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Research Article

Outlining Probable Fundamental Doctrine and Relations to Disasters in the Continental Crust

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ABSTRACT

With aim to address impacts of penetration points by human structures (hard points), vegetation (multi-point) and slope or hills (continuous) towards crustal faults, doctrine equations like Archimedes, relative centrifugal force, square cube, Newtonian, Bernoulli, kinetic and Coriolis and were tested using weight, area and height. Newtonian energy was well distributed with area in 2-dimension layout. However, the square-cube law applies to nature and focus was on 3-dimentional forms. Aboveground weight was converted into mass by relative centrifugal force, a down-ward vertical spiral that functions with Coriolis to settle crustal matter within their layers. The aboveground weight causes the belowground layer to thicken. While human structures are 3-dimensional, have spaces and rely on supporting beams as well as hard points to stabilize, under the same vertical spiral downward motion, pronate and supinate zones develop beneath the structure. This repulsion causes adjacent crustal materials to become displaced and move upward (180˚), similar to the expression of Archimedes. Eventually, crustal materials beneath human structures vibrate to resettle but, because their composition was already mixed, slips, cracks or voids continuously develop. Overall, the downward flow of kinetic *vis-à-vis* sideward repulsion becomes larger with height and the resultant voids partake a bubble-like motion in the crust. Overall, land clearing spills crustal materials between layers and the effects of mixing adds risk of contact with liquid medium. Such contact causes weathering, the formation of voids and eventually faults. Built environments need to evaluate belowground crustal matter preferably using the doctrines tested to avoid timely disasters.

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1. INTRODUCTION

The earth's crust contains stratified layers of parent material that develop through successive episodes of surface soil crusting, where solid and liquid phases interact during climatic events to form compacted horizons (Alnaser & Alkhafagi, 2020). Repeated rainfall and runoff progressively thin these layers by physicochemical dispersal of soil aggregates, a process in which detached clay and silt particles clog pore spaces and reduce infiltration (Romkens et al., 1990). Over time, this leads to the formation of dense surface crusts ranging from 1 to 10 mm in thickness (Bresson et al., 2004). At finer scales, reorientation of soil particles occurs in micro-layers as thin as 0.1 mm, where softer aggregates separate from hardened crusts, initiating cycles of crust disruption (McIntyre, 1958). These cycles generate distinct crust types such as disruptional crusts from raindrop impact on silty soils, sedimentary crusts from surface runoff on slopes, and laminar crusts from the weathering of sodium- and magnesium-rich soils. Seismic studies further reveal that the lower continental crust exhibits velocities greater than 6.9 km s^{-1} compared to 6.3–6.7 km s^{-1} in the upper crust, indicating heterogeneous lithology and compositional layering (Rudnick & Fountain, 1995). Thus, crustal matter is compacted into stratified units, analogous to lithogenous rock formation, shaped by both surface and deep-Earth processes.

The construction of built spaces was initially based on embedding or caving-in methods, where natural formations were minimally altered to provide shelter from predators and climatic extremes (Bozsaky, 2015). With the mastery of wood and stone, construction evolved into in-earth assemblies (Anselm, 2012). Early houses were small timber dwellings, but with the rise of commerce and territorial disputes, they expanded in both area and height (Güçhan, 2018). Land use practices shifted accordingly (Winkler et al., 2021). Early shallow embedding points gave way to hard points for stability, especially in regions with unpredictable weather. This transition marked the shift from direct land construction to foundation-based systems. For example, British Standards estimate that a 30 m² building weighing approximately 4 tonnes exerts about 40 kN of force, requiring removal of 150–300 mm of topsoil to establish a stable foundation (Marshall & Worthing, 2008). Human construction practices therefore accelerated subsurface modification, replacing gradual natural processes with rapid excavation, compaction, and hydrological alteration.

The only biotic components that directly interact with continental crusts are plants, through their roots, stems, and vascular tissues. Subject to physical forces such as Bernoulli and Coriolis effects, plants redistribute soil moisture upward via xylem transport (Raven, 2022). Vegetation stabilizes crustal systems by regulating organic matter cycling, enhancing soil porosity, and promoting aeration through root channels (Bardgett et al., 1998). By contrast, abiotic structures lack such feedback mechanisms. Building materials, regardless of porosity, do not facilitate moisture or gas exchange. Instead, they may trap water, accelerating subsurface weathering. Contact between limestone, dolomite, gypsum, or halite and infiltrating water produces micro-erosions, fractures, and bedding partings that expand into voids (Alonso et al., 2020). These voids may propagate upward, leading to subsidence and ground collapse (Kaufmann, 2014). While natural processes of geo-compression, deposition, and weathering unfold over geological timescales, urbanization accelerates them, resulting in rapid geological genesis in developed areas (Guo et al., 2023).

Modern human ecology is embedded within technologies, infrastructures, and facilities. Case studies such as Johannesburg's transit-oriented corridors highlight the need for sustainable planning to ensure long-term resilience (Schäffler & Swilling, 2013). Findings show that sand, metals, composites, and polymers degrade over time, requiring periodic refurbishment (Frantzeskaki et al., 2019). Built environments are further stressed by vibration, resonance, heat, and noise, necessitating continuous monitoring (Shaw et al., 2021). Yet unforeseen failures may arise from the interaction of liquid, gaseous, and solid states within the crustal environment.

Large earthquakes can alter stress fields, trigger subsequent seismicity or influence volcanic activity (Ma et al., 2025). Magma intrusions induce seismicity and deformation, precursors to eruptions (Biggs et al., 2022). The 2018 Palu earthquake and tsunami demonstrated the interplay of strike-slip faulting, liquefaction, and submarine landslides, producing tsunamis not directly linked to vertical seafloor displacement (Setyonegoro et al., 2024). Similarly, the 2021 Cumbre Vieja eruption in La Palma highlighted mantle plume activity, crustal fracturing, and volatile release, underscoring the need for integrated hazard monitoring (Amonte et al., 2022). While guided by the laws of nature, these observations suggest that the processes leading to belowground void formation which vary from crustal movement, fissuring to seismic vibrations were indeed outcomes of both natural geological cycles and human-induced acceleration. Therefore, this study aims to reveal the possibilities of natural genesis through equations derived from scientific doctrines. The comparison between plant, crustal folds and buildings provide clear-cut indications that built environments were prone to risk of subsidence, seismic hazards, and structural instability.

2. METHODOLOGY

2.1. Information Sourcing

Data from published, refurbished or ongoing projects were sourced from Google Patents (patents.google.com), WIPO (patentscope.wipo.int), Google Scholar, Web of Science (for Scientific and Academic Research, IP services such as Patent & Trademark, Real World Data and Research Reports). A total of 35,467 materials were retrieved. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was adopted from data searching until the qualitative analysis. The quantitative analysis was modified from Hamdani et al. (2021). First filtering used temporal (recent 20 years), impacts of natural disasters, rapid decisions, spatial planning and short-term solutions. This reduced materials to 797 sources comprising of 36 patents, 142 governmental decisions, 53 reviews, 201 social and ecology concerns and 365 research findings.

2.2. Developing the Library

The data was screened by articles that contain matrices, numbers, values, or keywords related to direction, decision, and implementations. The inclusion criteria were fitted by 68 reliable research materials. Though weakly associated, another 13 articles were reserved as support. These 81 articles have relevance with human doctrines grounded by gravitational attraction and equilibrium of matter; built material and composition; land size and clearing methods; cost-effective built; land transformation; elevation and structure height; residential offsets; objectives related to economy decisions, and policies; temporal size of human population and; carrying capacity. It offered support in the results and discussion sections and complemented the theme of this work which relates to earthquakes, unpredictable weather, and its consequences. These materials provided supporting information on theories, principals and laws which could be tested and evaluated using basic logarithmic manipulations of integers.

2.3. Mathematical Testing

The testing was carried out in Microsoft Excel using descriptive statistics. While raw data was processed using linear ($y = mx+c$) and logarithmic equations ($\log y = m \log x + \log k$), the calibration was carried out using x = time; x = area size and x = capacity. In 2-dimensional equilibriums, the value of y was fitted with factors derived from testing the value of x. In all cases, the regression value of $R^2 \geq 0.9$ was accepted. In some circumstance (as stated in the results), the linear equation was tempered by changing variables in the factors. Only then the linear equation generated weaker R^2 values and the equation was then challenged by increasing the number of factors. Hence, operators such as weight, height, distance, time, and area had to be maintained (fixed as operational factors) while other variables, pertaining to the sub-topic, become adjusted to produce a simple understanding on risks and chaos after transforming the earth's surface.

3. RESULTS AND DISCUSSIONS

3.1. Archimedes Principal

This principal describes events of displaced immersion under gravity. While mass endures downward-settling (or grounding) this matter also experiences a displacing repulsive effect alike immersion where mass becomes deficit as matters settle into each layer to reach isostatic equilibrium (Whipple, 2009). Basically, aboveground matter moves through a path, becomes sorted and the kinetic energy from this matter is redistributed by forces with upward and sideward trajectory. This mass has no other direction but to remain grounded in the trajectory of gravity and move along fixed paths set by boundaries (or thickness) of each layer. It was the basis for equation derived by Mohazzab (2017) and this fluid crust concept is seen in casting industry where additives could develop a matrix but become porous from rapid cooling processes (Lifton et al., 2022). To visualise the Archimedes principal, weight, size, and shape of crustal material must be consistent; mass of the crust was maintained at 1 kg s^{-2} (Figure 1). Foreign objects like buildings have varying weights and the force exerted could penetrate the crust with a strength that is similar with gravity as described in the equation below.

Equation 1: $y = 9.8x$; where y represents the force exerted while x is the weight of the object.

However, in layers of mixed substrate, the displacement could only occur if the weight of the building exceeds 1 kg (Figure 1a). In this case, increasing the weight of above ground objects (like buildings) causes a displacement effect to below ground bed materials in an exponential effect in the presence of gravity. Hence, for 1-1000 kg weights, the new equation was observed.

Equation 2: $y = e^{0.0098x}$; where y represents the exponential effects of force as x, the weight of an object becomes increased.

For the second case, vegetation (plants) penetrates the crust using a single point (radicle or embryonic root) during the germination process and as mass increases, the root radicle branches to become multipoint (Figure 1b). By using Log_1 on single decimal values of 1 kg, the immersion-penetration forces should equate to the force expressed by gravity. Therefore, even if the plant reaches 1000 kg, the amount of force remains linear.

Equation 3: $y = 3.626x$; where y represents the force exerted while x is the weight of a plant.

Every root and radicle will exhibit a force equivalent to 98 $kgm^2\,s^{-2}$ and the displacement force does not exceed 1 kg m^{-2}. Hence, after log transformation on the exponential equation, a new equation is derived.

Equation 4: $y = e^{0.0073x}$; where y represents the exponential effects of force as x, the weight of a plant becomes increased.

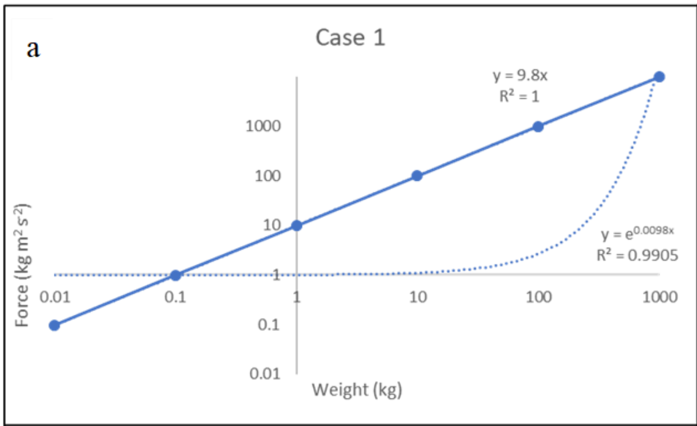
Therefore, a 10 kg plant embryo with single root radicle penetration obeys the calculation of and only causes a maximum displacement force of 98 $kgm^2\,s^{-2}$ to surrounding substrate. In the third case, crustal folding during the formation of hills, range and mountain is always linear (Figure 1c). While earth rotates, the Coriolis force was responsible for 90° displacement while momentum reacts on crust material in 180° angle. These forces act together to maintain mass which basically reflects on the stability of the crust itself. Therefore, the crustal folding of earth is $R^2 = 1$. Hence, folded mass is linear to the upward force expressed in a 180° angle.

Equation 5: $y = 0.102x$; where y represents the force exerted while x is the weight of crustal (bed) materials.

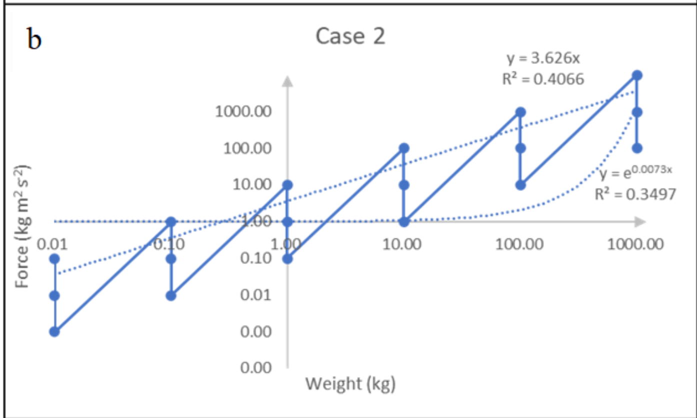
However, if the displacement force is exerted sideways, it obeys a logarithmic exponential increment where $R^2 = 0.9914$. Interestingly, crustal materials remain grounded in the same layers it was previously settled while the force that pushes the crust upward dissipates its free energy within the new formation.

Equation 6: $y = e^{0.0048x}$; where y represents the exponential effects of force as the weight (x) of a building becomes increased.

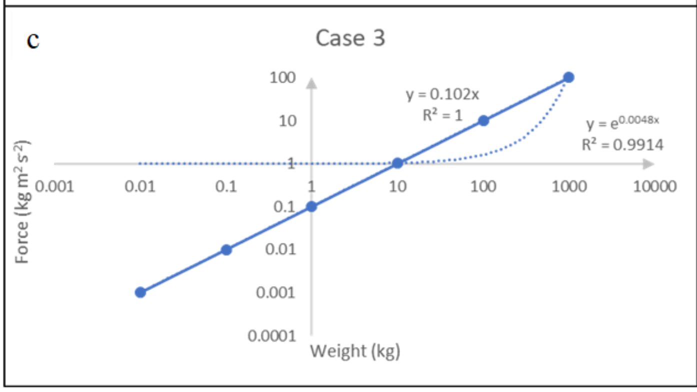
With stretching, thinning and hyperextensions observed in Nemčok et al. (2023), it was discovered that the absence of faults (listric or normal) maintains the nucleation of crustal layers. This observation disregards conditions where every layer of the affected crust was gradually becoming compressed, twinned, tensioned, or extended in the opposite, yet upward projection. Perhaps, this is the basis of twining that involves karstic limestone, heterogenous interbedded sediments or hard granite upward-convex developments. The crustal materials become solidly-compacted through hierarchical hexagonal close-packing (or polycrystalline deformation; Yoo, 1981).



Weight (kg)	Force (kgm s⁻²)
0.01	0.098
0.01	0.098
0.01	0.098
0.1	0.98
0.1	0.98
0.1	0.98
1	9.8
1	9.8
1	9.8
10	98
10	98
10	98
100	980
100	980
100	980
1000	9800
1000	9800
1000	9800



Weight (kg)	Force (kgm s⁻²)
0.010	0.10
0.010	0.01
0.010	0.00
0.100	0.98
0.100	0.10
0.100	0.01
1.00	9.80
1.00	0.98
1.00	0.10
10.00	98.00
10.00	9.80
10.00	0.98
100	980.0
100	98.00
100	9.80
1000	9800
1000	980
1000	98.00

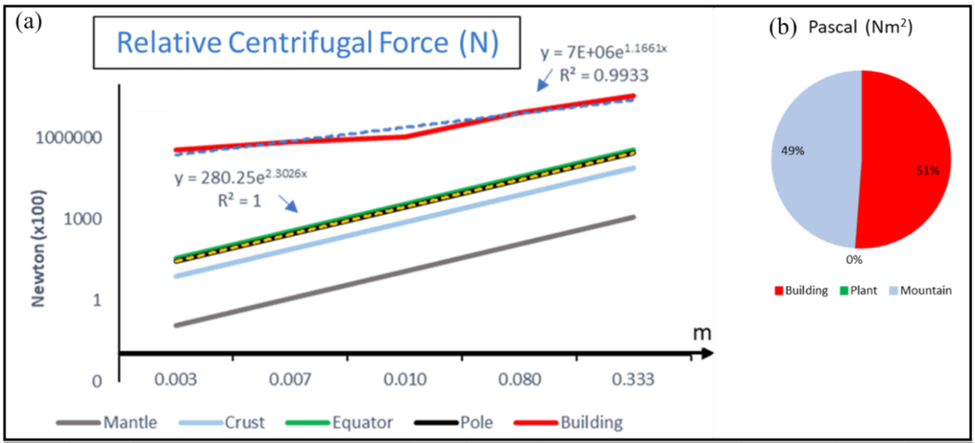


Weight (kg)	Force (kgm s⁻²)
0.01	0.00102
0.01	0.00102
0.01	0.00102
0.1	0.0102
0.1	0.0102
0.1	0.0102
1	0.102
1	0.102
1	0.102
10	1.02
10	1.02
10	1.02
100	10.2
100	10.2
100	10.2
1000	102
1000	102
1000	102

Figure 1. Graph of logarithmic weight increase and displacement force. Note: Cases 1-3 are in the respective order of built spaces (a), vegetation (b) and crustal rise (c)

3.2. Centrifugal Force

All crustal matter experiences an antagonistic vortex acceleration (or inertia) in the presence of Coriolis. This inertia was recognized with a relative centrifugation effect. Two factors, namely height (away from the core) and weight (mass of matter) behave unified under gravitational acceleration. Therefore, weight that undergoes acceleration does not only gain downward (in the path of gravity) trajectory but also an offset momentum (kg ms^2). Meanwhile mass gains a fixed velocity. In addition, height determines the magnitude of forces that acts on this mass. Together, a settling acceleration is created at the centre of a spiralling environment and mass within this region was assumed to experience a centrifugation effect *vis-à-vis* relative centrifugal force (Figure 2). When applied, relative centrifugal force could increase with the distance of objects from the earth's core. This observation could be tested using the equatorial bulge where crust at the pole is 27 km whereas it is 21 km at the equator (Figure 2a). There is exception for matter that originate from the crust because same-like materials could easily distribute and nullify kinetic energy (Figure 2b). Therefore, centrifugal forces that act on the crust could reduce with its thickness simply because same-like materials were present in each independent layer. Yet, there is exception for energy transfer across different states of a given mass (whether solid, liquid or gas) due to interstitial spaces.



Variables		Newton					Pressure (Nm^2 or Pascal)		
Height (km)	Weight (kg)	Mantle	Crust	Equator	Pole	Building	Building	Plant	Mountain
0.003	0.1	12	757	3603	2803	36027576	36027575	36031	34394871
0.007	1	119	7567	36033	28026	72041431	72041431	36024	32899442
0.01	10	1186	75669	360327	280255	108046716	108046716	36016	31528632
0.08	100	11864	756687	3603272	2802545	861503416	861503416	35998	30267487
0.333	1000	118640	7566872	36032722	28025451	3547026520	3547026520	35947	27024542

Figure 2. The amount of relative centrifugal force on every section of crust where living or non-living components were present. The comparison of relative centrifugal force for earth layers (a) and the total pressure from relative centrifugal force expressed in percentage (b)

Pressure behaves differently in liquid (hydrostatic) and solidified (compressed) environments. For the case of built spaces, compression is assumed to be created from embedded foreign materials that presses its weight on the crust and results in an evenly distributed compression. In a horizontal view (or 2-dimensional lattice of x-y), the weight of objects was dissimilar to crustal matter and weight-driven compression to each crustal layer depends on the compaction between the matter particles. Due to crustal layering, the relative centrifugal forces react proportionally with height and mass of the penetrating object at a single point. With this, compression is comparable to pressure exerted by objects, plants and mountains at a given space of 1 m^2. For this evaluation, the penetration points of a building was claimed with 2% more pressure than crustal materials (Figure 2b). It should be noted that height and area of buildings were consistent in the measurement (R^2 = 0.9933).

Equation 7: $y = 7E+06e^{1.1661x}$; where y represents the logarithmic exponential of momentum in kg ms^2 while x is the distance (or height) of a building.

Comparatively, plants also penetrate the earth's crust but distribute its mass on each point of the root radicle. The composition of soil layers remains unchanged while plant roots fill the interstitial spaces (R^2 = 1).

Equation 8: $y = 280.25e^{2.3026x}$; where y is the exponential increase in pressure and x is the height of a plant.

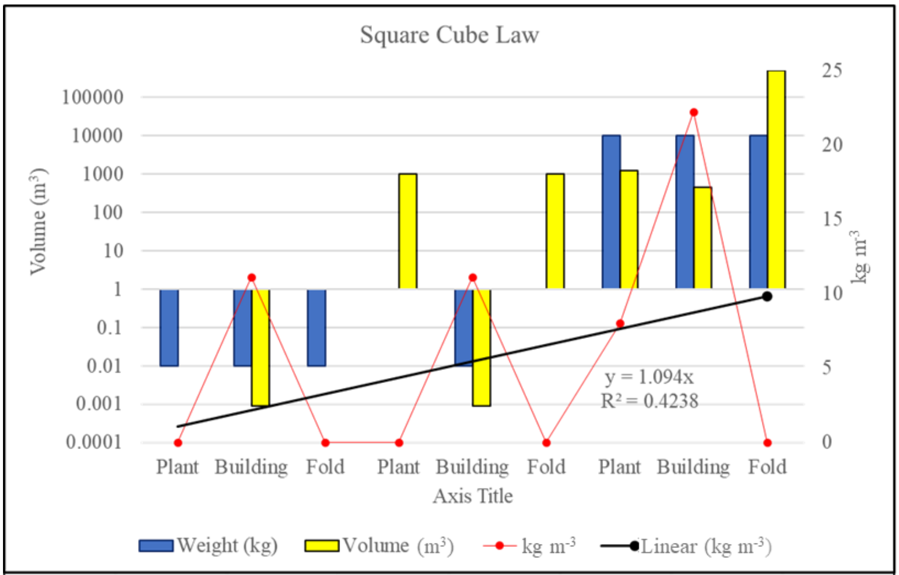
A given vegetation (or plant) distributes its weight using root hairs and regardless the weight increase, vegetative penetrations is not necessarily downwards. Rather, it could be sidewards in angles of 30-60-90º so that stability was assured. Unlike vegetation, every embedding point of built space will transfer this free energy towards the crust layer. In this process, a downward squeeze occurs alongside the trajectory of gravity. As plant roots pronate (Manners et al., 2015), adjacent sediments are pushed by supinate positions of the root but; these sediments remain intact between layers of same matrix. On occasion such as rainfall where alluvium becomes redistributed among root hairs, the tendency of sediment to become fluvial (or runoff) reduces (r^2 = 0.99) with the extent of root cover (Pan & Shangguan. 2006). Basically, the sediments remain intact and bounded to the plant root as well as its hairs while water seeps freely to fills voids present in porous terrain. This is indicative that vegetation also settles naturally in between crustal materials. Like folded crusts (the mountain), pressure for 1 m^2 area of plant becomes decreased with its height (Figure 2b). These effects occur because relative centrifugal force behaves differently to each mass where mixed-material proportions embed (building), crustal materials fold (crustal rise; e.g. hill or mountain) or encapsulated volume (plant root hairs) spread across layers of the crust.

3.3. Square Cube Law

Every object has mass but its density becomes dissimilar due to bonds and crystallization at the atomic level. In fact, all earthly materials have their volume increase with the cube of linear dimensions and inversely lose on specific surface area (Eriksen, 2023). Packing or compaction plays a major role in this binding relationship to the extent that every object occupies a certain area and height. It is different with human inventions because various materials could be bounded together using adhesives or by mechanical strength. In the natural environment, staked objects are filled, have minimal interstitial spaces and regardless size, shape or form, it entirely occupies a cubic amount of space. Therefore, it could be asserted that all mass on earth has 2-dimensional area and with height, mass gains a 3-dimensional volume. To develop an understanding, the subunits used in the formation of plant (vegetation) and fold (crustal fold = mountain, hill, slope, or range) are similar which also means, the materials have an endemic origin. Therefore, through retrogression partitioning and the stability of crustal roots or layers (*c.f.* Cenki-Tok et al., 2020), the base of pinched crusts could become thicker (~ up to 50% thicker than adjacent crust) if compared to the usual 35-40 km thickness in flatlands.

It is dissimilar for buildings because bricks (given width and length 0.03 m) are foreign cured subunits that need to be stacked by dimensions like length, width, and height. Buildings have rooms and it means these bricks do not completely occupy free space. In a collective comparison between plants, crustal folds and buildings, the volume (y) increases by a factor of 1.094 for each kg in weight (Figure 3). Although folded crusts gain height and supposedly possess larger weight than plants and buildings, at 10-tonnes of weight, crustal subunits only create a force of 0.020 kg m^3 compared to vegetation (plant) at 8 kg m^3 and building at 22 kg m^3 for every 1 m^3 of its volume. While the mean surface elevation of a crust is proportional to the horizontal compression and thickening, the crust folding processes displaces crustal materials into every direction possible (observing a 3-dimensional multi-planar distribution) to cancel-out free energy. In fact, crustal materials were being displaced by the same amount of energy or stress as evaluated by Tang et al. (2022). This normal force was sufficient to move inner (or beneath) layers outward but, the crustal materials remain intact (without magmatic spills or mixing) within their settled layers although being gradually pushed upward towards the crust surface in 180º angles against the direction of gravity. The shift from inertia to motion continues to abide the square-cube law especially for space filling. Space filling could be conceptualized using particle packing process as aggregates of various sizes collide to fill voids (Ghasemi et al., 2019).

Crustal layer always remains in equilibrium and the driving energy could freely transfer between same-like materials at a constant rate. Void filling caused by an upward push creates compression in adjacent layers and by losing thickness, lowlands or basins could develop despite simultaneously undergoing pressure from hydrospheric environments (Moulin et al., 2023). Free energy is projected in a downward direction with gravity and this energy moves along bottom layers beneath the crustal pinch. Areas affected will become tightly squeezed, thinned, or converge to become thickened but retain themselves within the original layer having same sub-units. It could be the role of centrifugal forces that counter acts on Newtonian influences from the crust surface as energy dissipates with depth along each crustal layer involved for a given volume of rise (or pinch). However, the circumstance, crust materials which occur as magmatic, fluvial, or solid do not spill out unless the crust surface tears. Generally, the weight endured by an area of the base was determined by the aboveground volume in a 3-dimensional overview that conserves the square-cube law application.



Criteria	Weight (kg)	Height (m)	Length (m)	Width (m)	Area (m^2)	Volume (m^3)	kg m^{-3}
Plant	0.01	1	1	1	1	1	0.010
Building	0.01	1	0.03	0.03	0.001	0.001	11.111
Fold	0.01	1	1	1	1	1	0.010
Plant	1.00	10	10	10	100	1000	0.001
Building	0.01	1	0.03	0.03	0.09	0.9	0.011
Fold	1.00	10	10	10	100	1000	0.001
Plant	10000	50	5	5	25	1250	8.000
Building	10000	50	3	3	9	450	22.222
Fold	10000	50	100	100	10000	500000	0.020

Figure 3. Criteria used to develop the square cube equation. Weight over volume was used to develop a ratio for gravitational forces that act on every penetrating point. Note: plant = vegetation; building = built space and; fold = crustal rise

3.4. Newton's Laws

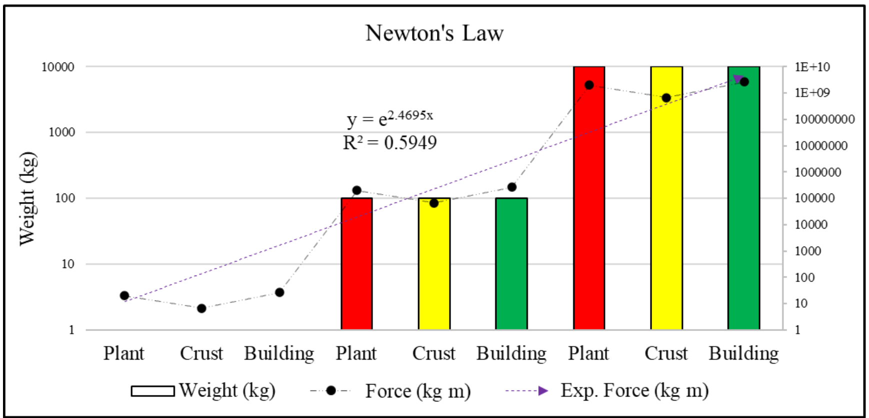
A falling object, its impact and converted energy has been the basis for modern applications, particularly for construction. Penetration of foreign objects such as steel or concrete into the crust provides stability. It could offer strength somewhat acting as a base for foreign objects. A given example is habitable sky-rise construction. This was never seen in the early existence of mankind because early dwelling units possessed extensive surface foundations, the building blocks were large or a large wall area (of space) provided stability to the entire structure. The embedding of piles through crustal boring was an innovation to save building space while offering aboveground structure stability. Basically, the new structure could be erected to greater heights. It also means, buildings could be disproportionally tall if compared to primitive building units. For instance, an object of 1 m height (best initial value obtained from the centrifugal force) may have a base of 1 m^2 or by using modern engineering, core pillars could be placed at the mid points to reinforce the object while allowing the building to maintain its occupied surface space of 1 m^2.

Buildings could be erected next to each other and using modern construction capabilities, these buildings could share the same foundation. Therefore, the weight of these objects could be anchored by similar points that penetrate the crust. This form of development is the basis of modern construction but it is opposite from natural forms. the average project span rarely exceeds prolonged periods; completion is hugely anticipated as rapid as possible depending on the technology employed. In addition, the weight of planted materials varies by its type, space allocation and total height of the new structure. Then, placement of structure on intact or jointed rocks will be influenced by the tri- and uni-axial compressing strength, weathering, and genesis of the rocks (Lajtai, 1991; Lu et al., 2021). This relates with rock mass and its fortification under the effects of time. Impacts such as rock splits, shears, slides, or rotation were commonly predicted using models after boreholes were carried out. Often, random sampling and perceived influenced by predicted factors (such as seepage pressure, confining stress, and effective stress) inspires the results of *in situ* stress (Ramamurthy, 2004). Usually, the perception of stability is strongly grounded by the fortification of a base constructed on the surface layer of the crust. Since the constructed base is built from materials that differ from the crust layer, there will be free energy generated at every embedding point; this energy was derived in this study but it could have always been overlooked. Attention could be drawn towards the stability of the built space.

In nature, because of completely filled volume, every force becomes evenly distributed to cancel out each other. Plants have disproportional form but, are stabilised by root radicles. Regardless height of a plant and area covered by the root system, plants obey the 30-60-90 triangle rule and therefore, their form is measured with stability. This means although penetrating in a 180° angle, the weight of a single plant is distributed within 30° and 90° of its root hair range. Through canonical quantification, position and momentum could be defined as self-joint operators (Umar & Shah, 2023). The following the equation a $\sqrt{3}^{-1}$ was used where a = depth. On the other hand, folded crusts also exhibit the 180° force-to-area gravitational attraction and therefore, the action-reaction force will always be in a factor of 1. However, in this calculation, gravitational acceleration was maintained at 0.98 ~ 1 m s^{-2}. Comparatively, buildings utilize penetration points to distribute its weight. Therefore, 2-dimensional (area) and 3-dimensional (volume) concepts were introduced. Since Newton's second law on force was applied with the universal gravitational principal G = gravity constant (6.6743 × 10-11 m^3 kg^{-1} s^{-2}) a given unit of mass will exhibit a downward force by squared unit of height (Figure 4; R^2 = 0.5949).

Equation 9: $y = e^{2.4695x}$; where y is the conceptual Newtonian force while x is the weight.

Interestingly, the regression score decreases for building because of their number of penetrating points (or base). This occurs because vegetation anchors themselves in the crust differently than buildings. Overall, the amount of force generated by a 1 m height building was subject to a force that stabilises its penetration. The reaction by countering displacement was witnessed. This force grows larger as the height of building increases. In contrast, folded crusts and vegetation were also subjected to an action (penetration) force but because the weight of natural objects was cancelled out, the Newtonian force towards the crust remains low (Figure 4).



Criteria	Weight (kg)	Force (kg m)
Plant	1	20.0229
Crust	1	6.6743
Building	1	26.6972
Plant	100	200229
Crust	100	66743
Building	100	266972
Plant	10000	2E+09
Crust	10000	6.67E+08
Building	10000	2.67E+09

Figure 4. Variations in weight and the resultant force exerted by buildings, plants and folded crust under gravitational acceleration and the Newtonian effect. In this case, force = $G(m_1m_2)\, d^{-2}$ where, G = gravitational constant (6.6743 × 10-11 m^3 kg^{-1} s^{-2}), m = mass and d = height of the object. Note: plant = vegetation; building = built space and; crust = crustal rise

3.5. General Theory, the Effect and Perceived Principal

Another basis of energy distribution relevant to crustal stability is the kinetic theory, where in its third rule, particles of the same construction or type do not exert energy onto each other. In practical terms, this means that objects composed of uniform matter transmit energy internally but only transfer it outward when interacting with adjacent, dissimilar materials. Traditional buildings, which were often constructed from single materials or simple composites, therefore exhibited limited internal energy transfer, whereas modern structures, built from mixed matrices such as cement-bound aggregates, demonstrate more complex energy dynamics (Haney, 2022). Kinetic energy in such systems is measurable because of the heterogeneity of materials, and it tends to increase with the height of the structure while decreasing with density when surface area is reduced (Table 1).

Since buildings are compartmentalized, their frames add volume and distribute load, but the square–cube law becomes less applicable in large, hollow structures where voids are filled with different materials. This contributes to greater kinetic energy generation, as weight increases while density decreases. The Coriolis effect, a natural phenomenon that displaces mass relative to Earth's rotation, further complicates this picture. Although it is most pronounced in the absence of strong gravitational or action–reaction forces, its influence scales inversely with surface area and height. Since objects are constructed using various compositions of building blocks, the attachment or belowground points make reduced surface contact with crustal matter. Yet, by adding materials, an object remains stable as it spreads horizontally or vertically despite its weight becoming increased. Perhaps this is the calculated observation for effects of Coriolis towards an object having weight (Table 1).

Buildings remain stable with Earth's rotation because all materials, regardless of state, are held in place by gravitational attraction. Modern built spaces are reinforced by concrete, a chemically modified crustal matrix altered in shape, texture, particle size, and composition (Abraik & Assaf, 2021). Aboveground structures transfer kinetic energy downward to their embedding points, which, once the concrete has cured, can only vibrate. The surrounding sediments, composed of loose aggregates, respond by converting this kinetic energy into vibrational energy that propagates laterally. Sediment particles are displaced away from the embed, creating alternating zones of tension and compression equivalent to pressure. This pressure compacts loose aggregates into voids, effectively thickening the crust beneath the foundation as the weight of the structure is projected laterally within the path of gravity.

Comparatively, gaseous particles freely circulate the environment without a fixed trajectory unless repelled by denser objects. The direction and speed of gaseous particles become altered from barometric changes, where pressure reduces with height. For this reason, Bernoulli's equation was considered applicable. The convergence of forces between incompressible fluid could fortify the understanding of action–reaction behaviour in solid, liquid, and gaseous states. Although forces from Bernoulli's equation were observed to increase with weight, the actual influence was the amount of force ((f = m \times a)) being originally exerted. An object is considered to accelerate with gravity and then possess action–reaction forces. On a two-dimensional layout, the displacement force could be calculated using Archimedes' principle. The direction of crust thickening varies in a horizontal direction and is magnified by the spatial span of construction that penetrates the crust. As a result, crustal materials tend to spread (as perceived with Archimedes' principle) and create disproportional or unhomogenised thickness (Artyushkov, 1973). Perhaps an isostatic equilibrium was attempted by the crust to cancel out the compression created by the weight of the new structure. However, in this process, weaker layers are forced to compress, causing the filling of vertical and horizontal interstitial spaces in the crust. Objects such as buildings are not grounded naturally but instead become anchored. In this two-dimensional layout, the foundation (base) experiences resonance (vibration) made from the collision of air particles. But, as volume increases (transition from 2- to 3-dimension), resonance increases with height of the object. For this work, the orchestra of force was calculated using Bernoulli's equation (Table 1).

In nature, all forces integrate with each other to develop a single function. Therefore, in nature, kinetic acts together under the influence of Coriolis because the right-hand triangle rule applies, and the force nullifies. If crustal folding was assumed with conical form, the right triangle rule could be applied to understand the concept of space or void filling (Gottschau et al., 2018). However, curves of right triangles should avoid isosceles applications. Otherwise, the entire concept will be deluded by quintic irrelevancies such as reptiling and gentiling. Using basic trigonometry, the effects of kinetic and Coriolis were minimal on human construction, but then again, these structures could add their height at the compensation of surface area. In fact, the volume remains at the frame. It also means that buildings of lower height have less tendency towards Coriolis and centrifugal forces due to possession of large surface area. However, increasing the area of a structure causes greater displacement because the building block materials were dissimilar to the crust. With this, the effects of Coriolis also become increased (Table 1). Comparatively, this new equation that combines kinetic, Coriolis, and Bernoulli describes that weight increases proportionally to height and volume of an object. Following an expansive soil experiment, vertical force could measure between 40 kPa and 970 kPa but stability was challenged by density (fixed at 1.2–1.5 t m^{-3} but in nature variable), time, moisture (29–47%), and unloading expansion (Nagaraj et al., 2010). Constant vibration challenges the stability of surrounding ground layers and together with weathering (Brownian motion for liquid against solid; Riyanto et al., 2015), weak crustal layers especially those with rocks continue to develop voids at microscales. But forces that act on natural systems was lower by number and magnitude if compared to man-made structures.

In a two-dimensional scheme (Table 1, attribute a), flat objects with larger bases do not penetrate the crust. These objects will have less effects of kinetic and Bernoulli although their weight increases. However, height will always be a determinant for the magnitude of kinetic and Bernoulli but it is calculated to be lower provided the 30–60–90 triangle rule becomes applicable. Yet, in built environments, the crust layers were becoming filled by materials of different physical state and boiling points. Hence, to reach an equilibrium, co-existing materials of these states (liquid vs solid) collide (Khodadadi, 2022) to cancel out the original displacement force (through pneumatic). Eventually, other structures adjacent to the repelling force have their stability challenged and it results in sinking or tilts in the surface layers of the crust. In this case, the crust surface itself which involves lithosphere and hydrosphere endures a shape-shifting process (derived as lattice, 3-dimensional or 40° multi-planar tilt encodes; Hayman et al., 2015). Crustal materials gradually move, collide, and slide to take new positions that offer isostatic equilibriums. Although this process is gradual, it could be responsible for unexplainable natural catastrophism which were often guessed rather than resolved. Ground sinking is a result of natural yet temporal events. Rapid movement of large compressed crusts, known as tectonics, triggers quakes that also result in the formation of visible sinkholes or faults (Venable et al., 2020). The case study that involves shear splitting by a 600 km deep earthquake in 235 teleseismic events between the Mediterranean and Northwestern Africa is a given example where rocks destabilize in their own layers and lead to physical changes of the surface crust layer (Miller et al., 2013).

Overall, presumably, modern technology was compromised by cost, logic, and efficiency (Straub, 2021). It is perceived with lesser environmental friendliness and perhaps responsible as a trigger for unwary natural events that harm modern societies. This finding suggests current building practices to adopt larger bases (foundation), where the base sits on the crust instead of penetrating, and every frame (wall) has its weight evenly distributed on each base (Table 1, attribute b). Guided by the laws of nature, these observations suggest that the processes leading to belowground void formation including crustal movement, fissuring, and seismic vibrations were outcomes of both natural geological cycles and human-induced acceleration. Therefore, this study reveals the possibilities of natural genesis through scientific doctrines, and the comparison between plants, crustal folds, and buildings provides clear-cut indications that built environments are prone to subsidence, seismic hazards, and structural instability.

Table 1. The attributes used to develop opinion that contrast Kinetic, Coriolis and Bernoulli to natural and modern environments

Attributes						Present			Natural		2D	3D
Weight (kg)	Area (m^2)	Height (m)	Vol. (m^3)	Density (kgm^3)	Force ($kgms^{-2}$)	Kinetic (kgm^2s^{-2})	Coriolis ($kgms^{-2}$)	Bernoulli ($kgm^{-3}s^{-2}$)	C-K	C-K-B	a	b
0.01	0.1	0.1	0.01	0.1	0.1	42915	-2	44371311	-0.007	0.6	0.59678	0.2
0.01	1	1	0.01	0.01	0.1	42915	-1	4437131	-0.004	0.2	0.59678	1.1
0.01	10	10	0.01	0.001	0.1	42915	0	443714	-0.001	1.1	0.59678	12.1
0.1	0.1	0.1	0.1	1	1.0	429150	-17	443713114	-0.068	5.5	0.05968	2.2
0.1	1	1	0.1	0.1	1.0	429150	-10	44371313	-0.038	2.2	0.05968	11.4
0.1	10	10	0.1	0.01	1.0	429150	-2	4437142	-0.007	10.8	0.05968	121.2
1	0.1	0.1	1	10	9.8	4291504	-175	4437131141	-0.682	55.3	0.00597	22.2
1	1	1	1	1	9.8	4291504	-96	443713133	-0.375	22.1	0.00597	114.2
1	10	10	1	0.1	9.8	4291504	-17	44371419	-0.068	107.8	0.00597	1211.9
10	0.1	0.1	10	100	98.0	42915042	-1746	44371311412	-6.818	553.3	0.00060	222.4
10	1	1	10	10	98.0	42915042	-960	4437131326	-3.750	220.5	0.00060	1142.1
10	10	10	10	1	98.0	42915042	-175	443714191	-0.682	1078.4	0.00060	12119.4
100	0.1	0.1	100	1000	980.0	429150418	-17462	443713114123	-68.182	5532.5	0.00006	2224.0
100	1	1	100	100	980.0	429150418	-9604	44371313265	-37.500	2205.0	0.00006	11421.4
100	10	10	100	10	980.0	429150418	-1746	4437141910	-6.818	10784.5	0.00006	121193.5
1000	0.1	0.1	1000	10000	9800.0	4291504182	-174618	4437131141230	-681.818	55325.5	0.00001	22239.7
1000	1	1	1000	1000	9800.0	4291504182	-96040	443713132645	-375.000	22050.0	0.00001	114214.3
1000	10	10	1000	100	9800.0	4291504182	-17462	44371419105	-68.182	107844.5	0.00001	1211935.1

Note: C-K = The integration of Coriolis and Kinetic to develop the equation (1.5/-2) x (mass x angular x tangential). C-K-B = additional integration with Bernoulli to develop the equation (force x area) + (0.5 x force x area / (area x height) x angular x tangential) + (force x area / (area x height)) + (force x area / (area x height) x 9.8m s^{-2} x height). The attributes were adopted from fundamentals of prior sections in this article. The information in 2D only considers x and y (area) for a given object and height is integrated into the 3D scheme

5. CONCLUSION

Experimental evaluations from Archimedes, centrifugal force, square cube law, Newton's Laws, Bernoulli, Kinetic and Coriolis were used to understand impacts of construction towards crustal matter and the resultant disasters like faults, sinks and quakes. Firstly, modern infrastructures have shifted against the natural balance, in which the triangle rule and square-cube law were been disregarded. Secondly, 3-dimentional disproportional distribution of weight with height develops vibrations that converts into free energy at the base. Thirdly, resettling of crustal matter into independent layers causes various form of thickness and risk of contact with belowground liquid. Weathering occurs and causes voids that later develop into aboveground hazards. Comparatively, nature regardless from land pinching or vegetation rooting maintains conservativity in weight-to-energy distribution because timescales were periodic. Overall, in 3-dimentional form, built spaces were constructed rapidly and channel free energy from pinnacle to its base because of mixed matter composition. This energy generates a downward force that channels towards the crust, causes materials within each layer to become displaced and could be visualised as litho- and hydro-sphere scars through loss of lives or property damage.

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CONFLICT OF INTEREST
The authors declare no conflicts of interest.

AUTHOR'S CONTRIBUTION
Salwa Shahimi & Chong Ju Lian: Data analysis and Interpretation, Jayaraj Vijaya Kumaran & Azi Azeyanty Jamaludin: Collection and/or assembly of data, Hassan Ibrahim Sheikh & Ahmed Jalal Khan Chowdhury: Final approval of the article, Lusita Meilana: Critical revision of the article, Karri Sharon, Harris C. Raj Kumar & Rasha Ghaleb Ahmad Moqbel: Research Concept and Design, Bryan Raveen Nelson: Writing the article.

DATA AVAILABILITY
All data generated or analyzed during this study are included in this published article.

DECLARATION OF GENERATIVE AI
Not applicable.

ETHICS
Not applicable.

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