

CORRIGENDUM – II

Date: 03-02-2025

NIT No.: CSEZ-CSZA01(2)/11/2022-SEZCochin dt: 17-01-2025

Tender ID:2025_CSEZA_785632_1

**Name of the work: Waterproofing Treatment on roof slab of SDF 16, 17, 17B and 43A in CSEZ
Kakkanad**

The Critical aspects in respect to the Tender is amended as follows.

Sl. No.	Section/Clause in Tender	As per uploaded tender document	Amendment
1	Section VIII Technical Specification SL No:3	Elastomeric polyurethane-based waterproofing Color: White, Density: 1.271 ± 0.05 g/ml, Recommended Thickness: 1 mm dry film thickness (DFT) applied in 3 coats, Cure Time: Initial cure at 35°C: 3 hours, Full cure at 35°C: 7 days, Tensile Strength: >2.50 MPa, Elongation: >1500%, Shore 'A' Hardness: 20 - 30 , Crack Bridging: 15 mm	Elastomeric polyurethane-based waterproofing Color: White, Density: 1.271 ± 0.05 g/ml, Recommended Minimum Thickness: 1 mm dry film thickness (DFT) applied in 3 coats, Cure Time: Initial cure at 35°C: 3 hours, Full cure at 35°C: 7 days, Tensile Strength: >2.50 MPa, Elongation: >150%, Shore 'A' Hardness: 20 - 30 , Crack Bridging: 1-5 mm.

**Sd/-
Secretary-in-charge**

Proceedings of the Pre-Bid meeting for selection of Waterproofing Treatment on roof slab of SDF 16, 17, 17B and 43A in CSEZ
NIT No.: CSEZ-CSZA01(2)/11/2022-SEZCochin dt: 17-01-2025
Pre-Bid meeting date and time – 28/01/2025 at 11.30 AM
Comments on Pre-Bid meeting queries

Sl. No.	NIT Tender Clause/Sub Clause No.	NIT Requirement	Bidder's query	Comments
1	BoQ - Sl No 1	Cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement. 20 mm cement plaster	Rather than considering cement plaster has slope correction, request you to kindly consider the slope correction with M20 grade concrete with fiber reinforcement because considering this is a large span. Water stagnation over the waterproofing material will damage the waterproofing system such as polyurethane or hybrid polyurea.*	Tender conditions shall prevail. However, cement plaster is for coving, plastering wherever required. For slope correction, self leveling non-shrink grout as mentioned in BOQ SL NO11
2	BoQ - Sl No 5	Finishing wall with waterproofing cement paint of required shade (New work-2 or more coat applied (3.84kg/10sqm) FOR WATER TANKS	The waterproofing system that needs to be applied for external surface of water tanks should be having UV resistance and anti-carbonation parameters rather than applying cement paint.*	Tender conditions shall prevail. However, tenderer can consider paint with UV resistant property if required which shall not affect the guarantee period.
3	BoQ - Sl No 10	Dismantling the APP membrane:-Dismantling the existing APP membrane completely using appropriate method using manually, the surface to completely remove bituminous oil based primer, shifting and stacking the dismantled membrane, including all waste from the rooftop to the ground up to lead of 200m from building to designated location for storage including all the cost associated with the dismantling, loading, unloading, stacking, labour charges etc complete as per direction of Engineer in charge and as per site condition. All work under the supervision of Engineer in Charge	During the dismantling of APP membrane, request you to consider proper surface preparation so as to remove the bituminous material which is penetrated inside the screed or plaster. This removal will ensure proper adhesion with upcoming waterproofing membrane.*	Tender conditions shall prevail. Tenderers can use any suitable method to obtain clean surface for the application of primer.
4	BoQ - Sl No 11	Surface Preparation for Waterproofing :- Removal of dust and preparation of surface including pressure wash, after pressure using water jet cleaning identifies cracks and filling the cracks with self leveling non-shrink grout on the required area, crack rectifications using crack mouth as "V" groove of not less than 10 mm x 10 mm and sealing with polymer modified cement mortar or joint fillers or hybrid polyurethane sealants as per the manufactures. Surface Preparation to ensure the effective adhesion of the waterproofing system. The surface must be free from any contaminants, moisture, or loose particles before application. This step involves: 1. Power Washing and Manual Cleaning: i) Thoroughly clean the surface using a power washer to remove dirt, dust, and debris. ii) Follow up with manual cleaning to ensure no particles remain. 2. Crack and Joint Sealing: Inspect the surface for any existing cracks or joints. These should be properly sealed using suitable fillers or sealants to prevent water infiltration. 3. Cleaning Terrace Area: Terrace area must be cleaned thoroughly. If these terraces have any existing membranes or coatings, they must be completely removed. 4. Surface preparation, including cleaning and sealing, should be conducted under the supervision of an experienced engineer to ensure that the substrate is ready for waterproofing application. All work under the supervision of Engineer in Charge	Surface preparation with crack or joint filling shall be considered different for different surface for example screed and clay tiles. For screed: The crack treatment shall be executed with Hybrid Polyurethane sealant with proper curing. For clay tiles: 1. Initially the damaged and debonded clay tiles shall be removed completely and replaced with new tiles with tile adhesive or repair mortar. 2. Tile joints shall be treated with tile joint fillers like RTM epoxy joint fillers *	Since the existing roof slab is covered with APP sheets, the exact damaged tiles cannot be assessed. However, if any such situations arise, the gap can be filled using cement plaster as mentioned in BoQ SL NO 1 as per the direction of Engineer in Charge.

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5	BoQ - SI No 12	Hybrid polymer modified cementitious Primer with chemically soaked membrane system for Waterproofing:- Providing and laying a Three-layer system Water Proofing over an open roof slab with elastomeric polyurethane base addition to chemically soaked membrane system . The application of the first layer primer bond comprises a hybrid polymer modified cementitious -based in a ratio of 1:4:8, depending on surface conditions ny brushing rolling. The second layer involves coating after fixing 45 GSM fiber mesh or 100 GSM chemical-soaked membrane system combinations as per required over the entire plain surface and 100 GSM geotextile mat in all construction joints, cores, patched areas, and corners, soaked membrane should be pressed firmly onto the base layer of waterproofing coating, ensuring adheres to the primer and joint filler beneath. Instead of coving, treat all corners with a chemical-soaked membrane system using hybrid polymer modified cementitious. Apply the third coat of primer after scrubbing and patching uneven surfaces. First Coat - hybrid polymer modified cementitious Primer Application	Application of waterproofing material (PU) over cementitious primer will not yield good adhesion. The adhesion strength of cementitious coating to surface, elastomeric PU based coating to cementitious coating is not mentioned which is an important technical consideration. The technical parameters mentioned for elastomeric PU coating with respect to what standard codes is not mentioned. It is better to consider higher tensile strength material (min 8 to 10 Mpa) with 45 gsm glass fibre mesh embedded in between the waterproofing coats	Strong adhesion to any type of surface is mentioned in Technical Sspecification No 4. Tenderers can use any suitable adhesive primer as per the site condtion without violating the water proofing .ASTM D 6083 or equilant/higher code can be referred.
	BoQ - SI No 13	Top Three-layer system Water Proofing Three Coats of an elastomeric polyurethane-based :- Providing and laying a Three layer system Water Proofing Three Coats of an elastomeric polyurethane-based coating designed for long-lasting waterproofing. This coating is applied in three coats to provide superior protection. A single-component, liquid-applied, elastomeric polyurethane-based coating. It is formulated for external applications and offers excellent waterproofing and durability.100% waterproofing, High abrasion resistance, Excellenttensile strength, UV resistance, High elastic recovery and crack bridging ability, Ease of application with a single-component formula		

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6	BoQ - SI No 14	Providing and laying a Five-layer system Water Proofing over head water tank with Arcylic cementitious base with chemically soaked membrane system , including surface preparation such as cleaning, bore packing, corner treatment, by grinding etc. After pressure using water jet cleaning identifies grooving the joints and filling with non-shrink grout, crack rectifications using crack mouth as "V" groove of not less than 10 mm x 10 mm and sealing with polymer modified cement mortar or joint fillers or hybrid polyurethane sealants as per the manufactures. . The application of the first layer primer bond comprises a acrylic polymer modified cementitious -based 2k products as per manufactures in a ratio of depending on surface conditions ny brushing, rolling. The second layer involves coating after fixing 45 GSM fiber mesh or 100 GSM chemical soaked membrane system combinations as per required over the entire plain surface and 100 GSM geotextile mat in allconstruction joints, cores, patched areas, and corners, soaked membrane should be pressed firmly onto the base layer of waterproofing coating,ensuring adheres wll to the primer and joint filler beneath. Instead of coving, treat all corners with a chemical-soaked membrane system using hybrid polymer modified cementitious. Apply the third coat of primer after scrubbing and patching uneven surfaces. Finally, apply 2 coats of a 2K based acrylic cementitious product Protective plastering required. Final Plaster should not cover under this item.All work under the super vision of Engineer in Charge	The waterproofing system that needs to be considered for water tanks should have CFTRI certification (Food grade certification). We kindly suggest you go with non-sag 100% solids polyurethane system which yields better results compared to cementitious coating.*	In addition to specifications already mentioned in the NIT, tenderers are also adviced to consider CFTRI certified waterproofing materials for use inside water tanks.
7	BoQ - SI No 15	Providing and laying PU injection grout using hydrophobic polyurethane grout reacts with water to closed cell rubber like foam while expanding its volume up to 27 times, is injected on to the plugs at a high pressure with the help of a PU injection pump.The reacted material doe snot shrink or swell.All work under the super vision of Engineer in Charge	The PU foam grout which is considered to prevent the seepage of water is of closed cell material, we request you to consider open cell PU foam grout has closed cell PU foam grout will put lot of pressure over the structure during the grouting works and not advisable for older structures. Pots the application of PU foam grout, the same shall be packed with PU resin grout as well which helps the Pu foam grout to work effectively and efficiently. Only PU foam grout will not yield positive results for long run.*	Tender condtions shall prevail.However, tenderers are adviced to use appropriate PU grouting system based on the properities of other material used without affecting the structrual intergity and warranty period.
8	BoQ - SI No 16	MODIFIED ELASTOMERIC POLYURETHANE - MODIFIED ACRYLIC MEMBRANE SYSTEM WITH PU MODIFIED ACRYLIC COAT ON EXPANSION JOINTS for Expansion Joint Waterproofing:- Providing and laying a Three-layer system Water Proofing on expansion joints with elastomeric polyurethane base addition to chemically soaked membrane system . The application of the first layer primer bond comprises a hybrid polymer modified acrylic -based , depending on surface conditions by brushing, rolling. Vibration resistant expansion joint treatment with chemical-soaked membrane and PU chemical filling technique	Expansion joint is covered with convention system like pedestals and coping or beam at top which is having leakages. Since it is not performing, we kindly request you demolish the old expansion joint structure and treat the expansion joint from the mother slab by providing pedestals on both sides of the expansion joint, application PU sealants inside the expansion joint, sealing the top surface with FPO tape and epoxy adhesive combination.*	Tender condtions shall prevail. Demolishing is not considered in NIT.However, tenderer may use appropriate suitable method without the need for demolishing.
			1.Bonding Issues Between Cementitious and Polyurethane Layers Cementitious coatings (SBR-based) are rigid and have limited flexibility whereas Polyurethane coatings are highly elastic and have a tensile strength of 2 MPa, which is significantly higher than typical cementitious coatings.Due to the difference in elasticity, the polyurethane layer may not bond well to the cementitious base, leading to delamination over time.	Hybrid polymer modified cementitious Primer with chemically soaked membrane system for Waterproofing is considering in BOQ SL NO 12.However, tenderers are adviced to select appropriate polymer suitable for same.

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9	SECTION VIII SCOPE OF WORK - Sl No 10	The membrane should be soaked well in the suitable waterproofing chemical before spreading over the base coating. Soaked membrane should be pressed firmly onto the base layer of the waterproof coating, ensuring that it adheres well to the primer and joint filler beneath. Any air bubbles, wrinkles, lifting, signs of improper bonding should be removed during this step, ensuring a smooth and uniform coverage. The fibre membrane should be overlapped by at least 100 mm on both sides, and having more than one layer with the fibre in opposite or either direction will be preferred.	<p>2. Tensile Strength of SBR Cementitious Coating The tensile strength of an SBR- modified cementitious coating with mesh reinforcement is typically around 1 MPa or lower. This means the polyurethane waterproofing layer (2 MPa tensile strength) is much stronger than the base, increasing the risk of failure due to incompatible movement under thermal or structural stress.</p> <p>3. Movement and Cracking Risks The cementitious layer is prone to minor cracking due to substrate movement. The polyurethane layer, being flexible, may bridge small cracks, but if the cementitious layer cracks too much, the PU coating could tear or lose adhesion.</p>	<p>As per the scope of work SL no 7, any other suitable materials can also be considered without affecting the required properties.</p> <p>Hybrid polymer modified cementitious Primer with chemically soaked membrane system for Waterproofing is considering in BOQ SL NO 12. However, tenderers are advised to select appropriate polymer suitable for same.</p>
10	SECTION VIII SCOPE OF WORK - Sl no 28	<p>The scope of work for waterproofing of expansion joint area is followed. (If required) Step 1: - The existing expansion joint treatment is removed, and expansion joint surface is cleaned thoroughly. Step 2: - 100 GSM geotextile/ fibre membrane soaked in hybrid polymer modified acrylic is applied on the surface up to a depth of 4 cm in a 'U' shape. (The remaining space is filled with existing pack foam) Step 3: - hybrid polymer modified adhesive is used to round the inner corner of the joints. Step 4: - Backer rod is placed on top the edge rounded U shape geotextile layer. Step 5: - The remaining space is filled with PU sealant. Step 6: - On top of the sealant filled surface, another 100 GSM geotextile /fibre membrane soaked in hybrid polymer modified is applied as a sealing.</p>	<p>1. The system provided where soaking the 100 GSM geotextile in acrylic solution is an inadequate system and the properties provided below is much below compared to dedicated tapes available in the market for expansion joint treatment.</p> <ol style="list-style-type: none"> Elongation Crack Bridging capability Waterproofing capability Chemical and UV resistance Adhesion to the substrate. <p>We are proposing Dedicated expansion joint treatment tapes such as Mapeband TPE which is Elastomeric Thermoplastic Polyolefine tape with following properties such as</p> <ol style="list-style-type: none"> Breaking load (EN 12311-2) (N/mm²): > 4.5 Elongation at break (EN 12311-2) (%): > 500 Resistance to atmospheric agents and ultraviolet rays (EN 1297): pass (> 5000 h / degree 0) Reaction to fire (EN 13501-1) (Euroclass): E Waterproofing level (EN 1928-B) (bar): 6 Permeability to water vapour (EN 1931): μ = approx. 30000 	<p>The procedure mentioned is tentative method only. However tenderers are advised to assess suitable properties based on site conditions without affecting the waterproofing properties.</p>
11	TECHNICAL SPECIFICATIONS SPECIFICATIONS - Sl No 4	Polyurethane (PU) waterproofing coatings that cure the prevailing atmospheric temperature and humidity or are moist curable may be preferred, considering the time or period of application. PU layers should be a highly elastic membrane with strong adhesion to any type of surface. The product should be elastomeric hydrophobic polyurethane resin and special inorganic fillers to produce excellent mechanical, chemical, thermal, UV, and natural element	<ol style="list-style-type: none"> Exposed polyurethane are categorized under aliphatic products and usually the products available don't exhibit tensile and elongation as mentioned and such parameters including high tensile shall be matched with aromatic grade pure polyurethane products. There is no product in the market with 1500 % elongation and for optimum performance, elongation of 400% to 500% adequate. Product with crack bridging of 15 mm is not available in the market and for optimum and long term performance on old slabs, crack bridging of 2.5 mm is adequate and more than that is considered as structural failure. 	<p>Technical Specification SL No 3 is amended as Elastomeric polyurethane-based waterproofing Color: White, Density: 1.271 ± 0.05 g/ml, Recommended Minimum Thickness: 1 mm dry film thickness (DFT) applied in 3 coats, Cure Time: Initial cure at 35°C: 3 hours, Full cure at 35°C: 7 days, Tensile Strength: >2.50 MPa, Elongation: >150%, Shore 'A' Hardness: 20 - 30 , Crack Bridging: 1-5 mm.</p>
	TECHNICAL SPECIFICATIONS SPECIFICATIONS - Sl No 3	Elastomeric polyurethane-based waterproofing Color: White, Density: 1.271 ± 0.05 g/ml, Recommended Thickness: 1 mm dry film thickness (DFT) applied in 3 coats, Cure Time: Initial cure at 35°C: 3 hours, Full cure at 35°C: 7 days, Tensile Strength: >2.50 MPa, Elongation: >1500%, Shore 'A' Hardness: 20 - 30 , Crack Bridging: 15 mm.	<p>we recommend a minimum thickness of 1.2mm to 1.5mm for the coating system to achieve optimal performance , durability , wear and tear.</p>	

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12	BoQ No 1:	Cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement. 20 mm cement plaster	<p>The main concern with the existing roof, especially the SDF 17 roof, is that the slope is not proper. In the south zone area of SDF 17, covering approximately 520 sqm, I personally inspected the site and found that the floor area is completely weak due to water stagnation. Additionally, on the bottom side of the south zone, water was dripping from the slab. Before my inspection during the rainy season, these issues were already evident. Ensuring a proper slope is crucial for extending the lifespan of the waterproofing. Additionally, a basic level of surface strengthening is required. I humbly request that these items be added to the tender. Your technical team asked a review against leading standards, which are also mentioned here. Any coating-based waterproofing system requires a proper slope as per ASTM D5295 (Standard Guide for Preparation of Concrete Surfaces for Adhered Membrane Waterproofing Systems). If water stagnates, it will lead to potential damage to the system, compromising its performance, as highlighted in BS 6229:2018 (Flat roofs with continuously supported flexible waterproof coverings - Code of Practice). As per DSR Code 22.23 (Providing and laying waterproofing treatment, including necessary surface preparation and ensuring a proper slope), ensuring proper sloping is essential for long-term durability and effectiveness *</p>	Tender conditions shall prevail. Cement plaster is not considered for the slope corrections. However, the tenderer is advised to consider any other suitable materials for slope correction if required.
13	BoQ No 10	Dismantling the APP membrane:-Dismantling the existing APP membrane completely using appropriate method using manually, the surface to completely remove bituminous oil based primer, shifting and stacking the dismantled membrane, including all waste from the rooftop to the ground up to a lead of 200m from building to designated location for storage including all the cost associated with the dismantling, loading, unloading, stacking, labour charges etc complete as per direction of Engineer in charge and as per site condition. All work under the supervision of Engineer in Charge	<p>In the main surface, certain floor areas and parapet walls require repair. I kindly suggest that loose plaster be properly removed, and the surface be repacked with polymer-based repair mortar. The existing structure is fixed with an APP membrane, which can be removed easily. However, the applied bituminous-based oil primer has penetrated the floor surface, making it difficult for a cement-based primer to adhere properly. To ensure the effectiveness of the next treatment, the existing surface primer should be carefully removed using mechanical methods. I sincerely request your consideration of these recommendations. In compliance with ASTM C928 (Standard Specification for Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repair), BS EN 1504-3 (Products and systems for the protection and repair of concrete structures - Structural and non-structural repair), and DSR Code 14.72 (Repairs to plaster of thickness 12mm to 20mm in patches, including cutting the patch in proper shape, raking out joints, preparing and plastering with cement mortar 1:4 or polymer-based repair mortar). Proper surface preparation is crucial to ensure adhesion and long-term performance. Your technical team asked a review against leading standards, which are also mentioned here. ASTM C928 (Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repair), BS EN 1504-3 (Products and systems for the protection and repair of concrete structures - Structural and non-structural repair), and DSR Code 14.72 (Repairs to plaster of thickness 12mm to 20mm in patches, including cutting the patch in proper shape, raking out joints, preparing and plastering with cement mortar 1:4 or polymer-based repair mortar). Proper surface preparation is crucial to ensure adhesion and long-term performance. *</p>	Tender conditions shall prevail. Tenderers can use any suitable method to obtain a clean surface for the application of primer.

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14	BoQ No 11	<p>Surface Preparation for Waterproofing :- Removal of dust and preparation of surface including pressure wash, after pressure using water jet cleaning identifies cracks and filling the cracks with self leveling non-shrink grout on the required area, crack rectifications using crack mouth as "V" groove of not less than 10 mm x 10 mm and sealing with polymer modified cement mortar or joint fillers or hybrid polyurethane sealants as per the manufactures. Surface Preparation to ensure the effective adhesion of the waterproofing system. The surface must be free from any contaminants, moisture, or loose particles before application. This step involves:1. Power Washing and Manual Cleaning:i) Thoroughly clean the surface using a power washer to remove dirt, dust, and debris.ii) Follow up with manual cleaning to ensure no particles remain.2.Crack and Joint Sealing: Inspect the surface for any existing cracks or joints. These should be properly sealed using suitable fillers or sealants to prevent water infiltration.3. Cleaning Terrace Area-Terrace area must be cleaned thoroughly. If these terraces have any existing membranes or coatings, they must be completely removed. Surface preparation, including cleaning and sealing, should be conducted under the supervision of an experienced engineer to ensure that the substrate is ready for waterproofing application. All work under the super vision of Engineer in Charge</p>	<p>For the expansion joint treatment, the existing specification may not be suitable for the current building conditions. To ensure long-term effectiveness, the treatment should be applied directly to the mother slab; otherwise, there is a high risk of system failure. Therefore, we humbly request that the existing screed, inverted beam, and plaster be carefully removed to expose the mother slab before beginning the treatment. If the treatment is applied over the plaster, water may seep beneath the surface and travel to the expansion joint, potentially compromising its performance. To achieve a durable and reliable solution, we sincerely recommend implementing a system that can accommodate the dynamic nature of expansion joints. The material used should have excellent expansion and contraction properties to adapt to structural movements. Without these properties, the material may become brittle over time, leading to potential failures. Additionally, after the expansion joint treatment, it must be protected with a proper system. While company names has been included tender (Migra, Durashield building sytems, Hilti), the specific item has not been mentioned here. We kindly request clarification on the specified product to ensure the best possible protection for the treated joint. We kindly request your thoughtful consideration of these recommendations to ensure the best possible outcome.Your technical team asked a review against leading standards, which are also mentioned here.Compliance with ASTM C920 (Standard Specification for Elastomeric Joint Sealants) and BS EN 15651-1 (Sealants for joints in buildings and pedestrian walkways) is essential for ensuring durability and performance. As per CPWD DSR 2022, the following items are applicable for expansion joint treatment: Item 5.44.1: Providing and fixing of expansion joint system for floor joints, including extruded aluminum base members with a self-aligning and self-centering arrangement, conforming to ASTM B221-02.*</p>	<p>Tender condtions shall prevail. Demolishing is not considered in NIT.However, tenderer may use appropriate suitable method without the need for demolishing.</p>
15	BoQ No 5	<p>Finishing wall with waterproofing cement paint of required shade (New work-2 or more coat applied(3.84kg/10sqm) FOR WATER TANKS</p>	<p>We sincerely request clarification on the waterproofing cement paint specified for 1184.76 sqm. Kindly advise on the appropriate type of paint, considering its durability and exposure to weather conditions. Without this information, preparing an accurate tender quotation may be challenging. Your kind guidance on this matter would be greatly appreciated.</p>	<p>Tenderers are advised to choose appropriate paint with UV resistant properties which enhances the water proofing properties.</p>
16	BoQ No12	<p>Hybrid polymer modified cementitious Primer with chemically soaked membrane system for Waterproofing:- Providing and laying a Three-layer system Water Proofing over an open roof slab with elastomeric polyurethane base addition to chemically soaked membrane system . The application of the first layer primer bond comprises a hybrid polymer modified cementitious -based in a ratio of 1:4:8, depending on surface conditions ny brushing, rolling. The second layer involves coating after fixing 45 GSM fiber mesh or 100 GSM chemical-soaked membrane system combinations as per required over the entire plain surface and 100 GSM geotextile mat in all construction joints, cores, patched areas, and corners, soaked membrane should be pressed firmly onto the base layer of waterproofing coating, ensuring adheres to the primer and joint filler beneath. Instead of coving, treat all corners with a chemical-soaked membrane system using hybrid polymer modified cementitious. Apply the third coat of primer after scrubbing and patching uneven surfaces. First Coat - hybrid polymer modified cementitious Primer Application</p>	<p>The system mentioned consists of three layers: the first coat is a hybrid polymer-modified cementitious primer application, followed by the fixing of a 45gsm geotextile mat, and the corners are planned to be reinforced with a 100gsm geotextile mat. However, the ratio mentioned for the application of the first layer primer bond, "hybrid polymer-modified cementitious-based in a ratio of 1:4:8," raises concerns. Does this ratio refer to Polymer (1 part): Water (4 parts): Cement (8 parts)? If this is the intended mix ratio, it is not recommended. Such a composition will result in poor bonding and can cause the system to peel off within 45 days due to insufficient polymercontent and improper bonding strength. Additionally, the recommended 100gsm geotextile for the corners is not suitable. As per industry standards and best practices, the 100gsm geotextile is typically used not for geotextile reinforcement its mainly using protection purpose only. For corner areas, we generally recommend 25gsm to 45gsm geotextile fabric. Using a higher gsm material may interfere with proper embedding and adhesion of the system, leading to potential failure. The underlying coat is weaker, and above it, you're suggesting the application of an elastomeric polyurethane coating, which may not withstand over time. If the bottom coating fails within 120 days, the polyurethane top coat will inevitably fail as well. The failure of the bottom layer compromises the bond, which will result in delamination and complete failure of the system, including the polyurethane coating above. It is crucial to ensure the correct foundation layer is applied with proper adhesion and durability before using polyurethane or any elastomeric coatings. Without a reliable base, the top coat will not perform as expected. I humbly request that you kindly review this specification, particularly in the context of long-span areas, both in terms of the area covered and the project references from reputed organizations during the execution phase. Without careful consideration of these factors, there is a risk that the system may fail. Your attention to this matter would be greatly appreciated. *</p>	<p>Tender conditions shall prevail.However, tenderers are advised to consider appropriate polymer suitable for the cementitious primer. The ratio 1:4:8 is for (Polymer:Water :Cement) eich is tentative ratio.The bidders may also assess appropriate ratio suitable for the type of primer used.</p>

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Sl. No.	NIT Tender Clause/Sub Clause No.	NIT Requirement	Bidder's query	Comments
17	BoQ No13	<p>Top Three-layer system Water Proofing Three Coats of an elastomeric polyurethane-based :- Providing and laying a Three layer system Water Proofing Three Coats of an elastomeric polyurethane-based coating designed for long-lasting waterproofing. This coating is applied in three coats to provide superior protection. A single-component, liquid-applied, elastomeric polyurethane-based coating. It is formulated for external applications and offers excellent waterproofing and durability.100% waterproofing, High abrasion resistance, Excellent tensile strength, UV resistance, High elastic recovery and crack bridging ability, Ease of application with a single-component formula.</p>	<p>The mention of another three-layer system is unclear. Are you planning to apply three coats or an additional three layers? Please clarify to avoid confusion. Additionally, a 1mm thick polyurethane coating will not provide a 10-year lifespan under exposed conditions. A minimum thickness of 1.5mm to 2mm is required to ensure long-term durability. Furthermore, the specification does not mention: Elongation properties – Wrongly mention the percentage? UV stability – This is a critical factor in determining the lifespan of an exposed waterproofing system.It is essential to define these parameters clearly, as inadequate UV resistance will lead to premature degradation, reducing the effectiveness of the waterproofing system.*</p>	<p>Technical Specification SL No 3 is amended as Elastomeric polyurethane-based waterproofing Color: White, Density: 1.271 ± 0.05 g/ml, Recommended Minimum Thickness: 1 mm dry film thickness (DFT) applied in 3 coats, Cure Time: Initial cure at 35°C: 3 hours, Full cure at 35°C: 7 days, Tensile Strength: >2.50 MPa, Elongation: >150%, Shore 'A' Hardness: 20 - 30 , Crack Bridging: 1-5 mm. The three coat mentioned was to achieved necessary thickness which may vary depending on the waterproofing material properties selected by the bidders.However, incase of higher thickness requirement, bidders may use additional layers of coating as per requirement to retain the waterproofing properties during the guarantee period. Bidders are advised to select the appropriate water proofing material with requiried UV resistance properties.</p>
18	BoQ No14	<p>Providing and laying a Five-layer system Water Proofing over head water tank with Arcylic cementitious base with chemically soaked membrane system , including surface preparation such as cleaning, bore packing, corner treatment, by grinding etc. After pressure using water jet cleaning identifies grooving the joints and filling with non-shrink grout, crack rectifications using crack mouth as "V" groove of not less than 10 mm x 10 mm and sealing with polymer modified cement mortar or joint fillers or hybrid polyurethane sealants as per the manufactures. The application of the first layer primer bond comprises a acrylic polymer modified cementitious -based 2k products as per manufactures in a ratio of depending on surface conditions ny brushing, rolling. The second layer involves coating after fixing 45 GSM fiber mesh or 100 GSM chemical soaked membrane system combinations as per required over the entire plain surface and 100 GSM geotextile mat in all construction joints, cores, patched areas, and corners, soaked membrane should be pressed firmly onto the base layer of waterproofing coating,ensuring adheres wll to the primer and joint filler beneath.. Instead of coving, treat all corners with a chemical-soaked</p>	<p>For overhead water tank waterproofing, you have recommended a five-layer system. However, there are concerns regarding the initial surface preparation step, where you have specified the use of polyurethane sealant. Polyurethane sealant is not suitable for water tank applications, as it will inevitably debond over time due to prolonged water exposure and lack of proper adhesion in continuously submerged conditions. Your suggested system consists of: First coat – Primer Second coat – 45gsm fiber mesh reinforcement (100 GSM chemical soaked membrane system combinations as per required over the entire plain surface and 100 GSM geotextile mat in all construction joints) Third layer – 2K waterproofing coating Fourth coat – Primer Fifth coat – 2K waterproofing coating Corner areas – 100gsm geotextile reinforcement. Please specify the technical parameters of the primer. If a minimum of 1 kg of slurryper square meter is required to adhere to the 45gsm mesh, it will not be possible to properly fix a 100gsm geotextile mat using this type of slurry. Additionally, 100gsm geotextile should never be used at the bottom of a water tank as a reinforcement layer. Higher thickness Geotextile is commonly used as a protective layer, not as an intermediate reinforcement layer within a waterproofing system. Proper reinforcement should be achieved using fiber mesh or 45 gsm geofabrics designed for submerged applications membrane system using hybrid polymer modified cementitious. Apply the third coat of primer after scrubbing and patching uneven surfaces. Finally, apply 2 coats of a 2K based acrylic cementitious product Protective plastering required. Final Plaster should not cover under this item.All work under the super vision of Engineer in Charge.*</p>	<p>Tender conditions shall prevailed. However, tenderers are advised to use geotextile having appropriate submergible properties.</p>

* The query is in the form of a suggestion. There shall be no changes in the tender conditions/BOQ.Improvisations , if any, shall be done at the risk and cost of the contractor,without any additional cost or financial burden to CSEZA and also satisfy performance guarantee/defect liability conditions in the tender.The improvisations,if found technically unsuitable , shall be declined by the engineer in charge, where discussion in this regard shall be final and binding on the contractor.