AMMANN & WHITNEY

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September 10, 2010

Donald B. Campbell
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Re: **Arecibo Radio Telescope Operational Limits**

Dear Don:

Ammann & Whitney previously issued a moment versus tie-down tension graph limiting the operational range of the telescope to insure that the U2-U2L3 main truss members operate within the as-designed stress limits. At NAIC's direction we have documented reinforcing procedures for the U2-U2L3, U2-L2, U1-L2 and U3-L4 members and the U2-U2L3 reinforcement is currently being installed.

The U2-U2L3 members are the components most sensitive to variations in tie-down tensions. Following reinforcement of these members, the need to maintain a minimum tie-down tension will no longer be as critical a criteria for the safe operation of the structure. Based on Ammann & Whitney's analyses, with the reinforced U2-U2L3 members, the telescope may be operated at up to 14,000 foot-kip unbalanced moment with a zero tension in any one tie-down. The maximum tie-down force at any one corner should not be allowed to exceed 118 kips and the sum of the tie-down forces at all three corners should not be allowed to exceed 240 kips.

Following completion of the reinforcement of the U2-L2, U1-L2 and U3-L4 members we would recommend that strain gauge testing be repeated to an unbalanced moment of 19,600 foot-kip with the same tie-down restrictions discussed above. Assuming that the data obtained from these tests demonstrates the same close correlation with our analytical results as was obtained with the previous measurements, we could then recommend that the telescope be used at a maximum of 19,600 foot-kip unbalanced moment.

Should you have any questions or wish clarification for any of the items discussed in this letter, please feel free to call either James Gould or myself.

Very truly yours,

Joel Stahmer, PE
Vice President

Cc: J. Gould (A&W)