

PebbleCrete Specification

Section 13 11 00 — Exposed-Aggregate Cementitious Pool Interior Finish

DOCUMENT
Guide specification

FORMAT
CSI MasterFormat, 3-part

REVISION
2026-10

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GUIDE SPECIFICATION — EDIT BEFORE USE A starting point for the project specification, not a finished one. **Complete the angle-bracket fields, check the clauses marked for a local check, and delete the specifier notes before issue** — the markings are explained below. The specifier remains responsible for the project specification and for its incorporation into the contract documents.

How the documents fit together. The Section states the requirements. It incorporates the PebbleCrete Method Statement and Technical Data Sheet at **Revision 2026-10** by "comply with" clauses, and sets the order of precedence in 1.3.C: **the Section, then the Method Statement, then the Technical Data Sheet**. A later revision applies only by the Architect's written instruction; a conflict is referred to the Architect before the work proceeds. Hold points H1 and H2 are recorded on the PebbleCrete Substrate Acceptance Protocol. Short-form clauses for NBS-style or general use are in Appendix A.

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For the specifier to complete or choose; delete the options that do not apply.

▲ **LOCAL CHECK**

Check against the law, codes and standards of the country of the project (Appendix B).

SPECIFIER NOTE

Guidance in the paragraph style "Specifier Note". To remove every note before issue, select one note, choose Select All Text With Similar Formatting, and delete.

H1 · H2

Hold points: work does not proceed until the release is recorded (3.4).

PART · 1.1 · A.

Automatic Word list numbering: deleting a paragraph rennumbers the rest. Cross-references in the text are typed — check them after editing.

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Section number. MasterFormat 2020 has no level-3 number specifically for pool interior finishes. We suggest **13 11 00 Swimming Pools** — as a separate section with a level-4 number assigned by the specifier, or as articles within the pool section. 13 11 13 Below-Grade Swimming Pools fits only where the whole in-ground pool is specified in one section. Where the project keeps finishes in Division 09, 09 97 23 Concrete and Masonry Coatings is an alternative. **The project specifier assigns the final number.** The editable .docx is available from info@pebblecrete.com.

Status of this document. This guide specification is technical information offered to specifiers as a starting point. It is not an offer and not a contract, and it does not create, extend or vary our warranty. PEBBLE CRETE CO., LTD. supplies material and technical documentation; it does not install and does not supervise installation unless agreed in writing. The specifier remains responsible for the project specification. In the Section, figures given with a tolerance or as a limit are requirements; figures introduced by "approximately" or "about" are descriptions or planning estimates, not acceptance criteria. Nothing in it excludes or limits liability for death or personal injury, for fraud, wilful misconduct or gross negligence, or any liability that cannot be excluded or limited under the applicable law, including, in Thailand, the Act on Liability for Injuries from Unsafe Products B.E. 2551. Where this document is issued in more than one language, the English text prevails. PebbleCrete™ is a trademark.

SECTION 13 11 00 <.xx>**EXPOSED-AGGREGATE CEMENTITIOUS POOL INTERIOR FINISH**

Project: <project name> · Project no. <number> · Issue <date / revision>

PART 1 GENERAL**1.1 SUMMARY**

- A.** Section includes the cement-based exposed-aggregate interior finish to the pool shell — **walls, floor and steps** — of <pool name(s)>, as shown on the drawings, and the layers beneath it that form the finish system:
1. Bond coat on the prepared shell, and render or levelling: <in this Section / in Section number, by the shell builder>.
 2. Bond coat, suction-control coat and upper bond coat: <in this Section / in Section number>.
 3. Cement primer on the walls, pigmented on coloured work, and the exposed-aggregate finish, 10 mm.
 4. Acid wash, filling, start-up and water care until handover.
 5. Existing pools: <not applicable / removal of the existing finish and tiles to sound concrete, Section 02 41 19>.
- B.** Not included: benches, coping, decks, walls above the waterline and any other surface that is not submerged in service. Where they are to receive an exposed-aggregate finish, specify them in Section <number>.

SPECIFIER NOTE Trades. Decide which trade provides the render, the bond coats and the suction-control coat. Where the shell builder provides them, specify them in the shell section by cross-reference to 2.7, 2.8, 3.2 and 3.3 of this Section — do not copy the text there — and keep hold point H1 in this Section: the installer of the finish accepts the layers it bonds to.

Surfaces outside the pool. For benches, coping and other surfaces outside the waterline, the manufacturer's minimum thickness is 9 mm (three times the nominal upper grain size). They are outside the model installer warranty, which covers only surfaces submerged 100 % of the time (2.2.C).

Existing pools. For a refurbishment keep 1.1.A.5, 1.2.I and 3.2.A; otherwise delete them.

1.2 RELATED REQUIREMENTS

- A. Section <03 30 00 Cast-in-Place Concrete / number>: pool shell, including its watertightness.
- B. Section <number>: pool fittings — inlets, drains, lights, skimmers; setting height: 3.1.A.3.
- C. Section <09 30 00 Tiling / number>: <water-line tile band,> step nosings, tile lines and coping.
- D. Section <number>: pool equipment and water treatment.
- E. Section <number>: hydrostatic relief, as designed by the pool designer.
- F. Section 01 25 00 Substitution Procedures.
- G. Section 01 31 19 Project Meetings.
- H. Section 01 33 00 Submittal Procedures.
- I. Section 02 41 19 Selective Demolition: <removal of existing pool finishes / not applicable>.

1.3 REFERENCES AND PRECEDENCE

- A.** Reference standards — the edition current at <the date of the contract / date>:
1. ACI 305R — Guide to Hot Weather Concreting (evaporation-rate nomograph).
 2. ASTM C150/C150M — Standard Specification for Portland Cement.
 3. ASTM C1583/C1583M — Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).
 4. ASTM E313 — Standard Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates.
 5. EN 197-1 — Cement — Part 1: Composition, specifications and conformity criteria for common cements.
 6. EN 1542 — Products and systems for the protection and repair of concrete structures — Test methods — Measurement of bond strength by pull-off.
 7. EN 12004-1 — Adhesives for ceramic tiles — Part 1: Requirements, assessment and verification of constancy of performance, classification and marking; ISO 13007-1 — Ceramic tiles — Grouts and adhesives — Part 1: Terms, definitions and specifications for adhesives.

8. EN 12004-2:2017 — Adhesives for ceramic tiles — Part 2: Test methods; ISO 13007-2 — Ceramic tiles — Grouts and adhesives — Part 2: Test methods for adhesives.
 9. EN 14891 — Liquid-applied water-impermeable products for use beneath ceramic tiling bonded with adhesives (used here only for the adhesion values of the suction-control coat).
 10. ISO 8502-3 — Assessment of dust on surfaces prepared for painting (pressure-sensitive tape method) (used here only for its pictorial dust-quantity rating scale).
 11. TIS 133-2562 (สทน. 133-2562) — White Portland cement (Thailand). ▲ **LOCAL CHECK**
- B.** Manufacturer's documents are not reference standards. Where this Section says "comply with" one of them, it means this revision: **PebbleCrete Method Statement — Rev 2026-10** (the Method Statement); **PebbleCrete Technical Data Sheet (TDS) — Rev 2026-10** (the TDS); **PebbleCrete Substrate Acceptance Protocol — Rev 2026-10** (the Protocol). A later revision applies only by the Architect's written instruction. Where the Installer finds that a later revision has been issued, it notifies the Architect in writing before starting the work affected.
- C.** Order of precedence: first this Section, then the Method Statement, then the TDS. Refer any conflict or ambiguity between them to the Architect in writing, and do not proceed with the work affected until the Architect has responded.
- D.** Methods: where this Section describes a method — for example the tape test, the spiked foot-boards, the iron and copper test of the fill water or the filling bin — it is the method of the Method Statement. Use another method only where the Architect accepts it in writing; the results required by this Section apply in either case.

1.4 DEFINITIONS

- A. Architect:** the architect or other contract administrator named in the contract.
- B. Installer:** the firm that applies the finish under its own contract.
- C. Substrate provider:** the party that built the shell or applied the render, a bond coat or the suction-control coat, where that is not the Installer.
- D. Suction-control coat:** a rigid cementitious coat that reduces and evens out the suction (water absorption) of the substrate and gives a sound cementitious surface for the bond coat; not a waterproofing membrane.
- E. Bond coat:** a continuous thin coat of polymer-modified cementitious tile adhesive.
- F. Primer:** a slurry of white cement and water of thick, creamy consistency, pigmented on coloured work, applied to the walls with a trowel or a roller immediately before the finish (2.9).
- G. SSD (saturated-surface-dry):** damp, not dry, without standing water.
- H. Mix:** the unit of batching, called a "batch" in the Method Statement and the TDS — three 25 kg bags of aggregate, 40 kg of white Portland cement, the modifier dose and, where the colour includes one, one pigment pack.
- I. Production lot:** material of one product that its manufacturer has marked with one batch or lot number — for the aggregate, modifier and pigment packs, the number on the bag or pack; for white cement, the lot number or the manufacture or packing date on the bag.
- J. Surface:** one element laid as a unit — the steps, a wall run between planned stops, or the floor.
- K. Reference plane:** the finished face of the upper bond coat (layer 6, 2.2.A), from which fittings are set.
- L. Hold point:** a stage beyond which work does not proceed until the release stated in 3.4 is recorded in writing.

1.5 ADMINISTRATIVE REQUIREMENTS

- A.** Coordination: coordinate the shell, render, fittings, tiling, coping, pool equipment and water supply so that the conditions of 3.1 are met before the substrate work begins and the pool can be filled within the window of 3.9.B.
- B.** Pre-installation meeting: Section 01 31 19. Convene it before the substrate work begins, with the Architect, the main contractor, the substrate provider, the Installer, the pool equipment contractor and *<the Owner's operator>*. Agenda: layer order, products and hold points; the Protocol and who signs it; stops and joints; the number of trowel passes; hot-weather and rain measures; the fill day, filling rate and start-up; water-care handover.
- C.** Sequencing:
1. Complete before the finish: tiling and coping; fittings set; pool equipment installed with pumps working; fill water arranged.
 2. Apply the finish in the order steps, walls, floor; plan stops and joints before the work starts (3.6.D).

3. **Acid wash, fill and start up the pool as one continuous operation, within the window of 3.9.B after the whole pool has been laid.** The main contractor provides water, power and access for filling or, failing that, for misting and drainage (3.10.G).
4. If the pool cannot be filled within that window, do not acid wash it (3.10.G).
- D. Written notice: before the finish is applied, the Installer gives written notice to the Owner and the Architect of the requirements of 3.9 and 3.10 and of the consequences of not meeting them.
- E. Departures from this Section, the Method Statement or the TDS: only on the Architect's written instruction, issued after the Installer has stated in writing what it considers wrong with the departure and the consequences it expects. Keep both with the project record.
- F. Manufacturer's written acceptance, where required (2.8.B, 3.12.E): allow <number> working days from the manufacturer's receipt of a complete data sheet or proposal, and include that time in the programme. The acceptance is a documentary check against the criteria of this Section and the Method Statement; it is not a design approval, a warranty or supervision of the work.

SPECIFIER NOTE Keep 1.5.D and 1.5.E as written. The notice and the statement of consequences protect the Installer where the Owner or others prevent the wet cure; the Method Statement (section 19) and the model installer warranty (clause 6, item 11) use the same rule.

1.6 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.
- B. Action submittals:
 1. Product data: the TDS; for the dry modifier supplied in Thailand, also the PebbleCrete Dry Cement Modifier — TDS Rev 2026-10.
 2. Bond coat: for a product named in 2.7.A, its current data sheet; for an equivalent, a data sheet showing each requirement of 2.7.B.
 3. Suction-control coat: for weberdry tex, its current data sheet; for an equivalent, a data sheet showing each criterion of 2.8.B, and the manufacturer's written acceptance.
 4. White Portland cement: data sheet or test report showing conformity with 2.5, with the whiteness test method stated, and the evidence of the alkali limit required by 2.5.E.
 5. Colour samples: the manufacturer's physical samples for <product line, colour>.
 6. Programme: fill-day arrangements — water source and filling rate, power, working pumps, access; planned stops and joints; allocation of production lots to surfaces; start-up arrangements (3.10.F).
 7. Installer's warranty: draft, for the Architect's approval before the work starts.
- C. Informational submittals:
 1. Installer qualifications (1.7.A).
 2. Safety Data Sheets: aggregate; the modifier supplied; for the pigment packs, the manufacturer's safety information, on request; the cement, adhesives, suction-control coat and acid obtained locally.
 3. Sample panel record (1.8); the manufacturer's Mock-up approval record may be used.
 4. **Signed Protocol:** H1 released, with photographs, before the upper bond coat; H2 recorded before the finish (3.4).
 5. Field records: tape tests, pull-off tests, surface temperatures, evaporation rates and thickness readings (3.12.C).
 6. Delivery records: delivery notes with production lot numbers and packing dates.
 7. The written notice (1.5.D), and any statement and instruction on a departure (1.5.E).
- D. Closeout submittals:
 1. Installer's warranty, executed at handover (1.12.B).
 2. PebbleCrete Material Warranty — Rev 2026-09, with the delivery notes and production lot numbers, and the Installer's written statement of the Owner's route for material defects (1.12.A).
 3. Water-care values handed to the Owner in writing (3.14.A).
 4. Start-up log from filling to handover (3.10.F).
 5. Installer's completed quality checklist (Method Statement, section 16), with production lot numbers and photographs of the cement bag markings.
 6. Acceptance inspection record (3.12.D).
- E. Maintenance material submittals: extra stock for repairs — aggregate and pigment packs from the production lots used, <quantity, for example 2 % of the area and not less than one mix per colour>, in sealed, labelled

bags and packs, delivered to *<the Owner's store>*. Do not stock the modifier: it has a 12-month shelf life and is supplied fresh at the time of a repair.

1.7 QUALITY ASSURANCE

- A. Installer qualifications — one of:
 - 1. Experience: *<number>* completed exposed-aggregate cementitious pool finishes of similar size and type in the last *<number>* years; evidence: project list with contact references *<and photographs>*.
 - 2. Training and experience: foreman and crew leader trained at the **PebbleCrete Masterclass**, evidenced by the record of training, and *<number>* completed pool finishes, evidenced as in 1.
- B. The Architect evaluates the evidence and may reject an installer whose evidence does not show the qualification.

SPECIFIER NOTE The PebbleCrete Masterclass is held on request at the manufacturer's facility in Phuket, Thailand. It is a record of training only: it does not make the installer an agent or representative of the manufacturer, does not approve or authorise the installer, and creates no warranty by the manufacturer. The manufacturer supplies material and technical documentation and gives technical advice on request; it does not install, and does not supervise or inspect installation unless agreed in writing.

- C. Single source and production lots: material for one pool from one manufacturer; white cement for one pool from one cement manufacturer. Supply the aggregate, the pigment packs and the white cement for each surface from one production lot of each. Where one surface needs more than one lot, show the change at a planned stop in the programme (1.6.B.6).
- D. Documents on site: keep the Method Statement, the TDS, the Safety Data Sheets and the Protocol on site throughout the work.
- E. Regulatory requirements: *<codes and regulations applicable to public or private pools, construction work and waste in the country of the project>*. ▲ **LOCAL CHECK**

1.8 SAMPLE PANEL (MOCK-UP)

- A. Before the work begins, make a site sample panel of the actual mix — the same product line, colour, cement, water and method — *<size, for example 1.0 × 1.0 m minimum>*, on a representative substrate at a location agreed with the Architect. Expose and acid wash it as specified.
- B. Record on the panel record the water per mix, the number of trowel passes and the date, with photographs. Use that number of passes on every surface (3.6.E).
- C. Slip resistance: where the applicable code requires a classification, have *<the party responsible for the finished surface>* test the panel, or laboratory specimens made from the panel mix, to *<test method and class required by the code>*, before the colour is approved. A result below the class required is a failure of the panel: do not proceed in the areas where the class applies until the Architect has issued an instruction. ▲ **LOCAL CHECK**
- D. Approval: in writing by *<the Architect / the Architect and the Owner>* on the Mock-up approval record (hold point H3 of the Method Statement). Assess colour and exposure in daylight with the surface wet; do not assess colour under artificial light.
- E. The approved panel is the acceptance standard for colour and degree of exposure of the installed finish; it is not a material-warranty reference. Retain it until *<completion>*; incorporation into the work: *<permitted / not permitted>*.

SPECIFIER NOTE Delete 1.8.C where no slip-resistance class is required. Barefoot ramp tests such as DIN 51097 are laboratory tests on specimens; state whether specimens are made from the panel mix.

Colour is produced to the manufacturer's standard recipes, with one pre-weighed pigment pack per mix where the colour includes one. Images and loose samples show colour family and texture only; the shade of a finished surface depends on the cement, the water, the application, the acid wash and the water chemistry. A difference in shade between the finished surface and a sample, a swatch or a previous pool is not a defect of the material (Material Warranty, 3.2). Where an order is placed against an approved dry material sample, the Material Warranty governs conformity of the dry material to that sample. The signed panel fixes the appearance of the installed finish for the project; it is not a material-warranty reference.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver in the manufacturer's sealed bags and packs, marked with product line, colour and production lot number; modifier packs with their packing date. Deliver not earlier than *<number>* weeks before use.
- B. Inspect on receipt, opening one bag of each production lot. Report visible defects in writing to the supplier within 7 days of receipt and before the material is used. Report rust staining from the aggregate that appears within 12 months of delivery promptly after it is found.

- C. Retain one unopened bag, or a sealed sample, of each production lot of aggregate, labelled with the lot number and delivery date, until *<the end of the Installer's warranty period>*.
- D. Store covered, off the ground, dry and out of direct sunlight. Keep dry modifier sealed and dry; store liquid modifier at 5–35 °C. Do not use modifier later than **12 months from its packing date**.
- E. White cement: sealed bags marked with a packing or manufacture date or a lot number; store dry; check for lumps before mixing. Where the bags are not 40 kg, weigh 40 kg for each mix.

1.10 FIELD CONDITIONS

- A. Temperature: material and all surfaces **10–38 °C**, for 24 hours before and 72 hours after application. Measure the surface temperature at the start of each surface *<with a contact or infrared thermometer>* and record it. Where a surface is above 38 °C, bring it into range with the measures of 3.8 before application.
- B. Air temperature above 38 °C: apply only with the measures of 3.8.
- C. Evaporation: calculate the evaporation rate (ACI 305R nomograph) at the start of each surface and *<every 2 hours>* during application, and record it. Where it exceeds **1.0 kg/m²/h**, do not apply the finish until the measures of 3.8 have brought it to 1.0 kg/m²/h or below.

SPECIFIER NOTE The 1.0 kg/m²/h threshold is not conservative for a 10 mm section: plastic-shrinkage cracking is possible below it. Keep the measures of 3.8 in place in hot, dry or windy weather even below the threshold.

- D. Rain: do not apply the finish if rain is expected within 24 hours after application, unless the pool is fully tented or covered so that neither rain nor run-off reaches the fresh finish.
- E. Water from outside: none entering the shell through the concrete, joints or penetrations when the finish is applied and until the pool is filled.
- F. Night work: permitted within the same limits, with lighting of not less than *<illuminance, for example 300 lux>* at the working surface and no condensation on the surface.

1.11 HEALTH AND SAFETY ▲ LOCAL CHECK

- A. Comply with the Safety Data Sheets of the materials (1.6.C.2) and with *<the occupational health and safety law of the country of the project>*. Site safety, including personal protective equipment and dust control, is the responsibility of the Contractor.
- B. Address in the site safety plan: respirable crystalline silica from dry handling, cutting or sweeping of the natural aggregate; strongly alkaline wet cement mixes, which can burn skin without immediate pain; hydrochloric acid — its dilution (acid into water), its fumes in a deep, tented or enclosed pool (ventilate), and its reaction with chlorine products.

1.12 WARRANTY ▲ LOCAL CHECK

- A. Material warranty: the **PebbleCrete Material Warranty — Rev 2026-09** is given to the buyer of the material. Where the Installer buys the material, directly or through its supplier, the Material Warranty passes down the supply chain to the Installer, who holds it, makes and pursues any claim under it, and uses the replacement material or credit received towards the repair under the Installer's warranty (1.12.B); **the Owner's route for a material defect in the finished work is then the Installer's warranty** (1.12.B). Where the Owner buys the material, the Owner holds the Material Warranty and makes any claim under it; any arrangement between the Owner and the Installer for the repair is a matter between them.
- B. Installer's warranty: a written warranty given by the Installer **in its own name**, *<on the manufacturer's Recommended Installer Warranty — Template Rev 2026-10 / on the Installer's form approved by the Architect>*, which:
 1. covers loss of bond from a substrate the Installer prepared or accepted at H1, loss of aggregate from the matrix, finishing defects in the Installer's application, and defects caused by material failing the Material Warranty;
 2. runs for *<period, not less than the statutory period>* from *<the fill date / the later of the fill date and the day after payment in full>*;
 3. is subject to *<maintenance conditions set out in the Installer's care guide>*;
 4. provides that covered defects are remedied free of charge to the Owner, including materials, labour, draining and refilling.
- C. These warranties are in addition to, and do not limit, the Owner's rights under the contract and the law.

SPECIFIER NOTE Material Warranty. It covers the material only — aggregate, cement modifier and pigment packs — from delivery, to the buyer and down the supply chain to the installer. Visible defects are notified within 7 days of receipt; rust staining from the aggregate that appears within 12 months of delivery. Remedy: replacement material or a credit of its invoice value. The manufacturer gives no warranty on installation, workmanship or the finished pool surface, no system warranty and no warranty jointly with any installer, dealer or distributor; it is not a party to the installer's warranty.

Period. The model installer warranty recommends 3 years for residential and 1 year for commercial pools, with maintenance the installer can see. State a period not less than the statutory liability period for building work in the country of the project. In Thailand, Civil and Commercial Code sections 600–601 set the contractor's liability for defects, with a longer period for a structure built on land; take local legal advice on whether the pool is such a structure before stating the period.

Start. The model starts the warranty on the later of the fill date and the day after payment in full (its clause 3). Where retention money is held, that start is deferred for as long as the retention is held; choose the start date with this in mind.

Submerged surfaces. The model covers only surfaces that are under water 100 % of the time. Without a water-line tile band, the strip of finish between the water line and the coping is outside it (2.2.C).

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Basis of design: **PEBBLE CRETE CO., LTD.** (บริษัท เพเบิล ครีท จำกัด), 61/25 Moo 3, Sakhu, Thalang, Phuket 83110, Thailand. LINE @pebblecrete · info@pebblecrete.com · www.pebblecrete.com.
- B. Source of supply: <the manufacturer direct / the manufacturer's distributor for the country of the project>.
- C. Substitutions: <not permitted / Section 01 25 00, for a system that meets 2.2 to 2.12 and allows hold points H1 and H2>. ▲ **LOCAL CHECK**

SPECIFIER NOTE Public procurement rules in some countries require a named product to be followed by "or equivalent" with stated criteria. Where that applies, use 2.2 to 2.12 as the criteria and keep hold points H1 and H2.

2.2 SYSTEM DESCRIPTION

- A. System, from the bottom up (Method Statement, 4.1):

Layer	Material and requirement
7 Finish	Exposed-aggregate finish (2.4), 10 mm, tolerance 9–11 mm; on the walls over a white-cement primer, pigmented on coloured work (2.9)
H2 Hold point	Bond coat ready — matured and firm, no longer tacky, with a sound surface free of dust and loose material (3.4.E)
6 Bond coat	Cementitious tile adhesive, grey, 2–3 mm (2.7); its finished face is the reference plane for fittings
H1 Hold point	Suction-control coat accepted — Protocol signed and H1 released (3.4.D)
5 Suction-control coat	weberdry tex or an accepted rigid equivalent (2.8); two coats, 2–3 mm
4 Bond coat	Cementitious tile adhesive, finished smooth — no notched trowel
3 Render or levelling	Cement render or screed, applied onto layer 2 while it is fresh (3.3.A)
2 Bond coat	Cementitious tile adhesive on the prepared shell
1 Concrete shell	In-ground monolithic reinforced concrete; watertight by its builder (1.2.A)

- B. Finish: 1–3 mm grains exposed in a white-cement matrix, **10 mm, tolerance 9–11 mm**; colour and degree of exposure as the approved sample panel (1.8.E). For description only: at normal exposure the grains stand proud by about one quarter of their diameter; at more than about one third they begin to loosen (over-exposure).
- C. Surfaces under water: design and build every surface that receives the finish so that it is under water in service. Set beach entries, lagoon shallows and ledges below the overflow crest of a flush overflow edge, with not less than <minimum water depth over the highest point of finish> of water over the highest point of the finish, renewed while circulation runs and remaining in place when it stops. Do not apply the finish to shallows built above the overflow level with a film of water flowing over them (wet-deck designs), or to surfaces left dry in direct sun.

SPECIFIER NOTE A water-line tile band is an option, not a requirement; deposits at the water line are routine cleaning. Without a tile band, the strip of finish between the water line and the coping is not under water 100 % of the time and is outside the model installer warranty. State the minimum water depth to match clause 4 of that warranty.

- D. Shell type: this Section applies to in-ground monolithic reinforced-concrete shells.

SPECIFIER NOTE For pools on or in buildings, rooftop, elevated or suspended pools, pools without backfill, and block or brick shells, consult the manufacturer before design. The finish system is rigid and does not accommodate structural movement; the pool designer remains responsible for the design, and the manufacturer's advice is not a design approval.

2.3 PERFORMANCE REQUIREMENTS

- A. No slip-resistance, service-life, freeze–thaw or watertightness performance is specified for the finish system. Where the applicable code requires a slip-resistance classification, it is determined as 1.8.C. ▲ **LOCAL CHECK**
- B. The suction-control coat and the finish are not waterproofing layers. The watertightness of the pool is specified in Section <number> (1.2.A).

SPECIFIER NOTE The manufacturer states no slip-resistance value and no service life, and makes no claim for performance in freezing conditions, watertightness or structural function (TDS, "What we do not claim").

2.4 POOL FINISH

- A. Product: **PebbleCrete™ <Classic / Supreme / Glass>** exposed-aggregate pool finish, formed on site from the manufacturer's aggregate, cement modifier and, for pigmented colours, pre-weighed pigment pack, with white Portland cement obtained locally:
1. PebbleCrete Classic — exposed aggregate finish.
 2. PebbleCrete Supreme — glass beads in every blend, with natural aggregate or glass crystals.
 3. PebbleCrete Glass — exposed glass finish, glass beads only.
- B. Aggregate: screened (washed where required), **fraction 1–3 mm**, with not more than 10 % by mass coarser than 3 mm and not more than 10 % by mass finer than 1 mm; 25 kg bags, nominal, average net weight per bag of a production lot not less than 24.5 kg; contains no cement.
- C. Colour: **<colour name>** from the manufacturer's current range, selected from the manufacturer's physical samples; one pre-weighed pigment pack per mix where the colour includes one. Acceptance standard: the approved sample panel (1.8.E).
- D. Cement modifier, supplied by the manufacturer and named on the delivery note: *<liquid (export): 500 mL per 25 kg bag of Classic or Supreme, 1 L per bag of Glass / dry (Thailand): 500 g per 25 kg bag of Classic or Supreme, 1 kg per bag of Glass>*. The two are different products; do not interchange their doses by unit.
- E. Primer pigment, for coloured work: one additional standard pigment pack per 40 m² supplied.

2.5 WHITE PORTLAND CEMENT ▲ **LOCAL CHECK**

- A. Obtain locally; **40 kg per mix**.
- B. Thailand: white Portland cement conforming to **TIS 133-2562**, in sealed 40 kg bags bearing the packing date.
- C. Elsewhere: white Portland cement to **ASTM C150/C150M Type I (white)** or, where the project requires European standards, a white CEM I to EN 197-1 as a separate alternative — in either case with a whiteness index not less than 90 (D65, 10°) determined by *<the method of TIS 133-2562 / ASTM E313>*, and Fe₂O₃ not more than 0.4 % by mass; bags marked with a manufacture date or a lot number.
- D. One cement manufacturer for one pool; one production lot for each surface (1.7.C).
- E. Both markets: total alkali content of Na₂O equivalent not more than **0.60 %** (Na₂O + 0.658 K₂O). In Thailand, the TIS 133-2562 mark on the bag, recorded by a photograph of the bag marking with the packing date; elsewhere, the cement mill certificate of the lot used or the manufacturer's data sheet stating the alkali content, kept with the job records.

SPECIFIER NOTE The value of a whiteness index depends on the method used; accept a report that states the method.

2.6 WATER

- A. Mixing water: clean.
- B. Fill water: clean; not from ponds or rivers, not green or dirty; each load checked for iron and copper (3.10.D).

2.7 BOND COAT

- A. Named products: **webertai gres (Weber) or Terraco Terrafix W22**, grey, obtained locally; accepted on their current data sheets (1.6.B.2).
- B. Equivalent — the requirements of this paragraph apply to an equivalent only: a polymer-modified cementitious tile adhesive, class **C1 or C2 to EN 12004-1 / ISO 13007-1, not classified S1 or S2**; tensile adhesion after water immersion ≥ 1.0 N/mm² (EN 12004-2 / ISO 13007-2); stated by its manufacturer as suitable for immersed swimming pools. An adhesive marketed as flexible but carrying no S1 or S2 class is assessed on its data sheet against these requirements.
- C. Colour: **grey, not pigmented** — including under a white finish.
- D. Thickness: 2–3 mm per coat.

SPECIFIER NOTE webertai gres declares no EN 12004 class; its data sheet gives a tensile adhesion of 1.60 N/mm² after immersion by its own test method. It is named as the product in use in Thailand, not as an example of the class. Estimating: about 10 m² per 20 kg bag per coat, three coats (layers 2, 4 and 6) — the bond coat is applied thinly; coverage figures for tiling do not apply.

2.8 SUCTION-CONTROL COAT

- A. Product: **weberdry tex** (Weber), a non-flexible (rigid) cementitious suction-control coat. Obtained locally.
- B. Equivalent, outside Thailand where weberdry tex is not available: a non-flexible (rigid) cementitious suction-control coat that meets every criterion below on its manufacturer's current data sheet, **accepted in writing by PEBBLE CRETE CO., LTD. before use** (1.5.F):
 1. **Cementitious:** A polymer-modified cementitious mortar that hardens to a cement-based surface — not a film-forming coating (acrylic, bituminous, polyurethane or epoxy).
 2. **Rigid:** No elongation or crack-bridging declared; not described by its manufacturer as flexible or elastic. Flexible variants of an otherwise rigid product line are not accepted.
 3. **Permanent water contact:** Stated by its manufacturer for swimming pools or water tanks and resistant to chlorinated water.
 4. **Cementitious covering:** Stated to accept tile adhesive, tiling or another covering material over it.
 5. **Substrate:** Applied on a substrate dampened to saturated-surface-dry (SSD), without a film-forming primer.
 6. **Adhesion:** Bond to concrete not lower than 0.70 N/mm²; tensile adhesion after water immersion and after contact with chlorinated water not lower than 0.5 N/mm² (EN 14891, used here only for the adhesion values).
 7. **Suitable substrate:** stated by its manufacturer as suitable over cement render or over a cementitious tile adhesive.
- C. The manufacturer's written acceptance is a documentary check that the data sheet states each criterion of 2.8.B. It is not an approval of the product's suitability for the project, a warranty of the product, or an approval of its application.
- D. Do not use flexible or elastic coatings or membranes — including flexible variants of otherwise rigid product lines, and any product described as flexible, elastic or crack-bridging, such as acrylic, polyurethane and 1K/2K flexible cementitious coatings.

2.9 PRIMER

- A. Slurry of white Portland cement (2.5) and water, of thick, creamy consistency, for the walls only. On coloured work, **pigmented to match the finish**: one additional pigment pack per 40 kg bag of cement, matched to the finish that goes over it, not to the project. Do not use uncoloured white primer under a coloured finish.
- B. Applied with a trowel or a roller, not with a brush; the finish is applied into the primer while it is still wet and tacky; dried or skinned primer is re-applied (3.5).

SPECIFIER NOTE Estimating: about 1 kg of cement per m² of wall primed — one 40 kg bag primes about 40 m² — in addition to the 40 kg of cement per mix.

2.10 ACID AND START-UP PRODUCTS

- A. Hydrochloric acid, obtained locally, diluted for the acid wash (3.10.C).
- B. Sequestrant (stain and scale preventer), used at start-up to its manufacturer's instructions.

2.11 ACCESSORIES

- A. PVC dividers for planned stops; epoxy for bedding a tile line used as a division; spiked foot-boards for walking on the fresh floor — wooden boards laced to the boots, each with six galvanised nails underneath (Method Statement, section 8); tape for closing the bottom return fittings.

2.12 MIXES

- A. Per mix: 3 × 25 kg aggregate (75 kg); 40 kg white Portland cement; the modifier dose (2.4.D) for all three bags; where the colour includes one, one whole pigment pack, dispersed first in 3–5 L of the mixing water; **approximately 18 L of water** in total, including the pigment water — a starting point, not a ceiling. Adjust to consistency in small additions. Proportion: one part white cement to 1.875 parts aggregate by mass.
- B. Water per surface: **fix the water on the first mix of a surface, record it, and hold it unchanged to the end of that surface.** Walls take a drier, stiffer mix; floors a more mobile one. Do not finish leftover mix on another surface.
- C. Do not split a pigment pack or a mix. Mixes per surface: area ÷ 5.4, rounded up. Allocate production lots to surfaces before the work (1.6.B.6); change lot only at a change of surface or a planned stop.
- D. Mixing: mechanical mixer; mix to a uniform colour and consistency, with no dry pockets and no undispersed pigment.
- E. Pot life: **discard mix not placed within 1 hour of adding water**, or earlier where it has begun to stiffen; do not add water to a mix that has begun to stiffen.

SPECIFIER NOTE Mixers: the Method Statement recommends a power mixer (mixing station, three mixes at a time) for pigmented colours, and a drill-mounted mixer at low speed, one mix at a time, for projects under 100 m², especially white colours.

Quantities for estimating: approximately 5.4 m² per mix and 1.8 m² per 25 kg bag at 10 mm. Add 5 % for error and overuse and price it: the manufacturer does not accept returns of surplus material. Add the primer cement (2.9) to the 40 kg of cement per mix. These are planning estimates, not guaranteed yields.

PART 3 EXECUTION

3.1 EXAMINATION

- A. With the substrate provider, verify and record on the Protocol:
 1. New concrete shell cured **28–30 days** before the first bond coat and the render.
 2. Shell structurally sound and non-moving; static cracks repaired before the render. Where there are moving cracks, do not proceed without the pool designer's written assessment.
 3. Fittings set to protrude **10 mm beyond the reference plane** — the finished face of the upper bond coat (layer 6) — so that they finish flush with the finished surface. Measured from the concrete face: render <thickness> + about 8–12 mm of bond coats and suction-control coat + 10 mm of finish. Where fittings were set by others, confirm the dimension in writing before the work begins.
 4. Tiling and coping complete; bottom return fittings closed and taped.
 5. Pool equipment installed and pumps working; fill water arranged at the rate of 3.10.D.4.
 6. No water entering the shell from outside; hydrostatic relief provided as designed.
- B. Report unsatisfactory conditions in writing. Do not proceed until they have been corrected.

3.2 PREPARATION

- A. Existing pools: *<not applicable / remove the existing finish, tiles and bedding to sound concrete (Section 02 41 19), repair it, and prepare it as B to F>.*
- B. Remove laitance, form-release agent, curing compound, paint and coatings **mechanically** — high-pressure water jetting or grinding — until water soaks in and does not bead. Clean with water; **do not use detergent or soap**, which can leave a film that causes bonding failure.
- C. Tape test: not fewer than 3 tests per surface and 1 per <number> m², on each layer before the next. Press 50 mm clear packing tape firmly onto the surface, pull it off and stick it on white card beside a label of the spot; photograph each result. Acceptance: no more than light traces of dust — a dust-quantity rating not higher than <2> by comparison with the pictorial scale of ISO 8502-3. Otherwise clean again and repeat.
- D. Pre-wetting: pre-wet the prepared shell, the render and the lower bond coat with clean water to SSD before the next layer and before each coat of the suction-control coat; flood existing concrete the day before. Before the

upper bond coat, keep the suction-control coat surface clean and dust-free, and dampen it to SSD, with no standing water.

- E. Flatness: grind high spots and fill low spots with the render **before the suction-control coat**, to the tolerance of 3.3.A.
- F. Local repairs and patches to the shell: complete them before the render, and cure them not less than 10 days, or longer where their data sheet requires, before the next layer. Levelling and screeds are layer 3 and are cured as 3.3.A.

3.3 SUBSTRATE LAYERS

- A. Layers 2 and 3: apply the bond coat to the prepared shell at SSD, and the render or levelling onto it while it is fresh (wet-on-wet). Render thickness: <mm>. Flatness of the finished render: <tolerance, for example mm under a 2 m straightedge>. Cure the render for the longer of 10 days or 7 days per 1 cm of thickness.

SPECIFIER NOTE The finish tolerance of 9–11 mm leaves about ± 1 mm: unevenness in the render shows as a thickness deviation in the finish. State a render flatness to match, and put it in the section that specifies the render where that is not this Section.

- B. Layer 4: apply the bond coat over the render and **finish it smooth with the flat side of the trowel — no notched trowel, no ridges**; let it harden; tape test; pre-wet it to SSD immediately before each coat of the suction-control coat.
- C. Layer 5, suction-control coat: **no primer or film-forming coat under it** — a film would act as a separating layer. Apply two coats, the second perpendicular to the first: the first not thicker than 2 mm (about 2 kg/m²); when it has set, re-dampen and apply the second at 1.5–2 kg/m²; total **2–3 mm** on walls and floor, to its manufacturer's data sheet, including its temperature limits. Let it harden as its data sheet requires; keep it clean and protected from dust; if it has stood exposed or become dusty, wash it and repeat the tape test.
- D. **Over the suction-control coat, apply only the bond coat**: no render, screed or scratch coat, and never the primer or the finish directly on it. Do not apply the coat over tiles or old coatings.
- E. Layer 6: apply the upper bond coat, grey, 2–3 mm, only after H1 has been released (3.4.D).

3.4 HOLD POINTS

- A. **H1 — suction-control coat accepted, before the upper bond coat.** Inspect the coat and record the result on the Protocol, signed by the Installer and, where others prepared the shell or applied the coat, by that party. Obtain from those others: product name, production lot and current data sheet (for an equivalent, the manufacturer's written acceptance); dates of the shell, of each bond coat, of the render with its thickness, and of each coat; photographs of the bare, pre-wetted lower bond coat before the coat, as original files with date and time. Checks: tape test (3.2.C); knife test — no peeling, powdering or blistering; hammer tap — no hollow areas.
- B. Pull-off tests on the suction-control coat:
 1. **Required where the photographs of the bare substrate are not provided.** At every other H1: <number of tests per pool / not required>.
 2. Method: EN 1542 or ASTM C1583/C1583M; not fewer than <3> tests per surface and 1 per <number> m². Record the failure mode; repair the test spots with the same product.
 3. Acceptance: each result **not less than <0.70> N/mm²**, or cohesive failure in the substrate below the coat.
 4. Cost: tests required because the photographs were not provided, and failed tests with their retests, at the cost of <the substrate provider>; other tests at the cost of <the Owner>.

SPECIFIER NOTE 0.70 N/mm² is the bond to concrete that weberdry tex declares; set the value for the product used. A failure within the concrete or render below the coat shows that the coat is bonded better than the substrate is strong; decide whether a minimum value applies to it too.

- C. Not accepted at H1: a dusty or unprepared substrate; a notched or ridged lower bond coat; a product other than weberdry tex or an equivalent accepted in writing; a flexible or elastic coating or membrane; render, screed or scratch coat over the coat; the coat over tiles or old coatings; missing substrate photographs without passed pull-off tests; a pull-off result below 3.4.B.3.
- D. Release of H1:
 1. Released <by the Architect in writing / by the signed Protocol, with a copy to the Architect as notice only>. Give the Architect <period> notice of the H1 inspection. Where the Architect releases H1, the Architect responds within <number> working days of receiving the signed Protocol.

2. Lines marked "Not verified" on the Protocol: *<not permitted at H1 / permitted only with the Architect's written acceptance, the item remaining the responsibility of the party that did that work>*.
 3. Where the substrate provider does not attend or refuses to sign, the Installer records the inspection alone, with photographs, and sends the Protocol to the Architect and the substrate provider within 24 hours; the Architect decides on the release within <number> working days.
- E. H2 — bond coat ready, before the primer and the finish.** Judged by condition: matured and firm, no longer tacky, with a sound surface free of dust and loose material; cool and damp, no standing water. Apply the finish not later than 72 hours after the upper bond coat is completed. The Installer records H2 on the Protocol; no release by the Architect is required.
- SPECIFIER NOTE** About 12 hours is usual in practice; the criterion is the condition, not the clock. H2 is left to the Installer's record because a window of 12 to 72 hours leaves no time for an inspection.
- F.** Where 72 hours has passed: clean the bond coat, check it by the tape test, and apply a fresh bond coat of the same product; judge H2 on the fresh coat.
- G. Do not apply the upper bond coat until H1 is released, or the primer or the finish until H2 is recorded.** Send a copy of the signed Protocol to the Architect *<before the next layer / within 24 hours>*.

3.5 PRIMER

- A.** Walls: apply the primer (2.9) to the walls with a trowel or a roller — not with a brush — immediately before the finish, over the bond coat recorded at H2, as a continuous coat without runs or ponding. Floor and steps: no primer.
- B.** Apply the finish about 5–10 minutes after the primer, while the primer is still wet and tacky; do not let it dry. Where the primer has dried or formed a skin, apply it again.

3.6 APPLICATION

- A.** Order: **steps first, then walls, then floor**; mixes allocated by surface; walls from the shaded towards the sunlit.
- B.** Walls: two coats — the first not more than 4 mm; let it stiffen until it carries the second without slumping, then apply the second to the full thickness; start at the bottom and trowel upwards. Floor: one coat to the full thickness, laid last. Do not mark or displace the fresh floor: walk on it only in spiked foot-boards (2.11).
- C.** Thickness: **10 mm, tolerance 9–11 mm**; fittings flush with the finished surface. Measure in the fresh material with a depth gauge — not fewer than 10 readings per surface and 1 per <number> m² — and record the readings. Acceptance: the mean of the readings on each surface not less than 10 mm; no single reading under 9 mm or over 11 mm.
- D.** Stops and joints, planned before the work starts and shown in the programme: in inside corners or where the depth changes gently; on a PVC divider placed on the planned line (on white material the divider may be removed next day and the joint worked in; not on coloured material); on large pools, a tile line bedded in epoxy between work sessions. Do not stop in a plain wall without a divider or a planned line.
- E.** Compaction: the trowel compacts; it does not smooth. **Not fewer than three cycles** of hard trowel, rinse off the excess paste, hard trowel again; use **the number of passes fixed on the sample panel** (1.8.B) on every surface. Remove expressed paste and water; do not work them back in. Rinse the expressed laitance off between passes with a light wash of clean water — do not pour it. **Do not spray water under the trowel.** Fill voids at once with fresh material containing aggregate, not with cement cream alone.

3.7 AGGREGATE EXPOSURE

- A.** When a finger leaves a print without sinking in, wash the surface with a wet, soft, natural-bristle hand brush to remove the cement paste and reveal the aggregate gradually, without dislodging grains. Judge the timing by fingerprint, not by the clock.
- B.** Order: **expose sunlit surfaces before shaded surfaces.**
- C.** When exposing the finish, do not use a roller or a sponge on coloured material.
- D.** Degree of exposure: as the approved sample panel (1.8.E). Surfaces visibly more exposed than the panel, or with grains dislodging, are not accepted; 2.2.B describes normal exposure and over-exposure.

3.8 HOT WEATHER

- A.** Where the air or a surface is above 38 °C (1.10.A, 1.10.B) or the evaporation rate is above 1.0 kg/m²/h (1.10.C), take these measures before and during application:
 1. Pre-soak the substrate to lower its temperature and absorption; leave no standing water.

2. Work in the cooler part of the day <early morning / at night within 1.10.F>; avoid the hottest part of the day.
3. Tent the pool; erect canvas or sheet barriers against sun and wind.
4. Lower the temperature of the mix: cold water; shaded and covered materials.
5. Provide enough applicators to complete each surface within the working time of the material.
6. Apply from the shaded walls towards the sunlit walls; expose in the opposite order.

3.9 CURING BEFORE FILLING

- A. Protect each exposed surface from traffic, dirt and adjacent works until the acid wash, and do not leave standing water on it.
- B. Acid wash, fill and start up within <number> to <number> hours after the last surface has been exposed.

SPECIFIER NOTE The Method Statement sets the acid wash on the day after the whole pool has been laid. State the window in hours after the last surface is exposed, so that night work leaves no doubt about "the day after".

3.10 ACID WASH, FILLING AND START-UP

- A. Cure the finish under water: carry out the acid wash, filling and start-up as one continuous operation within the window of 3.9.B.
- B. Protect adjacent work before the acid wash — stone coping, tile grout, stainless-steel fittings, light niches and other acid-sensitive surfaces — by <masking / covering / pre-wetting>; rinse any splash at once with clean water.
- C. Acid wash: hydrochloric acid at **10 % by mass as applied**; 15–17 % only where the laitance was poorly removed and the aggregate does not open; the acid as bought is diluted to this strength from the strength on its label; **never undiluted**. Walls from mid-height down to the floor, then from the waterline down to mid-height; keep the floor very wet throughout and wash it last. On a coloured finish, follow the acid with a pressure wash on the lightest setting or light hand scrubbing; do not let acid or residue dry on it. Rinse thoroughly. Dispose of the wash water <in accordance with local rules>. ▲ **LOCAL CHECK**
- D. Filling:
 1. Clean water; screen each load for iron and copper by the site check of the Method Statement, 13.1 (no green colour within 10–15 minutes of adding powder chlorine to a white bucket of the water) — a site screening check, not a water analysis. Laboratory analysis of the fill water: <not required / required, with limits>.
 2. Open the bottom return fittings.
 3. Do not direct high-pressure water from a truck or hose onto the finish: fill through a large plastic bin placed on the floor until there is at least 1 m of water, or full depth where the pool is shallower.
 4. Fill continuously, without interruption, at not less than <rate, m³/h> until the pool is full; mist the walls above the rising water until they are submerged.
 5. Keep leaves and debris out of the water.
- E. Start-up: start circulation as soon as the water reaches the skimmers or the overflow; add sequestrant at start-up; first chlorination 36 hours after the end of filling; no salt on the first fill — not earlier than 28–30 days after the end of filling. Keep the water balance of the Method Statement, section 14 (also TDS, section 7), from the first day: the working ranges given there, with the Langelier Saturation Index, 0.0 to +0.3, governing where readings conflict. For public and commercial pools, national bathing-water rules prevail. ▲ **LOCAL CHECK**
- F. Start-up responsibility: from filling to handover, the start-up and the water chemistry are the responsibility of <the Installer / the pool equipment contractor under the Installer's supervision>. Keep a daily log — date and time, water tests (pH, free chlorine, total alkalinity, calcium hardness, cyanuric acid, temperature), LSI, chemicals added and circulation hours — and submit it at handover (1.6.D.4).

SPECIFIER NOTE The model installer warranty (clause 6, item 10) excludes defects where the first 28 days were not run or supervised by the installer or by a person the installer named in writing. Assigning start-up to the Installer until handover keeps that period under the Installer's control only where handover is not earlier than 28 days after filling; otherwise state who runs or supervises the remaining days.

- G. If the pool cannot be filled within the window of 3.9.B, do not acid wash it until it can be. If the acid wash has been done but filling is nevertheless impossible, provide continuous misting with a drainage pump for at least seven days; this limits damage and does not replace filling. Notify the Architect in writing within <24 hours> of any event that prevents filling. The misting is at the Installer's cost.

3.11 PROTECTION

- A. Protect the finished surfaces from traffic, dirt and adjacent works until the pool is filled.
- B. **Do not place chlorine in any form — granules, tablets or liquid — directly on the finish.** Dose it through a balance tank or, at minimum, the skimmer, and add every treatment chemical only by a method permitted by both the chemical supplier's and the equipment manufacturer's instructions.
- C. Do not run the pool heater while there is dust in the pool; bypass it.
- D. **Do not drain the pool when the groundwater table is high.** Drain only with the agreement of the Installer who gave the warranty, and refill as soon as the work allows.

3.12 FIELD QUALITY CONTROL

- A. Complete the Installer's quality checklist (Method Statement, section 16) for each pool, with the production lot numbers and photographs of the cement bag markings.
- B. Record hold points H1 and H2 on the Protocol (3.4).
- C. Record the field measurements: tape tests (3.2.C), pull-off tests (3.4.B), surface temperatures and evaporation rates (1.10), thickness readings (3.6.C).
- D. Acceptance inspection of the finished surface: after the rinse that follows the acid wash and before filling, with <24 hours> notice to the Architect. Where the Architect does not attend at the notified time, record the inspection with photographs and proceed with filling. View in daylight from <3 m>. Accept the surface where:
 - 1. colour and degree of exposure match the approved sample panel, with the panel wetted for the comparison;
 - 2. there are no cracks <visible at the viewing distance / wider than a stated width>;
 - 3. joints occur only at planned stops (3.6.D);
 - 4. hammer tapping finds no hollow areas <at number points per surface>;
 - 5. no grains dislodge from the matrix when the surface is rubbed firmly by hand; loose particles left on the surface after the acid wash and removed by brushing or by the optional light buff (Method Statement, 12.1) are not a defect;
 - 6. the thickness records meet 3.6.C.
- E. Non-conforming work: repair it to the Method Statement, section 15 — for a drained pool the full procedure, colour-matched with a sample panel, using the extra stock (1.6.E) where it matches; repairs under water only to a procedure accepted in writing by the manufacturer (1.5.F).
- F. Manufacturer's field services: <none / by separate written agreement>.

3.13 CLEANING

- A. Clean tools and equipment with clean water before the material sets. Remove waste and dispose of it <in accordance with local rules>. ▲ **LOCAL CHECK**

3.14 CLOSEOUT ACTIVITIES

- A. Hand the water-care values of the Method Statement, section 14, to the Owner or operator in writing, with the rules on chlorine dosing and draining (3.11).
- B. Hand over the Installer's warranty (1.12.B), the Material Warranty with the production lot records (1.12.A), the start-up log (3.10.F) and the extra stock (1.6.E).

END OF SECTION 13 11 00 <.xx>

APPENDIX A Short-form specification

For specifications written in NBS style, and for general use in drawing notes and finishes schedules. **Clause numbers are illustrative** — renumber them to suit the work section in which they are placed, for example a swimming-pool or water-feature section. Where these clauses are used, the order of precedence is: **these clauses, then the PebbleCrete Method Statement — Rev 2026-10, then the TDS — Rev 2026-10**; a later revision applies only by the Architect's written instruction, and a conflict is referred to the Architect before the work proceeds. Where the full Section is also a contract document, the full Section governs.

110 POOL INTERIOR FINISH — EXPOSED-AGGREGATE CEMENTITIOUS

- **Manufacturer:** PEBBLE CRETE CO., LTD., Phuket, Thailand. LINE @pebblecrete · info@pebblecrete.com · www.pebblecrete.com
 - **Product reference:** PebbleCrete™ <Classic / Supreme / Glass> exposed-aggregate pool finish
- **Colour:** <colour name>, selected from the manufacturer's physical samples; acceptance standard: the approved site sample panel
- **Aggregate fraction:** 1–3 mm
- **Binder:** white Portland cement to TIS 133-2562, or ASTM C150/C150M Type I white, or, where European standards are required, a white CEM I to EN 197-1 as a separate alternative, with whiteness index ≥ 90 , $\text{Fe}_2\text{O}_3 \leq 0.4\%$ and total alkali Na_2O equivalent $\leq 0.60\%$ ($\text{Na}_2\text{O} + 0.658 \text{ K}_2\text{O}$), with alkali evidence as TDS 3.2, obtained locally, 40 kg per mix; manufacturer's cement modifier and pre-weighed pigment pack
- **Locations:** pool shell — walls, floor and steps — of <pool name(s)>, under water in service; not benches, coping, decks or surfaces above the waterline
- **Thickness:** 10 mm, tolerance 9–11 mm (mean per surface ≥ 10 mm, no reading under 9 mm or over 11 mm); fittings set 10 mm proud of the finished face of the upper bond coat
- **Finish:** exposed aggregate; colour and degree of exposure as the approved sample panel, assessed in daylight
- **Execution:** comply with the PebbleCrete Method Statement — Rev 2026-10

120 SUBSTRATE SYSTEM

- **Layer order:** reinforced-concrete shell → bond coat → render → bond coat, finished smooth → suction-control coat → bond coat → finish
- **Suction-control coat:** weberdry tex (Weber), two coats, 2–3 mm, on an SSD substrate without primer; outside Thailand, where it is not available, an equivalent non-flexible (rigid) cementitious suction-control coat meeting the Method Statement, section 5, accepted by the manufacturer in writing (a documentary check only). Flexible or elastic coatings and membranes: not permitted. Not a waterproofing layer
- **Bond coat:** webertai gres (Weber) or Terraco Terrafix W22, grey, 2–3 mm; or an equivalent cementitious tile adhesive C1 or C2 to EN 12004-1 / ISO 13007-1, not S1 or S2, tensile adhesion after water immersion $\geq 1.0 \text{ N/mm}^2$ (EN 12004-2), suitable for immersed pools
- **Watertightness:** by the pool shell and its builder: <section / clause reference>

130 HOLD POINTS

- **H1:** suction-control coat accepted on the signed PebbleCrete Substrate Acceptance Protocol before the upper bond coat — tape, knife and hammer-tap checks; pull-off tests ($\geq <0.70> \text{ N/mm}^2$, or cohesive failure in the substrate) where photographs of the bare substrate are missing; released by <the Architect / the signed Protocol>
- **H2:** bond coat ready — matured and firm, no longer tacky, with a sound surface free of dust and loose material — before the primer and the finish, not later than 72 hours after the bond coat; recorded by the installer; after 72 hours, a fresh bond coat

140 INSTALLER

- Experienced in cementitious exposed-aggregate pool finishes, with <number> completed projects of similar size; or foreman and crew leader trained at the PebbleCrete Masterclass (record of training only), with <number> completed projects. Evidence evaluated by the Architect

150 SAMPLE PANEL

- <size> panel of the actual mix and finish, approved in writing before work begins; acceptance standard for colour and exposure; the number of trowel passes recorded and used on every surface

160 APPLICATION, CURING AND START-UP

- **Order:** steps, walls, floor; walls in two coats; not fewer than three compaction cycles, with the number of passes fixed on the sample panel



- **Conditions:** material and surfaces 10–38 °C for 24 hours before and 72 hours after application, surface temperature recorded; hot-weather measures above 38 °C air temperature; no application while the evaporation rate exceeds 1.0 kg/m²/h; no application with rain expected within 24 hours unless the pool is fully covered
- **Curing:** acid wash, filling and start-up as one operation within <number> to <number> hours after the last surface is exposed; continuous filling; no acid wash if the pool cannot be filled
- **Start-up:** by <the installer / the pool equipment contractor under the installer's supervision> until handover, with a daily log
- **Handover:** water-care values of the Method Statement, section 14, to the owner in writing

170 WARRANTIES

- **Material:** PebbleCrete Material Warranty — Rev 2026-09: material only, from delivery, held by the buyer of the material (normally the installer); the owner's route for a material defect is the installer's warranty; the warranties do not limit the owner's rights under the contract and the law
- **Finished pool:** installer's written warranty in its own name, covering defects attributable to the installer and material defects, for <period, not less than the statutory period> from <the fill date / the later of the fill date and the day after payment in full>, subject to <maintenance conditions> ▲ **LOCAL CHECK**

180 SUBMITTALS

- Technical Data Sheet; data sheets of the suction-control coat, bond coat and white cement, with the alkali evidence for the cement lot used (TDS 3.2); Safety Data Sheets; colour samples; sample panel record; installer qualifications; programme and fill-day statement; signed Substrate Acceptance Protocol and test records; installer's warranty; start-up log; extra stock

GENERAL USE — ONE PARAGRAPH Pool interior finish: PebbleCrete™ <Classic / Supreme / Glass> exposed-aggregate cementitious finish by PEBBLE CRETE CO., LTD. (Thailand), colour <name> as the approved sample panel, aggregate 1–3 mm, 10 mm (9–11 mm), applied by an installer experienced in exposed-aggregate pool finishes, or trained at the PebbleCrete Masterclass with completed projects, in compliance with the PebbleCrete Method Statement — Rev 2026-10, over: concrete shell → bond coat → render → bond coat → weberdry tex suction-control coat (or an accepted rigid equivalent; no flexible membranes) → bond coat (webertai gres (Weber) or Terraco Terrafix W22, or an equivalent C1/C2, not S1/S2) → white-cement primer on the walls (pigmented on coloured work). Hold points H1 and H2 on the signed Substrate Acceptance Protocol. Acid wash, filling and start-up as one operation after the whole pool is laid. Warranties: manufacturer — material only, from delivery, held by the buyer of the material (normally the installer); installer — the finished pool surface, in its own name. Watertightness: by the pool shell.

APPENDIX B Local-law and local-standard check list

The clauses below are marked ▲ **LOCAL CHECK** in the text. They depend on the law, codes and standards of the country of the project, and the specifier checks them before issue — with local legal advice where needed. The list is a prompt, not a statement of any country's law.

Clause	Check against local law or standards	What typically differs
1.3, 2.5	Standard for white Portland cement; mandatory product-standard marks	National cement standards and marking rules; the equivalent of TIS 133-2562 / ASTM C150 white
1.8, 2.3	Slip-resistance requirement for wet barefoot areas: whether one applies, test method, class, and who tests	Codes for public pools; test on the site sample panel or on specimens from its mix
1.7	Codes for public and private pools; contractor licensing or registration of the installer	Permits, licences, work permits for foreign crews
1.11	Occupational health and safety: respirable crystalline silica, cement, acid; PPE; language of safety data sheets	Exposure limits; SDS language and GHS implementation
1.12, 170	Installer's warranty: period and start, statutory liability for building work, consumer law, form and language of warranties. Thailand: Civil and Commercial Code sections 600–601	Statutory periods, and whether and how far a contract may shorten them; in Thailand the period is longer for a structure built on land — whether an in-ground pool counts is a question for local legal advice
2.1	Public procurement rules on naming a product; "or equivalent" wording	Public projects may require criteria-based equivalents

Clause	Check against local law or standards	What typically differs
2.1	Product marking, registration or conformity certification required for import or use in the country of the project — for example CE / UKCA and a declaration of performance in the EU, EEA and UK, or SABER product conformity certification in Saudi Arabia	PebbleCrete materials carry no such marking or certification unless the manufacturer confirms it in writing; consult the manufacturer before specifying
3.10	Disposal of acid wash water and neutralisation; handling and storage of acid	Environmental and drainage rules
3.10	Bathing-water rules for public and commercial pools	National rules prevail over the Method Statement water table
3.13	Waste disposal	Local waste rules
All	Language of the contract documents and which language prevails	The PebbleCrete documents are issued in English; the English text prevails

APPENDIX C PebbleCrete documents referenced

Subject	Document and revision
Technical Data Sheet	PebbleCrete Technical Data Sheet (TDS) — Rev 2026-10
Technical data — dry modifier (Thailand)	PebbleCrete Dry Cement Modifier — TDS Rev 2026-10
Method Statement	PebbleCrete Method Statement — Rev 2026-10
Safety data — aggregate	PebbleCrete Pool Finish Aggregate — SDS Rev 2026-10
Safety data — liquid modifier (export)	PebbleCrete Liquid Modifier — SDS Rev 2026-10
Safety data — dry modifier (Thailand)	PebbleCrete Dry Cement Modifier — SDS Rev 2026-10
Material warranty	PebbleCrete Material Warranty — Rev 2026-09
Installer warranty — model	PebbleCrete Recommended Installer Warranty — Template Rev 2026-10
Hold points H1 / H2 — model form	PebbleCrete Substrate Acceptance Protocol — Rev 2026-10
Submittal package	PebbleCrete Submittal — Rev 2026-10
Short guide	PebbleCrete — How to specify — Rev 2026-10

This appendix lists PebbleCrete documents and their revisions. Only the documents named in a "comply with" clause of this Section (1.3.B) are incorporated, and only to the extent of that clause; listing a document here does not incorporate it. A later revision applies to a project only by the Architect's written instruction (1.3.B). Published at pebblecrete.com/technical-documents: this Section, the TDS and How to specify; the other documents, including the Mock-up approval record, are issued on request. Copies are free of charge from info@pebblecrete.com. The Substrate Acceptance Protocol and the installer warranty template are model forms: PEBBLE CRETE CO., LTD. is not a party to them.

PEBBLE CRETE CO., LTD.

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