

Morningstar Storage

Monolithic Slab on Grade – Huntersville, North Carolina



BarChip Reduced the Carbon Footprint of Reinforcement by 75%.

Fibre Reinforcement: BarChip MQ58

Dosage Rate: 7 lbs/cy

Original Design: #5 rebar mat 12" center spacing

Total Yardage: 1,470 yds³

Mix Design: 4000 psi normal weight non air

Slab Thickness: 10 inches

Placement Method: Telebelt Truck

In September 2025, BarChip was used to replace traditional steel reinforcement in a large monolithic slab for a new Morningstar Storage Facility in Huntersville, North Carolina. The original design specified a #5 rebar mat at 12 inches on center, but the project was changed to a BarChip reinforced design using 7 lbs per cubic yard of MQ58. In total, approximately 10,000 lbs of BarChip replaced 37,000 lbs of steel reinforcement, reducing the embodied carbon of the reinforcement by approximately 75% and eliminated two days of steel placement by two eight man crews, reducing labor requirements and speeding up the schedule.

To meet production demands, two readymix plants supplied the project, with quality control managers from each plant and two BarChip technical representatives overseeing batching and fiber addition to ensure uniformity. Fibers were introduced at the wash rack after each truck was fully loaded. After all fibers were added, each truck was mixed on high speed to ensure full dispersion. Before leaving the plant, slump was confirmed at 6 inches, and air content remained consistent with the non air-entrained target of approximately 1.5%.

At the site, concrete was discharged onto two telebelt trucks to distribute material efficiently across the slab area. This setup supported continuous placement, reduced pour time, and helped prevent cold joints or delays in finishing operations. Once placed, the finishing crew began screeding and power troweling operations. The MQ58 fibers behaved as expected, working smoothly into the surface paste to produce a clean, fiber free finish.

The use of BarChip MQ58 at 7 lbs/yd³ effectively replaced the structural function of the specified #5 rebar mat. With proper batching controls, fiber introduction procedures and quality oversight, the project demonstrated that macro synthetic fiber reinforced concrete can deliver performance and finish quality equal to, or better than traditional steel reinforcement.



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