

No. 04

ラオス人民民主共和国  
製薬技術開発センター建設  
計画基本設計調査報告書  
別冊

# ラオス国建設事情

昭和59年3月

国際協力事業団

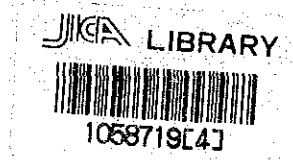
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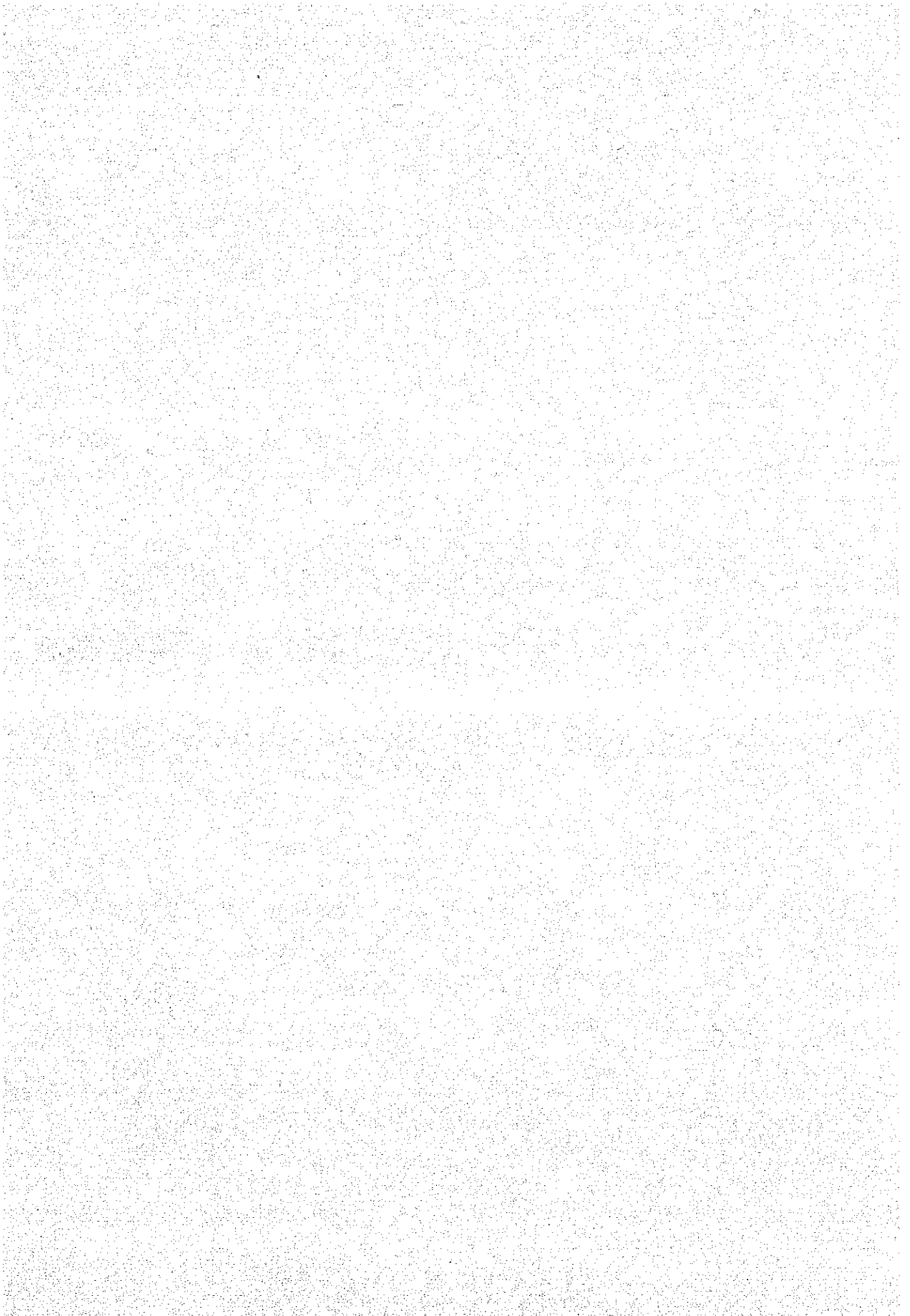
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## 第 1 章 自然条件





## 第1章 自然条件

### 1-1 地 勢

ラオス国はインドネシアの中央に位置し、東はベトナム、南はカンボジア、北は中国、西北はビルマ、西はタイの諸国にかこまれた内陸国である。東西は東経100度から107度、南北は北緯14度から22.5度まで、約1,000キロメートルの細長くのびる帯状をなしている。面積は236,800平方キロメートルでわが国の本州にほぼ相当する。

地勢は雲南高原から南下するアンナン山脈の高地が殆んどで、平地はメコン河とその支流ぞいの一部にあるのみで、耕地は全国土面積の8%にすぎない。北部ラオスの高地は、標高2,818メートルのブー・ピアをはじめ2,000メートル級の山岳地帯で交通の発達を阻害している。南部はベトナム国境のアンナン山脈からメコン河に至るなだらかな高原で、もっとも高いところでも2,100メートルである。

### 1-2 ビエンチャン市の地盤

ビエンチャン市周辺についての地質学的な資料については入手出来なかったが、現地における観察ならびにラオス国建設省に委託して実施した製薬技術開発センター建設予定地の地質調査の結果についてのべる。ビエンチャン市周辺は、かなり古い時代にメコン河により堆積し、その後隆起した河岸段丘状平野で、相当堅くしまっている。特に乾燥状態では堅く、現地調査の際のコーンペネトロメーターによる測定でも地中約30cmで貫入不能となり、その時点での読みは $250 \times 10^{-2}$ mmで地耐力は $14.9 \text{ t/m}^2$ と計算されている。ラオス国建設省に委託して実施した地質調査の結果は資料-1「報告書」のとおりである。

### 1-3 気象条件

気候は熱帯モンスーンに支置され、5月から10月までは、雨期で気温も比較的高く、約1,500mmの降雨がある。10月から4月までは、乾期で、2月までは比較的涼しいが、3月・4月には耐え難い暑さとなる。湿度は年間を通じてかなり高い。

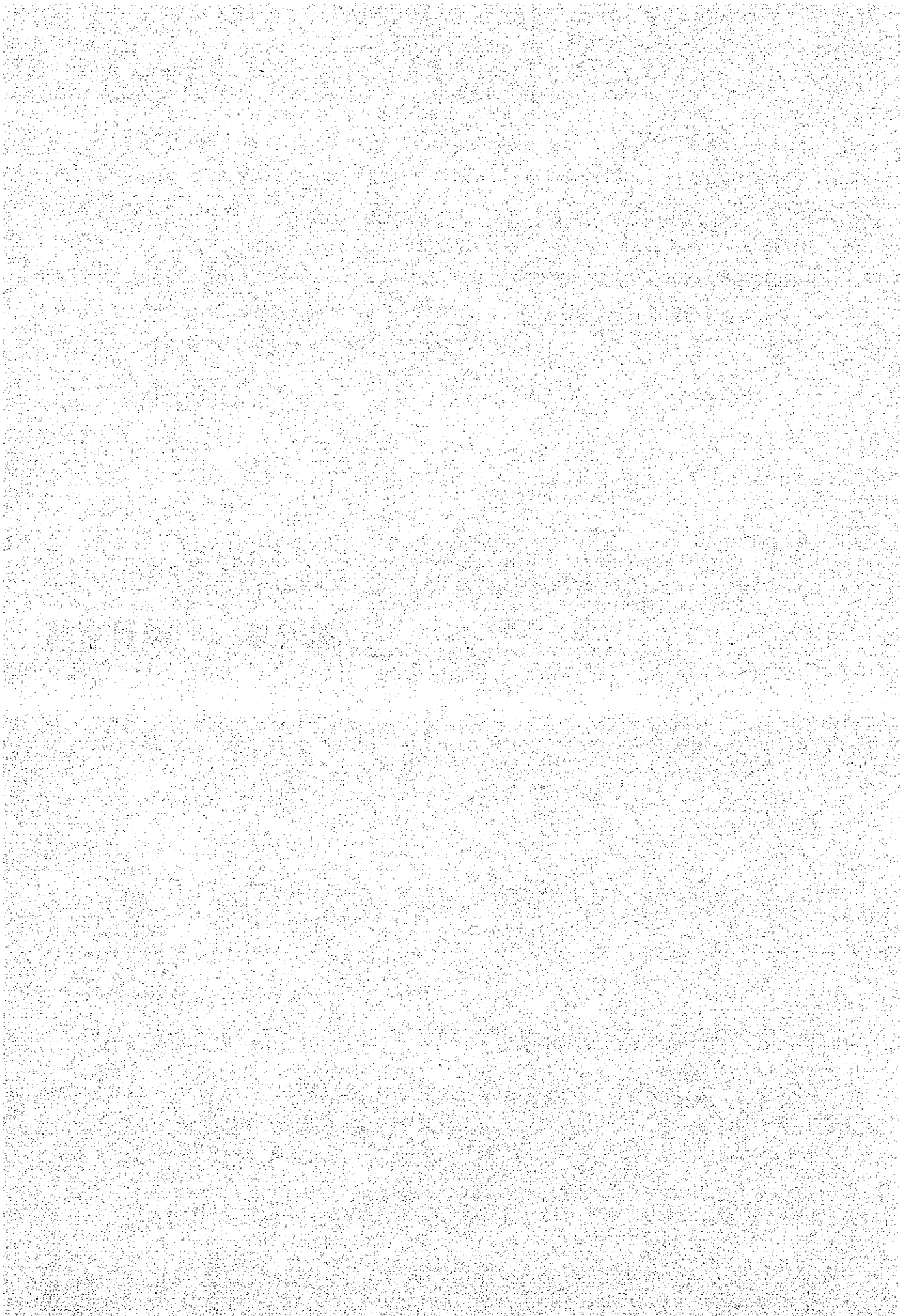
ビエンチャン市は、メコン河畔の海拔170メートルの平地部にあり、同市における過去12年間の気象観測資料は資料-2のとおりである。

#### 1-4 自然災害

ラオス国では、集中的降雨及びメコン河の増水による洪水のほか、構築物等に影響を及ぼすような自然災害は殆んど認められない。ただし、落雷はしばしばあり構造物に対する避雷設備は不可欠である。

地震については過去に記録がなく、今回の調査で打合せを行ったカウンターパートも地震についての体験はまったくないとの事であった。しかし乍ら、多年地震はないとされて来た隣国タイにおいて近年地震による建物被害がでて、タイ国において耐震基準見直しの話題もあるので、高層建築物の建設等については慎重な対応が必要と考えられる。

## 第2章 建設事情



## 第2章 建設事情

### 2-1 建設事情一般

ラオス国では、現体制確立以来一貫して社会主義経済体制の建設を進めており、国内の建設工事についても、すべてを建設省直轄の建設会社によって行うことを目標としている。しかし乍ら、経済体制移行過程の現在は、すべての建設工事が建設会社によって行われている訳ではないが、すくなくとも公共事業については、建設会社で行われることを原則としており、わが国の無償プロジェクトについても、現地サブコントラクターとしては建設会社を使用するよう強くもめている。

### 2-2 建設会社

ラオス国建設省の説明によれば、建設省直轄の会社は7つあり、建設工事を担当するのは第3会社である。第3会社はビエンチャン市北部の約2km<sup>2</sup>の敷地に事務所、材料（主としてコンクリート関係）試験室、小型生コンプラント、PC部材プラント、金物加工場、鉄筋及び小型鋼構造物加工場（一部工事中）等を持っている。

このうち、生コンプラントは場内のPC部材製作用のもので、市中現場で使用する生コンの需要をまかなえるものではない。

建設会社の技術力については、他国の技術援助、技術指導等の実態について説明を受けられなかったが、建設会社の各作業場にソ連人と思われる技術者の姿を相当数みられたことや、PC部材の製作方法等からみて、技術的にはソ連の全面的な支援指導を受けているものとみられる。

ただし、PC部材製作、コンクリートブロック製造、金属加工等いずれの技術をとってみても程度はそれ程高くなく、現状では、彼等の技術をそのまま利用することは無理があり良好な施工を確保するためには適切な指導・訓練が必要と考えられる。

### 2-3 建設関係法規制・建設規準

ラオス国においては建設関係の法規等はまだ十分に整備されておらず、設計に関する規準等も特に定められたものはないが、従来から旧宗主国フランス、主援助国アメリカ、さらにソ連と、それぞれの時期の技術供与国の規準により設計が行われてきている。ラオス国建設省では、現在、従来使用されてきた各国の規準を規範としたラオス国独自の設計基準の制定を目論み準備中であるが、実施の時期等については未だ、明らかにされていない。

こうしたなかで、1983年9月13日に道路保安規制（資料-3）が公布されたが、このな

かに、道路沿いの敷地に対する建設関係規制条文が含まれているので注意を要する。なお、今回の製薬開発センター建設計画については、この「道路保安規制」は特例として適用されないことが確認されている。

## 2-4 建設機材

第三公社事業場内にも幾つかの大型建設機械があり、町なかでも時々建機を見かけることがあり、ピエンチャン市周辺には相当数の建設機械があるものと考えられる。

しかし乍ら、我々が、第三公社の施工実績現場として見学した合板工場建設現場でも、使用されている機材はすべてわが国の56年度無償プロジェクト(上水道高架タンク)施工の際わが国から持込んだ機材が転用されており、これら機材が持込まれるまでは殆んど機材がなく、工事の進捗もままならなかったとの事で大巾な工期のおくれを出している。

したがって、実際に現場で使用出来る稼働可能な機械は限られており、工期を確保するためには、全機材の持込み、若しくは、充分に調査を行ったうえでの、不足機材若しくは部品の持込み等の対策が必要である。

## 2-5 建設労務者

建設労務者についても、現体制移行時の混乱による国外流出は例外ではなく、知識階級とともに熟練労務者が多数流出した。一方、国内に残った数少ない技能経験労務者も自己の技能経験(能力)が正当に評価されない等の理由から、労働意欲に問題があり、労務者間の技能程度、意欲にバラツキがあり、体制上特定の個人を優遇、抜擢することが困難なため、自然下方平均化される傾向が強く、使用経験者の実感として、わが国における労務者の作業能率に比べ、大凡5分の1程度と考えられるとの意見であった。

## 2-6 建設資材

ラオス国において、一般に求められる建設資材としては、砂利・砂等の骨材、れんが、木材(硬質のもの、軟質のもの)石材(一般石材、化粧用石材)等が主たるもので他はすべて輸入にたよっている。木材、石材についても、加工、運搬に難点が多く、所定の時期に、所要の材質寸法のものをまとめて調達することは相当の困難を伴うものの様である。

一般に輸入物資の調達は主としてタイ国(バンコック)で行われており、建設資材についても同様である。しかし、タイ国もセメント等一部の資材を除いては一次工業産品材料は輸入による場合が多く、この場合相当高率の関税が掛けられているため、無償プロジェクトでは価格的に殆

んどメリットがない。また、タイ国には資料-4の禁輸リストによる禁輸品目があり、両国間の政情の緊張度により適用度合いが運用されるため調達に安定性がなく、この点からもわが国からの持込みの方が有利と考えられる。

## 2-7 労務・資材価格

建設会社によつて調達される資材・労務者賃金単価は資料-5のとおりである。

このほか、セメントはタイ国から輸入されているが、ラオス国の統制価格（タナレン港着95米ドル/トン）と実勢価格（タナレン港着120～125米ドル/トン）との差から、調達を建設会社にまかせた場合は所要の時期に調達することが困難であり、予め対策をたてておく必要がある。又、タイ国におけるセメントの需給事情や両国の政治緊張度による供給制限等についても予め充分考慮しておく必要がある。

## 2-8 建築様式

ラオス国では、長い間の為政者若しくは庇護者の変転によつて、建てられる建築物の様式等もその時々々の為政者が持つ技術によつて行われており、ラオス独自の様式と呼べる様なものは特に認められない。

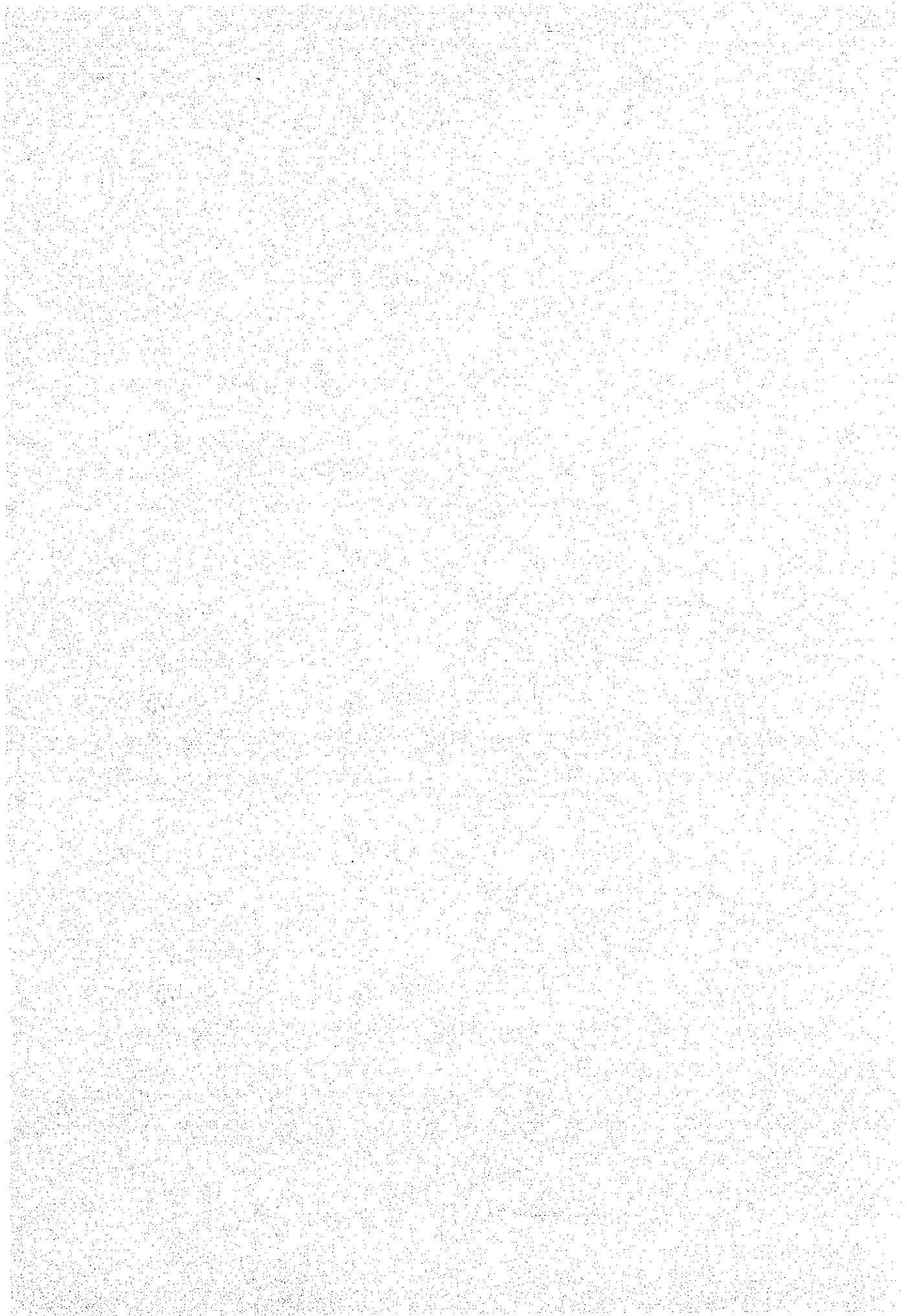
そのなかにあつて、特に目をひくのは急勾配で棟、けらばに独特の飾のある重層の屋根を持つ仏教寺院であるが、これとてもラオス様式というよりも、タイにおける仏教寺院の流れをくむものと考えられる。

しかし、一般民家は、高温多湿、高降雨量といった自然条件に対応するため、木柱又はコンクリート柱によるピロティーを設けた高床式で庇の深い作りが多く、その時々々の為政者によつて建てられた建築物でも室内空間を強い日ざしと降雨から守るために外周部に庇、ルーバー、袖壁、外庇等を設けた建物が多くなっている。



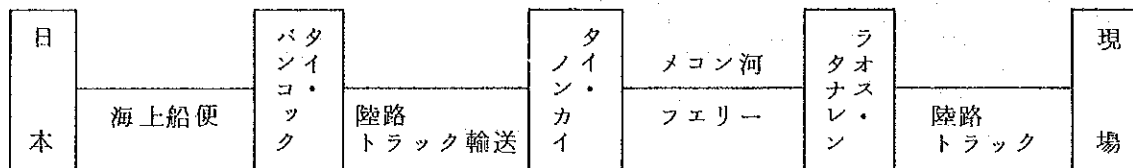


### 第3章 輸送事情



### 第3章 輸送事情

わが国からラオス国への物資輸送経路としては下記ルートが一般的であり、途中の道路事情、輸送機材事情を考慮すれば、ごく一部の特殊なケースを除き他のルートは考えられない。



バンコック港における荷扱はすべてPAT（タイ国港湾局）の手によって行われる。

また、ラオス向け貨物のタイ国内陸送はすべてタイ国のETO（陸送機関）のラオス向貨物専門部署において行われる。タイ国・ラオス国両国の国境のメコン河はラオス国が運営管理するフェリーによって渡されるが、原則として、タイ側ノンカイ、ラオス側タナレン両港における荷卸し積替え通関手続が必要である。ただし、タナレン港から25 Km以内に限っては、両国間の運送協定により予め、事前に、タイ国側、ラオス国側で所定の手続を行うことによって、タイ国ETOのトラックにより現場までの持込みが可能である。

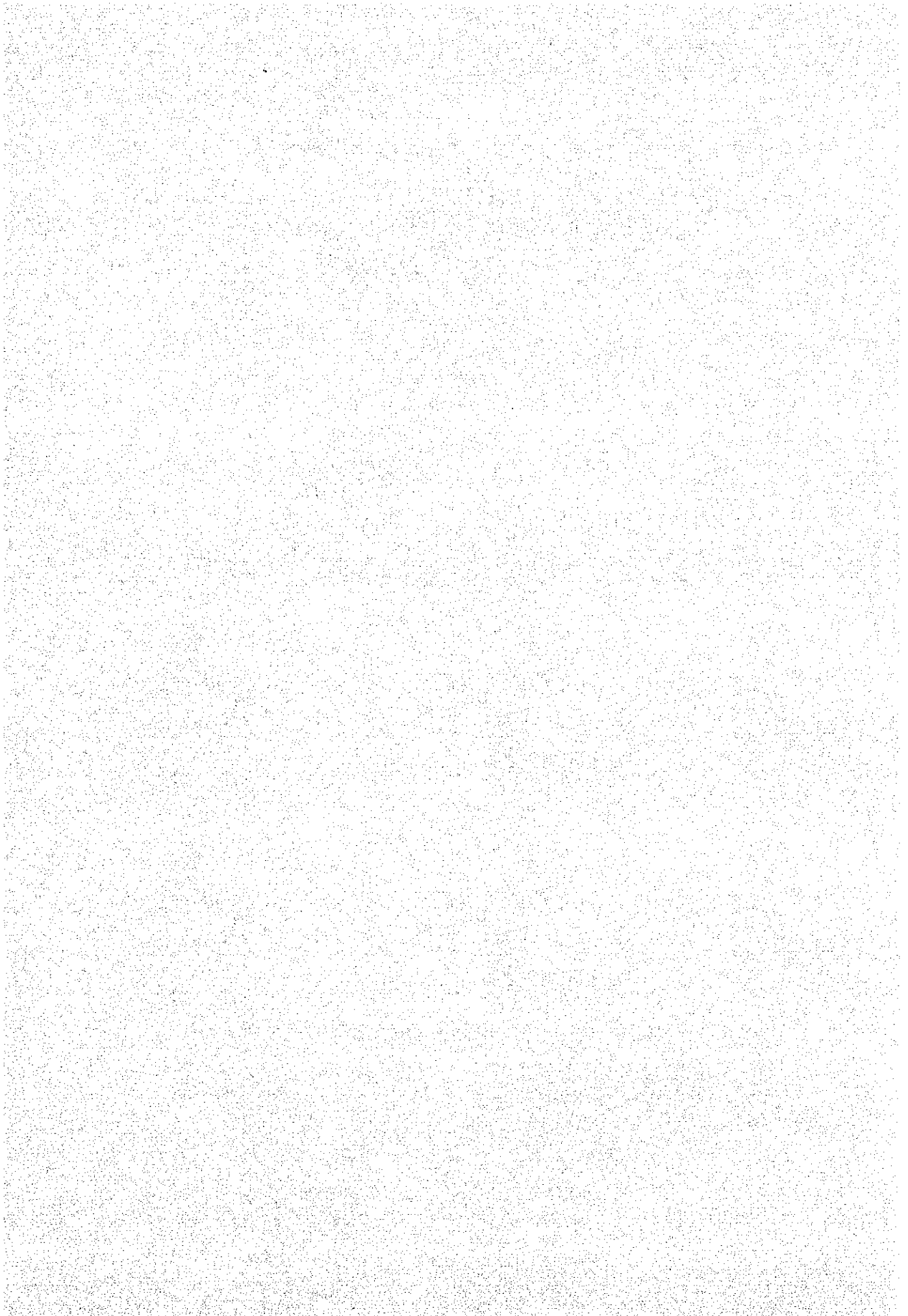
タイ国内の通過貨物については、原則的にタイ国の通関課税、輸出規制は免除されるが、両国間の政治的緊張度によっては輸出規制条項を適用されたケースもあるので充分注意を要する。

タナレン港における通関検査についても予め関係方面と十分に打合せを行い所定の手続をふみ、タナレン港から現場の開梱作業まで、検査官の立会をうければ現場開梱検査も可能との事である。

バンコック港—タナレン間のETOの標準運送料率及び諸手続は資料-6、資料-7の通りである。ただし、これらの料率手続方法はしばしば改訂が行われるとのことである。したがって実際の陸送及び費用の積算についてはその都度確認が必要である。



添付資料



Technical report on the geological conditions  
of the site of the Pharmaceutical Factory KM-8

The site for the Pharmaceutical Factory to be constructed is situated at the KM-8 to the South-East of Vientiane city, near the 555 Tobacco Company.

The soil conditions of the site are as follows: The site is adjacent to the left bank of the Mekong river; it is flat and inclined to the South towards the Mekong bank. It is about 172.55 to 173.35 high from the sea level. The geological investigation was undertaken according to the proposition of the JICA (represented by the Ministry of Health) on October 19, 1983. For the investigation, we have made 2 holes of 10 meters depth with the "UKABE"-50M, picked up 12 samples for the test and picked up some water from the 1st hole to examine its reaction. The examination of soil was undertaken at the Soil and Water Analysis Laboratory, the Planning and Designing Institute, Ministry of Construction of the Lao People's Democratic Republic.

The soil elements of the construction site are new soil of (Aluvi) ALQ-IV, and are spread on the whole site. They are mainly clay and silty clay which have different colours, and are solid and hard with small and large cobblestones from hard clay and limestone, as well as laterites in the form of cobblestones.

The results of the Vientiane Meteorologic Station from 1929 to 1982 demonstrate the characteristics of the explored site as follows:

The site is in the tropical monsoon zone: rainy season is from mid-May to the beginning of October and dry season is from November to March. The average temperature of January is +20°C, in the rainy season the temperature can reach 32 - 35°C, so the average temperature is about 28°C. In the rainy season, in the Vientiane region it rains very much with big storms and lightnings. On some days it rains 300 mm; during 1976 in Vientiane it rained 2342 mm, in 1975 it was 2,006.2 mm; in the area of the site of construction the winds blow towards South and South-East, the highest speed of the Winds is 32 - 35 m/second.

Geological stratum of the construction site:

First strata: Silty sand is spread over all the site area, mixed with silty clay and welding sand and also broken stones and some of cobble-stones; the depth of the ground is 1.00 meter.

Second strata: Silty clay is spread on the whole strata coloured of gray, reddish-brown; its state is solid on the top to inner soft and is mixed with pebbles and laterite in the forms of small and big cobble-stones. Its thickness is from 3.60 to 4.10 meters.

Third strata: The clay is expanded on the whole area with the red colour of the brick, reddish-brown, it is solid on the top to inner soft, oiled and congealed. Its thickness is from 2.00 to 3.50 meters.

Fouth strata: It is the strata of pebbles and beach stones mixed with sand and silty clay in the forms of thin stratum. Its thickness is 0.50 meters.

Fifth strata: It is a strata of silty clay dark-red coloured. It is soft.

In the explored area, there is underground water which is from 5.00 to 6.30 meters deep, and from 167.00 to 167.55 m above sea level. The high level of underground water is 2.50 to 2.60 m. The height above sea level is from 170.85 to 169.95 m; it has characteristics of strong low swelling.

The thickness of the strata which blocks up water is not more than 0.50 to 1.50 meters; the strata which does not absorb water is the strata of laterite.

The system of the underground water as well as its relation with the water in the Mekong river was not studied. Nevertheless we can affirm the following: during the heavy rainy season (June to September) and during the swelling of the Mekong river the underground water rises 1.00 m more than its usual level.

The chemical elements of the water are less in mineral materials and its reactionary characteristics are not so good but not so bad. The result of the chemical examination of the water from the hole N°1 is reported on the last page.

#### Conclusion

The results of the studies of the construction site of the pharmaceutical factory can be concluded as follows:



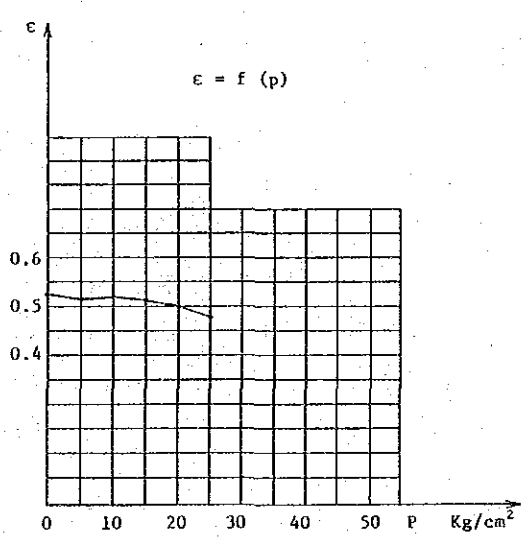
1. The area on which the pharmaceutical factory will be built is in the South-East of Vientiane city, 8 Km far from the center of the city. Its above the sea level is 173.75 m.
2. Its underground is new soil recently formed (Aluvi) ALQ-IV which is silty sand and clay. The architectural-geological conditions of the area are suitable for the construction.
3. The results of the physical and mechanical tests of the soil are demonstrated in the concluding paper of the test. The underground water is seen about 5.00 to 6.00 meters deep. According to these tests the underground water has no reaction against the concrete.
4. According to the map of the seismic areas in the Lao People's Democratic Republic, the construction area is in the seismic area with the strength about 7 Bals.

For avoiding the overcrowding of waters in the construction area, it is necessary to elevate the surface of the area with filling soils of 0.70 meters high.

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
silty clay		1/5	4.60	3.90 ~ 4.60			0.00000 37cm/s			
Material scale							= 0.0031968cm/s			
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.26	0.78	2.62	5.66	16.28	24.10	9.0	41.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity W <sub>TLL</sub>	Range of stickiness W <sub>P</sub> / L <sub>P</sub>	Span of stickiness W <sub>m</sub> / I <sub>P</sub>	W	B	γ <sub>y</sub> , g/cm <sup>3</sup>	γ <sub>o</sub> , g/cm <sup>3</sup>	n, Z	e <sub>o</sub>	G	
0.35	0.22	0.23	0.21	< 0	2.72	1.99	34.92	0.536	1.06	



Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity $\alpha$ , cm/kg	Module of charge M <sub>B</sub> , kg/cm
0.00	0.536			
0.50	0.524	0.0076		
1.00	0.516	0.0127		
2.00	0.507	0.0188	0.011	9.3
3.00	0.496	0.0254		

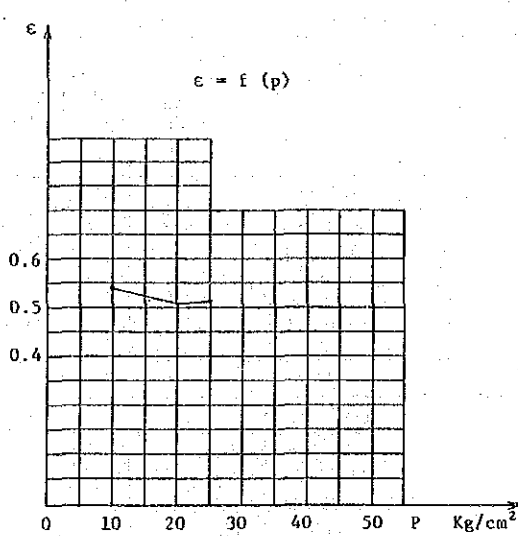
Dated on November 25, 1983  
Head of Enterprise of Geology  
sealed

Sample scale .....  
Height 25mm  
Diameter 87.4mm  
Examiner  
Inspector

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
silty clay		1/3	4.60	3.00 ~ 4.60			0.00000 37cm/s			
Material scale							= 0.0031963m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.26	0.78	2.62	5.66	16.28	24.0	9.0	41.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity W <sub>TLL</sub>	Range of stickiness W <sub>P</sub> LP	Span of stickiness W <sub>m</sub> IP	W	B	γ <sub>y</sub> , g/cm <sup>3</sup>	γ <sub>o</sub> , g/cm <sup>3</sup>	a, %	e <sub>o</sub>	G	
0.35	0.22	0.13	0.21	< 0	2.72	1.99	34.92	0.536	1.06	



Dated on November 25, 1983  
Head of Enterprise of Geology

sealed

Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity $\alpha$ , cm/kg	Module of charge M <sub>B</sub> , kg/cm
0.00	0.536			
0.50	0.532	0.0026		
1.00	0.527	0.0056		
2.00		0.0104	0.008	128
Soaking				
2.00	0.512	0.0156		
3.00	0.511	0.0158		

Sample scale .....

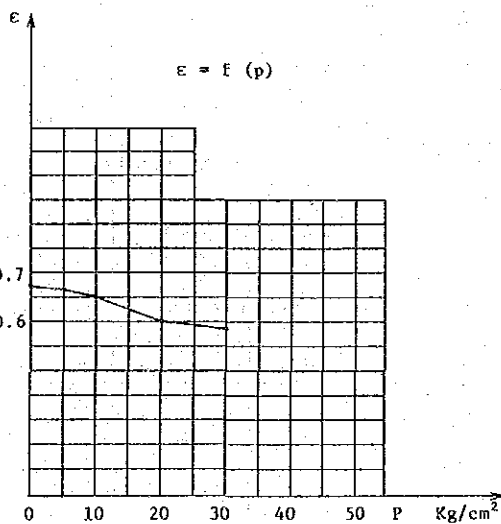
Height 25mm  
Diameter 87.4mm

Examiner  
Inspector

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
silty clay		1/5	7.80	6.30 ~ 7.80			0.00000 34cm/s			
Material scale							= 0.0029376m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt			clay
	10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.16	0.06	0.22	0.74	24.42	23.00	10.00	51.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity W <sub>L</sub> , FLL	Range of stickiness W <sub>P</sub> , LP	Span of stickiness W <sub>m</sub> , IP	W	B	γ <sub>y</sub> , g/cm <sup>3</sup>	γ <sub>o</sub> , g/cm <sup>3</sup>	n, %	ε <sub>o</sub>	G	
0.41	0.25	0.16	0.20	< 0	2.73	1.97	39.92	0.666	0.82	



Dated on November 25, 1983  
Head of Enterprise of Geology

sealed

Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity $\alpha$ , cm/kg	Module of charge M <sub>B</sub> , kg/cm
0.00	0.664			
0.50	0.658	0.0034		
1.00	0.652	0.0070	0.009	123
2.00	0.645	0.0114		
3.00	0.685	0.017		

Sample scale .....

Height 25mm

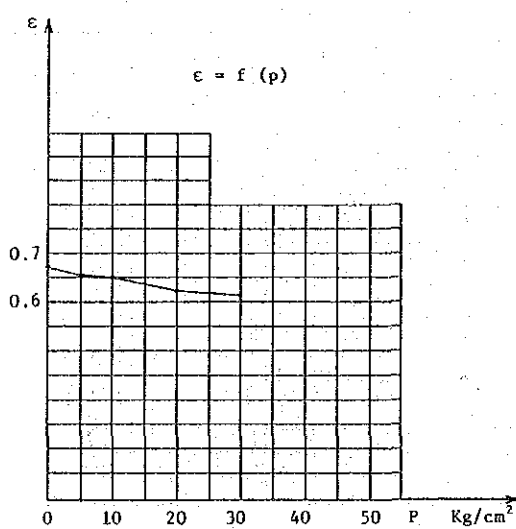
Diameter 87.4mm

Examiner  
Inspector

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
silty clay		1/5	7.80	6.30 ~ 7.80			0.00000 34cm/s			
Material scale							= 0.0029376m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0, 25	0.25 ~ 0.10	0.10 ~ 0.05	0.050 ~ 0.01	0.01 ~ 0.005
-	-	-	0.16	0.06	0.22	0.74	24.42	13.00	10.0	51.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity W <sub>TLL</sub>	Range of stickiness W <sub>P</sub> / W <sub>LP</sub>	Span of stickiness W <sub>m</sub> / W <sub>IP</sub>	W	B	γ <sub>y</sub> , g/cm <sup>3</sup>	γ <sub>o</sub> , g/cm <sup>3</sup>	n, %	e <sub>o</sub>	G	
0.42	0.25	0.16	0.20	< 0	2.73	1.97	39.92	0.664	0.82	



Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity $\alpha$ , cm/kg	Module of charge M <sub>B</sub> , kg/cm
0.00	0.664			
0.50	0.659	0.0028		
1.00	0.650	0.0080		
2.00	0.644	0.116		
Soaking			0.11	101
2.00	0.644	0.0126		
3.00	0.631	0.0196		

Dated on November 25, 1983  
Head of Enterprise of Geology

sealed

Sample scale .....

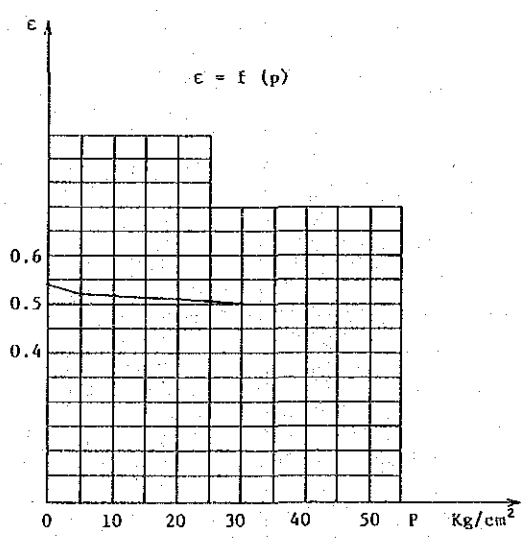
Height 25mm  
Diameter 87.4mm

Examiner  
Inspector

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
silty clay		2/2	3.00	0.90 ~ 3.00			0.00000 16cm/s			
Material scale							= 0.0023824m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt			clay
< 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	7.25 ~ 0.20	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005	< 0.005
-	-	-	0.62	0.62	1.52	7.02	17.82	20.0	8.00	44.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity $W_{LL}$	Range of stickiness $W_{PL}$	Span of stickiness $W_{mIP}$	W	B	$\gamma_y, g/cm^3$	$\gamma_o, g/cm^3$	n, %	$\epsilon_o$	G	
0.37	0.22	0.15	0.19	0	2.72	2.11	34.92	0.536	0.96	



Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity $\alpha$ , cm/kg	Module of charge M <sub>B</sub> , kg/cm
0.00	0.536			
0.50	0.529	0.0042		
1.00	0.524	0.0078		
2.00	0.520	0.0102		
Soaking			0.005	205
2.00	0.519	0.0208		
3.00	0.515	0.0182		

Dated on November 25, 1983  
Head of Enterprise of Geology

sealed

Sample scale .....

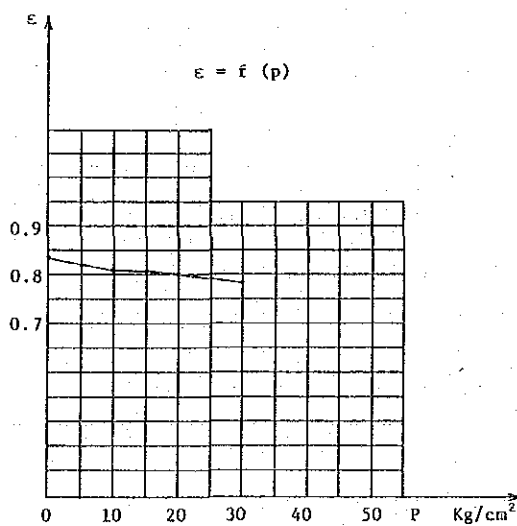
Height 25mm  
Diameter 87.4mm

Examiner  
Inspector

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
clay		2/4	6.20	5.00 ~ 6.20						
Material scale										
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.24	0.28	0.48	1.5	12.1	13.00	11.0	61.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity W <sub>L</sub> ILL	Range of stickiness W <sub>P</sub> LP	Span of stickiness W <sub>m</sub> IP	W	B	γ <sub>y</sub> , g/cm <sup>3</sup>	γ <sub>o</sub> , g/cm <sup>3</sup>	n, %	ε <sub>o</sub>	G	
0.48	0.28	0.20	0.27	< 0	2.76	1.94	45.51	0.835	0.90	



Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity α, cm/kg	Module of charge M <sub>8</sub> , kg/cm
0.00	0.835			
0.50	0.826	0.0046		
1.00	0.818	0.0091	0.014	117
2.00	0.804	0.0168		
3.00	0.792	0.0238		

Dated on November 25, 1983  
Head of Enterprise of Geology

sealed

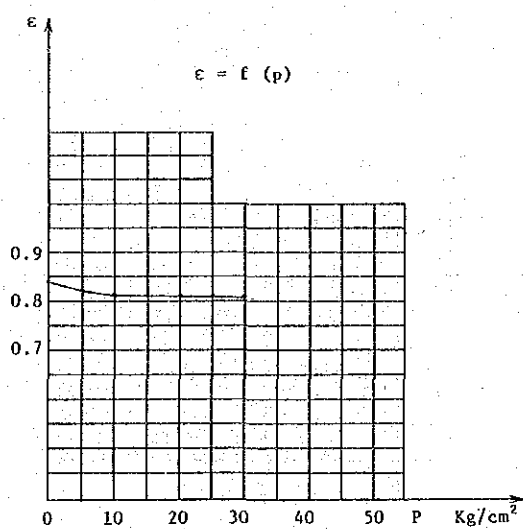
Sample scale .....  
Height 25mm  
Diameter 87.4mm

Examiner  
Inspector

Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
clay		2/4	6.20	5.00 ~ 6.20						
Material scale										
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand				silt		clay	
> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005	< 0.005
-	-	-	0.24	0.28	0.48	1.5	12.5	13.0	13.00	61.4
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity $W_{TLL}$	Range of stickiness $W_{P,LP}$	Span of stickiness $W_{m,IP}$	W	B	$\gamma_y, g/cm^3$	$\gamma_o, g/cm^3$	n, %	$\epsilon_o$	G	
0.48	0.28	0.20	0.27	< 0	2.76	1.94	45.51	0.835	0.90	



Dated on November 25, 1983  
Head of Enterprise of Geology

sealed

Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity $\alpha$ , cm/kg	Module of charge $H_8$ , kg/cm
0.000	0.835			
0.50	0.833	0.0006		
1.00	0.830	0.0024		
2.00	0.826	0.0046	0.004	412
Soaking			0.005	330
2.00	0.825	0.0050		
3.00	0.822	0.0070		

Sample scale .....

Height: 25mm

Diameter 87.4mm

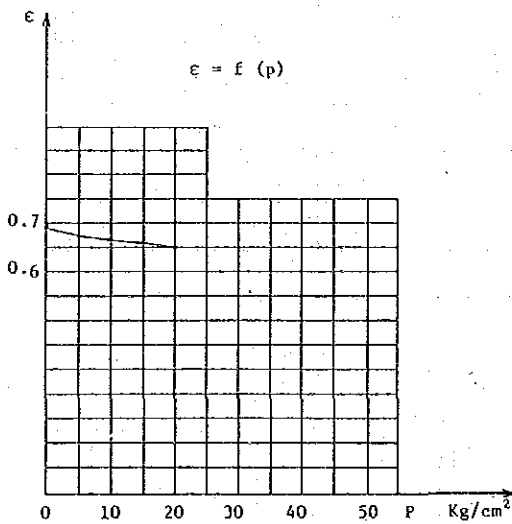
Examiner  
Inspector



Date of test on November 15, 1983

Project.....  
consolidation test

Kinds of material	Symbol of geology	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
silty clay		2/6	10.80	7.90 ~ 10.80			0.00000 34cm/s			
Material scale							= 0.0023256m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	pebbles		sand			silt			clay	
10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005	< 0.005
-	-	-	-	0.12	0.04	0.64	25.4	12.0	6.0	55.8
Characteristic of materials -----										
			Stream under the soil	Solidity	Net weight	Volume	Gap	Gap of coefficient	Saturation	
Range of liquidity W TLL	Range of stickiness WP LP	Span of stickiness Wm IP	W	B	γy, g/cm <sup>3</sup>	γo, g/cm <sup>3</sup>	n, %	εo	G	
0.40	0.25	0.15	0.19	< 0	2.75	1.96	40.36	0.676	0.77	



Consolidation Test

Specific pressure P, kg/cm <sup>2</sup>	Gap of coefficient	Consolidation $\frac{\Delta n}{h}$	Coefficient of solidity α, cm/kg	Module of charge M8, kg/cm
0.00	0.676			
0.50	0.666	0.0054		
1.00	0.661	0.0088		
2.00	0.656	0.0116	0.006	187
3.00	0.650	0.055		

Dated on November 25, 1983  
Head of Enterprise of Geology  
sealed

Sample scale .....  
Height 25mm  
Diameter 87.4mm  
Examiner  
Inspector

Date of test on November 8, 1983  
N°877/Geology

Name of the projector: Ministry of Public Health.  
Project: To survey the pharmaceutical Factory at 8 Km in  
Vientiane.

Shear Test

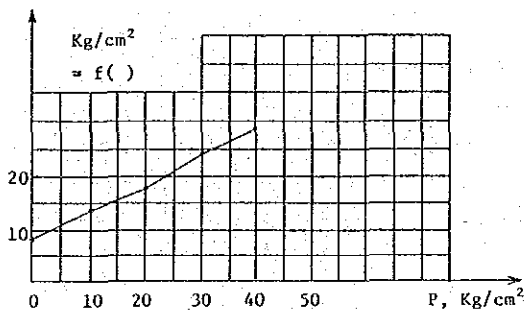
Kinds of materials	Geological symbol	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
Silty clay		1/3	4.60	3.00 ~ 4.60	-	-	0.00000 370m/s			
Material scale							= 0.0031963m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	ore		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	0.5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
			0.26	0.78	2.62	5.66	16.28	24.0	9.0	41.4

Characteristic of material

Range of stickiness			Stream under the soil W	Stickiness B	Net weight Yy, g/cm <sup>3</sup>	Volume Yo, g/cm <sup>3</sup>	Gap n, %	Coefficient of gap eo	Saturation G
Range of liquidity W TLL	Range of stickiness WP LP	Span of stickiness Wm IP							
0.35	0.22	0.13	0.21	< 0	2.27	1.99	34.92	0.536	1.06

Shear Test

Specific pressure P, Kg/cm <sup>2</sup>	Power Unit G, Kg/cm <sup>2</sup>	Shear Unit J, Kg/cm <sup>2</sup>	Coefficient of inner friction Tg	Angle of the inner friction ε	Value of cohesiveness C, Kg/cm <sup>2</sup>	Contained water after testing W
1.0	1.0	1.35	0.450	24°	0.900	20
2.0	2.0	1.78	-	-	-	
3.0	3.0	2.25				



The conditions and times of test:

- 24 hours soaking.
- The sample scale.....
- Height 35mm.
- Diameter 72mm.

Examiner  
Inspector

Dated on November 24, 1983  
Head of geological enterprise.

Date of test on November 8, 1983  
 N°877/Geology

Name of the projector: Ministry of Public Health.  
 Project: To survey the pharmaceutical Factory at 8 Km in  
 Vientiane.

Shear Test

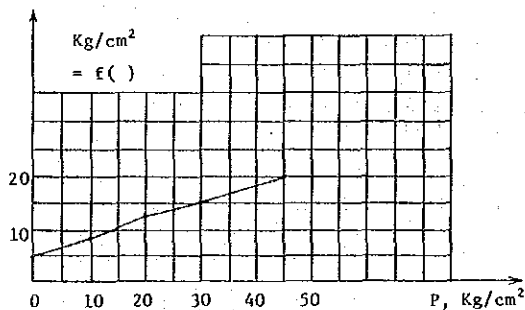
Kinds of materials	Geological symbol	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
Silty clay		1/5	7.80	6.30 ~ 7.80	-	-	-	-		
Material										
Material scale, mm counting as percentage										
Cobblestone mineral	ore		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	0.5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.16	0.06	0.20	0.74	24.42	13.0	10.0	51.4

Characteristic of material

Range of stickiness			Stream under the soil W	Stickiness B	Net weight yy, g/cm <sup>3</sup>	Volume Yo, g/cm <sup>3</sup>	Gap n, %	Coefficient of gap eo	Saturation G
Range of liquidity W TLL	Range of stickiness WP LP	Span of stickiness Wm IP							
0.41	0.25	0.16	0.20	< 0	2.73	1.97	39.92	0.664	0.82

Shear Test

Specific pressure P, Kg/cm <sup>2</sup>	Power Unit 6, Kg/cm <sup>2</sup>	Shear Unit J, Kg/cm <sup>2</sup>	Coefficient of inner friction Tg	Angle of the inner friction ε	Value of cohesiveness C, Kg/cm <sup>2</sup>	Contained water after testing W
1.0	1.0	0.7				
2.0	2.0	0.87	0.200	11°	0.50	0.25
3.0	3.0	1.40				



The conditions and times of test:

- 24 hours soaking.
- The sample scale.....
- Height 35mm.
- Diameter 72mm.

Examiner  
 Inspector

Dated on November 24, 1983  
 Head of geological enterprise.

Date of test on November 8, 1983  
 N°877/Geology

Name of the projector: Ministry of Public Health.  
 Project: To survey the pharmaceutical factory at 8 Km in  
 Vientiane.

Shear Test

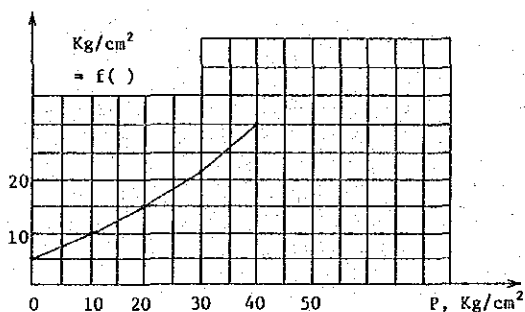
Kinds of materials	Geological symbol	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
Silty clay	-	2/2	3.00	0.80 3.00	-	-	0.00000 16cm/s			
Material							= 0.0013824m/day			
Material scale, mm counting as percentage										
Cobblestone mineral	ore		sand				silt			clay
	< 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	0.5 ~ 0, 25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.62	0.62	1.52	7.02	7.82	20.0	8.00	44.4

Characteristic of material

Range of stickiness			Stream under the soil W	Stickiness B	Net weight γ <sub>y</sub> , g/cm <sup>3</sup>	Volume γ <sub>o</sub> , g/cm <sup>3</sup>	Gap n, %	Coefficient of gap ε <sub>o</sub>	Saturation G
Range of liquidity W <sub>TLL</sub>	Range of stickiness WP LP	Span of stickiness W <sub>m</sub> IP							
	0.22	0.15	0.19	< 0	2.72	2.11	34.92	0.536	0.96

Shear Test

Specific pressure P, Kg/cm <sup>2</sup>	Power Unit G, Kg/cm <sup>2</sup>	Shear Unit J, Kg/cm <sup>2</sup>	Coefficient of inner friction T <sub>g</sub>	Angle of the inner friction ε	Value of cohesiveness C, Kg/cm <sup>2</sup>	Contained water after testing W
1.0	1.0	1.05				
2.0	2.0	1.60	0.525	28°	0.525	0.21
3.0	3.0	2.10	-	-	-	-



The conditions and times of test:

- 24 hours soaking.
- The sample scale.....
- Height 35mm.
- Diameter 72mm.

Examiner  
 Inspector

Dated on November 24, 1983  
 Head of geological enterprise.

Date of test on November 8, 1983  
 N°877/Geology

Name of the projector: Ministry of Public Health.  
 Project: To survey the pharmaceutical Factory at 8 Km in  
 Vientiane.

Shear Test

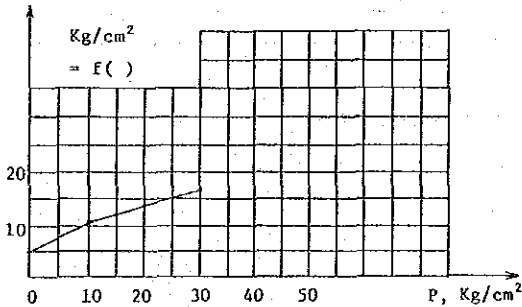
Kinds of materials	Geological symbol	Sample number	Deepness of sampling	Level of sampling	Sampling method	Sampling date	Permeability	Registered sampling number		
Silty clay	-	2/4	6.20	5.00 ~ 6.20	-	-	-	-		
Material										
Material scale, mm counting as percentage										
Cobblestone mineral	ore		sand				silt			clay
	> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	0.5 ~ 0.25	0.25 ~ 0.10	0.10 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005
-	-	-	0.24	0.28	0.48	1.5	12.1	13.00	11.0	64.4

Characteristic of material

Range of stickiness			Stream under the soil	Stickiness	Net weight	Volume	Gap	Coefficient of gap	Saturation
Range of liquidity	Range of stickiness	Span of stickiness							
W <sub>TLL</sub>	W <sub>P</sub> LP	W <sub>m</sub> LP	W	B	Yy, g/cm <sup>3</sup>	yo, g/cm <sup>3</sup>	n, %	eo	G
0.48	0.28	0.20	0.27	< 0	2.76	1.94	45.51	0.835	0.90

Shear Test

Specific pressure P, Kg/cm <sup>2</sup>	Power Unit G, Kg/cm <sup>2</sup>	Shear Unit J, Kg/cm <sup>2</sup>	Coefficient of inner friction Tg	Angle of the inner friction ε	Value of cohesiveness C, Kg/cm <sup>2</sup>	Contained water after testing W
1.0	1.0	0.50				
2.0	2.0	0.80	0.27	15°	0.23	0.23
3.0	3.0	1.05				



The conditions and times of test:

24 hours soaking.

- The sample scale.....
- Height 35mm.
- Diameter 72mm.

Examiner  
 Inspector

Dated on November 24, 1983  
 Head of geological enterprise.

Ministry of construction  
constructive designing  
and planning Institute.  
The geological Enterprise.

Lao People's Democratic Republic  
Peace, Independence, Unity and Socialism.  
Bill of hydraulic research results

Project: Constructing of the pharmaceutical Factory at the 6 Kilometer.  
The sample date: 01/11/83  
Date of sending to the laboratory: 02/11/83  
The sample place: Kilometer N°8 (way to Thadeua), a drilled hole N°1.  
Deepness : 6.30 m.  
Laboratory : The geological enterprise.

Characteristic on materials	Clearness	very clear	Colour	clear	Ordor	Non
Research chemical element			Figure/ Liter	Figure of equivalence	%	Remarks
Carbohydrate-Potesium carbonate	HCO <sub>3</sub> <sup>-</sup>	48.80	0.80	39		
Carbonic acid	CO <sub>3</sub> <sup>2-</sup>	00	00	00		
Chloride	Cl <sup>-</sup>	60.35	1.70	49		
Sulfate	SO <sub>4</sub> <sup>2-</sup>	15.61	0.32	12	No reaction to concrete	
Nitric acid	NO <sub>2</sub> <sup>-</sup>	-	-	-		
Nitrous acid	NO <sub>3</sub>	-	-	-		
Sum of anion	ΣA	100.36	-	100		
Calcium	Ca <sup>2+</sup>	00	00			
Magnesium	Mg <sup>2+</sup>	10.94	0.90	20	No reaction to concrete	
Na <sup>+</sup> + K <sup>+</sup> total calculation as	Na <sup>+</sup>	44.16	1.92	80		
Ammonia	NH <sub>4</sub>	00	00			
Iron (Fe <sup>2+</sup> + Fe <sup>3+</sup> ) total calculation as	Fe <sup>3+</sup>	00	00			
Sum of anion	Σk	55.10	-	100		
Sum of ion	Σi	155.46	-	-		
Dry element		172.00	-	-	No reaction to concrete	
Strength general provisional permanent	Ca <sup>2+</sup> + Mg <sup>2+</sup>	-	0.90	-		
Oxy-silicon	SiO <sub>2</sub>	-	-	-		
Absorption (as mg)	O <sub>2</sub>	0.80	-	-		
Carbonic acid-liberation	CO <sub>2</sub> libera- tion	00	00	-		
Carbonic acid-reaction	CO <sub>2</sub> agr	48.40	-	-	Medium-reac- tion to con- crete	
Ph		5.6	-	-	Slow reactor to concrete	
Sulfureted Hydrogen	H <sub>2</sub> S	-	-	-		



Ministry of construction Lao People's Democratic Republic  
 Designing & planning Institute Peace, Independence, Unity and Socialism  
 of the geological enterprise  
 Tel: 5400, 4419

THE TOTAL RESULTS OF RESEARCHING SOIL

Name of the projector: Ministry of Public Health.  
 Project: To survey the pharmaceutical Factory at the 8 Km.

Series	Sample number	Deepness of sampling	Component of material, % material scale, mm											% stream under the soil W	Range of stickness			Stickness B	Net weight according to test $\gamma\gamma, g/cm^3$	Volume		Gap n, %	Coefficient of gap	Saturation	Maximum pressure max g/cm <sup>3</sup>	Contained water W <sub>0</sub>	Shear angle		Cohesiveness C, Kg/cm <sup>2</sup>	Angle of inner friction	Modulation Md, Kg/cm <sup>2</sup>	Coefficient of permeability K, m/day	Definition of material	
			stone		pebble		sand					silt			clay	Range of liquidity WT(LL)	Range of stickiness WP(PI)			Span of stickiness WM(PI)	Nature $\gamma\gamma, g/cm^3$						Dry soil $\gamma, g/cm^3$	Day condition Q <sup>o</sup>						In the water Q <sup>o</sup>
			> 10	10 ~ 5	5 ~ 2	2 ~ 1	1 ~ 0.5	0.5 ~ 0.25	0.025 ~ 0.10	0.20 ~ 0.05	0.05 ~ 0.01	0.01 ~ 0.005	< 0.005																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
1	1/1	1.00	-	-	-	0.20	1.96	21.56	18.00	26.81	55.0	4.0	12.4	-	0.14	0.10	0.04	-	2.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	silty sand
2	1/2	3.00	2.30	14.4	22.70	0.73	0.87	1.97	3.79	9.2	10.89	10.29	22.86	-	0.36	0.22	0.14	-	2.70	-	-	-	-	-	-	-	-	-	-	-	-	-	silty clay	
3	1/3	4.60	-	-	-	0.26	0.78	2.62	5.66	16.28	24.0	9.0	41.4	0.21	0.35	0.22	0.13	∠0	2.72	1.99	1.77	34.2	0.53	61.06	-	-	-	-	0.900	24°	128 93	10-4 32	-	
4	1/4	6.30	-	-	-	0.48	0.40	0.68	1.0	11.04	16.0	7.0	63.4	0.29	0.59	0.36	0.23	∠0	2.75	2.00	1.55	43.63	0.77	41.04	-	-	-	-	-	-	-	clay		
5	1/5	7.80	-	-	-	0.16	0.06	0.22	0.74	24.42	13.0	10.0	51.4	0.20	0.41	0.25	0.16	∠0	2.73	1.97	1.64	39.92	0.66	40.82	-	-	-	-	0.50	11°	10-4 123	10-4 29	-	silty clay
6	1/6	9.80	-	-	-	0.50	1.18	2.12	2.64	17.16	19.0	9.0	48.4	0.18	0.39	0.24	0.15	∠0	2.76	2.05	1.73	37.31	0.59	50.83	-	-	-	-	-	-	-	-	-	
7	2/1	0.90	-	-	-	0.92	12.09	2.13	13.02	10.11	21.0	3.50	24.85	0.21	0.22	0.16	0.06	0.83	2.71	2.00	1.65	39.11	0.64	20.88	-	-	-	-	-	-	-	-	-	silty sand
8	2/2	3.0	-	-	-	0.62	0.62	1.52	7.02	17.82	20.0	8.00	44.4	0.19	0.37	0.22	0.15	∠0	2.72	2.11	1.77	34.92	0.53	60.96	-	-	-	-	0.525	28°	205 14	10-4 14	-	clay
9	2/3	4.50	35.14	10.79	14.90	1.09	1.49	3.33	6.09	1.28	6.62	4.29	44.98	4.98	0.38	0.22	0.12	∠0	2.72	2.02	1.71	37.13	0.59	0.82	-	-	-	-	-	-	330	-	-	
10	2/4	6.20	-	-	-	0.24	0.28	0.48	1.5	12.1	13.0	11.0	61.4	0.27	0.48	0.28	0.20	∠0	2.76	1.94	1.52	45.51	0.83	50.90	-	-	-	-	0.23	15°	117	-	-	clay
11	2/5	7.90	-	-	-	0.04	0.04	0.06	1.08	6.38	16.0	13.0	63.4	0.33	0.47	0.27	0.27	0.33	2.76	1.92	1.44	47.82	0.91	60.99	-	-	-	-	-	-	-	-	-	-
12	2/6	10.80	-	-	-	-	0.12	0.04	0.64	25.4	12.0	86.0	55.80	0.40	0.40	0.25	0.25	∠0	2.75	1.96	1.64	40.36	0.67	60.77	-	-	-	-	-	-	187	10-4 23	-	silty clay

- Remarks: 1. The material scale was defined by using a colander and putting a button.  
 2. The coefficient of permeability K was defined by the experimental equipment.  
 - 24 hours soaking.

Vientiane, dated on November 25, 1983  
 Head of geological enterprise

Examiner.....  
 Inspector.....





R.D.P.L.

Ministry of Construction

Project: Ministry of Health

Material Laboratory

Road : Thadeua Km 8

BORING TEST RESULTS

Layer N°	Type of Material	N° of blows per foot	Unconfined compressive strength qu: kg/cm <sup>2</sup>	Remark
0.00	silty sand	26	2.78	Average hole N° 1 and N° 2
1.00	clay + a little Laterite	10	1.07	
2.00	clay + a little Laterite	12	1.28	
3.00	clay + a little Laterite	17	1.82	
4.60	clay	20	2.14	
6.30	clay	22	2.35	
7.00	clay	23	2.50	
10.00				

Material Laboratory

February 15, 1984

REPUE LOQUE DEMOCRATIQUE POPULAIRE LAO  
PAIX INDEPENDANCE UNITE ET SOCIALISME

MINISTRE DE L'AGRICULTURE DE  
L'IRRIGATION ET DE COOPERATIVE

Direction de la Météorologie  
et de l'Hydrométéorologie

ATION DE : Vientiane

ສາມາດ ຈັດ ຈັດ ຈັດ  
( ຈັດ ຈັດ ຈັດ ) TEMPERATURE

Mois Année	I		II		III		IV		V		VI		VII		VIII		IX		X		XI		XII	
	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C	min °C	max °C
1971	07.3	33.0	13.1	33.6	16.0	36.5	21.3	37.5	21.6	36.4	23.0	33.5	22.8	33.5	23.2	34.0	22.7	33.4	16.8	32.0	10.5	32.4	14.5	30.5
72	11.9	33.2	15.5	34.3	14.2	35.8	21.2	37.0	22.4	37.6	22.6	35.6	23.7	34.7	22.1	33.4	23.0	33.7	22.2	33.5	19.4	32.4	15.5	31.0
73	14.8	33.3	16.2	36.3	19.5	37.3	21.9	37.3	22.9	35.6	22.9	35.5	23.0	34.7	21.7	33.6	23.2	32.7	17.7	33.4	12.6	32.5	07.6	32.2
74	04.7	32.1	10.7	37.5	14.2	35.8	20.2	36.8	22.5	35.0	23.4	34.3	22.5	34.8	22.5	34.8	22.8	33.5	21.6	33.2	10.6	32.1	15.7	32.0
75	14.1	31.6	10.4	34.6	20.1	37.8	21.0	40.8	22.3	36.0	23.5	34.0	22.2	34.6	22.8	33.5	23.0	33.6	21.5	33.1	11.7	32.5	05.3	22.2
76	07.3	29.6	13.0	35.1	16.8	36.6	20.3	38.0	18.9	34.9	21.8	34.9	22.8	34.8	22.9	33.5	23.0	34.6	21.9	32.9	13.3	31.9	12.9	32.4
77	15.5	32.7	13.9	34.8	14.0	37.8	20.3	37.9	24.8	37.0	24.0	35.5	23.0	34.5	23.0	34.5	21.8	33.9	20.2	35.0	18.1	32.1	14.6	32.2
78	14.5	33.7	15.1	33.6	18.8	36.7	20.0	38.4	22.2	35.3	23.4	34.3	22.8	34.3	23.0	33.6	22.7	33.6	15.3	33.6	15.9	32.3	11.8	31.2
79	17.2	36.3	15.2	36.7	19.1	37.9	22.3	38.5	22.0	36.9	22.3	34.3	23.5	35.6	23.0	33.6	23.0	34.0	18.6	33.1	14.4	22.6	12.7	31.2
1980	14.0	33.3	15.2	34.4	18.2	37.2	18.5	40.3	21.0	36.5	23.0	35.0	22.0	35.0	23.2	34.0	23.0	32.4	18.7	33.9	18.7	32.5	13.7	32.7
81	10.9	31.9	16.6	37.0	18.7	37.6	20.5	37.8	22.1	36.2	23.1	33.6	22.0	33.9	23.0	34.0	22.4	34.6	21.0	34.1	15.4	33.1	11.8	30.5
82	11.4	31.5	14.8	35.8	20.5	37.7	18.8	37.6	23.0	34.8	23.7	35.2	23.3	35.1	22.7	34.4	22.5	34.4	21.8	33.6	18.8	32.1	07.1	31.0
83	10.8	30.2	16.4	34.5	17.0	38.2	22.5	41.5	23.8	30.1	22.2	36.8	20.7	35.7										

REPUBLIQUE DEMOCRATIQUE POPULAIRE LAO  
PAIX INDEPENDANCE UNITE ET SOCIALISME

MINISTRE DE L'AGRICULTURE DE  
L'IRRIGATION DE LA COOPERATIVE

Direction de la Météorologie  
et de l'Hydro-météorologie  
Vientiane  
U. ກະຊວງ ນິຍາມ ກະຊວງ ກະສິກະ ກຳ ກະຊວງ ນິຍາມ ກະຊວງ ກະສິກະ ກຳ  
(ກະຊວງ ນິຍາມ ກະຊວງ ກະສິກະ ກຳ)

rain Fall

Année	Mois												Total Annuelle
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1971	NT	17.3	13.9	34.1	1294.0	1275.9	1289.4	1226.4	1163.4	1103.5	10.8	18.2	1426.9
72	NT	6.8	36.8	167.6	1115.6	1312.8	1246.1	1306.7	1166.3	1184.4	18.2	5.8	1521.1
73	NT	NT	37.0	36.4	1308.3	1200.7	1298.6	1263.9	1361.3	125.7	0.0	NT	1531.9
74	NT	1.6	36.7	97.4	1100.5	1159.2	1255.7	1368.4	1187.1	192.6	29.7	0.2	1329.1
75	23.5	26.3	13.2	121.8	1347.0	1473.9	1177.5	1430.4	1289.4	1194.4	8.5	0.0	2006.9
76	NT	23.0	119.9	126.9	1121.7	1167.3	1167.6	1403.1	1416.7	176.7	NT	NT	1614.9
77	15.2	NT	35.1	69.0	1151.9	1231.0	1211.1	1174.8	1190.3	126.5	16.5	22.8	1144.2
78	1.6	17.8	51.1	1145.9	1328.4	1254.9	1254.6	1293.6	1381.4	1128.9	28.5	NT	1986.7
79	NT	21.0	0.1	61.8	1344.7	1333.3	1150.1	1117.8	1253.1	119.2	NT	NT	1301.1
1980	NT	18.6	68.8	61.0	1319.5	1611.0	1461.5	1342.9	1253.4	154.7	0.0	NT	2291.4
81	NT	0.3	19.6	1124.2	1311.1	1238.5	1635.0	1210.0	1224.8	1117.8	40.5	0.0	1921.8
82	NT	6.1	60.8	69.6	1239.3	195.4	1253.8	1484.0	1319.5	190.2	22.2	0.6	1629.3
83	53.1	5.7	9.0	58.1	197.6	1243.8							

REPUBLIQUE DEMOCRATIQUE POPULAIRE LAO  
 PAIX INDEPENDANCE UNITE ET SOCIALISME

MINISTERE DE L'AGRICULTURE DE  
 L'IRRIGATION ET DE COOPERATIVE

Vientiane

ສາທາລະນະລາຍຮັບ  
 (ສະເລ່ຍຕໍ່ປີ) (max and min)  
 ຄວາມເຊື່ອມຕໍ່ກັນ (°C)

Direction de la Météorologie  
 et de l'Hydrometeorologie

RELATIVE HUMIDITY (%)

Année	MOIS																				
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII									
1971	36	191	137	190	150	194	160	196	162	196	165	196	155	195	148	193	135	195	140	194	
72	37	193	138	192	140	190	151	196	157	194	163	195	159	194	155	193	151	190	149	191	
73	39	191	139	187	139	182	137	181	145	189	158	192	154	195	155	195	168	192	153	191	147
74	40	191	143	194	146	186	149	189	153	190	159	192	160	193	167	194	159	193	157	192	153
75	54	191	141	188	142	186	137	178	156	193	157	191	156	190	160	192	160	193	152	190	148
76	35	190	139	188	141	185	152	190	160	193	157	193	159	192	163	193	160	195	156	193	148
77	47	191	140	181	139	181	145	190	149	191	150	189	159	193	160	193	158	194	152	192	144
78	43	188	148	187	141	190	149	189	160	193	161	194	165	195	166	194	162	196	151	193	147
79	42	193	142	191	136	186	144	186	156	192	164	195	156	193	163	195	160	195	146	190	138
1980	39	191	141	186	136	179	142	186	153	191	163	195	162	194	163	194	165	195	152	192	159
81	42	190	143	187	139	185	148	190	156	192	160	193	164	195	162	193	158	193	156	192	150
82	42	194	146	192	144	188	148	190	149	190	154	190	155	190	164	195	165	194	156	195	150
83	51	194	144	191	140	186	142	185	154	192	162	194	162	194	162	194	162	194	162	194	162

REPUBLIQUE DEMOCRATIQUE POPULAIRE LAO  
 PAIX INDEPENDANCE DEMOCRATIE UNIES PROSPERITE

MINISTRE DE L'AGRICULTURE DES  
 FORETS ET DE L'IRRIGATION

Service National de la météoro-  
 logie et de l'hydrométéorologie.

Vientiane : 17°57'N/102°54'E  
 Altitude : 170 m

- RADIATION SOLAIRE -

MOIS	H	H U R S	I	I	I	I	I	I	I	I	I
I	31	17-12	8-21	492.6	0.731	671.4	425.74	485	38.3	0.720	
II	28-29	11-61	7-58	454.8	0.652	754.3	440.59	522	35.1	0.749	
III	31	12.05	6.88	412.8	0.570	843.8	450.08	553	37.0	0.765	
IV	30	12.53	7.43	445.8	0.593	900.0	492.85	601	40.3	0.800	
V	31	12.98	6.52	391.2	0.562	918.7	451.80	615	39.7	0.790	
VI	30	13.17	5.25	315	0.398	918.7	392.06	620	39.7	0.785	
VII	31	13.07	4.80	288	0.356	915.7	373.02	613	38.4	0.780	
VIII	31	12.70	4.27	256.2	0.336	893.5	348.12	583	36.8	0.765	
IX	30	12.24	5.32	319.2	0.435	850.0	382.24	563	36.0	0.775	
X	31	11.75	7.28	436.6	0.619	773.8	436.25	550	38.5	0.780	
XI	30	11.33	8.03	481.2	0.707	583.6	422.82	510	35.7	0.750	
XII	31	11.06	8.25	495	0.746	647.3	512.04	488	34.0	0.735	

h : Durée d'insolation mesurée par l'héliographe compilée 1959-1972.

H : Heures et dixièmes d'heures calculés d'après les tables poklet et tables d'angot. (Durée astronomique du jour (11.))

$\frac{h}{H}$  : Insolation relative %

IGA : Radiation qui revient attendre le sol ( cal/cm<sup>2</sup>/minutes ).

IG : IGA (0.18 + 0.62  $\frac{h}{H}$  ) pour 0.94 cal/cm<sup>2</sup>/minutes ).

IG-D : Rayonnement direct et diffus avec thermomètre mois ( mesures actinométriques ).

REPUBLIQUE DEMOCRATIQUE POPULAIRE LAO  
 PAIX INDEPENDANCE UNITE ET SOCIALISME

Vientiane

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MINISTRE DE L'ARCHICULTURE DE  
 L'IRRIGATION ET DE COOPERATIVE

~w 11sj 30/1w 24 95/1ay (m/s)

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Direction de la Météorologie

et de L'Hydrometeorologie

WIND SPEED

Mois	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1971	ISE 16	IE 16	INE 16	IW 111	IE 17	IS 15	IW 17	IN 18	IN 16	IW 14	IE 14	INE 15
72	IE 15	IE 15	IS 115	IN 118	ISW 115	IE 18	IN 125	IE 19	IE 113	ENE 143	IE 131	SE 16
73	IE 14	INNE 13	INE 111	INW 113	IW 115	IW 114	IW 110	ISE 110	IE 115	ISE 15	IESE 16	IESE 140
74	IESE 17	IS 110	IW 130	IW 129	ISSE 122	IW 125	IS 120	IN 120	IS 114	IN 116	IE 110	SE 15
75	IS 17	INW 119	ISE 129	IN 129	IW 120	IE 115	ISW 112	SS 118	ISE 115	ISW 115	IE 110	ISE 15
76	IE 15	IN 15	IW 127	IN 116	IW 110	IS 119	IW 110	ISE 118	IS 117	IE 116	IN 116	INE 17
77	IN 18	IE 110	IE 112	IN 113	ISE 120	IS 110	IWNW 113	IESE 113	IN 116	INE 113	IE 111	IE 19
78	IE 110	IN 18	IW 114	INE 117	IN 122	IS 112	IS 118	ISE 112	IE 119	ENE 112	IE 113	IE 111
79	IE 110	IS 114	IN 120	IS/SE 115	IN 113	IW 117	IN 113	IW 119	IS 113	IE 115	IE 115	IE 116
1980	IN 15	IS 118	INW 116	IN 120	ISW 130	ISE 116	IN 115	IESE 118	INE 110	ENE 116	INE 115	ENE 17
81	IE 15	IW 15	IW 129	IW 133	IN 121	IW 114	IN 118	IS 110	INW 110	IN 110	IN 110	IN 116
82	INW 16	IE 16	INW 110	ISW 112	IW 115	IS 115	IS 110	ISSE 110	INE 119	IN 117	IE 116	ENE 18
83	SE 13	IN 13	IN 16	IN 115	IE 137	IW 110	IW 110	IW 110	IW 110	IW 110	IW 110	IW 110

THE REGULATION CONCERNING THE SAFEGUARD OF THE ROAD.

For better safeguarding the security of the traffic and transportation, for facilitating extensions and widening of the road and for realizing that the safeguard of the road is the general duty of all persons, organizations, departments of the State and the people,

The Ministers' Council issues the regulation concerning the security, the definition of the area and the safeguard of security of the traffic concerning the various communication roads as follows:

PART I:

The definition concerning the reserved area.

Article I: All roads must have reserved area on the ground, on the air and under the ground for safeguarding the ground of the roads, surface of the roads, bridges, pipes, drainages and other instruments of the road,

For assuring the security of the traffic of all kinds of cars, and for facilitating the roads to be widened and to be repaired.

Article 2: The area of safeguarding the road on the ground is the area of the two sides of the road which the Ministry of Transportation and Post administrators use for assuring the durability of the roads, surface of the roads, bridges, drainages and various duties of the construction. It is for the security of the car to facilitate the roads to be repaired and to be widened and assuring durability of the roads,

1. The reserved area of the various roads is defined as follows:
  - a). In case of national roads, it should be 20 meters on each side.
  - b). In case of provincial roads, it should be 15 meters on each side.
  - c). In case of communal and rural roads or the others, it should be 10 meters on each side.



Particularly, the roads in the city and the roads in the outside of the town should have definite areas when they are planned, however, the construction of houses, factories and various store-houses must be minimum 3 meters far from the foot-path.

2. The reserved area for protecting a big bridge or a port of the ferryboat must be 200 meters far from the middle of the road or the edge of the port of the ferryboat.

Along the road: It should be 11 meters far from the front of the bridge or the ferryboat port's area ( the road of coming down and going up to the port is considered a part of the port's area).

Article 3: The area on the air of the road and the bridge should be minimum 5 meters from the surface of the road and the bridge.

1). When making a gate on the road, we must make a solid one and it should be higher than 5 meters from the surface of the road, but posts of that gate must stand out of the edge of the road.

2). When constructing a road for old-styled vehicles, we must make a straight one, and it should be at the same level with the surface of the road for avoiding crumbling of the road.

- The telephone lines, telegraph wires and the others crossing the road should be minimum 5 meters high.

- The high power electric lines crossing the road such as special lines of 110 Kvolts should be minimum 8 meters high. The reclining point of the lines connecting two poles should be minimum 7 meters high.

Article 4: As for the area of under ground, when we make a hole for taking soil and others from the road's side, it must be far from the road about 5 meters, do not make a hole under the road in any case, excepting that we get an official permission from the authorities concerned, but we must assure the security of traffic and the road.

Article 5: The use of soil in the reserved areas defined in the Article 3, should be regulated as follows:

1. They can grow some vegetables, plants and rice in the reserved area but they should not be grown up more than 2 meters high and should be 5 meters far from the edge of the road and must not take the soil from the edge of the road, in any case, it is not allowed to plant on the edge of the road in order to avoid crumbling of the road.

2. All people, departments, organizations, factories of the State, the agricultural cooperatives, can not construct something permanent in the reserved areas.

a). If there is someone who has the purpose to construct various works such as houses, store-houses or shops, he must get a permission from the road administration office in that rural in advance. But the provisional constructive things must stand far from the road about minimum 5 meters, which should not be an obstacle to see the road ( only for the plain field).

b). As for the various constructive things whether provisional or permanent which already existed, we must improve as follows:

- If those constructive things have affected the durability of the road or the obstruction of the traffic and transportation, they should be destroyed or removed. The road administration office and the local administrators will account the losing values and propose to the Government for considering and solving the problems for the mutual benefits both to the State and to the people.

3. When making a new construction in the capital or other various cities they must get a permission from the road administration office in the town or the prefecture, but the permission of the construction in the town or prefecture must be correct to the rules and the principles of the city planning.

Article 6: The construction of small scaled irrigation systems such as dams, dikes, canals, drainages, basins or fish ponds, should be far from the edge of the road and the head of the edge should be about minimum 5 meters. If it is necessary to construct those things near the road, the owner of the project must construct them by cement for assuring durability of the road.

- When they plan or start to construct large scaled things such as dike systems under the road and the others, the owner of the project ( the irrigation field ) must consult with the communication section of the Ministry of Transportation and Post for the mutual interests and must be responsible for the cost of the repair and must pay back the various losses if necessary.

- If the frame-works are made in any Province, the administrators of that Province must agree and solve problems if any. when they construct a large scaled irrigation system, it must be administered by the Party, and any problems should be solved by Ministers' Council.

Article 7: In the rural or in the town a telephone or a telegraph post must stand in the outside of the ground road at least 5 meters, the post of the high powered electricity of more than 2 Kvolts must stand outside the road 25 meters of each side. In case of national land which is not maintained properly, the officials concerned must consult with the road administration office for researching the method of solving and assuring the security of the traffic and transportation. As for the installation of the electric posts in the town we must practise according to the plan adopted.

Article 8: The lime kiln, brick kiln, tile kiln, the charcoal oven must be installed far from the edge of the road at least 25 meters, do not dig or drill the edge of the road for making a stove or a brick kiln.

Article 9: The medicine production factory, the medicine store-house, the store-house of the poison elements, the warehouse of bombs, the warehouse of inflammable materials must stand far from the edge of the basis of the road at least 100 meters. But the oil pipe-line and gas line must be far from the road at least 30 meters.

Article 10: Boats, machine boats, ships must stop outside in the safety area of big bridges and the port of the ferryboat as mentioned in N°2 of the Article 2.

- In case of the boats, machine boats, ships or drafts which are drifting around the bridge or the port of bridge can be destroyed and the owner of the boats or drafts must be responsible for all losses occurred.

- In case of having no person in those boats, the cadres of controlling the bridge and the boat will have the rights to use all measures for safeguarding the security of the bridge and post of the bridge.

- Do not tie boats, draft ships, machine boats at the head of the bridge or the post of the bridge.

## PART II:

The definition of the traffic and the transportation on the land.

Article 11: It is prohibited that one should remove or destroy or make troubles to the roads, bridges, pipes, drainages, ferryboats and the various construction materials such as the systems of signal boards, sign posts, warehouses of materials, shops and other buildings which serve the communication and the transportation and are owned by the State or by the people.

Article 12: Do not dry straws, paddies, woods and other things on the road.

It is not allowed to tie domestic animals or to place various materials such as sands, mines, woods, bricks and timbers ( of the people or of the various fields ) on the roads, and edges of the roads in front of bridges which will be placed for long. We must carry out machines which are not working from the edges of the roads for not being an obstacle of the traffic of the vehicles.

Article 13: When we start to construct or repair the roads, when the bridges and roads were destroyed and the traffic and the transportation were also stopped, the road administration office or company and the road construction department must immediately place the signal board in order to warn their vigilance and give some security methods for protecting the vehicles and passengers, if it is necessary, we must take another way for passing by.

Article 14: When they construct a bridge or a pipe through villages, not only in the town but also in the ruals, the appropriate technics must be assured. Do not take the soil simply to fill the drainage because when the rainy season comes it will destroy the road. Do not dig the surface or the edges of the road. We must have detailed contracts with each other in order to assure correctly the water supply systems and repairs of the road.

Do not throw refuses or toilet papers, saw-dusts, and husks near the road and the drainage.

It is not allowed to do fish-trapping along canals near the roads.

Article 15: It is not allowed to use the tank or the other iron wheels or tire-chains on the roads and asphalted roads for avoiding destruction of the road. If there is a violation and destruction of the road, the owner of the car must pay for those things. In case of the car of the army which goes to struggle or to work, it must go along the edge of the road for preventing from destroying the road.

- If the car has an over weight ( over its weight limitation of the road) and goes along the road without permission from the road administration office, and the road was destroyed, the car's owner must respond to pay for all losses.

- It is not allowed to carry timbers, heavy things on the road or along the edge of the roads and the drainages near roads.

- It is not allowed to cart with iron wheels on roads, if it is necessary, we must tie them with tire wheels.

PART III:

Enforcement.

Article 16: The Ministry of Transportation and Post and the Provincial Administrative Committee publish and enforce this regulation.

Article 17: If there is any person or organization to violate any article of this regulation, he will be disciplined, pays back the losses and will be punished by the laws.

Vientiane, September 13, 1983.

The First-Vice-President of the  
Ministers' Council.

Nouhak PHOUMSAVANH.

INTERNATIONAL TRANSLATIONS  
22 SILOM ROAD  
BANGKOK 5, THAILAND  
TEL. 233.7714

NOTIFICATION OF MINISTRY OF COMMERCE

Re : Export of commodities out of the Kingdom

No. 16 (B.E. 2524)

For the benefit of national security, by virtue of the provisions of Section 5 (2), (3) and (6) of the Act on Export & Import of Commodities, B.E. 2522, the Minister of Commerce, by approval of the Council of Ministers, hereby issue a Notification as follows:

1. The commodities in the list attached to this Notification, shall be the commodities which must be approved in export out of the kingdom.
2. In case the Ministry of Commerce, in conjunction with the National Security Council, consider that the export of any commodities under Clause 1, to any country will not effect the security and safety of Thailand, the Ministry of Commerce shall assign the Customs Department to check and release said commodities to such country without having the need for the license.
3. The provision of Clause 1 shall not be applicable to the case of taking them on the person for personal use or for the case the vehicle takes them out for use in such vehicle or for the case of export as sample as necessary.

This Notification shall come into force on the day after the date of publication in the Government Gazette.

Given on the 23rd of December 1981

Sgd. Lcdr. (signature)

(Poonmee Poonnasri)

Minister of Commerce

Remark : Published in Government Gazette, Vol. 98, Sec. 210, dated 23rd December 1981)

Certified correct copy

signature

(Mr. Narong Nakayoki)

Economist, Class 7.

Department of Foreign Trade

A List of Goods Following the Announcement of the  
Ministry of Commerce  
Entitled Exportation of Goods out of the Kingdom  
No. 16 (1981)

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Mineral Product Goods

- |                |                       |
|----------------|-----------------------|
| 1. Glycerine   | 3. Lubricating Oil    |
| 2. Brake Fluid | 4. Lubricating Grease |

Chemical Industry Product Goods

- |                                 |  |
|---------------------------------|--|
| 1. Acetic anhydride             | 25. Carbon monoxide                      |
| 2. Acetyl bromide               | 26. Carbonyl chloride                    |
| 3. Acetyl chloride              | 27. Chlorine                             |
| 4. Acrolein                     | 28. Chloroacetone                        |
| 5. Amalol                       | 29. Chlorocyanide                        |
| 6. Ammonium nitrate             | 30. Chlorodiethyl sulphide               |
| 7. Arsenic trichloride          | 31. Chlorodimethyl sulphide              |
| 8. Arsine                       | 32. Chloroethyl phenyl sulphide          |
| 9. Bromine                      | 33. Chloroethyl rhodanide                |
| 10. Bromine acetate             | 34. Chloromethyl chloroformate           |
| 11. Bromoacetone                | 35. Chlorosulphonic acid                 |
| 12. Bromo acetophenone          | 36. Chlorovinyl dichloroarsine           |
| 13. Bromobenzyl cyanide         | 37. Cyanodimethyl ethoxy phosphine oxide |
| 14. Bromocyanide                | 38. Dianisidine                          |
| 15. Bromodiethyl sulphide       | 39. Dibromodiethyl selenide              |
| 16. Bromomethyl ethyl ketone    | 40. Dibromodiethyl sulphide              |
| 17. Benzyl bromide              | 41. Dibromodiethyl telluride             |
| 18. Benzyl chloride             | 42. Dibromodimethyl ether                |
| 19. Benzyl iodide               | 43. Dibromodimethyl sulphide             |
| 20. Cacodyl acetylene           | 44. Dibromoethyl sulphide                |
| 21. Cacodyl bromide             | 45. Dichloroacetone                      |
| 22. Cacodyl chloride            | 46. Dichlorodiethyl ether                |
| 23. Cacodyl cyanide             | 47. Dichlorodiethyl selenide             |
| 24. Carbon tetrachloro sulphide | 48. Dichlorodiethyl sulphine             |

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- |  |  |
|--|--|
| 49. Dichlorodiethyl telluride                  | 89. Ethyl cyanofornate                           |
| 50. Dichlorodimethyl ether                     | 90. Ethyl dichloroarsine                         |
| 51. Dichlorodimethyl sulphide                  | 91. Ethyl iodoacetate                            |
| 52. Dichlorodipropyl sulphide                  | 92. Ethyl monobromoacetate                       |
| 53. Dichloroethyl ethylamine                   | 93. Ethyl sulphurychloride                       |
| 54. Dichloroethyl sulphide                     | 94. Fluoro isopropoxymethyl phosphine oxide      |
| 55. Dichloro formoxime                         | 95. Fluoro sulphonic acid                        |
| 56. Dichloromethyl acetate                     | 96. Fulminate of mercury                         |
| 57. Dichloromethyl methylamide                 | 97. Fulminate of silver                          |
| 58. Dichloromethyl monochloro-carbonate        | 98. Gelatine carbonite                           |
| 59. Dichlorophenyl arsine dichloride           | 99. Gelatine dynamite                            |
| 60. Dichlorovinyl chloroarsine                 | 100. Heptoyl vanillylamide                       |
| 61. Dichlorovinyl ethyl sulphide               | 101. Hydrogen cyanide                            |
| 62. Diethyl arsine chloride                    | 102. Hydrozoic acid                              |
| 63. Difluoro diethyl selenide                  | 103. Iodo acetone                                |
| 64. Difluoro diethyl sulphide                  | 104. Methyl arsineamide                          |
| 65. Difluoro diethyl telluride                 | 105. Methyl arsine dibromide                     |
| 66. Diiodo diethyl selenide                    | 106. Methyl arsine dichloride                    |
| 67. Diiodo diethyl sulphide                    | 107. Methyl arsine disulphide                    |
| 68. Diiodo diethyl telluride                   | 108. Methyl arsine oxide                         |
| 69. Diisopropyl fluon phosphate                | 109. Methyl arsine sulphide                      |
| 70. Dimethyl amino ethoxycyano phosphine oxide | 110. Methyl bromide                              |
| 71. Dimethyl arsine ethyl sulphide             | 111. Methyl bromoacetate                         |
| 72. Dimethyl arsine oxide                      | 112. Methyl chlorosulphonate                     |
| 73. Dimethyl arsine rhodanide                  | 113. Methyl cyanofornate                         |
| 74. Dimethyl sulphate                          | 114. Methyl dichloroarsine                       |
| 75. Diphenyl amine chloroarsine                | 115. Methyl kodoacetate                          |
| 76. Diphenyl arsine oxide                      | 116. Methyl nitro phenyl arsine chloride         |
| 77. Diphenyl arsine rhodanide                  | 117. Methyl phenyl arsine cyanide                |
| 78. Diphenyl chloroarsine                      | 118. Methyl pinacolyl oxy fluoro phosphine oxide |
| 79. Diphenyl cyanoarsine                       | 119. Monochloro methylcarbonate                  |
| 80. Disulphur decafluoride                     | 120. Nitro cellulose                             |
| 81. Ethyl arsine dibromide                     | 121. Nitro glycerine                             |
| 82. Ethyl arsine dichloride                    | 122. Nitrogen mustard                            |
| 83. Ethyl arsine diethyl thioester             | 123. Nitrophenyl arsine diamyl ester             |
| 84. Ethyl arsine oxide                         | 124. Nitrophenyl arsine dichloride               |
| 85. Ethyl bromoacetate                         | 125. Nitrosyl bromide                            |
| 86. Ethyl carbazole                            | 126. Nitrosyl chloride                           |
| 87. Ethyl chloroacetate                        | 127. Penasarizine chloride                       |
| 88. Ethyl chlorosulphonate                     | 128. Perchloromethyl rhodanide                   |



- |  |  |
|--|--|
| 129. Phenyl arsine dichthyl ester        | 158. Trichloronitro methane  |
| 130. Phenyl arsine dimethyl ester        | 159. Trichloro trivinylarsine  |
| 131. Phenyl arsine dimethyl thioester    | 160. Trichlorovinyl arsine   |
| 132. Phenyl arsine oxide                 | 161. Trinitro cresol   |
| 133. Phenyl carbonyl arsine chloride     | 162. Trinitro crasyatos  |
| 134. Phenyl carbylamine chloride         | 163. Trinitro diphenylamine  |
| 135. Phenyl chlorophenyl arsine chloride | 164. Trinitro resorcinol   |
| 136. Phenyl cyanochloride                | 165. Trinitro toluene  |
| 137. Phenyl dibromoarsine                | 166. Trolyl  |
| 138. Phenyl dichloroarsine               | 167. Vinyl chloroarsine  |
| 139. Picric acid crystalline             | 168. Xylyl bromide   |
| 140. Potassium Chlorate                  | 169. Various kinds of driving powder   |
| 141. Red phosphorus                      | 170. Explosives  |
| 142. Straw dynamite                      | 171. Time blasting cap   |
| 143. Sulphide of arenic                  | 172. Detonator   |
| 144. Sulphurous chloride                 | 173. Primer  |
| 145. Sulphur dioxide                     | 174. Cartridge base cap, explosive<br>primer head cap, explosive<br>primer and blasting cap. |
| 146. Sulphuryl chloride                  | 175. Sulfur  |
| 147. Tetrachlorodichthyl sulphide        | 176. Potasium nitrate  |
| 148. Tetrachlorodimethyl sulphide        | 177. Calcium carbide   |
| 149. Tetrachloro dinitro methane         | 178. Seasoning powder  |
| 150. Tetrachloro ethane                  |  |
| 151. Tetra nitro diglycerine             |  |
| 152. Tetra nitro methane                 |  |
| 153. Tetryl                              |  |
| 154. Thiodiglycol                        |  |
| 155. Thiophosgene                        |  |
| 156. Trichloro ethylmine                 |  |
| 157. Trichloromethyl chloroformate       |  |

Field Equipment Goods

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| 1. Helmet with chin strap          | 13. Field rice pot                    |
| 2. Helmet lining with accessories  | 14. Field rice pot bag                |
| 3. Rain coat                       | 15. Water canteen                     |
| 4. Tent for personal use with rope | 16. Collapsible plastic water canteen |
| 5. Tent post                       | 17. Water canteen bag                 |
| 6. Tent Peg                        | 18. Water canteen cup                 |
| 7. Back pack                       | 19. Field belt                        |
| 8. Pack belt                       | 20. Light weapon cartridge bag        |
| 9. Field equipment belt            | 21. Hand gun cartridge bag            |
| 10. Field canvas bag               | 22. Nurse bag                         |
| 11. Collapsible field shovel       | 23. Hand gun holster                  |
| 12. Field shovel sheath            | 24. Bullet-proof vest                 |
|                                    | 25. Satchel                           |

Machinery, Mechanical Device, and electrical equipment goods and related accessories

1. Electrical charger and fire blower
2. Smoke maker
3. Radar and accessories
4. Radio remote controller
5. Vapour power generator
6. Power generator
7. Internal combustion cylinder engine and other engines.
8. Bulldozer
9. Earth mover
10. Electric generator.
11. Battery and electricity storage tank
12. Radio transmitter
13. Radio, telegraph, telephone machine
14. Telegraph telephone machine
15. Welder and welding machine equipment
16. Frequency converter
17. Dry cell battery

Vehicle goods and related accessories

1. War air plane
2. Parachute
3. Ground pilot training device
4. Air craft send-off device
5. Tractor
6. Jeep
7. Special truck
8. Special work vehicle
9. Crane
10. Search light truck
11. Mobile radio car
12. Motor boat
13. Motor cycle
14. Bicycle

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15. Other air plane not war airplane
16. Helicopter
17. Parts of air plane and helicopter

Rubber Goods

1. Tyre and inner tube of motor car, motorcycle and bicycle

Ordinary metal goods and those made of metal

1. Building frame iron
2. Iron roof frame
3. Iron roof
4. Iron bridge
5. Iron post with joining frame
6. Pillar and column (iron)
7. Iron Tower
8. Iron Building
9. Iron wire
10. Iron twisted wire
11. Iron cable
12. Iron sling
13. Barbed wire
14. Aluminum roof frame
15. Aluminum roof
16. Aluminum bridge
17. Aluminum post with joining frame
18. Pillar and column (aluminum)
19. Aluminum tower
20. Aluminum building
21. Aluminum cable
22. Joint
23. Pipe
24. Cramps
25. Angle steel

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Equipments related to light, bound, detail measurement and others

1. Binoculars
2. Tools and equipments for navigation and aviation
3. Gas mask

Miscellaneous goods

1. Metal tank and empty plastic tank with 20 liter capacity and over
2. Medicine
3. Canned food.

## ラオス国主要建設資材、労務費単価表

建設会社による。

	品目	単位	単価
1	砂利	m <sup>3</sup>	4 1 0 K
2	砂	m <sup>3</sup>	3 0 0 K
3	木材		
	硬質材	m <sup>3</sup>	1 0, 8 3 4 K
	中質材	m <sup>3</sup>	8, 3 7 6 K
	軟質材	m <sup>3</sup>	7, 2 5 0 K
4	一般石材	ton	4, 5 0 0 K
5	仕上石材	ton	7, 3 0 0 K
	労務費		
	一級技能者		3 5 0 K
	二級技能者		3 0 0 K
	三級技能者		2 5 0 K
	一般労務者		2 0 0 K
	単純労務者		1 5 0 K

TANAENG - PORT TRANSIT SHIPMENT RATE

GENERAL CARGO

1 ton US \$ 29.50 OR 678.50 BATHS

1 cube meter US \$ 17.50 OR 402.50 BATHS

1 cube foot US \$ 0.49 OR 11.27 BATHS

CARGO which cannot be transported by truck or train

1 ton US \$ 56.00 OR 1,288 BATHS

1 cube meter US \$ 15.41 OR 354.43 BATHS

1 cube foot US \$ 0.44 OR 10.12 BATHS

CARGO which is small or light, US \$ 0.029 per kilogram or US \$ 0.49 (11.27 BATHS) per cube foot, but minimum price per item is US \$ 20.00

CAR SERVICE FEE WITH DRIVER

The car weight less than 1,500 Kg. service fee per a car  
US \$ 112.50 OR 2,587.50 BATHS

The car weight more than 1,500 Kg. service fee per a car  
US \$ 135 OR 3,105 BATHS

(The owner must pay for port fee and insurance premium)

CAR SERVICE WITHOUT DRIVER

The car weight less than 1,500 Kg. service fee per a car  
US \$ 55 OR 1,265 BATHS

The car weight more than 1,500 Kg. service fee per a car  
US \$ 62.50 OR 1,437.50 BATHS

Notice

1. Exchange rate US \$ 1 = 23.00 BATHS
2. Even if the car was carrying a full cargo, when the owner is in a hurry, he has to pay full price and also pay US \$ 52.95 for guardman.
3. Nalaeng port - vientiane  
truck (10 wheels) extra fee per a car US \$ 45.00  
(less than 10 ton)  
trailer extra fee a car US \$ 150.00  
Nalaeng port - namggum  
truck (10 wheels) extra fee per a car US \$ 132.00  
(less than 10 ton)  
trailer extra fee per ton US \$ 33.00

Transmit Shipment BANGKOK Office

O.T.C.P.

TEL. 2861976 or 2863193

No. O.T.C.P. 01

To whom uses O.T.C.P.'s service for transferring cargo over boundary

Even still now, some of the people who use this service for Laos don't understand the method of application and how customs formalities do, and so on. We would like to inform you in detail as follows.

1. INVOICE & PACKINGLIST Each of invoice & PACKINGLIST, in the case of declared items<sup>s</sup> under six are needed one manuscript and four copies, declared items over six are needed one manuscript and ten copies, as not to forget to add seals and the owner's signature to these papers absolutely. In case that INVOICE & PACKINGLIST are not written in English, they must be translated into English.

2. B/L needs one manuscript and four copies (The manuscript B/L must change D/O by shipping company and certified four B/L's copies completely)

3. One manuscript that a title to transfer right and one copy and one receiver's photograph which is sized one inch.

- a. Consignee may transfer right to O.T.C.P. directly.
- b. Consignee may entrust right to representative. But the representative must hand over title to transfer right to



O.T.C.P., adding five baths or ten baths (by case) to it.

4. In B/L, INVOICE & PACKINGLIST You must fill "VIENTIANE LAOS VIA BANGKOK" or "LAOS VIA BANGKOK" in the blanks the parts of being indicated as cargo item.

Unless these sentence were filled in them, the owner must complete it by adding to M'fest.

5. If the cargos are resistered only as an import cargos without admission to cross over the boundary, that cannot be accepted. So the owner has to go through due formalities.

6. According to the customs regulation, especially fixed cargo, for example gun and some plants, has to be declared by the owner beforehand.

7. As usually shipping company will inform the owner that how much it costs for a part of stevedore including cargo's price, before going to change D/O in B/L, the owner must pay shipping company for all.

8. In case that the shipping company declares the cargos to customs house only as import cargos, the owner must force the shipping company to go through due formalities for correct manifest.

9. In case that the owner wants to change the route for

transportation, he has to go through due formalities because of reporting to customs house.

10. In case of cigarette and liquor, INVOICE and PACKINGLIST have to be declared more details. For example how many bottles, packages and so on.

On the fact mentioned above, any further information will be gladly given by TRANSMIT SHIPMENT BANGKOK OFFICE, DEPARTMENT OF INTERNATIONAL CARGOS TRANSPORTATION, O.T.C.P. TEL. 2861976

THE ORGANIZATION of TRANSPORTATION

CARGOS and PROVISIONS

MAY 1980

DEPARTMENT OF INTERNATIONAL CARGOS TRANSPORTATION

TEL.2453231 ext 245





JICA