

## Water resources Protection Manual

### Requirements and Recommendations

The following requirements will be used to determine compliance with Section 2.3.3 (6) of the Water resources Protection Ordinance (Ordinance 06-1). Recommended practices are outlined at the end of each section as appropriate. Illustrative detail and clarification on the specific application of the requirements and recommendations can be found in the Design Guide contained in Chapter 3.

#### I. Riparian Corridor Protection

- A. Existing native riparian vegetation is retained unless it presents a threat to public health and safety, including an imminent danger of induced flooding, and/or a biologist/arborist confirms that removal will improve the stream ecology or habitat or it is deemed that removal is unavoidable.
- B. When riparian vegetation is removed, required mitigation is provided.
- C. Non-native species are not planted between the top of banks of a stream or within an existing riparian corridor.
- D. Planting of non-native invasive species is not taking place adjacent to an existing riparian corridor.
- E. Invasive species are not planted.

#### Recommendations:

- 1. Preserve in and near-stream existing riparian vegetation whose canopies provide shade and nutrients to aquatic life.
- 2. Protect stream characteristics suitable for fish habitat when a modification is proposed to influence these characteristics including riffles, pools, gravel beds, stable undercut banks, overhanging vegetation and in-stream woody debris.
- 3. Use watershed specific native species for major development restoration landscaping.
- 4. Locate loading docks, trash enclosures, chemical storage areas, and stationary noise producing mechanical equipment away from streams and riparian corridors.
- 5. Locate new paved areas, active recreational areas, agricultural growing areas, and grazing activities outside riparian corridors.
- 6. Avoid nighttime lighting in riparian corridors.
- 7. Locate trash bins away from streams.
- 8. Avoid bright colors and glossy or glare producing building finishes on structures facing the stream or riparian areas.
- 9. Direct nighttime lighting away from the riparian corridor.
- 10. Maximize the distance between nighttime lighting and the riparian corridor.

## **II. Levee and Pipeline Protection**

- A. A slope stability analysis shows the integrity of the levee is maintained related to any modification to a levee.
- B. Replacement of fill in levees is designed according to District specifications.
- C. Trees are not planted on levees unless additional fill is placed against the levee.
- D. Bubbler or drip-system irrigation is used within the outboard levee slope, and only for plant establishment purposes.
- E. Main irrigation lines are not installed on levees.
- F. Any structure providing support to levees is designed for a 50 to 100-year life span.
- G. Water pipelines are outside District levees.
- H. Trees are not planted within easements or right-of-way of District water supply pipelines.

### Recommendations:

- 1. Provide a building setback for levee sections of 18 to 25 feet from the toe of the levee.
- 2. Place fill adjacent to the dry side of the levee to minimize the levee height unless it causes drainage problems, disturbs wetlands, creates safety concerns, or impacts aesthetics of properties.

## **III. General Landscaping**

- A. Irrigation systems are designed such that runoff will not cause erosion.
- B. Use of pesticides on District property or easements is conducted according to District's pesticide policy.

### Recommendations:

- 1. Follow efficient water use landscape ordinance requirements for drought tolerant plants and water conservation.

## **IV. Streambank Stability and Streambed Conditions**

- A. Projects are located outside the slope stability area, defined as the greater of 1 or 2, below:
  - 1. Two to one (2:1) slope stability requirement. Please note that distance may need to be increased depending on whether the stream is deeply incised or have highly erodible banks.
  - 2. Twenty (20) feet from top of bank.
- B. Projects which are within the slope stability area have a geotechnical analysis demonstrating that:
  - 1. The development would not require introduction of hardscape in order to maintain active floodplain or active channel slope.
  - 2. Maintenance or repair of the stream can be provided.
  - 3. The location of the proposed structure will not threaten bank stability.
  - 4. Bank instability will not threaten existing structures and/or potentially cause a health and safety hazard.

## **V. Encroachments between the Top of Bank**

- A. Decks, pathways, and buildings or any other structures do not overhang or encroach beyond or within the top of bank.
- B. New and replacement bridges are constructed as clear span structures unless length of the span makes clear span infeasible, then
  1. Footings and pile caps are designed based on channel scour to prevent erosion.
  2. Foundation depth is a minimum of three (3) feet below the active channel invert.
  3. The clearance under the bridge is a minimum of 12 feet unless access to the stream is to be provided from the road.
- C. Structures proposed between the top of bank do not reduce the active channel or active floodplains' conveyance area or re-direct flow to the detriment of another bank or the river bed unless a hydraulic analysis indicate no increase in erosive velocity or flood elevations will result.
- D. Any required hydraulic analysis:
  1. Is prepared using HECII or HEC-RAS format (small rural streams may utilize simpler hydraulic analysis methods).
  2. Models debris loading on piers (3 times the pier width).
  3. Includes a scour analysis.
- E. Structures proposed between the top of bank along jurisdictional creeks comply with District freeboard requirements.
- F. Proposed encroachments in the active channel and active floodplains provide for fish passage and do not impact aquatic life.
- G. Proposals to place structures in the active channel due to structural requirements, feasibility, or otherwise, include the appropriate accepted feasibility, geomorphic, biological, and/or hydraulic analyses.

### Recommendations:

1. Mitigation for loss of riparian habitat or aquatic habitat impacts related to construction of new structures is located as close to the new structure as possible.

## **VI. Erosion Prevention and Repair**

- A. Remediation of onsite existing erosion is provided.
- B. Erosion repair projects have an evaluation of the project on potential impacts and no negative impacts are found relating to
  1. Upstream and downstream banks.
  2. Post-construction erosion potential.
  3. Flood elevations.
  4. Or, mitigation is identified and provided as part of the project.
- C. Construction on slopes greater than 5 percent include plans for implementation of erosion and sediment control measures.
- D. Hardscape or retaining wall proposals have an analysis demonstrating that
  1. All softer methods have been evaluated
  2. The proposed method will reduce erosion
  3. The proposed method will not cause erosion or negatively impact proper stream function in other areas
  4. Or, mitigation is identified and provided as part of the project.
- E. Channel repairs match the contours of the upstream and downstream banks.

- F. Treatment of bare earthen slopes to minimize erosion and sedimentation resulting from work is provided.
- G. Design cutoff walls or keys anticipate scour depth and have a minimum depth of three (3) feet.
- H. Design of erosion protection utilizes the softest possible method.

Recommendations:

- 1. Include guidance provided in the Bank Protection and Erosion Design Guide for any erosion prevention and repair design work.
- 2. Appropriate vegetation is planted between the top of banks as an alternative to hardscape bank protection while maintaining design channel capacity.
- 3. Encourage drainage designs that avoid the need for outfalls or reduce the size and/or number of outfalls.
- 4. Lay back over-steepened banks to a more stable configuration whenever possible.

## **VII. Grading**

- A. Grading adjacent to streams provides for buffer areas and vegetated swales between the stream and graded areas.
- B. Erosion and sediment control measures are taken to prevent sediment contribution from any construction area into Calero, Anderson, Lexington, Coyote, and Almaden reservoirs.

Recommendation:

- 1. Consider protective measures in source water protection zones and sensitive areas of reservoir watersheds.

## **VIII. Outfalls, Pump Stations and Site Drainage**

- A. Runoff is directed to the same watershed where the project is located.
- B. Site drainage is directed through vegetated areas or stilling basins prior to discharge or collection in storm drain systems.
- C. Concentrated drainage (i.e. roof overhangs or downspouts) is directed away from the stream or overbank drainage is directed to vegetative buffer strips or landscape areas prior to reaching the stream.
- D. The minimum number of outfalls is used.
- E. New channel outfalls conform to the municipality's drainage master plan.
- F. Slope protection for outfalls meet District minimum engineering standards.
- G. Outfalls do not overhang the stream bank or bed.
- H. The minimum outfall diameter is 12 inches.
- I. Outfall discharge is oriented downstream and pipe invert is at least 2 feet above the stream bottom in areas where sediment deposition is anticipated.
- J. Flap gates are installed whenever 100-year surface water elevation is above adjacent ground at inlet.
- K. Dormers in outfalls are provided with flap gates to isolate the flap gates and keep them out of flow area.

- L. In conjunction with new or redevelopment, abandoned outfall pipes and slope protection are removed and the stream bank restored to similar condition existing upstream and downstream of site.
- M. Outfall discharge does not pollute receiving water or cause channel erosion.
- N. A discharge management plan is developed to manage pump operations during high water (flood) events for development projects requiring a pump station that discharges to a stream.

Recommendations:

- 1. Limit pump discharges to the extent feasible during peak flows to minimize potential impacts from flooding.
- 2. Prefer that there are no new outfalls

## **IX. Channelization**

- A. On-site surface streams are not buried.
- B. On-site surface streams are not in culverts except for road crossings in which case the crossing is clear span and:
  - 1. Carries the bank full flow.
  - 2. Accommodates a modified floodplain drainage.
  - 3. Accommodates the 100-year flow, if feasible.
- C. Regional debris or sediment basins that will be owned or maintained by the District are designed for 50-year sediment capacity.
- D. Modifications to open channels have an accepted hydraulic analysis including stream dynamics and induced flooding.
- E. Stream conveyance area is designed for 100-year design flow with freeboard, unless the active channel and floodplain will not contain the designed 100-year flow.
- F. Creeks are not filled to accommodate grading and construction until impact avoidance and minimization efforts are maximized.
- G. Impacts to habitat are demonstrated to be avoided.

Recommendation:

- 1. Dedicate an 18 to 22-foot wide maintenance area to the District for stream modification projects.
- 2. Recommend restoration of natural stream processes if possible.
- 3. Use multi-stage culverts with cross-sections designed to carry different flows for meeting IX.B.1,2 and 3.

## **X. Utility Encroachments**

- A. Proposals do not include longitudinal (parallel) encroachments within District right of way.
- B. Utility pipes or conduits are under the stream or placed inside of, or attached to, the downstream face of a bridge, and go under any levee (no cuts in levees). If it is unfeasible to go under or attach to the downstream face of bridge, the utility crossing is located on the upstream face of bridge and the design provides the following features:
  - 1. Would not catch debris,
  - 2. Would be capable of surviving impacts from floating debris in high flow,
  - 3. Would not hinder emergency debris removal or maintenance operations.
- C. New or replacement bridges provide locations for future utility crossings.

- D. Utilities proposed under the stream are concrete encased or placed in a sleeve.
- E. Borings are five (5) feet below lined channels and eight (8) feet below unlined channels.
- F. The minimum clearance for cut and cover is three (3) feet and is based on scour depth.
- G. A fracout prevention and response plan (describing how water quality will be protected in the event of fracout) is prepared for directional drilling projects using bentonite or other lubricants to go beneath or near streams and aquatic habitats.

Recommendations:

1. Utilize directional bore to install under-channel utilities.

## **XI. Trail Construction**

- A. Trails are located so as to avoid impacts to stream and riparian areas unless unfeasible.
- B. Deep excavation for trail construction takes place outside tree root zones unless unfeasible.
- C. Trails on District right of way have an agreement defining maintenance, management, and liability responsibilities of facilities.

Recommendations:

1. Encourage joint use of pedestrian/bicycle paths along creeks.
2. Place paved multi-use trails so as to maximize the distance between the stream and the riparian areas.

## **XII. Septic Systems**

Recommendations:

1. Consult with District to determine whether land feature is an active floodplain or swale and assist in determining high water marks at reservoirs.

## **XIII. Groundwater Protection**

- A. Groundwater resource assessments acceptable to the District are prepared when there is potential for significant groundwater supply or groundwater quality impacts.
- B. Wells are shown on plans and are registered with the District and either be maintained or destroyed in accordance with District standards.

Recommendations:

1. Manage (limit, monitor and implement best management practices) existing high risk activities in recharge areas of basin.

## **XIV. Flood Protection**

- A. In special flood hazard zone A (areas where base flood elevations have not been determined) hydraulic analyses are prepared to determine the base flood elevation for subdivisions greater than 5 acres or 50 lots whichever is lesser.
- B. For major developments near streams subject to California Environmental Quality Act (CEQA) review that are compatible with the General Plan utilized for developing District hydrology

and the Federal Emergency Management Agency (FEMA) floodmaps, development does not increase site runoff so as to increase depth (0.1 foot increase in water surface) or lateral extent of flooding or increase discharge in local streams.

- C. A hydraulic analysis, prepared by registered civil engineer, is prepared to demonstrate that there will not be flood impacts created in relation to XIV.B.

Recommendations:

1. Recommend increased levels of protection as described in the Department of Water Resources Model Floodplain Ordinance, recommendations of California Floodplain Management Task Force (Dec 2002), and FEMA's Community Rating System Program.
2. Utilize any other available base flood elevation data as criteria for meeting National Flood Insurance Program requirements for construction and substantial improvements for subdivisions other than those covered under XIV.A.