

River Pebble Processing Characteristics



RIVER PEBBLE

Hard, dense and typically abrasive feed for aggregate and manufactured-sand production.

Process implication

Use controlled primary reduction, compression crushing and screened recirculation; add VSI only where sand yield or particle shaping requires it.

Material factor

What it changes in the circuit

Hard / dense feed

Higher reduction duty; jaw and cone stages carry the main size-reduction work.

High abrasiveness

Liner and VSI wear-part exposure becomes a major operating constraint.

Large or variable feed

Primary opening and reduction ratio must be confirmed from the actual top size and gradation.

Clay / natural fines

Pre-screening may be needed so fines do not occupy crushing capacity or reduce screen efficiency.

High sand-production ratio

More material is routed to VSI and fine screening; shaping duty increases.

CORE RULE

Feed size, abrasiveness, required capacity and final product requirements define the circuit. Hardness alone does not define the number of crushing stages.

Crushing Stage Configuration

Three practical routes cover most river-pebble aggregate and sand-making duties. The stage count is selected from reduction requirement, circulating load and finished-product target.

A. TWO-STAGE CRUSHING

Moderate reduction; coarse aggregate is the main product.

Jaw Crusher

Primary reduction



Cone Crusher

Secondary compression crushing

B. THREE-STAGE CRUSHING

Finer aggregate, larger feed or higher return load requires additional size control.

Jaw Crusher

Primary reduction



Secondary Cone

Main intermediate reduction



Tertiary Cone

Fine reduction / return-load control

C. CRUSHING + VSI SAND MAKING

Manufactured sand or additional particle shaping is required.

Jaw Crusher

Primary reduction



Cone Crusher

Compression crushing



Optional Tertiary Cone

When further reduction is required



VSI

Sand making / shaping

Stage-selection inputs

Feed size

Plant throughput

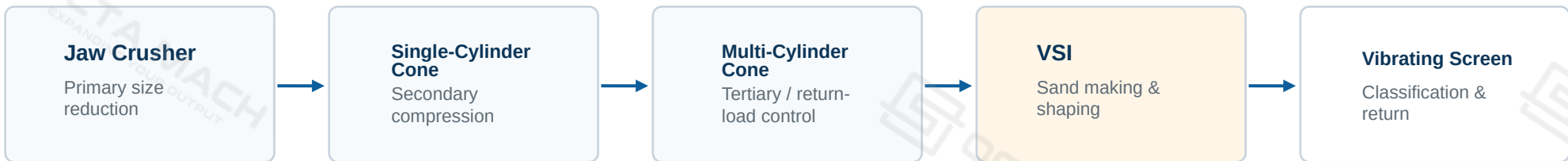
Target product size

Circulating load

Manufactured-sand ratio

Crusher Duties in the Sand-Making Circuit

Each machine should carry a defined process duty. Primary and cone crushing control size reduction; VSI and screening control final sand yield, shape and classification.

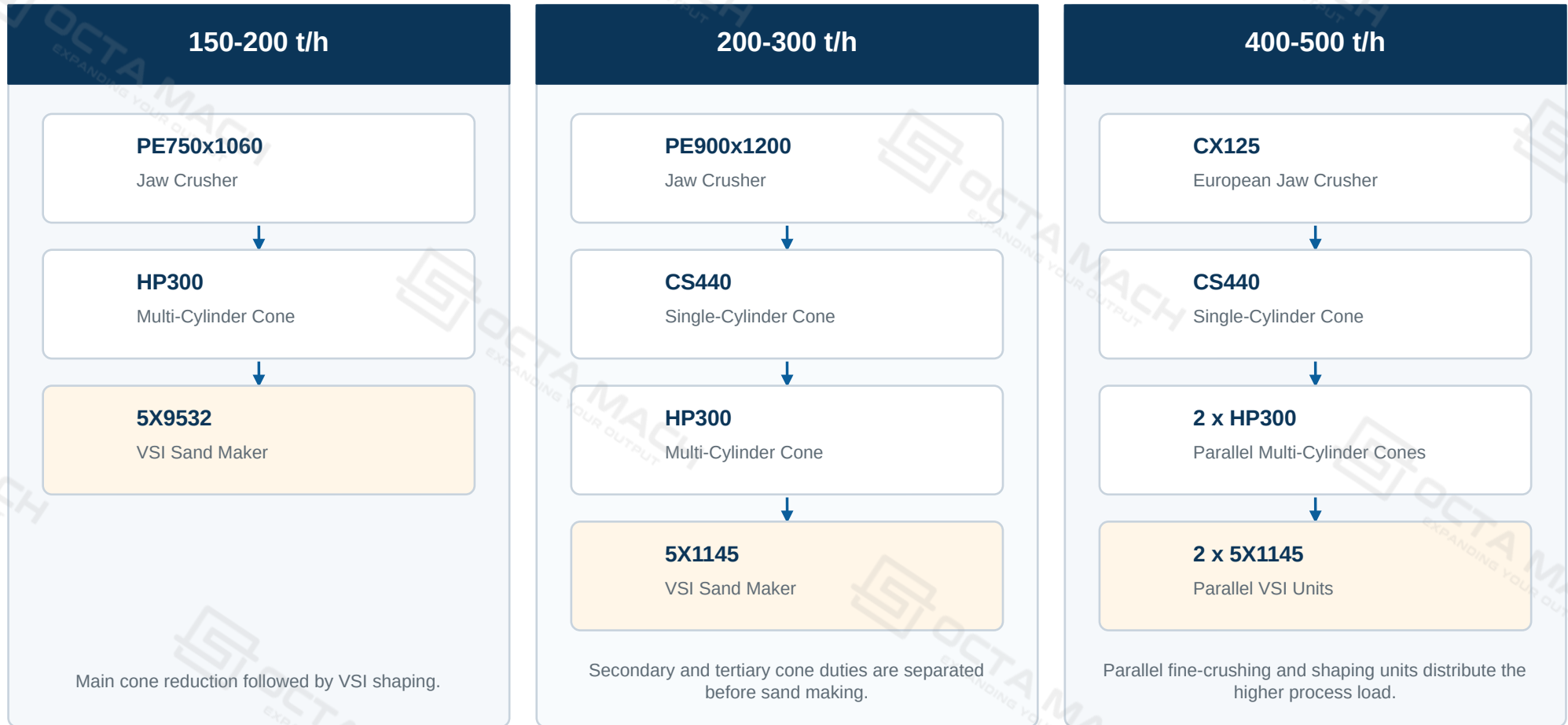


Equipment duty and controlling input

Jaw Crusher	Maximum feed size; required primary discharge
Single-Cylinder Cone	Throughput; incoming size; compression-reduction duty
Multi-Cylinder Cone	Finer product target; circulating oversize; downstream feed control
VSI	Actual material entering the shaping stage; sand ratio; particle-shape requirement
Vibrating Screen	Product fractions; screen aperture; circulating load
VSI sizing rule	Size VSI from actual shaping-stage feed, not total plant throughput.
Screening rule	Screen area must account for return load, not fresh feed alone.

River Pebble Configuration by Capacity

Reference hard-rock sand-making layouts show how crushing duty shifts from one main cone stage to separated and parallel cone/VSI duties as throughput increases.



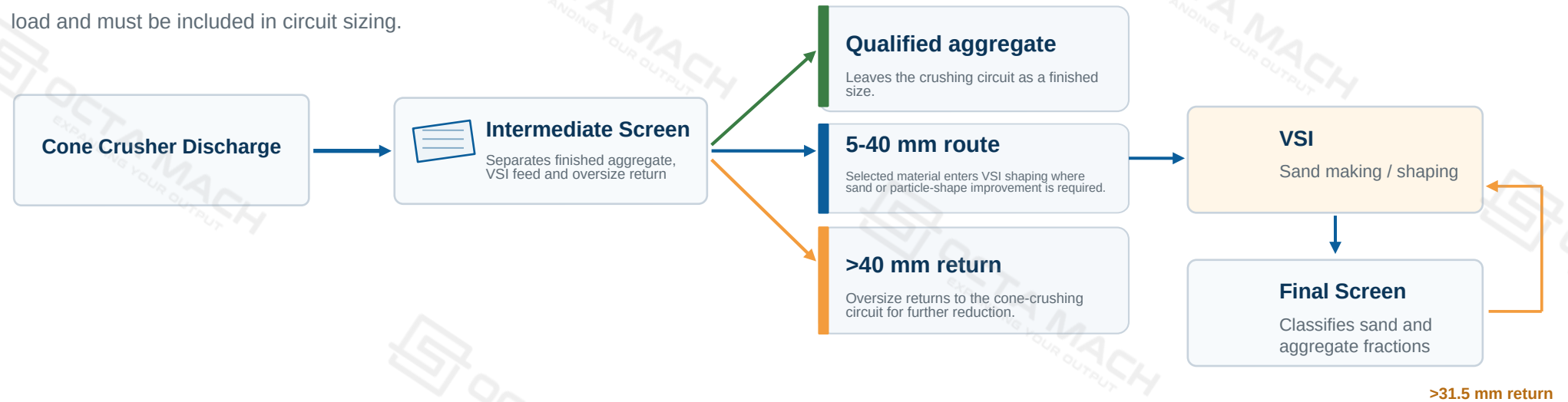
Typical product fractions: 0-5 mm manufactured sand | 5-10 mm | 10-20 mm | 20-31.5 mm graded aggregate

Capacity boundary:

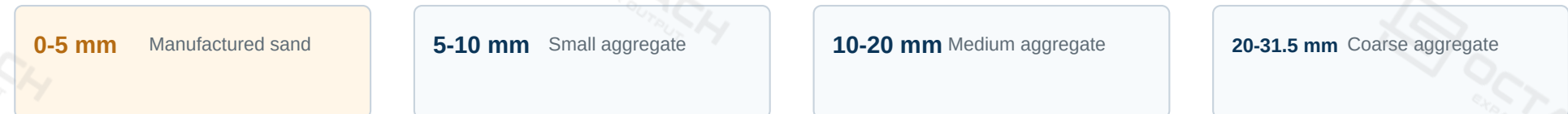
Actual output depends on feed, crusher settings, screening and recirculating load.

Closed-Circuit Screening and Product Routing

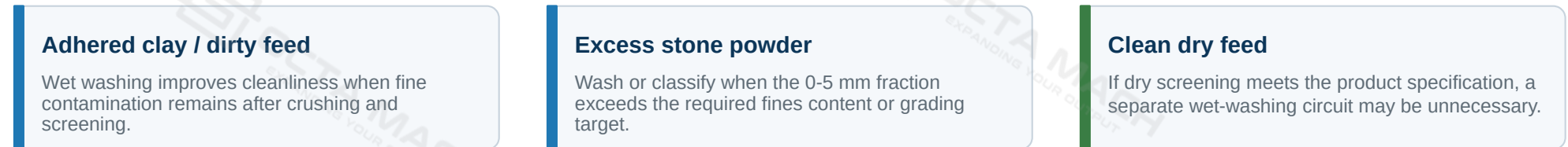
Screening determines whether material becomes a finished product, enters VSI shaping or returns for additional crushing. The return stream is part of the plant load and must be included in circuit sizing.



Finished fractions



When washing adds value



River Pebble Plant Selection Matrix

Select the complete material-flow circuit first, then confirm individual crusher models. The matrix below links project inputs to the part of the circuit they control.

Design Input	What It Controls	Configuration Impact
Maximum feed size	Primary reduction duty	Jaw crusher size and required downstream reduction
Required capacity	Total process duty	Crusher size, parallel units, screen area and conveyor capacity
Target product sizes	Reduction and classification	Two- vs three-stage crushing; screen apertures; return load
Manufactured-sand ratio	VSI and fine-screening load	VSI size / quantity and fraction routed to shaping
Particle-shape requirement	Final shaping duty	Whether VSI shaping is required after cone crushing
Abrasiveness	Wear exposure	Chamber, liner and VSI wear-part selection
Clay / natural fines	Feed preparation and cleaning	Pre-screening, bypass or washing requirement
Circulating load / layout	Closed-circuit stability	Screen area, surge capacity, return conveyors and stockpile routing

Selection logic

