

Attachment 7

Technical Justification of Project Physical Benefits

Overview

The Ash Avenue Improvement Project improvements will result in many physical benefits. The current project includes a bioretention system that contains a natural bottom and native plants that thrive in the adjacent Carpinteria City/State Beaches and Salt Marsh located approximately 0.5 miles from the project. The parking area encompassing a total of 0.25 acres that is being formalized as part of the project will have a permeable surface to permit infiltration. The drainage area that flows to the project area is approximately 20 acres, including many public streets and railroad track. Drainage improvements within the project include a concrete swale along the street that flows across a decomposed granite parking surface into a landscape area. Creative educational components located within the project, including informational kiosk (with video message and links to City website for the “User’s Manual” for the project environmental benefits) and interpretive area will expand and enhance the larger interpretive area that currently exists in the Salt Marsh Park.

The Physical Benefits of the project include:

- Replacement of a low functioning flood control structure.
- Installation of a high functioning drainage area.
- Capture and treat run-off prior to entering an environmentally sensitive area.
- Formalizing the drainage flow in the area surrounding the project.
- Improved recreational/educational enhancements

Detailed Description of the Project’s Physical Benefits

Replacement of a Low Functioning Flood Control Structure

Currently, the 380 foot long flood control structure along the western edge of the project area is an asphalt lined drainage ditch that is in a state of poor repair. This type of structure, when functioning as it was designed, carries water efficiently from one point to another without opportunity for infiltration, treatment or sedimentation. The project proposed to replace this structure with a more efficiently design system.

Installation of a High Functioning Drainage Area

The project proposes to construct approximately 4,000 square feet of a bioretention system that not only transmits water, but also permits infiltration and treatment due to the natural bottom being created. The new swale is also designed to work with and respond to the tidal influences that exist near the project. At this time, the sea water surface in the Salt Marsh is influenced by the tides. During higher tides, sea water has been documented to flow into the drainage area that is part of this project. The project landscaping area totaling over 3,500 SF is being designed to encourage plant growth in this type of environment, in addition to providing for infiltration and treatment of run-off from drainage area that influences this system, including street run-off. A series of five rain garden type areas totaling approximately 1,500 square feet are proposed to be constructed at various points along the bioretention system to provide additional areas for

Capture and Treat Run-off Prior to Entering an Environmentally Sensitive Area

The bioretention swale proposed is designed to capture and treat surface run-off from the approximately 20 acres attributed to this drainage area before entering the Salt Marsh. Within this area lie a number of public streets, private parking areas and an active railroad line. The vehicles that use these facilities have environmentally significant constituents that can be transmitted along the drainage system. Currently, the asphalt lined channel does not have any environmental benefits. The surface run-off currently travels in a number of directions due to the unimproved nature of the parking areas. The surrounding land uses include medium and high density residential parcels and associated streets. The project is designed to treat the water quality design event (85th percentile, 24-hour storm event), which for the City of Carpinteria is 2.7 inches (0.225 feet). Therefore the project is sized to treat a volume of 117,612 Cubic Feet. This amount is found by multiplying the drainage area by the storm event size times a run-off factor of 0.6. The project is planned to be completed in the winter of 2014 so the full project benefit was assumed that year. Subsequent year's project benefit was conservatively based on a 90% factor of the total storm water run-off.

The 380 foot long walking path and parking areas within the project are proposed to be constructed with pervious materials that promote treatment of surface run-off and allow for some infiltration prior to entering the drainage system.

Formalizing the Drainage Flow in the Area Surrounding the Project

The surface run-off currently meanders under the parked vehicles and then into the asphalt lined channel. Due to this historic flow, localized flooding has occurred. The drainage system is designed to formalize and direct the surface run-off into the bioretention system. With the project, the surface drainage will be channelized along the parking area and the improved concrete swale. The channelization of the run-off will reduce the potential for localized flooding and improve the access to the parking area.

Improved Recreational/Educational Enhancements

A unique project element is the improvements for public recreation and educational enhancements that are planned for the project. The improvements for public recreation include better access to the Salt Marsh for pedestrians, formalized improved parking areas for the Salt Marsh Park access and local residents. The project also includes designs for an interpretive area for a kiosk that would provide information to trail and other users describing the environmental benefits and improvements for the project and how this interacts with the Salt Marsh.

Annual Project Physical Benefits

The project's physical benefits that are measureable are summarized in Table 7-1 below.

Table 7-1 Annual Project Physical Benefits			
Project Name: Ash Avenue Improvement Project			
Type of Benefit Claimed: Improved water quality			
Measure of Benefit Claimed (Name of Units): Cubic feet			
Additional Information About this Measure: See comment section.			
(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (b) – (c)
2012	117,612	0	117,612
2013	117,612	0	117,612
2014	117,612	105,851	11,761
Etc	117,612	105,851	11,761
Last Year of Project Life (estimated life 20 years)	117,612	105,851	11,761
Comments: The contributing drainage area to the project is approximately 20 acres. The surrounding land uses include medium and high density residential parcels and associated streets. The project is designed to treat the water quality design event (85th percentile, 24-hour storm event), which for the City of Carpinteria is 2.7 inches (0.225 feet). Therefore the project is sized to treat a volume of 117,612 Cubic Feet. This amount is found by multiplying the drainage area by the storm event size times a run-off factor of 0.6. The project is planned to be completed in the Winter of 2014 so the full project benefit for the year was assumed. Subsequent year's project benefit was conservatively based on a 90% factor of the total storm water run-off.			

As seen in this table, the project (when constructed in 2013-14) would result in a significant water quality benefit for the Carpinteria City/State Beaches and the Salt Marsh. Water quality would be conservatively improved by 90% compared to pre-project conditions.