Executive Summary:
We worked to reduce the average per day water usage of an individual by 20 gallons per day. This was achieved by applying low flow fixtures for household appliances. This will effectively reduce water consumption by over 17 gallons per person per day. We also designed a grey water recycling system that will take the water produced by the shower, bathroom sink, and washing machine, pass it through a series of filters, and divert it for use as irrigation and for the toilet. This would reduce the water used per day per person by an additional 6 gallons, bringing our water saving totals to around 24 gallons per day.

Fixtures:
- Delta Foundations 2-piece 1.28 GPF
- Single Flush Round Front Toilet
- 0.5 Gallons per Minute Sink Faucet Aerator
- Fisher-paykel DD245AX9 24in. Full Drawers Console Dishwasher
- Shower Boss
- ShowerTimer
- Residential unit
- Niagara Consavation Sava 1-Spray Patterns 4.5 in. Single Wall Mount 1.5 GPM Fixed Shower Head
- Bau Cosmopolitan Battery Powered Single Hole Touchless Bathroom Faucet
- Jeonestan Foot Pedal Faucet Set, Touchless Floor Mount Foot Control Faucet Kit

Water Savings:
- From Fixtures: 141.54 gal/day
- From Recycling: 91.5 gal/day
- Total Savings: 233.04 gal/day

Schematic:

Soaps & Detergents:
- What to Avoid:
  - Salt and Sodium Compounds
  - Boron
  - Chlorine Bleach
  - Alkaline Compounds
- Safe Brands:
  - Dr. Bronner
  - Oaxis

Filters:
- Sand:
  - Used for primary treatment of water
  - Modeled off of the the Showerloop system and pool sand filters
- Sand is compressed in a geotextile fabric bag for further filtration and easy maintenance
- Components:
  - Acrylic Tube
  - Geotextile Fabric
  - Acrylic Compression Disks
  - Quartz Sand
  - PVC Caps

Soil:
- Light shield prevents algae growth
- Filter replacement every 1 year

References:
[4] Fresh Water Systems:

Flow rate Micron rating Initial Cost Replacement Cost Lifespan
2.6 gal/min 20 $85 $30 1-2 years

“Big Blue” Carbon Block Filter:
- Removes Volatile Organic Chemicals
- Micron rating is low enough to pair with drip irrigation without clogging
- Filter replaced annually

Max Flow Rate Micron Rating Initial Cost Replacement Cost Lifespan
4 gal/min 5 $50 $25 1 year

Table:

<table>
<thead>
<tr>
<th>Fixtures</th>
<th>Initial Cost</th>
<th>Replacement Cost</th>
<th>Lifespan</th>
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</thead>
<tbody>
<tr>
<td>Delta Foundations</td>
<td>$25</td>
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