



G. M. SELBY, Inc.

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Jose,

GM Selby has been in business since 1990 and involved in telecommunications since 1994 until today..

Regarding Alex Gil, Mr. Gil has been in telecoms since 1996 deploying networks from Canada down to Argentina. He has sold, deployed and maintained wireless technologies for more than 20 years (including E911), and specific to the Caribbean region has had extensive experience supporting and recovering from hurricane's across the region including the building of new towers and rooftop sites, installation of new BTS's, A&L, microwave links, power systems, aerial fiber, aerial copper, etc. While Mr. Gil has experience with DMR and P25 networks, he is partnered with Communications International which specializes in P25 networks for the public safety space with seven (7) offices across the state of Florida and extensive experience engineering P25 and DMR networks for the state of Florida and elsewhere. In this particular case, this is not an issue of engineering a P25 network so they have not been engaged. It is about what is the correct site solution for the P25 network to be deployed to support public safety in Broward County and the City of Hollywood. Lastly, unlike KCI which has a long pre-existing relationship with Motorola (and therefore bias in favor of anything Motorola suggests), GM Selby (and its partners) is an independent 3rd party subject matter expert that is providing an unbiased analysis for the City of Hollywood and Broward County to review in analyzing what is the ideal solution for serving the needs of public safety for the residents of City of Hollywood.

Please make note. While P25 is a newer public safety standard with greater levels of encryption, IP backhaul, interoperability, etc., the underlying RF technology remains TDMA based technology utilizing



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12.5kHz TDMA channels which is an old RF technology going back to the 1970's. Analyzing RF performance, shading, coverage areas,

etc. can be performed by any firm with experience and tools for RF engineering. For the purpose of the needs of the City of Hollywood, the primary focus is on identifying the ideal structure for supporting the P25 network that will serve the people of Hollywood without bias for (or against) the supplier of the P25 network (Motorola).

Each solution (tower vs roof top) has its corresponding advantages (and disadvantages). West Lake Tower does not afford the same level of protection for the P25 infrastructure as the CIRC building. This is fact, not opinion.

- It is in close proximity to the ocean (1.1 miles) and West Lake (.5 miles) which means that it will be subject to high storm surges and flooding during a hurricane or tropical storm. To protect the P25 equipment, the equipment will need to be installed on a platform at least 20' off the ground underneath the tower. This way the tower affords the shelter some form of protection against waves and debris associated with the storm surge.
- The generator and fuel tank will need to be up on the platform or it will risk damage associated with storm surge and flooding. This will also affect the ability for the city and county to quickly access the site and begin refueling the generator tank. <NEED TO DETERMINE HOW AC POWER IS GOING TO BE RUN TO THE SITE. AERIAL OR BURIED IN DUCTING?>
- The tower affords zero protection to the antennas, microwave and coax up on the tower, and no space to store spare material for rapid recovery of the site after the storm passes. During a major hurricane, it is fairly certain that all that material (P25 antennas, microwave antennas and coax cabling) will get torn off the tower and require replacement. If the County and City elect to install stronger installation hardware to prevent the equipment from being torn off the tower, it increases the probability of the tower coming down due to wind loading of the tower being exceeded.
- Lastly, in preparation for disaster recovery, the county and city will need to have spare antennas (BTS and microwave) on hand in order to quickly recover the site. Unless the building installed



under the tower is large enough to house all the spare antennas, the recovery crew will need to bring it with them together with all the installation hardware, climbing equipment, cathead, load ropes, tag ropes, etc. That will in effect slow the recovery, because we are assuming movement to site of 8' microwave dishes, BTS antennas and a minimum of one (1) 300' reel of 1 5/8" coax weighing approximately 250lbs.

The CIRC building affords the P25 network more protection.

- The building is further inland (1.7 miles) than the proposed tower location (1.1 miles from the ocean, .5 miles from West Lake), and affords the P25 sites more protection against the high tide of storm surges and flooding.
- The concrete and rebar walls of the building afford the equipment more protection, and there is ample room in the building where spare equipment can be housed in order to quickly recover the P25 site in the event BTS antennas or the microwave dishes are sheared off the building. The most that would be torn off the building would be the BTS antennas and the microwave antennas. The coax would be protected in the building. In addition, spare coax can be maintained in the building for backup.
- Utilities to CIRC are buried and thus have a higher degree of protection and by default will likely be recovered quickly compared to West Lake Park. Plus, as a residential building, it has a higher level of priority in recovery than a park where no people are resident.
- There is a better solution for the site design than the one utilized in the document comparing CIRC to the West Lake Park tower. The County can install the antennas and P25 BTS up near the roof. Either an AC or -48VDC solution can be utilized, and the power plant and battery strings can be located at a lower floor in the building that has the capability to support the weight of the solution without structural reinforcement. In addition, utilization of LiOn batteries (or hydrogen fuel cells) will provide the same level of battery backup without the drawbacks of lead acid batteries:
 - Heavy weight - Lead acid is heavy and is less durable than nickel- and lithium-based systems.
 - Memory - A full discharge (which is common during a disaster due to loss of power and complete utilization of



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diesel fuel) causes strain and each discharge/charge cycle permanently robs the battery of a small amount of capacity which in time results in the batteries having to be

replaced in order to maintain the target level of battery backup.

- Access – CIRC hotel (post storm) can be accessed from multiple roads (5, 820, side roads, etc.). The West Lake Park site can only be access from one single road (822). If that road is damaged preventing access, the only way in is by foot or by boat and that limits the ability to bring in fuel, equipment, resources, etc.

After a storm, the speed of disaster recovery is all dependent upon access, protection of the equipment and power. Based purely on the facts, the CIRC hotel affords the Broward County P25 network more advantages than disadvantages, and the exorbitant cost estimates utilized in the analysis can be reduced to a point where the cost of the CIRC deployment is comparable to the West Lake Park site (and it can be done faster). Whoever was behind the original analysis intentionally disregarded all the above in order to sway the decision in favor of building a new tower, because people experienced in disaster recovery would all side in favor a large concrete and rebar building inland (with a stable supply of power) over a tower right near the coast line.

Best regards,

Gerald Zadikoff, PE
CEO

Cc: Andria Wingett – City of Hollywood