



AQUITY INFRASTRUCTURE & SAFETY

ON-SITE WATER PURIFICATION & INFRASTRUCTURE BLUEPRINT

Two complete, buildable systems for construction sites and low-resource workplaces in Faridabad and the wider NCR. System 1 is a zero-electricity drum filter that can be built in one day from local materials. System 2 is a permanent two-tank chlorination station with a pre-filter and a six-tap stainless manifold.

Rs 19,309

SYSTEM 1 CAPEX

Rs 63,100

SYSTEM 2 CAPEX

600 L/day

SYSTEM 1 OUTPUT

3,000 L/day

SYSTEM 2 OUTPUT

CapEx versus the cost of getting sick

SYSTEM 1

65-worker site

One-time CapEx Rs 19,309

Illness and downtime cost per month Rs 9,425

Payback about 5.5 months after running costs

SYSTEM 2

250-worker site

One-time CapEx Rs 63,100

Illness and downtime cost per month Rs 36,250

Payback about 2.8 months after running costs

Illustrative planning model. Assumptions: 5% of workers lose 3 working days to a water-related illness each month; each lost day costs Rs 800 (wage, supervision and slowed work); each episode costs Rs 500 in treatment; the system prevents 70% of episodes. Replace these with your own site records.

System 1, 65-worker site

3.2 episodes a month cost Rs 9,425. After Rs 3,068 monthly running cost, net saving is Rs 3,529 a month and the build pays back in about 5.5 months.

System 2, 250-worker site

12.5 episodes a month cost Rs 36,250. After Rs 2,893 monthly running cost, net saving is Rs 22,482 a month and the build pays back in about 2.8 months.

What these systems do not do. Neither system removes dissolved salts, hardness, fluoride, arsenic or nitrate. Aquty's own lab report on a Faridabad bore well (Nitya Laboratories, 23/11/2024) shows 1,680 mg/l total dissolved solids, 384 mg/l hardness and 0.178 mg/l iron. That water is inside the IS 10500 permissible limits but above the 500 mg/l acceptable limit for TDS, and it needs RO to drop to the 92 mg/l measured after treatment. Test the source first (decision tree, page 11). Install RO first where TDS exceeds 2,000 mg/l or a chemical contaminant is over its limit.

Benchmarks used throughout (IS 10500:2012)

PARAMETER	ACCEPTABLE	PERMISSIBLE, NO ALTERNATIVE SOURCE
Free residual chlorine at the tap	0.2 mg/l minimum	1.0 mg/l maximum
Turbidity	1 NTU	5 NTU
Total dissolved solids	500 mg/l	2,000 mg/l
E. coli / thermotolerant coliform	Absent in 100 mL	Absent in 100 mL

SYSTEM 1

The DIY multi-barrier sand-charcoal drum

A gravity-fed, no-electricity filter built from two 200 L food-grade drums and local media, for remote or early-stage sites that need water the same week. Chlorination in the storage vessel is part of the system: filtration clears the water and charcoal improves taste, but chlorine makes it microbiologically safe.

30 to 40

L/H THROTTLED FLOW

500 to 800

L/DAY (16 TO 24 H)

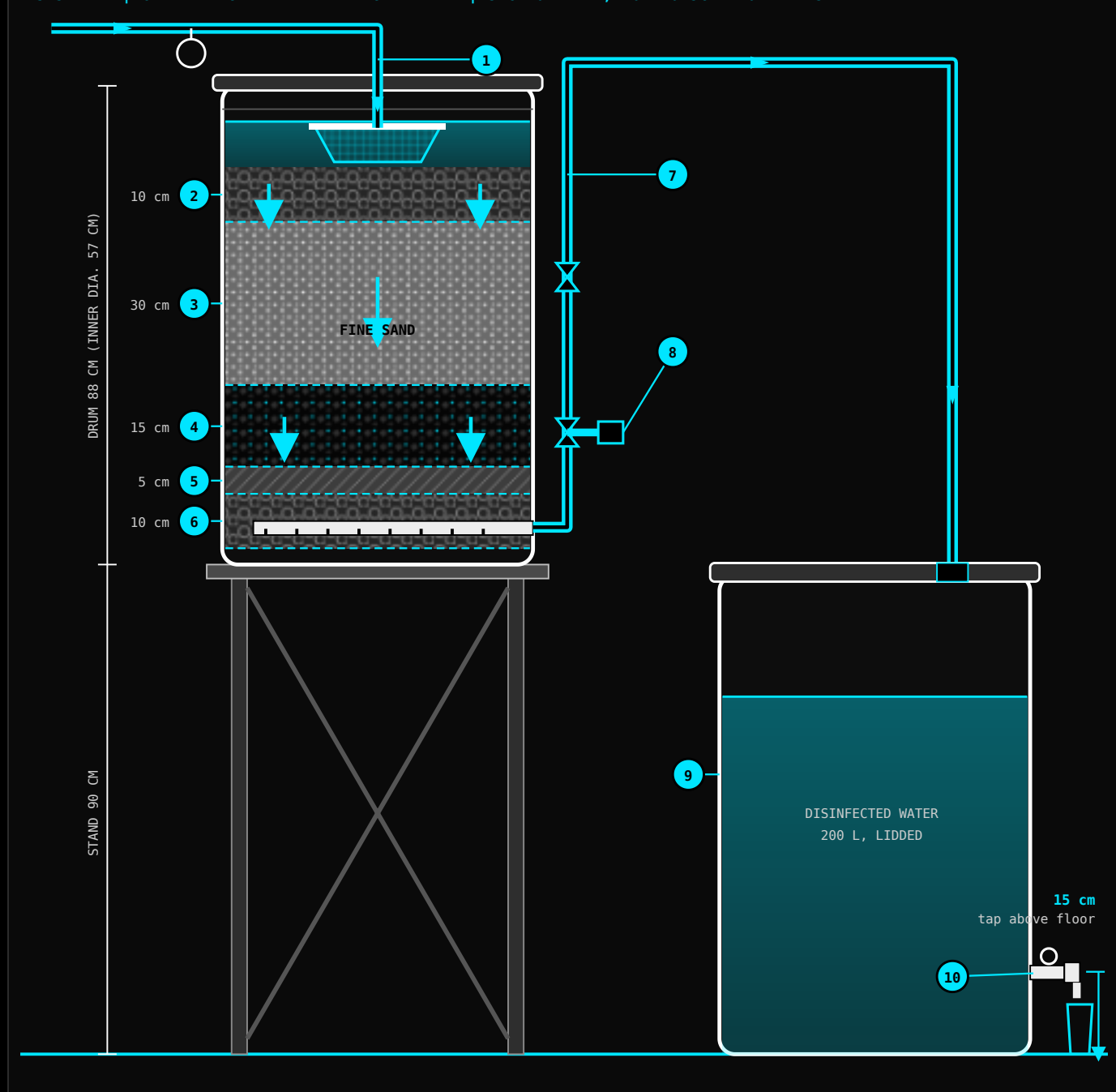
125 to 200

WORKERS AT 4 L EACH

1 day

2 HELPERS TO BUILD

SYSTEM 1 | GRAVITY MULTI-BARRIER DRUM FILTER | SECTION VIEW, NOT TO SCALE ON PIPES



Numbered markers are explained in the diagram key on the next page. Layer heights are shown on the left of the drum.



Diagram key, media design and running cost

1	Raw-water inlet, float valve 25 mm line from borewell, tanker or tap; float valve stops overfilling. Hand-filling from buckets is possible using a two-step platform.
2	Strainer mesh and diffuser 1 mm mesh basket plus perforated disc break the jet so the sand surface is not scoured. 15 cm free water head above the bed.
3	Coarse gravel, 20 to 40 mm, 10 cm Catches grit, leaves and silt before the sand.
4	Fine silica sand, 0.5 to 1.0 mm, 30 cm Main mechanical barrier against turbidity and suspended matter.
5	Activated coconut-shell charcoal, 15 cm Adsorbs odour, taste and organics. Not a dependable pathogen barrier.
6	Fired-clay granules, 5 cm, and support gravel, 10 cm Polishing layer, then a 6 to 12 mm gravel bed burying the slotted 25 mm PVC underdrain.
7	Standpipe crest at 85 cm Outlet rises above the top of the bed, so the media can never drain dry and lose its water seal.
8	Throttle valve and backwash port Throttle sets 30 to 40 L/h. The tee and ball valve let clean water be run up through the bed for a gentle rinse.
9	Storage vessel, 200 L, lidded Disinfected before first use; chlorine is dosed here every batch (see dosing table).
10	Brass bib tap, 15 cm above the vessel floor The 15 cm of dead water below the tap holds settled sludge so it is never drawn off. Vessel stands on the ground; a cup fits under the tap.

Media design

The bed is built inside a 200 L drum with an inner diameter of about 57 cm (area 0.255 m²) and an inner height of about 88 cm. Measure your own drums before buying media and scale the volumes in proportion. Water flows downward through the layers in the order listed. Volumes and masses are net; the bill of materials on the next page adds a 10% allowance.

LAYER, TOP TO BOTTOM	HEIGHT CM	VOLUME L	MASS KG	PURPOSE
Free water head	15	-	-	Keeps the bed submerged; strainer and diffuser sit here
Coarse gravel 20 to 40 mm	10	26	38	Takes the first load of silt, leaves and grit; protects the sand
Fine silica sand 0.5 to 1.0 mm	30	77	115	Main mechanical barrier; removes turbidity and most suspended matter
Activated coconut charcoal, 8×30 mesh	15	38	19	Adsorbs odour, taste, organics and chlorine by-products. It is not a pathogen barrier
Fired clay granules 3 to 6 mm	5	13	15	Polishing layer; catches charcoal fines
Support gravel 6 to 12 mm	10	26	38	Carries the bed; buries the slotted underdrain

Flow design: throttled to 30 to 40 L/h, the bed sees 0.12 to 0.16 m/h, and the outlet crest at 85 cm keeps the media submerged. Weight: the filled filter drum is about 300 kg, so the stand is specified for 400 kg or more.

Running cost per month, System 1

Activated charcoal, replaced every 3 months	880
Filter sand, replaced yearly	195
DPD tablets, 1 per day plus checks	330
Bleaching powder (about 0.2 kg per month)	30
H ₂ S bacteriological vials, 2 per month	300
Quarterly lab panel, IS 10500 basic set (about 4,000 per test)	1,333
Total per month	Rs 3,068



Bill of materials, System 1

Indicative Faridabad / NCR prices, 2026. Collect two written quotes per item before ordering. Drums must carry food-grade marking and must never have held pesticides, oil, solvents or chemicals.

#	ITEM AND SPECIFICATION	QTY	UNIT	RATE RS	AMOUNT RS
1	Filter column drum. 200 L food-grade HDPE open-head drum, lid and locking ring, reconditioned, never used for chemicals	1	no.	1,800	1,800
2	Storage vessel. 200 L food-grade HDPE open-head drum with lid, reconditioned (clean, opaque or translucent)	1	no.	1,800	1,800
3	Fine filter sand. Washed silica sand, 0.5 to 1.0 mm, graded (river sand only if washed and sieved)	130	kg	18	2,340
4	Coarse gravel. Washed gravel, 20 to 40 mm	45	kg	6	270
5	Support gravel. Washed gravel, 6 to 12 mm	42	kg	7	294
6	Activated charcoal. Granular activated coconut-shell charcoal, 8×30 mesh	22	kg	120	2,640
7	Clay granules. Fired clay (terracotta) granules, 3 to 6 mm, washed	17	kg	15	255
8	Separation net. Nylon filter net, 40 mesh, 1 m x 1 m	1	no.	120	120
9	Strainer and diffuser. 1 mm SS304 or nylon strainer basket plus perforated HDPE diffuser disc, 45 cm	1	set	250	250
10	Bulkhead fittings. 25 mm HDPE bulkhead with EPDM gaskets: filter outlet, storage inlet, spare	3	no.	220	660
11	Brass bib tap. 20 mm brass bib tap with CPVC tank connector, fitted 15 cm above the storage vessel floor	1	no.	500	500
12	Underdrain and standpipe. 25 mm PVC pipe, 3 m (underdrain H-manifold, 4 mm slots every 5 cm, plus riser)	3	m	60	180
13	PVC fittings. Tees x3, elbows x6, end caps x2, unions x2, solvent cement, PTFE tape	1	lot	420	420
14	Ball valves. 25 mm PVC ball valve: flow throttle and backwash port	2	no.	180	360
15	Float valve. 25 mm float valve for raw-water inlet	1	no.	380	380
16	Flexible hose. 25 mm braided hose, food-grade, for crest-to-storage link and inlet	4	m	90	360
17	Filter stand. MS angle 40×40×5 mm frame, 90 cm high, 70 × 70 cm top with 6 mm plate, braced, epoxy painted, rated at least 400 kg	1	no.	3,200	3,200
18	Concrete pad. Levelled pad, 1.2 m x 2.0 m, cement, sand, aggregate	1	lot	600	600
19	Chlorine test kit. DPD No.1 free-chlorine tablets (100) with comparator	1	kit	650	650
20	Disinfectant. Bleaching powder, 33% available chlorine, 1 kg (starter stock)	1	kg	120	120
21	Stock-solution can. 10 L opaque HDPE can with tap, plus 100 mL measuring cup	1	set	260	260
22	Tools and washing. Two 20 L buckets, scrub brush, PVC mixing paddle, hacksaw blade, 4 mm drill bit	1	lot	350	350
23	Protective gear. Nitrile gloves, splash goggles	1	set	300	300
24	Labour. 2 site helpers x 1 day (build time)	2	day	600	1,200
TOTAL CAPEX, SYSTEM 1				Rs 19,309	

Assembly and maintenance protocol

Build sequence (one day, two helpers)

- 1 Prepare the base.** Cast or level the 1.2 × 2.0 m pad. Weld and place the 90 cm MS stand; check it is level and braced. Place the storage drum on the ground beside it, with its tap side facing the dispensing area.
- 2 Clean both drums.** Scrub with detergent, rinse, then swirl 50 mg/l chlorine solution around the inside, leave 1 hour, drain and rinse.
- 3 Fit the fittings.** Filter drum: 25 mm bulkhead outlet 5 cm above the base. Storage drum: 25 mm bulkhead inlet in the lid, and the 20 mm brass tap connector 15 cm above the floor.
- 4 Build the underdrain.** Cut a 25 mm PVC H-manifold, 40 cm wide. Saw 4 mm slots every 5 cm on the underside, cap the ends, connect to the outlet bulkhead and the riser.
- 5 Wash every media.** Rinse sand in a bucket until the water runs clear (five to six rinses). Rinse charcoal until no black dust comes off. Rinse gravel and clay.
- 6 Fill bottom to top, wet.** Fill the drum with 10 cm of water first. Add 10 cm support gravel, the 40-mesh net, 5 cm clay, 15 cm charcoal, then sand in three 10 cm lifts, tamping lightly under water to avoid air pockets. Finish with 10 cm coarse gravel.
- 7 Fit the inlet.** Place the diffuser disc and strainer basket under the inlet, connect the 25 mm line with the float valve.
- 8 Build the standpipe.** Run the riser up the outside to 85 cm above the filter base, over the top, and down by hose to the storage lid. Fit the throttle valve on the riser and the backwash tee and valve below it.
- 9 Commission.** Set the throttle to 30 to 40 L/h (a 10 L bucket takes 15 to 20 minutes). Run 400 L to waste, until the outlet is clear and turbidity is below 5 NTU.
- 10 Disinfect and test.** Dose chlorine into the storage vessel (table at right), mix, wait 30 minutes and test. Label the vessel and tap, and lock the chemical stock away.

Chlorine dose for the 200 L vessel

TARGET MG/L	BLEACHING POWDER G (33%)	1% STOCK ML
2	1.2	40
3 (default)	1.8	60
5 (turbid water)	3.0	100

Make 1% stock by mixing 300 g bleaching powder into 10 L water. Stir, let it settle 30 minutes, and use only the clear liquid. Keep it in an opaque labelled can, out of sun, and make fresh every 7 days. Wait 30 minutes (60 minutes if the water is below 15 C). Free chlorine at the tap must read 0.2 to 0.5 mg/l; add 1 mg/l to the next dose if below 0.2, and cut 1 mg/l if above 1.0.

Cleaning and backwash schedule

WHEN	TASK
Every day	Time a 10 L bucket at the tap (target 15 to 20 min). Dose chlorine, test residual, record it on the log sheet.
Every week	Lift out the coarse gravel, scrape and discard the top 1 to 2 cm of sand, rinse the gravel in a bucket, put it back and top up sand. Takes about 20 minutes.
Every 4 weeks, or flow below 20 L/h	Gentle upflow rinse: close the throttle, run clean water in through the backwash tee at no more than 5 L/min for 15 minutes, letting it overflow at the rim. Do not go faster or the charcoal will lift and mix with the sand.
Every 4 weeks	Empty the storage vessel, scrub it, rinse and re-disinfect with 50 mg/l chlorine for 1 hour.
Every 3 months	Replace the charcoal sooner if water smells. Re-wash the clay and the gravel.
Every 12 months	Replace all sand. Replace hoses, check the stand for corrosion.

Safety. Never mix chlorine with acids or ammonia. Wear gloves and goggles. Keep stock out of children's reach. If the flow stops for more than a day, discard the first 50 L before drinking.

SYSTEM 2

The low-cost professional tanki and chemical station

A permanent, high-capacity station for larger or longer-running sites. Water is pre-filtered through a 5-micron cartridge, dosed with a fixed volume of chlorine stock, held for 30 minutes in a dedicated tank, then dispensed through six stainless steel taps. Two 500 L tanks work as duty and standby, so one is always dispensing while the other fills and contacts. A single 1,000 L tank also works but stops service during every contact period.

3,000

L/DAY, 6 BATCHES

500+

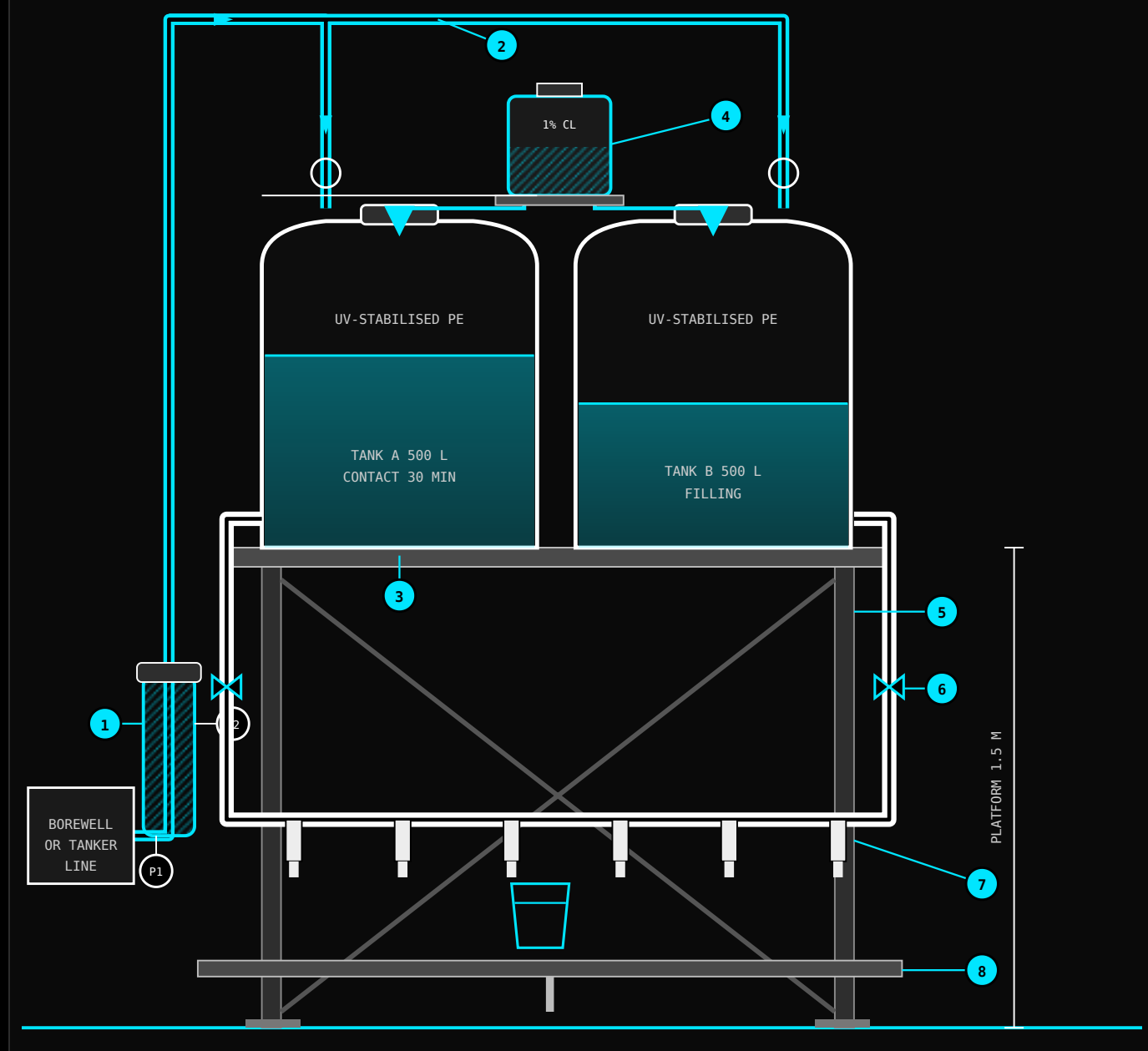
WORKERS AT 4 L EACH

6

TAPS, NO QUEUE

3 days

TO INSTALL

SYSTEM 2 | TWO-TANK CHLORINATION AND STAINLESS MANIFOLD | ELEVATION, NOT TO SCALE ON PIPES


Numbered markers are explained in the diagram key on the next page. P1 and P2 are the pressure gauges either side of the pre-filter.

Diagram key and specification

1	5-micron pre-filter and pressure gauges P1, P2 20 inch spun polypropylene cartridge. Change when P1 minus P2 reaches 0.7 bar or flow drops by 30%.
2	Raw-water main with float valves 1 inch line to both tanks. Float valves stop overflow; isolation valves let either tank be shut off.
3	Tank A and Tank B, 500 L each Duty and standby. One tank fills and doses while the other holds its 30-minute contact time and dispenses. Each tank is its own contact chamber.
4	Chlorine dosing dispenser 20 L opaque can of 1% chlorine stock (10,000 mg/l). A calibrated 250 mL cylinder and drip lines deliver a fixed volume per batch.
5	MS platform, 1.5 m Carries about 1.1 t of water and tank weight. Fabricated and anchored to footings.
6	Outlet isolation valves One per tank, so a tank can be drained, cleaned or sampled without stopping the other.
7	Stainless steel manifold, 6 taps SS304 header with six 15 mm taps at 68 mm centres, so six people fill at once instead of queuing at one tap.
8	Drip tray and drain Keeps the dispensing area dry and mosquito-free; drains to a soak pit or the site drain.

HYDRAULIC BASIS

Tank outlets sit at 1.5 m, giving about 0.15 bar at the taps. Each 15 mm tap passes about 6 L/min, so six taps fill 500 L in roughly 14 minutes. A 20 inch 5-micron cartridge passes up to about 2,000 L/h clean, so a 500 L tank fills in 15 to 30 minutes on typical site water.

BATCH CYCLE, PER TANK

Fill 20 min, dose and mix 5 min, contact 30 min (60 min in winter), test 5 min: about 60 to 70 minutes. Two tanks alternating give 6 to 8 batches in a working day, 3,000 to 4,000 L. Size the daily volume at 4 L per worker, plus 20% for peak days.

Siting and installation notes

- Place the platform on firm, levelled ground at least 3 m from vehicle lanes, concrete mixers and burning areas, and outside any excavation edge.
- Shade the tanks or choose UV-stabilised dark outer layers to limit algae and warming; keep lids locked and vents screened.
- Fit the drip tray over a soak pit or connect it to the site drain, so no standing water collects around the taps.
- Keep the dosing can, stock box and test kit inside the lockable box next to the platform, never on the tank lid.
- Put the instruction sheet (pages 9 and 10) and the daily log on the platform leg in a plastic sleeve.



Bill of materials, System 2

Indicative Faridabad / NCR prices, 2026. Collect two written quotes per item before ordering.

#	ITEM AND SPECIFICATION	QTY	UNIT	RATE RS	AMOUNT RS
1	Water tanks. 500 L triple-layer UV-stabilised PE tank with lid (Sintex / Plasto style), duty and standby	2	no.	4,300	8,600
2	Raised platform. MS frame: 75×75×6 angle columns, 1.5 m high, deck 2.0 m x 1.0 m, 50×50 angle bearers, 6 mm plate, braced, epoxy painted, rated at least 1.8 t	1	no.	17,500	17,500
3	Footings. Concrete footing pads 450 × 450 × 300 mm, anchor bolts	4	no.	600	2,400
4	Pre-filter housing. 20 inch jumbo housing, 1 inch BSP, polypropylene, with pressure-relief button	1	no.	2,600	2,600
5	5-micron cartridges. 20 inch spun polypropylene sediment cartridge, 5 micron (1 fitted, 3 spare)	4	no.	380	1,520
6	Pressure gauges. 0 to 4 bar, 1/4 inch, fitted at housing inlet and outlet	2	no.	240	480
7	Housing wrench. Cartridge housing wrench	1	no.	150	150
8	Brass ball valves. 1 inch brass ball valve: inlet isolation, drain, tank inlets x2, tank outlets x2	6	no.	340	2,040
9	Float valves. 1 inch brass float valve, one per tank, prevents overflow	2	no.	520	1,040
10	Piping. 1 inch CPVC / PVC pipe, 20 m, SCH 40	20	m	85	1,700
11	Pipe fittings. Tees, elbows, unions, reducers, thread tape	1	lot	1,400	1,400
12	Tank connectors. 1 inch tank connectors for float valve, outlet and overflow	6	no.	220	1,320
13	Chlorine dosing dispenser. 20 L opaque HDPE stock can with tap and wall bracket, 250 mL dosing cylinder, two 6 mm drip lines with shut-off clips	1	set	1,100	1,100
14	Mixing paddles. PVC pipe and plate paddle, 1.2 m	2	no.	150	300
15	Stainless manifold. SS304 header pipe 40 mm x 1.8 m with end caps, wall brackets and six 15 mm SS304 bib taps (6 × 380 + pipe and fittings)	1	set	5,200	5,200
16	Drip tray and drain. SS304 tray, 1.8 m x 0.3 m, with 25 mm drain	1	no.	2,100	2,100
17	Vent screens and lid locks. Insect mesh vent covers and padlock hasps	2	set	300	600
18	Chlorine test kit. DPD No.1 free-chlorine kit with 250 tablets	1	kit	1,100	1,100
19	Bacteriological test vials. H2S paper-strip vials for coliform presence, 10 tests	10	no.	150	1,500
20	TDS and pH meter. Handheld combo meter with calibration solution	1	no.	1,200	1,200
21	Disinfectant. Bleaching powder, 33% available chlorine, 5 kg	5	kg	120	600
22	Protective gear. Gloves, splash goggles, apron, dust mask	1	set	450	450
23	Lockable chemical box. Ventilated steel box, 40 L, with padlock, plus weatherproof safety signage	1	set	2,200	2,200
24	Installation labour. Fabricator 2 days, plumber 1 day, helper 2 days	1	lot	6,000	6,000
TOTAL CAPEX, SYSTEM 2					Rs 63,100

Optional upgrade: a 0 to 4 L/h diaphragm dosing pump (230 V), about Rs 9,500, automates dosing but needs mains power and a trained operator.

Optional saving: use a single 1,000 L tank (about Rs 7,800) instead of two 500 L tanks, accepting a pause in service during each contact period. Have a fabricator or structural engineer confirm the platform design for your site before casting footings.

Standard operating procedure: dosing and contact

Daily dose table: chlorine against tank volume

TANK L	TARGET MG/L	CHLORINE NEEDED G	BLEACHING POWDER G (33%)	NADCC G (50%)	1% STOCK ML	USE WHEN
200	2	0.4	1.2	0.8	40	Clear water, low demand
200	3	0.6	1.8	1.2	60	Default for site water
200	5	1.0	3.0	2.0	100	Turbid, iron above 0.3 mg/l, first fill, monsoon
500	2	1.0	3.0	2.0	100	Clear water, low demand
500	3	1.5	4.5	3.0	150	Default for site water
500	5	2.5	7.6	5.0	250	Turbid, iron above 0.3 mg/l, first fill, monsoon
1000	2	2.0	6.1	4.0	200	Clear water, low demand
1000	3	3.0	9.1	6.0	300	Default for site water
1000	5	5.0	15.2	10.0	500	Turbid, iron above 0.3 mg/l, first fill, monsoon

Formula: product grams = volume (L) x target mg/l / 1,000 / available-chlorine fraction. Stock mL = volume (L) x target mg/l / 10. Check the product label; if bleaching powder is older than 3 months, or the label is missing, assume 25% and multiply the grams by 1.3. Default is 3 mg/l.

Batch procedure, per tank

- 1 Check the other tank is full and ready to serve, then close the dispensing valve of the tank to be filled.
- 2 Open the inlet and let it fill to the float-valve level (500 L). Read gauges P1 and P2.
- 3 Measure the stock into the 250 mL cylinder: 150 mL for 3 mg/l. Pour it into a bucket of water, then into the tank while filling.
- 4 Stir top to bottom with the paddle for 1 minute. Close the lid and lock it. Write the time on the log.
- 5 Wait 30 minutes (60 minutes if water is below 15 C, which is common in NCR winter mornings, or pH above 8).
- 6 Draw a sample from the farthest tap. Free chlorine must be 0.2 to 0.5 mg/l. Record it, then open the tank for dispensing.
- 7 If under 0.2 mg/l, add 1 mg/l of stock and wait 15 minutes. If over 1.0 mg/l, let it stand uncovered 2 hours or dilute with the next batch.

Worked example

Tank A, 500 L, default 3 mg/l. Chlorine needed is $500 \times 3 / 1,000 = 1.5$ g. That is **150 mL of 1% stock**, or 4.5 g of 33% bleaching powder, or 3.0 g of 50% NaDCC. Mix, wait 30 minutes, test.

Contact time

CONDITION	DOSE MG/L	HOLD MIN
Clear water, 15 C or warmer, pH 8 or below	2 to 3	30
Water below 15 C (winter mornings) or pH above 8	3	60
Turbid over 5 NTU, iron above 0.3 mg/l, monsoon, first fill after cleaning	5	60

Reading the residual

FREE CHLORINE AFTER CONTACT	ACTION
Under 0.2 mg/l	Do not serve. Add 1 mg/l of stock, wait 15 minutes, retest. Raise the standard dose by 1 mg/l.
0.2 to 0.5 mg/l	Serve. Record the reading.
0.5 to 1.0 mg/l	Serve. Cut the next dose by 0.5 mg/l.
Over 1.0 mg/l	Hold. Leave the lid off 2 hours or blend with the next batch, then retest. Cut the next dose by 1 mg/l.

Chlorine does not kill everything at any dose. Cloudy water, high iron and skipped contact time all reduce its effect, which is why the cartridge and the hold time are part of the procedure.



Monitoring, replacement and safety

ITEM	FREQUENCY AND TRIGGER
Free chlorine residual (DPD)	Every batch, at the farthest tap, after contact time
5-micron cartridge	Every 4 weeks as a default. Earlier if P1 minus P2 is 0.7 bar or more, or flow drops 30%. Every 1 to 2 weeks in monsoon or excavation. Never beyond 8 weeks.
Cartridge housing	At every change: wash, wipe the O-ring, rinse with 50 mg/l chlorine for 5 minutes, flush
Tank scrub and rinse	Every 4 weeks, one tank at a time, soft brush, no detergent
Tank disinfection	Every 3 months: 50 mg/l chlorine for at least 12 hours, then drain and flush until residual is under 1.0 mg/l
H2S bacteriological vial	Weekly, one tank at a time; any positive means re-clean and re-dose
TDS and pH	Weekly with the meter; investigate a TDS jump of more than 20%
Full lab panel	Every 3 months at a NABL-accredited lab, IS 10500 basic set
Stock solution	Make fresh every 7 days, opaque can, shaded, locked

Running cost per month, System 2

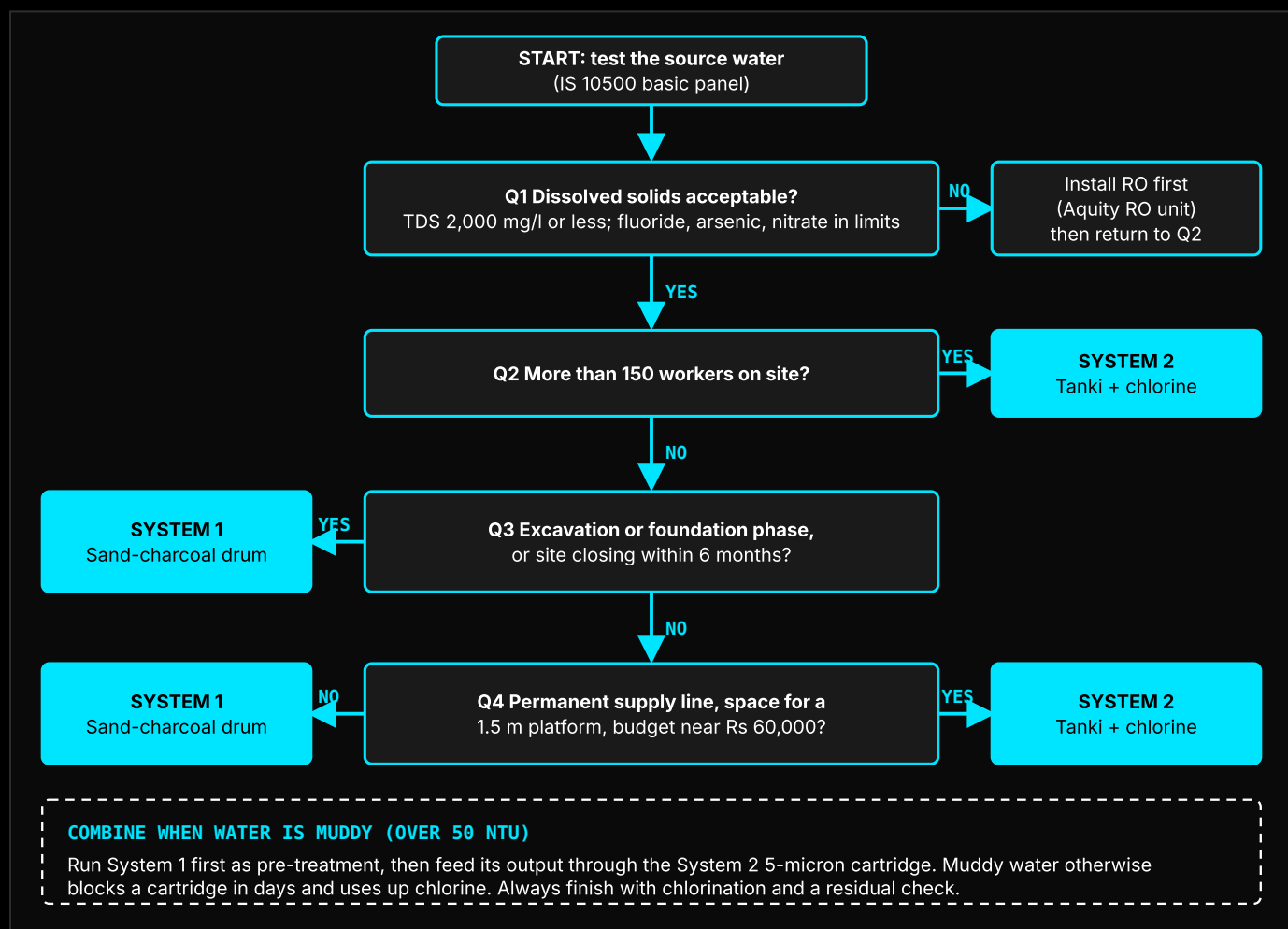
5-micron cartridge, about 1 per month	380
Bleaching powder (about 0.8 kg per month)	100
DPD tablets, 2 per day plus checks	330
H2S bacteriological vials, 4 per month	600
Tank scrub and disinfection materials	150
Quarterly lab panel, IS 10500 basic set (about 4,000 per test)	1,333
Total per month	Rs 2,893

Chemical safety. Handle bleaching powder only with gloves, goggles and a dust mask, in open air. Never mix with acids, ammonia or cleaning products. Store in a closed, labelled, locked box, dry and away from sun and fuel. On skin or eyes, rinse with clean water for 15 minutes.

Comparison matrix

CRITERION	SYSTEM 1: SAND-CHARCOAL DRUM	SYSTEM 2: TANKI AND CHLORINE
Daily capacity	500 to 800 L/day	3,000 to 4,000 L/day
Workers served (4 L each)	125 to 200	500 or more
Build time	1 day, 2 helpers	3 days: fabricator, plumber, helpers
CapEx	Rs 19,309	Rs 63,100
OpEx per month	Rs 3,068 (about Rs 170 per 1,000 L)	Rs 2,893 (about Rs 32 per 1,000 L)
Electricity	None	None (pump optional)
Turbidity output	Typically under 5 NTU, target 1 NTU or less	5-micron cartridge; works best under 50 NTU raw
Microbiological safety	Only with chlorine dosed in the vessel; filtration alone is not enough	Chlorine at a fixed dose with a 30-minute contact tank
Dissolved salts, hardness	Not reduced	Not reduced
Operator skill	Basic; daily bucket test and weekly scrape	Trained attendant for dosing and records
Main failure mode	Clogged sand, exhausted charcoal, skipped dosing	Empty stock can, old cartridge, unlocked chemicals
Design life	Drums 3 to 5 years; media per schedule	Tanks and platform 10 or more years
Best-fit site phase	Excavation and foundation: dusty, changing site, closing within 6 months	Finishing and long projects: fixed site layout, over 6 months, over 150 workers

Decision tree



**Commissioning checklist (sign each line before the system is declared in service)**

DONE	CHECK	PASS CRITERION
☐	Source water tested for TDS, hardness, chloride, iron, turbidity, pH	Report on file; Q1 of decision tree passed
☐	Drums and tanks are food-grade, scrubbed and disinfected	Marking seen; 50 mg/l rinse done
☐	Stand or platform level, braced, anchored	No rocking under load
☐	All joints dry after 1 hour under full head	No drips
☐	Flow set and timed (System 1) or P1 minus P2 recorded (System 2)	30 to 40 L/h, or under 0.2 bar clean
☐	First batch dosed and tested at the farthest tap after contact	0.2 to 0.5 mg/l free chlorine
☐	H ₂ S vial negative on the first tank of water	No colour change in 48 h
☐	Chemical box locked, signage fitted, operator trained and log sheet issued	Operator can state the dose and the test

Document control

Document	AQ-INF-001, On-Site Water Purification & Infrastructure Blueprint
Revision	1.0, issued 29 October 2026
Owner	Aqurity Initiative, Infrastructure & Safety
Status of figures	Costs and the ROI model are planning estimates for NCR in 2026. Dose and contact-time values follow common IS 10500 and WHO small-system practice. Confirm with local quotes, a site test and a qualified engineer or public-health officer before the system serves drinking water.