***Attachment A.10 – Item 3.2 Best Management Practice Installation Detail with Dimensions and Product Data Sheet***

| ***3.2.1 BMP Description : Water for Dust Control*** | |
|---|---|
| ***Installation Schedule***: | • *Minimize exposed areas through the schedule of construction activities*<br>• *Utilize vegetation, mulching, sprinkling, and stone/gravel layering to quickly stabilize primary entrances/ exits prior to commencement of construction*<br>• *Anticipate the prevailing wind direction to minimize the amount of dust generated*<br>• *Do not over-spray water for dust control purposes*<br>• *Direct construction vehicular traffic to stabilized roadways*<br>• *Comply with the 2005 Hawaii standard specifications for road and bridge in sections 209 and 620.* |
| ***Maintenance and Inspection***: | • *Inspect construction site periodically and after rain to identify areas requiring installation, repair, or replacement of additional BMPs to cover bare ground or redirect off-site runoff.* |
| ***Product Specification Reference***: | • *Manufacturer – GeoTech Solutions, Inc.*<br>• *Product – Soil Sement*<br>• *Model Number- (Contact Troy at troyo@geotechsolutions.com or 808-677-1580)*<br>• *Or approved equal* |

| ***3.2.2 BMP Description*: *Drain Inlet Protection*** | |
|---|---|
| ***Installation Schedule*:** | • *Five types of inlet protection are described below.*<br>  o *Geotextile Filter Fabric Fence: Applicable to drainage basins less than one acre and with less than a 5 percent slope.*<br>  o *Block and Stone Filter: Applicable to flows exceeding 0.5 cfs.*<br>  o *Stone and Wire Mesh Filter: Applicable to curb or drop inlets subjected to traffic from construction equipment.*<br>  o *Sandbag Barrier: Applicable to sloped, paved streets; creates a small sediment trap upstream of inlets.*<br>  o *Excavated Drop Inlet Sediment Trap: Applicable to areas requiring overflow capability due to expected high flows; an excavated area around the inlet which detains runoff and allows sediment to settle.*<br>• *In addition to the methods of inlet protection described above, there are other effective methods and proprietary devices, which may also be used.*<br>• *Limit to drainage areas less than one acre, unless a sediment trap intercepts the runoff prior to the inlet protection device.*<br>• *Provide an area for water to pond around inlet without flooding nearby structures and property.*<br>• *Inspections and maintenance*<br>• *Other proprietary devices may be used and shall be installed per manufacturer's recommendations.* |
| ***Maintenance and Inspection*:** | • *Inspect weekly during dry periods as well as within 24 hours of any rainfall of 0.5 inch or greater which occurs in a 24-hour period and daily during periods of prolonged rainfall.*<br>• *Immediately replace clogged geotextile filter fabric or stone filters.*<br>• *Remove accumulated sediment when depth reaches half of the filter height or half of the sediment trap depth.*<br>• *Remove inlet protection after stabilization of upstream soils and sweeping of streets is completed. Properly dispose of trapped sediment.* |
| ***Product Specification Reference*:** | • *Manufacturer: New Pig*<br>• *Product: Curb- Style Drain Insert Plus*<br>• *Model Number: FLT214*<br>• *Or approved equal* |

| ***3.2.3 BMP Description*: *Silt Fence*** | |
|---|---|
| ***Installation Schedule***: | • *Primarily use where sheet flow occurs.*<br>• *Install silt fence along or parallel to contours.*<br>• *Ends of silt fence shall be turned uphill and the geotextiles should be overlapped.*<br>• *Silt fence posts shall be driven 14 inches minimum into the trench (see silt fence detail) and the geotextile filter fabric shall be embedded a minimum of 6 inches vertically into the ground or install according to manufacturer's recommendation.* |
| ***Maintenance and Inspection***: | • *Inspect weekly during dry periods as well as within 24 hours of any rainfall of 0.5 inch or greater which occurs in a 24-hour period and daily during periods of prolonged rainfall.*<br>• *Repair or replace damaged fence or posts.*<br>• *Remove accumulated sediment when depth reaches 1/3 the barrier height.* |
| ***Product Specification Reference***: | • *Manufacturer: Granite Environmental*<br>• *Product: Silt Fence*<br>• *Model Number: Call for Details (+1-772-646-0597 or toll free at (888- 703-9889)*<br>• *Or approved equal* |

| ***3.2.4 BMP Description*: *Construction Exit Wash Water*** | |
|---|---|
| ***Installation Schedule***: | • *Grade the stabilized entrance/exit to prevent runoff from discharging off-site.*<br>• *Direct runoff to a sediment trap or basin prior to discharge.*<br>• *Construct stabilized entrance/exit on level ground where possible.*<br>• *Provide ample turning radii.*<br>• *Crushed aggregate free of fine material shall be 3 to 6 inches in size. The use of crushed asphalt concrete (AC) is not allowed.*<br>• *Depth of aggregate shall be 12 inches thick or as recommended by the soils engineer. Contractor is responsible to design stabilized construction entrances/exit to support heaviest vehicles and equipment that will use it.*<br>• *Place geotextile filter fabric beneath the aggregate.*<br>• *Dimensions shall be a minimum of 50 feet in length and 30 feet in width. If project site layout will not accommodate minimum dimensions identify additional BMPs to minimize tire tracking.* |
| ***Maintenance and Inspection***: | • *Inspect construction entrance/exit weekly during dry periods as well as within 24 hours of any rainfall of 0.5 inch or greater which occurs in a 24-hour period and daily during periods of prolonged rainfall for damage.*<br>• *Remove deposited sediment from adjacent roadways or paved areas within 24 hours.*<br>• *Replenish surface aggregate periodically.*<br>• *Upon project completion, all construction entrances/exits shall be removed by the contractor and restore the area to the condition approved by the Engineer.* |
| ***Product Specification Reference***: | • *Manufacturer – Ameron*<br>• *Product – Surge Material*<br>• *Model Number - (Contact Sand Island Sales Dept.*<br>*7:30 am - 4:15 pm, M – F*<br>*Phone: (808) 832-9245*<br>*Fax: (808) 832-9470*<br>*Email: sales@ameronhawaii.com*<br>• *Or approved equal* |

| ***3.2.5 BMP Description*: *Solid Waste Management*** | |
|---|---|
| ***Installation Schedule***: | • *Separate contaminated clean up materials from C&D wastes. Contamination may be from hazardous substances, friable asbestos, waste paint, solvents, sealers, or adhesives.*<br>• *Inert fill material shall not contain vegetation, organic material, or other solid waste.*<br>• *Inert fill materials shall not be mixed with other C&D waste.* |
| ***Maintenance and Inspection***: | • *Inspect construction waste and recycling areas regularly.*<br>• *Schedule solid waste collection regularly.*<br>• *Schedule recycling activities based on construction/demolition phases.* |
| ***Product Specification Reference***: | • *Manufacturer- Rolloffs Hawaii*<br>• *Product- 40 Cubic Yard Rolloff Can*<br>• *Model Number- Contact Rolloffs Hawaii, LLC at (808) 664-1504 for details*<br>• *Or approved equal* |

| ***3.2.6 BMP Description*: *Construction Staging Area*** | |
|---|---|
| ***Installation Schedule***: | • *Provide training for employees and contractors on proper material delivery and storage practices and procedures.*<br>• *Designate on-site material delivery and storage areas. Areas shall be located near construction entrances and away from watercourses. Earth berms or other containment measures shall surround storage areas.*<br>• *Flammable materials shall comply with the fire codes of Honolulu. Contact the local Fire Marshal for site specific requirements. Refer to the Flammable and Combustible Liquid Code, NFPA30 for more information.*<br>• *Maintain accurate and up to date records of material delivered and stored on-site.*<br>• *Minimize on-site inventory.*<br>• *Retain a complete set of material safety data sheets on-site.*<br>• *Minimize handling of hazardous materials.*<br>• *Store materials under cover during the rainy season.*<br>• *Store chemicals, drum, and bagged materials on a pallet and when possible, under cover in secondary containment.*<br>• *If drums must be stored in an uncovered area, place them at a slight angle to minimize ponding of rainwater on the lids to minimize corrosion.*<br>• *Hazardous chemicals shall be well-labeled and stored in the original containers.*<br>• *Employees with emergency spill cleanup training shall be present during unloading of dangerous materials or liquid chemicals.*<br>• *Any significant residual materials remaining on the ground after the completion of construction shall be removed and properly disposed. If the residual materials contaminate the soil, then the contaminated soil shall also be removed and properly disposed.* |
| ***Maintenance and Inspection***: | • *Storage areas shall be clean and well organized.*<br>• *An ample supply of spill cleanup materials shall be kept with work crew supplies.*<br>• *Conduct weekly inspections of material containers for corrosion.*<br>• *Conduct weekly inspections of storage areas which may require repair or replacement.* |
| ***Product Specification Reference***: | N/A |

| ***3.2.7 BMP Description*: *Concrete Truck Wash Water*** | |
|---|---|
| ***Installation Schedule***: | • *Properly store concrete materials away from runoff and under cover.*<br>• *Avoid mixing excess concrete, if possible. Discard excess concrete in the designated area.*<br>• *Wash concrete-coated vehicles or equipment off-site or in the designated wash area. Locate on-site concrete wash area a minimum of 50 feet away from storm drain inlets, open drainage facilities, or water bodies. Runoff from the on-site concrete wash area shall be contained in a temporary pit or level bermed area where the concrete can set.*<br>• *Temporary pit shall be lined with plastic to prevent seepage of the wash water into the ground. Allow wash water to evaporate or collect wash water and all concrete debris in a concrete washout system bin.*<br>• *Break up and properly dispose of hardened concrete from wash area.*<br>• *Collect and properly dispose of aggregate concrete sweepings.*<br>• *Provide concrete waste management training for employees and contractors.* |
| ***Maintenance and Inspection***: | • *Inspect concrete wash areas for damage and repair as necessary.*<br>• *Regularly remove and dispose hardened concrete.*<br>• *Monitor contractors to ensure proper concrete waste management measures are implemented.* |
| ***Product Specification Reference***: | N/A |

| ***3.2.8 BMP Description*: *Maintenance and Staging Area*** | |
|---|---|
| ***Installation Schedule***: | • *Prevent excessive accumulation of oil and grease by keeping vehicles and equipment clean.*<br>• *Use off-site repair and maintenance facilities where practical.*<br>• *Designate a maintenance area away from drainage courses to prevent pollutants from entering the drainage system.*<br>• *Place drip pans or drop cloths under vehicles and equipment to absorb spills or leaks.*<br>• *Provide an ample supply of readily accessible spill cleanup materials.*<br>• *Use absorbent materials on small spills. Promptly remove and properly dispose of absorbent materials. Do not hose down or bury small spills.*<br>• *On-site vehicles and equipment shall be inspected regularly for leaks and all leaks shall be immediately repaired.*<br>• *Incoming vehicles and equipment shall be checked for leaks. Leaking vehicles and equipment shall not be allowed on-site.* |
| ***Maintenance and Inspection***: | • *Regularly inspect vehicle and maintenance areas.*<br>• *Ample supplies of spill cleanup materials shall be kept on-site.* |
| ***Product Specification Reference***: | N/A |

| ***3.2.9 BMP Description***: ***Saw Cutting Slurry*** | |
|---|---|
| ***Installation Schedule***: | • *Slurry and cuttings shall be vacuumed during cutting and surfacing operations.*<br>• *Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.*<br>• *Slurry and cuttings shall not drain to any natural or constructed drainage conveyance.*<br>• *Collected slurry and cuttings shall be disposed of in a manner that does not violate groundwater or surface water quality standards.*<br>• *Process water that is generated during hydro-demolition, surface roughening or similar operations shall not drain to any natural or constructed drainage conveyance and shall be disposed of in a manner that does not violate groundwater or surface water quality standards.*<br>• *Cleaning waste material and demolition debris shall be handled and disposed of in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, the material must be hauled out of the area to an appropriate disposal site.* |
| ***Maintenance and Inspection***: | *The Saw Cutting Slurry shall not be allowed to enter the sewer, storm drain, or any other natural outlet. Use as little cooling water as possible during saw-cutting. Shovel or vacuum saw-cut slurry, then dispose of into a holding area until the slurry dries and the remainder disposed into an approved facility in accordance with State and Federal Laws.* |
| ***Product Specification Reference***: | *N/A* |

| ***3.2.10 BMP Description*: *Concrete Curing Water*** | |
|---|---|
| ***Installation Schedule***: | *Chemical Curing*<br>• *Avoid over spray of curing compounds.*<br>• *Minimize the drift of chemical cure as much as possible by applying the curing compound close to the concrete surface.*<br>• *Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.*<br>• *Use proper storage and handling techniques for concrete curing compounds.*<br>• *Protect drain inlets prior to the application of curing compounds.* |
| ***Maintenance and Inspection***: | • *Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.*<br>• *Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds.*<br>• *Inspect cure containers and spraying equipment for leaks.*<br>• *No discharge of concrete curing water is allowed to be discharged to State waters.* |
| ***Product Specification Reference***: | *N/A* |

| ***3.2.11 BMP Description*: *Paving Operations*** | |
|---|---|
| ***Installation Schedule***: | • *Limit paving operations during wet weather when possible.*<br>• *Store materials for paving activities away from concentrated runoff.*<br>• *Use asphalt emulsions as prime coat when possible.*<br>• *Place drip pans under paving equipment to contain leaks and spills. Clean up spills with absorbent materials.*<br>• *Place geotextile filter fabric over drain inlet structures and manholes during application of tack coat, seal coat, slurry seal, and fog seal.*<br>• *Saw cut slurry shall be removed from site by vacuuming. Provide storm drain protection during saw cutting.*<br>• *Refer to Section 3.11 in this BMP Plan for activities involving Portland cement concrete.*<br>• *Adhere to the following when paving involves asphaltic concrete (AC):*<br>o *Properly dispose of old or spilled asphalt. Collect and remove broken asphalt. Recycle asphalt when possible;*<br>o *Excess sand and gravel shall be swept to prevent discharge into the storm drainage system or adjacent water body; and*<br>o *Comply with storm water permitting requirements for industrial activities if paving requires an on-site mixing plant.* |
| ***Maintenance and Inspection***: | • *Ample supplies of drip pans and absorbent materials shall be kept on-site.*<br>• *Inspect inlet protection equipment.*<br>• *Monitor employees to ensure appropriate paving practices and procedures are being implemented.* |
| ***Product Specification Reference***: | *N/A* |

***3.2.12 BMP Description***: ***Seeding and Planting*** *- Seeding of grasses and plantings of trees, shrubs, vines and ground covers provide long term stabilization of soil.*

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| ***Installation Schedule***: | *Grasses:*<br>*• Ground preparation: fertilize and mechanically stabilize the soil.*<br>*• Tolerant of short-term temperature extremes and waterlogged soil conditions.*<br>*• Appropriate soil conditions: shallow soil base, good drainage, slope 2:1 or flatter.*<br>*• Develop well and quickly from seeds.*<br>*• Mowing, irrigating, and fertilizing are vital for promoting vigorous grass, growth.*<br><br>*Trees and Shrubs:*<br>*• Selection Criteria: vigor, species, size, shape & wildlife food source.*<br>*• Soil conditions: select species appropriate for soil, drainage & acidity.*<br>*• Other Factors: wind/exposure, and irrigation needs.*<br><br>*Vines and Ground Covers:*<br>*• Ground preparation: lime and fertilizer preparation.*<br>*• Use proper seeding rates.*<br>*• Appropriate soil conditions: drainage, acidity, slopes.*<br>*• Generally avoid species requiring irrigation.* |
| ***Maintenance and Inspection***: | *• Shrubs and trees must be adequately watered and fertilized and if needed pruned.*<br>*• Grasses may need to be watered and mowed.* |
| ***Product Specification Reference***: | *N/A* |