

Order of Engineers and Architects

3rd Branch-(Electrical Consulting Engineers)

Engineering Safety

In Lebanon

Belfast, Oct 23,2014



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Results	Reason	Incident
-	Mud Slide	Building Collapse Byaqoot
2 Fatalities	Vibrations	Building Falling Kahhaleh
10 fatalities 4 of which are children 2 are infants	Faulty Design	Building Collapse Naemeh
4 fatalities	Old Building Faulty permit	Building Collapse Beirut Mazraa
11 syrian workers	Extra load	Elevator Falling
10 fatalitities	absence of operational safety	Fire Paint Factory
1 fatality	Faulty Engineering	Balcony Bank
2 fatalities	Electric Wiring	Fire in Chtoura



- ◆ Earthquake of Lebanon in 1956
- ◆ Turkey 1998
- ◆ Algerian Quake
- ◆ Bam Quake in Iran.

240,000 fatalities

**More than 100 Billion Dollars
of Losses**

In History

Date	Magnitude	Location
Aug 15, 1157	> 7.0	Hama
June 29, 1170	> 7.0	Idlib
May 20, 1202	7.5	Baalbeck
Feb. 22, 1404	Large	Hatab
April 29, 1407	~ 7.0	Orontes
Oct. 30, 1759	6.6	S. Bekaa
Nov. 25, 1759	7.4	Bekaa
April 26, 1796	6.6	Ladhikiya
Aug 13, 1822	7.4	Aafrine
April 3, 1872	7.2	Amik Golu







فلسطين

Quake of 1956



Room Fault

5.8 on Richter Scale

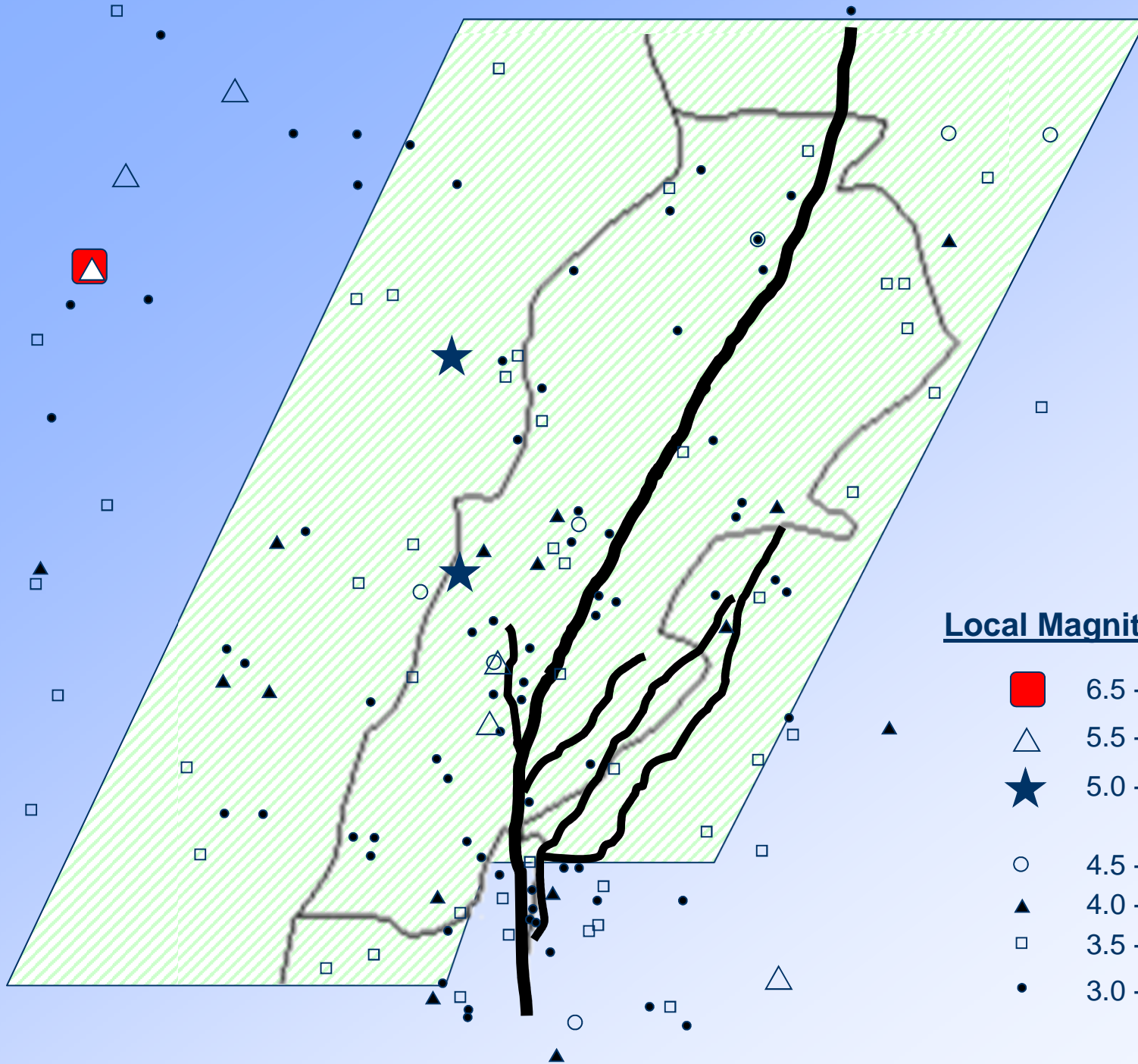
136 Dead

6000 home Destructed
Fully

**Instrumental
earthquake
events between
1903 – 1999
and proposed
seismic area
source for
hazard analysis
of Lebanon.**

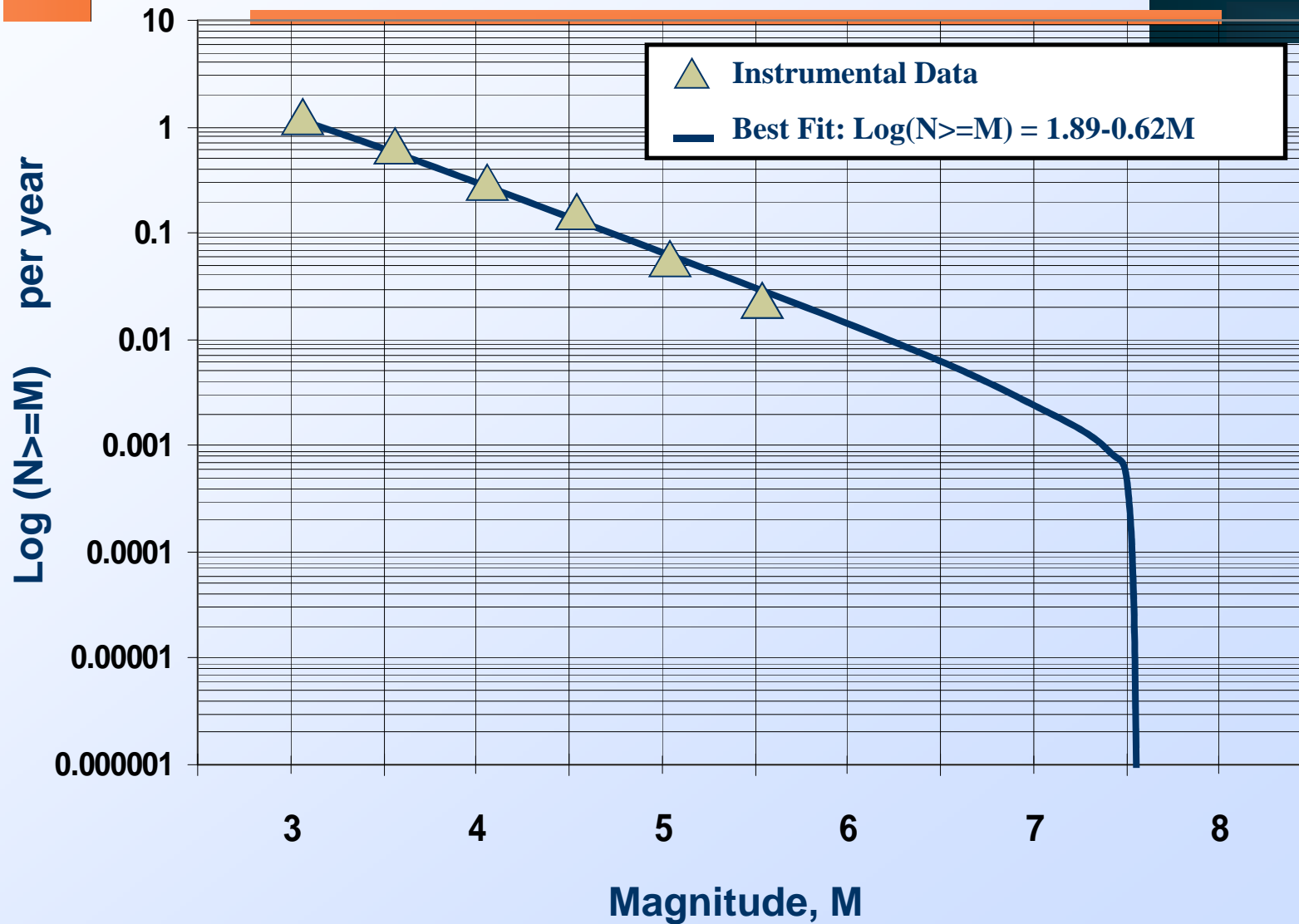
Local Magnitudes 1903-1999

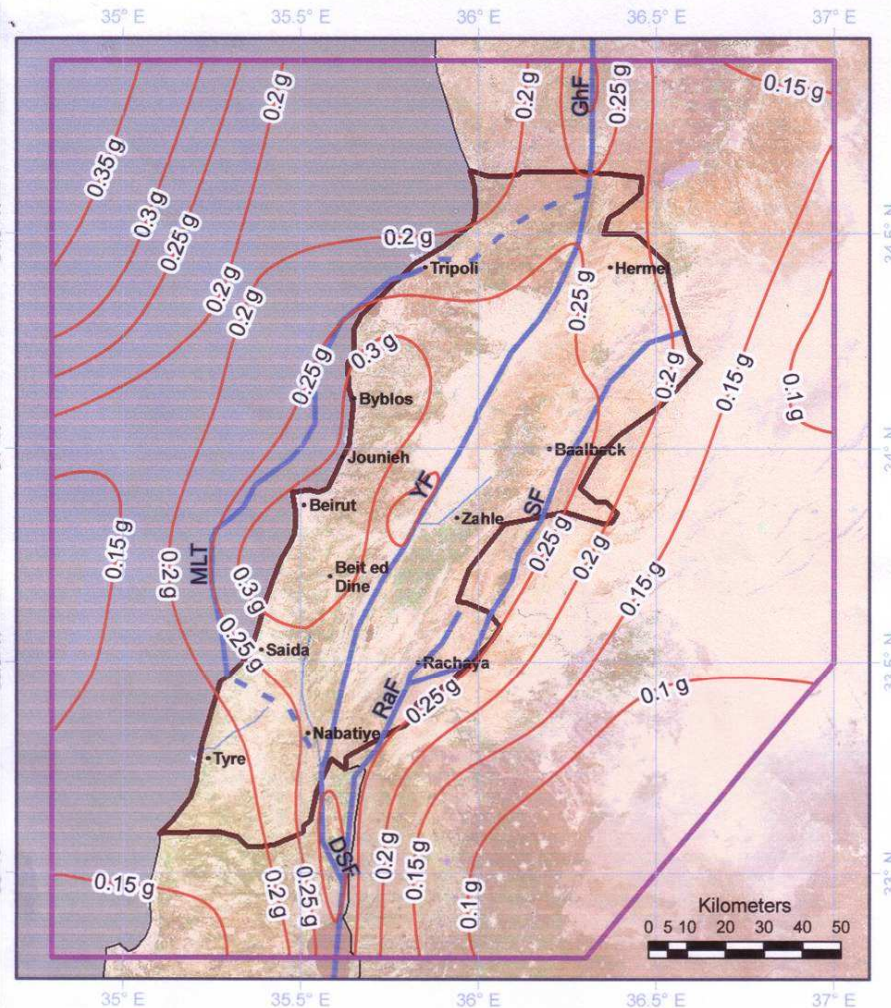
-  6.5 - 6.9
-  5.5 - 5.9
-  5.0 - 5.4
-  4.5 - 4.9
-  4.0 - 4.4
-  3.5 - 3.9
-  3.0 - 3.4





Predicted Magnitude-Frequency Relationship for $\mu = 7.5$





Legend

- Area Of Interest
- Lebanon
- Contourline
- Faultline
- Faultlines not used in model

**PGA with a 10% probability
of exceedance in 50 years**
Site Class B

Dead Sea Fault
Serghaya Fault
Rachaya Fault

Ghab Fault
الجاب

Public Safety Definition



- Lebanese legislative scripts are unclear.
- They give general overviews; unspecific and dispersed within few laws
- The previous Building code gave general overviews and barely touched on the requirements of Safety measures
- Difficulty in pinpointing liabilities
- The government views that the liability lies on the shoulders of the engineers and that the engineer is in charge and responsible about maintaining safety



Safety Regulations in Buildings and Facilities - Damage Prevention, which can be hazardous

Are there any rules that
govern the liabilities?

Particular Laws that Govern Safety in Buildings and Facilities in Lebanon



- Decree # 7380, May 1967
Linked with regulating protection and prevention in construction sites.
 - Protection of workers and passers-by from hazards caused by demolitions, restorations, or maintenance.
- Decision # 27, Dec 1980
Related to the enforcement of public safety regulations in commercial establishments within the province of Beirut for the purpose of securing engineering requirements for preventive measures as identified by the decision. (Hence Incomplete)



- **Legislative Decree # 69, Sept 1983**
(As amended by law 52 Dec, 1989)
Stipulating the affaires of Urban Planning
securing guarantees for new buildings addressing safety,
health, aesthetics and the environment.

- **Building Law issued by legislative decree # 148, Sept 1983**
 - Stipulating the need for compliance in issuing licenses before designs.
 - Stipulating regulations in force, particularly those linked with Urban Planning, public health and safety.
 - Issuance of Licenses are subject to gaining the approval of the Technical Departments and fulfilling the fees.



- Decision # 1388, Nov 1989

- Addresses the requirements of installation and operation of **elevators** in buildings within the province of Beirut.
- Prior Licensing Issuance by the governor based on subjecting non compliers by the municipality to halt **elevator** operation.

Decrees of 1997



- **Decree # 11264, Dec 1997**

Stipulating regulatory requirements Related to public safety and **Fire Prevention** for the purpose of **Fire Hazards Prevention**.

- Human lives given 1st priority,
- Material Losses - at a lower degree.

- **Decree # 11266, Dec 1997**

Addressing conditions and assets to be applied in the design and construction of facilities against **earthquakes**.

- **Decree # 11267, Dec 1997**

Stipulating the determination of technical and preventive measures related to the public safety of **Elevator Installations**.



- Decree 14293, Feb 2005
(Amended in 2010)

Terms and conditions for securing public safety in buildings and facilities, **elevator installations**, and prevention from **Fire and earthquakes**.

The Barriers Preventing the Enforcement of Legal and Regulatory Texts?



I. Deficiencies in Technical Terms:

- **Fragmental Standards** Inspired by European and American standards.
- The need to **Lebanonize** the standards to meet privacy needs.
- **Conflicting points: Feasibility of Standards.** Not accounting for **financial burdens.**
- Mandating the **Urban Planning Administration** to be in charge of standards processing and issuance, which heavily conflicts with the powers given to "LIBNOR."

The Barriers Preventing the Enforcement of Legal and Regulatory Texts?



II. Inexistence of the Proper Institutional Set Up for the Implementation:

- Decrees lacking proper mechanism for monitoring and auditing.
- Mandating the powers to the General Directorate of Urban Planning through conducting what it deems appropriate.
- Forming a conflict of powers between the municipalities and the Directorate of Urban Planning.
- Shifting some of the responsibilities to the Civil Defense authorities and to firefighters



**Public Safety in
Lebanon remains to be
threatened and violated
with no treatment seen.**

The Role of the Judiciary in Ensuring Public Safety in Buildings



- The responsibility of the engineer and every building in all matters relating to public safety, is the concern of public order.
- The engineer cannot be exempt from liabilities. Failure could have negative consequences for society in general.
- Law of Obligations and Contracts for Lebanese-matters relating to human safety - Exemption is prohibited.
- Article 139. human life and personal integrity are above all agreements.

Standards Legislation and Applications in Lebanon



- A Standard is "a document approved by a recognized authority to set a standard of quality and accuracy required for a product."
- Quality is directly linked with the safety of persons and hence is a concern for public safety.
- The Lebanese legislature acknowledged the standards in the law that created LIBNOR, as being the **National Interest**.
- It is impossible to develop laws and legislation without consulting all of the stakeholders.

Standards Legislation and Applications in Lebanon



- In guarantee to the national economy and in maintaining the safety and interest of the consumers, the supreme authority should adopt Technical Requirements.
- In Accordance with the general method that ensures the consultation and discussions amongst the stakeholders involved, which should take into account the individual's interest of the consumer, public safety and public health of the entire community.



Lebanon is obliged to draw up regulations and take into account the insurance of technical auditing conditional with mandatory related tasks such as:

- Durability and safety installations (foundations - structures - handrails ... etc.).
- Fire resistance and fire Protection Requirements.
- Electricity Hazards requirements.
- Heating and Ventilation Hazards requirements.
- Elevators, escalators, moving scaffolding (Cradles), cranes and construction site elevators requirements.
- Thermal insulation requirements.
- Acoustic insulation requirements.
- Reception for the disabled requirement.

Through Reviewing :



- Drawings and Technical Studies
- Terms of References
- Architectural Drawings.
- Drawings and Structure Studies
- Electrical Drawings
- Mechanical Drawings
- Soil Reports and studies
- ... etc

Auditing shall not be limited to plan/drawings checking. Should extend to the implementation phase, through inspection teams site visits, to ensure compliance in order to issue final reports for the projects including studies and executed works.

The Role of Urban Planning in Enforcing Safety measures - Mandates and Responsibilities



- Suspending the enforcement of 1997 Decrees
- Suggestions about possible enforcement mechanisms adopted.
- Urban Planning dismissed suggestions.
- Minister of Public works issued a decision to nominate committees to study mechanisms for enforcement.
- Reconsideration of the decrees was found necessary.
- 10 fatalities due to Building Collapse in Na'emeh.

The Role of Urban Planning in Enforcing Safety measures - Mandates and Responsibilities



- Proposal to amend or revoke the decrees in order to cover for loopholes.
- Government's behavior about the issue of public safety came as a reaction to the pain which was released from under the rubbles of the collapsed building of Na'emeh.
- Earlier Governments of the republic were not on the level of the required rationality.
- Standards without enforcements remain ink on paper in Lebanon

The Role of Urban Planning in Enforcing Safety measures - Mandates and Responsibilities



- Adopting enforcement mechanisms adopted by most countries, was ruled most appropriate.
- Ensure Standards and the enactment of Bureau de Control (Auditing)

"Although we believe that these measures will increase the consequences of the material on the property owner and the owner of the project, however, it ensures in return the durability of construction and public safety. Moreover the adoption of this method will restore confidence in the construction sector in Lebanon, and guarantees the rights of the owners of apartments fair compensation in case of collapse."

The New Decree 14293, Feb 2005

(Amended in 2010)



- Issuance of standards, its developments, and its follow-ups is mandated to "LibNor".
- Standards shall be enforced as of a starting date.
- Engineers are allowed on a temporary basis to adopt the practiced standards in the European Union or in the United States until the national codes are made available.
- Protection measures against earthquakes over the Lebanese territories is required at a minimum of 0.25% horizontal acceleration.

The New Decree 14293, Feb 2005

(Amended in 2010)



- Some of the building and elevator standards were found unsuitable and hence placed in a list of exceptions.
- As for fire protection in existing buildings, LibNor is commissioned to issue suitable standards for these buildings.

Enforcement Mechanism of the Decree



- Standards shall be enforced mandatorily once issued.
- Technical Control shall be carried out by Technical Audit firms (Bureau de Control).
- Linking the work of audit firms with insurance policies can cover the risks originating from defects of standards implementation in both the studies, the designs or in the execution.
- Technical Auditing, and insurance mandatory measures shall proceed on a gradual basis.



Quick look at the mechanism of technical auditing at the department of Building and Safety at the City of Los Angeles



RIGHT TO LIFE & PEOPLE

CITY OF LOS ANGELES
DEPARTMENT OF
BUILDING & SAFETY
MECHANICAL BUREAU
JAN 10 - 1990

O'Dell Photo





Permit Fee Estimate

- Home
- Building
- Electrical
- Fire Sprinkler
- Grading
- HVAC
- Plumbing
- Sign

B BUILDING PERMIT FEE ESTIMATE

Fees calculated using this application is an approximation of the actual fees based on the current fee ordinance and may be subject to change without notice. The final fees will be determined when an application is submitted.

Select One:(1) Submittal Fees for Plan Check
 Total Fees for Permit Issuance

Project Valuation:(2)
 Building Type

[Expedite Plan Check?](#) Yes No
 Project in Hillside Area? (3) Yes No
[Link to Parcel Profile Report](#)

FLOOR AREA

(Enter the floor area in square feet for each use in the boxes below)

Arts Development? (4)	<input type="radio"/> Yes <input checked="" type="radio"/> No	Office (\$1.57 / sf)	Retail (\$1.31 / sf)	Manuf (\$0.51 / sf)	Warehouse (\$0.39 / sf)	Hotel (\$0.52 / sf)
		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
School District Fee? (5)	<input type="radio"/> Yes <input checked="" type="radio"/> No	Commercial (\$0.34 / sf)	Residential (\$3.73 / sf)	Garage (\$0.09 / sf)	Self Storage (\$0.28 / sf)	
		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	

Notes:

(1) Submittal Fees for Plan Check - This amount is due when plans are submitted for plan check.
 Total Fees for Permit Issuance - This amount is due when the permit is ready to issue. In general, the actual fee due at permit issuance is this amount less the submittal fees if they have been paid at plan check submittal.



Permit Fee Estimate

- [Home](#)
- [Building](#)
- [Electrical](#)
- [Fire Sprinkler](#)
- [Grading](#)
- [HVAC](#)
- [Plumbing](#)
- [Sign](#)

E

ELECTRICAL PERMIT FEE ESTIMATE

Fee calculated using this application is an approximation of the actual fees based on the current fee ordinance and may be subject to change without notice. The final fees will be determined when an application is submitted.

[Expedite Plan Check?](#)

Yes No

New Branch Circuits

Ltg/Gen Rec, Dwell App, Non-Dwell App	15-20 Amp 208V to 277V Lighting	All Other Lighting 600v or Less	Three-Phase Lighting
56	12	3	16

Existing Branch Circuits

Permanent Yard Lighting	Lamp Holder for Temporary Lighting	Number of Units	Utilization Equipment Not Over 3 HP-KVA
0			6

Non-Dwelling Power Equipment (HP-KVA)

3.1 thru 5	5.1 thru 20	20.1 thru 50	50.1 thru 100	Over 100
5	2	1		

Busway, Cable Bus & Bus Equipment

0 to 99A (ft)	100 to 400A (ft)	Over 400A (ft)	Cable Tray(ft)
1	1		

Services

0 to 200A	201 to 600A	601 to 1200A	Over 1200A	Over 600V
			12	

Signs

Sign or Gas Tube System 1 Branch Circuit	Additional Circuit for Sign or Gas Tube System	Added Sign or Gas Tube System to 1 Circuit	Number of Flashers, time Clocks or Controllers
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Events	Special Inspections			
Trade Show or Carnival <input type="radio"/> Yes <input checked="" type="radio"/> No	Existing Building	Reconnect Existing Service	Special Equipment	Witnessing Tests
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fire Alarm, Comm & Control

Number of Comm Devices	Number of Comm Panels	Number of Control Devices	Number of Control Panels	Number of Fire Alarm Devices	Number of Fire Alarm Panels	Guest Rooms Smoke Detectors	SFD & Apt Smoke Detectors
<input type="text" value="125"/>	<input type="text" value="4"/>	<input type="text" value="12"/>	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Miscellaneous							Energy
Change of Address	Extra Trip	Misc. Permit	Moved Building	Swimming Pools	Transfer of Permit	Supplemental Permit	Conditioned floor area (sq ft)
<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="text"/>	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="text"/>	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="text"/>

Item	Units	Fees
	Plan Check	Permit
Subtotals	0.00 .dd	0.00 .dd
Permit Issuing Fee	-	0.00 .dd
One Stop Surcharge	0.00 .dd	0.00 .dd
System Development Surcharge	0.00 .dd	0.00 .dd
ELECTRICAL TOTAL FEES	0.00 .dd	0.00 .dd
ELECTRICAL COMBINED TOTAL	0.00 .dd	

The Most Important Electrical Systems that are Checked



- ◆ *Grounding/Earthing Systems*
- ◆ *Lightning Protection Systems*
- ◆ *Fire Detection Systems*
- ◆ *Emergency Lighting Systems*
- ◆ *Branch Circuits, and Feeder Cable Calculations*
- ◆ *Overcurrent Protections*
- ◆ *Hazardous Locations*
- ◆ *Elevator Safety*

Applicable laws in Developed Countries



- ◆ Norm Français **NF**
- ◆ British Standard **BS**
- ◆ National Electrical Code **NEC**
- ◆ International Electrotechnical Commission **IEC**
- ◆ VDE



Activities of the 3rd Branch

(Branch of Consulting Electrical Engineers)

Order of Engineers and Architects

م on	الجهة المنفذة Action By	التفاصيل Descriptions	رقم البند
١ ٢ ٣ ٤		<p>المهندس حسين سلوم أشار إلى النقاط التالية:</p> <p>١. عتاب إلى الدولة الكريمة على عدم الإقدام إلى اعتماد سياسة قادرة أن تطبق تجاه السلامة العامة من قبل أو في أدنى الإيمان منذ تأسيس الجمهورية الثانية. أي لماذا لم تقم الدولة بإنشاء وإصدار مواصفات للسلامة العامة وإيجاد الآليات المناسبة اللازمة على تطبيقها حتى الآن؟</p> <p>٢. المادة الثالثة - البند "٣": حصر الإلزامية بدول العالم الأول إلى حين صدور المواصفات الوطنية هو بمثابة وعد من الدولة بإستصدار المواصفات، من دون الإتيان على ذكر لأي جدول زمني لذلك مما يعرض المسألة للشك الكبير لجهة إستصدار مواصفات لبنانية في المستقبل القريب.</p> <p>٣. الإعتماد على مواصفات دول العالم الأول يفرض علينا إغناء صناعاتهم هم لا غيرها.</p> <p>٤. المادة الرابعة - البند "٣": أوليس الأولى والأجدر أن تصدر شهادة التدقيق عن المديرية العامة للتنظيم المدني كجهة مخولة وذات صلاحيات واسعة قادرة على أن تفرض هيتها في عملية التطبيق.</p> <p>٥. المادة الرابعة - البند "٣أ" - من هي الجهة المخولة تشخيص إستحالة التنفيذ بهذه الأحكام وما هي الأسس التي يجب أن تعتمد لتشخيص الإستحالات؟ هل هذا يعني إفساح المجال لهامش إستنساب قد يكون خاضع لجهة سياسية معينة.</p>	٥



Activities of the 3rd Branch

- ◆ The conclusion of a protocol of cooperation between the Order of Engineers and Consuel- France in order to create a similar one in Lebanon.

Consuel = **Comite National pour la Securite des Usagers de l'Electricite**

- ◆ The similar Commission:

COLISUEL = **Comité Libanais pour la Sécurité des Usagers de l'Électricité.**

Activities of the 3rd Branch



- ◆ **Colisuel's mission:** Issuing licenses concerned with the safety of electrical installations in Buildings (safe for occupation).
- ◆ **Consuel of France** dispatches inspectors to verify conformity. (Percentage of buildings that are subject to inspection is 35%.)

أعمال الفرع الثالث في نقابة المهندسين



- ◆ The Establishment of CEL

CEL = Comite Electrotechique Libanais

- ◆ Main mission is to issue and amend standards related to the electrical trade.

Activities of the 3rd Branch



Fisuel

Federation de Consuel

Was held at OEA in 2002

Where 10 to 12 countries attended deliberating and reviewing their experiences with law enforcement of public safety.

This conference was planned to take place in Portugal, but the intensity of Lebanese efforts led to its transfer to Lebanon

Activities of the 3rd Branch



- ◆ **Electrical and Mechanical trades:** The Technical Bureau at OEA is requesting from engineers to include **earthing system designs in their drawings.**
- ◆ Most drawings submitted for licensing do not pay attention to electrical and mechanical trade design requirements.
In the absence of control, some design drawings submitted do not reflect proper requirements.

Recommendations



The Lebanese government needs to realize that **public safety** is one of the most **urgent framework demands** which should be addressed in the Lebanese society for the purpose of achieving prosperity by adopting immediately and without delay, **a course of policies rooted with public safety measures** lifted to a level that makes the case a humanitarian value in similarity with the civilized nations.

Conclusions and Recommendations



- ◆ The Lebanese Government should work to **develop safety concepts in the minds of its public** by referencing to **clear legal terms**.
- ◆ Immediate launching of the **comprehensive legislation and implementation processes** by carrying out the following actions:



Conclusions and Recommendations

- ◆ Work on developing an advanced modern realistic **building law** which enforces the adoption of national standards that would protect the rights of the engineers in their professions and that would protect the nation from safety disastrous hazards
- ◆ Develop required comprehensive set of laws and regulations for public safety that would generate the **Local codes and standards** (Lebanese Codes and Norms)

Conclusions and Recommendations



- ◆ Building codes- Collapse preventions against seismic activities.
- ◆ Fire resistance codes.
- ◆ Elevators/escalators codes.
- ◆ Electrical Installation codes.
- ◆ Mechanical Installation codes .

Conclusions and Recommendations



- ◆ **Support LibNor** with required human resources and financing, to the fast issuance of the complete set of required standards.
- ◆ Identify the required **standards** that needs to be adopted to **ensure public safety** in the building sector and mandate its issuance to LibNor only.



Conclusions and Recommendations

- ◆ **Adopt similar rules in other developed countries and urge to benefit from their experience and expertise** through the deployment of Lebanese immigrants with the aim of enriching the national technical rules of Lebanon.
- ◆ **Establish immediate control mechanisms** based on engineering and technical auditing to ensure the safety and durability of structures on a sound footing.

Conclusions and Recommendations



- ◆ Establish the **rules of scrutiny (Inspection)** in construction projects similar to what was adopted by the developed countries by first subjecting the technical studies to technical audit processing to comply with the conditions of engineering and technical rules, and secondly to **monitor the execution** of the works.
- ◆ **Mandate soil mechanics studies** for all public sector projects such as: roads, bridges, dams, public buildings, factories, hospitals, schools, communities, places of worship, municipalities and ministries facilities.

Conclusions and Recommendations



- ◆ Employ the required engineering and inspection **Cadres at Urban Planning to carry out the full duties** of auditing and monitoring of implementation. Warn the Ministry of Public Works of the consequences.
- ◆ Demand from the Lebanese Government to establish **cooperation with the Order of Engineers** in order to determine the liabilities.
- ◆ Conduct a **survey of all buildings susceptible to collapse** throughout the country.

Conclusions and Recommendations



- ◆ **Statistics** on incidents arisen as a result of not implementing safety measures are the property of the people. It is hence required from the government to work on their **dissemination**.

Counterfeit and smuggling in Lebanon



Counterfeiting accounts for 5 to 7 percent of global trade – Lebanon is no different.

Although certain areas are repeatedly mentioned as having a prevalence of products of suspect authenticity, counterfeit products are available throughout Lebanon.

Counterfeit products and smuggled products pose the most serious threat. Look-alikes and parallel imports are also damaging, but to a lesser extent.

The evidence from legal cases suggests that most counterfeiters in Lebanon are low-income individuals. Counterfeiters who are apprehended are often released and there appears to be a belief that counterfeiting is not a serious crime.

Counterfeit and smuggling in Lebanon



The impact includes detrimental effect on consumer health, lower investments, fewer job opportunities, losses in national tax revenues, damage to Lebanon's image abroad and increased corruption.

The current system of laws in place in Lebanon to combat counterfeit and smuggling activities is generally perceived to be weak, particularly with respect to the effectiveness of enforcement.

Counterfeit and smuggling in Lebanon



The Government of Lebanon should address the problem of illicit trading activities in Lebanon in order to reduce the damaging consequences of these activities which include a detrimental impact on its economy, consumer health and international reputation. The protection of intellectual property rights is an important trade issue for many of the current WTO members, and Lebanon should be prepared to discuss and implement the improvements it intends to bring to its domestic IPR laws and their robust enforcement. The international community and investors expect Lebanon to achieve minimum standards of IPR protection.



Fédération Internationale pour la Sécurité des Usagers de l'Electricité
International Federation for the Safety of Electricity Users
Federacion Internacional para la Seguridad de los Usuarios de la Electricidad

THANK YOU

MERCI

