## KERALA WATER AUTHORITY



TECHNICAL CIRCULAR No.KWA/JB/TMU/4659/2021 Dated 17.03.2021



## No.KWA/JB/TMU/4659/2021

Head Office, Kerala Water Authority, Thiruvananthapuram.

## TECHNICAL CIRCULAR 01/2021

Vide proceedings no. KWA/WASCON/AEE II/697/2018 dated 23.03.2019, the Managing Director, KWA, ordered to adopt dual media sand filter using anthracite wherever a re-sanding of existing rapid sand filters is necessary, as a policy measure, and the same can also be provided in new schemes. It was ordered to adopt the following specification for anthracite: Effective Size (d10) – 1.0 to 1.6mm, Specific Gravity – 1.45 to 1.55, Uniformity Coefficient – 1.7 or Lower, Hardness (Mohs Scale) > 2.7 and Acid Solubility < 5%. It was also specified that anthracite shall conform to AWWA: B100 Standards and it shall be tested in Regional Research Laboratory / CSIR Labs of Government of India for its suitability.

The benefits of using anthracite is reported as higher filtration rate, enhanced productivity without additional civil construction cost, lesser head loss when compared to single media filter and lesser quantity of water for backwash, when compared to single media filters. It is also reported that as per cost benefit analysis, anthracite is found to be better than sand media filter. It is noted that there was an improvement in water quality and rate of filtration after refurbishment of Filter Beds using anthracite. It is also noted that there was an increase in filter run, resulting in the reduction of frequency of backwashing.

Under these circumstances, it was decided to publish the supply rates for anthracite as well as the square meter rate for refurbishment of filter beds using anthracite. Accordingly, the rates were arrived at and placed before the Technical Committee.

The Technical Committee, which met on 10.12.2020, after detailed discussions, recommended a rate of Rs.55,000/- per cubic meter plus applicable GST for supply of anthracite, for approval by the Authority. The anthracite shall have a minimum carbon content as specified in British Standard / European Standard 12909: 2012 or later edition, in addition to conforming to the specification detailed in proceedings no. KWA/WASCON/AEE II/697/2018 dated 23.03.2019 of the Managing Director. The Technical Committee recommended a rate of Rupees One Lakh per square meter (Including all taxes) for the refurbishment of filter beds using anthracite dual media, for approval by the Authority. The Technical Committee also recommended that the square meter rate for refurbishment of filter media shall be used only for the preparation of rough cost estimates. Detailed estimates shall be prepared before issuing TS and the bills shall be prepared based on detailed item-wise measurements.

The Authority, in its 419<sup>th</sup> meeting, which met on 23.02.2021, discussed the Agenda in detail and vide resolution no. 11139, resolved to approve a rate of Rs.55,000/- per cubic meter plus applicable GST for supply of anthracite. The Authority also resolved to approve a rate of Rupees One Lakh per square meter (including all taxes) for the refurbishment of filter beds using anthracite dual media, including cost of anthracite and all other materials and labour. The square meter rate



for refurbishment of filter media shall be used only for the preparation of rough cost estimate. Detailed estimates shall be prepared before issuing TS and the bills shall be prepared based on detailed item wise measurements.

Under these circumstances, the following rates may be used for refurbishment of filter media using anthracite.

- Supply rate of Anthracite with specification detailed in KWA/WASCON/AEE II/697/2018 dated 23.03.2019: Rs.55,000/- plus applicable GST per cubic meter. The supply rates include transportation cost to the site. As recommended by the Technical Committee, anthracite shall have a minimum carbon content as specified in British Standard / European Standard 12909: 2012 or later edition (the present value is 90%).
- 2. Rate for refurbishment of filter beds using anthracite dual media, including cost of anthracite and all other materials and labour: Rs.1,00,000/- (including all taxes) per square meter. The rate includes the provision for (i) design of the dual layer filter media (ii) removing the old filter media (iii) repair / alteration of the underdrain system (iv) modification / alteration of existing backwashing system (v) providing new air scouring system and new pressure regulating system (vi) washing and cleaning of filter chamber and rectifying damages (vi) strengthening of filter floors and leak proofing (vii) strengthening of existing central gullet (viii) cleaning, drying and sieving of reusable filter media (ix) segregating pebbles (x) supply of suitable size gravel (xi) supply of filter sand (xii) supply of anthracite with additional 10% (for maintenance) (xiii) laying of filter media and (xiii) trial run for thirty days (xiv) providing training to KWA personnel for thirty days. The square meter rate for refurbishment of filter media shall be used only for the preparation of rough cost estimate. Detailed estimates shall be prepared before issuing TS and the bills shall be prepared based on detailed item wise measurements.

Following shall be adhered to while refurbishing the filter media using anthracite.

- 1. Availability of sufficient quantity of anthracite shall be ensured.
- 2. The dual media filter requires meticulous attention during backwashing and therefore, the operator needs to be given training on operation procedures.
- 3. Special design of underdrain system needs to be developed for collecting clear water and air scouring as the specific gravity of anthracite is lower than sand. For the replacement of mono sand filter media with dual media filter with anthracite, under drainage system and subbase are to be improved / repaired so as to get the benefit in all respects.
- 4. Before adopting the practice of using dual media filter in WTP's of new water supply projects, detailed analysis on its cost implication is to be carried out and thus ascertaining the effect on the overall cost of water treatment plant.

Dated: 17.03.2021

Venkatesapathy S. IAS Managing Director

Copy to: The Chief Engineer (SR / CR / NR / P&O / PPD&Wascon / HRD&GL)

Copy to: The Superintending Engineer, PH Circle/PPD, JNNURM Circle, Thiruvananthapuram / Kollam / Pathanamthitta / Kottayam / Alappuzha / Kochi / Muvattupuzha / Thrissur / Palakkad / Kozhikkode / Malappuram / Kannur.



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DBA

Copy to: The Director, State Referral Institute, Nettoor. Copy to: PA to MD, AE to TM, CA to AM, DCE (GL) / DCE(Vigilance) / DCE-1(PIU) / DCE-2(PIU) / DCE-3(PIU) / DCE-4(PIU) / Secretary / EE (Operations). Copy to: AEE-8 (PIU) for incorporating the analysis of rates in the PRICE software. Copy to: DBA for publishing on the website.

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