TABLE OF CONTENTS

Section 16 Building Block 3.4: Setback Levees to Restore Shaded Riverine Habitat 16-1

16.1 Introduction 16-1
16.1.1 Background 16-1
16.1.2 Purpose and Scope 16-1
16.1.3 Objective and Approach 16-1
16.2 Description of Improvement 16-1
16.3 Findings 16-2

Figures

16-1 Building Block 3.4: Setback Levees to Restore Shaded Riverine Habitat

16.1 INTRODUCTION

Figure 16-1 shows the flash card for Building Block 3.4: Setback Levees to Restore Shaded Riverine Habitat.

16.1.1 Background

This building block is intended to restore shaded riverine habitat for use in potential risk-reduction evaluations. The discussion includes background information; describes conceptual development of the building block; and provides a cost estimate, risk reduction, findings, and conclusions.

16.1.2 Purpose and Scope

This building block was developed to restore shaded riverine habitat and reduce the likelihood of levee failures due to seismic events. The building block involves the construction of 20 to 30 miles of seismically repairable setback levees along Sutter Slough, Steamboat Slough, or San Joaquin River.

The scope of the analysis includes data review, an engineering analysis, a cost estimate, and a risk reduction estimate.

16.1.3 Objective and Approach

The objective is to confirm the engineering feasibility of this building block, evaluate its effect on risk, and develop a preliminary cost estimate. A typical upgraded setback levee cross section was developed to estimate cost and risk reduction using the available geotechnical database and information from the Geographic Information System database specifically prepared for Phase 1 of the Delta Risk Management Strategy (DRMS) project.

The California Department of Water Resources is currently undertaking a project to complete the light detection and ranging (LiDAR) survey of the entire study area. However, the results of the LiDAR survey effort were not available at the time of the analysis.

16.2 DESCRIPTION OF IMPROVEMENT

The setback levees considered for this building block are designed to offer some degree of seismic resistance. Specifically, these “seismically repairable” setback levees will likely deform and slump during a large earthquake but will prevent flooding of the islands. Because these levees have a lower level of seismic resistance than the seismic-resistant levees proposed in Section 8, Building Block 1.6: Armored Pathway (Through-Delta Conveyance), these levees would require repair after a major earthquake.

The seismically repairable setback levees discussed for this building block include many of the same features as the seismic-resistant setback levees discussed in Section 8, Building Block 1.6: Armored Pathway (Through-Delta Conveyance). However, the foundation improvements included with the seismic-resistant setback levees are not provided for the seismically repairable setback levees considered in this building block. Nonetheless, the riparian bench and the shaded

riverine habitat to be created under this building block are similar to those developed in conjunction with the seismic-resistant setback levees. See Section 8.2.3.4 for a discussion of the riparian benches created under building block 1.6 and Appendix 8A for a discussion of the environmental impact of the armored pathway.

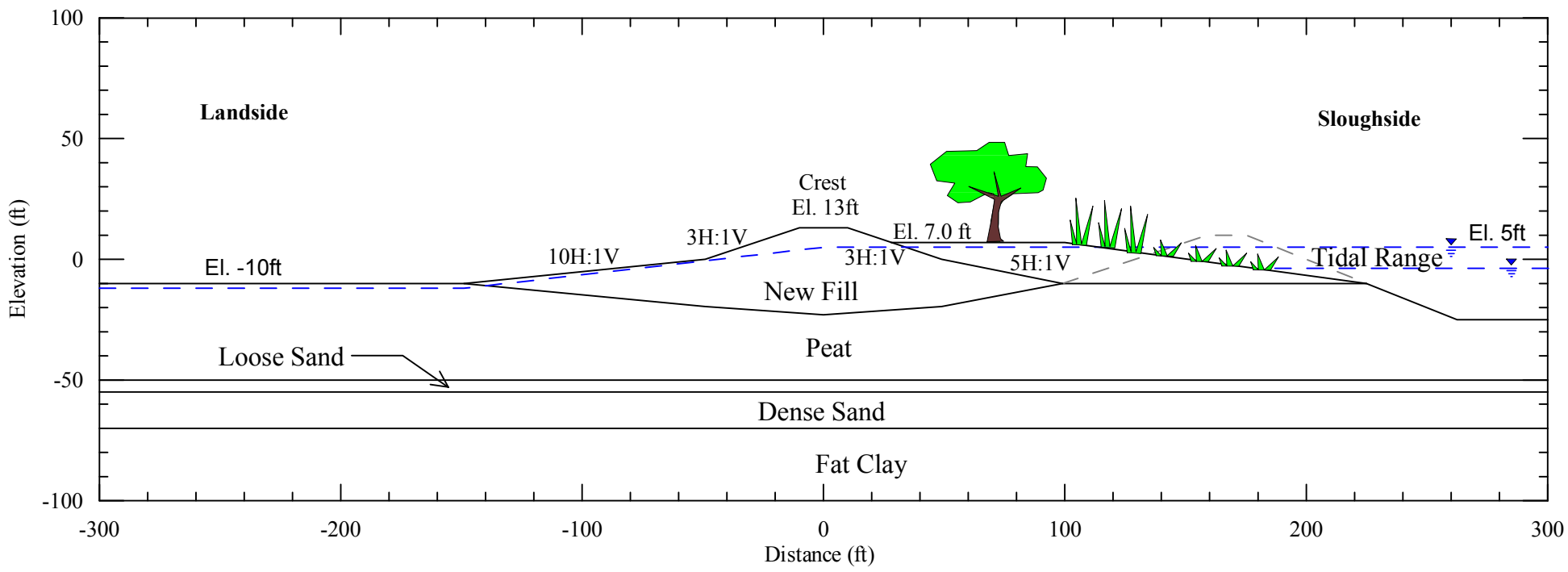
16.3 FINDINGS

The key findings of this building block are as follows:

- The candidate sites for the creation of a 20- to 30-mile-long, 200- to 300-foot wide riparian corridor are Sutter Slough, Steamboat Slough, or San Joaquin River. This corridor would establish shaded riverine aquatic habitat on either side of the selected slough or river.
- The cost of constructing 20 miles of setback levees is estimated to be $480 million, and the cost of constructing 30 miles of repairable setback levees is estimated to be $720 million. These costs include landscaping and plantings for shaded riverine habitat restoration.
- Although the setback levees are not seismic-resistant levees, they have some capacity to withstand a major earthquake without failing to the point of breaching. However, the setback levees would experience excessive deformation and slumping and would require repair after a major earthquake.

Figures

Typical Seismically Repairable Setback Levee Cross Section



Project Information

Select 20 to 30 miles of levees to restore shaded riverine habitat by constructing seismically repairable setback levees

Construct setback levees to the following standards:

- Maximum waterside slope of 3H:1V, with a waterside riprarian bench
- Maximum landside slope of 3H:1V to 10H:1V (varies with peat thickness and levee height)
- Minimum crest width of 20 feet
- 3 feet of freeboard above the 100-year flood stage

Levee lengths for upgrade: 20 to 30 miles along Sutter Slough, Steamboat Slough, or San Joaquin River

Benefits

- Restoration of shaded riverine habitat (a 200- to 300-foot-wide riprarian corridor)
- Reduction of seismic risk for 20 to 30 miles of selected levees, though levees may require repair after major earthquake

Project Cost

20 miles: $480 million

30 miles: $720 million