Gaps between drain covers and the side of the drain between 5-10mm wide
* Drain grating is properly painted

Apron 1

* Bitumen joints with neat edges and sufficient length
* No ponding

Apron 2

* As per Apron 1

Inspection Chamber

* Inspection chambers are level with surrounding area without depressions and within specified tolerance
* Covers should be level with the frames

Roadwork & Carpark

Side Drain

* As per External Work - Apron & Drain

Road Surface

* No ponding
* Road painting according to drawings with dimensional tolerance of 5mm
* Gaps between aeration slabs should be properly filled up with sand
* Aeration slabs should be stable and not broken

Kerbs

* As per General Requirements

Road Sign

* Provided according to specifications
* Firm and secured at base – with footing if required
* Metal parts below ground are treated for corrosion

Lightings

* As per Road Sign

Footpaths & Turfing

Footpath

* As per Internal Finishes – Floor

Turfing

* No depression or bald patches
* Turfing done evenly, no dead grass or weeds

Lightings

* As per Roadwork & Carpark - Road Sign

Fencing & Railing

* As per Road Sign
* Wire fencing is PVC covered
* Footings provided for supports
* Vertical tolerance (4mm / 1.2m)

Other Fixtures

* As per Internal Finishes - Components

Playground

Floor

* As per Internal Finishes - Floor

Permanent Fixture 1

* As per Internal Finishes – Components

Permanent Fixture 2

* As per Internal Finishes – Components

Lightings

* As per Roadwork & Carpark - Road Sign

Signage

* As per Internal Finishes – Components

Court

Floor 1

* As per Internal Finishes - Floor

Floor 2

* As per Internal Finishes – Floor

Signage

* As per Internal Finishes – Components

M&E Fitting

* As per M&E Fitting - Basic M&E Fittings

Permanent Fixture

* As per Internal Finishes – Components

Fences & Gates

Fence Left

* As per Internal Finishes – Components

Gate

* As per Internal Finishes – Components

Fence Right

* As per Internal Finishes – Components

M&E Fitting

* As per M&E Fitting - Basic M&E Fittings

Signage

* As per Internal Finishes – Components

Swimming Pool

Side Drain

* As per Internal Finishes – Floor

Foot Path 1

* As per Internal Finishes – Floor

Foot Path 2

* As per Internal Finishes – Floor

M&E Fitting

* As per M&E Fitting - Basic M&E Fittings

Other Fixture

* As per Internal Finishes – Components

Club House

External Wall 1

* As per Internal Finishes – Wall

External Wall 2

* As per Internal Finishes – Wall

External Wall 3

* As per Internal Finishes – Wall

External Wall 4

* As per Internal Finishes – Wall

Apron & Drain

* As per External Finishes - Apron & Drain

Guard House

External Wall 1

* As per Internal Finishes – Wall

External Wall 2

* As per Internal Finishes – Wall

Apron & Drain

* As per External Work - Apron & Drain

Gantry

* As per Internal Finishes – Components

Other Fixture

* As per Internal Finishes – Components

Electrical Substation

External Wall 1

* As per Internal Finishes – Wall

External Wall 2

* As per Internal Finishes – Wall

External Wall 3

* As per Internal Finishes – Wall

External Wall 4

* As per Internal Finishes – Wall

Apron & Drain

* As per External Work - Apron & Drain

Suspended Swimming Pool

* No water leakage

Quality Standards for Material & Functional Tests

The sample size for all functional tests will be based on the specifications required, or at least half of the actual site sampling

Field Window Water-Tightness Test

* No sign of leakage using AAMA 501.2 Window Water-tightness Test method. Leakage is defined as “any appearance of uncontrolled water, other than condensation, on the indoor face of any part of the wall & window”
* AAMA 501.2 standard requirement
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

Wet Area Water-Tightness Test (i.e. Bathrooms, toilets & flat roof)

* No sign of leakage after ponding wet areas over a minimum period of 24 hours.
* Ponding with final finish in-place
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

Internal Wet Area Waterproofing Process

* According to approved method statement, shop drawings and based on BCA’s Good Industry Practices guides
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

Tiling Installation Process

* According to approved method statement, shop drawings and based on BCA’s Good Industry Practices guides
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

Quality Standards for Material & Functional Tests

Timber Flooring Installation Process

* According to approved method statement, shop drawings and based on BCA's Good Industry Practices guides
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

Windows Installation Waterproofing Process

* According to approved method statement, shop drawings and based on BCA's Good Industry Practices guides
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

Water Flow Test (at Common Area)

* For dwelling unit corridor, lift lobbies, footpaths, exposed walkway in the carpark and basement carpark
* Ponding should not be more than 3mm
* Water should flow in the right direction
* Records of the test to be verified by a Resident Technical Officer or Qualified Person

100% EN 14179-2 Heat Soak Test

* For tempered glass (including laminated tempered glass) used at balcony, canopy and shower screen + 3-year warranty for all glasses
* Test method based on EN 14179-2 as stated in SS 653:2020 Code of Practice for glazing in buildings
* The 3-year warranty for all glasses to start from DLP Commencement
* An item is deemed to have failed if any one of the standards is not met

Engineered Materials and Designs

Engineered Materials and Designs

This part highlights some engineered materials and designs used in residential developments which often lead to higher quality and productivity compared to traditional methods and materials. The adoption of these materials and designs has helped developers deliver high quality homes within a shorter span of time. Homeowners may wish to take note of such materials or designs when investing in such units.

Drywall

There is a growing trend in Singapore where internal drywall partitions are used as a substitute for brickwork and plastering. Most drywall partitions are produced from recycled materials available from many sources and use low energy in the production process. They are therefore environmentally friendly and contributes to sustainable construction. Some brands of drywall partitions are certified as green building materials.

The drywall system is able to resist high-impact forces and it can support loads such as TVs, cabinets, shelves, etc., when attached to it. Drywall systems are faster to erect in contrast to traditional construction methods such as brick and blockwork. The productivity rate is 3 to 4 times higher compared to brickwork. The partitioning works can be completed faster with better quality.

Rough surfaces and inconsistent paint finishes are the most frequent non-compliances in plastered walls. The smoothness, consistency and texture in paintwork are very much dependent on the substrate i.e. plastered surface. If the substrate is smooth and not wavy, it will be easier to achieve good paintwork either by roller or spray method. In contrast, drywalls have an even board surface and only the drywall joints are required to be applied with putty and sanding before painting.

Engineered Materials and Designs Sample

Proper anchorage system facilitates mounting of TV, shelves and cabinets on drywall partitions.

Agglomerated Marble (Compressed Marble)

Agglomerated marble is made of the same material, and the entire body is homogeneous. Gentle grinding and polishing after installation make the floor surface smooth and shiny. This high-quality finish can still be achieved years after installation through re-grinding and re-polishing. Agglomerated marble is slightly harder than natural marble. The addition of resin and inorganic pigments minimizes tone variations in the same production batch.

Tonality consistency is a key feature of agglomerated marble finishes.

Inherent imperfections such as open veins, tone variations, and pinholes are common in natural stones. These imperfections are sometimes classified as 'defects' by end users. The defects can be rectified, and they should not be felt by the finger. Much time and cost need to be expended to address such 'imperfections,' apart from the inconvenience to end users. For this reason, dry laying is often necessary in natural stone works to reduce or minimize such imperfections.

However, a well-controlled mechanism in the manufacturing process for agglomerated marble using compressed vacuum technology will reduce concerns like pinholes and open veins in flooring. Agglomerated marble requires less effort to install as no dry lay is required compared to natural stones like marble or granite. Batch control is required to avoid the tonality problem.

Agglomerated Marble (Compressed Marble)

Difficult to address inherent flaws in natural stones, especially after installation.

Agglomerated marble can react with acids and alkalis. Thus, it is advisable to apply a compatible impregnator to prevent or minimize stain ingress and other reactions.

Also, it should be cleaned only with pH-neutral detergents. Some other tips to maintain the original surface finish are:

* Remove stains immediately
* Avoid using cleaning agents containing soluble salts like sulphate or chloride
* Use a neutral cleaner or plain water for regular maintenance

Engineered Hardwood Floor

Engineered wood consists of multiple layers of veneer and lumber bonded together with adhesive. The top layer is genuine hardwood, while the engineered components underneath make the flooring more stable. This flooring is available in various wood types and colors and generally comes prefinished.

Engineered hardwood flooring is dimensionally stable as it can withstand twisting to a certain extent, thanks to its construction using multiple ply planks. In addition to the top layer of hardwood, engineered wood flooring typically has several more core layers at the bottom. These core layers may be plywood, high-density fiberboard, or other materials. The layers are arranged alternately along the lengthwise and crosswise grain to ensure dimensional stability.

The controlled factory environment ensures a uniform coating on the surface.

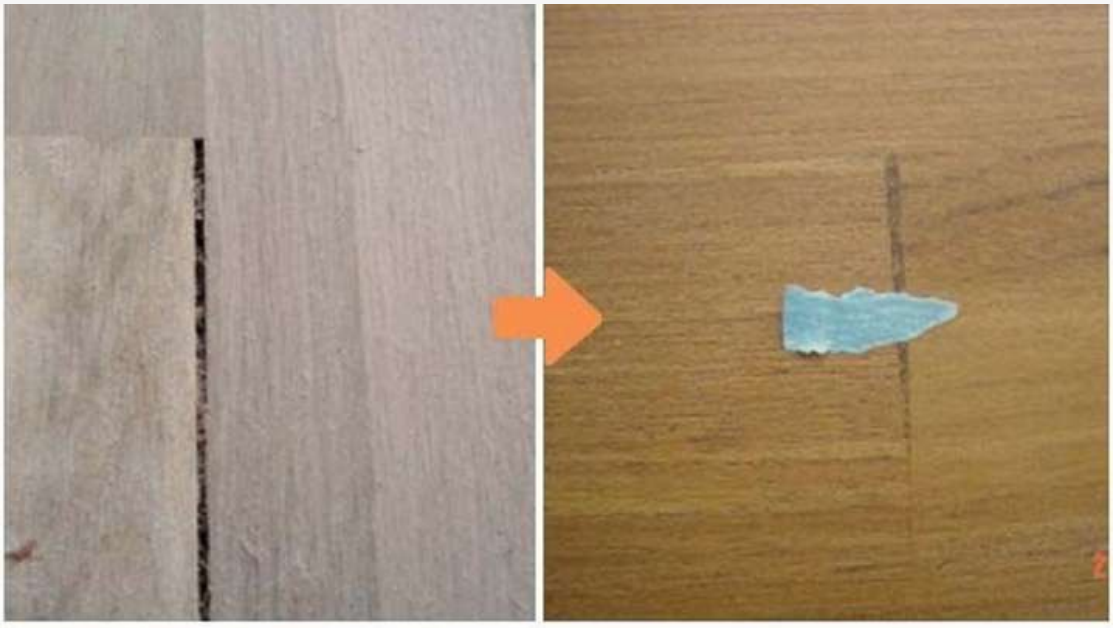
Engineered Hardwood Floor

With engineered hardwood flooring, the following quality issues in timber flooring can be minimized:

Open Joints

The predominant cause is that wood is sensitive to variations in humidity and temperature, making it susceptible to deformation. Other reasons include dimensional variation of the timber strip, unskilled installation, moisture levels of the material and substrate, etc.

Open joint in timber floor



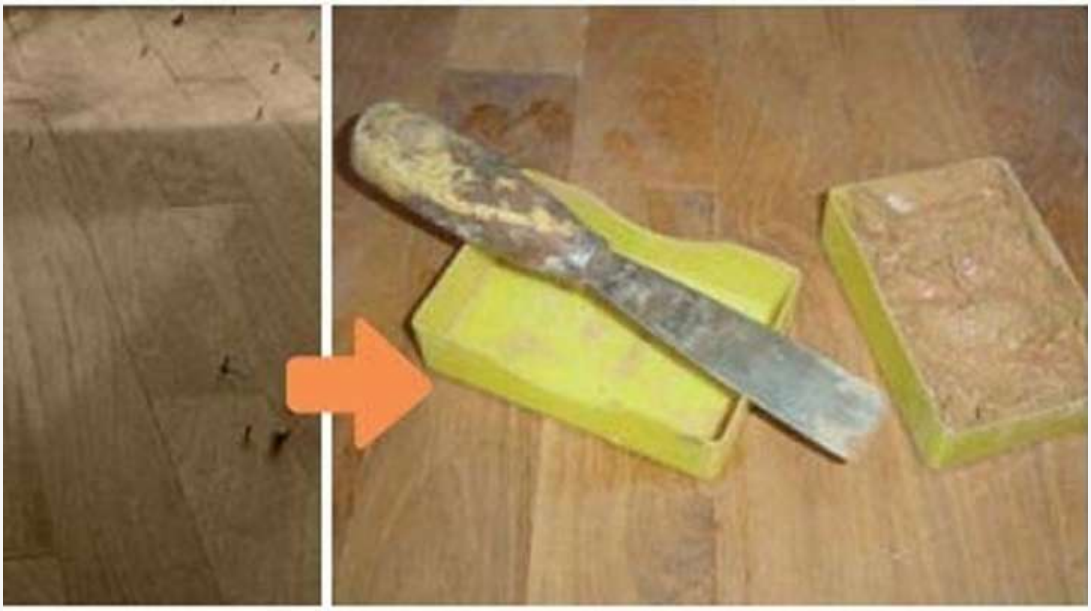
Engineered Hardwood Floor

Nail hole mark

Nail-down is required when laying timber strips to avoid movement and to secure tight joints between the strips, especially when the installation is directly on the screed.

These nails are removed only after the day of installation. Frequently, the nail holes are patched with timber putty during the first sanding and varnishing stage. It is also not uncommon that improper fillings or discoloration of filling materials can affect the aesthetics of the flooring.

Nail-hole marks and patch-ups often undermine the aesthetics of the flooring



Engineered Hardwood Floor

Uneven floor due to over-sanding

Poor control of sanding on a single spot by unskilled workers during the grinding process is another root cause of unevenness in the timber floor surface.

Poor control in the sanding process may lead to unevenness in the finished surface

Engineered Hardwood Floor

Inconsistency due to varnishing

The uniformity of on-site varnish depends on many factors, such as the skill level of the worker, the surface condition of the floor, and the surrounding environment. As a result, the quality of the outcome is likely to be inconsistent.

Consistency in varnishing is likely to vary in manual application

Composite Fibre Plastic Material

As an alternative to natural wood, composite fiber-plastic material offers a practical middle ground and can be used to replace timber in some applications. Due to its inherent characteristics, such as resistance to weather, moisture, termites, and low maintenance requirements, it is increasingly being used widely in many applications as a substitute for natural wood.

Advantages of Composite Fibre Plastic Material:

Durability

The lifespan of composite materials is generally longer, resulting in reduced costly maintenance and less frequent replacement due to rotting and splintering.

Appearance

The material is popular because of its uniform appearance and consistency in pattern.

Moisture Resistant

The plastic content in composite decking makes it less susceptible to moisture, reducing wear and tear and preventing warping. The synthetic material also protects the surface from decay caused by prolonged exposure to weather.

Resistance to Heating and Fading

The material is treated with a UV stabilizer, and hence it has better resistance to heating and fading. The added preservatives and colorant maintain a uniform appearance and prevent the material from fading to some extent.

Composite Fibre Plastic Material

Design flexibility

Its ability to be molded to meet special shapes and sizes. It can be extruded to create continuous profiles of the desired cross-section with better dimensional consistency and accuracy. It can also be shaped using conventional woodworking tools, and colour can be applied, if desired, for aesthetic reasons.

Environment

The material uses recycled plastics and can also be recycled completely and processed without any significant deterioration in performance.

Low Maintenance

They can easily be cleaned occasionally by normal sweeping, hose or water jet.

Composite Fibre Plastic Material

Limitations of Composite Fibre Plastic Material:

* While composite materials are manufactured with UV coatings, they may still be susceptible to the adverse effects of UV radiation on the surface.
* The surface hardness is also not as robust as that of hardwood, making it prone to damage or scratching under normal wear and tear.
* Composite materials are not load-bearing or structural members, and they are not as strong as traditional hardwood. This is why some brands of composite wood decks still rely on a hardwood base to maintain structural rigidity.

The soft surface is prone to scratches and wear