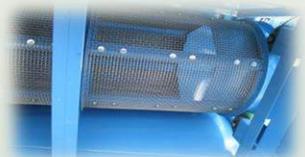




# Andela Products Designs and Manufactures Glass Recycling Machines and Equipment



# We Serve Communities, Countries, Islands and More



<https://andelaproducts.com/blog/quick-links/>

# THE SYSTEM





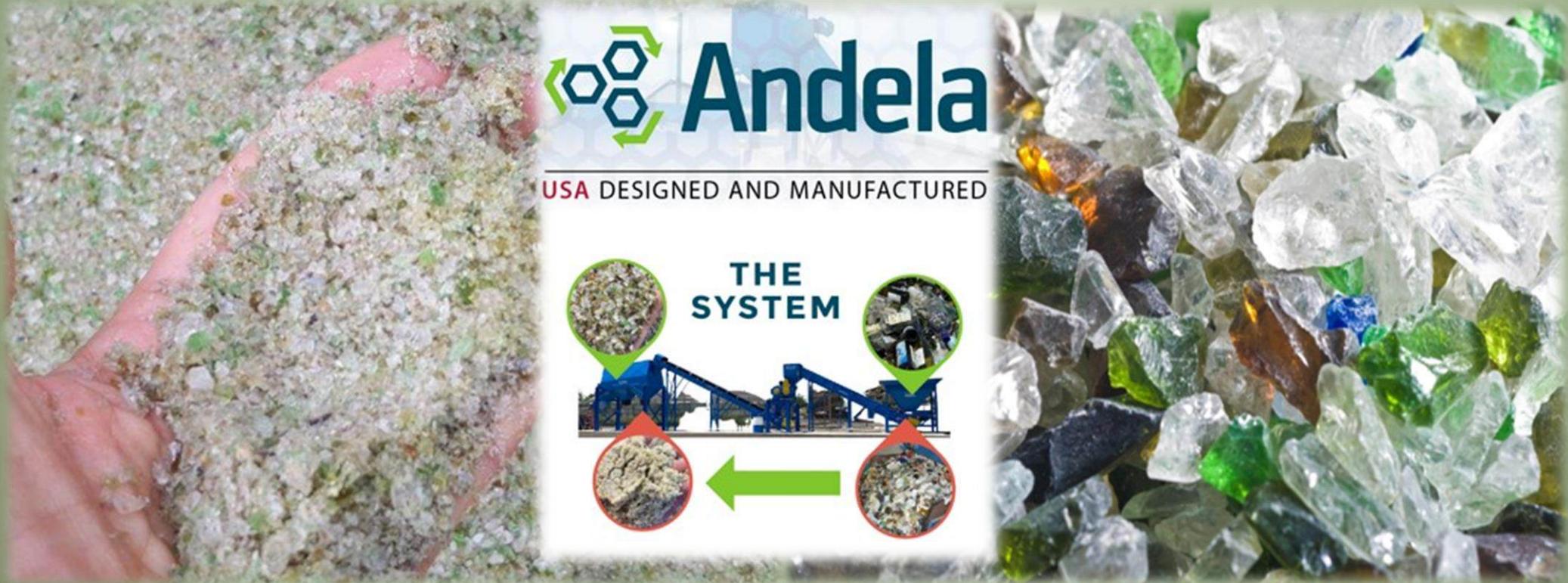
# Sources of Glass

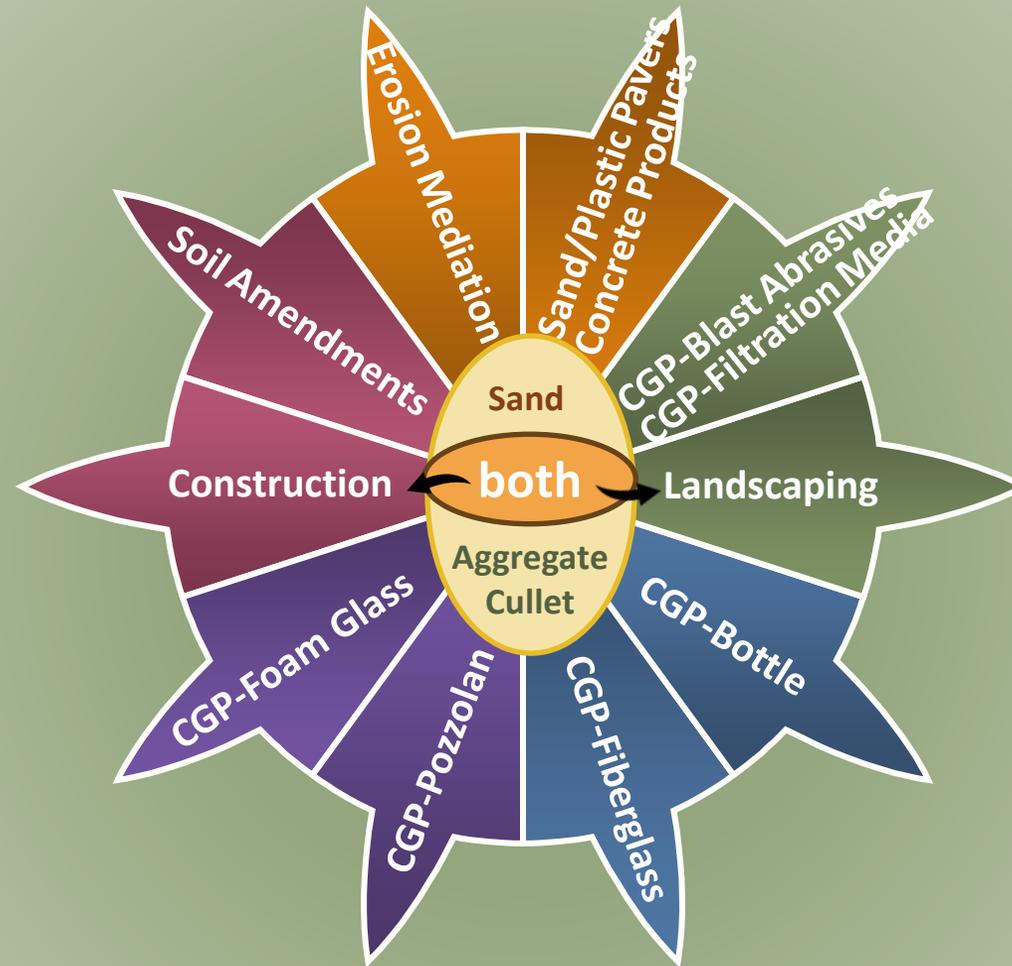
- Material Recovery Facility (MRF)
- Whole or broken bottles
- Plate glass
- Ceramics
- Any frangible material

# Local Collection and Processing

Recycle waste glass into a safe-handling product with no sharp edges

Community use as a substitute for sand and cullet/aggregate





## GLASS SAND & GLASS CULLET/AGGREGATE USES

# EROSION MEDIATION

## Glass Half Full, New Orleans Rehabilitated Louisiana's Coastline Using Pulverized Glass!

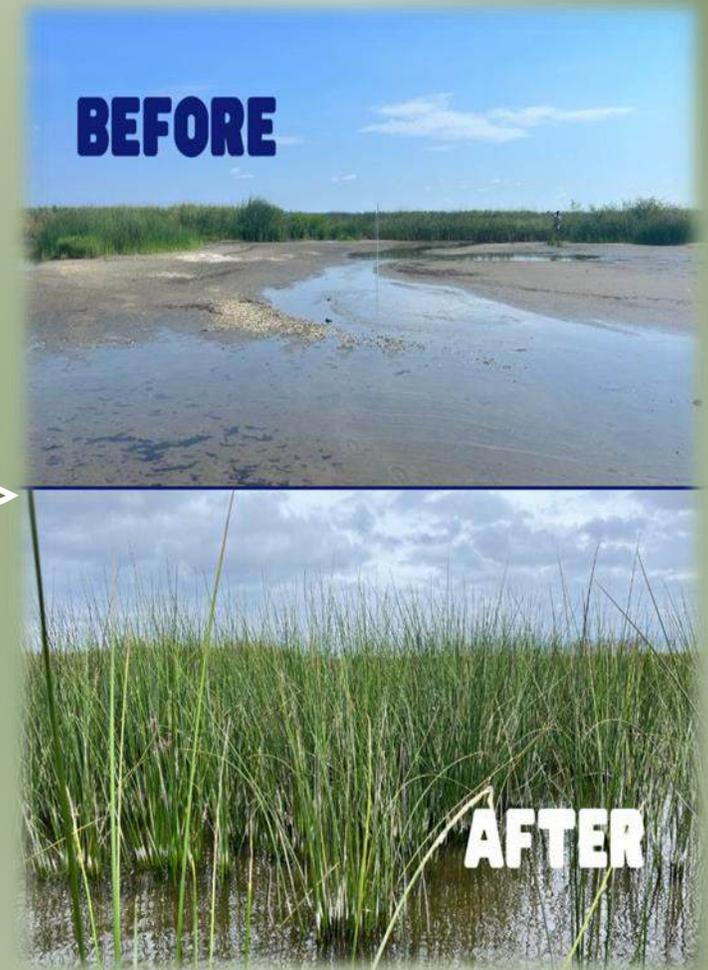
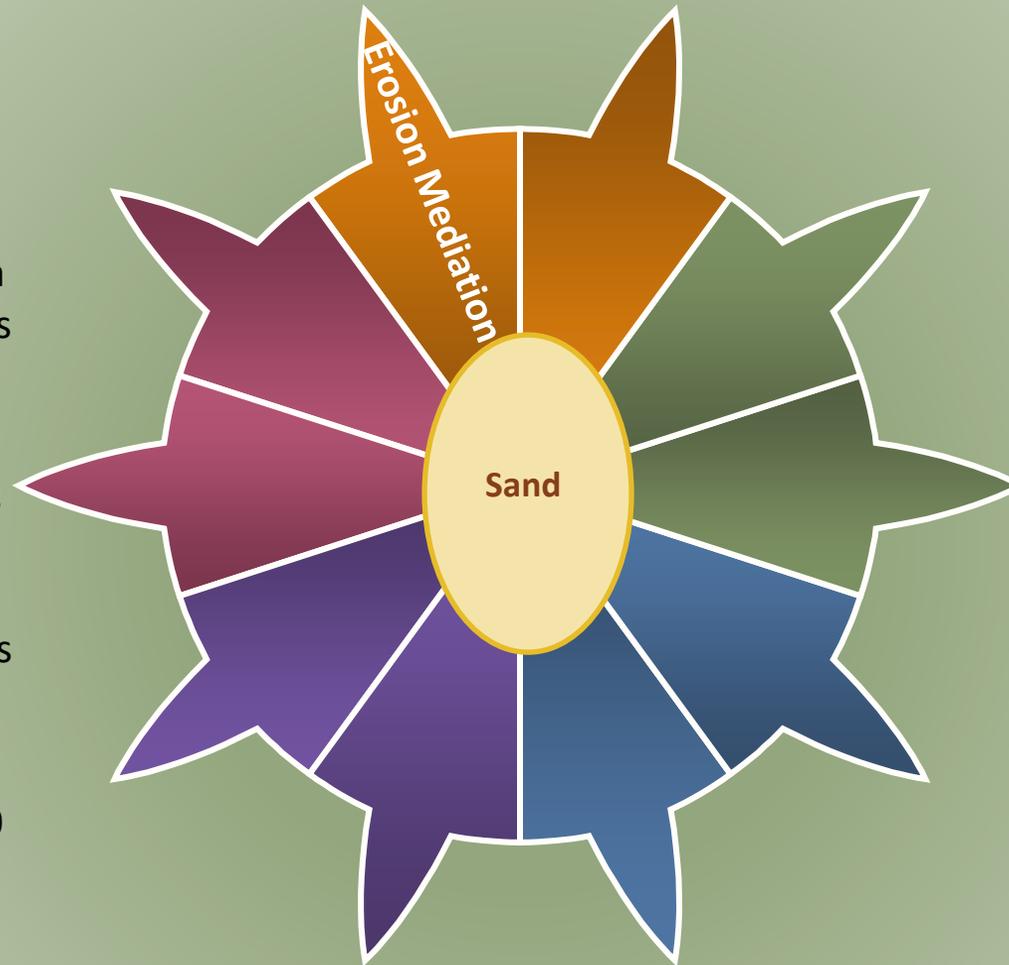
How?

First, they bought an Andela Glass Pulverizing System, then they created a glass collection program in New Orleans to build a mountain of glass waste.

Then, partnering with local universities and ReCoast, they gathered data determining which wetlands would benefit the most from a pulverized glass sand restoration.

With a team of volunteers and 100,000 pounds of recycled glass waste they planted 8,000 native bulrush plugs.

Teamwork paid off!



## GLASS SAND & GLASS CULLET/AGGREGATE END USES

# EROSION MEDIATION

Tulane, Glass sand to prevent coastal erosion: <https://news.tulane.edu/pr/tulane-scientists-and-engineers-use-recycled-glass-sand-prevent-coastal-erosion>

ReCoast, Glass sand ecological testing: <https://recycleforthe coast.org/ecological>

Glassroots KY, Cayman Islands study: <https://www.caymancompass.com/2023/10/26/glass-to-grass-can-crushed-glass-help-restore-caymans-coastal-environment/>

UTRGV, Bottle to Beach...Saving Coastlines:  
<https://www.utrgv.edu/newsroom/2024/08/21/groundbreaking-research-project-that-repurposes-glass-waste.htm>

Business Insider, Glass Half Full: <https://youtu.be/dIOTsBhFF7M?si=BKkIJLELIWmd3cPF>

Andela Products, Coastal and Marshland Restoration  
Using Crushed Glass: <https://andelaproducts.com/coastal-marshland-restoration/>

# SOIL AMENDMENTS

University of Pennsylvania Department of Earth and Environmental Science in conjunction with OLIN Labs performed a life cycle analysis (LCA) on soil made with Andela pulverized glass.

Results: The addition of glass sand to mulches or soils improves both their mechanical properties, and chemical or nutritional properties. Better water flow of glass-sand mulch mixes. Leachate analysis met safety standards. Glass-sand retains water longer than natural sand. Economic analysis showed community benefits of diverting glass from landfill.

**How to:** Mix glass sand with compost to make a soil blend that includes organic nutrients from the compost, and filtration and water retention from the glass sand.



# LANDSCAPING

**BOTH GLASS SAND AND CULLET/AGGREGATES** are a natural fit for Landscaping applications.

User-friendly with rounded edges, pulverized glass is attractive and doesn't break down like the mined and dredged products they replace.

Bonus: Glass mulch keeps insects, slugs, and other weeds from attacking plants.

And glass mulch creates an insulated layer to protect the plant's roots from extreme temperatures.

In addition, pulverized glass retains moisture on the surface of particles, providing water and available silica for the plant's growth!

## GLASS SAND & GLASS CULLET/AGGREGATE END USES

# Soil-Landscaping Links

OLIN Labs, Circular Soil: <https://olinlabs.com/soil-less-soil>

OLIN Labs, Resiliency Park: <https://andelaproducts.com/blog/circular-soil-northwest-resiliency-park/>

OLIN Labs/Bottle Underground/Bennett Compost soil mix: glass-sand, food-waste compost, biochar:  
<https://olinlabs.com/flowershow>

Olin Labs/Temple University, Soilless Soil: <https://olinlabs.com/blog/2022/9/9/soilless-soil-2020-2022-recap>

University of Texas Rio Grande Valley, Salsa Mix: <https://sustainablebrands.com/read/study-glass-grow-ingredients-protect-coastlines>

Alfred University, Glass as Fertilizer conduit:

<https://www.alfred.edu/about/news/pressreleases/2024/08/alfred-university-undergraduates-research-use-of-waste-glass-in-promoting-plant-growth.cfm>

Colgate University, Tomato study: [https://andelaproducts.com/wp-content/uploads/2024/03/Andela-Glass-and-Soil-Amendment-Information-2023\\_compressed.pdf](https://andelaproducts.com/wp-content/uploads/2024/03/Andela-Glass-and-Soil-Amendment-Information-2023_compressed.pdf)

Landscaping Tips: <https://andelaproducts.com/wp-content/uploads/2024/01/5-Creative-Ways-To-Use-Recycled-Glass-Outdoors.pdf>

<https://andelaproducts.com/glass-soil-and-mulch/>

# CONSTRUCTION SAND AND AGGREGATE

## Pulverized Glass & Construction

The angular shape of recycled pulverized glass sand particles makes them interlock more easily which increases their construction strength.

Also, waste glass can be crushed to varying particle sizes.

This is important because engineering characteristics of building materials differ with different particle sizes.

### USES:

- Bedding
- Backfilling Material
- Concrete
- Road drainage
- Embankment Fill
- Landscaping



## GLASS SAND & GLASS CULLET/AGGREGATE END USES

# Construction Sand and Aggregates

Cano Martin Pena, Puerto Rico: <https://wp.wpi.edu/puertorico/projects/2022-spring/cano-recycling/>

Australia Specifications for Recycled Glass Aggregates: [https://andelaproducts.com/wp-content/uploads/2024/01/Specification for RCG as SAR-compressed.pdf](https://andelaproducts.com/wp-content/uploads/2024/01/Specification_for_RCG_as_SAR-compressed.pdf)

US FDOT Guidelines for use in Pavement Construction: [https://andelaproducts.com/wp-content/uploads/2024/03/Waste-Glass-Material-Description-User-Guidelines-for-Waste-and-Byproduct-Materials-in-Pavement-Construction-FHWA-RD-97-148\\_compressed.pdf](https://andelaproducts.com/wp-content/uploads/2024/03/Waste-Glass-Material-Description-User-Guidelines-for-Waste-and-Byproduct-Materials-in-Pavement-Construction-FHWA-RD-97-148_compressed.pdf)

Other presentations:

<https://andelaproducts.com/wp-content/uploads/2024/01/Andela-Products-Glass-Aggregate-Applications.pdf>

[https://andelaproducts.com/wp-content/uploads/2022/08/Applications-for-Using-Pulverized-Glass-Sand\\_Aggregate.pdf](https://andelaproducts.com/wp-content/uploads/2022/08/Applications-for-Using-Pulverized-Glass-Sand_Aggregate.pdf)

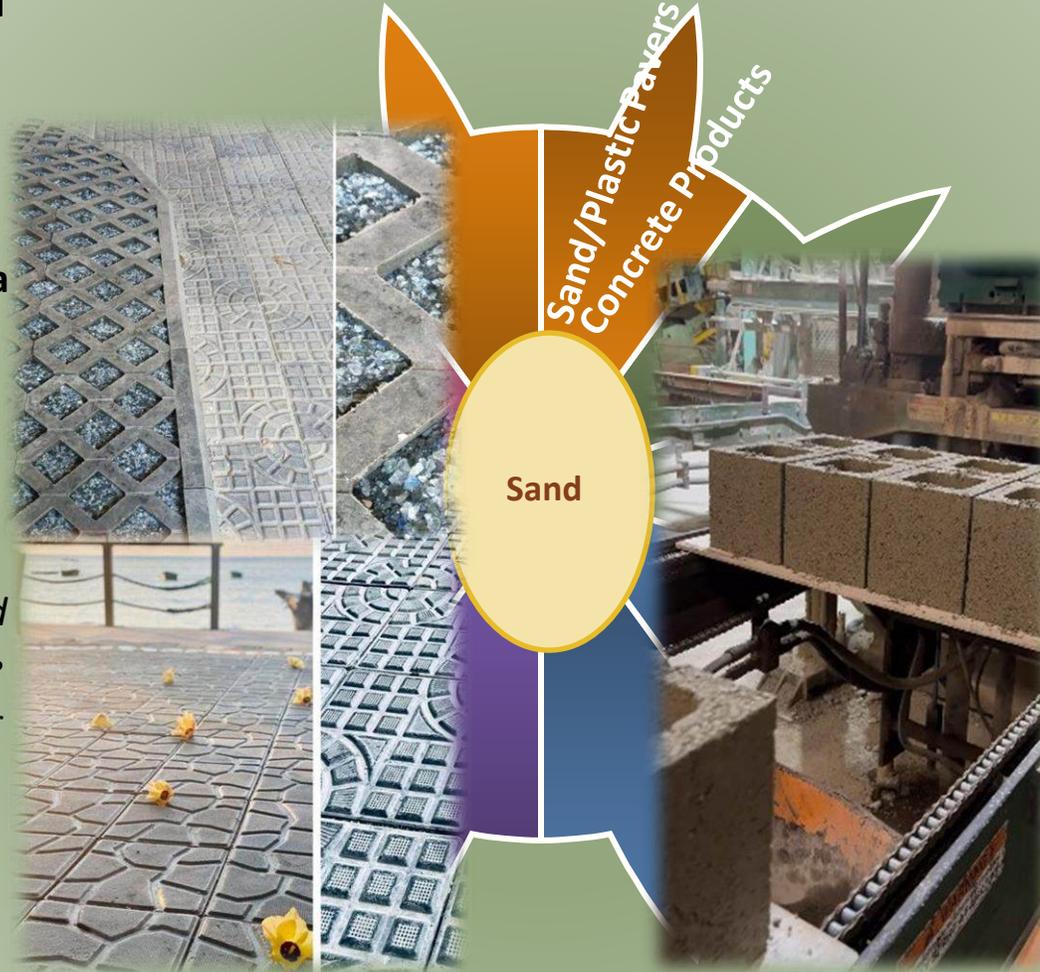
## SAND & PLASTIC PAVERS

Waste Glass And Plastics Go Unrecycled  
In Remote and Island Locations.

There is a solution! Turn them into  
products that can be used locally!  
**How?**

Caltech in Timor-Leste uses their Andela  
Pulverizer to make sand for Pavers,  
Bricks, Building Blocks, and Curb Units.

To create glass and plastic pavers,  
follow these steps: 1)Pulverize glass  
using the Andela unit or system. 2) Shred  
mixed plastics into little chips. 3) Mix the  
glass and shredded plastic chips. 4) Pour  
them into the heating unit. 5) Press  
melted plastics and glass mix into the  
Paver mold. 6) Cool molded product in  
water and you have PAVERS!



## CONCRETE PRODUCTS

Bloques Caribe, a construction company  
in Puerto Rico, uses their Andela  
Pulverizer to make glass sand for  
concrete blocks.

José Mercado Quintana of Bloques  
Caribe keeps his company on the  
forefront of recycling by **using pulverized  
glass in the cement mixture for both  
environmental and economic purposes.**

One report states that Bloques Caribe's  
annual savings for substituting glass sand  
for natural sand in their cement block  
mixture is approximately \$507,892--  
based on the weight of an 8" x 8" x 16"  
block with the estimated 11% glass in  
weight per block.

<https://andelaproducts.com/wp-content/uploads/2024/04/Caltech-Andela-Circular-solution-Pavers-min.pdf>

## GLASS SAND & GLASS CULLET/AGGREGATE END USES

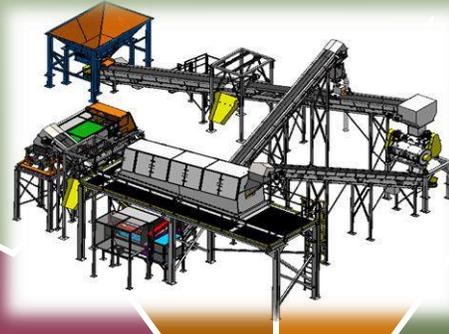
# Andela Clean Glass Plant

An Andela Clean Glass Plant includes an Andela Glass Pulverizer combined with an Andela Glass Clean Up System.

The Andela CGP, Clean Glass Plant, includes Drying, screening and re-grinding processes to turn MRF (Material Recovery Facility) glass into clean glass products for further refinement.

MRF glass includes broken glass, flattened metals, plastics, and shredded paper.

Andela's CGP utilizes our Selective Reduction Technology which leaves the non-glass residue typical of MRF glass in a larger form that exits the system as "Overs."



The output of our CGP is ready to be shipped to a bottle, fiberglass, foam glass, or pozzolan manufacturer. Or it can be used for glass blast abrasives and filtration media.

What an Andela customer chooses for their market depends on the location of the end-user relative to their plant, and the highest and best use of the outputs.

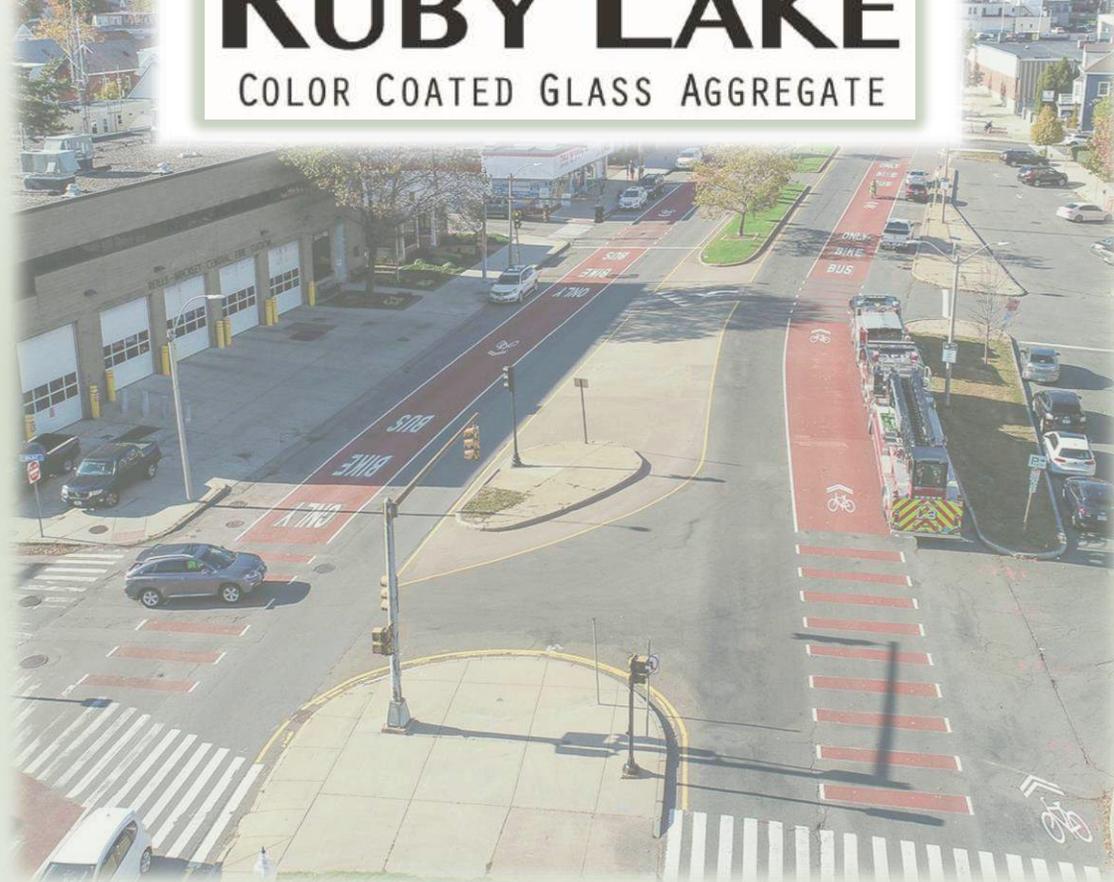
**Andela Clean Glass Plants include:**  
Hopper, Pulverizer, Trommel Screen, Blower/Density Separator, Eddy Current, Conveyors, Dryer and Screeners integrated into a turnkey solution.

## Clean Glass Sand & Cullet End Markets

COLOR TEXTURE DURABILITY



**RUBY LAKE**  
COLOR COATED GLASS AGGREGATE



[www.rubylakeglass.com](http://www.rubylakeglass.com)



# Andela

USA DESIGNED AND MANUFACTURED

Glass Pulverizing, Crushing, And  
Cleaning Systems



[www.andelaproducts.com](http://www.andelaproducts.com)