Part 3 Stormwater Management Plan

Introduction

The preliminary Stormwater Management Plan for Phase 1 Division 14 of the Suncadia Master Planned Resort (MPR) is described in this part. The Stormwater Management Plan reflects application of design guidelines detailed in the Department of Ecology Stormwater Management Manuals as well as information presented in the April 1999 (Rev. July 1999) Master Drainage Plan (MDP) that was prepared by W&H Pacific for the MPR. The MDP outlines stormwater design procedures, guidelines, and protocols for the development.

Updates to the MDP include;
(1) adoption of the drainage standards set forth in Washington State Department of Ecology's Stormwater Management Manual for Western Washington August 2001 (DOE SMM),
(2) an addendum to the MDP dated August 2002 that provides (a) water quality protocol information for golf course areas that discharge to surface waters, and (b) revision of golf course water quality protocol summary information for infiltration to conform with the detailed protocol information.

Design specifics addressed in this part include:

- Runoff rate/volume estimation methodology
- Infiltration facility collection and conveyance
- Water quality treatment
- Overflow routing
- Conceptual Stormwater Plan

The proposed Phase 1 Division 14 land use for the resort is shown in the General Site Plan for Phase 1. The property is located north of Big Hill Drive and Phase 1 Division 13.

The Suncadia stormwater system will be owned, operated, and maintained by either the Suncadia Residential Owners Association, or the Suncadia Community Council, depending on the location within the resort. Construction of facilities will be by Suncadia Resort LLC.

Conceptual Drainage Plan

Stormwater runoff for the Phase 1 Division 14 roadway will be divided into local basins and conveyed downstream, following the natural topography of the site, to water quality treatment, detention & dispersion, and infiltration facilities.

The majority of soil on the site is underlain by Quatenary deposits of Glacial Outwash and Glacial Moraine. For additional information regarding the existing geology and soils, see the EIS Technical Report for Geology, Groundwater and Soils prepared by AESI and dated June 29, 1999.

A portion of the proposed Phase 1 Division 14 plat that contains steep slopes has been mapped in the Erosion Hazard Map (Figure 4-13 of the MPR DEIS) as Zone 1 "High to Severe Hazard Risk" and in the Landslide Hazard Map (Figure 4-14 of the MPER DEIS) as Zone 3 "Moderate Hazard Risk". To mitigate for these erosion and landslide risks, the developed portion of Phase 1 Division 14 will have appropriate building setbacks from the top of slope per the geotechnical report.

Runoff from Road A be collected in catch basins, conveyed in pipes along the roadway and will be directed to bio-infiltration swales or gravel dispersion trenches that will provide flow control (by infiltration and dispersion) and water quality treatment. For more information, see the Conceptual Utility Exhibit.

Runoff from the 39 detached resort residential units will be typically handled on the individual lots by dispersion and infiltration.

Infiltration and Detention Facilities

As discussed in the Conceptual Drainage Plan narrative, detention facilities followed by dispersion trenches or infiltration facilities are proposed onsite. Furthermore, infiltration and dispersion may also be provided for the individual lots.

Water Quality Treatment

Water quality treatment will be provided for runoff from impervious road surfaces requiring stormwater treatment. Treatment will be provided in one of several Department of Ecology recommended treatment facility types. Water quality treatment options available for Suncadia are wetponds/lakes, stormfilter systems, biofiltration swales, bio-infiltration, and sheet flow dispersion. All water quality facilities are sized to treat the water quality storm. The water quality storm is that storm for which all storms equal or smaller in size account for 90 percent

of the average annual runoff. For Phase 2, the water quality design storm is 1.68 inches in 24-hours. Proposed water quality facilities are described below.

Sheet Flow Dispersion

Sheet flow dispersion is an approved Department of Ecology water quality and quantity control method for areas that preserve the existing forest duff. D.O.E. allows this treatment when the impervious area is less than 10 percent of the basin and 65 percent or more of the forest duff is retained. This water quality treatment method will be used for flow control for the 148 detached resort residential units and for the roadways, as feasible.

Bio-Infiltration

Bio-infiltration can be provided as described in the Department of Ecology Stormwater Management Manuals by routing runoff for the water quality storm through a 6-inch bed of filtration medium with specific characteristics for infiltration rate, cation exchange capacity, and total organics that establish suitability for water quality treatment. This method of providing water quality treatment can be provided by lining roadside ditches or tops of infiltration facilities with a 6-inch bed of filtration medium that meets or exceeds the soil characteristics as follows:

Infiltration rate: Less than 2.4 inches/hour
Cation Exchange Capacity: At least 5 meq/ 100 grams of dry soil
Organic Content: At least 1%

Water quality treatment can also be provided by routing runoff through native soils with infiltration rates greater than 2.4 inches per hour as long as the bed thickness is increased to provide an equivalent resonance time.

This water quality treatment and flow control method will be used for the proposed roadways.

Overflow Routes

Each bio-infiltration swale will have a controlled overflow structure. The overflow will discharge through a gravel dispersion trench located near lowest portion of each swale and continue downstream as overland sheetflow or infiltrate where conditions are favorable. This will provide for the infiltration and dispersion of stormwater even if one facility is partially clogged or out of operation.

The overflow routes proposed for the roadways are controlled dispersion areas.