

Republic of the Philippines
HOUSE OF REPRESENTATIVES
Quezon City

Seventeenth Congress
Third Regular Session

HOUSE BILL NO. 8871



Introduced by Rep. Scott Davies S. Lanete, M.D.

AN ACT ORDAINING STANDARDIZATION OF STEEL REINFORCING BAR QUALITY IN HIGH RISE INFRASTRUCTURES TO RESIST AGAINST WIND AND EARTHQUAKE IN THE PHILIPPINES, AND FOR OTHER PURPOSES

EXPLANATORY NOTE

The Philippines sits on the "Ring of Fire," an area in the basin of the Pacific Ocean where many earthquakes and volcanic eruptions occur. Ninety percent (90%) of the world's earthquakes, and eighty-one percent (81%) of the world's *largest* earthquakes occur along the Ring of Fire. According to the Philippine Institute of Volcanology and Seismology, intense earthquakes will inevitably hit the Philippines' most densely populated areas and provinces. Such events will possibly collapse buildings, and consequently cause a catastrophic loss of life.

Aside from the earthquake threat, about twenty (20) major storms batter the Philippines each year. According to Time Magazine, the Philippines is "the most exposed country in the world to tropical storms." The high winds these storms bring pose significant risks to the stability of tall buildings.

High rise infrastructure is highly vulnerable to wind and earthquake damage. With the advent of exponential growth and industrialization, large portions of Philippine metropolises are comprised of these structures. These massive buildings, ranging from condominium residences, office buildings, or recreational malls, now tower over millions of Filipinos, who live, work, shop, stroll, and play in them every day.

In the construction of these tall structures, steel reinforcing bars ("rebars") have a critical role. Rebars impart toughness and resiliency to a building's concrete body. If a building's rebars were to fail under the stress of an earthquake or a typhoon's violent winds, the building would shatter and crumble. In this regard, the Philippine steel

industry has long recognized that steel rebars in high-rises must meet a minimum grade of 60 to ensure adequate safety.

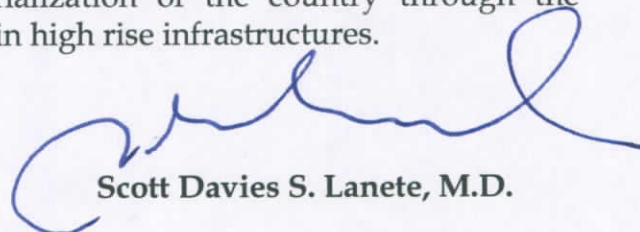
In recent years, Quench Tempered ("QT") or Thermomechanically Treated ("TMT") rebars (collectively "QT rebars") have become commonly used in the construction of high-rises in the Philippines. However, QT rebars have a fatal flaw - only the *outer skin* of the rebar meets the minimum grade. Once this thin skin is stressed or damaged, whether through welding, rebending or threading, the rebar experiences a critical loss of strength. Ironically, any high-rise construction process will inevitably involve some degree of welding, rebending or threading of rebars. Therefore, any new high-rise building constructed with QT rebars could have its strength already *dangerously compromised*.

In fact, the structural codes of seismically active countries, such as Taiwan, Australia, and New Zealand, already prohibit or discourage the use of QT rebars in high-rise buildings.

In contrast, higher quality *microalloyed* rebars have a consistent hardness and toughness throughout their *entire cross-section*, not just the outer skin.

Hence, in order to mitigate damage and loss of life, there is a need to standardize the use of high-quality rebars in all high rise infrastructures across the nation. The use of higher quality rebars which are more resistant to the effects of wind and earthquakes should be made mandatory in high-rise infrastructures. Furthermore, these rebars should have embossed labels and grades (not merely color-coded) so as to ensure quality control. After all, the safety and welfare of Filipinos should never be compromised.

To attain these objectives, it should be the policy of the Government to promote the welfare, economic progress, and industrialization of the country through the standardization of steel reinforcing bar quality in high rise infrastructures.



Scott Davies S. Lanete, M.D.

SEVENTEENTH CONGRESS)
OF THE REPUBLIC OF THE PHILIPPINES)
Third Regular Session)

House of Representatives
House Bill No. 8871

Introduced by Rep. Scott Davies S. Lanete, M.D.

1 AN ACT ORDAINING STANDARDIZATION OF STEEL REINFORCING BAR
2 QUALITY IN HIGH RISE INFRASTRUCTURES TO RESIST AGAINST WIND
3 AND EARTHQUAKE IN THE PHILIPPINES, AND FOR OTHER PURPOSES

4 *Be it enacted by the Senate and House of Representatives of the Philippines in Congress*
5 *assembled:*

6 **SECTION 1. *Short Title.*** – This Act shall be known as the “Philippine Wind &
7 Earthquake Resistance Standardization Act of 2019 (PWERSA).”

8 **SECTION 2. *Declaration of Policy.*** – Powerful earthquakes and typhoons pose a
9 constant threat because the Philippines sits on the Ring of Fire, and in the midst of the
10 Pacific cyclone corridor. In particular, high-rise structures are extremely vulnerable to
11 these natural disasters. Earthquakes and typhoons could knock down or damage
12 buildings, and possibly cause catastrophic loss of life. The use of high-quality rebars in
13 all high rise infrastructures across the nation would mitigate destruction and loss of life.
14 Thus, it is hereby declared to be the policy of the Government to prevent loss of lives
15 and limit earthquake and typhoon damage through the standardization of steel
16 reinforcing bar quality in high rise infrastructures.

17 **SECTION 3. *Definition of Terms.*** – As used in and for purposes of this Act, the
18 following terms, whether in singular or plural are hereby defined as follows:

- 19 a. “Certifying Authority” refers to the Bureau of Product Standards of the
20 Department of Trade and Industry.
- 21 b. “Steel industry” refers to the group of persons, entities, or enterprises engaged in
22 the preparation, smelting, crushing, soaking, blooming, slabbing, melting, firing,
23 rolling, casting, shaping, plating, galvanizing of steel and all other processes
24 involved in transforming raw materials into semi-finished steel products and/or
25 semi-finished products into finished steel products.

- c. "Steel manufacturers" refer to any person, whether natural or juridical, that manufactures, produces, or otherwise causes the manufacture or production of steel and steel products within the steel industry.
- d. "Steel importers" refer to any person, whether natural or juridical, that bring in steel from a foreign territory into Philippine territory, whether for consumption, warehousing, or admission within the steel industry.
- e. "Reinforcing bar (rebar)" refers to a steel bar or mesh of steel wires used as a tension device in reinforced concrete and reinforced masonry structures to strengthen and aid the concrete under tension.
- f. "High rise structure" refers to any multi-story building or structure with an occupied floor located more than 23 meters (75 feet) above the lowest level of fire department vehicle access, or the ground floor, whichever is more accessible.
- g. "Quench Tempered (QT) or Thermomechanically Treated (TMT) rebars" are steel rebars manufactured by rapid cooling of plain low carbon steel by a fine water spray or otherwise rapidly cooled by liquid, resulting in a quenched surface which is tempered by the heat of a red hot core.
- h. "Microalloyed (MA) rebars" refer to rebars which derive strength from alloying materials such as, but not limited to, vanadium and carbon, and consists of a uniform material cross section manufactured from steel billets.
- i. "Mislabeling" refers to the embossing or labelling of steel grades or types which do not reflect the actual grade or type of the steel, or otherwise indicating steel grades and types which are false, or indicating a steel grade or type which is different from that of its original raw material;
- j. "Cyclic loading test" refers to the application of repeated or fluctuating stresses, strains, or stress intensities on the rebars.
- k. "Grade 60 rebar" refers to steel rebars which offer a minimum yield strength of 60,000 pounds per square inch, or 420 megapascals on the metric grading scale, which features a continuous line system, with one line running along the length of the bar which is offset a minimum of five spaces from the center.

SECTION 4. Minimum Steel Grade for High Rise Structures. – All high rise structures shall make use of, at the minimum, grade 60 microalloyed steel rebars, which are capable of passing the cyclic loading test.

SECTION 5. Cyclic Loading Test. The Certifying Authority shall prescribe the manner and the parameters of the cyclic loading test, which shall be conducted on a random sampling basis. The Certifying Authority may accredit independent, non-commercial centers or institutions to carry out the actual testing. Upon passing the cyclic loading test, the Certifying Authority shall issue a Certificate of Conformity to the steel manufacturers or importers concerned. The Certificate of Conformity shall be renewable at such times as may be determined by the Certifying Authority.

SECTION 6. *Certification of Conformity.* - No Building or Construction permit shall be issued, nor construction, conversion, repair, alteration, renovation, or alteration be permitted until the person or entity that owns the high rise structure or causes such aforementioned works upon a high rise structure possesses a Certification issued by the Certifying Authority that the rebars to be used are in conformity with Sections 4 and 5 of this Act.

SECTION 7. *Embossing of Manufacturer Label and Steel Grade.* All rebars must have their steel grade embossed distinctly and clearly on each rebar so as to properly identify the quality of the steel. All steel manufacturers shall similarly emboss their name or logo distinctly and clearly on each rebar, as well as the date of production of the rebar. Painting or color-coding the steel grade, or other means of identifying the steel grade in a manner that may easily be removed or changed, is expressly prohibited.

SECTION 8. *Periodic and Random Testing.* - The Certifying Authority shall have the authority to periodically and randomly test steel rebar quality. The Certifying Authority may take custody of rebars available in the market for this purpose.

SECTION 9. *Prohibited Acts and Practices.* - The following acts and practices shall be prohibited:

- a. Use of Quench Tempered or Thermomechanically Treated Steel Rebars in High Rise Structures. - Using Quench Tempered or Thermomechanically Treated steel rebars in high rise structures in any capacity;
- b. Failure to Comply with Steel Grade Requirement. - Using rebars in any capacity in high rise structures that fail to comply with the minimum steel grade requirement as stated in this Act;
- c. Failure to Emboss Manufacturer Label and Steel Grade. - Failing to emboss steel grades for rebars distinctly and clearly on each rebar so as to properly identify the quality of the steel, or failing to emboss the steel manufacturer's name or logo, or date of production distinctly and clearly on each rebar;
- d. Mislabeling of Steel Grade or Type - Embossing or labelling of steel grades or types which do not reflect the actual grade or type of the steel, or otherwise indicating steel grades and types which are false, or indicating a steel grade or type which is different from that of its original raw material;
- e. False Certification of Conformity. - Causing the issuance or presentation, or attempting to cause the presentation of a false Certification of Conformity;
- f. No Certification of Conformity - Causing or otherwise constructing, altering, modifying, repairing, adding, renovating a high rise structure without a Certification of Conformity;
- g. Manipulation, Submission, or Tampering with Testing Result. - The manipulation, submission, or tampering with the testing result as mentioned in

103 this Act, or the submission of misleading, false or forged evidence of any kind to
104 the Certifying Authority or any accredited testing center.

105 **SECTION 10. *Enforcement of the Act by Officers of the Law.*** - It shall be the duty of all
106 duly constituted law officers of the national, provincial, city, and municipal
107 governments, or any political subdivisions thereof, to enforce the provisions of this Act
108 and to prosecute any person or entity violating the same.

109 **SECTION 11. *Penal provisions.*** - Any person, and in cases of juridical entities, its
110 board of directors and its officers, who shall violate any of the provisions of this Act
111 shall, without prejudice to violations of other laws and ordinances shall, upon
112 conviction, be sentenced to suffer imprisonment for not less than one (1) year and not
113 more than three (3) years, and shall pay a fine of Ten Million Pesos (PHP 10,000,000).

114 **SECTION 12. *Prescription of Offenses.*** - All offenses punishable under this Act shall
115 prescribe in ten (10) years.

116 **SECTION 13. *Application.*** - This Act shall apply to all high rise buildings and
117 structures constructed and any change or repair made thereon after the approval of this
118 Act. High rise buildings or structures constructed before the approval of this Act shall
119 not be affected thereby; Except, where their continued use or occupancy is dangerous to
120 life or limb; or where alterations, additions, conversions, or repairs are to be made
121 thereon, this Act shall apply only to such portions of the high rise building or structure
122 which have to be altered in order to effect such alterations, changes, or repairs.

123 Where the building is in the process of construction when this Act takes effect, the
124 construction of the portion or portions in violation of this Act shall be stopped until the
125 same shall have been altered to conform to this Act, unless such partial alteration will
126 impair the stability and safety of the whole or part of the structure, in which case, only
127 the remaining portions to be constructed shall conform to this Act.

128 **SECTION 14. *Separability Clause.*** - If any provision of this Act or the application of
129 such provision or circumstances is declared invalid, the remainder of the Act or the
130 application of such provision to other persons or circumstances shall not be affected by
131 such declaration.

132 **SECTION 15. *Effectivity.*** - This Act shall take effect after fifteen (15) days following its
133 complete publication in the Official Gazette or in a national newspaper of general
134 circulation.