THE FAÇADE BRIEF
AN EDITORIAL BRIEF FOR DEVELOPERS & ARCHITECTS

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LEAD EDITORIAL / THE TWO LOADS THAT TEST EVERY ENVELOPE

WIND & WATER

*Wind is a **pressure**. Water is a **system**. The Philippine coastline is where the two arrive at the same time.*

TYPHOON SEASON / NSCP 2015 WIND ZONES / ASTM E283 / E331 / E547 / AAMA 501.1

260
KPH / COASTAL DESIGN WIND

The design wind speed a coastal Philippine curtain wall must be engineered against under NSCP 2015 Zone I.

15+
TYPHOONS / YEAR

The average count of tropical cyclones entering the Philippine Area of Responsibility every year — the most of any country on earth.

04
TEST STANDARDS TO NAME

ASTM E283 (air), E331 (static water), E547 (dynamic water), AAMA 501.1 (dynamic wind + water). The four that decide the envelope.

LEAD EDITORIAL

Wind is a pressure. Water is a system.

In the Philippine market, the envelope of a tall building has to answer two questions at once. It has to resist a wind load that the structural engineer can calculate — and a water load that arrives sideways, under pressure, and finds the smallest defect first. The two questions are related. But they are not the same, and they should not be answered with the same test.

BY THE FASCLAD TECHNICAL TEAM · THE FAÇADE BRIEF · № 04

Every Philippine developer knows the season. It begins in June, peaks in September, and does not fully release its grip until November. Fifteen or more tropical cyclones enter the Philippine Area of Responsibility every year — the highest count on the planet — and roughly half of them will make landfall. The envelopes we are drawing today will be tested by every single one of them for the next fifty years.

The wind load is the number the structural engineer gives you. NSCP 2015 breaks the country into three zones; the coastal band along Northern Luzon and the Visayas is Zone I, with a design basic wind speed of 260 kilometres per hour. The curtain wall bracket, the anchor, the mullion, the panel — all of them are calculated to hold that force. This part is well understood.

The water load is a different problem. Water does not push a curtain wall over. Water finds the joint. It finds the interruption between two panels, the interface between the frame and the slab, the corner where the mullion meets the transom. Under a wind that is driving rain sideways at 100 kilometres per hour, water enters a curtain wall through defects that a still-air inspection would never reveal.

This is the distinction that decides the specification. Wind is answered with structural calculation and a static pressure test. Water is answered with an air-tightness test, a static water test, a dynamic water test — and, for any building on a Philippine coast, a full-scale AAMA 501.1 field test simulating wind-driven rain.

Everything in this issue follows from that observation.

FIG. 01 · A COASTAL CEBU HIGH-RISE — NUSTAR RESORT & CASINO AT SOUTH ROAD PROPERTIES, CEBU CITY. THE ENVELOPE CARRIES THE FULL TYPHOON-SEASON LOADING OF THE VISAYAS STRAITS.

THE DISTINCTION

The wind load is a calculation. The water load is a system.

A curtain wall passes the wind check with numbers. It passes the water check only when every joint, gasket, interface, and drain in the wall works together.

LEAD EDITORIAL / CONTINUED

Three principles of a wind-tight, water-tight envelope.

> *A curtain wall does not fail at the panel. It fails at the joint. And the joint is decided six months before the first panel is fabricated — in the specification, and in the coordination with the structural engineer.*
>
> A WORKING RULE FOR FAÇADE PROCUREMENT

THE COASTAL ADDER

Every Philippine coastal site is a Zone I site.

A curtain wall spec written to an inland office tower will fail on a coastal high-rise. Wind pressure, driving rain, salt, and typhoon-season debris load — every one of them steps up a tier at the shoreline.

01. Pressure equalisation, not sealant reliance. A wind-driven-rain-resistant curtain wall does not depend on a perfect exterior seal to keep water out. It relies on a rain-screen principle — a drained and pressure-equalised cavity behind the exterior line, with weep paths that return infiltrated water to the outside. Sealant fails. Drainage does not.

02. Tested to a Philippine wind speed, not a European one. A curtain wall system with European CE-mark ratings against 900 pascals of driving rain will not survive a Philippine coastal typhoon. The specification should require dynamic water testing at a pressure at least equal to the site design wind pressure — for a Zone I coastal high-rise, that is a materially higher number than a European or East-Asian temperate benchmark.

03. Assembly-mockup test, before fabrication release. The performance of a curtain wall is not the performance of one panel. It is the performance of the joint between two panels, the interface between the frame and the slab, the corner where three surfaces meet. A full-scale performance mockup, tested to ASTM E283/E331/E547, is what tells the specifier whether the system will hold — before the first production panel is shipped.

Where any one of the three is absent, the envelope is being sold on a promise of weather-tightness — not on evidence of it.

REFERENCE / THE WORKING STANDARDS

The four tests a Philippine curtain-wall spec should name explicitly.

The word "weathertight" carries no legal weight. The test that produced the number carries all of it. These four are the standards written into every serious Philippine curtain-wall specification — and what each of them is actually asking the wall to do.

STANDARD	WHAT IT MEASURES	LOAD
ASTM E283	Air infiltration through the assembly at a specified static pressure differential. Result reported as cubic feet per minute per square foot of wall.	AIR
ASTM E331	Water penetration under uniform static air-pressure difference. A calibrated water spray on the exterior at a fixed pressure — the wall must show no controlled water leakage.	STATIC WATER
ASTM E547	Water penetration under cyclic static pressure. The same wall as E331, but the pressure cycles — closer to the pulsing pressure of a real weather event.	CYCLIC WATER
AAMA 501.1	Dynamic water penetration test. A calibrated aircraft-propeller rig drives water against the wall at a wind speed matching the site design — the closest test to a real typhoon.	DYNAMIC W+W
NSCP 2015	National Structural Code of the Philippines. Defines the design basic wind speed by zone — Zone I 260 kph, Zone II 240 kph, Zone III 200 kph — from which structural wind loads are calculated.	WIND LOAD

THE SPECIFICATION RULE

One air test. One static water test. One dynamic wind-and-water test.

ASTM E283 alone is not weather-tightness — it is air-tightness. ASTM E331 alone is not typhoon-resistant — it is a still-air rain test. The specification for any Philippine coastal high-rise should combine all three, plus an AAMA 501.1 dynamic test at the site design wind pressure.

Note. The National Building Code of the Philippines and NSCP 2015 accept a combination of the standards above as basis for wind and water performance compliance. The specification document should name each applicable test, the required pressure, and the site design wind speed explicitly.

TEST REFERENCE / WATER PENETRATION

Two water tests. Two different questions.

The two workhorse water-penetration tests in a Philippine curtain-wall specification look similar on paper — a spray rack, a wall, a pressure. In practice they answer very different questions, and a specification that names only one of them is a specification with a gap.

STATIC WATER TEST

ASTM E331

Water penetration of exterior windows, curtain walls, and doors by uniform static air-pressure difference.

RIG	Calibrated spray rack — 5.0 US gallons / sq.ft / hour of water at 60 psi delivery pressure.
PRESSURE	**Uniform static** — held constant for 15 minutes at a specified differential.
ANSWERS	Does the wall resist water penetration under a still-air rainfall event of the specified intensity?
LIMITS	Does not simulate wind gusting; does not reveal defects that open only under dynamic loading.
WHERE IT FITS	Every curtain-wall specification. Baseline test — necessary but not sufficient for coastal high-rise.

DYNAMIC WATER TEST

AAMA 501.1

Standard test method for water penetration of windows, curtain walls, and doors using dynamic pressure.

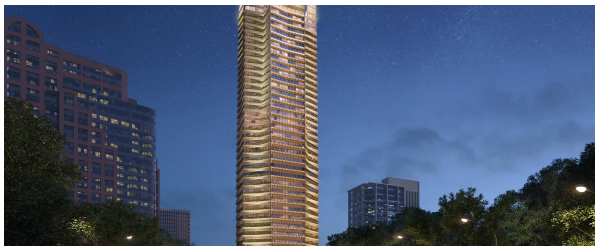
RIG	Aircraft-engine-driven propeller directs an airstream carrying calibrated water spray onto the wall.
PRESSURE	**Dynamic gusting** — wind speed matched to site design, driving water sideways against the wall.
ANSWERS	Does the wall resist wind-driven rain at the site design wind speed — closest to real typhoon conditions.
LIMITS	Requires a specialised rig and a full-scale mockup; more costly than E331 alone.
WHERE IT FITS	Any Philippine coastal high-rise. Any building where the site design wind exceeds temperate benchmarks.

Test methods as published by ASTM International and the American Architectural Manufacturers Association. Fasclad Inc. performance mockups are tested against the combination of ASTM E283, E331, E547, and AAMA 501.1 as required by the project-specific specification and site design wind pressure. Test reports are issued by third-party accredited laboratories.

PROJECT SPOTLIGHT / WIND & WATER IN THE FIELD

Two Fasclad projects. Two coastal Cebu envelopes.

The specification argument in this issue is not theoretical. Below are two projects where Fasclad executed the wind-and-water performance brief at scale — both on the Cebu coastline, both facing the Visayas typhoon corridor.



COASTAL HIGH-RISE RESIDENTIAL

Masters Tower Cebu

A Cebu Landmasters residential landmark with a Skidmore, Owings & Merrill design lead — a coastal Cebu high-rise on the Visayas typhoon corridor.

LOCATION	Cebu City, Central Visayas — coastal orientation on the Mactan Channel.
WIND ZONE	**NSCP 2015 Zone I** — design basic wind speed 260 kph.
ENVELOPE SPEC	Unitised curtain-wall system, engineered for coastal typhoon loading and driving-rain resistance.
TEST PATH	**ASTM E283 / E331 / E547** plus **AAMA 501.1** at site design wind pressure — full performance mockup built & witnessed.

MASTERS PMU · WATER RIG · FASCLAD YARD

Full-scale mockup under pressurised spray — cyclic-water & dynamic wind-and-water witnessed before production release.

INTEGRATED RESORT & CASINO

NuStar Resort & Casino

A landmark integrated resort on reclaimed land at South Road Properties, Cebu — the storm-surge and driving-rain zone of the Mactan straits.

LOCATION	South Road Properties, Cebu City — direct exposure to the Bohol Sea.
WIND ZONE	**NSCP 2015 Zone I** — design basic wind speed 260 kph.
ENVELOPE SPEC	Composite façade — unitised curtain wall to the tower, sculpted ACP canopy to the mall expansion, hurricane-hardened glazing at the podium.
TEST PATH	**ASTM E283 / E331 / E547** to project mockup; assembly performance report on file.
FASCLAD SCOPE	Envelope contractor across the resort & casino, performing arts theater, and mall expansion.

FASCLAD WORKING PRACTICE

The performance mockup is finished before fabrication begins.

On both projects the specification named an air, a static-water, a cyclic-water, and a dynamic wind-and-water test. The performance mockup was built, tested, and reported against the site design wind pressure — before the first production panel was fabricated.

PERFORMANCE MOCKUP / NUSTAR RESORT & CASINO

Where the specification stops being an argument and becomes a measurement.

Every claim made in the preceding pages — that wind is a pressure, that water is a system, that a coastal envelope needs a dynamic test at site design pressure — is settled at one place: the performance mockup. Below is the PMU built for NuStar Resort & Casino, South Road Properties, Cebu.

Why the mockup is non-negotiable on a coastal project.

01. A curtain wall is a system of joints, not panels. Each production panel is built to tolerance. The performance question is what happens where two panels meet — where the mullion returns, where the transom crosses, where the corner terminates. The PMU is a full-scale assembly of those joints, tested as one.

02. Static tests do not predict typhoon-hour performance. ASTM E283 (air) and E331 (static water) are the baseline. They do not demonstrate how the specimen behaves when 260 kph of wind is driving water sideways for six hours. That is what the AAMA 501.1 rig — a full-scale aircraft-propeller assembly firing at the mockup while spray bars deliver design-storm water — measures.

03. The mockup is finished before the first production panel is released. This is Fasclad's working discipline. The PMU is not a post-fabrication verification — it is a pre-fabrication gate. Any defect the mockup reveals is corrected in the production panel design, not on a punchlist after installation. This is what Early Contractor Involvement makes possible.

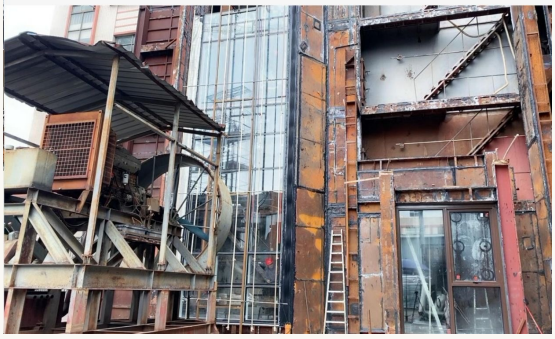


FIG. 02 · LIVE PMU REVIEW — FASCLAD TECHNICAL TEAM & CLIENT REPRESENTATIVES

TEST REGIME — NUSTAR PMU

ASTM E283 · E331 · E547 + AAMA 501.1

Air infiltration to E283; static water to E331; cyclic water to E547; dynamic wind-and-water to AAMA 501.1 at site design pressure. Third-party witnessed. Report on file.

> *The mockup is where the wall becomes real. Everything before that is a drawing. Everything after that is a schedule.*
>
> FASCLAD TECHNICAL TEAM — WORKING NOTE ON PMU DISCIPLINE

REGIONAL BRIEF / WIND & COASTAL CODES

The Philippines is not a temperate wind market.

A curtain-wall specification imported from a temperate ASEAN market will underperform on a Philippine coastal site. The design wind, the water pressure, and the debris load are materially higher. The specification has to be written to that reality.

PAG-ASA ZONES

NSCP 2015 divides the Philippines into three wind zones. Zone I — Northern & Central Luzon, Eastern Visayas — carries a 260 kph design basic wind speed. Zone II is 240 kph; Zone III (Palawan, western Mindanao) is 200 kph. Cebu, Manila, and Davao coastal high-rises all sit in Zone I or Zone II.

TYPHOON SEASON

An average of 20 tropical cyclones enters the Philippine Area of Responsibility each year, of which about half make landfall. Peak activity is August through October. Every Philippine envelope is tested by roughly half a dozen named storms in any given year of operation.

DEBRIS LOAD

Coastal typhoons carry more than water. NSCP 2015 requires impact-resistant glazing on wind-borne debris zones — glass unit that survives the strike of a 2×4 timber at design wind speed without breach.

REGIONAL COMPARISON

Vietnam MOC design wind speeds max out at ~180 kph on the northern coast; Singapore and central Malaysia design to ~140 kph; Indonesia's Jakarta belt sits at ~120 kph. A specification portable from any of those markets to the Philippine coast is an under-specification by 60 to 140 kph of design wind.

ASEAN TEST CONVERGENCE

ASTM E283/E331/E547 and AAMA 501.1 are the recognised working tests across ASEAN for glazed envelopes. Where a project team is producing a specification portable across the region, these four tests — plus a locally-named structural wind test — are the working baseline.

THIRD-PARTY VERIFICATION

Manufacturer's in-house test data is a starting point. Third-party reports from Intertek, TÜV, Element, UL, or an equivalently accredited body are what carry weight with the AHJ and, where required, with the project insurer.

SPECIFICATION CONCLUSION

The safest working practice for any building over 15 metres on a Philippine coast is to name the NSCP 2015 zone and design wind speed, require ASTM E283/E331/E547 to the mockup, and require an AAMA 501.1 dynamic test at the site design pressure. Anything less accepts a gap the typhoon will find.

> *Wind is a calculation. Water is a system. The Philippine coastline is where the two arrive at the same time.*
>
> THE WORKING RULE FOR EDITION 04

PRACTICAL / SPECIFICATION WORKSHOP

Six questions before you specify a coastal envelope.

A working checklist for design managers, façade consultants, and procurement teams writing the wind-and-water performance section of a curtain-wall specification for a Philippine coastal high-rise. Written to force the conversation onto evidence, not brochure claims.

01 **What is the NSCP wind zone?** Name the NSCP 2015 zone and the design basic wind speed for the site. The specification serves the code, not the other way around.

02 **What is the site design wind pressure?** Convert wind speed to pressure at the design elevation and require the envelope to test at that pressure — not at a temperate benchmark.

03 **Air, static water, cyclic water?** Require ASTM E283, E331, and E547 to the performance mockup. All three are baseline for any Philippine curtain wall.

04 **Dynamic wind-and-water?** For any coastal high-rise, require AAMA 501.1 at the site design wind pressure — the only test that simulates typhoon loading.

05 **Impact-resistant glazing?** For wind-borne debris zones, name the impact test standard (ASTM E1886/E1996 or equivalent) and require the glazing unit to be certified against it.

06 **Performance mockup before fabrication?** Require a full-scale performance mockup, tested and reported, before production release. Substitutions after the mockup void the test.

CURTAIN WALL A non-loadbearing exterior wall system — panels, mullions, transoms — hung off the primary building structure. The envelope of most Philippine high-rises.

UNITISED A curtain-wall system fabricated as complete units in the factory and hoisted into place. Higher performance under wind-driven rain than stick-built assemblies.

PRESSURE EQUALISATION A design principle where the cavity behind the exterior line is equalised to outside pressure — reduces the pressure differential that drives water inward.

RAIN SCREEN A drained-and-vented cavity behind an outer skin. The outer skin sheds most water; the cavity drains the rest. The working principle for a wind-driven-rain envelope.

DESIGN WIND PRESSURE The pressure the envelope is engineered to resist — derived from the NSCP zone wind speed, the site exposure, and the design elevation.

PERFORMANCE MOCKUP A full-scale physical prototype of the envelope, tested to the specification's air, water, and dynamic tests — before production release.

IN SUMMARY · THE ARGUMENT OF THIS ISSUE

Name the wind zone. Test to the site pressure. Mock up before you fabricate.

Wind is a calculation the structural engineer can hand you. Water is a system decision the specifier has to make — and it is decided by the tests written into the specification, and by the performance mockup that proves them.

FOR THE DESIGN & DEVELOPMENT COMMUNITY

Thank you.

For reading. For sharing. And for the wind-and-water performance specifications you are writing today that will hold up on the day a Category 5 typhoon actually arrives.

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