

## Red de Observacion del Nivel del Mar para America Central (RONMAC)

### Guatemala Reconnaissance Report (Puerto Quetzal)

Monday, June 19, 2000

Began with a meeting at Instituto Nacional de Sismologia Vulcanologia Meteorologia e Hidrologia (INSIVUMEH). Met with;



Eddy Sanchez Benett  
Director General  
70 Av. 14 -17 Z-13  
Guatemala, C.A.

Tel: 502-2-3315944  
Fax: 502-2-3315005  
Email:  
Insivume@ops.org.gt

Demonstrated the data communications system, discussed the RONMAC project and toured the INSIVUME facility, including the instrument maintenance shop. We were introduced to Mr. Pedro Tax, Coordinator of Hydrological Services. We provided an information package to Mr. Sanchez and Mr. Tax (see Attachment 'A').

Mr. Tax drove us to Puerto Quetzal on the Pacific Coast, about 90 km south-southwest of Guatemala City. Puerto Quetzal is the new section of the port, the old section, which is no longer in use is Puerto San Jose. Puerto San Jose is where the historic tide station was located, just to the west of Puerto Quetzal. There are at least two of the historic benchmarks remaining, which can be connected to the new site.

We met with the Departamento Observacion e Invsetigacion Maritima (OBIMAR).

Ricardo A. Reyes Recinos  
Jefe, OBIMAR  
7a. Avenida 3 – 74, Zona 9 Edificio 74 7o Nivel  
Guatemala, C.A.

Tel: 334-7101 y 334-8133  
Fax: 332-3586 y 334-8152

We gave a demonstration of the equipment and communications to the OBIMAR staff and provided them with an information package (see Attachment 'A'). The OBIMAR person who was introduced to us as the main contact/participant for the RONMAC monitoring site installation and subsequent O & M is Nicolas Solares Cortez, Tecnico Oceanografo. Following the demonstration and discussion we visited the existing tide gauge site.



Existing Tide Gauge House  
Puerto Quetzal, Guatemala

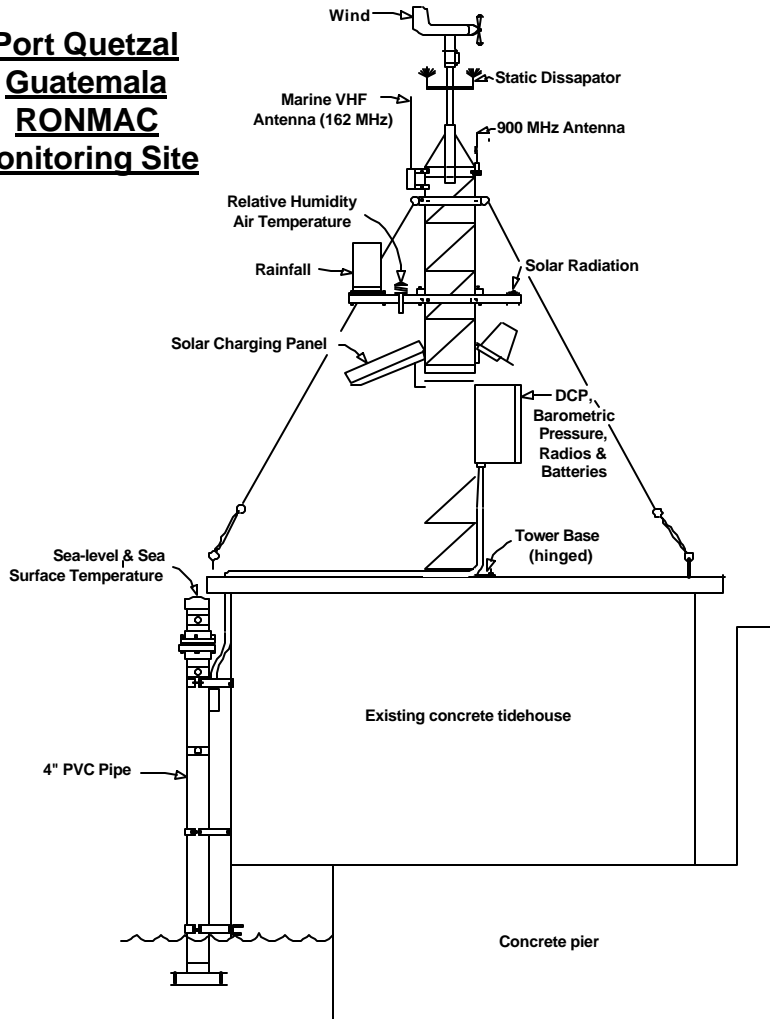
After discussing the suitability of using the existing site for the RONMAC monitoring installation a design was discussed and it was agreed that the existing location would be an excellent choice, with some minor modifications.



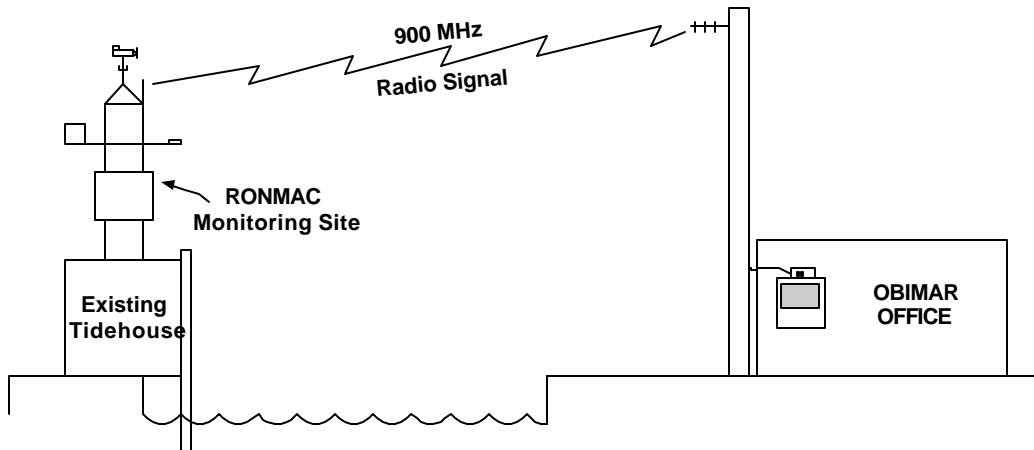
The existing tide house has an 8" diameter "float-well" and a PVC Tide Staff. Both items would remain in place, but a lower cross brace would be added to secure the RONMAC protective well at the waterline. The water depth is 5m

A design was settled upon as shown below. The existing "pole" will be removed from the tide house roof to accommodate the RONMAC tower.

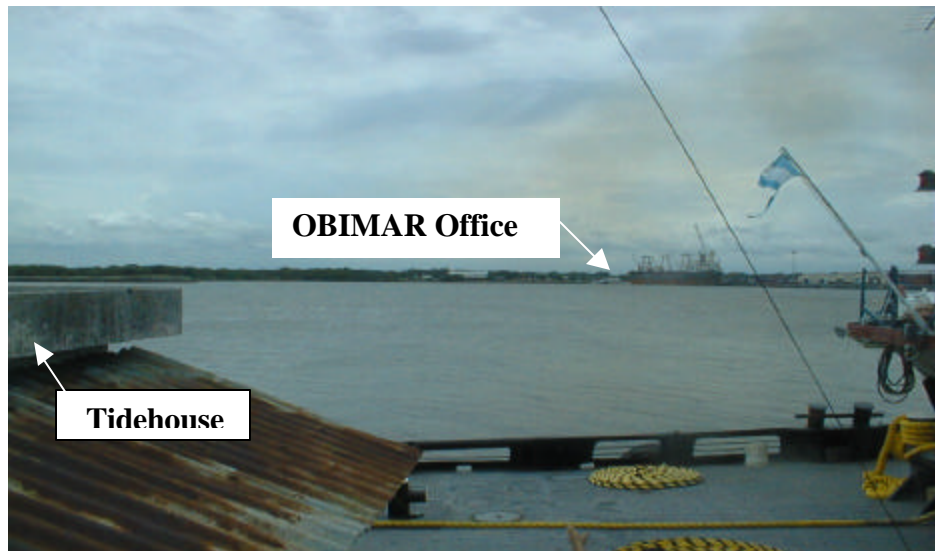
**Port Quetzal**  
**Guatemala**  
**RONMAC**  
**Monitoring Site**



The OBIMAR will weld a steel cross brace at the low waterline to attach the lower bracket for the protective well. The real-time communications are shown below;



The real-time signal from the Monitoring Site to the OBIMAR office should not be a problem because of the height of the existing antenna tower at the OBIMAR office.



View looking from the tide house towards the OBIMAR office. The office is located just beyond the bow of the ship in this picture.

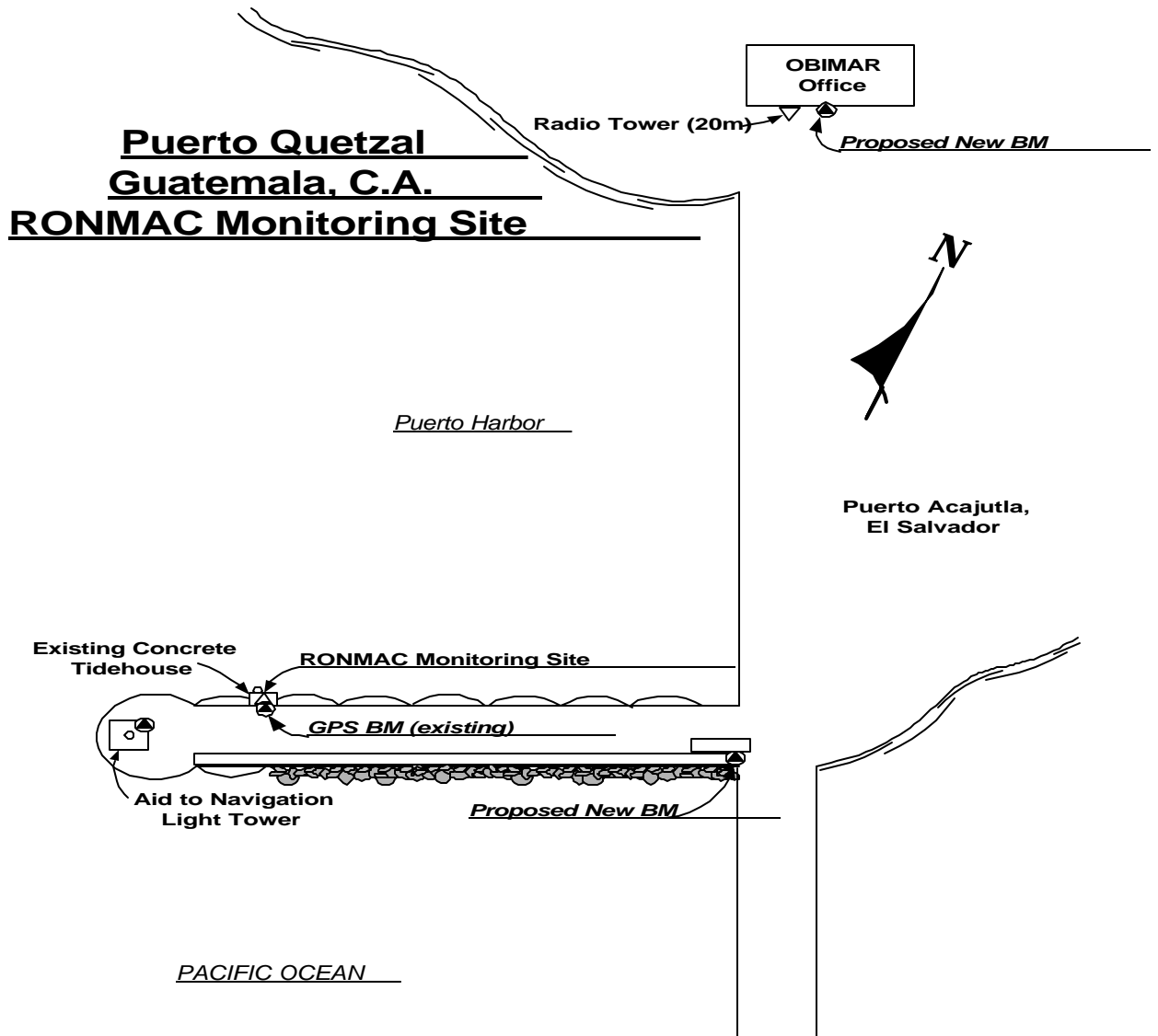
One question that has been raised is; is RONMAC providing a computer to monitor the line-of-sight real-time output? The original plan did not include a computer for this purpose, however since this monitoring requires a very minimal computer, we could provide one for around \$300 (USD), or we could try to find “excess property” computers from NOAA or OAS. The communications and monitoring plan is very basic, but very attractive to port operations and would create more enthusiasm for operation and maintenance responsibilities.

There is two existing benchmarks at this site. One is located on top of the tide house (it is a GPS mark) from a recent hydrographic survey, performed by the US Navy Oceanographic Office;

Mr. Skip Dery  
Bldg. 8100, N332,  
Stennis Space Center, Mississippi 39522-5001  
Tel: (228) 688-4150

This hydrographic survey is in cooperation with the OBIMAR and IGN. The second BM is located on the navigation aid at the west end of the pier. Both marks can be connected by the OBIMAR personnel to the historic BM's located across the basin at the old Puerto San Jose (see NOAA/NOS descriptions). The OBIMAR personnel have good leveling equipment, Sokkia automatic level and meter rods. From discussions with the OBIMAR technical personnel, it is apparent that with a minimum of instruction in precise tidal type differential leveling, they will be able to perform all of the required connections, both at installation, and into the future. The OBIMAR technical personnel were familiar with the

existing bench marks at the old Puerto San Jose site, and were able to show us which ones were still in existence. In terms of qualified personnel, OBIMAR appears to be very well matched to participate in this project. Two additional BM's will be installed as part of the RONMAC installation (see below).



The choice of Puerto Quetzal for the monitoring site is a particularly good one. The site is well situated in relation to the ocean, it is relatively well protected from extreme storms, it has good security because of its location within the port, the port operations people are keen on the idea, their technical personnel are well qualified and will do a good job with a minimum of "hands on" training.

## **Names & Coordinates in Guatemala**

### **Jose Felix Palma**

**Director**

**GS/OAS**

7a Avenida 12-19, Zona 9  
Edificio ETISA, Nivel 7  
Ciudad de Guatemala, C.A.

E-mail: [oeagua@ns.concyt.gob.gt](mailto:oeagua@ns.concyt.gob.gt)

Telephone: **(502) 332-47-73, 334-10-37, and 331-81-24**  
Facsimile: **(502) 332-44-54**

### **International Postal Address:**

OEA/GUATEMALA  
1325 North West  
93 Court, Unit B-102  
Miami, Florida 33172, E.U.A.

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### **Eddy Sanchez Benett**

**Director General**

**INSIVUME**

70 Av. 14 -17 Z-13  
Guatemala, C.A.

Tel: 502-2-3315944

Fax: 502-2-3315005

Email: [Insivume@ops.org.gt](mailto:Insivume@ops.org.gt)

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Nivel  
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### **Nicolas Solares Cortez**

**Tecnico Oceanografo**

**OBIMAR**

Puerto Quetzal

Tel: 334-7101 y 334-8133

Fax: 332-3586 y 334-8152

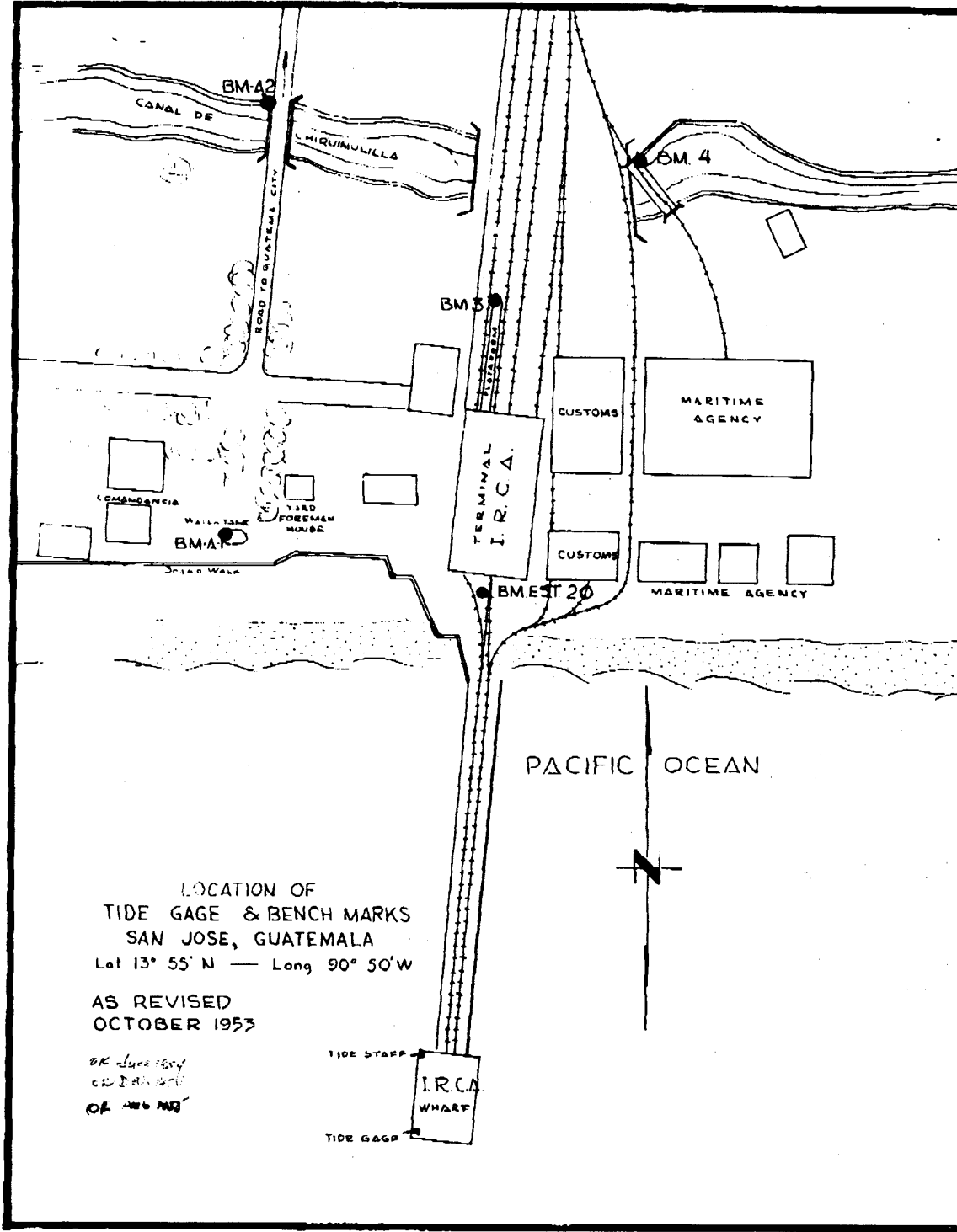
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# Historic Tide Station Sketch s for Puerto San Jose, Guatemala

06/26/00 MON 13:33 FAX 301 713 4485

N/CS41 Req & Eng Branch

007



11/28/60

U. S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

TIDAL BENCH MARKS

Puerto San Jose, Guatemala, Central America  
Lat. 13° 55'.0 N.; Lon. 90° 49'.8 W.

BENCH MARK EST 20 (1949) is a standard disk, stamped "EST 20 1942", set in top of 6-inch square concrete post, 20 feet south of International Railways of Central America terminal building, which is building nearest pier (concrete building). Bench mark is 18½ feet southwest of center line of main track at edge of terminal, 2½ feet southeast of center line of western track at edge of terminal and 6¼ feet northwest of inner angle formed by intersection of main and western tracks. Elevation: 16.92 feet above mean sea level.

BENCH MARK A 1 (1949) is a standard disk, stamped "B. M. A 1 1947", set in concrete at top center of threshold of west door of octagonal base of old water tank tower. Concrete base tapers toward top where tank rests and is about 25 feet high. Bench mark is about 190 feet west of Bench Mark EST 20 and about 80 feet east of front entrance of Commandancia Building on beach in Puerto San Jose. Bench mark is approximately one foot above sandy ground. Elevation: 12.84 feet above mean sea level.

BENCH MARK A 2 (1949) is a standard disk, stamped "A 2 ELEV.", set in top of northwest pier abutment of concrete street bridge across Chiquimulilla Canal. Abutment is concrete trapezoidal column 5 feet by 4 feet by 3 feet wide. Bench mark is 1½ feet from north edge, 2½ feet west from bridge street curb, 1 foot above deck of bridge, 11 feet northwest of center line of bridge, 3 feet southeast of northwest corner of abutment and 2 feet southwest of east leg of telegraph pole. Elevation: 12.77 feet above mean sea level.

BENCH MARK 3 (1949) is a standard disk, stamped "B M 3 1949", set in top of concrete loading platform which extends 60 feet north of railroad terminal building in Puerto San Jose. Bench mark is on northeast corner of west platform running parallel to railroad tracks, 20 feet west from near (west) rail of railroad center track and 275 feet north of bench Mark EST 20. It is one foot each way from end and side of platform and 2½ feet above ground. Elevation: 15.96 feet above mean sea level.

BENCH MARK 4 (1953) is a standard disk, stamped "TIDAL BM 4 1953", set in bridge wall on east side of concrete trestle bridge over Chiquimulilla Creek, which is approach to railroad terminal in Puerto San Jose. Bench mark is at northeast corner of 4-foot high parapet wingwall, about 1 foot below and 3½ feet east of easternmost rail, 8 feet east of west rail of track leading to east side of Aduana, and 23 feet south of center line of road going east along north bank of Chiquimulilla Creek. Elevation: 11.28 feet above mean sea level.

Mean sea level at Puerto San Jose, Guatemala is based on 36 months of records, June 1957 - May 1960. Elevations of other tide planes referred to this datum are as follows:

	<u>Feet</u>
Highest tide observed	4.3
High water springs	3.05
Mean high water	2.50
Mean tide level	0.00
Mean sea level	0.00
Mean low water	-2.50
Low water springs	-3.05
Lowest tide observed	-5.4