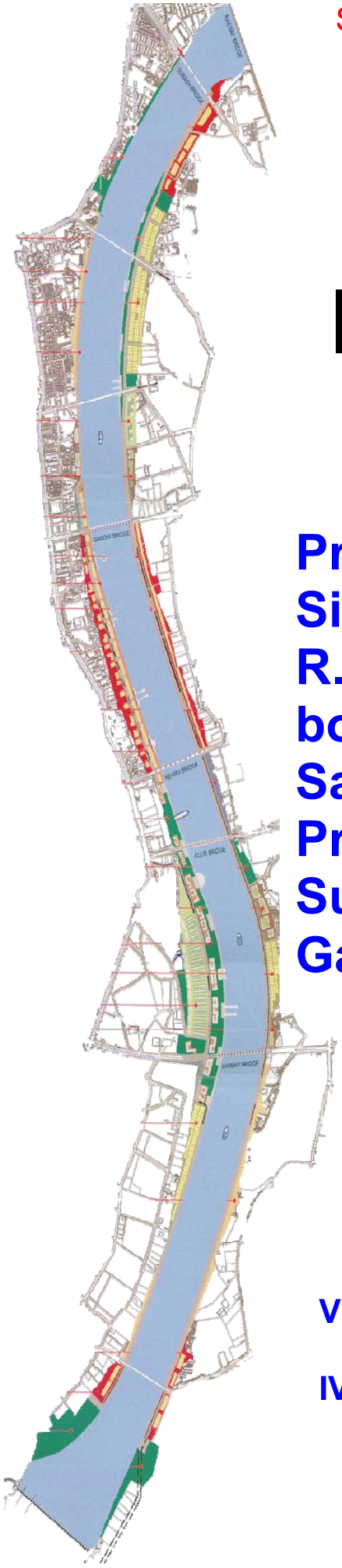
SABARMATI RIVER FRONT DEVELOPMENT



Sabarmati River Front Development Corporation Limited

1st Floor, Inside Health Development
Dr. Ramanbhai Patel Bhavan,
West Zone Office, AMC,
Usmanpura, Ahmedabad

BID DOCUMENT

Protective coating by Silicone on existing R.C.C. Surface on both sides of Sabarmati Riverfront Project area from Subhash Bridge to Gandhi Bridge.

VOLUME- 02

IV) Technical Specification

TECHNICAL SPECIFICATION
FOR
CIVIL WORKS

GENERAL

The specifications to be followed for this work are the specification for road & bridges are published by the MORTH for relevant Items. This specification shall be supplemented by the technical specification as given here under in this document and also the provision in the relevant IRC & IS codes.

In case of any discrepancy or contradiction if any in the provision of above specification the order of the precedence shall be followed.

1. MORTH
2. IRC Provisions
3. Technical Specification in this Volume
4. IS Provisions
5. Sound Engineering Practice
6. Manufacture specification for special items

All work shall be carried out in confirmation with the above specifications. These specifications broadly cover all major aspects of the work involved. Minor details may not be specified here however if these are necessary for completion of work the contractor shall execute such minor items without any additions to the costs.

All work shall be executed in accordance with good engineering practices.

The Contractor shall remain responsible for workmen's compensation if any, when such case occurs, the contractor shall arrange for red lamps at night and fencing etc. shall be responsible for any damage of life and or property if any happen, during the execution of work. In case of

dispute for unseen or overlooked items, the decision of Engineer in charge shall be final. The Contractor shall have to give site clean of all rubbish on completion of work and handover the bridge with final finishing as directed. All the rejected materials shall be removed from site within 24 hours by Contractor at his risk and cost.

The Contractor shall have to make his own arrangement for water required for the work.

If in the interest of SRFDCL, it is necessary to change either any site or the design of the proposed work the Contractor shall carry out the works and he will be paid at the rates quoted by him and no claim for extra for subsequent changes made, entertained.

The cubical contents of the cement bag shall be taken as per actual weight of bag and the Contractor shall have to prepare the concrete mixes using weigh batches.

Contractor will be fully responsible for compliance of the various provisions under Contract Labour Act, 1970 and the Rules framed there under.

Contractor is requested to procure their quarry materials required for construction work through legal sources i.e. only from the quarry lease holders permit holders or middleman who satisfies the contractor as to the legality of the source of purchase by him of these materials.

GENERAL DETAILS

All work shall be carried out in confirmation with these specifications. In general, provisions of Indian Standard, Indian Road Congress codes and other national standards shall be followed unless otherwise specified. These specifications are not intended to cover the minor details. The work shall be executed in accordance with best modern practices & all latest codes and standards referred to in these specifications shall be read in conjunction with the

various other documents forming the contract, tender specifications, BOQ, contract drawings and other related documents.

Measurement and payments

a) The methods of measurement and payment shall be as described under various items and in Price Bid. Where specific definitions are not given, the methods described in MORTH will be followed. Should there be any detail of construction of materials which has not been referred to in the specifications or in Price Bid and drawings but the necessity for which may be implied or inferred there from, or which are usual or essential for the completion of the work in the trades, the same shall be deemed to be included in the rates quoted by the contractor in Price Bid.

b) Unacceptable work

All defective works are liable to be demolished, rebuilt and defective materials replaced by the contractor at his own cost. In the event of such works being accepted by carrying out repairs etc. as specified by the engineer in charge, the cost of repairs will be borne by the contractor and will be paid for the works actually carried out by him at reduced rates of the tendered rates, as may be considered reasonable by the engineer in charge, in the preparation of final or on account bills.

SPECIFICATION FOR CIVIL WORKS

1. The specification for various items of work shall be same as specified for such items in the MORTH SPECIFICATIONS FOR ROAD AND BRIDGE WORKS, latest published prior to 1 month before issue of tender.

2. The inclusions and exclusions from quoted rates are specified in the details of each item of work in the specifications and the Bill of Quantities. In case there is no specific mention of a particular detail, the mode of specification as prescribed in MORTH SPECIFICATIONS for such an item shall be followed.

3. In the event of contradiction between the MORTH specifications referred to above and this Contract document, the provisions of this Contract document shall prevail.

List of Approved Make for Works

1	Silicon sealant/ Silicon paint	Wacker, Dowcorning, GE, Soudal, Bostik
	Polysulphide sealant	Pidilite, Chawksey Sika, Fosroc, Mccoy Soudal,
	P.U sealant/ Fire rated PU	Sikka (Exterior grade - UV resistant)

Note:

All the Materials/Makes listed above and other than as specified above shall be used after obtaining prior approval from the Engineer-in-charge.

Item No-01

Providing and applying Hydrophobic Silane - Siloxane (Silicone) coating of approved make, to exposed concrete surfaces at all heights & leads and wherever instructed by Engineer-In-Charge. The treatment shall be in two coats wet-on-wet or as recommended by approved manufacturer including preparation of surfaces by cleaning, curing, protecting, independent double legged scaffolding etc complete. The rate includes the cost of all materials, its application by specialized applicators by spray coating with airless sprayer, cleaning the substrate of all laitance, construction dust, contaminants, double scaffolding, labour etc., all complete and at all levels, leads and heights as per particular specification & directions of engineer in charge. Guarantee Bond in the prescribed proforma shall be executed by the contractor for the satisfactory performance of the application for 5 years.

Solvent Based

1.0 Materials

1.1 Silicone paint

1.1 Silicone Paint shall conform to M-69.

2.0 Workmanship

2.1 The silicone paint shall be diluted with water or solvent (benzene or toluene) based in proportion as per manufacturer's specifications. The paint shall be sprayed with spray gun as directed. As far as possible ready mix paint shall be used.

2.2 Concentration of silicon content shall be in proportion so that after the application, surface is clear and as it is. The sample shall be approved by architect or engineer-in-charge. Normally 5% concentration is sufficient for not to have change In parent color.

2.2.a Before applying the surfaces should be thoroughly cleaned of dust, dirt, concrete slurry or any other foreign material or efflorescence from within the brick if any, using method like pressurized water jets, rubbing with gunny bags and soft brush, washing with bio wash chemical etc. as approved by the EIC. Pressurized water jet shall be applied in such a way that the surface on which it is applied does not get damaged.

2.2.b Before applying the specified coats of silicon paint the efflorescence of the exposed brick work should be removed in the following manner

1) Apply solution of - mixer of liquid ammonia and soft water (1:6) + mixer of teapol

(mild detergent) and water (1:6) on brick surface using brush.
2) After required / specified time interval the surface treated as mentioned in 1 above should be washed with soft water using brush or spray.

2.4 The concrete surfaces shall also be thoroughly cleaned of dust, dirt, rust, concrete slurry or any other foreign material using appropriate method so as not to damage the RCC work, as approved by the EIC

2.3 Rate shall be inclusive of moping, cleaning, masking the door windows/floor/plants etc during and after the execution for protection.

2.5 Unless otherwise specified silicone paint shall be executed through approved specialized agency. Contractor shall furnish a guarantee of 5 years on stamp paper to the employer directly and the tender rate shall be inclusive of the same which is also to be signed by the specialized agency. However, soul responsibility shall be of main contractor for any leakages.

2.6 Copy of work order mentioning the rate issued to the specialized agency shall be attached with guarantee bond.
A guarantee bond on appropriate stamp paper, shall be given by the Contractor to the Client in the manner form prescribed below

Product description

Solventless silicone concentrate that is based on a mixture of silane and siloxane.
Dilutable with organic solvents.

Dilute solutions of in organic solvents serve as high-quality general-purpose water repellents for impregnating and priming mineral and highly alkaline substrates.

Special features

- good depth of penetration
- high resistance to alkalis
- tack-free drying
- effective even on damp substrates
- rapid development of water repellency

After application to the mineral substrate, reacts with the atmospheric moisture or pore water in the substrate, thereby generating the active ingredient while liberating alcohol. The active

ingredient greatly lowers the water absorbency of the substrate, which nevertheless retains a very high degree of water vapour permeability since neither pores nor capillaries are clogged.

Application

Suitable for imparting water repellence to absorbent, porous, mineral construction materials, e.g.:

- brickwork
- all kinds of concrete
- aerated concrete
- sand-lime brickwork
- cement fiber boards
- mineral plasters
- mineral-based natural and artificial stone
- mineral paints

Suitable as primer for exterior paints and not suitable for rendering gypsum water repellent.

Processing

Flooding, preferably not under pressure, is the best technique for applying which is ready to use after dilution. Apply several coats, wet on wet, until the substrate is saturated. Generally, at least two applications suffice for all substrates.

Do not leave long breaks between coats. Apply the next when the substrate has absorbed the previous one and is no longer shiny (wet-on-wet working). The substrate must not have damp spots, i. e., it should look dry. The requisite quantity of depends on the absorbency of the substrate. The amount of impregnating agent required for a substrate and the effectiveness of the impregnation should be determined on site by testing a small area of the material to be treated.

Dilution

The solvents best suited for diluting aliphatic hydrocarbons (e. g. White Spirit 130/175), aromatic hydrocarbons (solvent naphtha, e. g. Shellsol A) or low-odor isoparaffin hydrocarbons (e. g. Isopar H). The solvent used should have a boiling range of 140-190°C and an evaporation number of 30-90.

If the above-mentioned hydrocarbon solvents are used as should be diluted in a weight ratio of 1:11 to 1:15. Anhydrous alcohols, such as ethanol or 2-propanol, could also be used and are even indispensable whenever contact of the impregnating agent with solvent-sensitive materials (such as expanded polystyrene, bitumen, etc.) cannot be avoided. The alcohol must be completely anhydrous. If alcohol is used as a solvent, a dilution ratio of 1:12 pbw is recommended. When impregnating slightly damp substrates will give better results if diluted with hydrocarbons than with alcohol.

Stir vigorously when adding the diluents. reacts with humidity, prolonged contact with air must be avoided. The containers must be hermetically sealed.

Before applying be sure to cover windows and other non-absorbent surfaces properly because the product cures so quickly that it will be extremely difficult, if not impossible, to remove after a few hours. Wipe off any splashes on window panes immediately, using a solvent if necessary. For this reason, the figures quoted below are intended as a guide only:

Concrete	[l/m²]	0.25 – 0.5
Plaster	[l/m²]	0.5 – 1.0
Sand-lime brick	[l/m²]	0.4 – 0.7
Brickwork	[l/m²]	0.4 – 2.0
Aerated concrete	[l/m²]	0.5 – 2.0
Cement fiberboard	[l/m²]	0.1 – 0.3
Natural stone	[l/m²]	0.05 – 3.0

Storage

The Best use before end date of each batch is shown on the product label.

Storage beyond the date specified on the label does not necessarily mean that the product is no longer usable. In this case however, the properties required for the intended use must be checked for quality assurance reasons.

Product data

Typical general characteristics	Inspection Method	Value
Appearance		colorless, hazy
Silane / siloxane content		approx. 100 %
Density at 25 °C	DIN 51757	1,05 g/cm³
Viscosity, dynamic	DIN 51562	15 - 19 mPa.s
Flash point	DIN 51755	42 °C

Active component for formulating penetrating water repellent treatments

Or

Features & Benefits

- Excellent beading in as little as 5 minutes after application
- Dilutable in organic solvent to formulate water repellent products
- Produces a hydrophobic treatment that inhibits water absorption
- Excellent performance at low active solids levels, in range of 5–10 percent
- Penetration of absorbent surfaces due to small molecular structure provides added repellency
- Chemically bonds to the substrates
- Performs on both neutral and alkaline substrates
- UV stable to increase the life of the treatment
- Water vapor permeable but resistant to liquid water
- Reduction in water absorption reduces cracking and spalling due to freeze-thaw and efflorescence, thereby increasing the life of the substrate
- Penetrating treatment will not change the appearance of the substrate at low solids levels
- Performs at low solids level allowing higher dilution rate

Composition

- Solvent-free silane/siloxane concentrate
- Clear liquid

Applications

- For use on neutral and alkaline mineral substrates such as brick, sandstone, concrete and mortar that require water repellency

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Color		Clear to straw
Active Ingredient	percent	98
Non-Volatile Content	percent	92.8
Specific Gravity at 25°C (77°F)		0.96
Flash Point, closed cup	°C (°F)	10 (50)
Density	g/cm3 (lb/gal)	0.96 (8.01)
Volatile Organic Compound (VOC) Content	g/L (lb/gal)	73 (0.63)
Solvent (Thinner)		Alcohol, chlorinated solvents, aromatic or aliphatic hydrocarbons, or silicone solvent

Description :- Silane/siloxane concentrate, dilutable in organic or silicone solvents to formulate a water repellent. Upon proper application, the formulated product will penetrate and provide water repellency by chemically reacting with the substrate. Treated substrates are hydrophobic and retain their original appearance. A catalyst is present, so it can be used on both neutral and alkaline substrates.

The active ingredients react with moisture to produce hydroxy groups. These hydroxy groups will bond with the substrates and themselves to produce a hydrophobic treatmentthat inhibits water absorption into the substrate. Exposure to water before use as a treatment may cause the material to cure in the container.

How To Use

Dilution

Water Repellent should be diluted in organic solvents such as aliphatic hydrocarbons, aromatic hydrocarbons, anhydrous alcohol, chlorinated solvents, or low molecular weight polydimethyl-siloxanes, Cyclotetrasiloxane before use. Recommended dilution level for neutral substrates, such asbrick and sandstone, is 1 part Water Repellent to 19 parts solvent.

For alkaline substrates, such as mortar and concrete, Water Repellent should be diluted in organic or silicone solvent at 1 part Water Repellent to9 parts solvent.

atory performance data for 5, 10 and 15 percent active solids levels of Water Repellent are shown in Table 1. Laboratory results for modified NCHRP 244 testing are shown in Table 2. The performance may vary depending on actives level appliedto different substrates. Optimization of the actives level may be required to obtain maximum performance on your selected substrate(s).
OC-compliant formulations with less than 600 g/L VOC can be achieved with Water Repellent by using a VOC-compliant solvent.

How To Use (Cont.)

Application

Methods of application include airless sprayer, roller and brush. When a brush or roller is used, repeated applications should be made until the surface remains moist for a few minutes. If an airless sprayer is used, application should continue until the substrate is thoroughly saturated. On vertical applications, material should be applied from the bottomup and achieve a 6 to 8 inch rundown. Sprayers should be fitted with solvent-resistant hoses and gaskets.

To ensure compatibility and the desired water repellent result, a test application is necessary on each surface to be treated. Surfaces should be free of standing water, surface dirt, dust, oils and other contaminants. Formulated Water Repellent may be applied to damp or wet surfaces, although dry surfaces are preferred to achieve maximum penetration into the substrate.

As with most repellents, plants or shrubs should be protected from exposure to the treatment. Windows and any other material that should not be treated must be protected or cleaning with solvents may be necessary to remove the treatment. Likewise, if applied as spray, control overspray and drift to prevent contamination of nearby substrates, especially windows, vehicles, etc.

Handling Precautions	water Repellent evolves methanol and ethanol upon cure. Exposure to water may cause the material to cure in the container. Use dry solvents when diluting the product. During the dilution procedure, limit exposure to air. Take safety precautions at all times. Do not store or use near sparks or open flames. Do notsmoke in the vicinity of application. Use this material in a well-ventilated area away from sparks and open flames. Always wear protective goggles and gloves. If inhaled, move immediately to fresh air. In case of skin or eye contact, flush immediately with water for 15 minutes. Remove contaminated clothing and shoes and call a physician. Local, state and federal regulations should be consulted for proper disposal procedures. Product safety information required for safe use is not included in this document. Before handling, read product and safety data sheetsand container labels for safe use, physical and health hazard information. The safety data sheet is available on the dow website at www.consumer.dow.com, or from your dow sales application engineer, or distributor, or by calling dow customer service.
Usable Life AndStorage	When stored in original, airtight containers at or below 35°C (95°F), Water Repellent has a shelf life of 1 year from date of manufacture. Refer to product packaging for "Use By" date. Keep away from heat and open flame.
Packaging Information	Water Repellent is supplied in 190 kg (418 lb) drums and 18 kg (40 lb) pails, net weight.
Limitations	This product is neither tested nor represented as suitable for medical or pharmaceuticaluses. Do not use on structures under hydrostatic pressure. Do not apply when temperature is at orbelow 4°C (40°F).
Shipping Limitation	DOT Classification: Combustible liquid.
Health And Environmental	To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

FORM OF GUARANTEE BOND

Removing the expansion filler materials from joints, cleaning, repairing of the edges with epoxy mortar of approved colour and make, fixing of abro tapes on the edges to prevent the adjoining surface, etc. complete as directed by engineer-in-charge. The contractor should furnish a

"I/We .....(Contractor) hereby guarantee that work will remain unaffected and will not be in any way damaged by water or any other humid conditions, for a period of 5 years after completion of the work of Silicone painting as per the terms and conditions of the contract and Contractor hereby indemnifies and agrees to save the Client from any loss and or damage that might be caused on account of exposure to water and hereby Guarantees to make good any loss or damages suffered by the Client and further guarantee to redo the affected work without claiming any extra cost."

This guarantee shall remain in force for a period of 05 years from the completion of the work under the contract and it shall remain binding to the Contractor for period of 05 years.

The deposit at the rate of 10 % of the cost of this item from the running and final bills shall be recovered and retained for Guarantee period (5 Year) .

After completion of First year -2.00 % Released

After completion of Second year -2.00 % Released

After completion of Thired year -2.00 % Released

After completion of Forth year -2.00 % Released

After completion of Fifth year -2.00 % Released

3.0 Mode of Measurements and Payment

3.3 The rate shall be for an unit of one sqm.

Item-02

. **POLYSULPHIDE SEALANT**

Providing and filling the expansion joints, with Polysulphide sealant of size 25mm x 12mm with application of primer including scraping guarantee of 05

years as directed.

20.1 The polysulphide sealant shall be of Sika, Fosroc, Mccoy Soudal, Pidilite as approved by the engineer-in-charge. It shall conform to relevant IS codes.

20.2 It shall be a two component polysulphide sealant. The mix ratio of both the parts should be as per manufacture's specification. It should not contain chloride or other corrosive substance.

20.3 It shall be pourable or gungrade.

20.4 It shall be used for sealing joints in water retaining structures, buildings, roofs, external walls, cladding, concrete highways, airport runways, bridges, parking and cargo areas and buildings. It shall have excellent adhesion to wide range of building materials like Aluminium, Stainless Steel, Glass, Concrete, Marble, Stone, Brick, Masonry block, Plaster, Ceramic and quarry tiles, Timber etc.

20.5 It should accommodate continuous and pronounced cyclic movements. Material should be low in shrinkage, UV resistance, water resistant to bio-degradation. It should be water resistant to occasional spillage of dilute acids, alkalis, petrol, aviation fuels, diesel, kerosene, lubricating oils etc. It should be non-toxic.

20.6 The density of the material should be 1.58 ± 0.03 Kg / ltr. The pot life should be more than 2 hrs. at 30ºC. Shore A hardness should be 16 to 22 after complete curing. Movement accommodation should be 25% for butt joints and 50% for lap joints. Joint size should be 5 to 50 mm. and depth to width ratio should be 1:2 (min). For joints with skew movement the ratio shall be 1:1

1.0 Materials

1.1 Material shall confirm to relevant material specification.

2.0 Workmanship

2.1 Preparation - The joint surfaces must be thoroughly dry, clean, and all the dirt, laitance, oil or grease, rust, scale and protective lacquers from metal surfaces should be cleaned before positioning a bond breaker or back up tape.

2.2 **Supply and Handling -** Joint filler must be checked for tight packing so that no gaps or voids exist at the base of the sealing slot.

2.3 **Installation -** A thin coat of primer should be applied on the concrete surfaces and allowed to dry "tack free" before sealing. The mixed polysulphide sealant must be applied after the evaporation of the solvent but before the primer film has completely reacted. After 3 hours the surface should be re primed before the application of sealant. The sealant should be thoroughly mixed with a paddle stirrer for a full five numbers (at 300 - 500spm). The mix should be applied by a Gun to the joint and should be tooled to a smooth finish. These joints should be flush and unpainted.

3.0 Measurement for Payment

3.1 The sealant Joint shall be measured in running meters.

3.2 The contract unit rate shall include the cost of materials, labour, equipment and other incidental charges for fixing the sealant in position.

Item-3

Providing & doing Rendering to the existing concrete surface with required proportion of grey and white cement including needed curing as per specification and making the surface finish acceptable to the satisfaction of the Client/ Consultants. The cost includes chipping out concrete, all labour and material, making the surface finish up to desired level in conformity with existing concrete wall as well as filling the tie rod holes in the concrete with arrangement of required scaffolding at any level and curing as per the instruction by Engineer in charge.

This item includes Providing & doing Rendering to the existing concrete surface with required proportion of grey and white cement including needed curing as per specification and making the surface finish acceptable to the satisfaction of the Client/ Consultants. The cost includes chipping out concrete, all labour and material, making the surface finish up to desired level in conformity with existing concrete wall as well as filling the tie rod holes in the concrete with arrangement of required scaffolding at any level and curing as per the instruction by Engineer in charge.

The rate shall be for a unit of one sq.mt.