

NATIONAL RADIO ASTRONOMY OBSERVATORY
Charlottesville, Virginia
18 October 1985

TO: VLBA Memo Series
FROM: Buck Peery
SUBJECT: Station Building Design Changes; Meeting with A/E

A meeting was held with the A/E in Charlottesville on October 14 and 15 to review the cost estimates and design of the site, antenna foundation and station building for Pie Town.

The technical questions on the site and antenna foundation design were answered and it was agreed the design was accepted subject to a confirmation of some soil data.

A review of the estimates did not discover any major changes except to point out that NRAO felt they were extremely high when compared to some of our estimates. The A/E maintained the estimates were realistic even though they were conservative in their estimating. The result of this was a decision to reduce the size and rethink our requirements and specifications for the station building.

The following decisions were made as means of lowering the cost to bring it in line with the funds available:

1. Reduce the length of the building by 6 feet, as follows:
 - a) Reduce Control Room to 12 by 18 feet (from 12 by 22);
 - b) Reduce Equipment Room to 12 by 14 feet (from 12 by 16);
 - c) Combine the remaining work rooms into one large space with 6 feet less total length, and rename it "Auxillary Room."
2. Reduce RFI shielding requirement so that only the Control Room is shielded. The shielding shall provide a minimum of 60 dB of attenuation for electric fields and plane waves, and 30 dB for magnetic fields, from 10 kHz to 2 GHz. Consideration should be given to using a pre-fabricated shielded room with necessary filtering, or field-constructed shielding, whichever is more cost effective. Field testing of attenuation is not required.
3. Consider prefab metal building for cost saving and some limited RFI shielding or other possible outside wall construction.

4. Retain access (computer) floor in control room and equipment room.
5. Concrete floors to be one pour using 6" x 6" mesh reinforcing wire bonded to the ground system.
6. Delete special foundations for masers.
7. Install only one door into the equipment room (from control room). Door shall be thermal and RFI shielded. A window in this door, approximately 12 inches square, can replace the window between the Equipment Room and the Control Room.
8. Include two 1/8 inch thick aluminum panels between the control room and the equipment room. One (12" x 24") below the floor and one 8" above the floor.
9. Reduce ceiling height to approximately 8'4" and eliminate the overhead cable trays (cables will be under the floor).
10. The kitchen unit shall be roughed in only. NRAO will purchase and install fixtures when needed.
11. Delete window from Control Room to outside.
12. Revise air conditioning specifications as follows:
 - a) Control Room: Supply temperature controlled air at minimum rate of 500 cfm to each of three underfloor ducts, to be routed to equipment by NRAO. At each duct outlet, the air temperature shall be stable to ± 2 deg F. In addition, supply a minimum of 300 cfm of air to the underfloor space, with an appropriately located perforated panel in the floor to allow this air into the room. Room air temperature shall be stable to ± 2 deg F, and humidity shall be maintained at $30\% \pm 10\%$.
 - b) Equipment Room: Supply temperature controlled air at minimum rate of 900 cfm to each of two underfloor ducts, to be routed to equipment by NRAO. At each duct outlet, the air temperature shall be stable to ± 0.75 deg F. In addition, supply a minimum of 200 cfm of air to the underfloor space, with an appropriately located perforated panel in the floor to allow this air into the room. Room air temperature shall be stable to ± 2 deg F; humidity is not specified.

- c) Rest of Building: Maintain room temp to ± 2 deg F of thermostat setting (ordinary building control).
 - d) Eliminate heat recovery system.
 - e) Study air flow for the Equipment Room to determine if return air can be routed through the Auxillary Room to conserve and recover some of the heat.
 - f) All outside walls shall have a minimum of R-11 insulation. The equipment room shall have a minimum of R-19 insulation in all four walls, and a minimum of R-30 insulation in the ceiling, for temperature stability.
13. Study whether it would be cost effective to replace the 300 sq ft generator building with a 150 sq ft storage building and to locate the generator outdoors in a weather proof enclosure.
 14. Fuel for the emergency generator shall be propane gas, and storage shall be above ground. (This will be cost effective in meeting new EPA requirements.)
 15. Reduce the size of the UPS system to 5 kVA peak output and 1 hour battery life at this output.
 16. Eliminate Halon fire protection system.
 17. Consider eliminating some equipment that NRAO might purchase and install later at a cost saving (emergency generator, UPS, etc.).
 18. Delete lightning protection.
 19. A/E to suggest other cost saving changes for our consideration.
 20. NRAO will investigate the need to provide facilities for the handicapped.

After considerable discussion it was agreed to bid the project as designed, except for minor changes which can be made now, with a target date of Dec. 17 for receiving bids. The bid package would ask for the bid in three parts, one for the site work, one for the antenna foundation, and one for the station control building with the option to accept a combination of two or three of the parts. If negotiations with the contractors, using the above list as a guide, does not get the building cost within the funds available, a new design will be necessary.