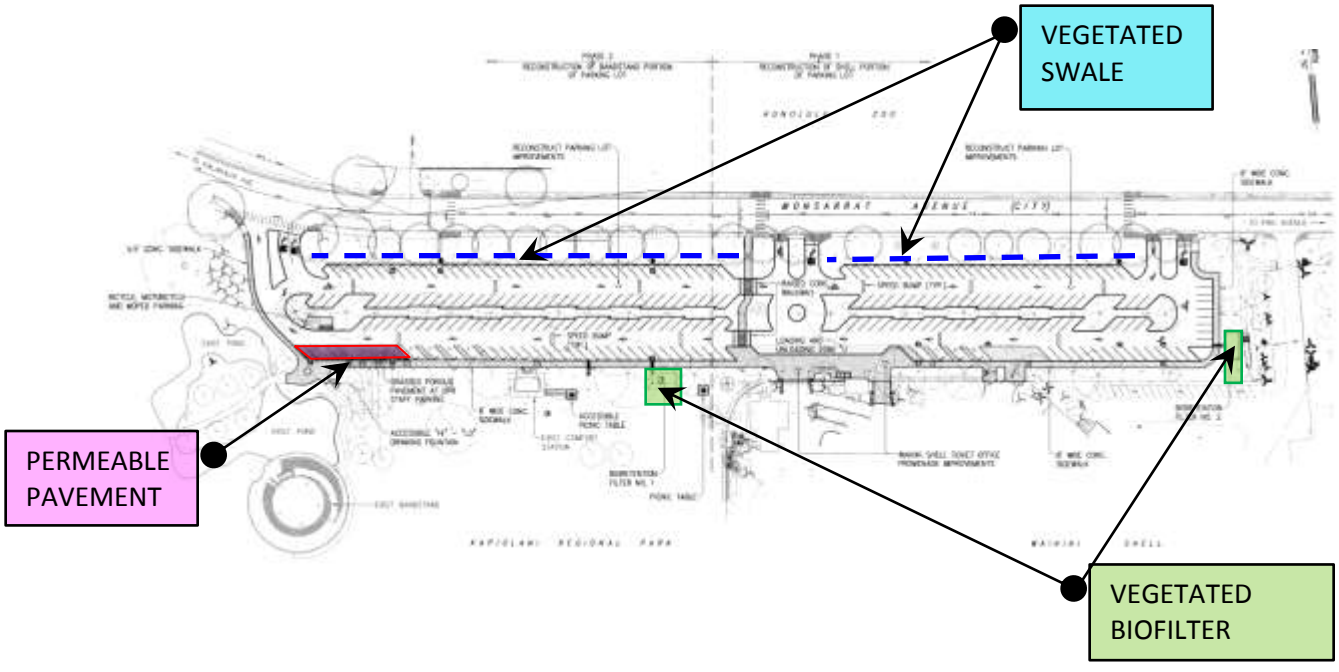
Storm Water Pollution Prevention Low Impact Design Installation Initiative
Department of Facility Maintenance

OWNER: City and County of Honolulu
DESIGNER: Park Engineering
FACILITY: Kapiolani Regional Park
ADDRESS: 2805 Monsarrat Avenue, Honolulu, HI 96815
PROJECT TITLE: Reconstruction of Bandstand & Shell Parking Lots and Related Site Improvements at Kapiolani Regional Park; May 8th, 2012
TMK: 3-1-043:001

REFERENCES:

1. City and County of Honolulu Stormwater Best Management Practice (BMP) Manual, New and Redevelopment, July 2014.
2. NPDES Permit for City and County of Honolulu, MS4, Small MS4, Industrial Facilities; HI S000002; effective February 16, 2015; Part D.1.e.(1)(iii) which requires management practices prioritized to favor infiltration, evapotranspiration, or harvesting/reuse, followed by treatment and release practices.

PROJECT SUMMARY:
The design was done prior to the City's Stormwater BMP Manual for New and Redevelopment dated July 2014 and the new MS4 permit. However, the project included post construction treatment control BMPs. Treatment controls consisted of 1,300 square feet of permeable pavement, 850 lineal feet of vegetated swales downstream of parking areas, and two vegetated biofilter areas. For small storm events, runoff from pavements and associated pollutants are filtered through the vegetated swale, permeable pavement, and bioretention areas.



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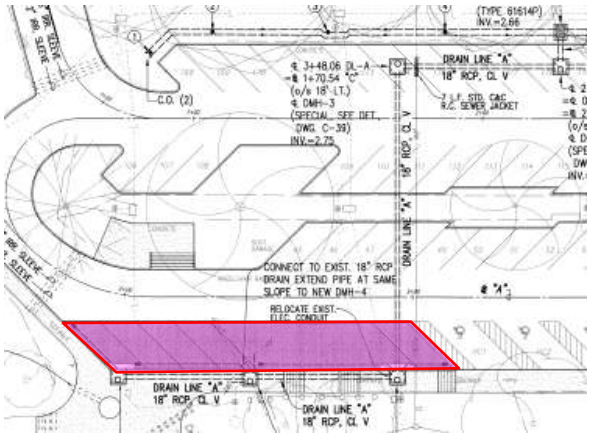
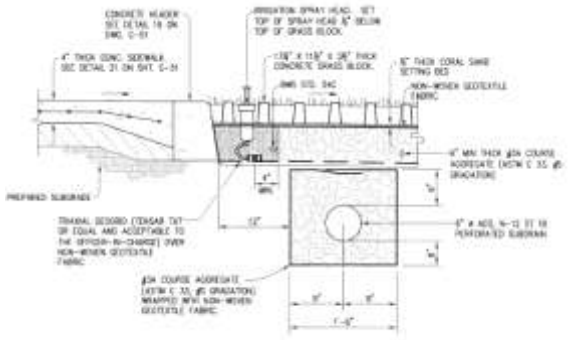
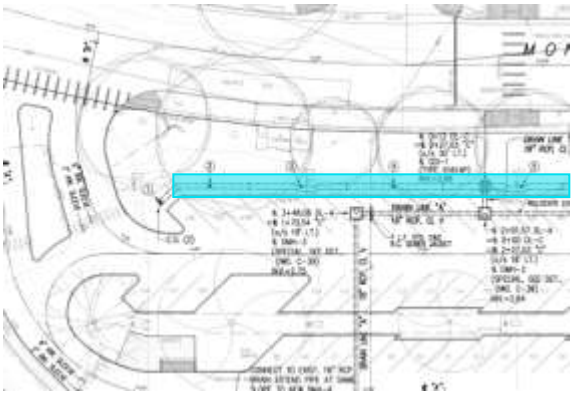


PLAN VIEW



CROSS SECTION

City Treatment Control BMP TC-13; Permeable Pavement: Permeable pavement is a porous surface often built with an underlying stone reservoir that temporarily stores surface runoff before it infiltrates into the subsoil. Permeable paving is used for light vehicle loading in parking areas, replacing traditional pavement, that allows parking lot storm water to infiltrate directly for treatment. From the surface, porous asphalt and pervious concrete appear to be the same as traditional pavement. However, instead of having fine material as in traditional pavement, porous pavement has air voids that encourage infiltration.



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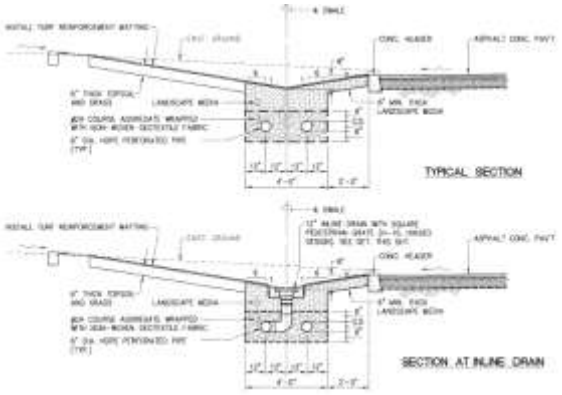
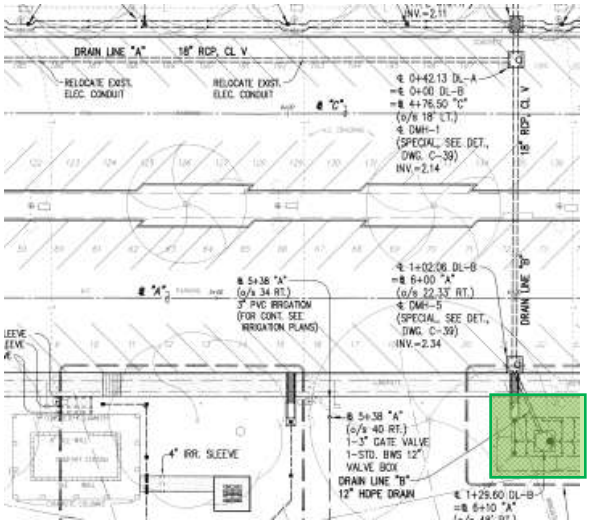


CROSS SECTION

City Treatment Control BMP TC-30; Vegetated Swales: Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff by filtration from the vegetation in the channel, from the subsoil matrix and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of storm water runoff. Vegetated swales can serve as part of a storm water drainage system and can replace curbs, gutters and storm sewer systems.



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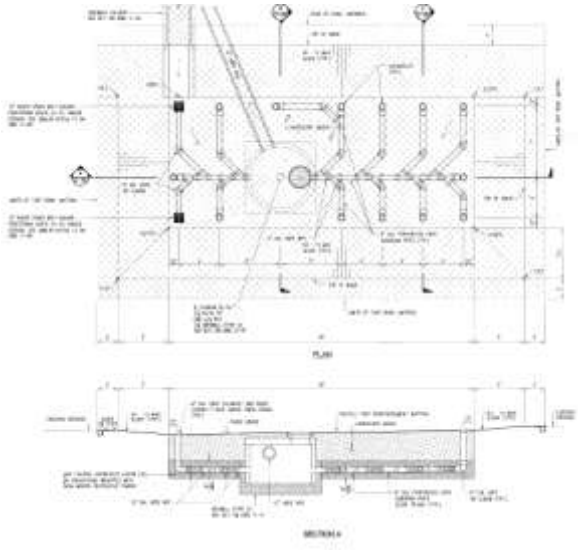

CROSS SECTION

City Treatment Control BMP TC-32; Vegetated Biofilter: Vegetated Biofilters, also called bioretention areas or rain gardens, are landscaping features adapted to provide on-site treatment of storm water runoff. The vegetated biofilter functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes similar to the mechanisms used in forested ecosystems. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through the buffer strip and then distributed into a ponding area. The filtered runoff discharges through an underdrain system.