comprises a second conduit operably connected to the holding tank, wherein the second conduit is configured to transport concrete wash water to the holding tank. The second conduit can, e.g., transport concrete wash water from a sedimentation pond to the holding tank.

[0013] In certain embodiments, provided is a composition comprising (i) a hydraulic cement; (ii) mix water for the hydraulic cement, wherein the mix water comprises carbonated concrete wash water.

[0013a] In certain embodiments, provided is a method of preparing a concrete mix comprising (i) adding concrete materials to a mixer; (ii) adding mix water to the mixer, wherein the mix water comprises carbonated concrete wash water, and wherein the carbonated mix water has specific gravity of more than 1.10; and (iii) mixing the water and the concrete materials to produce a concrete mix.

[0013b] In certain embodiments, provided is a method of preparing a concrete mix comprising (i) adding concrete materials to a mixer; (ii) adding mix water to the mixer, wherein the mix water comprises carbonated concrete wash water, and wherein the carbonated wash water has a specific gravity of at least 1.03; and (iii) mixing the water and the concrete materials to produce a concrete mix.

INCORPORATION BY REFERENCE

[0014] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The novel features of the invention are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present invention will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the invention are utilized, and the accompanying drawings of which:

[0016] Figure 1 shows set acceleration in concrete produced with wash (grey) water at various specific gravities and ages, where the water was with and without carbon dioxide treatment. See Example 1.

[0017] Figure 2 shows set acceleration in concrete produced with wash (grey) water produced with Ordinary Portland Cement (OPC, 50%) and supplementary cementitious materials (SCM, 50%), where the water was treated and untreated with carbon dioxide, and aged 1 or 6 days.

[0018] Figure 3 shows workability (slump) in concrete produced with wash (grey) water produced with Ordinary Portland Cement (OPC, 50%) and supplementary cementitious materials (SCM, 50%), where the water was treated and untreated with carbon dioxide, and aged 1 or 6 days.

CLAIMS

What is claimed is

1. A method of preparing a concrete mix comprising

(i) adding concrete materials to a mixer;

(ii) adding mix water to the mixer, wherein the mix water comprises carbonated concrete wash water, and wherein the carbonated mix water has specific gravity of more than 1.10; and

(iii) mixing the water and the concrete materials to produce a concrete mix.

2. The method of claim 1 wherein the carbonated concrete wash water comprises at least 10% of the total mix water.

3. The method of claim 1 wherein the carbonated concrete mix water comprises at least 40% of the total mix water.

4. The method of claim 1 wherein the mix water comprises a first portion of water that is not carbonated mix water and a second portion of mix water that comprises carbonated mix water, wherein the first batch of mix water is added to the concrete materials before the second batch of mix water.

5. The method of claim 4 wherein the first portion of water is added at a first location and the second portion of water is added at a second location, wherein the first and second locations are different.

6. The method of claim 5 wherein the second location is the drum of a ready-mix truck.

7. The method of claim 4 wherein the second portion of mix water is added at least 2 minutes after the first portion.

8. The method of claim 1 wherein the carbonated concrete wash water has a density of at least 1.10 g/cm^3.

9. The method of claim 1 wherein the carbonated concrete wash water has been held for at least 1 day after rinsing from a concrete truck.

10. The method of claim 1 wherein the carbonated concrete wash water has been held for at least 3 days after rinsing from a concrete truck.

11. The method of claim 1 wherein the concrete mix is sufficiently workable for its intended use, and the carbonated wash water is of an age that the same mix made with the wash water of the same age in the same proportions would not be sufficiently workable for its intended use.

12. The method of claim 1 wherein the mix water comprises carbonated wash water in an amount that results in a concrete mix that is at least 5% stronger at a time after pouring than the same concrete mix made without carbonated wash water.

13. The method of claim 12 wherein the time after pouring is 1 day, 7 days, 28 days, or any combination thereof.

14. The method of claim 1 wherein the mix water comprises carbonated wash water in an amount that allows the concrete mix to contain at least 5% less cement than, and retain a compressive strength after pouring of within 5% of, the same concrete mix made without carbonated wash water and with the extra 5% cement.

15. A method of preparing a concrete mix comprising

(i) adding concrete materials to a mixer;

(ii) adding mix water to the mixer, wherein the mix water comprises carbonated concrete wash water, and wherein the carbonated wash water has a specific gravity of at least 1.03; and

(iii) mixing the water and the concrete materials to produce a concrete mix.

16. The method of claim 15 wherein the carbonated wash water has a specific gravity of at least 1.05.

17. The method of claim 15 wherein the carbonated wash water has a specific gravity of at least 1.10.