Mix (stabilizing agent)
• The Stabilizing Additive Material (fiber) is a very important part of the mix.
  - Slag Wool (min. 0.4% of total mix)
  - Cellulose (min. 0.3% of total mix)
• The fiber keeps the asphalt binder from draindown at high temperatures due to higher asphalt content.

Mix (stabilizing additive)
• Most asphalt plants are not equipped with the equipment to introduce the fiber into the mix, so the plant has to be setup when placing this type of mix.
  - Batch Plants
    Entered through pugmill of weigh hopper
  - Drum Plants
    1 ft upstream of the Asphalt Binder line

Balancing Production
• OGFC cools down quickly so that mix production and delivery must be balanced with lay down and compaction to ensure a smooth operation and a high quality mat.
• Haul trucks: Adequate numbers (and no pack driving!)
• Before you begin paving, calculate an ideal paver speed and continuously check and maintain it.
• Remember, balance of all the production rates is the key to quality OGFC pavement.

Plant Production
• Aggregate
  - Because the coarse aggregate is controlling in the mix design, more than one cold feed bin should be used to handle and monitor the aggregate to minimize variability and provide better control.
• Asphalt Binder
  - Mechanical agitators may be required in tanks because of modified binder usage.
• Calibration
  - It is critical to calibrate and check for consistent flow of the feed systems for of all aggregate, asphalt binder and stabilizing additives feed systems prior to beginning production.

Mixture Storage/Delivery
• OGFC should not be stored at elevated temperature for an extended period of time due to draindown.
• OGFC should not be stored for more than 2 hrs.
• Truck bed should be cleaned and fully coated with release agent due to bonding tendency of modified asphalt binder.
• Delivery times for OGFC should be as short as possible. And preferably less than 1 hour to prevent draindown and maintain temperature.
• To keep mix temperature high, allow tarp to drape close to mix to minimize air between the mix and the tarp.
OGFC Best Practices

Placement

• Shoulders need to be clipped prior to paving to allow for good drainage

• OGFC will not function properly if placed on a milled surface. Prior to placing OGFC an impermeable/very dense layer needs to be placed. This is generally accomplished by placing a thin layer of CS mix.

Placement

• Paving Season
  - April 1 to November 1

• Surface & Air Temperature are critical
  - minimum 55°F
  - Paving below 55°F has proven to lead to raveling of the mix.
  - Mix cools quickly after placement due to openness, surface area, and thickness.

Ponding and Drainage

• CS mix is placed so that the water is allowed to drain. Important to get proper cross slope (2% min.) for drainage

• Extra attention needs to be taken when placing the CS mix in the gore areas at ramps to ensure that the water does not pond in a travel lane.

• Careful attention to OGFC and 411D tie-in
  - Tie-ins need to be avoided in areas where water will have drainage issues (OGFC placed upslope of 411D)
**Shoulder stone**

- Shoulder stone needs to be placed after the CS layer but before the OGFC. This allows free flow of the water out of the mix.
- Shoulder stone is necessary to help us achieve our Maintenance Rating Index standard of less than 4” drop off. This helps to increase the safety of the roadway by creating a recoverable drop off.
- If the shoulder stone is placed after the OGFC, the fines from the stone fills up the voids in the mat which slows to drainage of the water.

**Tack Application**

- It is very important to ensure a proper tack application but we don’t want so much tack that it bleeds into the voids.
- Typical application is 0.07gal/SY. This may need to be field adjusted depending on the situation.
- Trackless tack works best with OGFC. It helps prevent build up on the tires which shows up in the mat.

**Compaction (407.15a.4)**

- Minimum of 2 rollers and 10 ton for each
- No test strip required
- No pneumatic rollers & No vibratory mode
- Make a least two passes with a steel double drum roller before the temperature of the mix falls below 185°F.
- An approved release agent may be added to the watering system of the roller to help prevent the newly placed mix from adhering to the rollers.

**Opening to Traffic**

When placing OGFC, it is important to minimize the amount of hand work required as it is very difficult to lute the mix.

**Opening to Traffic**

After Compaction, wait until the pavement temperature gets down to about 110°F-120°F prior to opening to traffic to keep from picking up any of the surface material. When paving during time restrictions, this needs to be accounted for.

Failure of OGFC not cooling down prior to traffic
OGFC Best Practices

**Bridge (tie ins)**
- Attention needs to be paid at the bridge ends so as not trap water.
- Since the spec only allows for 1.5" drop, additional milling may be required immediately preceding the CS layer, or a pavement wedge could be used and removed prior to paving.

**Bridge**
- Expansion joints may require additional work, will be dependent on a case by case basis.
- Different type of bridge overlays may also cause additional investigation
- Bridge ends are hard to tie into which sometimes requires hand work. Since OGFC is hard to lute, there are still some issues with getting a smooth transition.

**Paving at Drains**
- When paving around drains, the bottom if the OGFC layer needs to be left higher than the drains
- Depending on the location of the drains, different options will need to be evaluated.
Paving around ramps

- When paving around ramps, the top of the CS mix needs to be placed evenly with the ramp at joint of other tie in so that the water can drain out of the OGFC.
- OGFC has been used to fully overlay concrete pavement, a possible solution to avoid ponding on adjacent ramp is to continue OGFC overlay across the concrete ramp.

Hazmat Cleanup

When accidents occur, it is important to make sure that anything that seeps down into the mix is cleaned out. This will be hard to do since it cannot be seen.

Snow and Ice

- OGFC needs to be placed to the outside edge of the shoulder so snowplow can be most effective
- When water gets trapped in the mix and it starts to freeze, it causes a foaming action which pushes the ice to the surface. This is why it is important to have adequate drainage.
- Roadways may look clear, but you may have issues with the OGFC section freezing over.