D.- RECOMMENDED ACTIONS AND COST

Just like it has been indicated in each case, the conclusions and recommendations given in Parts B and C of this report are supported by information collected at the site, essentially through visual inspection, and based on previous experiences. This, due to the fact that no access to structural plans, layouts nor calculation-data was possible, that would have allowed a more reliable quantitative evaluation.

Additionally, the Kingstown Hospital installations are subject to a Master Plan of reconstructions, relocations and expansions that extends itself to 11 phases, of which two have already been executed. Therefore, the recommended actions have the goal of mitigation and reduction of the present vulnerability to the natural threats.

All in all, in this Report a number of specific actions directed to reduce the vulnerability to natural threats are recommended; These are synthesized in Table D.1. Cost estimates and unitary prices are based in collected data from different sources; they may require local adjustments and are the following:

- Non-specialized labour ..... 6 US$/hour
- Specialized labour ..... 15 US$/hour
- Installed steel cost ..... 0,8 US$/Kg
- Forms and scaffolding cost ..... 28 US$/$m^2$
- Ready-mixed concrete ..... 75 US$/$m^3$
- Reinforced concrete slab of 11 cm in width + beams ..... 65 US$/$m^2$

TABLE D.1

SYNTHESIS OF THE RECOMMENDED ACTIONS TO REDUCE THE FUNCTIONAL AND STRUCTURAL VULNERABILITY OF THE KINGSTOWN HOSPITAL. ESTIMATED COST

BUILDING AND/OR INSTALLATION	RECOMMENDATION	ESTIMATED COST (US$)
Buildings A and B	1. Verify the seismic resistance of the masonry walls incorporating the exsisting openings, specially in the long walls (North-South).	3.000
	If the resistance were not enough, tie-beams and/or confining tensors should be added; substitution of the slab with one made of reinforced concrete might be necessary.	15.000
	2. Placement of metallic strips to ensure proper union of the wooden columns to the wooden beams that support the corridor roofs.	3.000
	3. Fixing of the roof's gable-end in the Northern façade of Building A, near the Administration area.	8.000
	4. Correct the drainage deffect on top of the roof of the staircase complex of Buildings B-D, and repair the roof support beam in its deteriorated length.	3.000
	5. Place an adequate support, for example a metallic corbel, to supprot the aerial corridor that connects Buildings A and B-D.	2.000

TABLE D.1 (Cont.)

SYNTHESIS OF THE RECOMMENDED ACTIONS TO REDUCE THE FUNCTIONAL AND STRUCTURAL VULNERABILITY OF THE KINGSTOWN HOSPITAL. ESTIMATED COST

BUILDING AND/OR INSTALLATION	RECOMMENDATION	ESTIMATED COST (US$)
Building C	1. Substitution of the wooden slabs by a reinforced concrete slab. 500 m2 x 65 US$/m2.	32.500
	2. Anchor to the walls, all equipments susceptible to tipping under the action of quakes and take the necessary measures to avoid the spill of reactives.	2.000
Building D	1. Placement of metallic strips to secure the union of the reinforced concrete beams to the wooden planks over which the corridor roof rests.	3.000
	2. Repair the support beam (see point 4, Buildings A and B in this Table).	–
Buildings E and F	1. Check the origin of the humidity towards the Southern extreme of Building E, Radiology, and repair leack.	1.000

TABLE D.1 (Cont.)

SYNTHESIS OF THE RECOMMENDED ACTIONS TO REDUCE THE FUNCTIONAL AND STRUCTURAL VULNERABILITY OF THE KINGSTOWN HOSPITAL. ESTIMATED COST

BUILDING AND/OR INSTALLATION	RECOMMENDATION	ESTIMATED COST (US$)
Buildings G and H	1. Verify the earthquake resistance, in the longitudinal direction (North - South) and the stability in perpendicular direction to its plane, of the masonry walls placed near the central axis, having the largest slenderness.	3.000
	2. Actions that come out from point 1, not able to be quantified for now.	
	3. Place a second row of fixation nails of the metallic sheeting, separated about 20 cm, towards the edges of the gable-ends, specially on the roofs with a slope of less than 30 degrees.	1.000
Building I	--	--
Building J	1. Eliminate the short-column effect at the ends of the Eastern and Northern façades, filling the holes that generate short columns with reinforced elements.	5.000
Water supply	1. The water reserve in the present hospital's elevated tanks (25.900 liters) covers 24 hours demand; it is recommended to expand this reserve to 72 hours, with a subterranean tank of twice the capacity.	12.000

TABLE D.1 (Cont.)

SYNTHESIS OF THE RECOMMENDED ACTIONS TO REDUCE THE FUNCTIONAL AND STRUCTURAL VULNERABILITY OF THE KINGSTOWN HOSPITAL. ESTIMATED COST

BUILDING AND/OR INSTALLATION	RECOMMENDATION	ESTIMATED COST (US$)
Energy	1. Anchor the high voltage generator located next to the emergency plant.	1.000
	2. Anchor the gasoil tank that supplies the emergency plant to the support walls.	1.000
Gas storage cylinders	1. Establish simple fixation systems for the metallic bottles or gas cylinders to the walls.	1.000
Cremation Plant	1. Anchor the gasoil tank that supplies the cremation plant to the support walls.	1.000
Gable-end and roof-ridge edges	1. Just like in the recommendation for Buildings G and H, a second row of fixation nails should be placed towards the edges of the roof-ridge, specially in roofs with slopes less than 30 degrees. This is a general recommendation, since not all the roof coverings could be inspected.	3.000

According to the information supplied by the Hospital's Administration, the Emergency Plan elaborated for contingency situations is practiced. Nontheless, the internal comunications system that now depends of the telephonic installation is planned to be updated in the next phase of the Master Plan mentioned before.

Finally, it is recommended that the Hospital's Administration recovers all the structural, architectural and installations drafts and layouts, and creates an ad-hoc file for their internal consultation. The convenience of this measure was shared by the Maintenance Chief, Mr Henderson.

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