

Note on audit observations by Mr. Sathyanarayan Bhambore and Mr. Govind Ranjan.

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Introduction and Context

1. Mr. Sathyanarayan and Mr. Govind had made audit observations on various construction projects as given in annexe 1.
2. Mr. P.R. Srinivasamurty, Under Secretary, Auroville Foundation had on 13th July 2018 communicated that a two-man committee "consisting of Mr. Toine and Mr. Dhruv" may look into "the issues which were highlighted by Mr. Govind Ranjan and Mr. Sathyanarayan".
3. Mr. Dhruv initially showed willingness to take part in the work of the committee and communicated about possible meeting and site visit dates. On 09-08-2018 Mr. Dhruv indicated his inability to join the committee.
4. I checked with Mr. P.R. Srinivasamurty, Under Secretary, Auroville Foundation in person on 14-08-2018 whether I was still required to do the work as a single member committee and he requested me to complete the work.

Work approach

1. Mr. Govind Ranjan had prepared an overview of issues in the form of a table. I requested him to add a column with for each issue a possible remedy. The table attached as annexe 1 includes that additional column.
2. On 22-08-2018 I visited Bharat Nivas and had a detailed discussion with Mr. Govind Ranjan and Mr. Sathyanarayan (hereinafter referred as the "Audit Team"). I saw some of the work about which the issues were raised during this visit.

Conclusions / Suggestions

1. *Bharat Nivas internal road work (Auroville Road Service)*

Observations of Audit Team

- M40 paver blocks should have been used instead of M30 so that the internal road can take the load of vehicular traffic (e.g. delivery of goods and materials);
- Sectional elevation drawings not available. Hence difficult to assess quantities;
- Surface drain too close to the kerb wall (which may cause the kerb wall to loose support on the outer side);
- Accounts to be finalised

Suggestions / Action points

- Surface drain may be shifted or altered such that kerb wall support erosion does not take place;
- Future road projects of this nature to include specifications of proposed usage with matching technical specifications;
- Future road projects documentation to include sectional elevations (at intervals to be agreed on);
- Any missing data needed for accounts finalization to be provided.

2. *Bharat Nivas - electrical work*

Observations of Audit Team

- The quantity of cable purchased exceeded the required quantity by about 200m. This was pointed out to AVES;
- The additional cable will be used to connect the “circular buildings” at Bharat Nivas.
- Accounts have been finalised.

Suggestions / Action points

- When cables are purchased in a quantity that exceeds the quantity needed for a particular project (e.g. a full cable drum), the purchase may be done by AVES followed by the issue of debit notes / bills for the quantity needed for each project, rather than one project paying for the full quantity, which would require intra-project accounting adjustments;
- In the above mentioned case the problem could be solved by Bharat Nivas absorbing the cable length for a subsequent work phase, but this may not be the case for other projects;
- Having AVES play the role of a bulk purchaser with project-wise material allocation and accounting, would be a more convenient way of working for all concerned.

3. *Bharat Nivas – work by Auroville Water Service*

Observations of Audit Team

- Design calculations not available;
- As-built drawings not available;
- Accounts have been finalised.

Suggestions / Action points

- For future works, design calculations to be provided;
- As-built drawings to be given.

4. *Bharat Nivas – Optical Fibre Cable (Aurinoco)*

Observations of Audit Team

- Estimate revised after commencement of work by almost 1.5 times;
- As-built drawings needed;
- Accounts to be finalised.

Suggestions / Action Points

- This type of work needs a clear process, which includes more accurate estimates and good documentation that includes as-built drawings.
- Any missing data needed for accounts finalization to be provided;
- Needs close follow-up and early finalization by Bharat Nivas trustees.

5. *Bharat Nivas – telephone cables (Auroville Telephone Service)*

Observations of Audit Team

- Work completed within budget;
- No technical drawings given;
- No clarity about installed and available cable pairs;
- Accounts finalized.

Suggestions / Action Points

- Drawing showing cable routing to be given;
- Available free cable pair capacity to be communicated.

6. *Bharat Nivas – toilet block (Auropriya Construction)*

Observations of Audit Team

- Roof leakage;
- Lack of visual barriers;
- Over-billing of INR 3.90 lakhs.

Suggestions / Action Points

- Roof leakage to be attended to;
- Visual barrier needed for urinals section (the temporary solution may be replaced with an aesthetical permanent solution);
- Cubicle doors may be provided with closing magnets or another solution that prevents door slamming during wind;
- Joint measurement (Bharat Nivas trust and builder) and settlement of accounts;
- Needs close follow-up and early finalization by Bharat Nivas trustees.

7. *Bharat Nivas – rain water harvesting system (Auropriya Construction)*

Observations of Audit Team

- Wasteful expenditure of INR 6 lakhs since the system serves no purpose;
- Backflow into Kalakendra basement.

Suggestions / Action Points

- The harvesting tank has several incoming pipes and one outgoing pipe that discharges the water into an existing open well. The tank is basically an aggregator and not a percolation tank. Considering the purpose of the tank, the size could probably have been smaller, thereby reducing costs.
- Backflow to Kalakendra to be prevented with a bypass, or other suitable arrangement.

8. *Bharat Nivas – Sri Aurobindo Auditorium - Sound proofing and acoustical clouds (Sound Wizard, Aureka, New Dawn Carpentry)*

Observations of Audit Team

- Doubts about the benefits of the system in relation to cost;
- Project management issues;
- Excess disbursement of a total of INR 1.90 lakhs to be recovered from three service providers.

Suggestions / Action Points

- Sound Wizard may be asked to provide documentation, including test reports, to substantiate the stated benefits;
- The work may be re-measured for early account finalization;
- Needs close follow-up and early finalization by Bharat Nivas trustees.

9. SAIER – Use of steel reinforcement for various buildings

Observations of Audit Team

- Type 2 steel (lower quality) used, type 1 steel (higher quality) billed. The type 2 steel that has been procured is of Suryadev Steel make;
- The type 1 steel costs about INR 73 per kg while the type 2 steel costs about INR 64 per kg;
- Loss to Auroville Foundation (SAIER) on account of usage of low quality steel with high quality steel billing;
- Total financial impact not calculated.

Suggestions / Action Points

- For 2 – 3 recent SAIER projects, the original steel vendor bills need to be verified. If indeed type 2 has been used while type 1 has been billed for, a claim needs to be raised on the contractors / builders involved;
- This is not only a financial issue but also a safety issue;
- Needs close follow-up and early finalization by the SAIEER team;
- If indeed there was the practice of using type 2 steel while type 1 steel was billed for, the builders / contractors may need to be black-listed.

Note: The Tamil Heritage Centre comments by the Audit Team are not covered in this note since already a detailed audit exercise has been undertaken for this project.

10. General observations

- Documentation needs to be improved and needs to include as-built drawings and as-built quantity statements;
- The internal “clients” (Bharat Nivas Trust, SAIER) may need to become more assertive with builders in terms of adherence to costs, quantity, quality and time lines.
- When during site inspections it is found that quantities differ from the estimated or billed quantities, it is recommended that the matter is resolved without delay and that, if necessary, a re-measurement takes place.
- For the above mentioned cases for which account closure is pending, the observations of the Audit Team must be taken seriously and acted upon with a sense of urgency.
- I have recommended to the Audit Team that for cases where there is disagreement on quantities, re-measuring may take place in the presence of the internal “client” (Bharat Nivas Trust, SAIER), the Audit Team and the Builder to arrive at final measurements and account settlement.



Toine van Megen
27AUG18

Overview received from Mr. Govind Ranjan

| Experiences during the execution of several construction activities within Bharat Nivas Campus and Auroville | | | | | | | |
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| SI No | Issues | Executing Agency | Technical issues | Work Status | Observations | Remarks | Remedial mesures/Suggested corrections |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | Infrastructure work in Bharat Nivas campus | | | | | | |
| | Road Work | Auroville Road Service | Paver Blocks used for padestrian movement while vehicular movement is envisaged. Improper Pavement Design and approval by PEC Professor Dr S Kothandaraman of Detailed estimate without sectional transverse & longitudinal elevation | Work completed, accounts agreed and setteled bewteen road service and Bharat Nivas as per the financial statement. | Extremely difficult to settle the accounts as no sectional elevation is available. Several items of approved work were found not to be part of work to be executed. | Unit rates of all the items of work are approved at par with the PSR while several equipments used by the road service for this work is bought by the GOI grant | The laid paver blocks can't be removed and laid again as it involves a lot of work as well the cost. The surface drain created right along the kerb walls should be closed and shoulder on either side should be first developed and then the surface drain. As of now, soil along the kerb wall are washed aways as a result, the kerb walls may open up and ultimately the interlockig paver blocks too might open up. |
| | Electrical work | Auroville Electrical Service | No design calculations available | Work completed | Extremely difficult to settle the accounts as the cable trenches were closed without joint measurement of work | In the absence of proper design and coordination in work, excess quantity of UG cable worth nearly 2 lakhs were procured which was confirmed recently after several attempts to verify the emasurements of work. | Part of extra length of availabe cables could be used for three circular buildings |
| | Water service | Auroville Water Service | No design calculations available either for water demand & supply or sizes of UG HDPE pipes laid | Work completed, accounts agreed and setteled bewteen water service and Bharat Nivas as per the financial statement. | Timely measurement and supervision of work done properly but could have been better if we get the as built drawings. | The estimates of different items of work is received in phases with remarks of items forgotten. | None |
| | OFC | Auronico | Estimate Revised during the progress of work almost 1.5 times of the original projected cost | Work almost completed, accounts yet to be finalised and settled | As executed technical drawing and updates yet to be available with BN team | We must get the details regarding connected load and available capacity for future connects | None |
| | Telephone cables | Auroville Telephone service | | Work completed within the projected budget | No technical drawing and information of work as executed available with BN team | We must get the details regarding connected pairs and available free pairs to connect in future. | None |
| 2 | Toilet Block near the Sri Aurobindo Auditorim, Bharat Nivas | Auropriya Construction /Contractor Logu/Architect Suhasini | Internal partition cubicals executed witout consultation with the office and approved preliminary estimate included primary treatment system (DEWATS) which was not executed in the funds released. Vertical cudappah slabs does not create visual barrier to the men unirals. | Work completed, accounts finalised at Bharat Nivas. leakage in the roof observed | Based on the approval obtained on preliminary estimate the attempt was made to match the Bill of completed work to the preliminary budget approved | While settelemnt of bills, the measurement of work changed and the total bill amount reduced by nearly 20% of the submitted bill amount; Rs. 4.2 lakhs | Leakage in the roof needs to be attanded to. The opening between vertical cudappah fins needs to be closed upto certain height (may be by glass bricks to add beauty) to bring the clear visual barrier to the men & women toilets |

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| 3 | Rain water Harvesting in Bharat Nivas Campus | Auropriya Construction /Contractor Logu with Angad and a designer | Rain water harvest project executed for collection and storage but rather than serving any purpose it has become nuisance for letting the roof top water reach the recharge well. | Work completed account settled and paid to the contractor Logu. | Wasteful expenditure of Rs 6 lakhs. Even the filter media created at the entrance of recharge well is removed, as it did not work properly. | The Steel reinforcement details of RCC water storage tank was corrected due to timely intervention otherwise even the UG tank would not have survived. | Provisions shall be made to bypass this rain water UG sump in order to avoid back flow into the basement of Kalakendra and direct the water directly to the recharge well. |
| 4 | Tamil Heritage Centre in Bharat Nivas Campus | Passive Contractor - Dhanapal, Active Contractor Mohan, Project Management - Babu | The technical drawings are not completed to arrive at the complete cost of execution. The technical/structural drawings of roof level slab kept revising while the estimate of casting roof slab was in progress. I strongly recommend to go for Design Proof before proceeding to execute the roof slab having an overhang of more than 6 m. | Work completed until bottom of Roof slab and waiting for further clarity to complete the Roof slab. | Based on preliminary estimate approved by Dr S Kothanadaraman from PEC the work was commenced with the understanding of sharing a profit margin of 10% among Dhanapal, Mohan & Babu. After a rigorous exercise of nearly six months, I could conclude the embayment amount of Rs. 37 lakhs to be recovered which was reconfirmed by another Engineering professional. | It was very much possible to conclude and set the recoverable amount from all the three main involved personnel but FAMC took over the case for Forensic Audit, which I personally feel not correct for two reasons - another wasteful expenditure and exposing the internal matter to outside Auroville auspices. | I would like to have a copy of Forensic Audit Report to look closely the achievements and update my self. |
| 5 | Sri Aurobindo Auditorium , Bharat Nivas | | | | | | |
| | Carpentry work for Sound proofing | Sound Vizard & Aureka | Carpentry work executed by local carpenter RAVI was not supervised properly by the Sound Vizard as a result, several times rework happened, Air conditioning duct for recirculation Air were closed. | Work completed | Estimate of work was projected for Rs 8.75 lacs and the Bills were presented exactly matching the estimate while checking the measurement of work, the bill amount is reduced to 5.25 lacs | Carpenter took away the sound proofing board worth Rs. 1.2 lacs which he is not even agreeing to. | corrective measures are applied by employing another team of workers to allow the recirculation of Air conditioned air to the bottom two AC Plants. Soundproofing in the top two plants were done by closing the recirculation air duct which is opened now but still the sealing of duct work is pending as on date. |

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| | Acoustic Works | Aureka, Ricardo - New Down Carpentry | Technically the outcome is not known. In a meeting with Kumbha, it was discovered that the implementation of Sound Clouds might improve the quality of sound very little but it can be observed well for the Coir performances. Unfortunately, the Coir performances can't take place often inside the Auditorium due to the Piono can't be brought inside. | Work in progress for hanging the clouds. The cost of hanging the clouds in position is being worked out among the Auditorium team and Aureka which again shows that inspite of technical/ financial team available in the office, attempt is being made to by pass the process which we have tried to follow over the last one year. We will again face the same problem, the bills will come to the desk of Mr Sathyanarayan and I will be asked to check and the same problem again for us... | Sound Vizard, Angad intially submitted an estimated for entire Acoustic works for Rs 42.94 lacs where as on 20th July 2018, a sum of Rs. 51.01 lakhs has already been spent on this incomplete work. Further, 57 clouds have to be fixed in position for which there is no clarity about the total expenditure to be incurred. Neither Sound Vizard nor Aureka is taking any responsibility towards the cost escalation and justify the over spent till date. This shows that the Sound Vizard and Angad have not prepared the proper estimate. | Ricardo left the work incomplete for want of his monitory gain. Later on Aureka has accepted to accomplish the work which has just started with hanging of the clouds in position. | Amount to be recovered is worked out against the value of left over materials and the same shall be recovered from the respective units. |
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| 6 | Issue of Steel Reinforcement bars in the works of SAIER | SAIER Project Management Team with Ar Shailaja, contractor Bhaskar | SAIER Staff Quarter, Dehashakti | Work of 1st Block completed and second block in progress | During the steel reinforcement bar checking for casting of roof, it was observed that the lower grade of steel bars were used while the rates approved were for 1st Quality of Bars. | Dr S Kothandaraman and his assistant Mr Gajendran are involved in approval and maintaing the records of the steel bars. If they are only approving the BoQ and allowing the use of lower grade of steel, then, their integrity is questionable and hence their involvement in Auroville Work should be stopped without any further discussion. Finally a Note is released to all the contractors and Architects to use class - 1 grade of steel as reccomended & approved. | No corrective measures can be applied to the structure of executed buidling but we hope that for next buildings, the proper steel reinforcement bars are being used. However, we must ask the refund of money from the Contrcator towards the payment made against the entire steel reinforcement bars for the first pahse of work. The rate applied is 72.93/Kg while the work is executed with the steel bars of @ Rs. 64.07/ Kg |