

Claims

1. A method for processing incinerator bottom ash (IBA) comprising the steps of:
 - (i) carbonating IBA aggregate material by CO₂ sequestration; and
 - 5 (ii) providing a stabilizing additive for mixing with the carbonated IBA aggregate material, wherein the additive comprises one or more components from group (b1) and one or more components from group (b2), wherein group (b1) consists of aluminium chloride and at least one other metal chloride, and wherein group (b2) consists of silica, zeolite and
 - 10 apatite.
2. The method for processing IBA as claimed in claim 1, comprising the further step of:
 - 15 (iii) adding the additive to the carbonated IBA material to form a stabilized IBA composition.
3. The method for processing IBA as claimed in claim 1 or claim 2, wherein the additive is mixed with the carbonated IBA material as an aqueous solution.
- 20 4. The method for processing IBA as claimed in any preceding claim, wherein step (i) comprises exposing the IBA aggregate material to atmospheric CO₂ and/or non-atmospheric CO₂.
- 25 5. The method for processing IBA as claimed in any preceding claim, wherein step (i) comprises windrowing the IBA aggregate material.
6. The method for processing IBA as claimed in any preceding claim, comprising the further step of (iv): combining the carbonated IBA aggregate material and the additive of steps (i) and (ii), or the stabilised carbonated IBA
- 30 aggregate composition of step (iii), with cement to form a binder composition.
7. The method for processing IBA as claimed in any preceding claim, wherein the at least one other metal chloride in group (b1) is selected from: sodium

chloride, potassium chloride, magnesium chloride, calcium chloride, barium chloride, ammonium chloride, strontium chloride, and combinations thereof.

- 5 8. The method for processing IBA as claimed in any preceding claim, wherein the one or more components from group (b1) make up 70.0-99.0 wt.% of the total weight of the components (b1) and (b2).
- 10 9. The method for processing IBA as claimed in any preceding claim, wherein the one or more components from group (b2) make up 1.0-30.0 wt.% of the total weight of the components (b1) and (b2).
- 15 10. The method for processing IBA as claimed in any preceding claim, wherein the additive comprises 1 to 10% by weight of aluminium chloride; 45 to 90% weight of the at least one other metal chloride from group (b1); and 1 to 10% by weight of the components from group (b2).
- 20 11. The method for processing IBA as claimed in any preceding claim, wherein the additive further comprises one or more components from a group (b3), wherein group (b3) consists of magnesium oxide, calcium oxide and a combination thereof.
- 25 12. The method for processing IBA as claimed in claim 11, wherein the one or more components from group (b3) make up 5-40 wt.% of the total weight of components (b1), (b2) and (b3).
- 30 13. The method for processing IBA as claimed in any preceding claim, wherein the additive comprises ImmoCem ® , RoadCem ® , or a mixture thereof.
- 35 14. The method for processing IBA as claimed in any one of claims 6 to 13, wherein the binder composition comprises: carbonated IBA aggregate in an amount of 50.0 – 70.0 wt %, based on the total weight of the binder composition; additive in an amount of 0.1 – 5.0 wt %, based on the total weight of the binder composition; and cement in an amount of 25.0 – 69.9 wt %, based on the total weight of the binder composition.

15. The method for processing IBA as claimed in any one of claims 6 to 14, wherein the binder composition comprises carbonated IBA aggregate and cement in a 70% / 30 % by weight and/or by volume ratio.
- 5 16. The method for processing IBA as claimed in any preceding claim, further comprising the precursor processing steps of :
- (a) grinding IBA to form IBA aggregate material;
- (b) separating ferrous and non-ferrous metals from the IBA aggregate material; and
- 10 (c) grading the IBA aggregate material obtained from precursor step (a) or precursor step (b) into suitable size ranges for step (i).
17. The method for processing IBA as claimed in claim 16, wherein precursor step (b) (separating of ferrous and non-ferrous metals from the IBA aggregate material) includes the sub-step of transferring the separated metals for metal recycling.
- 15 18. The method for processing IBA as claimed in claim 16 or claim 17, wherein precursor step (c) (grading the IBA aggregate material) includes the sub-steps of grading the IBA aggregate material to separate particles of greater than 28 mm in size, and optionally returning said particles to precursor step (a) for further grinding.
- 20 19. The method for processing IBA as claimed in claim 18, wherein precursor step (c) (grading the IBA aggregate material) includes grading the IBA aggregate material to separate particles of less than 28mm, and preferably less than 25 mm, for step (i).
- 25 20. A stabilized IBA aggregate formed in accordance with the method defined in any one of claims 2 to 19.
- 30 21. A binder composition comprising cement and the stabilised carbonated IBA aggregate material formed in accordance with the method defined in any one of claims 2 to 19.

22. A construction composition comprising a binder composition as claimed in claim 21.
- 5 23. A construction composition as claimed in claim 22, wherein said construction composition further includes an aggregate component in addition to the stabilised carbonated IBA aggregate.